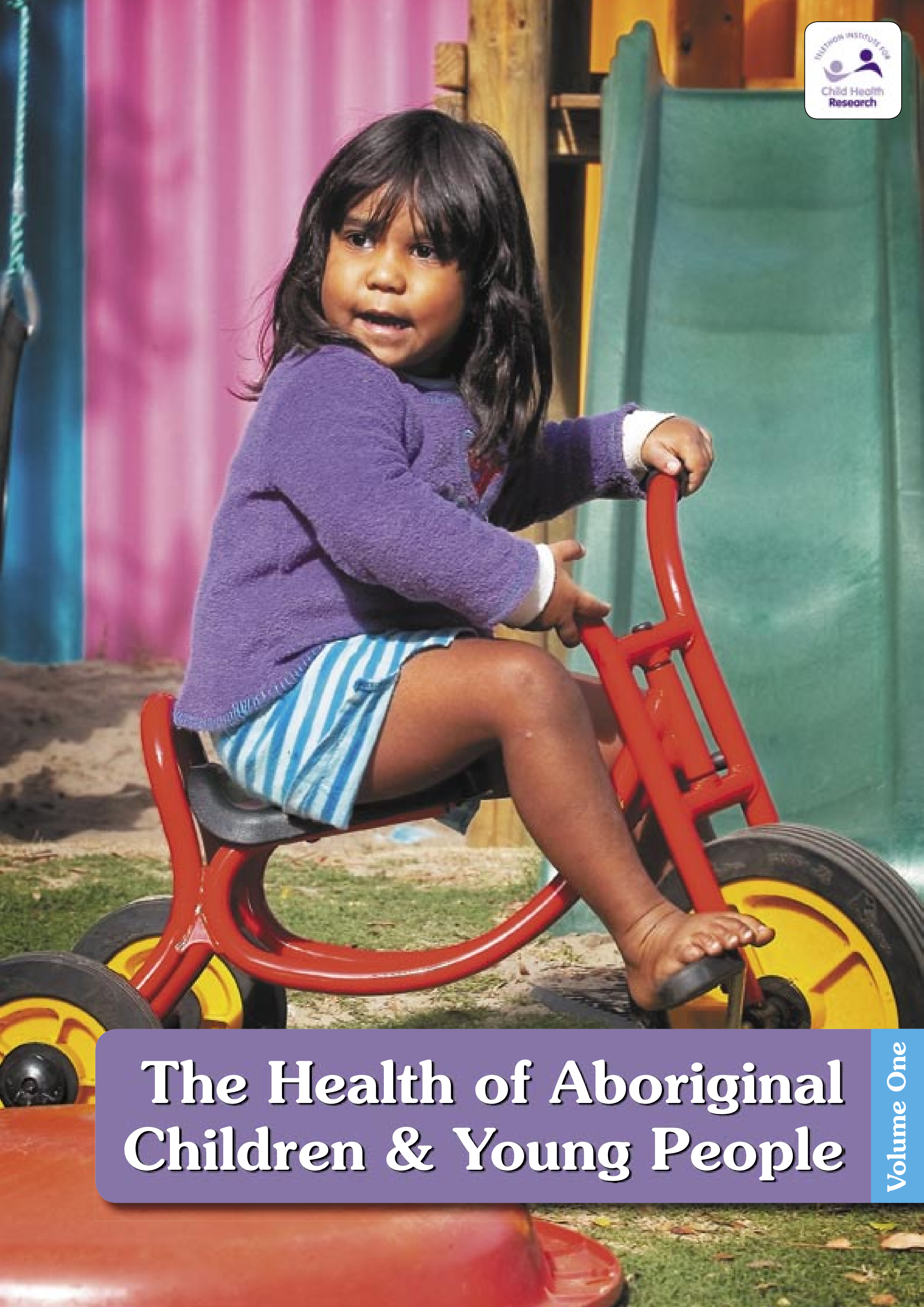

Telethon Institute for Child Health Research

The Health of Aboriginal Children & Young People

Volume One

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The
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PROJECT STEERING COMMITTEE

Ted Wilkes (Chair), Ken Wyatt, Pat Kopusar, Danny Ford, Shane Houston, Henry Councillor, Gregg Stubbs, Shirley Bennell, Lester Coyne, Irene Stainton

The Western Australian Aboriginal Child Health Survey has been carried out under the direction of the project's Aboriginal Steering Committee. As the Aboriginal custodians of the survey data, the Steering Committee is responsible for the cultural integrity of the survey content, field methodology, analysis and interpretation of findings. This committee also has oversight of the survey's community feedback and dissemination strategy to ensure the appropriate utilisation of the data for the benefit of Aboriginal people.

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FOREWORD

Since the establishment of the Swan River Colony 175 years ago there have been major changes in the health status of Aboriginal children which have impacted significantly on the quality of life and opportunities of individuals, their families and communities.

Thirty years ago the rate of Australian Indigenous infant mortality was more than double that of the non-Indigenous population. Similar high levels of indigenous infant mortality and disparities with their non-indigenous counterparts also occurred at that time in other formerly colonised countries such as Canada, the USA and New Zealand. However, in contrast to Australia, these other countries have made significant progress over the past three decades in closing the gap in health status between indigenous and non-indigenous people in terms of both infant mortality and average life expectancy. It is unacceptable that a wealthy nation such as Australia has failed to match these gains for its Indigenous people.

The Aboriginal community in Western Australia has placed enormous trust in the Telethon Institute for Child Health Research and the Aboriginal Steering Committee for the Western Australian Aboriginal Child Health Survey. The Steering Committee has been responsible for the governance, cultural integrity and relevance of the survey content, the community engagement processes, the survey methods and the dissemination of findings. The research team at the Institute has worked to secure the resources and to provide the scientific expertise needed to carry out the survey.

This survey has been a monumental effort and both the Aboriginal community of Western Australia and the research team are to be congratulated for the spirit of partnership that has been obvious since its inception. It is in this context that the vision and leadership of Professor Fiona Stanley in supporting the development of the Kulunga Research Network and her championing the need for this survey should be particularly acknowledged.

This first volume of findings contains a wealth of information on the living circumstances of Aboriginal families with children. It covers a wide range of health issues that affect children's health, development and future opportunities. Documenting the current state of Aboriginal child health and development and identifying the key factors which assist Aboriginal children to be nurtured into healthy, productive and fulfilling adult lives is an important step towards policy which acknowledges the lived reality of present day Aboriginal experiences.

If used wisely, this ground-breaking research can help break the shackles of the past and assist the process of true reconciliation by informing effective planning, coordination and delivery of services by the Commonwealth, State, Local Government and Aboriginal community controlled sectors.

It is time that we placed the highest priority on working together to enable all Aboriginal children to grow into healthy adults, to sustain their cultural heritage and enjoy a similar quality of life to other Western Australians.

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Centre for Developmental Health
Curtin University of Technology and
Telethon Institute for Child Health Research

Heather D'Antoine
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Appendices

ABOUT THIS PUBLICATION

This publication was produced by the Telethon Institute for Child Health Research (ICHR) through its Kulunga Research and Training Network, a formal partnership between the Institute and the Western Australian Aboriginal Community Controlled Health Organisations (WAACCHO), with the assistance of the Australian Bureau of Statistics (ABS).

ATTRIBUTABLE COMMENTS

The views expressed in the numbered chapters of this publication relating to the implications of the Western Australian Aboriginal Child Health Survey (WAACHS) findings and for future directions in Aboriginal health are those of the Institute. Views expressed in the Foreword and in the Preface are those of the authors.

RELATED PUBLICATIONS

This publication is the first of five volumes planned for release from the results of the Western Australian Aboriginal Child Health Survey. The focus of this volume is Physical Health. Forthcoming volumes will focus on: Social and Emotional Well-being; Education; Family & Community; and Justice issues.

STRUCTURE OF THE PUBLICATION

This volume includes a guest-written foreword and a guest-written preface. Five chapters comprise the bulk of the volume. Non-text elements, such as maps, graphs and charts within chapters are numbered as ‘Figures’ and are placed as proximate as possible to their reference in the text. Fully estimated statistical tables are numbered as ‘Tables’ and are at the end of each chapter. ‘Figures’ usually have ‘Tables’ as their source and are referenced accordingly. Additional information is included within shaded boxes. The contents of these boxes may assist the reader with specific definitions, and provide background, context or comparison. References cited within commentary boxes are end-noted within the box. Other references within a chapter are noted at the end of that chapter. A series of Appendices and a Glossary follow the final chapter.

UNDERSTANDING THE DATA

The tables and text included in this volume are derived either directly from the Western Australian Aboriginal Child Health Survey, or through linkage of WAACHS data and administrative data. Survey reports were provided by carers of Aboriginal children and were accepted as given, interviewers were not in a position to verify carer responses either at time of interview or afterwards. Medical practitioners were not involved to either diagnose conditions or to validate carer reports of given conditions. Some discrepancy may exist between reported values and actual values.

CUSTODY OF THE DATA

An Aboriginal Steering Committee directed all phases of the Survey. This Committee remains the custodian of all data collected and is responsible for the cultural integrity of the survey methods, analysis and dissemination processes.

COMMUNITY FEEDBACK

The Kulunga Research and Training Network has designed a communication strategy which will maximise information available to Aboriginal communities. The results and findings will be reported and profiled for each of the ATSIC regions throughout the state.

CONTACT FOR INQUIRIES

General inquiries about the WA Aboriginal Child Health Survey and inquiries seeking statistical clarification of any of the topics covered should be directed to the Telethon Institute for Child Health Research at waachs@ichr.uwa.edu.au .

OBTAINING COPIES OF THIS PUBLICATION

This publication is available electronically as a portable document format (PDF) file on the Institute's website: www.ichr.uwa.edu.au. Hardcopies of the publication may also be purchased through the Institute for Child Health Research, PO Box 855, West Perth, WA 6872. Telephone (08)9489 7777, Fax (08)9489 7700.

A summary booklet for each of the volumes will be produced in hard copy and will also be available electronically. The summary for this volume is currently available on the ICHR web site.

PREFACE

A/Professor Helen Milroy, MBBS, FRANZCP, Cert Child Psych
Director of the Centre for Aboriginal Medical and Dental Health
University of Western Australia

I wish to thank Associate Professor Ted Wilkes for sharing his extensive knowledge, experience and wisdom in preparing the material for discussion.

FAMILY: Children are a gift, born from country into a family, ancestry and culture as enduring as the universe. Connected for eternity through love, life and spirit.

For all the lost children, those still searching, and for the little ones yet to find their way in the world.

ABORIGINAL CHILD HEALTH AND HISTORY

Children have always been regarded as precious and central to Aboriginal society. They represent the continuing link with Aboriginal ancestry and spirituality and carry with them the hopes for the future. Cultural continuity rests on their shoulders and every child has an integral and irreplaceable part to play in life, culture and history. However, Aboriginal children have been traumatised over many generations since colonisation and their place in broader society is yet to be determined. What guarantees can we give Aboriginal children today in view of the level of disadvantage and discrimination currently experienced by Aboriginal peoples within Australia?

Writing from the perspective of an Aboriginal medical practitioner and psychiatrist, I have used the term Aboriginal recognising that some of the issues and experiences discussed in this preface may apply to both Aboriginal and Torres Strait Islander peoples. Whatever terms are used to describe Aboriginal and Torres Strait Islander peoples, they should be used with respect and instil a sense of pride, bearing in mind these ‘labels’ are applied to identify our children on the basis of their unique cultural heritage. [1]

The journey to this point in time is built upon the many stories which reflect the experiences, injustices, resilience and relationships of both the Aboriginal and non-Aboriginal communities of Australia. To understand how these have and continue to affect Aboriginal children’s health requires consideration of this historical legacy and a cross-sectional view of children’s development within multiple dimensions. The Western Australian Aboriginal Child Health Survey represents a new benchmark in Australian research and gives voice to the lived reality for Aboriginal and Torres Strait Islander children, families and communities throughout this state.

The survey seeks to capture contemporary family portraits or snapshots of children within families. To fully understand these portraits a multidimensional and holistic view of health is required that includes traditional, historical and contemporary contexts while also taking into account the biological, psychological or emotional, social, spiritual and cultural dimensions of life which all impact on and shape the way children develop. It also requires recognising that the collective stories of Aboriginal families and children are as crucial and important to their survival as are any statistical data.

This first volume of findings focuses particularly on children’s physical health. The subsequent volumes will focus on other aspects of health and life and progressively build a multi-layered picture of the many factors impacting on health and development. This multidimensional view reflects the holistic way in which Aboriginal people consider health and life. This view is central to and evident in many of the Aboriginal community driven health initiatives that have already been developed. While the tables, graphs and other statistical information provide a unique account of the current state of Aboriginal child health we must remember that these represent real children in real families, in communities and life.

CONCEPTS OF HEALTH

The concept of health as discussed in the “National Aboriginal Health Strategy 1989” report suggests that:

> *“[Health is]…not just the physical well-being of the individual but the social, emotional, and cultural well-being of the whole community. This is a whole-of-life view and it also includes the cyclical concept of life-death-life.”*[2]

This is also compatible with the holistic view of health articulated in the Guiding Principles of the “Ways Forward” report by Swan and Raphael (1995):

> *“The Aboriginal concept of health is holistic, encompassing mental health and physical, cultural and spiritual health. Land is central to wellbeing. This holistic concept does not merely refer to the “whole body” but in fact is steeped in the harmonised inter-relations which constitute cultural wellbeing. These inter-relating factors can be categorised largely as spiritual, environmental, ideological, political, social, economic, mental and physical. Crucially, it must be understood that when the harmony of these inter-relations is disrupted, Aboriginal ill health will persist.”*[3]

Physical health is considered part of the broader concept of wellbeing and is hence interconnected to all other aspects of life and development with a particular emphasis on the connection to land. A holistic model of health allows for the development of broader and more innovative solutions to health problems. Policy development, service provision and research all need to encompass this broader understanding of health. They also need to acknowledge that many of the potential solutions or interventions needed to address current health issues lie outside of the health sector and require ‘whole of life’, ‘whole of government’ approaches.

HISTORY AND ITS IMPACT ON HEALTH

The health status of Aboriginal children has changed over time and currently reflects the way in which historical issues have impacted on health. From the Aboriginal perspective, carrying the past with you into the future is as it should be and this reflects both a collective consciousness as well as an individual journey. Stories of ancestors are carried in this way, enabling individuals, families and communities to know where they have come from and where they are heading. As Mick Dodson (1994) points out;

> *“ The repossession of our past is the repossession of ourselves.”*[4]

Prior to colonisation, Aboriginal people lived within a structured, inclusive society with a comprehensive system of governance and law. There were extensive intact family kinship networks and Aboriginal people appeared to enjoy a relatively good state of health. Following colonisation however, there are several prominent issues that arise from the many traumas that ensued including the decimation of the Aboriginal population over generations. This historical legacy must be considered in order to understand the deplorable state of Aboriginal health in 2004 and include the cumulative effects of:

- Dispossession from traditional lands
- Massacres
- Exposure to introduced diseases

- Incarceration of men, women and children
- Extreme legislative control over all facets of life
- Radical changes in diet, nutrition and physical activity
- Fragmentation of family over generations especially through the forced removal of children
- Discrimination against and segregation of Aboriginal peoples
- Exclusion from health care and education

TRAUMA AND GRIEF

The historical context of Aboriginal history since colonisation is one of profound trauma resulting in a sense of powerlessness and multigenerational grief that is experienced both within and across Aboriginal communities throughout Australia. The level of trauma that has been sustained over generations combined with the sheer physical stress required for survival for an entire cultural group has taken a very significant toll. The effect of these stresses on immune systems, biology, physiology and neurochemistry must be considered. As well, the cumulative effect of grief and loss cannot be underestimated in light of current levels of morbidity. It is also important to understand the impact of these traumas on health from the cultural perspective. For example, the connection to 'country' is seen by Aboriginal peoples as central to their health and wellbeing. What then is the impact of the dispossession of peoples from their homelands and in some cases the inability to return or fulfil cultural and spiritual obligations to country? Where whole communities have been displaced the whole community may potentially suffer ill health with flow-on effects for generations.

LOSS OF FAMILY

When considering the decimation of the Aboriginal population, the effects can be felt at all levels of the population group. Not only was there the loss of individual family members but in some cases, family groups and entire communities died out potentially affecting the whole balance of life. The more profound level of stress associated with deaths from massacres, deliberate poisoning and frontier violence should not be underestimated. High rates of incarceration, particularly of the men have impacted on the ability of family groups to be protected, hunt for food, and develop prosperous family systems. This also left women and children vulnerable to exploitation and sexual abuse. As the prison system was an introduced concept (there was no equivalent in Aboriginal society), the impact of incarceration on growth and development as well as the emotional cost of being confined for prolonged periods of time has often been underestimated. Some of the missions where children were housed were 'locked' institutions as were the 'lock hospitals' where parents and children with infectious diseases such as leprosy were confined. This loss of freedom and space was previously unknown.

LEGISLATION AND CONTROL

The impact of the legislation particularly after 1900 is worth noting. The extreme measures of control in place over all aspects of daily life, included where Aboriginal people could live, work and congregate. Children were considered to be under the legal guardianship of the Chief Protector. Parents lived under the fear of child removal and made many sacrifices in order to maintain the care of their children.

The 1997 "Bringing Them Home" Report documents the devastating impact of the forced removal of Aboriginal and Torres Strait Islander children from their families and the ongoing fragmentation of families today. Importantly the impact on physical health should be noted:

> *"The inquiry found that the experiences of forcibly removed children overwhelmingly contradict the view that it was in their 'best interests' at the time. A 1994 Australian Bureau of Statistics (ABS) survey found people who were forcibly removed in childhood are twice as likely to assess their health status as poor or only fair (29%) compared with people who were not removed (15.4%)"* [5]

The report also highlights the ongoing effects of institutionalisation on generations of Aboriginal men, women and children. [6]

POVERTY AND NEGLECT

The impact of significant and sustained changes in diet, lifestyle and physical activity of Aboriginal families is important. A population was transformed from essentially a healthy hunter-gatherer lifestyle to one of food rations, mission life and forced labour. At times food was inadequate, rations sometimes consisted of flour, sugar and tea, and even missions struggled to feed the children. The "Bringing Them Home Report" documented the harsh conditions children endured:

> "*The Inquiry found that the conditions of missions, government institutions and children's homes were often very poor. Resources were insufficient to improve them, or keep children properly clothed, fed and sheltered."* [7]

It is also important to consider that the magnitude of the trauma experienced by Aboriginal peoples increased over time due to both the scale (every community eventually becomes affected in some way) and the longevity (over multiple generations).

DISCRIMINATION AND EXCLUSION

The devastating effects on health of the exposure to new diseases such as smallpox, influenza and venereal diseases over the past 200 years is well documented. However, it is less well known that legislation to enforce public health measures to contain the spread of these diseases constituted some of the earliest enforced segregation (Briscoe, 2003).[8] This brought about a concentration of Aboriginal people in conditions where the effects of disease and poverty were compounded. Since then Aboriginal peoples have endured many other forms of discrimination including forms of segregation in transport, public facilities, schools and hospitals. In some cases, Aboriginal people had to apply for a permit to enter a country town or risk prosecution. There were also few avenues open for appeal or to escape the discriminatory practices adding to the stress of trying to just survive let alone ensure the safe and healthy development of children. The exclusion of Aboriginal peoples from health care as well as past inappropriate health care practices may still be affecting attitudes and outcomes today. When mainstream health care shows little understanding of cultural differences and the meaning of illness, and if one's experience of health care is significantly distressing, the chances of successful outcomes are reduced. Hunter (1991) makes some important observations about the historical roles and influence of doctors in Aboriginal medicine:

> *“The racist ideology that allowed, on the one hand, exploitation and ill-treatment of Aborigines, and which on the other lamented the “passing of the Aborigines”, was contributed to by the medical profession.”* [9]

The implications for a population of a history of near annihilation are both profound and prolonged. Given the impact of this history in its totality, the question of genocide as it is currently defined in International law needs to be raised.[10] The ‘Bringing Them Home’ Report, discusses the forcible removal of Aboriginal children from their families as an act of genocide.[11] The deliberate fragmentation of Aboriginal families and society has profoundly affected the ability to trust those in authority as well as trust in the decision making processes on issues which directly affect Aboriginal people’s lives and remains a significant issue in the process of reconciliation.

INTERNATIONAL CONTEXT

Although there have been some significant improvements in Aboriginal health over time, the discrepancy between the health status of Aboriginal peoples and the rest of Australia continues with a widening gap in life expectancy.[12] From an international perspective, many of the world’s Indigenous peoples have experienced similar levels of morbidity, socio-economic disadvantage, poor access to health services and ongoing marginalisation and yet significant inroads have been made in reducing the gap in health inequities in formerly colonised countries. According to the AMA Public Report Card 2002;

> *“In the late 1990s, Canada, NZ, and the US reduced the gap between their Indigenous and non-Indigenous populations [life expectancy] to between 5 and 7 years – compared to Australia’s 20 years.”* [13]

Ring and Firman in their 1998 study comparing the health status of Indigenous peoples in Canada, the USA, New Zealand and Australia make an interesting observation:

> *“…Treaties, no matter how loosely worded, have appeared to play a significant and useful role in the development of health services and in social and economic issues, for the indigenous people of New Zealand, the United States and Canada.”* [14]

What has emerged from the discussion is a complex set of historical factors that individually and in combination have impacted on physical health and development across the age spectrum and continue to underlie the poor health outcomes for Aboriginal peoples. Although some of these factors cannot be altered, some are still to be recognised and resolved within the present context. Importantly Aboriginal children continue to grow up struggling to reconcile conflicting versions of Australian history making it all the more difficult to accept and comprehend. Where there is denial, secrecy and continuing semantic debates our ability to put the past to rest is severely compromised, and the potential for future uncertainty becomes all the more apparent.[15]

THE PRESENT CONTEXT

The ill-health burden carried by Aboriginal communities impacts significantly on future prosperity. The continuing high rates of incarceration of Aboriginal people and child removal under care and protection orders combined with the high levels of morbidity and premature death of community members highlights the continuing loss and fragmentation of family. There appears to be little time to grieve before another loss or traumatic event impacts on the community. Many children have already experienced the loss of several family and community members by the time they reach adolescence.[16] The cycle of disadvantage, fragmentation of families and discrimination continues unabated.

RESILIENCE

At the same time, the strengths and resilience within Aboriginal families should not go unrecognised. Despite high levels of adversity and illness, families and communities continue to support each other, take their obligations seriously, share their resources and show considerable tolerance, humour, patience and compassion. From a clinical perspective, children often show remarkable resourcefulness, respect, enthusiasm for life and respond well to clinical interventions. The present state of health for Aboriginal children must be understood in the context of family, culture and society. The Aboriginal kinship system continues to operate as a significant attachment system which confers benefits for children's health and wellbeing throughout their development. Child rearing practices, family structure, roles and responsibilities all need to be viewed from this important cultural perspective.

Although there have been many prominent and successful Aboriginal people in Australia, there is still a lack of positive male and female role models across professions. Negative stereotyping of Aboriginal people continues to exist in Australian society, particularly in the media. Reports depicting Aboriginal people as a 'problem' are not always adequately balanced by positive images of competent, successful Aboriginal people and families. This impacts on how our children view their future prospects and place in Australia and is further complicated by the many other unresolved issues that continue to affect the lives of Aboriginal peoples. These include the role of reconciliation, native title, and the issues surrounding the 'Stolen Generation'. While there are ongoing debates over an apology, Aboriginal and Torres Strait Islander identity, compensation, and sovereignty, the unresolved burden of trans-generational trauma and grief continues to accumulate.

PHYSICAL HEALTH

From a developmental and biological perspective, the cycle of ill health begins very early, possibly even prior to conception with the presence of many risk factors already evident in the Aboriginal population. In particular tobacco use, poor maternal health, obstetric complications, low birth-weight and higher infant mortality rates continue to cause concern. The Indigenous infant mortality rate remains more than twice that of the total population while Indigenous mothers are twice as likely as non-Indigenous mothers to deliver babies of low birthweight.[17] Failure to thrive and infectious diseases are all too common. Some diseases still prevalent in Aboriginal children are virtually non-existent in the non-Aboriginal community, for example, rheumatic fever, causing significant life-long morbidity. In their review 'Rheumatic Fever in Aboriginal Children', Currie and Brewster (2002) have identified that although morbidity and mortality from rheumatic heart disease can be improved in the short term, addressing the underlying issues of overcrowding and poor living conditions remains a "National responsibility".[18]

Aboriginal children suffering from chronic otitis media may develop significant problems with hearing, placing their language development and learning at risk. Anaemia and poor nutrition also appear to be common. If these basic health problems are not addressed early in life, Aboriginal children may struggle to make the expected developmental milestones placing their health, education, development and wellbeing at risk and increasing the likelihood of chronic disease as adults.

Due to the illness burden and presence of complicated chronic disease requiring specialist medical care, for example chronic renal failure, families may again be separated through hospitalisation or transfer to major hospitals. Children naturally worry about the health of their families and may take on additional roles within the family in order to share the responsibility of care. The markedly reduced life expectancy of Aboriginal people can have significant practical implications for children with there being fewer older relatives within the extended family available to provide support. Similarly, the need for placing children in alternative care arrangements due to parental illness is also a particular concern for Aboriginal families.

HOLISTIC HEALTH

To fully understand the physical health of today's Aboriginal children, consideration needs to be given to its interplay with other dimensions of health. The role of psychological development, social and community life, spiritual development and cultural heritage are all of importance to children's health and wellbeing but beyond the scope of this first volume of findings. Healthy psychological development is fundamental to good physical health but many Aboriginal children continue to suffer from the burden of chronic stress and trauma. Some have not had the opportunity to experience the innocence of their youth nor the freedom to play and discover the world before being confronted by the harsh reality of life and death, abuse and discrimination, exclusion and incarceration. There are few services adequately equipped to deal with these issues with even less availability in rural and remote locations. Children benefit from having stimulating and well-resourced environments in order to enhance their potential for development yet this is often not the case given the socio-economic disadvantage present in many communities.

Children grow and develop within the cultural constructs of their family and community. This influences the way they see the world, experience life, develop behaviours, adapt to stressors and give value and meaning to existence. Health, wellbeing and illness are also experienced within an Aboriginal cultural and family context and this can have a profound influence over symptom formation, interpretation and meaning of illness, understanding and acceptance of treatment. The development of culturally secure health care practices is an evolving process and has significant potential for influencing the way health care is delivered in the future. Spirituality is another important dimension of children's health and wellbeing through the way it gives meaning and significance to life, experiences and relationships. Children's spiritual beliefs and experiences are tempered by their Aboriginal heritage and parent's belief systems and treatment may need to be considered from this viewpoint.

FUTURE DIRECTIONS

Aboriginal culture and community has endured and remains vibrant and dynamic. Aboriginal people have achieved at all levels in society and have made significant inroads across professional disciplines. Our children are growing up into a new era of freedom, opportunity, achievement, cultural renaissance and pride in Aboriginal identity. Many of the strengths of Aboriginal society are based on the inclusive nature of kinship and the sense of being connected for eternity. Surely this strength in family, the importance of relationships and the great value placed on children is desired by all of society.

A critical part of the solution for the physical health burden for Aboriginal people in Australia rests in acknowledging the past, understanding the present and redefining the future relationship between Aboriginal and non-Aboriginal society. In a country with first class health care, world renowned researchers, and leading edge technology, the gap between the health status of Aboriginal and non-Aboriginal peoples is almost beyond comprehension and must be addressed. Growing healthy children seems to be the most obvious answer to preventing chronic disease.

Health is a complex issue and solutions have not been easily found but it is important to build on existing knowledge and what has been achieved in advancing Aboriginal health. This includes:

- The knowledge, commitment and expertise that already exists within the Aboriginal community
- The contribution of Aboriginal community controlled health organisations in health care delivery
- The growing number of Aboriginal health professionals
- The many innovative health programmes currently being delivered
- The developing partnerships and collaboration in health care across other sectors
- The many excellent reports and research already completed.[19]

The expertise and contribution of Aboriginal peoples at a community and professional level has not always been fully recognised or valued appropriately. There continues to be a lack of holistic, culturally secure health care delivery and planning. Difficulties ensuring adequate resources and funding for programmes to operate successfully are ongoing, and there has been a chronic failure on the part of successive governments to fully implement the many useful recommendations made in previous reports and inquiries.

While it is imperative to address the current burden of ill-health, we must also consider the broader socio-political and historical contexts under-pinning our systems of care and the significant impact of sectors outside the health arena. This requires generational planning for the health of our children and learning from our Aboriginal elders as well as from the significant inroads into health being made by other indigenous peoples in New Zealand, Canada and the USA. It is in this context that the comment made by Dr Phelps, President of the Australian Medical Association in 2002 is of particular relevance:

> *"It is an anomaly that Australia does not have a treaty. It is the only Commonwealth country colonised by the British that does not have one in some form. It is an anomaly that has left the rights and obligations of Australia's indigenous peoples unclear. It has led to an historical legacy of unfinished business so that issues such as indigenous health have no framework for progress."* [20]

This highlights the roles of self-determination and sovereignty in their relationship to health and health care delivery. The "Social Justice Report 2002" provides a valuable discussion on the importance of self-determination and states:

> *"Essential to the exercise of self-determination is choice, participation and control. The essential requirement for self-determination is that the outcome corresponds to the free and voluntary choice of the people concerned."* [21]

Recognising Aboriginal sovereignty acknowledges the rightful place Aboriginal peoples have in the history and development of Australia as a nation. It also recognises the central importance Aboriginal culture plays in the identity of Australia that so often receives accolades internationally. In this view, Aboriginal people are ‘core business’ for ensuring the health of all of Australia including the health of the land. Acknowledging Aboriginal sovereignty also acknowledges a pathway for co-existence based on mutual respect, equality, tolerance and understanding of difference. Aboriginal children should be proud of what their ancestors achieved as custodians of Australia for many thousands of years and look forward to their grandchildren living healthy, prosperous lives in such a unique and bountiful country.

Our children are our future, their health and development is everybody’s business.

ENDNOTES

1 Swan P, Raphael B, Ways Forward, Aboriginal and Torres Strait Islander Mental Health National Policy Consultancy Report 1995, includes a discussion on Torres Strait Islander mental health issues.

2 A National Aboriginal Health Strategy: Report of the National Health Strategy Working Party: 1989. Canberra.

3 Ways Forward, Aboriginal and Torres Strait Islander Mental Health Policy. National Consultancy Report. 1995: part 1, p13.

4 Dodson M, 'The Wentworth Lecture. The end in the beginning: Re(de)fining Aboriginality', Australian Aboriginal Studies No 1,1994: www.aiatsis.gov.au.

5 Bringing Them Home: National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from their families: Community Guide, pg 19: HREOC www.austlii.edu.au/.

6 Bringing Them Home: National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from their families: HREOC www.austlii.edu.au. The full report is recommended reading for further information on personal accounts and generational effects.

7 Bringing Them Home: National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from their families: Community Guide, pg 15: HREOC www.austlii.edu.au.

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9 Hunter E. Stains on the Caring Mantle. Doctors in Aboriginal Australia have a history. Medical Journal of Australia 1991; 155: 779-783, pg 780.

10 For further discussion on Genocide in Australia, see Tatz, C. Genocide in Australia. AIATSIS Research Discussion Papers No 8 1999. Available at www.aiatsis.gov.au/rsrch/rsrch_dp/genocide.htm.

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12 Ring I, Firman D: Reducing Indigenous Mortality in Australia: lessons from other countries. Medical Journal of Australia 1998; 169: 528-533.

13 AMA Public Report Card 2002 Aboriginal and Torres Strait Islander Health No More Excuses. Canberra AMA, Media Releases 24th May 2002. Available at www.ama.com.au.

14 Ring I, Firman D. Reducing Indigenous Mortality in Australia: lessons from other countries. Medical Journal of Australia 1998; 169: 528-533.

15 Recommended reading regarding the debate over Aboriginal history and the Stolen Generations, Robert Manne discusses these issues at length. See Manne, R. In Denial: The Stolen Generations and the Right. Published by Black Inc., 2001. Melbourne.

16 There are a growing number of web sites containing the health, justice and welfare data for Aboriginal and Torres Strait Islander peoples including: Human Rights and Equal Opportunity Commission; Australian Institute of Family Studies; Edith Cowan Health Infonet; Australian Bureau of Statistics; State and Commonwealth Departments of Health and Justice.

17 AMA Public Report Card 2002 Aboriginal and Torres Strait Islander Health No More Excuses. Canberra AMA, Media Releases 24th May 2002. Available at www.ama.com.au.

18 Currie BJ, Brewster DR. Rheumatic Fever in Aboriginal Children (Editorial) Journal of Paediatrics and Child Health, Vol 38(3). June 2002. Pg 223-225.

19 There are too many reports to mentions here but include The Bringing Them Home Report, Ways Forward, The Royal Commission into Aboriginal Deaths in Custody, The Gordon Inquiry, The National Aboriginal Health Strategy, The National Strategic Framework for Social and Emotional Wellbeing plus the annual reports into health from state and commonwealth departments.

20 Phelps K, AMA President: Speech to the ATSIC National Treaty Conference, Canberra 29th August 2002. www.ama.com.au.

21 Social Justice Report 2002: Report of the Aboriginal and Torres Strait Islander Social Justice Commissioner to the Attorney-General as required by section 46C(1)(a) Human Rights & Equal Opportunity Commission Act 1986. Page 29. There are many other important discussion papers on self-determination including the United Nations Permanent Forum on Indigenous Issues.

CHAPTER 1

THE SURVEY – OBJECTIVES, DESIGN AND PROCESS

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THE SURVEY – OBJECTIVES, DESIGN AND PROCESS

The Western Australian Aboriginal Child Health Survey, a large-scale epidemiological survey of the health and well-being of 5,289 Western Australian Aboriginal and Torres Strait Islander children, was undertaken in 2001 and 2002 by the Telethon Institute for Child Health Research. The survey was designed to build an epidemiological knowledge base from which preventive strategies can be developed to promote and maintain healthy development and the social, emotional, academic, and vocational well-being of young people. This is the first undertaking to gather comprehensive health, psychosocial and educational information on a population-based random sample of Aboriginal and Torres Strait Islander children in their families and in their communities. This introduction broadly details the background and methods used to collect the data and also describe the survey sample.

SUMMARY

- The primary objective of the Western Australian Aboriginal Child Health Survey (WAACHS) was to identify the developmental and environmental factors that enable competency and resiliency in Aboriginal children and young people.

- Questionnaire content covered child and youth development, health and well-being, probes for functional impairment and disability, use and access to health, education and social services, and a selected number of questions about diet and nutrition.

- The survey was based on an area sample of dwellings. Families in selected dwellings who reported that there were, 'Aboriginal or Torres Strait Islander children or teenagers living at this address who are aged between 0 and 18 years', were eligible to be in the survey.

- An Aboriginal Steering Committee has directed the planning, implementation and reporting of the survey. The survey content and processes were developed in consultation with Aboriginal leaders, key Aboriginal bodies, and through extensive consultations throughout the state with Aboriginal community councils, parents and key service providers.

- The study methodology, data management and reporting processes met the requirements of the Western Australian Department of Health's Aboriginal Health Information and Ethics Committee as well as the Ethics Committees of King Edward Memorial and Princess Margaret Hospitals.

- The Institute for Child Health Research (ICHR) is home to the Kulunga Network – a collaborative maternal and child health research, information and training network. The Kulunga Network is an advocate for Aboriginal children and families in Western Australia and is developing additional materials from the survey for Aboriginal readers.

- An index of Level of Relative Isolation (LORI) has been developed for use in this survey. LORI allows greater discrimination of the circumstances of survey respondents with respect to their isolation from population centres of various sizes and better differentiates between areas and communities that are extremely remote from major metropolitan centres.

- Over 95 per cent of interviewed carers gave consent for responses from this survey to be linked to their children's birth records and to their entries on the Hospital Morbidity Data System. This linkage to records of hospital admissions, diagnoses, procedures, and transfers adds power to the survey data by giving a comprehensive record of health services contacts**.**

THE TELETHON INSTITUTE FOR CHILD HEALTH RESEARCH

The Telethon Institute for Child Health Research is a centre of excellence for the conduct of research into child health. Founded in 1987, the Institute's research programs include the study of asthma and allergic disease, birth defects, child and adolescent mental health, childhood death and disability, leukaemia and other cancers as well as Aboriginal health and infectious disease.

The Institute's mission is to improve the health of children through the development and application of research into:

- causes of ill health
- the maintenance of good health
- prevention of ill health
- the treatment of conditions affecting children.

The Institute is the home of the Kulunga Network – a collaborative maternal and child health research, information and training network, involving the Institute for Child Health Research and member services of the Western Australian Aboriginal Community Controlled Health Organisation (WAACCHO). The Kulunga Network is an advocate for Aboriginal children and families in Western Australia. The Network seeks to ensure that community-based and culturally relevant research benefits them by influencing the policy and planning of government and other key agencies, and by involving Aboriginal people in all areas of research and implementation of outcomes. The survey was a project of the Network.

SURVEY OBJECTIVES

The survey's primary objective was to identify developmental and environmental factors that enable competency and resiliency in Aboriginal children and young people. There was emphasis on defining priority targets for existing and future health, education and social services. Building an epidemiological knowledge base from which preventive strategies can be developed to facilitate the social, emotional, academic and vocational competency of young people was a notable feature of this survey.

The specific aims of the survey were to:

- describe and define the health and well-being of Western Australian Aboriginal and Torres Strait Islander children and young people aged 0–17 years
- estimate the prevalence and distribution of commonly occurring chronic medical conditions and disabilities (e.g. asthma, cerebral palsy, visual and hearing impairments, intellectual disability) and describe how they may affect a child's well-being and functioning
- estimate the prevalence, distribution and functional impact of common health and mental health problems in Aboriginal children and young people aged 0–17 years and their families
- estimate the prevalence and distribution of adverse health behaviours (e.g. smoking, alcohol, drug and volatile substance misuse)

- estimate the prevalence and distribution of other psychosocial problems such as early school leaving, conduct problems, and juvenile offending
- describe Aboriginal and Torres Strait Islander children, adolescents and their families' access to, effective use of and satisfaction with health care, education, juvenile justice, housing and social services
- identify markers resulting in protection from, and amelioration of poor health and well-being (mental health), adverse health behaviour(s) and other psychosocial problems
- develop estimates of risk and markers identifying Aboriginal and Torres Strait Islander children and young people at increased risk for various health, educational and vocational outcomes.

SURVEY CONCEPT AND DEVELOPMENT

The concept of gathering child health and well-being information from families with Aboriginal and Torres Strait Islander children was first proposed in 1991 during the development of the Western Australian Child Health Survey[1,2,3]. However, for reasons owing to scale, cost, and expertise, families with Aboriginal children were principally excluded from this earlier survey. The Telethon Institute for Child Health Research undertook to reassess the feasibility of conducting an Aboriginal Child Health Survey following the conclusion of the original Western Australian Child Health Survey. The assessment of the feasibility, design and scope of the Aboriginal Child Health Survey was subsequently undertaken between 1996 and 1999.

Survey methodology and instrumentation were developed in consultation with Aboriginal leaders, key Aboriginal bodies (the Aboriginal and Torres Strait Islander Commission regional council, the Aboriginal Council of Elders, the Aboriginal Justice Council, and WAACCHO), and through extensive community consultations throughout the state. A survey project team, reporting to an Aboriginal Steering Committee, had basic carriage of securing funding, developing the survey instruments, and implementing the fieldwork.

The Australian Bureau of Statistics was a principal provider of consultancy services, expertise and support through all phases of survey development, implementation and analyses. Efforts were made to ensure that the data collected are both scientifically relevant and pertinent to current government information needs and policy initiatives. To do this, reference groups were convened during1997–1998 with representation from the various government departments and community agencies that had an interest in the outcome of the survey findings. This process involved senior policy input from the Western Australian State Departments of Health, Education and Training, Community Development and Police; the Alcohol and Drug Authority; the Disability Services Commission; the State Housing Commission; the Catholic Education Office of Western Australia; and the Association of Independent Schools of Western Australia. Commonwealth Departments were also consulted to advise on policy needs and were asked to specifically comment on content and design of the survey.

ABORIGINAL DIRECTION

All phases of the survey and its development, design, and implementation were under the direction of the Western Australian Aboriginal Child Health Survey Steering Committee. Established in 1997, the Steering Committee had the responsibility to control and maintain:

- cultural integrity of survey methods and processes
- employment opportunities for Aboriginal people
- data access issues and communication of the findings to the Aboriginal and general community
- appropriate and respectful relations within the study team, with participants and communities, with stakeholders and funding agencies and with the governments of the day.

COMMUNITY CONSULTATION AND APPROVAL

The survey represented a large undertaking involving extensive household sampling and voluntary participation in the survey of many Aboriginal and Torres Strait Islander people across Western Australia. Seeking support and approval for the survey required establishing an extensive and ongoing process of consultation. Repeated consultations were undertaken during 1998 and 1999 with specific visits to Aboriginal communities in Albany, Bunbury, Broome, Carnarvon, Collie, Derby, Esperance, Fitzroy Crossing, Geraldton, Halls Creek, Kalgoorlie, Karratha, Katanning, Kwinana, Kununurra, Narrogin, Perth, Pinjarra, Port Hedland, and Roebourne. Every attempt was made to engage participation of community leaders, community councils, administration staff, service providers, and local residents in discussing their views about the need for the survey and to request their approval to be included in the survey. People were asked about the methods and processes that they felt would assist or hinder the success of the survey, their requirements with respect to specific survey content, their expectations about the use of the survey data and intended outcomes.

The initial community consultations for the survey established that most participating carers and youth expressed a preference for the survey to be written and administered in plain Standard Australian English (SAE). The precise wording of survey questions was kept as simple as possible to accommodate a wide range of proficiency in SAE and Aboriginal English. The survey materials presented in this format were assessed in the pilot and dress rehearsal and found to yield reliable and valid information for all but the most remote and culturally intact Aboriginal communities where there was a high level of traditional language use. In these communities, the majority of (but not all) families chose to be interviewed with the assistance of an Aboriginal language translator employed through the local community council or Aboriginal Medical Service.

Approval for the survey was also obtained from WAACHO, the Western Australian Council of Elders, the Aboriginal Justice Advisory Committee and the Aboriginal and Torres Strait Islander Commission (ATSIC) State Council.

ETHICAL APPROVAL FOR THE SURVEY

This project met the requirements of, and was approved by, the Western Australian Department of Health's Aboriginal Health Information and Ethics Committee as well as the Ethics Committee of King Edward Memorial and Princess Margaret Hospitals. These clearances ensured that the survey process and procedures conformed with requirements and protocols for health research with Indigenous people and that they adhered to National Health and Medical Research Council (NHMRC) ethical standards and guidelines for research with human subjects.

INDIGENOUS IDENTIFICATION AND THE SCOPE OF THE SURVEY

The survey was based on area sample of dwellings *(see dwelling in Glossary)*. Families in selected dwellings who reported that there were 'Aboriginal or Torres Strait Islander children or teenagers living at this address who are aged between 0 and 18 years' (*see Indigenous status in Glossary*) were eligible to be in the survey.

Children living within group homes, institutions and non-private dwellings were not in the scope of the survey. However, where a selected household had a child temporarily living away from home (e.g. in a boarding school or hostel), these children were included in the scope of the survey.

Once the authority for the survey and the nature of the survey was explained to a responsible adult (usually the carer(s) or head of the household), and consent to participate was obtained, Indigenous status was determined for each person who was reported to 'usually' live in the dwelling by asking, 'Does (the person) consider him/herself to be of Aboriginal or Torres Strait Islander origin?' Data were gathered on all Aboriginal and Torres Strait Islander children under the age of 18 in each of the participating households.

TERMINOLOGY

Throughout this publication the term 'Aboriginal and Torres Strait Islander peoples' has been used as the most precise and inclusive reference for Indigenous Australians. This is the form recommended by ATSIC for use in official documents. Where other group terms such as Aboriginal people(s), Australian Aboriginals and Indigenous Australians have been used, it should be noted that this is intended to refer to Aboriginal and Torres Strait Islander peoples.

THE SURVEY POPULATION

The terms 'children' and 'child' for this survey refer to persons under the age of 18 years at the time of the initial interview.

For purposes of analysis and presentation of the findings, they are further grouped into the following age groups:

- 0 to 3 years
- 4 to 11 years
- 12 to 17 years.

GEOGRAPHIC DISTRIBUTION OF THE SURVEY POPULATION

The impact of European settlement on Indigenous culture and ways of living has reflected the state's history of colonisation and how this has been shaped by the state's geography. Families with Aboriginal children live in an enormously diverse range of communities distributed across the state. Some of these communities are small and discrete and are located in remote and isolated areas and may have associated 'out stations' (*see Glossary*). Other communities may be within towns or on the outskirts or fringes of towns, while still others are part of rural centres or urban areas. Some of these communities, particularly those that are isolated from mainstream population centres, have predominately Indigenous residents. City areas on the other hand have proportionally small Indigenous populations scattered more widely across the urban areas.

Western Australia comprises over one third of the continental landmass of Australia. The northwest and centre of the state includes large tracts of desert and some of the most remote and sparsely populated areas in the world. The more populated southwest of the state includes extensive agricultural and forested areas with numerous small population centres. Over two thirds of the State's total population and one third of the Aboriginal and Torres Strait Islander population resides in the metropolitan area of Perth. Physical distance is not the only form of isolation for Aboriginal people. Psychological, social, spiritual and cultural isolation or distance within society can also impact on health and well-being. Some may argue that this may be greater in larger metropolitan centres due to the relative minority status in the population and hence a greater potential to experience alienation from mainstream society.

QUESTIONNAIRE DEVELOPMENT

The survey was designed to place as low a burden on respondents as possible while at the same time acknowledged that sufficient time must be spent in gaining access, understanding and a good level of rapport with respondents. The interviews took considerable time, and multiple visits were often necessary to ensure complete data and to minimise respondent fatigue. Interviews were budgeted for a three-hour time period per household in which no more than 90 minutes would be used in formal data collection.

Questionnaire content covered child and youth development; health and well-being; functional impairment and disability; use and access to health, education and social services; and a selected number of questions about diet. These data were collected from interviews with the carers in the household who were the most knowledgeable about the survey children. In addition to the information collected on children, separate interviews were undertaken with up to two carers per child to gather information about the demographic and social characteristics of the household and family and to ask questions about the dwelling, neighbourhood and community. Consent was obtained from carers and young people to collect separate health and well-being information from young people aged 12–17 years.

Where possible, processes and measures paralleled those used in the study of mental health in the 1993 WA Child Health Survey. Many of the data items were selected from previous surveys of Indigenous families and communities while other items were specifically developed and piloted for this survey.

Throughout 1998 and 1999, repeated visits were made to remote and rural Aboriginal communities to consult with Aboriginal stakeholders and potential participants. Meetings and focus groups were used to determine content of the survey questionnaires. Specific interests and needs were identified. Of particular interest to Aboriginal people and communities were the following:

- alcohol use and problems
- gambling – particularly where this involved children
- difficulties getting enough sleep
- violence in communities and families
- how children are doing at school
- aspirations of young people and their hopes for the future
- experiences of racism
- use of Aboriginal language(s)
- diet and nutrition.

In 1999 and 2000, the pilot and dress rehearsal phases were used to refine the questionnaires. In the main, questions were culled where they were shown to be ineffective or of low meaning and relevance. The order and sequence of the questions was subject to considerable revision to make the questionnaire content logically flow and tell a more appropriate story.

A guide to the survey fieldwork instruments is presented in Appendix A.

PILOT SURVEY

Prior to the dress rehearsal and main survey, a pilot survey was carried out in September and October 1999 in Kununurra, Beagle Bay, Kalgoorlie, Northam, Lockridge, and Bentley. Seven experienced interviewers approached 55 Indigenous households seeking consent for participation in interviews. A total of 51 households consented (93%). Information was gathered on 95 children aged 0–17 years. This pilot tested all aspects of the questionnaire design, community acceptability, burden on both the participating families and the interviewer, and assessed sample and data yield. A full debriefing with the interviewers took place in October 1999. Data quality and the survey processes were agreed to be acceptable. Extensive modifications were undertaken to the design of the survey forms to improve administration of the interviews. Additionally, content and item wording were modified where this was needed to improve face validity and where empirical analysis and interviewer feedback indicated improvements could be made.

DRESS REHEARSAL

Following a revision based on the pilot, a full dress rehearsal was undertaken in April 2000. The aims of the dress rehearsal were to formally test the training curriculum for use with Indigenous and non-Indigenous interviewers; test the field procedures; and assess the final survey content, process and yield. This involved recruiting and training eight screeners who listed the dwellings in the census districts, screened households and approached eligible families in urban and town areas, and training nine interviewers who conducted the interviews in Kwinana, Gosnells, Carnarvon, Geraldton, Collie, Halls Creek, Port Hedland, Pinjarra and Stirling. In all, 95 families with 225 children were randomly selected and interviewed.

MAIN SURVEY

The main survey commenced in May 2000 and was completed in June 2002. Dwellings were selected for screening using an area-based clustered multi-stage sample design. From 166,290 dwellings in 761 census collection districts, 139,000 dwellings were approached to determine if residents were eligible to participate in the survey. Using this method, a random sample of 2,386 families with 6,209 eligible children was identified throughout metropolitan, rural and remote regions of Western Australia. A total of 1,999 of these families (84 per cent) with 5,513 eligible children consented to participate in the survey. Interviewers gathered useable data on 5,289 (96 per cent) of these participating children. In addition to the data gathered on children, data were also gathered on families from:

- 2,113 (95 per cent) participating carers identified as the persons who knew the most about the individual survey child (*See primary carer in Glossary*)
- 1,040 (83 per cent) other participating carers of the survey children *(See secondary carer in Glossary*) wherever this was possible and wherever they were present in the household
- 1,073 (73 per cent) participating young people aged 12 to 17
- the school principal and teacher(s) of surveyed children in 388 Western Australian schools.

TERMINOLOGY

Throughout this publication the terms ‘primary carer’ and ‘secondary carer’ have been used to describe those adults nominated to provide information about children selected in the survey. Primary and secondary carers were considered to be the people who spent the most time with the children and who knew them best. In most cases, the primary carer was the mother of the child.

From October 2000, the 3,419 survey children who were in school were followed up with survey instruments that collected details from the school principal and the classroom teacher. A total of 485 schools were sent survey materials and returns were received for about 2,379 (70 per cent) children attending approximately 388 of these schools. This allowed estimates of health, mental health and competencies as observed in the school context. Information was also gathered from school principals about the school’s physical, social and community environment and about the capacity of the school to meet its educational mission.

NON-RESPONSE AND REFUSAL TO PARTICIPATE

Non-response characteristics. For families that participated in the survey, information on the primary carer and on children as reported by the primary carer was almost always obtained (95 per cent and 96 per cent respectively). However where separate contact was required with other household members (i.e. the secondary carer or youths), the response rate was considerably lower (83 per cent and 73 per cent respectively).

Non-response at the family and person level was dealt with by means of weighting adjustments. These adjustments were derived after comparing the distribution of a range of characteristics for the survey respondents with data from the 2001 census. Characteristics chosen included sex, region, age, ability to speak an Aboriginal language, school attendance, carer education, carer income, household size, dwelling type, dwelling ownership and tenancy arrangements.

Of the characteristics considered, significant differences were found between sample and population distributions according to child's age, and number of persons living in the household. From age 12 years to age 17 years there is a continuing decline in representation of older children such that by age 17 years, participation in the survey was 40 per cent lower than expected based on census figures. The survey also had a lower proportional representation of children living in small households. These characteristics were also found to be associated with survey participation in the 1993 WA Child Health Survey. None of the other characteristics tested were found to be associated with response rate.

Finally, additional information was collected about young people using a youth self-report form. The interviewer could either administer the form, or it could be left with the youth for self-completion and later collection. Only 73 per cent of youths in participating families completed the youth self-report. For many of the non-responding youths, information was available from the primary carer. This made it possible to compare characteristics of respondents and non-respondents to the youth form by using information collected from the primary carer.

Youths responding to the youth self-report were more likely to be aged between 13–15 years and to be living in the Perth metropolitan region, while non-respondents were more likely to live in CDs classified to the bottom 5 per cent of socio-economic disadvantage, to have had contact with police, juvenile justice or courts, or have an abnormal mental health problem score.

These results suggest that youths with significant mental health and behavioural problems are under-represented in the respondents to the youth self-report. While the weights have been designed to compensate for the differential response rates by age and region, it is not possible to adjust for the lower representation of youths with mental health problems, as no population benchmarks are available at this level.

CHARACTERISTICS OF FAMILIES WHO REFUSED TO PARTICIPATE

In addition to examining characteristics of respondents compared to census distributions, some rudimentary information was collected about the 387 families who refused participation in the survey. At the time of initial screening, the interviewer explained the importance of having some information on families that were not able or willing to participate. As a result, a Household Record Form was completed for 245 of these families. This provided a list of all the residents of the household, their ages, Indigenous status and relationships within the household. Of the remaining 142 dwellings where the family refused to participate, the interviewer was able to obtain a basic age breakdown of the number of in-scope children living in the household in 92 cases. In the remaining 50 dwellings, families refused to give any indication of the number of in-scope children resident.

Analyses showed that families with older children were more likely to refuse participation. In the Perth region, household size and socio-economic status were also significant predictors, with families refusing to participate more likely to live in large households and live in more disadvantaged areas. Within the South West and the Midwest and Goldfields regions, the only significant association was with older age of child. In the Kimberley and Pilbara, household size was also a significant factor with non-respondents more likely to come from large families.

Because of these findings, age, region and household size are factors that have been incorporated into the weighting design.

Further information about non-response and sample weighting may be found in Appendix B.

SURVEY OUTPUTS AND COMMUNITY FEEDBACK

Four further volumes of results from the Western Australian Aboriginal Child Health Survey are planned. Forthcoming volumes will focus on Social and Emotional Well-being, Education, Family & Community and Justice issues. A Summary booklet for each volume will be produced. As well there are plans to write a number of research papers and professional journal articles.

A communication and dissemination strategy has also been designed to maximise knowledge and awareness of the findings to both the Aboriginal and wider communities. The strategy, to be driven by the Kulunga Research Network, aims to engage Aboriginal communities in committed action, using the data as a catalyst for political and community action and social change. The data results and findings will be reported and profiled for each of the ATSIC regions throughout the state.[4]

A pilot study has been conducted in the Fitzroy Valley region of the Kimberley to initialise the first key steps of the communication and dissemination strategy. The steps of this study involved consultation with communities to determine preferred methods for feedback of findings, requirements for region-specific information, and communities' overall survey experience. Feedback from the pilot showed that community members were positive about receiving feedback, that they preferred plain language information materials with a strong focus on visuals, and that all participants should be included in the feedback process. These understandings will guide the production of community information resources and point toward the conduct of an extensive series of meetings workshops and seminars.

RESEARCH INNOVATIONS

To maximise the usefulness of the data from this survey, a number of innovative research tools and methods were developed or used. These include:

- a new way of looking at remoteness and isolation
- record linkage between survey data and administrative data and
- three level hierarchical modelling of weighted survey data.

A NEW WAY OF LOOKING AT REMOTENESS AND ISOLATION

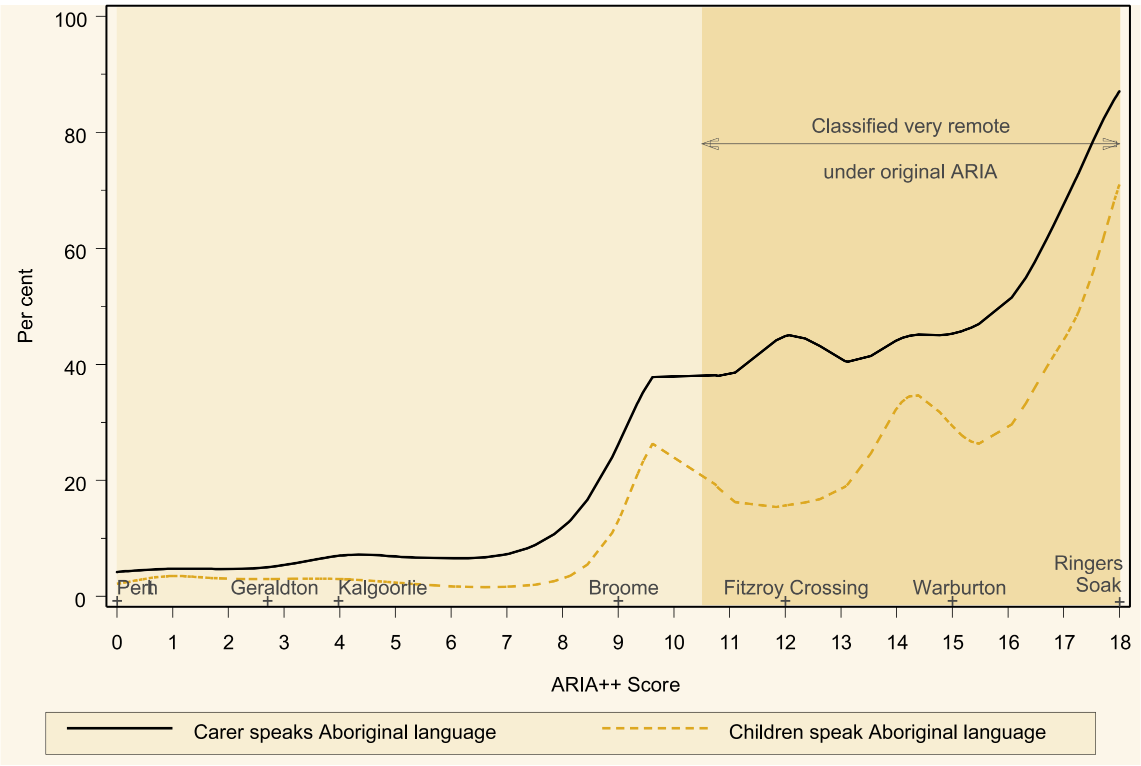
The Accessibility/Remoteness Index of Australia (ARIA) is the commonly used standard classification of remoteness and access to services. Produced by the National Key Centre for Social Applications of Geographic Information Systems (GISCA) in 1997 for the Commonwealth Department of Health and Aged Care, it has been rapidly adopted throughout the country. The ABS has included a refined version of the ARIA, called the ARIA+, in the Australian Standard Geographic Classification for the 2001 census.

ARIA is based on scoring the distance from every locality in Australia to service centres of varying sizes. The ARIA score, ranging from 0 to 12, puts locations on a gradient from large capital cities through to very remote regions. It has worked well in describing the total population of Australia. However in our first analyses of WAACHS data, it became apparent that it masked considerable variation in the remoteness and access to services of Aboriginal communities. For instance, while only 1 per cent of the total population of WA lives in areas classified as very remote under ARIA and ARIA+, over 25 per cent of Aboriginal and Torres Strait Islander people in the state live in these very remote areas which comprise over two–thirds of the land mass of the state. The WAACHS data showed that there were large variations in the circumstances of Aboriginal communities within this region ranging from small regional centres like Fitzroy Crossing with its own hospital servicing the surrounding region, through to truly isolated Aboriginal communities with strong ties to traditional cultures and lifestyles.

GISCA has recently produced a further product, ARIA++, which extends the range of service centres used in scoring the index by adding a further category for centres with a population of 200–999. The ARIA++, which scores on a range from 0 to 18, has been used in our analysis of WAACHS data. The extra discrimination at the remote end of the scale has been very effective in discriminating between communities with quite different characteristics within very remote Australia.

As one example, Figure 1.1 shows the proportion of carers and children who speak Aboriginal languages by ARIA++ score. Locations scored above 10.5 (defining Very Remote in the original ARIA) range from 40 per cent of carers speaking an Aboriginal language to almost 90 per cent. This variation is masked under ARIA by treating these diverse regions as equally remote.

FIGURE 1.1: PROPORTION OF CARERS AND CHILDREN WHO SPEAK ABORIGINAL LANGUAGES, BY ARIA++



To simplify analysis, 5 levels of remoteness have been created for the WAACHS based on the new ARIA++ score from GISCA. The cut–off scores for these regions were determined from an analysis of WAACHS data which identified cut–off points that produced regions that are as internally homogenous as possible, while conveying the differences across the continuum of remoteness.

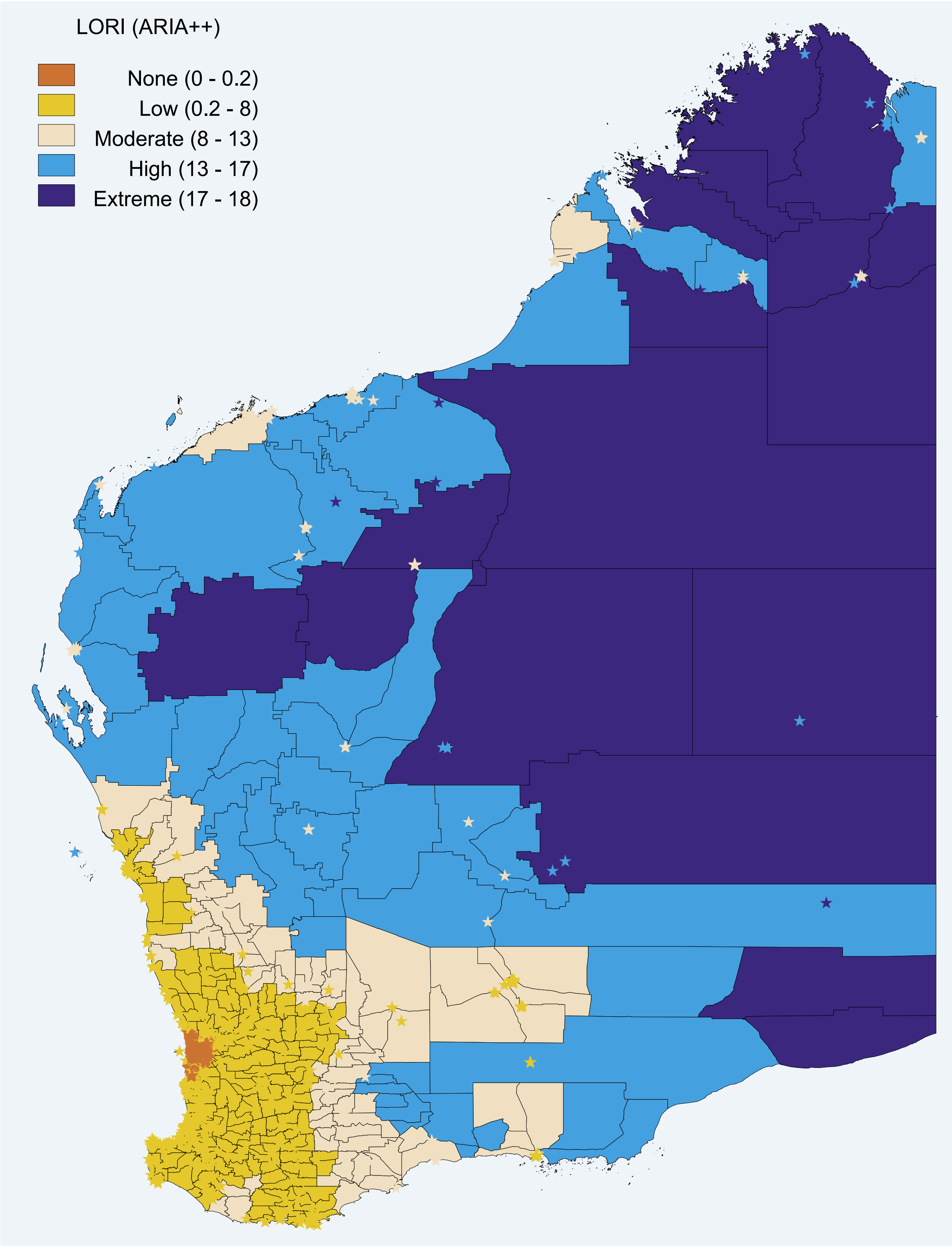
To avoid confusion with the existing ARIA and ARIA+ classifications and the ABS adoption of ARIA+, new language has been chosen to describe these ARIA++ levels. In this publication the five levels are referred to as Levels of Relative Isolation (LORI) and have been labelled None, Low, Moderate, High and Extreme. The first level, LORI None, corresponds exactly with Capital City Australia under ARIA+. In WA, this is the Perth Metropolitan area. Each of the other four regions has been constructed specifically for WAACHS, and differs from the regions defined under ARIA or ARIA+. Figure 1.2 shows the distribution of survey children in these five regions.

FIGURE 1.2: LEVEL OF RELATIVE ISOLATION (LORI) CATEGORIES: ARIA++ RANGES

Level of relative isolation	ARIA++ range	Proportion of WAACHS children %
None (Perth Metropolitan area)	0 – 0.2	30.9
Low	0.2 – 8	31.7
Moderate	8 – 13	18.3
High	13 – 17	9.8
Extreme	17 – 18	9.1

Figure 1.3 maps the five LORI regions in WA. Locations such as Halls Creek and Fitzroy Crossing are classified as moderate relative isolation. Warburton has high relative isolation while the surrounding central desert communities have extreme relative isolation. Under ARIA and ARIA+ all of these locations are classified as ‘Very Remote’. For details of ARIA++ and the derivation of the LORI categories, see Appendix C.

FIGURE 1.3: WA CENSUS COLLECTION DISTRICTS – LEVEL OF RELATIVE ISOLATION (LORI) CATEGORIES BASED ON ARIA++ VALUES



LORI categories derived from ARIA++
Source: National Key Centre for Social Applications of Geographic Information Systems

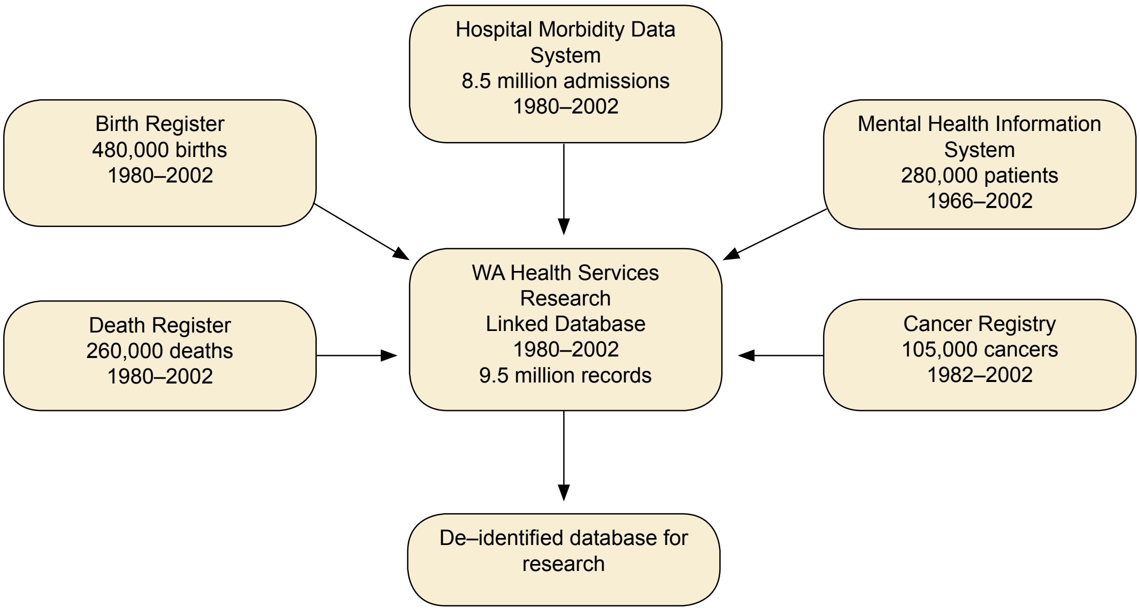
RECORD LINKAGE BETWEEN SURVEY DATA AND ADMINISTRATIVE DATA

Carers were asked for consent to access their hospital records, as well as the birth and hospital records of their children. Carers who consented were given the opportunity to opt out at any stage should they change their mind. The vast majority of carers consented to these records being accessed. Of primary carers, 96.7 per cent consented to allow access to their hospital records, while 92.8 per cent of secondary carers gave similar consent. Overall, 96.3 per cent of all carers gave consent for their children's birth and hospital records to be accessed.

The WA Record Linkage System

The WA Record Linkage System is unique in Australia, and one of only a handful of similar data collections in the world. It links together birth and death registrations with administrative hospital data from several sources to give a comprehensive record of health services contacts for the population of Western Australia. Figure 1.4 shows the major components of the WA Record Linkage System. As there are no unique identifying numbers, probabilistic record linkage has been used to link the files together. This operates on matching names, dates of birth, hospital names and addresses. The procedure allows for possible changes in the matching fields by calculating the probabilities of records being correct matches. Records that are potential links are clerically reviewed, and overall the error rate is less than 1%.[5]

FIGURE 1.4 THE WA RECORD LINKAGE SYSTEM



Key components of the record linkage system for use with the WAACHS are the birth records and the Hospital Morbidity Data. The birth registrations have been combined with data from forms filled in by midwives to produce the Maternal and Child Health Research Data Base (MCHRDB)[6]. For every midwife–attended birth in Western Australia wherever it occurs, the midwife submits a completed form indicating the characteristics of the infant, its condition at birth, details of the pregnancy and delivery together with some demographic details.

The Hospital Morbidity Data System (HMDS) records every admission to private and public hospitals in WA since 1980. The system records demographic information about the patients, diagnostic information (coded using the 9th and 10th revisions of the International Classification of Diseases)[7,8] and information about service use including length of stay, any procedures performed in hospital, and transfers between hospitals.

While almost all carers gave consent for record linkage to occur, it was not always possible to match records. Approximately 5 per cent of survey children were born outside of WA and thus could not be linked to their birth records. Overall, 4,637 of the 5,289 survey children were successfully linked to their birth records (87.7 per cent).

While several key components of the WA Record Linkage System date back to 1980 or earlier, the oldest survey children were born in 1982. Where population comparisons have been derived from the full set of linked data for the total population, the period 1982–2001 has been used as the relevant reference period.

Community Housing and Infrastructure Needs Survey

The Community Housing and Infrastructure Needs Survey (CHINS) was conducted in 1999 and 2001 by the Australian Bureau of Statistics on behalf of ATSIC. ATSIC kindly provided a copy of the 2001 CHINS data which has been linked to WAACHS data by community. Some 1,089 of the 5,289 survey children (20.6 per cent) were living in discrete Aboriginal communities covered by the CHINS. CHINS collects a large range of information about services in Aboriginal communities in addition to information about the quality of community infrastructure and housing stock. Access to the CHINS data for discrete Aboriginal communities will allow the examination of the relationship between a range of community characteristics and child health and well–being.

The use of record linkage adds considerable value to the survey data, without burdening respondents with extra questions. It enables the study of children's current health and well–being in the light of prior encounters with the health system and their health status at birth, including detailed diagnostic information that carers could not be expected to know.

THREE LEVEL HIERARCHICAL MODELLING OF WEIGHTED SURVEY DATA; CHILDREN, CHILDREN IN FAMILIES, CHILDREN IN COMMUNITIES

The nature of the survey data presented several challenges for statistically appropriate analysis. Unlike data collected from a simple random sample, the survey children are clustered within families and communities. The sample was selected in three stages: census collection districts (CDs), families and children. CDs were selected with probabilities of inclusion in the survey proportional to the number of Aboriginal and Torres Strait Islander children living in the CD. Once families had been selected, each Aboriginal and Torres Strait Islander child under the age of 18 years was selected in the survey. As a result of this selection hierarchy, the data for individual children in the survey sample violate one of the basic assumptions of traditional regression modelling: that the observations are independent. For many data items, children within the same family are more likely to have the same characteristics than children chosen randomly from throughout the state.

Multi–level, or hierarchical, modelling can be used to account for the hierarchical structure of the survey data.[9] The analysis is further complicated because unequal probabilities of selection have been used. CDs have been selected into the sample with probabilities proportional to the number of in–scope children. Survey weights have also been developed to adjust for different levels of non–response by age group and family size. While there are techniques to model data collected from surveys where unequal weights are used, and a range of software available that can fit multi–level models, addressing both issues at the same time is a relatively new statistical challenge. Pfeffermann *et al*[10] proposed a technique, called Probability Weighted Iterative Generalised Least Squares (PWIGLS) that can fit a multilevel model accounting for a complex survey design. The PWIGLS technique as described by Pfeffermann *et al* fits a two–level model to a normally distributed continuous variable. We have adapted this technique for the WAACHS where we wanted to model a three level hierarchy: children within families within communities. As many of the survey variables are binary indicators we have also adapted the PWIGLS technique to fit logistic regression models *(see Glossary)*. These new techniques have been implemented within SAS software. As far as we know, this is the first time such techniques have been used in a full–scale survey.

Where modelling results are shown in this volume, the models have been fitted accounting for both the hierarchical structure of the data, and the survey design and survey weights. Multi–level models are an ideal analytic tool for use in the survey, as they enable children's health and well–being to be described in terms of not only child level factors, but family and community level factors as well. The use of survey weights allows us to generalise the results of the models to the entire population of Aboriginal children in Western Australia.

SURVEY SIGNIFICANCE

This is the first undertaking to gather comprehensive health, psychosocial and educational information on a population-based random sample of Aboriginal and Torres Strait Islander children in their families in their communities. The extent of the sample, complexity of the sampling strategy, logistics and demands of the field work, and endeavours to engage Aboriginal leadership and input into the design of the field methods and questionnaires, make this project one of considerable social and scientific significance. The active involvement of State and Commonwealth agencies, and obligation on the part of the survey team to provide meaningful and relevant information and feedback to Aboriginal communities should ensure that important policy needs are addressed and information critical to assist planning, prevention and intervention is made available.

ENDNOTES

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CHAPTER 2

CHARACTERISTICS OF THE POPULATION

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The composition and diversity of the Aboriginal and Torres Strait Islander population in Western Australia has rarely been documented at a family level. Aside from the five–yearly Census of Population and Housing this is the first large scale undertaking to describe families with Aboriginal and Torres Strait Islander children in Western Australia. This chapter provides an overview of the broad demographic characteristics of these families. These characteristics will be used in other chapters to further describe the health, well–being and living circumstances of Aboriginal and Torres Strait Islander children and their carers.

SUMMARY

- Demographic diversity in Aboriginal family life and living circumstance is the central observation that emerges from these data. Both within and across levels of relative isolation this diversity is evident in the distribution and variation of language use, experiences of forced separation and relocation, household composition, the care of children in their families and key characteristics such as carer education, employment, income, occupation and housing.

- The descriptions in this Chapter are important for several reasons:

    - First, they describe the population of families with Indigenous children under the age of 18 years. Population studies of Indigenous people to date have largely focused upon Aboriginal and Torres Strait Islander people aged 18 years and over. Relatively few data are available from which to describe the current social and material circumstances in which young Aboriginal people live and develop.

    - Second, the use of an indicator of the Level of Relative Isolation (LORI) provides a method of apportioning regional variation in population distribution with respect to remoteness. Using this method, the composition of Western Australian ATSIC regions show substantial variations within levels of isolation. This makes broad generalisations about Indigenous families based on regional location hazardous without further information about the composition of the region with respect to varying levels of isolation.

    - Third, the use of family trees to describe the relationships with the household provides considerable depth in both the classification of the household structure by usual residents as well as the care arrangements of children within families. There are striking variations in the distribution of these types of households and care arrangements across levels of relative isolation as well as age-groups of survey children. This variation reflects the historical disenfranchisement of Aboriginal people from their land and country, policies that separated children from families as well as the limited range and variety of housing stock across differing levels of isolation in which there are both non–traditional and traditional living requirements. These household and care classifications are novel and their association with child development will be explored in following chapters.

    - Finally, despite the large demographic diversity there are high levels of socioeconomic disadvantage within families as measured by carer education, employment, occupational skill level, and income. This is an observation that has been repeatedly made over time and across settings.

- This demographic foundation outlines many of the characteristics and associations of families with Aboriginal children, and forms a platform for the analyses that follow. Variations in the level, concentration and persistence of both disadvantage and resilience, and the association of these with the development of Aboriginal children and young people, are a central concern throughout subsequent chapters and volumes.

ABORIGINAL CHILDREN, FAMILIES AND COMMUNITIES — A POPULATION PERSPECTIVE

The Australian Bureau of Statistics estimated the resident population of Aboriginal and Torres Strait Islander people in Western Australia at 30 June 2001 to be 66,069.[1] Children under the age of 18 comprised almost half (29,817) of the Aboriginal and Torres Strait Islander population and, of these, 23.2 per cent were aged 0–3 years, 46.3 per cent aged 4–11 years and 30.5 per cent were aged 12–17 years (Table 2.1). The equivalent proportions in the total population of children under the age of 18 years were 20.9 per cent, 44.4 per cent and 34.7 per cent respectively.

Across all ages, the Western Australian Indigenous population comprise nearly 3.5 per cent of the total population. Because of the younger age profile, Indigenous children aged 0–17 years comprise 6.1 per cent of all Western Australian children in this age group. [1]

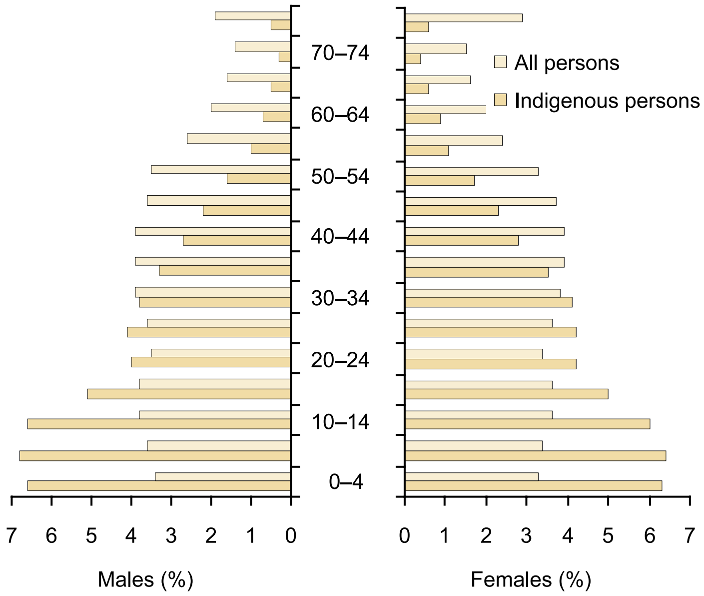
FIGURE 2.1: ABORIGINAL AND TORRES STRAIT ISLANDER EXPERIMENTAL POPULATION ESTIMATES WESTERN AUSTRALIA

Age group (years)	1991	1996	2001
		Number	
0–3	5 457	6 163	6 913
4–11	9 194	12 264	13 802
12–17	5 783	7 349	9 102
0–17	*20 434*	*25 776*	*29 817*
18–24	6 617	7 396	7 891
25–64	15 728	21 406	26 356
65 and over	1 303	1 627	2 005
Total	**44 082**	**56 205**	**66 069**

Source: Table 2.1

The population pyramid from 2001 preliminary experimental population estimates (Figure 2.2) shows the differences in the proportions of males and females in the Western Australian Indigenous population compared with those of the total population.

FIGURE 2.2: INDIGENOUS AND TOTAL POPULATION, WESTERN AUSTRALIA — POPULATION PYRAMID, 2001



Source: Australian Bureau of Statistics, (2003). Australian Demographic Statistics, September quarter 2002, Catalogue 3101.0. Canberra.

Highlighted in the population pyramid is the relative youth of Western Australia's Indigenous population. The median age for the Indigenous population in 2001 was 20.5 years compared with 36.1 years for non–Indigenous population. These differences are also reflected in the median ages of males and females. The median age for Aboriginal and Torres Strait Islander males is 19.6 years and for females, 21.4 years. For non–Indigenous males and females, the median ages are 35.3 years and 36.8 years respectively.[1]

WEIGHTED POPULATION ESTIMATES

Discussion of the 'population' throughout the text and commentary refers to the weighted estimates. These have been derived by weighting the survey sample to reflect the population of Aboriginal and Torres Strait Islander children and their carers in the scope of the survey. In practise, this permits the responses from the 5,289 Aboriginal children who participated in the survey to be used to estimate the expected responses from the 29,817 Aboriginal children aged 0–17 years who reside in Western Australia. Similarly, the responses of the 3,153 carers of Aboriginal children who responded to the survey have been weighted to permit estimation of the responses expected from the total of 19,500 carers of Aboriginal children in the state. To assist readers in assessing the reliability of the estimates derived from the weighted sample data, ninety–five per cent confidence intervals (CI:) are presented in the text and the tables.

More detail about the reliability of the survey estimate is in *Appendix D*.

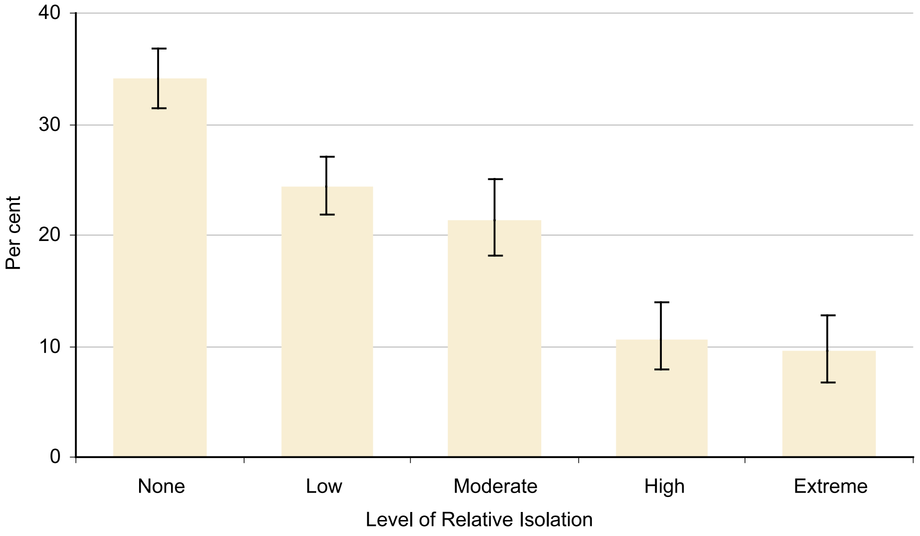
Where census data or other data from other agencies are introduced, for comparison or extension, their source is clearly labelled.

POPULATION DISTRIBUTION

Families with Aboriginal children live in an enormously diverse range of communities distributed across the state. Some communities are small and discrete, located in remote and isolated areas and may have associated 'out stations' *(see Glossary)*. Other communities may be in towns or on the outskirts or fringes of towns, while others are part of rural centres or urban areas. Some of these communities, particularly those that are isolated from mainstream population centres, have predominately Aboriginal residents. On the other hand, while the majority of Aboriginal people live in urban areas, they represent a small proportion of the total population in these areas.

Figure 2.3 shows the proportions of Aboriginal children living in areas of Western Australia characterised by their Level of Relative Isolation (LORI) *(see Chapter 1 and Appendix C)*. Almost one in ten (9.5 per cent; CI: 6.8%–12.7%) Aboriginal children live in extremely isolated areas while 10.6 per cent (CI: 7.9%–14.0%) live in areas of high isolation. About 58.5 per cent (CI: 54.2%–62.5%) of Aboriginal children in Western Australia live in areas where the levels of relative isolation were either 'low' or 'none'.

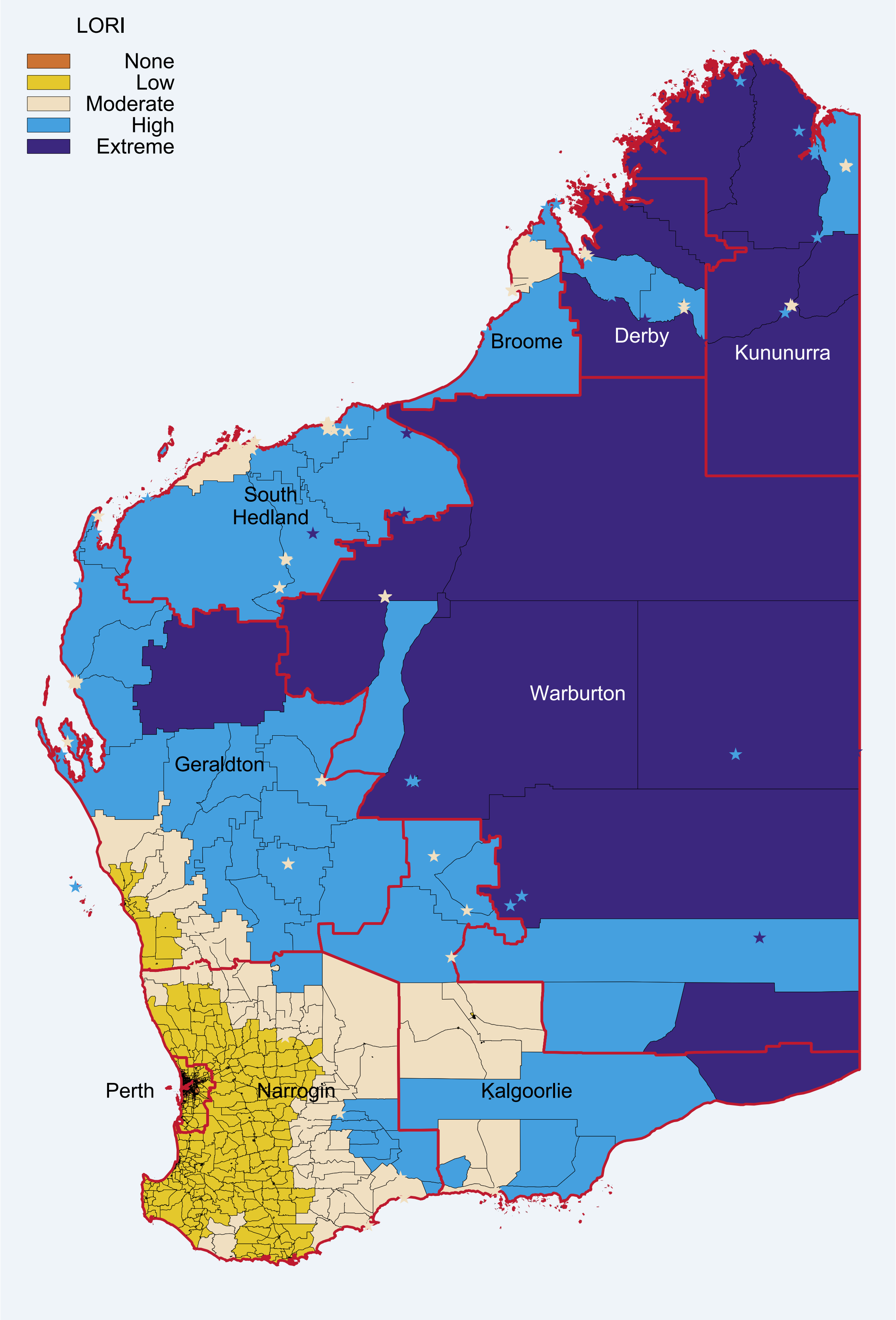
FIGURE 2.3: ABORIGINAL AND TORRES STRAIT ISLANDER CHILDREN — LEVEL OF RELATIVE ISOLATION OF USUAL RESIDENCE



Source: Table 2.2

Western Australia is divided into nine regions administered by the Aboriginal and Torres Strait Islander Commission (ATSIC). Figure 2.4 shows these ATSIC regions and how they overlap the LORI categories that have been derived from ARIA ++ *(See Appendix C)*. From this map it can be seen, for example, that in the ATSIC region of Warburton, the level of relative isolation is predominately 'extreme' while in the ATSIC regions of Geraldton and Kalgoorlie there are more varied degrees of isolation.

FIGURE 2.4: CATEGORIES OF LEVEL OF RELATIVE ISOLATION (LORI) SHOWING ATSIC REGIONS BASED ON 1996 CENSUS BOUNDARIES



LORI categories derived from ARIA++
Source: National Key Centre for Social Applications of Geographic Information Systems

Figure 2.5 shows the distribution of children throughout the state according to the ATSIC region in which they live. The nine ATSIC regions are listed in order of their average level of relative isolation. Approximately half of Western Australia's Aboriginal children live in the Perth and Narrogin ATSIC regions. The total population of children is more highly concentrated in the south west with almost 90 per cent living in the combined ATSIC regions of Perth and Narrogin.

FIGURE 2.5: INDIGENOUS AND TOTAL CHILDREN — DISTRIBUTION BY ATSIC REGION

ATSIC region	Indigenous children(a)		Total children(b)	
	Number	%	Number	%
Perth	10 710	35.9	361 352	74.1
Narrogin	4 088	13.7	70 948	14.5
Kalgoorlie	1 548	5.2	15 126	3.1
Geraldton	2 909	9.8	16 724	3.4
Broome	1 539	5.2	3 910	0.8
South Hedland	2 673	9.0	11 120	2.3
Derby	2 073	6.9	2 990	0.6
Kununurra	2 572	8.6	3 583	0.7
Warburton	1 706	5.7	2 183	0.4
Total WA	**29 817**	**100.0**	**487 936**	**100.0**

(a) ABS Experimental Estimates of the Indigenous population at June 2001, unpublished data

(b) ABS Estimated Resident Population (preliminary) 2001

The range of geographic contexts in which Aboriginal and Torres Strait Islander children live in Western Australia is further demonstrated in Figure 2.6, which shows the proportion of children living in each ATSIC region by their level of relative isolation within each region.

For example, 94.9 per cent (CI: 92.3%–96.9%) of children in the Perth ATSIC region are classified as living in the lowest level of relative isolation (i.e. 'none') while the remaining 5.1 per cent (CI: 3.2%–7.7%) are living in areas of 'low' isolation. In contrast, the vast ATSIC region of Warburton, has a preponderance of communities with 'extreme' or 'high' levels of isolation. In this region, 79.3 per cent (CI: 54.4%–93.9%) of children live in 'extreme' isolation, while 19.4 per cent (CI: 6.3%–38.1%) live in areas of 'high' isolation.

FIGURE 2.6: CHILDREN — ATSIC REGION, BY LEVEL OF RELATIVE ISOLATION

ATSIC region	None	Low	Moderate	High	Extreme
	Proportion (%)				
Perth	94.9	5.1			
Narrogin		97.1	2.9		
Kalgoorlie		71.4	8.4	14.9	5.3
Geraldton		56.7	30.5	9.0	3.8
Broome			65.4	34.6	
South Hedland			69.9	30.1	
Derby			55.3	21.6	23.1
Kununurra			47.0	21.7	31.3
Warburton			1.3	19.4	79.3

Source: Table 2.4

BIRTHPLACE

Almost all Aboriginal and Torres Strait Islander children living in Western Australia were born in Australia, with 94.6 per cent (CI: 93.4%–95.6%) born in the state. Of the remaining children, 2.3 per cent (CI: 1.6%–3.4%) were born in the Northern Territory and less than 1 per cent were born in each of the remaining states and territories (Table 2.5).

An estimated 86.1 per cent (CI: 84.3%–87.8%) of primary carers *(see Glossary)* were born in Western Australia. Approximately 2 per cent of primary carers were born in each of New South Wales, South Australia, Northern Territory, Queensland and Victoria. The distribution of place of birth for secondary carers *(see Glossary)* is similar to that of primary carers (Table 2.5).

INDIGENOUS STATUS AND BIRTH MOTHER STATUS OF CARERS

The relationship between the Indigenous status of carers and their children is a complex one.

An estimated 82.6 per cent (CI: 80.6%–84.5%) of primary carers and 78.6 per cent (CI: 75.7%–81.3%) of secondary carers identified themselves as being of Aboriginal or Torres Strait Islander origin. There is a relationship between the proportion of carers who are Indigenous and levels of relative isolation. As the level of relative isolation increases, so too does the proportion of primary and secondary carers who are Indigenous. (Tables 2.6, 2.7)

Aboriginal birth mothers are the primary carers of 68.4 per cent (CI: 66.2%–70.6%) of all Aboriginal children in Western Australia. The next most common primary care arrangement is care for by an Aboriginal carer who is not the birth mother of the child (17.3 per cent; CI: 15.7%–18.9%). Non–Aboriginal carers are the primary carers and natural mothers of 11.4 per cent (CI: 9.7%–13.3%) of Aboriginal children in Western Australia. Children being cared for by non–Aboriginal carers who are also *not* the natural mothers of those children amount to 2.2 percent (CI: 1.4%–3.3%) of all the Aboriginal children in the state. (Table 2.9)

The majority (80.4 per cent; CI: 78.6%–82.0%) of primary carers are the birth mothers of the children in their care. Of these birth mothers, 85.1 per cent (82.9%–87.2%) identified themselves to be of Aboriginal and Torres Strait Islander origin. Similarly, 19.6 per cent (CI: 18.0%–21.4%) of carers were not the birth mothers of the children and 87.9 per cent (82.9%–92.0%) of this group identified themselves to be of Aboriginal and Torres Strait Islander origin (Tables 2.10, 2.11).

FORCED SEPARATION AND FORCED RELOCATION

The 1997 Report of the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from Their Families, ‘Bringing them Home’[2], has documented the past laws, practices and policies which resulted in the separation of Aboriginal and Torres Strait Islander children from their families by ‘compulsion, duress or undue influence’. Separation took three general forms: putting children into government run institutions; the adoption of children by white families; and the fostering of children into white families. This occurred across the country from the late 1800s until the practice was officially ended in 1969. Over this period, as many as 100,000 Indigenous children are believed to have been forcibly separated, or ‘taken away’, from their families. Submissions to the ‘Bringing them Home’ inquiry also described the immediate and subsequent effects on individuals who were forcibly removed, institutionalised, denied contact with their Aboriginality and in some cases traumatised and abused. The report also includes references to entire communities being forcibly relocated away from traditional lands of special cultural and spiritual significance.

It is generally recognised that both forced separation and forced relocation have had devastating consequences in terms of social and cultural dislocation and have impacted on the health and well-being of subsequent generations. Until recently there has been little or no empirical data to document the nature and extent of these intergenerational effects. The Western Australian Aboriginal Child Health Survey sought to ascertain the number of children and young people currently living in households in which parents, carers and/or grandparents were forcibly separated from family or who had been forcibly relocated away from traditional lands. The association between forced separation and relocation and health and well-being outcomes will be investigated in this and forthcoming volumes.

HOUSEHOLDS AFFECTED BY FORCED SEPARATION

The survey asked primary and secondary carers of Aboriginal and/or Torres Strait Islander origin whether they had been ‘taken away’ from their natural family by ‘a mission, the government or welfare’. Around 12.3 per cent of primary carers (CI: 10.6%–14.3 %) and 12.3 per cent of secondary carers (CI: 9.7%–15.4%) reported they had been subject to such separation. Carers were given the option of not providing answers to questions relating to forced separations and relocations and 5.0 per cent of primary carers (CI: 3.4%–6.8%) and 3.8 per cent of secondary carers (CI: 2.4%–5.6%) chose not to answer these questions. (Table 2.12)

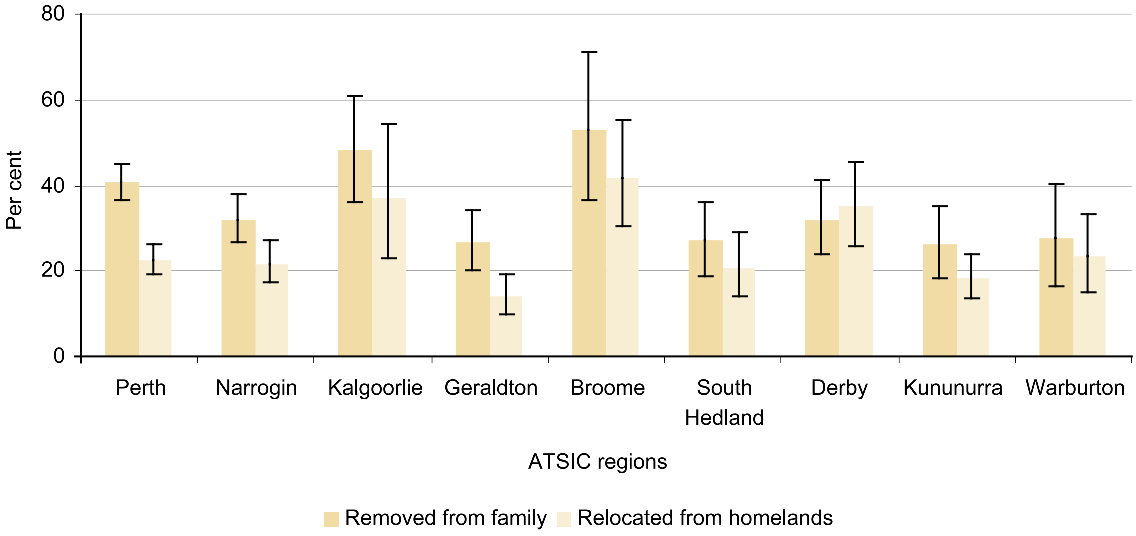
Aboriginal carers were also asked whether either of their parents had been subject to forced removal from their natural family. Some 20.3 per cent (CI: 18.2%– 22.6%) of the mothers of primary carers (e.g. grandmothers of the survey children) had been forcibly separated. In contrast, 12.6 per cent (CI: 10.9%–14.6%) of the fathers of primary carers (e.g. grandfathers of the survey children) had been separated. Some 16.1 per cent (CI: 13.4%–18.9%) of secondary carers reported their mothers had been separated and 11.0 per cent (CI: 8.8%–13.6%) reported their fathers were separated. (Table 2.12)

While not all carers of Aboriginal children are Aboriginal, and not all children live in households with secondary carers, 10.7 per cent of children were living in a family where the primary carer had been subject to forced separation (CI: 9.2%–12.4 %) and 5.6 per cent of children were living in a family where the secondary carer had been subject to forced separation (CI: 4.6%–6.8%). (Table 2.13)

At the time of the survey, just under half (49.8 per cent; CI: 47.2%–52.4%) of all Aboriginal children were living in households where there had not been any forced separation of a primary or secondary carer or their parents, 21.0 per cent (CI: 19.0%–23.1%) were in households affected by one such separation, 10.3 per cent (CI: 8.8%–11.9%) were in households affected by two forced separations and 4.0 per cent (CI: 3.2%–5.0%) were in households affected by three or more forced separations. For 7.8 per cent of children (CI: 6.2%–9.6%) it was not known if the family had been affected by forced separations, and 7.1 per cent of children (CI: 5.7%–8.8%) live in families with no Aboriginal carers. Carers were not asked about forced separations and removals more than one generation prior to their own generation. (Table 2.14)

Of the 29,800 Aboriginal and Torres Strait Islander children and young people living in Western Australia, 35.3 per cent (CI: 32.8%–37.8%) were found to be living in households where a carer or a carer’s parent (e.g. grandparent) was reported to have been forcibly separated from their natural family. While the proportion of households directly affected by forced separation did not vary significantly by level of relative isolation (LORI), some differences were observed between ATSIC regions. This variation is summarised in Figure 2.7 where it can be seen that the Broome ATSIC region had the highest proportion of children in families affected by forced separation (53.0 per cent; CI: 36.6%–71.2%) in contrast to other regions such as South Hedland (27.3 per cent; CI: 18.8%–36.2%) and Kununurra (26.1 per cent; CI: 18.4% – 34.9%). (Table 2.15)

FIGURE 2.7: CHILDREN — PROPORTION LIVING IN HOUSEHOLDS WITH EXPERIENCE OF FORCED INTERGENERATIONAL SEPARATION OR RELOCATION



Source: Tables 2.15, 2.16

HOUSEHOLDS AFFECTED BY FORCED RELOCATION

Primary and secondary carers were also asked if either they or their parents had been forcibly relocated from an area that was their traditional country or homeland.

Around 23.8 per cent (CI: 21.6%–26.0%) of children were living in households that had been affected by such relocation. Figure 2.7 shows that this percentage varied by ATSIC region, ranging from 41.8 per cent (CI: 30.3%–55.2%) in the Broome ATSIC region to 14.0 per cent (CI: 10.0%–19.2%) in the Geraldton ATSIC region. (Table 2.16)

HOUSEHOLDS AFFECTED BY FORCED SEPARATION AND/OR FORCED RELOCATION

Around 40.9 per cent (CI: 38.4%–43.5%) of children were living in households that had been affected by the forced separation or forced relocation from land of at least one primary or secondary carer or grandparent. The proportion of children thus affected varied across the state with a range from 57.5 per cent (CI: 39.2%–74.5%) in the Broome ATSIC region to 32.1 per cent (CI: 25.2%–39.1%) in the Geraldton ATSIC region. (Table 2.17)

EXTRACT FROM ‘BRINGING THEM HOME’, REPORT OF THE NATIONAL INQUIRY INTO THE SEPARATION OF ABORIGINAL AND TORRES STRAIT ISLANDER CHILDREN FROM THEIR FAMILIES

> ‘Evidence to the Inquiry presented many common features of the removal and separation practices. Children could be taken at any age. Many were taken within days of their birth (especially for adoption) and many others in early infancy. In other cases, the limited resources available dictated that the authorities wait until children were closer to school age and less demanding of staff time and skill. Most children were institutionalised more typically with other Indigenous children and with primarily non–Indigenous staff. Where fostering or adoption took place, the family was non–Indigenous in the great majority of cases.
>
> Because the objective was to absorb the children into white society, Aboriginality was not positively affirmed. Many children experienced contempt and denigration of their Aboriginality and that of their parents or denial of their Aboriginality. In line with the common objective, many children were told either that their families had rejected them or that their families were dead. Most often family members were unable to keep in touch with the child. This cut the child off from his or her roots and meant the child was at the mercy of institution staff or foster parents. Many were exploited and abused. Few who gave evidence to the Inquiry had been happy and secure. Those few had become closely attached to institution staff or found loving and supportive adoptive families.
>
> ... It is difficult to capture the complexity of the effects for each individual. Each individual will react differently, even to similar traumas. For the majority of witnesses to the Inquiry, the effects have been multiple and profoundly disabling.’
>
> Human Rights and Equal Opportunities Commission (1997)

LANGUAGE AND CULTURAL ACTIVITIES

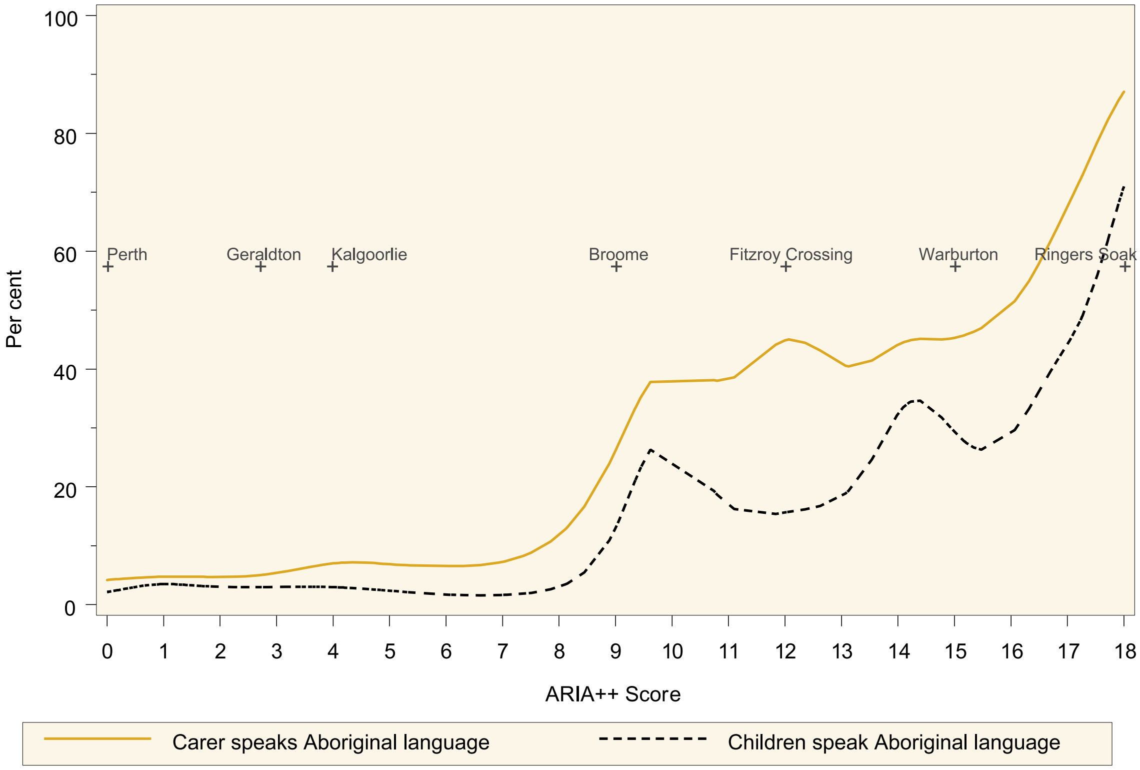
LANGUAGE

Approximately 12.9 per cent (CI: 10.9%–15.1%) of primary carers reported that at least one of the children in their care was conversant in an Aboriginal language and a further 37.8 per cent (CI: 35.3%–40.4%) reported that their children knew a few words of an Aboriginal language (Table 2.18). Not surprisingly, as shown in Figure 2.8, there were strong associations between conversational Aboriginal language use by children and levels of remoteness (as measured by ARIA ++). In the Perth metropolitan area and in areas with ‘low’ levels of relative isolation, about 1.8 per cent (CI: 0.6%–4.2%) and 3.3 per cent (CI: 2.3%–4.7%) of carers respectively reported that their children were conversant in an Aboriginal language. This increased to 59.7 per cent (CI: 47.9%–70.4%) where levels of relative isolation were ‘extreme’ (Table 2.19).

A level of language proficiency to enable conversation in an Aboriginal language was reported by 21.7 per cent (CI: 19.4%–24.1%) of primary carers and 25.4 per cent (CI: 22.4%–28.5%) of secondary carers. A further 35.3 per cent (CI: 32.8%–37.9%) of primary carers and 36.0 per cent (CI: 32.7%–39.4%) of secondary carers reported that they knew ‘a few words’ of an Aboriginal language (Table 2.18).

As was the case with children, the proportion of carers conversant in an Aboriginal language varies with the level of remoteness of their community (Figure 2.8). Of Aboriginal and Torres Strait Islander people living in the Perth metropolitan area or in areas with a ‘low’ level of relative isolation, 5.6 per cent (CI: 4.4%–7.0%) reported that they were able to hold a conversation in an Aboriginal language. This proportion increases substantially to 80.6 per cent (CI: 70.3%–88.4%) in areas with ‘extreme’ levels of relative isolation.

FIGURE 2.8: CHILDREN AND CARERS CONVERSANT IN ABORIGINAL LANGUAGES — REMOTENESS (ARIA ++)



ABORIGINAL LANGUAGES

Over 100 Aboriginal languages have been spoken in Western Australia. Relatively small groups traditionally spoke these languages, but each had its territory, culture and transmission assured. Since European settlement, the situation of traditional languages has changed drastically. Some languages are still spoken by adults and children; some have very few speakers while many others are extinct.

In addition to surviving traditional languages, two contemporary Aboriginal languages, Aboriginal English and Kriol are also spoken in many of the states more remote areas. Aboriginal English is the name given to dialects of English spoken by Aboriginal people who are influenced by Aboriginal languages and worldview. In the Kimberley, Kriol is the name for an English–based Creole spoken across the Kimberley (and Northern Territory). It is a contemporary Aboriginal language that encompasses an Aboriginal worldview. Kriol has pronunciation and grammar from traditional Aboriginal languages and in some areas is spoken as a first (primary) language by up to four generations of Aboriginal people. Over recent decades, an increasing proportion of Aboriginal people have become conversant in Standard Australian English through its use as the language of instruction in schools and its pervasive use as the dominant language of commerce, government and the media.

The rate of loss of traditional Aboriginal language from one generation to the next can be gauged by comparing the distribution of carers and children who are conversant in an Aboriginal language. This is highly dependent on the degree of relative isolation (remoteness) and the extent to which there have been systematic initiatives to preserve and recover traditional languages (e.g. Kimberley Aboriginal Language Resource Centre) or where there are local opportunities for bilingual or traditional first language education (e.g. several Western Australian Aboriginal Independent Community Schools have developed strategies which use the children's traditional language and culture as a bridge to developing competence in Standard Australian English).

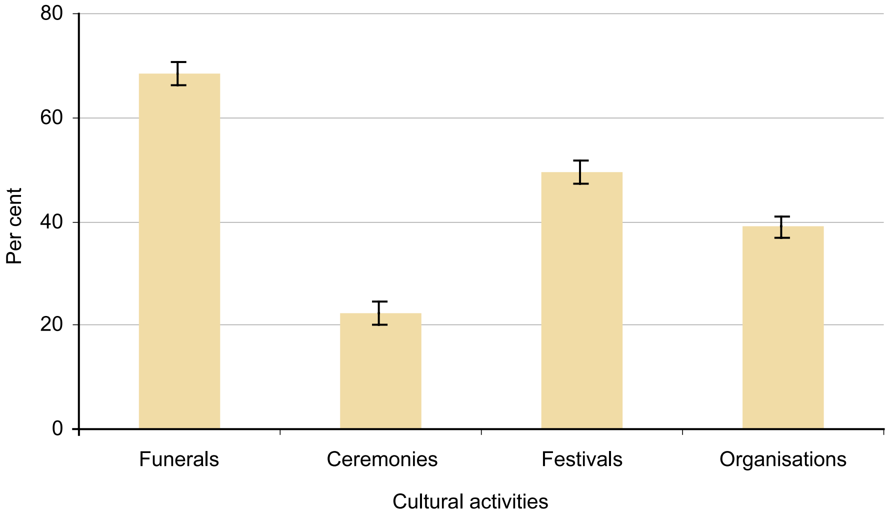
It is of particular interest to note that the rate of traditional language loss is greatest in those larger rural communities (e.g. Kalgoorlie, Broome, Port Hedland, Carnarvon) that are service and educational centres for more remote, outlying traditional Aboriginal communities. Aboriginal children in these communities not surprisingly experience more acculturative stress than those within more traditional communities and those in larger metropolitan centres. This suggests that such transitional communities have a priority need for, and potential to benefit from, traditional language promotion and preservation initiatives.

CULTURAL ACTIVITIES

The carers in the survey were asked if they had participated in Aboriginal cultural activities over the previous twelve months. These activities included attending funerals, participating in Aboriginal ceremonies, attending Aboriginal festivals/carnivals, or involvement in Aboriginal organisations.

In the 12 months prior to the survey, 68.6 per cent (CI: 66.3%–70.8%) of all carers had attended an Aboriginal funeral indicating both the generally high levels of family bereavement and the cultural and communal importance placed on attending funerals. In the same period, 49.5 per cent (CI: 47.1%–51.9%) of carers had attended an Aboriginal festival/carnival that involved arts, crafts, dancing, music or sport, 38.9 per cent (CI: 36.7%–41.1%) had participated in Aboriginal organisations while 22.2 per cent (CI: 20.2%–24.4%) reported attending Aboriginal ceremonies (Figure 2.9). Similar proportions of male and female carers participated in these activities.

FIGURE 2.9 ALL CARERS — PARTICIPATION IN CULTURAL ACTIVITIES

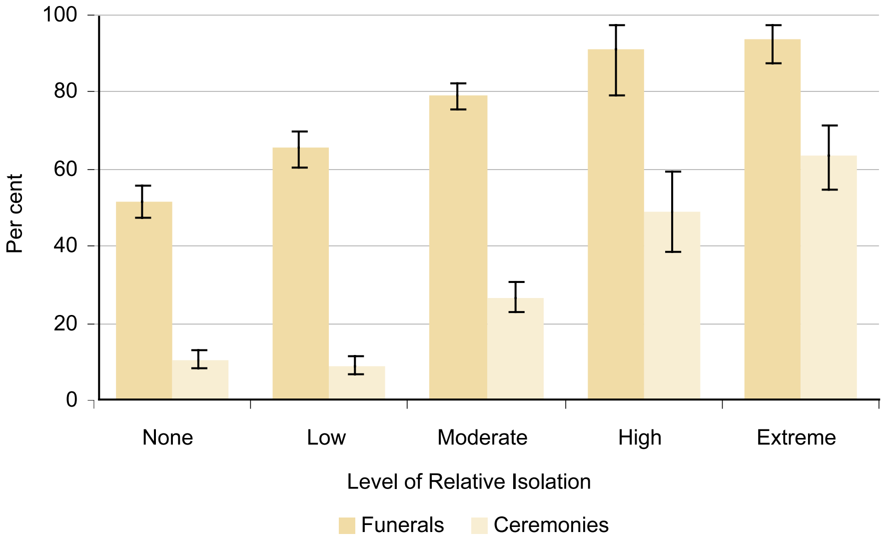


Source: Table 2.21

These summary data conceal large regional variations in levels of cultural participation. For example, in the Warburton ATSIC region, 69.8 per cent (CI: 59.5%–79.0%) of carers participated in Aboriginal traditional ceremonies compared with 43.4 per cent (CI: 35.0%–51.9%) in Derby ATSIC region and 9.0 per cent (CI: 4.1%–15.9%) in Kalgoorlie ATSIC region. Similarly, while 51.5 per cent (CI: 47.4%–55.6%) of families in the Perth ATSIC region had attended an Aboriginal funeral in the past year, much higher proportions had done so in very remote ATSIC regions of South Hedland (82.7 per cent; CI: 76.6%–87.9%), Derby (89.5 per cent; CI: 83.5%–93.7%) and Warburton (92.4 per cent; CI: 84.2%–97.2%). (Table 2.21)

Participation in cultural activities also showed variations with different levels of relative isolation. The clearest association with levels of relative isolation, as shown in Figure 2.10, was participation in Aboriginal funerals and Aboriginal ceremonies. As the level of relative isolation increases, so too does the participation in cultural activities.

FIGURE 2.10: ALL CARERS — PARTICIPATION IN SELECTED CULTURAL ACTIVITIES BY LEVEL OF RELATIVE ISOLATION



Source: Table 2.22

CULTURAL PARTICIPATION

The Aboriginal cultures of Western Australia encompass a wide variety of beliefs, customs and laws that inform identity, spiritual connection to the land and the social functioning of group and kinship systems. These traditional cultures have had to adapt to extensive political, social and ecological change since European settlement. Most particularly, the policies of assimilation, forced removal of children and relocation of communities has resulted in unprecedented cultural dislocation.

The economic pressure for migration from traditional lands to agricultural, mining and urban centres has been one of the main reasons for the loss of many traditional Aboriginal activities. The grouping together of families and children from differing traditional cultures within missions, welfare and educational institutions is a major factor contributing to cultural discontinuity.[1]

The carer’s reports of their participation provide a general indication of the level of family involvement in Aboriginal cultural activities. However, it needs to be acknowledged that culture is dynamic and evolving and is lived as an everyday experience and is not just a matter of participating in traditional ceremonies or attending cultural events.

There is high correspondence between levels of cultural participation and traditional language use in the more remote regions of the state but this is much less obvious in more urban communities. Care should be taken in interpreting this to suggest that the lower levels of language and cultural participation in metropolitan areas equate to greater assimilation or integration and therefore, special services or consideration is unwarranted. If anything, it should suggest a greater need for cultural restoration and renaissance to redress the historical legacy.

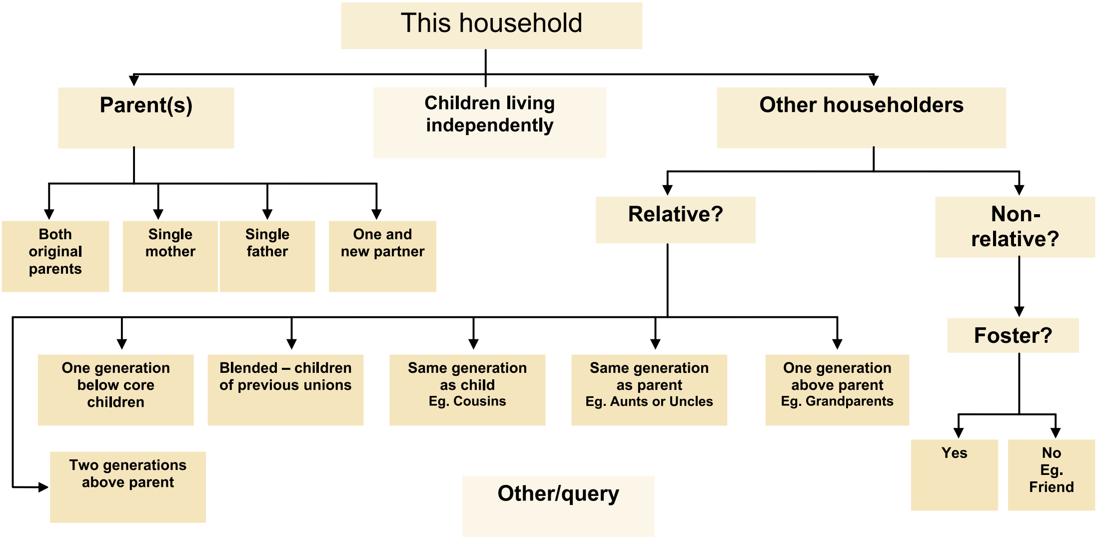
1 Hunter E, (1993). Aboriginal Health and History: Power and Prejudice in Remote Australia. Cambridge University Press. Cambridge.

CLASSIFICATION OF HOUSEHOLD BY USUAL RESIDENTS

Information from respondents was obtained about the ‘usual residents’ *(see Glossary)* of the dwelling and about family members who were away at the time of the interview. This information was updated where repeated visits were necessary to complete interviews. A special feature of the survey was the use of ‘family trees’ *(see Glossary)* to describe the relationships among the usual residents of the household. Family trees were constructed with the cooperation and participation of the interview families — particularly where there were large numbers of family members living together. The use of family trees allowed the application of standard descriptions to code family relationships (e.g. cousins, aunts, uncles) where these terms may otherwise have a wider variation of meaning within Aboriginal culture when compared with mainstream Australian culture. Data from the household record form and family trees were used to classify the entire household in terms of its structural and generational complexity.

Multiple judgments needed to be exercised to arrive at household classifications. Each household was examined to assess a ‘core’ family structure and the generational complexity around this core family unit. As a rule this core structure had as its reference point the principal or largest child–adult unit from which the total household was then described. The focus of this classification was upon *structural complexity* rather than direct child care lines *(see Glossary – household care arrangement)* within the household. Figure 2.11 shows the classification system used at the household level.

FIGURE 2.11: CLASSIFICATION OF HOUSEHOLD BY USUAL RESIDENTS



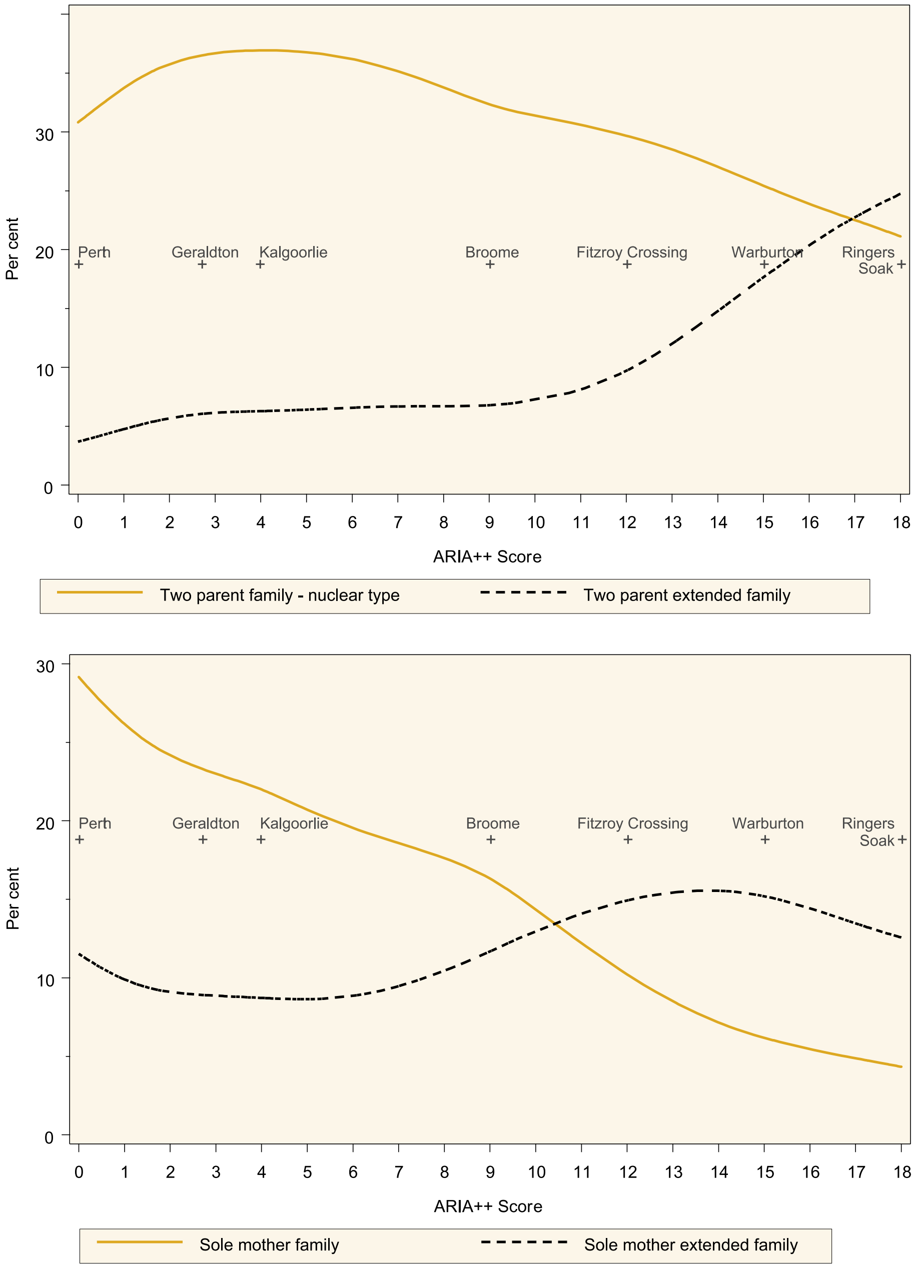
The diversity of Aboriginal and Torres Strait Islander household types is shown in Table 2.23. Most common are two parent household nuclear–type in which two parents are living together with children of that partnership (31.1 per cent; CI: 28.9%–33.4%) and sole mother households (21.8 per cent; CI: 19.8%–23.9%). Households in which two parents are living together with children of that partnership plus children from previous spouse relationships (two parent households – blended type) represented 11.2 per cent (CI: 9.7%–12.9%). A similar proportion, 11.3 per cent (CI: 10.0%–12.8%), is found in households in which a sole mother and her children are living with extended family members (sole mother households – extended type). Less common, but still relatively prevalent (6.9 per cent; CI: 5.5%–8.4%), are two–parent nuclear families living with extended family members (two parent household – extended type). An estimated 5.9 per cent (CI: 4.8%–7.1%)

of households had no identifiable original parent present and were instead headed by an aunt or grandparent.

HOUSEHOLD CLASSIFICATION BY LEVEL OF RELATIVE ISOLATION

The classification of household types varies considerably according to remoteness (Figure 2.12). In particular, 'two parent – extended family type' households range from 2.8 per cent (CI: 1.2%–5.2%) in the Perth metropolitan area to 23.2 per cent (CI: 16.4%–31.4%) in areas of 'extreme' isolation (Figure 2.12). In contrast, the proportion of 'sole mother family' households ranges from 31.0 per cent (CI: 27.2%–35.0%) in the Perth metropolitan area to 6.3 per cent (CI: 2.9%–10.8%) in areas of 'extreme' isolation. While there is a lower proportion of two parent 'family–nuclear type' households in areas of 'high' and 'extreme' isolation relative to areas with lower levels of isolation, this variation is not as marked as for other household classification. (Table 2.23)

FIGURE 2.12: SELECTED HOUSEHOLD CLASSIFICATIONS BY REMOTENESS (ARIA ++)



HOUSEHOLD CLASSIFICATION

The classification of households presented here needs to be interpreted with caution. The method used in the interviews of describing the 'usual residents of a household' is dwelling based and does not span extended families that may be resident in more than one dwelling. The fluctuation in compositional complexity of Aboriginal and Torres Strait Islander households over time and in different locations is well documented.[1] Additionally, the methods used in the survey for gathering the data are relatively novel and have not been used widely in mainstream studies to describe household family composition, thus making comparisons difficult. Notwithstanding this, the data show that there is considerable complexity in the composition of Aboriginal and Torres Strait Islander households. The relationship of this complexity to the health and well-being of children will be examined in subsequent volumes.

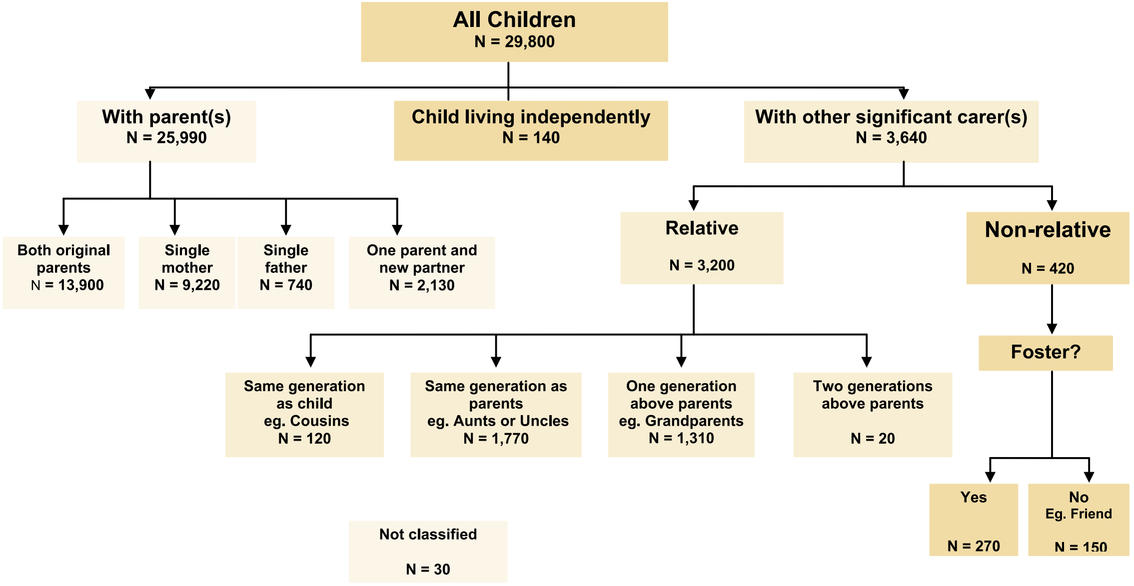
[1] Altman JC, Hunter B, Smith DE and Taylor J, (1997). Indigenous Australians and the National Survey of Living Standards, Report to the Department of Social Security, Centre for Aboriginal Economic Policy Research, ANU, Canberra.

CARING FOR CHILDREN AT HOME

Knowing about the structural complexity of the household does not necessarily reveal arrangements for the specific care of children within the household. As households become large and more complex they offer greater opportunities within them for different care arrangements for children.

Figure 2.13 shows the classifications used to describe the household care arrangements for each child. Carers were asked 'Who cares for (this child)?'. Each child was assessed to accurately describe their line of care within the household. Multiple codes were assigned to each child to comprehensively describe their care arrangement within the household. Family trees were then used to further understand the nature of the care arrangement for each child.

FIGURE 2.13: CHILD CARE ARRANGEMENTS AT HOME



Children cared for by both of their original parents represent 46.7 per cent (CI: 44.5%–48.9%) of all Aboriginal and Torres Strait Islander children (Table 2.24). More specifically, 40.6 per cent (CI: 38.3%–42.9%) of children were cared for exclusively by their original parents while the remaining 6.1 per cent (CI: 5.0%–7.4%) were cared for by their original parents in combination with other extended family members in the household. Although other members of the extended family may live in these households they were not identified by the main carers as having any direct responsibility for the care of the child.

The next most prevalent type of care within households was the sole mother care arrangement (30.9 per cent; CI: 28.8%–33.2%). This included approximately 6.8 per cent (CI: 5.7%–8.0%) of children who were cared for by their sole mothers as well as other family members of the extended family within the household.

Smaller proportions of children are cared for in families by an original parent living with a new partner (7.1 per cent; CI: 6.2%–8.2%) or are cared for by only extended family members rather than by an original parent (5.9 per cent; CI: 5.0%–7.0%).

FAMILY STRUCTURE AND CARE ARRANGEMENTS

In commenting on the care of children within Aboriginal families, it is important to note that mainstream Australian culture is predominately organised around family units – particularly the nuclear family. In contrast, traditional Aboriginal societies have been organised by their language group and, within this, their local group (e.g. clans/hordes/bands) and family. As a result Aboriginal families are extended through a system of kinship. In this way individuals in a language group can identify their relationship to others in the same language group and determine their social roles and obligations. Terms such as father, mother, brother, sister, for example, are extended to include a greater number of family members within the language and local groups.[1]

While kinship extension is particularly evident in more isolated areas where greater preservation of traditional culture has been possible, it is present to some degree throughout less isolated and more urban areas. Because of this, the patterns of care for children within families will reflect kinship patterns that extend well beyond the mainstream Australian care arrangements established around nuclear families.[2] Within the survey findings, children are cared for in families that can be described as ‘nuclear’ in their structure. However the emergence of this pattern reflects the historical impact of colonisation upon the cultural practices of child rearing within Aboriginal families living in their traditional local and language group.

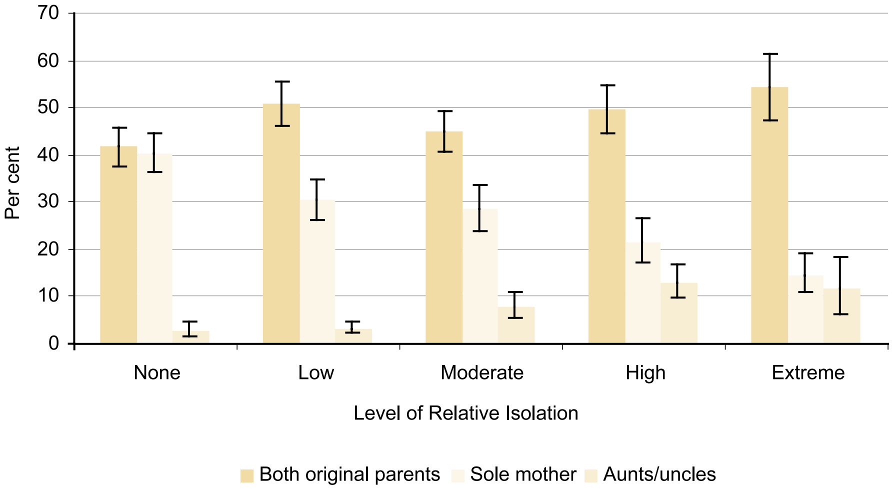
As with the section on the classification of household by usual residence, the organisation of the care of children within families has been described with respect to individuals usually living within a particular dwelling. Thus, the cross–sectional nature of the survey provides a ‘snapshot’ of the living circumstances of the child at the time of the interview but does not capture the dynamic nature of family care arrangements that span across time and different dwellings. The data show that more complex family care arrangements occur in areas of greater relative isolation and where larger numbers of family members lived in the dwelling. However it should also be noted that within the households surveyed over three quarters of Aboriginal children are cared for by at least one of their original parents.

[1] Edwards WH, (1988). An introduction to Aboriginal societies. Social Science Press,Wentworth Falls. New South Wales.

[2] Warrki Jarrinjaku ACRS Project Team, (2002). Warrki Jarrinjaku Jintangkamanu Purananjaku: Working together everyone and listening. Commonwealth Department of Family and Community Services. Canberra.

There are variations in the household care arrangements for children across differing levels of relative isolation (Figure 2.14). In particular, the likelihood of children being cared for principally by a sole mother decreases as isolation increases. In the Perth metropolitan area, sole mothers care for 40.2 per cent (CI: 36.2%–44.6%) of children declining to 14.6 per cent (CI: 10.8%–19.0%) in areas of 'extreme' isolation. In contrast, the proportion of children being cared for principally by aunts (and uncles) is higher in areas of 'moderate', 'high' and 'extreme' isolation when compared with the metropolitan Perth area or areas of 'low' relative isolation. However, with the exception of areas of extreme isolation and the Perth metropolitan area, there was little variation in the proportion of children cared for by both of their original parents. In areas of extreme isolation, 54.4 per cent (CI: 47.5%–61.3%) of children were cared for by both of their original parents compared with 41.7 per cent (CI: 37.5%–45.8%) in the Perth metropolitan area.

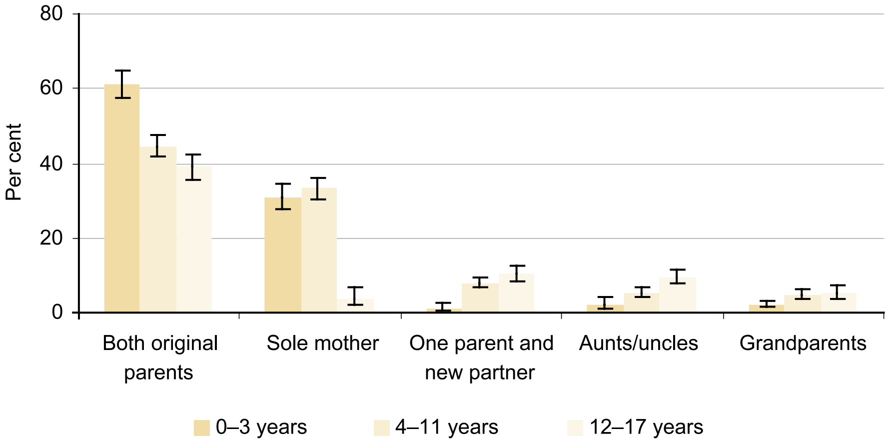
FIGURE 2.14 HOUSEHOLD CHILD CARE ARRANGEMENTS, BY LEVEL OF RELATIVE ISOLATION



Source: Table 2.25

Patterns of direct care within households also reflect the dynamics of family separation and/or divorce and reformation. Table 2.26 shows the variation in proportions of children in differing household care arrangements by the age of the child. These data reveal considerable differences in household care arrangements as children become older (Figure 2.15). Sixty–one per cent (CI: 57.3%–64.7%) of children aged from birth to three years are being cared for by both original parents, compared with 44.5 per cent (CI: 41.7%–47.5%) of children aged 4–11 years and 39.0 per cent (CI: 35.5%–42.6%) of children aged 12–17 years. In contrast, rates of sole mother care remain relatively constant until age 11 years and then decline. For older children, there are substantial increases in care by 'one parent and a new partner' families, aunts and uncles and grandparents.

FIGURE 2.15: CHILDREN — SELECTED HOUSEHOLD CARE ARRANGEMENTS BY AGE OF CHILD



Source: Table 2.26

FINANCIAL STRAIN, FINANCIAL STABILITY, CARER INCOME AND BENEFITS

The survey content was designed to collect information about carer and family income in four broad domains. Carers were asked to:

- rate their family's 'money situation' on a scale of financial strain
- report whether their family's money situation was better now relative to a year ago
- report their personal income over the past two weeks from all sources
- identify from pictures of health care cards, concession cards, and benefit cards which benefits they received.

The information provided on financial strain, stability, income and benefits were gathered from carers of each child in the survey. However, it was not always possible to personally interview a child's secondary carer. Twenty–seven per cent of secondary carers were not interviewed directly. For these people, proxy information was collected from the child's primary carer.

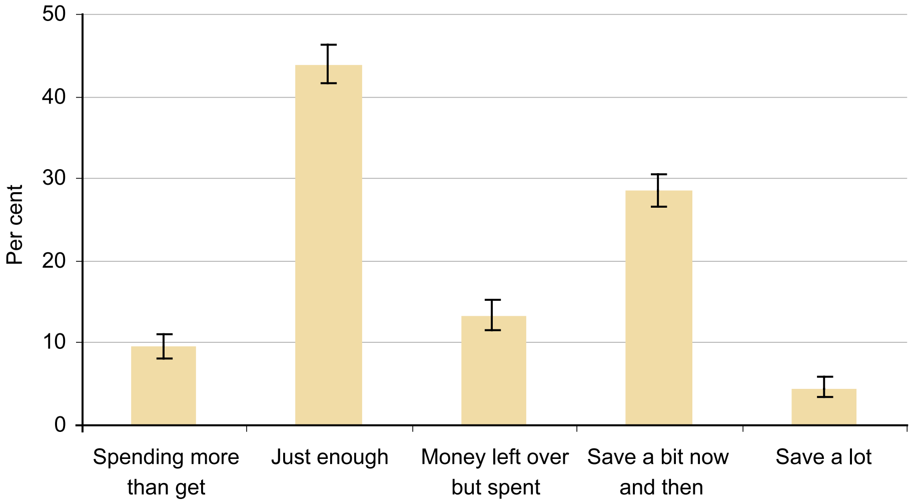
RELATIVE MONEY SITUATION

With respect to whether the family's current money situation is better than it was twelve months ago, 40.2 per cent (CI: 37.7%–42.7%) of primary carers and 44.5 per cent (CI: 41.1%–47.9%) of secondary carers reported that their family money situation was about the same (Table 2.27). An estimated 38.1 per cent (CI: 35.8%–40.6%) of primary carers and 35.6 per cent (CI: 32.2%–39.0%) of secondary carers reported that their family money situation that was better now than a year ago. In contrast, 21.7 per cent (CI: 19.8%–23.7%) of primary and 19.9 per cent (CI: 17.3%–22.7%) of secondary carers reported that their family was not better off than it was a year ago.

FINANCIAL STRAIN

Table 2.28 shows self–assessed financial strain from primary and secondary carers. About 28.6 per cent (CI: 26.5%–30.6%) of primary carers reported that their family could 'save a bit now and again' and 4.6 per cent (CI: 3.5%–5.8%) reported that their families could 'save a lot'. Families having 'just enough money to get through the next payday' were reported by 43.9 per cent (CI: 41.6%–46.4%) of primary carers while 9.5 per cent (CI: 8.2%–11.0%) reported that their families were 'spending more money than we get'. Finally, about 13.4 per cent (CI: 11.6%–15.3%) of primary carers reported that their family had 'some money left over each week but [they] just spent it'. Secondary carer reports of the level of family financial strain were comparable to primary carer reports.

FIGURE 2.16: PRIMARY CARERS — FAMILY FINANCIAL STRAIN



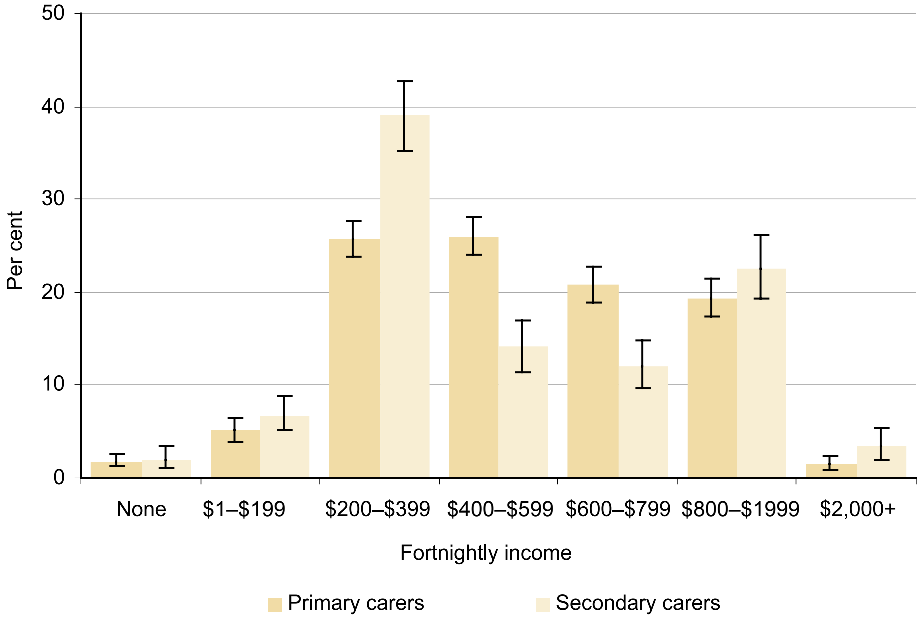
Source: Table 2.28

CARER INCOME

Figure 2.17 shows the proportions of reported carer earnings from all sources (e.g. wages, Community Development Employment Project (CDEP), pensions and study allowances) over the period two weeks prior to the interview.

In the two–week period previous to interview, 25.7 per cent (CI: 23.8%–27.7%) of primary carers earned $200–$399, 26.0 per cent (CI: 24.0%–28.0%) earned $400–$599 and 20.9 per cent (CI: 18.9%–22.8%) earned $600–$799. An income of $800–$1,999 was earned by 19.3 per cent (CI: 17.3%–21.4%) of primary carers while a small proportion (1.4 per cent; CI: 0.8%–2.4%) reported receiving $2,000 or more a fortnight. An estimated 5.1 per cent (CI: 3.9%–6.4%) of primary carers reported receiving or earning less than $200 a fortnight while 1.7 per cent (CI: 1.2%–2.5%) reported no income in the previous two weeks.

FIGURE 2.17: PRIMARY AND SECONDARY CARERS(a) — FORTNIGHTLY INCOME FROM ALL SOURCES



(a) Only those secondary carers who were interviewed personally

Source: Table 2.29

Secondary carer income in the two week period previous to the survey was more variable. As it was difficult to collect personal income information by proxy, this analysis was restricted to the 74 per cent of secondary carers who were interviewed personally. Of these, 6.7 per cent (CI: 5.1%–8.6%) reported receiving or earning less than $200 a fortnight while 2.0 per cent (CI: 1.1%–3.4%) reported no income. In contrast, 39.0 per cent (CI: 35.3%–42.8%) of secondary carers earned $200–$399, 22.6 per cent (CI: 19.3%–26.1%) reported earning $800–$1,999 and 3.4 per cent (CI: 1.9%–5.4%) reported earning $2,000 or more a fortnight (Table 2.29).

FAMILY AND HOUSEHOLD FINANCE

Several considerations were made in deciding how to collect information about family finance and income in Aboriginal and Torres Strait Islander households.

First, the collection of comprehensive data about household income would require access to all household members who contributed to its financial base. However, interviews were more typically done with carers who may not know the contribution that other family members made to household finance.

Second, annual income was likely to vary in response to the number of contributing family members in the household over a twelve–month period of time – this would make accurate household income estimation difficult and raise questions about measuring the variability or dependability of household income relative to its absolute level.

Third, even assuming interviews that assessed all sources of income for a family were possible, such an interview would be potentially extensive and over–burden both the respondents and be disproportionate in its emphasis relative to the aims of the survey.

FAMILY AND HOUSEHOLD FINANCE (Continued)

Fourth, contributions to family income are not necessarily bounded by the dwelling–based definition used in the survey to define a 'household'. Contributions to total family income may span more than one household across both time and geographical location. In summary, no attempt was made to establish total family income and its composition and contributors, nor were respondents probed for information on a 'main earner'.

With this in mind several comments are warranted. The modal personal income received from all sources by carers was $200–$399 per fortnight ($5,200–$10,400 per annum). About 25.7 per cent (CI: 23.8%–27.7%) of primary carers and 39.0 per cent (CI: 35.3%–42.8%) of secondary carers received income in this range. While it is not possible to use these data to directly calculate household or family income, a recent report noted that the average equivalised gross household income for Indigenous persons was $364 per week, or 62 per cent of the corresponding income for non–Indigenous persons ($585 per week).[1] The observations made here on financial strain, stability and carer income are broadly congruent with numerous observations of substantial economic disadvantage in Indigenous households.[2]

[1] Australian Bureau of Statistics (2003). The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples. ABS Catalogue 4704.0. Canberra

[2] Gray MC, and Auld JC, (2000). Towards and Index of relative Indigenous socioeconomic disadvantage. CAEPR Paper 196. Centre for Aboriginal Economic Policy Research, ANU, Canberra

BENEFITS

The most common cash benefit received by carers was the Family Allowance (Table 2.31). About 71.9 per cent (CI: 69.5%–74.1%) of primary carers and 8.6 per cent (CI: 7.0%–10.6%) of secondary carers reported receiving a Family Allowance – a proportion lower than might be expected. It is possible that there were some carers who received this allowance but were unaware of it. For the purposes of the survey, the primary carer was identified as the person taking primary responsibility for the care of the child and is not necessarily the person who would receive a family allowance payment in respect of the child. As only 70 per cent response was received from secondary carers, it is possible the person receiving a family allowance payment may not have participated in the survey.

The other common payment was the Parenting Payment received by 56.9 per cent (CI: 54.2%–59.6%) of primary carers. In the Perth metropolitan area the Parenting payment was received by 62.4 per cent (CI: 57.4%–67.1%) of primary carers. This was a significantly higher proportion than primary carers in areas of extreme isolation where 37.0 per cent (CI: 28.6%–45.6%) of primary carers received this payment (Table 2.32).

At the time of the survey, a Child Disability Allowance was received by 2.3 per cent (CI: 1.7%–3.0%) of all carers in Western Australia. Receipt of a Child Disability Allowance varied at different levels of isolation with fewer carers receiving the allowance as levels of isolation increased. In the Perth metropolitan area, the allowance was received by 4.3 per cent (CI: 2.8%–6.0%) of carers compared with 0.6 per cent (CI: 0.1%–2.2%) in areas of extreme isolation. (Table 2.33)

EMPLOYMENT

EMPLOYMENT STATUS

Of the 19,500 carers in Western Australia, 63.2 per cent (CI: 61.1%–65.2%) were in the labour force, i.e. either in a job or looking for work. Slightly more than half of these were women (50.6%; CI: 47.8%–53.3%). Of the 12,320 carers in the labour force, 75.6 per cent (CI: 73.2%–77.8%) were currently employed, in equal proportions of men to women. (Table 2.34)

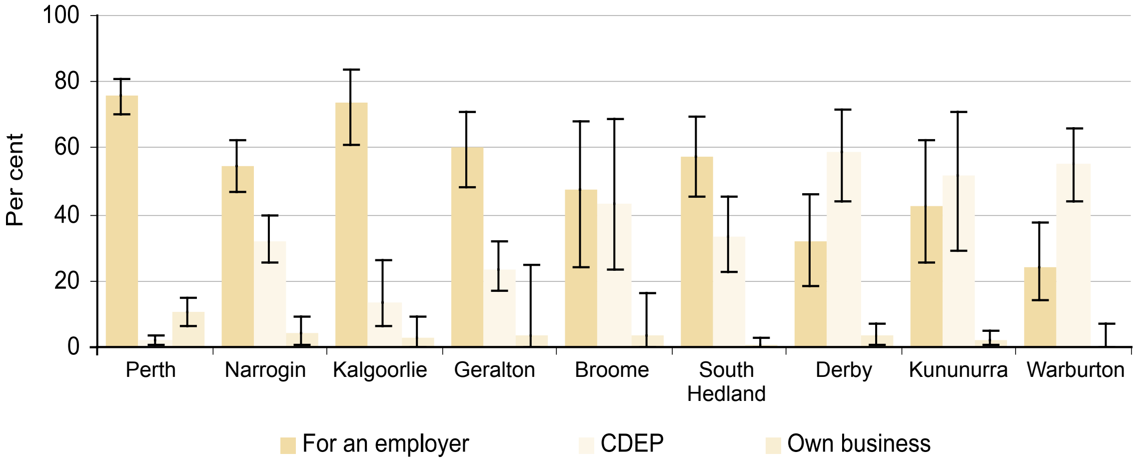
The employment status of carers in the labour force for each of the ATSIC regions is shown in Table 2.35. Rates of unemployment averaged about 24.4 per cent (CI: 22.2%–26.8%) across all regions. In the Perth ATSIC region the unemployment rate was 32.9 per cent (CI: 28.1%–37.8%). Lower levels of unemployment were observed in Derby (11.5 per cent; CI: 7.1%–17.5%), Warburton (13.7 per cent; CI: 8.5%–20.2%) and Broome (13.7 per cent; CI: 7.4%–23.1%). However, it should be noted that lack of job opportunities in remote areas mean that fewer people are in the labour force, so the rates of unemployment appear lower.

EMPLOYERS

Table 2.36 shows the source of employment for employed carers. Sources are summarised to include the ATSIC administered and funded Community Development Employment Project (CDEP); other employers; and own business.

CDEP principally operates in rural and particularly remote regions of Western Australia (Figure 2.18). Thus, substantially higher proportions of employed carers in the ATSIC regions of Derby (58.8 per cent; CI: 44.1%–71.3%) and Warburton (55.5 per cent; CI: 44.1%–66.1%) are employed through CDEP in contrast to Perth (1.9 per cent; CI: 1.0%–3.5%) or Kalgoorlie (13.7 per cent; CI: 6.4%–26.2%). Carers working in their own business were more likely to be doing so in the Perth region (10.3 per cent; CI: 6.6%–14.6%).

FIGURE 2.18: EMPLOYED CARERS IN SURVEY WEEK — EMPLOYER TYPE, BY ATSIC REGION



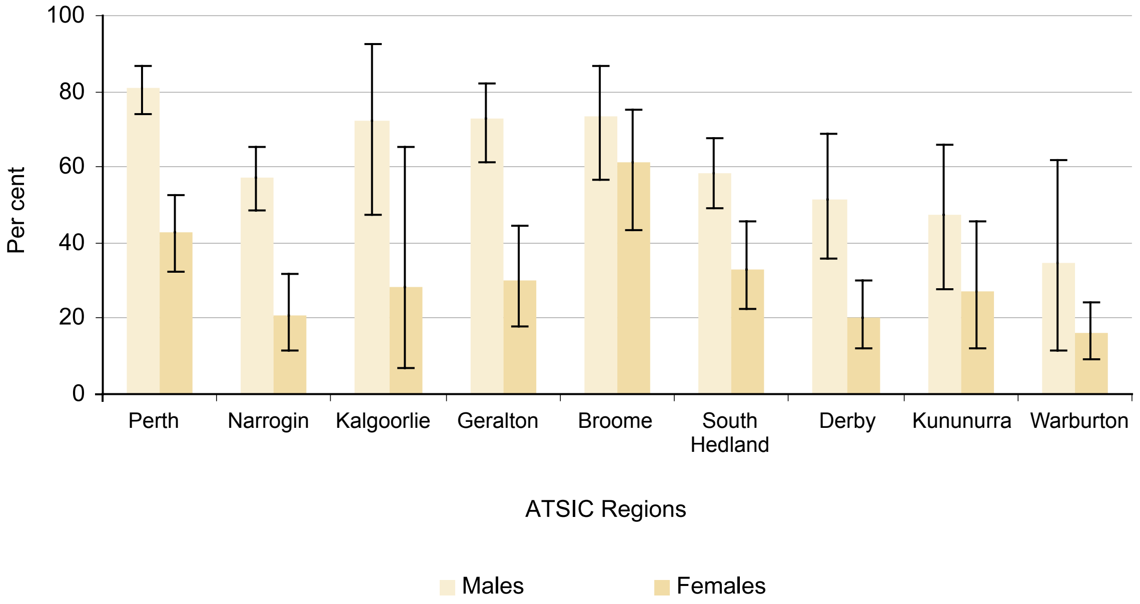
Source: Table 2.36

HOURS WORKED

In the week previous to the survey, carers who were employed and at work for 35 hours or more were classified as working full–time while those working less than 35 hours per week were classified as working part–time. Table 2.37 shows the proportions of carers by ATSIC region and by sex who were employed full– or part–time. Almost two–thirds (64.4 per cent; CI: 60.3%–68.2%) of males worked full–

time compared with 31.8 per cent (CI: 27.5%–36.5%) of females. These proportions varied considerably for each sex within regions as shown in Figure 2.19. The ATSIC region of Perth had the highest proportion of employed males working full–time (80.9 per cent; CI: 74.1%–86.7%), while the highest proportion of employed females working full–time (61.2 per cent; CI: 43.3%–75.1%) was reported in Broome.

FIGURE 2.19: EMPLOYED CARERS — PROPORTION EMPLOYED FULL–TIME, BY SEX AND ATSIC REGION



Source: Table 2.37

CARER PARTICIPATION IN THE LABOUR FORCE

Any discussion of the employment status of Indigenous carers in the survey must account for the effects of the Community Development Employment Projects (CDEP) scheme on the rates of their employment. The survey findings show that about 76 per cent (CI: 73.1%–77.8%) of all carers in the labour force were employed and of these 34.2 per cent (CI: 34.2%–38.0%) worked in the CDEP scheme. When carers were employed in the CDEP scheme, 80.0 per cent (CI 76.0%–84.7%) worked part–time. Carers working on CDEP reported working for an average of 23 (CI: 22–24) hours per week. Important geographical variations in this pattern are evident. Over 50 per cent of carers in more isolated regions worked within the CDEP scheme with this proportion falling to levels of 20–40 per cent in areas less isolated but outside large urban centres. If CDEP is counted as unemployment, then the rate of unemployment of the survey carers is about 51 per cent. Keeping in mind that the scope of the survey is families with children under the age of 18 years, then these survey findings generally conform to those reported by Taylor and Hunter (1998) and Hunter (2002). [1,2]

1 Taylor J and Hunter B, (1998). The job still ahead: Economic costs of continuing Indigenous employment disparity. Aboriginal and Torres Strait Island Commission. Canberra.

2 Hunter BH, (2002). The rise of the CDEP scheme and changing factors underlying Indigenous employment. CAEPR Working Paper No.13. Centre for Aboriginal Economic Policy Research, Australian National University. Canberra.

EDUCATION

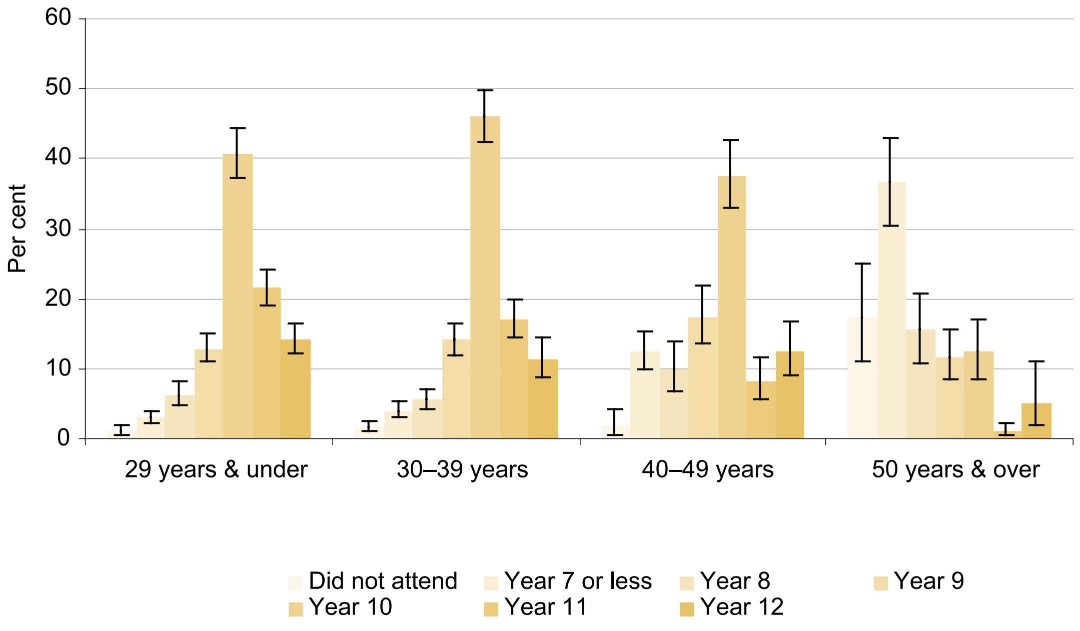
HIGHEST LEVEL OF SCHOOL

Table 2.38 shows the distribution of school level educational attainment for carers of Aboriginal and Torres Strait Islander children in Western Australia. Almost all carers (96.7 per cent, CI: 95.7%–97.4%) reported that they had attended school. However, 30.0 per cent (CI: 28.1%–31.9%) of carers left school before completing year 10 – the level of schooling necessary to achieve a secondary school certificate. About 8.3 per cent of carers (CI: 7.4%–9.4%) had left school by Year 7. With respect to the sex of the carer, Table 2.38 shows that about 39.4 per cent (CI: 36.5%–42.4%) of male carers have not completed formal schooling beyond Year 9 level compared with 30.0 per cent (CI: 27.7 –32.4%) of female carers.

While 18.3 per cent (CI: 16.6%–20.0%) of carers were non–Aboriginal, analyses not shown here indicated that the carer's age rather than Indigenous status was a larger determinant of school retention particularly for those carers under the age of 50 years.

Figure 2.20 demonstrates how changes over time and consequently the age of carers have influenced their level of school retention into upper high school. Of carers aged 50 years or over, 53.9 per cent (CI: 46.8%–60.3%) did not go to high school, compared with 4.2 per cent (CI: 3.2%–5.3%) of carers aged 29 years and under. Approximately 12.5 per cent (CI: 8.6%–17.2%) of carers over the age of 50 left school after Year 10 compared with 37.6 per cent (CI: 32.9%–42.7%) of carers aged 40–49 years and 46.0 per cent (CI: 42.3%–49.7%) aged 30–39 years. While the proportion of carers aged 29 years and under who left school after Year 10 (40.8 per cent; CI: 37.3%–44.4%) was not as high as carers aged 30–39 years, carers in this age group were more likely to go on to complete Years 11 and 12.

FIGURE 2.20: ALL CARERS — HIGHEST SCHOOL GRADE COMPLETED, BY AGE

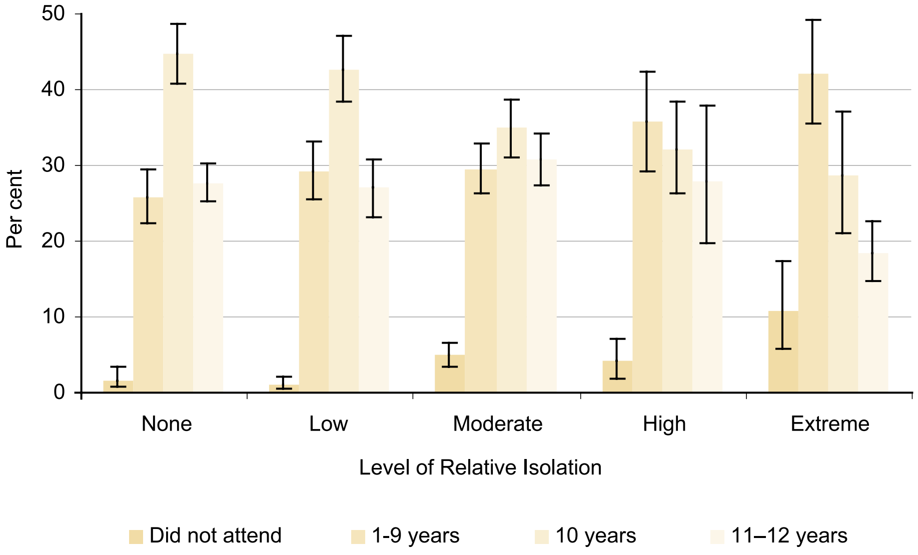


Source: Table 2.39

The highest level of school that carers completed also varies with the level of relative isolation. As a rule, as the level of relative isolation increases the proportion of carers completing at least Year 10 or at least Year 11 declines. For example, 28.6 per cent (CI: 21.1%–37.0%) of carers living in extremely isolated areas left school after completing Year 10 and another 18.5 per cent (CI: 14.7%–22.6%) completed Year 11 or Year 12. These proportions are significantly lower than those of carers living in areas with none or low relative isolation.

Of carers living in the Perth metropolitan area, 7.6 per cent (CI: 5.7%–10.0%) either did not attend school, or completed up to Year 7 or less. This figure rises to 27.5 per cent (CI: 21.3%–34.1%) for carers living in 'extreme' isolation.

FIGURE 2.21: ALL CARERS — HIGHEST SCHOOL YEAR COMPLETED, BY LEVEL OF RELATIVE ISOLATION



Source: Table 2.40, WAACHS unpublished data

EDUCATION EXPERIENCES OF CARERS

In assessing the findings in this section, it is important to recognise that there are several influences on the educational experiences of carers. These influences include: the historical circumstances surrounding colonisation and the role of education as a colonising force; the regional role of missions in the provision of education; the impact of forced separation and relocation of children and family members from one another and from traditional lands; the relevance of mainstream Australian education in Aboriginal life and culture; and the practical realities of access to schooling in extremely isolated areas. Formal education is only one aspect of learning for Aboriginal people and it is highly valorised in mainstream Australian culture. Many carers in the survey repeatedly acknowledged the importance of formal education for themselves and their children. They also acknowledged that culturally transmitted knowledge about Aboriginal history, land, culture, and spirituality, along with skills in traditional ways of living and bushcraft all constitute a vital part of Aboriginal life and learning.

POST SCHOOL EDUCATION

Over one third (37.2 per cent; CI: 35.0%–39.4%) of all carers have achieved some level of post–school qualification (Table 2.42). An estimated 43.0 per cent (CI: 39.9%–46.2%) of male carers achieved a post–school qualification compared with 34.0 per cent (CI: 31.3%–36.8%) of female carers. Male carers are more likely than female carers to have attained a trade or apprenticeship level qualification, with 13.5 per cent (CI: 11.4%–15.9%) of all male carers holding these, compared with 1.2 per cent (CI: 0.7%–2.0%) of female carers (Table 2.43).

Table 2.44 shows the types of post school qualifications held by carers by level of relative isolation. While there was little variation across the levels of relative isolation in the type of qualifications held, there was a difference in the proportion with no post school qualifications. In extremely isolated locations, 80.7 per cent (CI: 71.1%–87.8%) of carers have no post school qualifications compared with 56.6 per cent (CI: 52.6%–60.6%) in the Perth metropolitan area.

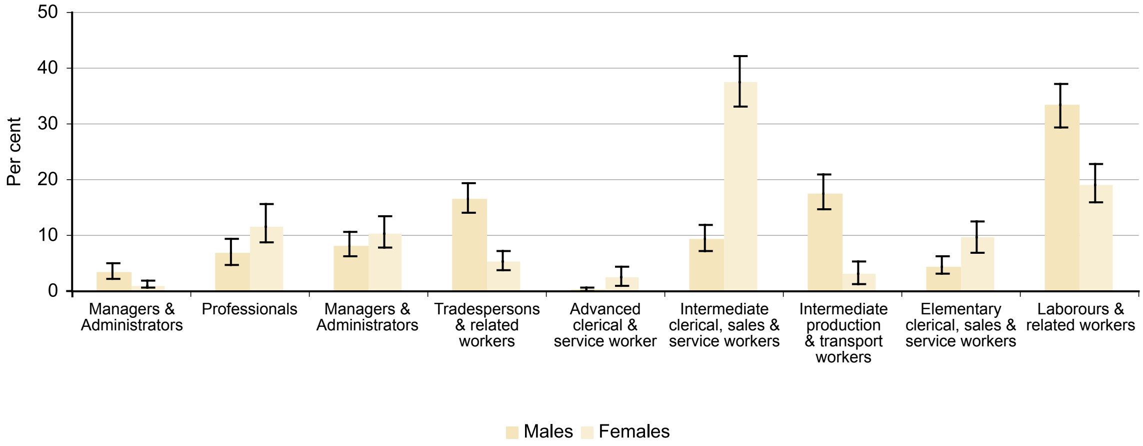
OCCUPATION

Employed carers who had worked the previous week were asked the kind of work that they did in their main job. Table 2.45 shows the main occupational groups for all carers by sex.

A combined total of 67.6 per cent (CI: 63.8%–71.3%) of male carers were in the occupational groups of Tradespersons and Related Workers (16.7 per cent; CI: 14.2%–19.5%), Intermediate Production and Transport Workers (17.5 per cent; CI: 14.6%–20.8%) and Labourers and Related Workers (33.4 per cent; CI: 29.5%–37.3%). A total of 27.6 per cent (CI: 23.9%–31.7%) of female carers were employed in these same occupation categories. Female carers were more likely to be employed in the occupational category of Intermediate Clerical, Sales and Service Workers (37.6 per cent; CI 33.0%–42.1%). (Table 2.45)

Overall, almost two–thirds (64.8 per cent; CI: 61.1%–68.4%) of employed male carers are working in the lower skill categories *(see* 'Australian Qualifications Framework *in Glossary)* of 'Intermediate clerical, sales and service workers', 'Intermediate Production and Transport Workers', 'Elementary Clerical, Sales and Service Workers' and 'Labourers and Related Workers'. A similar pattern prevails for female carers, with 69.3 per cent (CI: 64.9%–73.6%) working in these categories. While it is noted that not all carers are Indigenous, and not all Indigenous people are carers, the survey data is supported in part by the 2001 Census of Population and Housing which found that 62.1 per cent of employed Indigenous males and 64.3 per cent of employed Indigenous females were employed in these lower skill categories. By contrast, in the total population of Western Australia, 36.8 per cent of employed males and 50.5 per cent of employed females were employed in these categories.[3]

FIGURE 2.22: EMPLOYED CARERS — OCCUPATION, BY SEX



Source: Table 2.45

CARER'S OCCUPATIONAL SKILL LEVELS

Occupation and occupational skill level for Indigenous people are the outcome of several dynamics. Level of education, and opportunity for training and employment are relatively proximal factors in their influence on occupational skill level. However, these factors are enmeshed in the more pervasive social exclusion that Indigenous people experience that give rise to deprivations in personal, social, political and financial opportunity.[1]

As with education and employment, the data on occupation and occupational skill level of Indigenous carers reflect considerable levels of disadvantage. When Indigenous carers are employed, they are more likely to be employed in occupations entailing lower levels of skill. Unlike the total population, where more women than men are employed in the lower occupational skill categories, there is no significant difference in the proportions of Indigenous men and women employed in these categories.

[1] Hunter BH, (2000). Social exclusion, social capital, and Indigenous Australians: Measuring the social costs of unemployment. CAEPR Discussion Paper 204. Centre for Aboriginal Economic Policy Research, ANU. Canberra.

DWELLING CHARACTERISTICS

Information about the characteristics of the family dwelling was collected to assess its structure, ownership, and tenure and to determine the ease of obtaining housing and levels of crowding within the dwelling.

DWELLING STRUCTURE

The main dwelling type in Western Australia for families with Aboriginal and Torres Strait Islander children is a separate house, with 91.4 per cent (89.6%–93.0%) of all families living in this type of dwelling (Table 2.46). A further 4.1 per cent (CI: 3.1%–5.3%) reside in a combination of semi–detached style housing and another 2.3 per cent (CI: 1.4%–3.7%) in slightly higher density flat and apartment style living. These figures mirror those for the general population as reported in the 1993 Western Australia Child Health Survey. This reflects the low density of housing in general across Western Australia.

TENURE

Approximately 70.7 per cent (CI: 68.2%–73.1%) of families caring for Aboriginal children in Western Australia are renting their place of residence. A further 15.9 per cent (CI: 14.1%–17.9%) of dwellings are being paid off while 7.4 per cent (CI: 6.0%–9.1%) are owned outright by carers of Aboriginal children (Figure 2.23).

Similar proportions were obtained at the time of the 2001 Census with 65.6 per cent of the 14,464 dwellings containing Indigenous households being rented, 19.0 per cent being purchased and 7.5 per cent fully owned. For the total population of Western Australia, the equivalent proportions were 24.0 per cent, 33.7 per cent and 37.5 per cent respectively (Figure 2.24).

FIGURE 2.23: INDIGENOUS HOUSEHOLDS — SELECTED TENURE TYPE

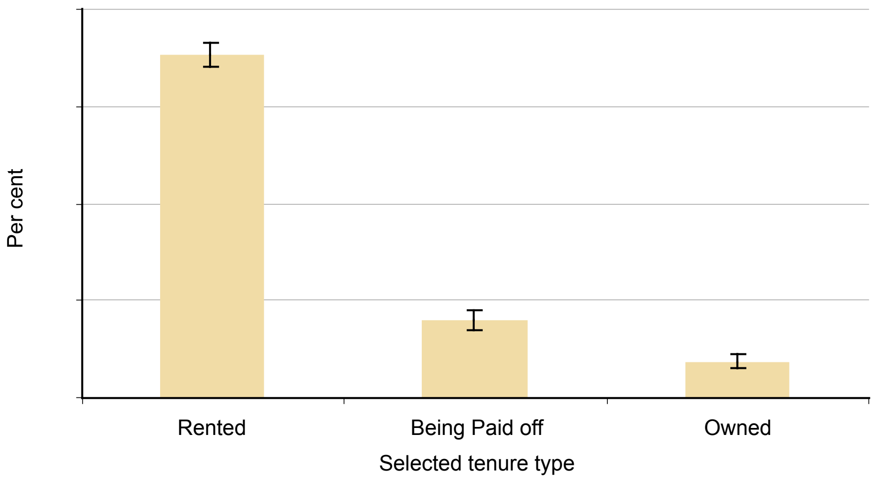
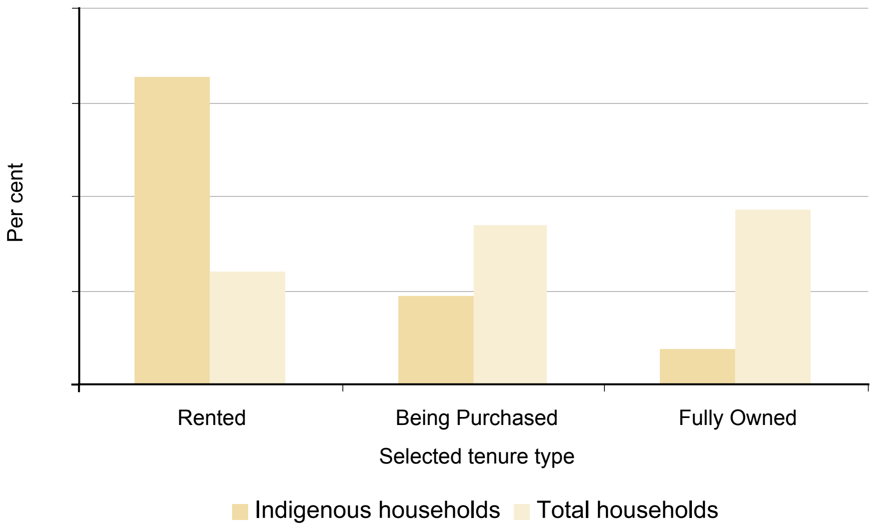


FIGURE 2.24: ALL HOUSEHOLDS IN WESTERN AUSTRALIA — SELECTED TENURE TYPES, BY INDIGENOUS STATUS

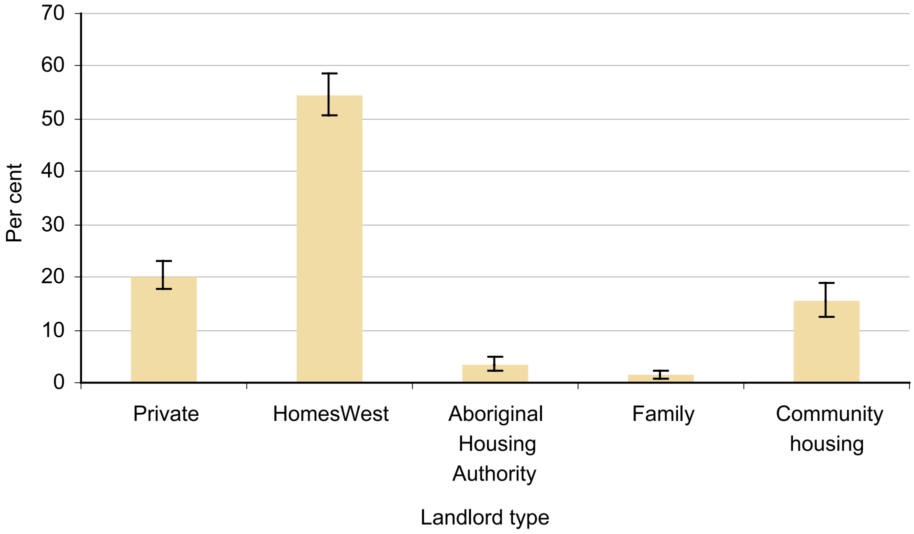


Source: Australian Bureau of Statistics, (2002). Indigenous Profiles – Census of Population and Housing 2001. ABS Catalogue 2020.0. Canberra

Families with Aboriginal children rely heavily on the state government to provide affordable and appropriate housing. Of all families with Aboriginal children, 38.6 per cent (CI: 35.7%–41.6%) live in dwellings rented from HomesWest. This represents almost three times the 14.3 per cent (CI: 12.4%–16.4%) of families who have secured private rental properties (Table 2.48).

Of the families who are renting, 54.6 per cent (CI: 50.8%–58.5%) are renting from HomesWest, and another 3.3 per cent (CI: 2.2%–4.8%) rent from the state operated Aboriginal Housing Authority (Figure 2.25).

FIGURE 2.25: RENTED DWELLINGS — PROVIDER OF ACCOMMODATION



Source: Table 2.48

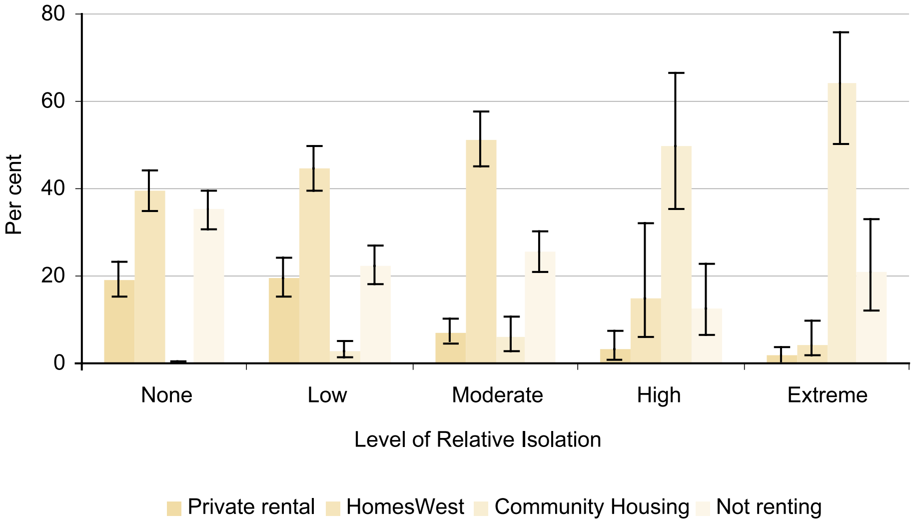
Levels of relative isolation affect the nature of tenure (*see Glossary*) of Aboriginal and Torres Strait Islander dwellings. For example, in the Perth metropolitan area, 26.9 per cent (CI: 22.9%–31.2%) of dwellings are being paid off compared with 1.2 per cent (CI: 0.4%–3.5%) in areas of ‘high’ relative isolation. The prevalence of households not fitting the standard classifications for ownership status also increases as areas become more isolated. Households in the ‘None of these’ category in the Perth metropolitan area amount to 1.5 per cent (CI: 0.7%–2.9%) and increase to 16.7 per cent (CI: 9.4%–26.4%) in areas of ‘extreme’ relative isolation. (Table 2.49)

At the time of the survey, 19.1 per cent (CI: 15.5%–23.3%) of carers in the Perth metropolitan area and 19.6 per cent (CI: 15.4%–24.4%) in areas of ‘low’ relative isolation were living in private rental accommodation compared with 1.7 per cent (CI: 0.6%–3.9%) in areas of ‘extreme’ isolation (Table 2.50).

Community Housing (*see Glossary*) provides 11.0 per cent (CI: 8.7%–13.5%) of families with shelter, and much of this is in the more remote areas of Western Australia (Table 2.48). The proportion of families living in Community Housing increases from levels of 3.0 per cent (CI: 1.5%–5.2%) in areas of ‘low’ isolation and 6.1 per cent (CI: 2.9%–10.6%) in areas of ‘moderate’ isolation to account for 50.0 per cent (CI: 35.5%–66.7%) and 64.2 per cent (CI: 50.1%–76.0%) respectively of all housing in areas where the levels of relative isolation are ’high’ and ‘extreme’ (Table 2.50).

Carers living in HomesWest accommodation were most prevalent in areas with 'moderate' levels of isolation (51.2 per cent; CI: 45.0%–57.7%). This proportion declined to 39.5 per cent (CI: 35.1%–44.2%) in the Perth Metropolitan area. In areas of 'high' and 'extreme' isolation a combination of Community Housing and Aboriginal Housing Authority reduce the role of HomesWest accommodation to 15.1 per cent (CI: 6.2%–32.0%) and 4.3 per cent (CI: 1.7%–9.6%) respectively (Figure 2.26).

FIGURE 2.26: HOUSEHOLDS — SELECTED LANDLORD TYPES, BY LEVEL OF RELATIVE ISOLATION



Source: Table 2.50

EASE OF RENTAL ACQUISITION

Carers were asked to report whether they had any difficulty acquiring their current rental accommodation. Of the 8,030 dwellings currently rented, 90.8 per cent (89.1%–92.4%) were rented without difficulty (Table 2.51). However, while the majority of households had no difficulty finding rental accommodation, choice of dwellings available (rental or otherwise) was limited. Differences were experienced between households where the primary carer of Aboriginal children was of Indigenous origin compared with those who were non–Indigenous. When moving to their current residence, 43.2 per cent (CI: 40.4%–46.1%) of primary carers of Indigenous origin reported having a choice compared with 61.3 per cent (CI: 54.9%–67.8%) of non–Indigenous carers (Table 2.52).

HOUSING RENTAL AND OWNERSHIP

The Aboriginal 'Protection' laws that applied in Western Australia during the first half of the last century resulted in many Aboriginal people being confined to camps, missions and reserves without access to the kind of housing infrastructure or services generally available to non–Aboriginal people. When assimilation was abandoned as official government policy in the early 1970s, government–funded Aboriginal housing (except in reserves) was 'main–streamed' and the State Housing Commission of WA, now the Department of Housing and Works, assumed responsibility and control of housing for Indigenous people in 1972.[1] The majority (70 per cent) of Aboriginal and Torres Strait Islander families with children now live in rental accommodation. While Aboriginal people are a small proportion of the Western Australian population, they make up 18 per cent of

HOUSING RENTAL AND OWNERSHIP (Continued)

tenants of public housing provided by HomesWest, the rental accommodation section of the Department of Housing and Works. [2]

In 1995, the Department of Housing and Works developed the Aboriginal Home Ownership Scheme, an initiative to help more Aboriginal people make the transition from renting to home ownership. Since its inception, this scheme has approved housing loans totalling over $26 million, with a yearly average of 40–60 loans worth $4 million.[2] Despite improvements in Indigenous housing over recent decades, there are still major disparities between the housing circumstances of Aboriginal and non–Aboriginal people. For example, the information on housing tenure reported in the Aboriginal Child Health Survey indicates that, in 2001, households with Indigenous children were 2.5 times more likely to be living in rental accommodation, 1.7 times less likely to be paying off their home and 5 times less likely to own their home outright than non–Indigenous families with children under the age of 18 years. Difficulty in finding rental accommodation as well as limited choice of accommodation available was experienced by Indigenous families. Such difficulties are consistent with other recent Australian research regarding discrimination by landlords against groups such as single mothers, renters with children, people with disabilities and Indigenous people.[3] The importance of adequate housing for the health of children and family functioning has been extensively documented by national and international research.[4,5,6]

According to the World Health Organisation, 'Healthy housing is not just concerned with sanitary and hygienic design of the shelter but with the whole health spectrum of physical health, mental health and social well–being both within the dwelling and the residential environment.'[6] Housing adequacy thus spans a number of inter–related factors including the effects of crowding, the physical condition and type of housing, socio–economic and geographic factors, lifestyle factors, access to services such as power and safe water, the presence and functionality 'health–infrastructure' such as cooking, laundry, bathing and toilet facilities.

At the time of the West Australian Aboriginal Child Health Survey, most rental accommodation by Aboriginal people was either funded and managed by HomesWest, or funded by ATSIC and managed by local authorities. With the signing of the new five–year Commonwealth–State Bilateral Aboriginal Housing Agreement in July 2002, all funds from the State and ATSIC Community Housing and Infrastructure Program are now pooled. [7]

HomesWest continues to manage the majority of Aboriginal rental accommodation through its existing mainstream programs for people on low incomes with special needs, and the allocation of 2,500 additional rental homes which are exclusively reserved for Aboriginal people. The Department of Housing and Works now supports Aboriginal communities in remote areas in managing and maintaining their housing stock through its Indigenous Housing Management System and the Indigenous Infrastructure Projects Program. A new Aboriginal Housing and Infrastructure Council to oversee all publicly funded Aboriginal housing in Western Australia was also established as part of the 2002 Bilateral Aboriginal Housing Agreement. This council comprises four ATSIC members, two community members, the Executive Director of the Aboriginal Housing and Infrastructure Unit of the State Government's Department of Housing and Works and an independent chair. [7]

1 O'Dea DJ [Commissioner] (1991). Royal Commission into Aboriginal Deaths in Custody. Regional Report of Inquiry into Underlying Issues in Western Australia Vols 1 and 2. AGPS. Canberra.

2 Department of Housing and Works, (2003). Clean and Healthy Communities, Aboriginal Housing and Infrastructure. Government of Western Australia. http://www.housing.wa.gov.au/abor_intro.cfm

3 San Pedro N, (2000). Discrimination in Private Rental, *Parity*, 13 (5), 10–11.

HOUSING RENTAL AND OWNERSHIP (Continued)

4 Australian Bureau of Statistics, (2003). The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples. ABS Catalogue 4704.0. Canberra

5 Gray A, (2001). Definitions of Crowding and the Effects of Crowding on Health: A Literature Review. New Zealand Ministry of Social Policy Te Manatu mo nga Kaupapa Orana Tangata. Wellington. (ISBN: 0–478–25101–7).

6 Ranson R, (1991). Healthy Housing: A practical guide, World Health Organisation & E.& F Spon. London.

7 Department of Housing & Works and Aboriginal and Torres Strait Islander Commission (ATSIC), 2002. Western Australia's Aboriginal Housing and Infrastructure Operational Plan 2002–2003. Aboriginal Housing Infrastructure Unit. Perth.

OTHER PLACES OF RESIDENCE

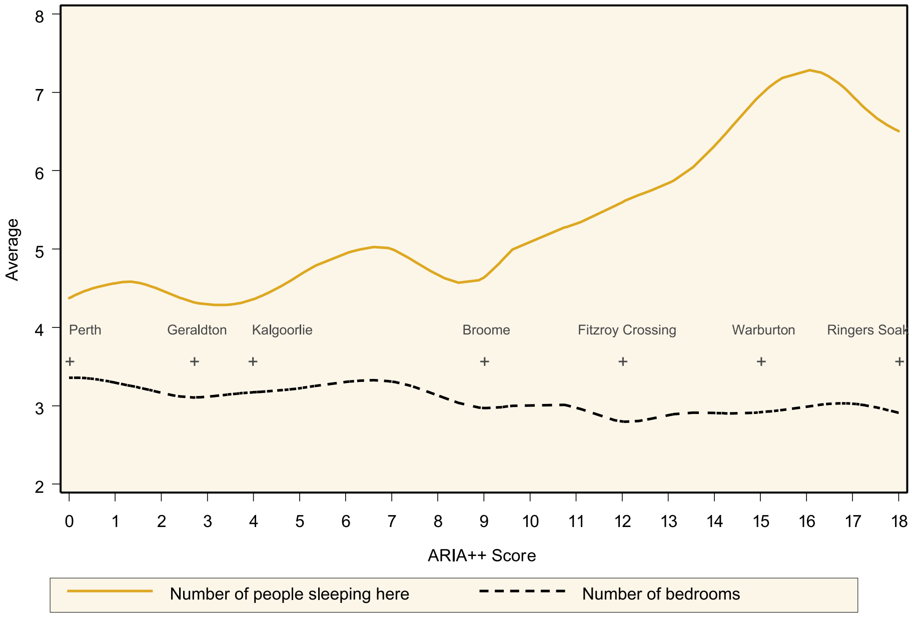
Carers were asked whether they had other places in which to live during the year and the length of time they spent living in their current dwelling. An estimated 90.4 per cent (CI: 89.0%– 91.7%) of primary carers do not have another place that they live in for parts of the year. A small proportion, (4.0 per cent; CI: 3.2%–5.0%) of primary carers lived in their current dwelling for 6 months or less during the year. (Tables 2.51, 2.52)

CROWDING

Crowding in homes of Aboriginal and Torres Strait Islander children was assessed by considering the number of bedrooms in their home and the number of people who usually sleep there. Table 2.55 shows that 39.5 per cent (CI: 31.0%–48.3%) of households with a maximum of two bedrooms have five or more people sleeping in them, 24.3 per cent (CI: 21.5%–27.3%) of three bedroom dwellings have six or more people sleeping there, 24.1 per cent (CI: 19.9%–28.5%) of four bedroom dwellings have seven or more people sleeping there, and 58.1 per cent (CI: 47.7%–67.6%) of dwellings with five or more bedrooms sleep seven or more people. Overall, about 20.0 per cent (CI: 17.8%–22.3%) of Western Australian households with Aboriginal children routinely sleep seven or more people.

As shown in Figure 2.27 the average number of people sleeping in a dwelling increases as levels of relative isolation increase. The average number of bedrooms per dwelling remains relatively steady regardless of the level of relative isolation.

FIGURE 2.27: DWELLINGS — AVERAGE NUMBER OF BEDROOMS AND AVERAGE NUMBER OF PEOPLE SLEEPING IN DWELLING, BY REMOTENESS (ARIA ++)



CONCEPTS OF CROWDING

Crowding has been variously defined to include occupancy rate, persons–per–room, persons–per–bedroom and measures using other defined standards. While such statistical definitions are easy to use they do not properly take into account the complexity of contemporary Indigenous household composition. The high rates of social upheaval along with unmet housing need combine to produce chronic exposures to overcrowding. A recent report noted the much greater housing needs of Indigenous people, and that existing housing policies, far from being favourable to them, have been, on balance, inequitable and inadequate. This would justify increased resources being put into programs directed specifically towards addressing their housing needs.[1]

Concepts of crowding have been said to have a high degree of cultural relativity leading Meyers et al to conclude ‘after a century of debate, it is still in question whether so–called overcrowding is harmful to the people affected, or merely socially distasteful to outsiders who observe its presence’.[2] The data presented here however stand in stark contrast to this claim. They confirm that significant levels of over–crowding exist especially for Indigenous people living in rural remote areas and that these levels are associated with higher rates of disease – particularly infections. These observations are in line with the international and national literature confirming that overcrowding is directly linked with diseases affecting Aboriginal children – particularly in rural and remote areas. These diseases include suppurative ear infections, rheumatic fever, trachoma, and skin infections, many of which are linked to later chronic renal disease.[3]

1 Neutze M, Sanders W, and Jones G, (1999). Public expenditure on services for Indigenous people: Education, employment, health and housing. The Australia Institute. Canberra.

2 Meyers D, Baer WC, and Choi Seong–Youn (1996). The changing problem of overcrowding housing, Journal of the American Planning Association, 62 (1).

3 Couzos S, and Murray R, (2003). Aboriginal Primary Health Care: an Evidence Based approach. Oxford University Press. Melbourne.

WESTERN AUSTRALIAN ABORIGINAL HOUSING AND INFRASTRUCTURE COUNCIL

In July 2002 the Commonwealth Government, the Government of Western Australia and the Aboriginal and Torres Strait Islander Commission (ATSIC) signed off on the *Agreement for the provision of Housing and Infrastructure for Aboriginal and Torres Strait Islander People in Western Australia July 2002 – June 2007*.[4] This represents a significant change in the way housing and infrastructure services are planned, administered and delivered to Aboriginal and Torres Strait Islander people

Key elements of this agreement include:

- The pooling of Commonwealth, State and ATSIC housing funds
- Centralised management and administration of the pooled funds by the Aboriginal Housing and Infrastructure Directorate (AHID) within the State Department of Housing and Works
- Establishment of the Aboriginal Housing and Infrastructure Council (AHIC), comprising ATSIC and State representatives, which is responsible for strategic policy and planning to ensure that funds are utilised to meet the core objectives of the plan.

Crucially, via the AHIC, this represents a substantial commitment to greater Aboriginal involvement and direction in the planning and delivery of housing to Aboriginal families in Western Australia. It heralds a more holistic approach that recognises on–going problems in addressing Aboriginal housing issues and the relationship between unmet housing need and a range of health and social outcomes.

ENDNOTES

1 Australian Bureau of Statistics, (2002). Population Distribution Aboriginal and Torres Strait Islander Australian 2001. ABS Catalogue 4705.0. Canberra.

Also Australian Bureau of Statistics, unpublished data.

2 Human Rights and Equal Opportunities Commission (1997) 'Bringing them Home' Report of the National Inquiry into the separation of Aboriginal and Torres Strait Islander Children from their families. HREOC. Canberra.

3 Australian Bureau of Statistics, (2002). Census of Population and Housing 2001, Community Profile Series – Indigenous Profile. ABS Catalogue 2002.0.

4 Western Australian Aboriginal Housing and Infrastructure Council (2004). Strategic Plan 2003/04 – 2006/07. Department of Housing and Works. Government of Western Australia, Perth.

Table 2.1: Aboriginal and Torres Strait Islander experimental population estimates

Age group (years)	Males	Females	Persons
	1991		
0–3	2 863	2 594	5 457
4–11	4 699	4 495	9 194
12–17	2 950	2 833	5 783
Total aged 0–17 years	*10 512*	*9 922*	*20 434*
18–24	3 389	3 228	6 617
25–64	7 789	7 939	15 728
65 and over	600	703	1 303
All persons	22 290	21 792	44 082
	1996		
0–3	3 154	3 009	6 163
4–11	6 215	6 049	12 264
12–17	3 713	3 636	7 349
Total aged 0–17 years	*13 082*	*12 694*	*25 776*
18–24	3 700	3 696	7 396
25–64	10 285	11 121	21 406
65 and over	727	900	1 627
All persons	27 794	28 411	56 205
	2001(a)		
0–3	3 533	3 380	6 913
4–11	7 196	6 606	13 802
12–17	4 642	4 460	9 102
Total aged 0–17 years	*15 371*	*14 446*	*29 817*
18–24	3 922	3 969	7 891
25–64	12 773	13 583	26 356
65 and over	8 74	1 131	2 005
All persons	32 940	33 129	66 069

(a) At the time of initial analysis, only the preliminary experimental Estimated Resident Australian Indigenous Population figures were available. In June 2003 the ABS published final Experimental Estimated Resident Australian Indigenous Population figures for June 2001. (See: ABS 2003, Australian Demographic Statistics, Catalogue 3101.0 Canberra). The difference between the preliminary and the final figures in Western Australia was minimal, around 140 persons or 0.2 per cent, and did not impact on the analysis.

Table 2.2: Children — Level of Relative Isolation (LORI) of usual residence

LORI	Number	95% CI	%	95% CI
None	10 200	(10 000 – 10 400)	34.1	(31.5 – 36.8)
Low	7 270	(6 640 – 7 930)	24.4	(21.8 – 27.0)
Moderate	6 390	(5 400 – 7 420)	21.4	(18.1 – 25.1)
High	3 170	(2 360 – 4 160)	10.6	(7.9 – 14.0)
Extreme	2 830	(2 040 – 3 800)	9.5	(6.8 – 12.7)
Total WA	29 800	(29 800 – 29 800)	100.0	

Table 2.3: Children — Age group, by ATSIC region

Age group (years)	Number	95% CI	%	95% CI
Perth ATSIC region				
0–3	2 450	(2 160 – 2 780)	22.9	(20.1 – 25.8)
4–11	4 920	(4 580 – 5 290)	46.0	(42.7 – 49.2)
12–17	3 340	(3 000 – 3 710)	31.1	(27.9 – 34.6)
Total	10 700	(10 600 – 10 900)	100.0	
Narrogin ATSIC region				
0–3	930	(770 – 1 120)	22.8	(19.6 – 26.4)
4–11	1 930	(1 680 – 2 190)	47.2	(42.8 – 51.4)
12–17	1 230	(960 – 1 520)	30.0	(25.0 – 35.1)
Total	4 090	(3 620 – 4 600)	100.0	
Kalgoorlie ATSIC region				
0–3	380	(240 – 560)	24.6	(17.8 – 32.3)
4–11	730	(470 – 1 080)	47.3	(38.6 – 55.8)
12–17	440	(240 – 720)	28.1	(19.2 – 40.0)
Total	1 550	(1 050 – 2 180)	100.0	
Geraldton ATSIC region				
0–3	650	(470 – 900)	22.3	(17.5 – 27.5)
4–11	1 450	(1 130 – 1 820)	49.9	(44.9 – 54.8)
12–17	810	(640 – 1 000)	27.8	(24.4 – 31.4)
Total	2 910	(2 340 – 3 590)	100.0	
Broome ATSIC region				
0–3	340	(210 – 540)	22.1	(17.0 – 28.0)
4–11	730	(450 – 1 150)	47.5	(41.0 – 54.0)
12–17	470	(310 – 710)	30.5	(24.3 – 37.6)
Total	1 540	(1 000 – 2 310)	100.0	
South Hedland ATSIC region				
0–3	610	(380 – 920)	23.0	(17.6 – 28.8)
4–11	1 210	(870 – 1 660)	45.2	(39.5 – 51.0)
12–17	850	(600 – 1 190)	31.8	(27.9 – 36.0)
Total	2 670	(1 910 – 3 630)	100.0	
Derby ATSIC region				
0–3	550	(350 – 840)	26.6	(21.3 – 32.7)
4–11	890	(590 – 1 300)	42.8	(38.0 – 47.9)
12–17	630	(430 – 910)	30.6	(26.7 – 34.8)
Total	2 070	(1 420 – 2 970)	100.0	
Kununurra ATSIC region				
0–3	720	(500 – 980)	28.1	(24.3 – 32.2)
4–11	1 190	(850 – 1 620)	46.2	(41.9 – 50.7)
12–17	660	(440 – 940)	25.7	(20.6 – 31.3)
Total	2 570	(1 830 – 3 420)	100.0	
Warburton ATSIC region				
0–3	270	(170 – 400)	15.9	(11.7 – 20.9)
4–11	750	(470 – 1 090)	44.0	(36.1 – 51.8)
12–17	680	(380 – 1 100)	40.1	(30.3 – 49.9)
Total	1 710	(1 130 – 2 520)	100.0	
Total WA				
0–3	6 910	(6 470 – 7 360)	23.2	(21.7 – 24.7)
4–11	13 800	(13 300 – 14 300)	46.3	(44.6 – 48.0)
12–17	9 100	(8 580 – 9 630)	30.5	(28.8 – 32.3)
Total	29 800	(29 800 – 29 800)	100.0	

Table 2.4: Children — Level of Relative Isolation (LORI), by ATSIC region

LORI	Number	95% CI	%	95% CI
	Perth ATSIC region			
None	10 200	(10 000 – 10 400)	94.9	(92.3 – 96.9)
Low	540	(340 – 840)	5.1	(3.2 – 7.7)
Moderate	0	(0 – 60)	0.0	(0.0 – 0.5)
High	0	(0 – 60)	0.0	(0.0 – 0.5)
Extreme	0	(0 – 60)	0.0	(0.0 – 0.5)
Total	10 700	(10 600 – 10 900)	100.0	
	Narrogin ATSIC region			
None	0	(0 – 60)	0.0	(0.0 – 1.4)
Low	3 970	(3 500 – 4 490)	97.1	(93.4 – 98.9)
Moderate	120	(50 – 260)	2.9	(1.1 – 6.6)
High	0	(0 – 60)	0.0	(0.0 – 1.4)
Extreme	0	(0 – 60)	0.0	(0.0 – 1.4)
Total	4 090	(3 620 – 4 600)	100.0	
	Kalgoorlie ATSIC region			
None	0	(0 – 60)	0.0	(0.0 – 3.6)
Low	1 100	(650 – 1 700)	71.4	(50.6 – 87.9)
Moderate	130	(20 – 480)	8.4	(1.2 – 30.4)
High	230	(80 – 490)	14.9	(5.3 – 32.8)
Extreme	80	(10 – 390)	5.3	(0.1 – 19.6)
Total	1 550	(1 050 – 2 180)	100.0	
	Geraldton ATSIC region			
None	0	(0 – 60)	0.0	(0.0 – 1.9)
Low	1 650	(1 150 – 2 280)	56.7	(41.3 – 69.5)
Moderate	890	(530 – 1 350)	30.5	(18.3 – 44.3)
High	260	(80 – 580)	9.0	(3.0 – 20.0)
Extreme	110	(20 – 350)	3.8	(0.9 – 12.2)
Total	2 910	(2 340 – 3 590)	100.0	
	Broome ATSIC region			
None	0	(0 – 60)	0.0	(0.0 – 3.6)
Low	0	(0 – 60)	0.0	(0.0 – 3.6)
Moderate	1 010	(560 – 1 570)	65.4	(38.4 – 88.2)
High	530	(200 – 1 180)	34.6	(11.8 – 61.6)
Extreme	0	(0 – 60)	0.0	(0.0 – 3.6)
Total	1 540	(1 000 – 2 310)	100.0	
	South Hedland ATSIC region			
None	0	(0 – 60)	0.0	(0.0 – 2.1)
Low	0	(0 – 60)	0.0	(0.0 – 2.1)
Moderate	1 870	(1 170 – 2 760)	69.9	(49.2 – 84.7)
High	800	(420 – 1 470)	30.1	(15.3 – 50.8)
Extreme	0	(0 – 60)	0.0	(0.0 – 2.1)
Total	2 670	(1 910 – 3 630)	100.0	
	Derby ATSIC region			
None	0	(0 – 60)	0.0	(0.0 – 2.7)
Low	0	(0 – 60)	0.0	(0.0 – 2.7)
Moderate	1 150	(670 – 1 860)	55.3	(34.0 – 78.2)
High	450	(140 – 960)	21.6	(7.8 – 45.4)
Extreme	480	(170 – 1 170)	23.1	(6.1 – 45.6)
Total	2 070	(1 420 – 2 970)	100.0	

Table 2.4: Children — Level of Relative Isolation (LORI), by ATSIC region (Continued)

LORI	Number	95% CI	%	95% CI
Kununurra ATSIC region				
None	0	(0 – 60)	0.0	(0.0 – 2.1)
Low	0	(0 – 60)	0.0	(0.0 – 2.1)
Moderate	1 210	(770 – 1 790)	47.0	(28.3 – 65.7)
High	560	(180 – 1 240)	21.7	(7.5 – 43.7)
Extreme	810	(370 – 1 490)	31.3	(13.8 – 50.2)
Total	2 570	(1 830 – 3 420)	100.0	
Warburton ATSIC region				
None	0	(0 – 60)	0.0	(0.0 – 3.2)
Low	0	(0 – 60)	0.0	(0.0 – 3.2)
Moderate	20	(0 – 1 970)	1.3	(0.0 – 70.8)
High	330	(110 – 670)	19.4	(6.3 – 38.1)
Extreme	1 350	(830 – 2 060)	79.3	(54.4 – 93.9)
Total	1 710	(1 130 – 2 520)	100.0	

Table 2.5: Children, Primary Carers and Secondary Carers — Birthplace

Birthplace	Number	95% CI	%	95% CI
		Children		
New South Wales	190	(120 – 290)	0.6	(0.4 – 1.0)
Victoria	100	(50 – 160)	0.3	(0.2 – 0.5)
Queensland	270	(170 – 410)	0.9	(0.6 – 1.4)
Western Australia	28 200	(27 900 – 28 500)	94.6	(93.4 – 95.6)
South Australia	260	(170 – 380)	0.9	(0.6 – 1.3)
Tasmania	60	(20 – 210)	0.2	(0.1 – 0.7)
Northern Territory	690	(460 – 1 000)	2.3	(1.6 – 3.4)
Australian Capital Territory	10	(0 – 10)	0.0	(0.0 – 0.1)
Overseas	30	(10 – 70)	0.1	(0.0 – 0.2)
Not stated	10	(0 – 10)	0.0	(0.0 – 0.0)
Total	29 800	(29 800 – 29 800)	100.0	
		Primary Carer		
New South Wales	290	(200 – 410)	2.3	(1.6 – 3.2)
Victoria	200	(130 – 290)	1.6	(1.0 – 2.3)
Queensland	200	(130 – 290)	1.6	(1.0 – 2.3)
Western Australia	10 800	(10 600 – 11 000)	86.1	(84.3 – 87.8)
South Australia	200	(140 – 290)	1.6	(1.1 – 2.3)
Tasmania	70	(30 – 160)	0.6	(0.2 – 1.3)
Northern Territory	210	(150 – 280)	1.7	(1.2 – 2.3)
Australian Capital Territory	10	(0 – 60)	0.1	(0.0 – 0.5)
Overseas	380	(280 – 510)	3.1	(2.2 – 4.0)
Not stated	180	(110 – 270)	1.4	(0.9 – 2.1)
Total	12 600	(12 500 – 12 600)	100.0	
		Secondary Carer		
New South Wales	160	(100 – 240)	2.4	(1.5 – 3.4)
Victoria	100	(60 – 150)	1.4	(0.9 – 2.2)
Queensland	90	(40 – 170)	1.3	(0.6 – 2.4)
Western Australia	5 860	(5 670 – 6 030)	84.6	(81.8 – 87.1)
South Australia	90	(20 – 220)	1.2	(0.2 – 3.1)
Tasmania	30	(0 – 110)	0.4	(0.0 – 1.6)
Northern Territory	140	(90 – 210)	2.1	(1.3 – 3.0)
Australian Capital Territory	10	(0 – 20)	0.1	(0.0 – 0.4)
Overseas	330	(230 – 450)	4.8	(3.4 – 6.6)
Not stated	130	(80 – 200)	1.9	(1.2 – 2.8)
Total	6 930	(6 870 – 6 930)	100.0	

Table 2.6: Primary Carers — Indigenous status, by Level of Relative Isolation (LORI)

Indigenous status	Number	95% CI	%	95% CI
LORI — None				
Indigenous	3 290	(3 100 – 3 490)	72.9	(68.6 – 76.8)
Non–Indigenous	1 200	(1 020 – 1 390)	26.6	(22.6 – 30.8)
Not stated	30	(10 – 70)	0.6	(0.2 – 1.5)
Total	4 520	(4 430 – 4 600)	100.0	
LORI — Low				
Indigenous	2 480	(2 220 – 2 740)	78.9	(74.3 – 82.9)
Non–Indigenous	650	(520 – 800)	20.6	(16.7 – 25.3)
Not stated	20	(10 – 40)	0.5	(0.2 – 1.2)
Total	3 140	(2 880 – 3 420)	100.0	
LORI — Moderate				
Indigenous	2 430	(2 070 – 2 810)	90.4	(87.5 – 92.9)
Non–Indigenous	240	(170 – 340)	8.9	(6.4 – 11.9)
Not stated	20	(10 – 30)	0.7	(0.4 – 1.1)
Total	2 690	(2 300 – 3 110)	100.0	
LORI — High				
Indigenous	1 040	(730 – 1 430)	97.2	(91.2 – 99.4)
Non–Indigenous	20	(0 – 80)	1.9	(0.0 – 7.2)
Not stated	10	(0 – 40)	0.9	(0.1 – 3.9)
Total	1 070	(750 – 1 480)	100.0	
LORI — Extreme				
Indigenous	1 140	(840 – 1 540)	98.8	(97.5 – 99.5)
Non–Indigenous	0	(0 – 60)	0.0	(0.0 – 4.7)
Not stated	10	(10 – 30)	1.2	(0.5 – 2.6)
Total	1 150	(840 – 1 540)	100.0	
Total WA				
Indigenous	10 400	(10 100 – 10 600)	82.6	(80.6 – 84.5)
Non–Indigenous	2 110	(1 870 – 2 360)	16.8	(14.9 – 18.8)
Not stated	80	(50 – 120)	0.7	(0.4 – 1.0)
Total	12 600	(12 500 – 12 600)	100.0	

Table 2.7: Secondary Carers — Indigenous status, by Level of Relative Isolation (LORI)

Indigenous status	Number	95% CI	%	95% CI
	LORI — None			
Indigenous	1 470	(1 340 – 1 610)	66.4	(60.5 – 72.2)
Non–Indigenous	730	(610 – 870)	33.0	(27.5 – 39.3)
Not stated	10	(0 – 30)	0.6	(0.2 – 1.4)
Total	2 220	(2 160 – 2 280)	100.0	
	LORI — Low			
Indigenous	1 360	(1 190 – 1 530)	75.0	(68.3 – 80.5)
Non–Indigenous	450	(340 – 580)	24.7	(18.9 – 31.1)
Not stated	10	(0 – 50)	0.3	(0.0 – 2.7)
Total	1 810	(1 640 – 1 990)	100.0	
	LORI — Moderate			
Indigenous	1 150	(950 – 1 390)	82.2	(75.6 – 87.4)
Non–Indigenous	250	(170 – 350)	17.5	(12.2 – 23.9)
Not stated	0	(0 – 20)	0.3	(0.0 – 0.9)
Total	1 400	(1 170 – 1 660)	100.0	
	LORI — High			
Indigenous	710	(530 – 950)	97.9	(89.1 – 99.9)
Non–Indigenous	20	(0 – 80)	2.1	(0.1 – 10.9)
Not stated	0	(0 – 60)	0.0	(0.0 – 7.4)
Total	730	(540 – 970)	100.0	
	LORI — Extreme			
Indigenous	750	(570 – 990)	97.9	(92.9 – 99.5)
Non–Indigenous	10	(0 – 50)	1.3	(0.0 – 6.2)
Not stated	10	(0 – 20)	0.8	(0.1 – 2.6)
Total	770	(580 – 1 000)	100.0	
	Total WA			
Indigenous	5 450	(5 250 – 5 630)	78.6	(75.7 – 81.3)
Non–Indigenous	1 450	(1 260 – 1 650)	20.9	(18.2 – 23.8)
Not stated	30	(10 – 60)	0.4	(0.2 – 0.9)
Total	6 930	(6 870 – 6 930)	100.0	

Table 2.8: Children — Indigenous status of Primary Carer, by Level of Relative Isolation (LORI)

Indigenous status of Primary Carer	Number	95% CI	%	95% CI
LORI — None				
Indigenous	7 920	(7 480 – 8 360)	77.8	(73.5 – 81.8)
Non–Indigenous	2 190	(1 790 – 2 650)	21.5	(17.6 – 26.0)
Not stated	60	(10 – 160)	0.6	(0.1 – 1.6)
Total	10 200	(10 000 – 10 400)	100.0	
LORI — Low				
Indigenous	5 920	(5 330 – 6 550)	81.5	(76.7 – 85.8)
Non–Indigenous	1 310	(1 000 – 1 700)	18.1	(13.8 – 22.8)
Not stated	30	(0 – 110)	0.4	(0.1 – 1.5)
Total	7 270	(6 640 – 7 930)	100.0	
LORI — Moderate				
Indigenous	5 830	(4 930 – 6 800)	91.3	(87.6 – 94.5)
Non–Indigenous	500	(300 – 790)	7.8	(4.7 – 11.7)
Not stated	60	(30 – 100)	0.9	(0.4 – 1.6)
Total	6 390	(5 400 – 7 420)	100.0	
LORI — High				
Indigenous	3 060	(2 260 – 4 000)	96.8	(90.3 – 99.3)
Non–Indigenous	70	(10 – 340)	2.3	(0.4 – 10.5)
Not stated	30	(10 – 80)	0.9	(0.2 – 2.8)
Total	3 170	(2 360 – 4 160)	100.0	
LORI — Extreme				
Indigenous	2 810	(2 040 – 3 800)	99.4	(98.5 – 99.8)
Non–Indigenous	0	(0 – 60)	0.0	(0.0 – 2.0)
Not stated	20	(10 – 40)	0.6	(0.2 – 1.5)
Total	2 830	(2 040 – 3 800)	100.0	
Total WA				
Indigenous	25 500	(24 900 – 26 100)	85.7	(83.6 – 87.6)
Non–Indigenous	4 070	(3 500 – 4 690)	13.7	(11.7 – 15.7)
Not stated	200	(120 – 320)	0.7	(0.4 – 1.1)
Total	29 800	(29 800 – 29 800)	100.0	

Table 2.9: Children — Indigenous status and birth mother status of child's Primary Carer

Indigenous status and birth mother status of Carer	Number	95% CI	%	95% CI
Birth mother				
Indigenous	20 400	(19 700 – 21 000)	68.4	(66.2 – 70.6)
Non–Indigenous	3 400	(2 900 – 3 960)	11.4	(9.7 – 13.3)
Not stated	160	(80 – 270)	0.5	(0.3 – 0.9)
Non Birth mother				
Indigenous	5 150	(4 670 – 5 640)	17.3	(15.7 – 18.9)
Non–Indigenous	670	(420 – 990)	2.2	(1.4 – 3.3)
Not stated	40	(10 – 90)	0.1	(0.0 – 0.3)
Total children	29 800	(29 800 – 29 800)	100.0	

Table 2.10: Children — Birth mother status of Primary Carer, by Indigenous status of Primary Carer.

Birth mother status of Primary Carer	Number	95% CI	%	95% CI
	Child's Primary Carer is Indigenous			
Non birth mother	5 150	(4 670 – 5 640)	20.2	(18.4 – 22.0)
Birth mother	20 400	(19 700 – 21 000)	79.8	(78.0 – 81.6)
Total	25 500	(24 900 – 26 100)	100.0	
	Child's Primary Carer is Non–Indigenous			
Non birth mother	670	(420 – 990)	16.5	(11.2 – 23.8)
Birth mother	3 400	(2 900 – 3 960)	83.5	(76.2 – 88.8)
Total	4 070	(3 500 – 4 690)	100.0	
	Child's Primary Carer – Indigenous status 'not stated'			
Non birth mother	40	(10 – 90)	20.0	(6.1 – 45.6)
Birth mother	160	(80 – 270)	80.0	(54.4 – 93.9)
Total	200	(120 – 320)	100.0	
	Total children			
Non birth mother	5 860	(5 360 – 6 390)	19.6	(18.0 – 21.4)
Birth mother	24 000	(23 400 – 24 500)	80.4	(78.6 – 82.0)
Total	29 800	(29 800 – 29 800)	100.0	

Table 2.11: Children — Indigenous status of Primary carer, by birth mother status

Indigenous status of Primary Carer	Number	95% CI	%	95% CI
	Child's Primary Carer is not child's birth mother			
Indigenous	5 150	(4 670 – 5 640)	87.9	(82.9 – 92.0)
Non–Indigenous	670	(420 – 990)	11.4	(7.5 – 16.7)
Not stated	40	(10 – 90)	0.7	(0.2 – 1.6)
Total	5 860	(5 360 – 6 390)	100.0	
	Child's Primary Carer is child's birth mother			
Indigenous	20 400	(19 700 – 21 000)	85.1	(82.9 – 87.2)
Non–Indigenous	3 400	(2 900 – 3 960)	14.2	(12.2 – 16.5)
Not stated	160	(80 – 270)	0.7	(0.3 – 1.1)
Total	24 000	(23 400 – 24 500)	100.0	
	Total children			
Indigenous	25 500	(24 900 – 26 100)	85.7	(83.6 – 87.6)
Non–Indigenous	4 070	(3 500 – 4 690)	13.7	(11.7 – 15.7)
Not stated	200	(120 – 320)	0.7	(0.4 – 1.1)
Total	29 800	(29 800 – 29 800)	100.0	

Table 2.12: Aboriginal and Torres Strait Islander Carers — Forced separations from natural family by a mission, the government or welfare

Whether separated from family	Number	95% CI	%	95% CI
	Primary Carers			
Not separated	8 580	(8 250 – 8 890)	82.7	(80.0 – 85.1)
Separated	1 280	(1 090 – 1 490)	12.3	(10.6 – 14.3)
Don't want to answer	520	(360 – 710)	5.0	(3.4 – 6.8)
Not Aboriginal	0	(0 – 60)	0.0	(0.0 – 0.5)
Total	10 400	(10 100 – 10 600)	100.0	
	Secondary Carers			
Not separated	4 570	(4 340 – 4 790)	83.9	(80.6 – 86.8)
Separated	670	(530 – 840)	12.3	(9.7 – 15.4)
Don't want to answer	200	(130 – 310)	3.8	(2.4 – 5.6)
Not Aboriginal	0	(0 – 60)	0.0	(0.0 – 1.0)
Total	5 450	(5 250 – 5 630)	100.0	
	Primary Carer's mother			
Not separated	7 780	(7 460 – 8 090)	74.9	(72.3 – 77.4)
Separated	2 110	(1 870 – 2 350)	20.3	(18.2 – 22.6)
Don't want to answer	490	(330 – 680)	4.7	(3.2 – 6.6)
Not Aboriginal	0	(0 – 60)	0.0	(0.0 – 0.5)
Total	10 400	(10 100 – 10 600)	100.0	
	Primary Carer's father			
Not separated	8 570	(8 260 – 8 880)	82.6	(80.3 – 84.8)
Separated	1 310	(1 120 – 1 510)	12.6	(10.9 – 14.6)
Don't want to answer	490	(330 – 680)	4.7	(3.2 – 6.6)
Not Aboriginal	0	(0 – 60)	0.0	(0.0 – 0.5)
Total	10 400	(10 100 – 10 600)	100.0	
	Secondary Carer's mother			
Not separated	4 370	(4 140 – 4 590)	80.2	(76.9 – 83.1)
Separated	880	(730 – 1 040)	16.1	(13.4 – 18.9)
Don't want to answer	200	(130 – 310)	3.7	(2.4 – 5.6)
Not Aboriginal	0	(0 – 60)	0.0	(0.0 – 0.5)
Total	5 450	(5 250 – 5 630)	100.0	
	Secondary Carer's father			
Not separated	4 640	(4 420 – 4 860)	85.3	(82.4 – 87.9)
Separated	600	(480 – 740)	11.0	(8.8 – 13.6)
Don't want to answer	200	(130 – 310)	3.7	(2.4 – 5.6)
Not Aboriginal	0	(0 – 60)	0.0	(0.0 – 1.0)
Total	5 450	(5 250 – 5 630)	100.0	

Table 2.13: Children — Number living in households where carers and/or carer's parents have experienced forced separations from their natural families

Whether carers or carer's parents separated from family	Number	95% CI	%	95% CI
	Primary Carers			
Not separated	20 500	(19 700 – 21 200)	68.6	(65.9 – 71.2)
Separated	3 200	(2 740 – 3 700)	10.7	(9.2 – 12.4)
Not known	2 060	(1 620 – 2 580)	6.9	(5.4 – 8.7)
Not applicable (a)	4 110	(3 550 – 4 750)	13.8	(11.9 – 15.9)
Total	29 800	(29 800 – 29 800)	100.0	
	Secondary Carers			
Not separated	10 700	(9 900 – 11 400)	35.8	(33.3 – 38.3)
Separated	1 680	(1 370 – 2 020)	5.6	(4.6 – 6.8)
Not known	420	(260 – 630)	1.4	(0.9 – 2.1)
Not applicable (a) or (b)	17 000	(16 300 – 17 800)	57.1	(54.5 – 59.7)
Total	29 800	(29 800 – 29 800)	100.0	
	Primary Carer's mother			
Not separated	18 500	(17 800 – 19 300)	62.2	(59.5 – 64.7)
Separated	5 120	(4 560 – 5 730)	17.2	(15.3 – 19.2)
Not known	2 040	(1 600 – 2 560)	6.8	(5.4 – 8.6)
Not applicable (a)	4 110	(3 550 – 4 750)	13.8	(11.9 – 15.9)
Total	29 800	(29 800 – 29 800)	100.0	
	Primary Carer's father			
Not separated	20 500	(19 700 – 21 300)	68.8	(66.2 – 71.3)
Separated	3 140	(2 700 – 3 600)	10.5	(9.1 – 12.1)
Not known	2 040	(1 600 – 2 560)	6.8	(5.4 – 8.6)
Not applicable (a)	4 110	(3 550 – 4 750)	13.8	(11.9 – 15.9)
Total	29 800	(29 800 – 29 800)	100.0	
	Secondary Carer's mother			
Not separated	10 300	(9 600 – 11 100)	34.7	(32.2 – 37.2)
Separated	2 030	(1 700 – 2 400)	6.8	(5.7 – 8.1)
Not known	410	(250 – 620)	1.4	(0.8 – 2.1)
Not applicable (a) or (b)	17 000	(16 300 – 17 800)	57.1	(54.5 – 59.7)
Total	29 800	(29 800 – 29 800)	100.0	
	Secondary Carer's father			
Not separated	11 000	(10 200 – 11 700)	36.8	(34.4 – 39.3)
Separated	1 390	(1 120 – 1 690)	4.6	(3.8 – 5.7)
Not known	410	(250 – 620)	1.4	(0.8 – 2.1)
Not applicable (a) or (b)	17 000	(16 300 – 17 800)	57.1	(54.5 – 59.7)
Total	29 800	(29 800 – 29 800)	100.0	

(a) Carer either not Aboriginal or did not participate in survey
(b) No Secondary Carer

Table 2.14: Children — Number living in households where carer and/or carer's parents have experienced forced separation from their natural families, number of separations within each household

Number of separations within household	Number	95% CI	%	95% CI
None	14 800	(14 100 – 15 600)	49.8	(47.2 – 52.4)
One	6 250	(5 650 – 6 890)	21.0	(19.0 – 23.1)
Two	3 060	(2 630 – 3 550)	10.3	(8.8 – 11.9)
Three or more	1 200	(950 – 1 500)	4.0	(3.2 – 5.0)
Not known	2 340	(1 860 – 2 870)	7.8	(6.2 – 9.6)
Not applicable(a)	2 130	(1 690 – 2 620)	7.1	(5.7 – 8.8)
Total children	29 800	(29 800 – 29 800)	100.0	

(a) No Aboriginal carers

Table 2.15: Children — Number living in households where one or both carers or grandparents were forcibly separated from natural family by a mission, the government or welfare, by ATSIC region

Whether family affected by forced separation	Number	95% CI	%	95% CI
		Perth ATSIC region		
Not forcibly separated	4 420	(4 000 – 4 890)	41.3	(37.2 – 45.4)
Forcibly separated	4 340	(3 900 – 4 810)	40.5	(36.3 – 44.7)
Not known	720	(510 – 1 010)	6.7	(4.7 – 9.3)
Not applicable (a)	1 230	(910 – 1 610)	11.4	(8.4 – 14.9)
Total	10 700	(10 600 – 10 900)	100.0	
		Narrogin ATSIC region		
Not forcibly separated	2 170	(1 840 – 2 560)	53.1	(47.3 – 59.0)
Forcibly separated	1 310	(1 050 – 1 600)	32.0	(26.6 – 37.7)
Not known	240	(140 – 410)	6.0	(3.4 – 9.7)
Not applicable (a)	370	(220 – 570)	9.0	(5.2 – 13.6)
Total	4 090	(3 620 – 4 600)	100.0	
		Kalgoorlie ATSIC region		
Not forcibly separated	600	(390 – 890)	39.0	(28.4 – 50.4)
Forcibly separated	740	(440 – 1 170)	48.0	(36.2 – 61.0)
Not known	40	(0 – 200)	2.3	(0.1 – 12.0)
Not applicable (a)	170	(60 – 370)	10.7	(4.3 – 23.0)
Total	1 550	(1 050 – 2 180)	100.0	
		Geraldton ATSIC region		
Not forcibly separated	1 640	(1 270 – 2 080)	56.4	(49.4 – 63.7)
Forcibly separated	780	(550 – 1 090)	26.8	(20.3 – 34.2)
Not known	390	(250 – 570)	13.2	(8.7 – 19.1)
Not applicable (a)	100	(10 – 440)	3.6	(0.5 – 14.3)
Total	2 910	(2 340 – 3 590)	100.0	
		Broome ATSIC region		
Not forcibly separated	530	(270 – 870)	34.6	(19.6 – 51.4)
Forcibly separated	820	(490 – 1 270)	53.0	(36.6 – 71.2)
Not known	170	(0 – 830)	10.7	(0.3 – 44.5)
Not applicable (a)	30	(0 – 110)	1.7	(0.0 – 7.2)
Total	1 540	(1 000 – 2 310)	100.0	
		South Hedland ATSIC region		
Not forcibly separated	1 550	(1 020 – 2 180)	57.9	(46.1 – 69.5)
Forcibly separated	730	(450 – 1 100)	27.3	(18.8 – 36.2)
Not known	270	(100 – 530)	10.0	(4.4 – 18.8)
Not applicable (a)	130	(50 – 330)	4.8	(1.7 – 11.9)
Total	2 670	(1 910 – 3 630)	100.0	
		Derby ATSIC region		
Not forcibly separated	1 240	(800 – 1 800)	59.9	(50.8 – 68.4)
Forcibly separated	660	(430 – 1 000)	31.9	(23.7 – 41.1)
Not known	170	(50 – 390)	8.2	(3.2 – 17.5)
Not applicable (a)	0	(0 – 60)	0.0	(0.0 – 2.7)
Total	2 070	(1 420 – 2 970)	100.0	
		Kununurra ATSIC region		
Not forcibly separated	1 580	(1 120 – 2 130)	61.5	(52.4 – 69.9)
Forcibly separated	670	(410 – 1 040)	26.1	(18.4 – 34.9)
Not known	210	(110 – 370)	8.2	(5.0 – 12.9)
Not applicable (a)	110	(30 – 240)	4.3	(1.6 – 9.4)
Total	2 570	(1 830 – 3 420)	100.0	

Table 2.15: Children — Number living in households where carers or grandparents were forcibly separated from natural family by a mission, the government or welfare, by ATSIC region (Continued)

Whether family affected by forced separation	Number	95% CI	%	95% CI
Warburton ATSIC region				
Not forcibly separated	1 100	(680 – 1 650)	64.3	(51.7 – 74.9)
Forcibly separated	470	(250 – 810)	27.6	(16.4 – 40.3)
Not known	140	(40 – 320)	8.2	(2.7 – 18.1)
Not applicable (a)	0	(0 – 60)	0.0	(0.0 – 3.2)
Total	1 710	(1 130 – 2 520)	100.0	
Total WA				
Not forcibly separated	14 800	(14 100 – 15 600)	49.8	(47.2 – 52.4)
Forcibly separated	10 500	(9 800 – 11 300)	35.3	(32.8 – 37.8)
Not known	2 340	(1 860 – 2 870)	7.8	(6.2 – 9.6)
Not applicable (a)	2 130	(1 690 – 2 620)	7.1	(5.7 – 8.8)
Total	29 800	(29 800 – 29 800)	100.0	

(a) No Aboriginal carers

Table 2.16: Children — Number living in households where one or both carers or grandparents were forcibly relocated from an area which was their traditional country or homeland, by ATSIC region

Whether family affected by forced relocation	Number	95% CI	%	95% CI
Perth ATSIC region				
Not forcibly relocated	6 230	(5 770 – 6 700)	58.1	(53.8 – 62.4)
Forcibly relocated	2 420	(2 050 – 2 830)	22.6	(19.1 – 26.4)
Not known	840	(610 – 1 100)	7.8	(5.8 – 10.3)
Not applicable (a)	1 230	(910 – 1 610)	11.4	(8.4 – 14.9)
Total	10 700	(10 600 – 10 900)	100.0	
Narrogin ATSIC region				
Not forcibly relocated	2 570	(2 160 – 3 040)	62.9	(56.7 – 68.8)
Forcibly relocated	890	(710 – 1 110)	21.7	(17.3 – 27.0)
Not known	260	(150 – 420)	6.3	(3.8 – 10.1)
Not applicable (a)	370	(220 – 570)	9.0	(5.2 – 13.6)
Total	4 090	(3 620 – 4 600)	100.0	
Kalgoorlie ATSIC region				
Not forcibly relocated	760	(500 – 1 140)	49.0	(35.6 – 62.7)
Forcibly relocated	570	(300 – 1 010)	36.9	(22.7 – 54.2)
Not known	50	(10 – 190)	3.3	(0.4 – 11.5)
Not applicable (a)	170	(60 – 370)	10.7	(4.3 – 23.0)
Total	1 550	(1 050 – 2 180)	100.0	
Geraldton ATSIC region				
Not forcibly relocated	2 010	(1 550 – 2 540)	69.2	(61.2 – 77.1)
Forcibly relocated	410	(270 – 580)	14.0	(10.0 – 19.2)
Not known	390	(250 – 570)	13.2	(8.7 – 19.1)
Not applicable	100	(10 – 440)	3.6	(0.5 – 14.3)
Total	2 910	(2 340 – 3 590)	100.0	
Broome ATSIC region				
Not forcibly relocated	710	(440 – 1 120)	45.9	(32.4 – 59.3)
Forcibly relocated	640	(410 – 970)	41.8	(30.3 – 55.2)
Not known	170	(0 – 830)	10.7	(0.3 – 44.5)
Not applicable (a)	30	(0 – 110)	1.7	(0.0 – 7.2)
Total	1 540	(1 000 – 2 310)	100.0	
South Hedland ATSIC region				
Not forcibly relocated	1 720	(1 220 – 2 360)	64.4	(56.2 – 72.4)
Forcibly relocated	550	(320 – 870)	20.7	(14.1 – 29.0)
Not known	270	(100 – 530)	10.0	(4.4 – 18.8)
Not applicable (a)	130	(50 – 330)	4.8	(1.7 – 11.9)
Total	2 670	(1 910 – 3 630)	100.0	

Table 2.16: Children — Number living in households where one or both carers or grandparents were forcibly relocated from an area which was their traditional country or homeland, by ATSIC region (Continued)

Whether family affected by forced relocation	Number	95% CI	%	95% CI
Derby ATSIC region				
Not forcibly relocated	1 130	(730 – 1 670)	54.4	(45.3 – 63.1)
Forcibly relocated	730	(470 – 1 090)	35.1	(25.5 – 45.6)
Not known	220	(80 – 430)	10.5	(4.8 – 18.7)
Not applicable (a)	0	(0 – 60)	0.0	(0.0 – 2.7)
Total	2 070	(1 420 – 2 970)	100.0	
Kununurra ATSIC region				
	1 780	(1 270 – 2 420)	69.2	(61.6 – 76.6)
Forcibly relocated	470	(300 – 690)	18.4	(13.7 – 24.0)
Not known	210	(110 – 370)	8.2	(5.0 – 12.9)
Not applicable (a)	110	(30 – 240)	4.3	(1.6 – 9.4)
Total	2 570	(1 830 – 3 420)	100.0	
Warburton ATSIC region				
Not forcibly relocated	1 160	(710 – 1 820)	68.2	(56.2 – 78.3)
Forcibly relocated	400	(240 – 610)	23.6	(15.1 – 33.4)
Not known	140	(40 – 320)	8.2	(2.7 – 18.1)
Not applicable (a)	0	(0 – 60)	0.0	(0.0 – 3.2)
Total	1 710	(1 130 – 2 520)	100.0	
Total WA				
Not forcibly relocated	18 100	(17 300 – 18 800)	60.6	(58.1 – 63.1)
Forcibly relocated	7 090	(6 440 – 7 740)	23.8	(21.6 – 26.0)
Not known	2 540	(2 050 – 3 060)	8.5	(6.9 – 10.3)
Not applicable (a)	2 130	(1 690 – 2 620)	7.1	(5.7 – 8.8)
Total	29 800	(29 800 – 29 800)	100.0	

(a) No Aboriginal carers

Table 2.17: Children — living in households where one or both carers or grandparents were were forcibly separated from natural family by a mission, the government or welfare, and/or forcibly relocated from an area which was their traditional country or homeland, by ATSIC region

Whether family affected by forced separation and/or relocation	Number	95% CI	%	95% CI
Perth ATSIC region				
Not forcibly separated and/or relocated	4 110	(3 690 – 4 570)	38.4	(34.3 – 42.5)
Forcibly separated and/or relocated	4 660	(4 220 – 5 120)	43.5	(39.3 – 47.7)
Not known	710	(490 – 970)	6.6	(4.7 – 9.2)
Not applicable (a)	1 230	(910 – 1 610)	11.4	(8.4 – 14.9)
Total	10 700	(10 600 – 10 900)	100.0	
Narrogin ATSIC region				
Not forcibly separated and/or relocated	1 990	(1 660 – 2 360)	48.6	(42.9 – 54.7)
Forcibly separated and/or relocated	1 500	(1 230 – 1 810)	36.8	(31.1 – 42.7)
Not known	230	(120 – 390)	5.6	(2.9 – 9.2)
Not applicable (a)	370	(220 – 570)	9.0	(5.2 – 13.6)
Total	4 090	(3 620 – 4 600)	100.0	
Kalgoorlie ATSIC region				
Not forcibly separated and/or relocated	530	(340 – 830)	34.4	(23.7 – 46.0)
Forcibly separated and/or relocated	810	(490 – 1 250)	52.6	(39.3 – 65.4)
Not known	40	(0 – 200)	2.3	(0.1 – 12.0)
Not applicable (a)	170	(60 – 370)	10.7	(4.3 – 23.0)
Total	1 550	(1 050 – 2 180)	100.0	
Geraldton ATSIC region				
Not forcibly separated and/or relocated	1 490	(1 130 – 1 890)	51.1	(44.0 – 58.5)
Forcibly separated and/or relocated	930	(680 – 1 250)	32.1	(25.2 – 39.1)
Not known	390	(250 – 570)	13.2	(8.7 – 19.1)
Not applicable (a)	100	(10 – 440)	3.6	(0.5 – 14.3)
Total	2 910	(2 340 – 3 590)	100.0	
Broome ATSIC region				
Not forcibly separated and/or relocated	460	(260 – 810)	30.1	(17.6 – 47.1)
Forcibly separated and/or relocated	890	(540 – 1 350)	57.5	(39.2 – 74.5)
Not known	170	(0 – 830)	10.7	(0.3 – 44.5)
Not applicable (a)	30	(0 – 110)	1.7	(0.0 – 7.2)
Total	1 540	(1 000 – 2 310)	100.0	
South Hedland ATSIC region				
Not forcibly separated and/or relocated	1 350	(910 – 1 880)	50.5	(40.5 – 60.4)
Forcibly separated and/or relocated	920	(590 – 1 350)	34.6	(26.4 – 42.9)
Not known	270	(100 – 530)	10.0	(4.4 – 18.8)
Not applicable (a)	130	(50 – 330)	4.8	(1.7 – 11.9)
Total	2 670	(1 910 – 3 630)	100.0	
Derby ATSIC region				
Not forcibly separated and/or relocated	880	(530 – 1 330)	42.4	(33.2 – 52.1)
Forcibly separated and/or relocated	1 030	(700 – 1 500)	49.7	(39.9 – 59.2)
Not known	160	(50 – 390)	7.9	(2.4 – 16.1)
Not applicable (a)	0	(0 – 60)	0.0	(0.0 – 2.7)
Total	2 070	(1 420 – 2 970)	100.0	

Table 2.17: Children — living in households where one or both carers or grandparents were were forcibly separated from natural family by a mission, the government or welfare, and/or forcibly relocated from an area which was their traditional country or homeland, by ATSIC region (Continued)

Whether family affected by forced separation and/or relocation	Number	95% CI	%	95% CI
Kununurra ATSIC region				
Not forcibly separated and/or relocated	1 400	(1 000 – 1 920)	54.5	(46.0 – 62.3)
Forcibly separated and/or relocated	850	(550 – 1 230)	33.0	(25.9 – 41.5)
Not known	210	(110 – 370)	8.2	(5.0 – 12.9)
Not applicable (a)	110	(30 – 240)	4.3	(1.6 – 9.4)
Total	2 570	(1 830 – 3 420)	100.0	
Warburton ATSIC region				
Not forcibly separated and/or relocated	960	(580 – 1 490)	56.3	(45.3 – 67.2)
Forcibly separated and/or relocated	610	(350 – 930)	35.5	(25.1 – 48.3)
Not known	140	(40 – 320)	8.2	(2.7 – 18.1)
Not applicable (a)	0	(0 – 60)	0.0	(0.0 – 3.2)
Total	1 710	(1 130 – 2 520)	100.0	
Total WA				
Not forcibly separated and/or relocated	13 200	(12 400 – 13 900)	44.2	(41.7 – 46.7)
Forcibly separated and/or relocated	12 200	(11 500 – 13 000)	40.9	(38.4 – 43.5)
Not known	2 310	(1 850 – 2 860)	7.7	(6.2 – 9.6)
Not applicable (a)	2 130	(1 690 – 2 620)	7.1	(5.7 – 8.8)
Total	29 800	(29 800 – 29 800)	100.0	

(a) No Aboriginal carers

Table 2.18: All Carers — Aboriginal language use

Whether Aboriginal language spoken	Number	95% CI	%	95% CI
Primary Carers – any children conversant in Aboriginal language				
No	6 190	(5 870 – 6 520)	49.3	(46.7 – 51.9)
A few words	4 750	(4 440 – 5 070)	37.8	(35.3 – 40.4)
A conversation	1 620	(1 360 – 1 900)	12.9	(10.9 – 15.1)
Total	12 600	(12 500 – 12 600	100.0	
Primary Carers				
No	5 400	(5 080 – 5 720)	43.0	(40.4 – 45.6)
A few words	4 430	(4 120 – 4 760)	35.3	(32.8 – 37.9)
A conversation	2 730	(2 440 – 3 030)	21.7	(19.4 – 24.1)
Total	12 600	(12 500 – 12 600	100.0	
Secondary Carers				
No	2 680	(2 450 – 2 910)	38.6	(35.4 – 42.0)
A few words	2 490	(2 270 – 2 730)	36.0	(32.7 – 39.4)
A conversation	1 760	(1 550 – 1 980)	25.4	(22.4 – 28.5)
Total	6 930	(6 870 – 6 930	100.0	

Table 2.19: Primary Carers — Proportion who reported that children in their care are conversant in Aboriginal language, by Level of Relative Isolation (LORI)

LORI	Number	95% CI	%	95% CI
None	80	(30 – 190)	1.8	(0.6 – 4.2)
Low	100	(70 – 150)	3.3	(2.3 – 4.7)
Moderate	420	(320 – 550)	15.7	(12.1 – 19.5)
High	330	(190 – 550)	30.4	(17.3 – 44.9)
Extreme	690	(460 – 980)	59.7	(47.9 – 70.4)
Total WA	1 620	(1 340 – 1 920)	12.9	(10.7 – 15.3)

Table 2.20: All Carers — Proportion conversant in Aboriginal language, by Level of Relative Isolation (LORI)

LORI	Number	95% CI	%	95% CI
None	340	(230 – 470)	5.0	(3.4 – 7.0)
Low	320	(220 – 430)	6.4	(4.7 – 8.7)
Moderate	1 380	(1 120 – 1 690)	33.8	(28.7 – 39.0)
High	900	(610 – 1 290)	49.9	(37.8 – 61.0)
Extreme	1 550	(1 140 – 2 060)	80.6	(70.3 – 88.4)
Total WA	4 490	(4 040 – 4 950)	23.0	(20.7 – 25.4)

Table 2.21: All Carers — Participation in Aboriginal cultural activities in the last 12 months, by ATSIC region

ATSIC region	Number	95% CI	%	95% CI
Attended an Aboriginal funeral				
Perth	3 670	(3 380 – 3 970)	51.5	(47.4 – 55.6)
Narrogin	1 820	(1 550 – 2 120)	63.4	(57.1 – 69.4)
Kalgoorlie	670	(420 – 990)	71.3	(56.5 – 84.0)
Geraldton	1 530	(1 210 – 1 910)	81.2	(74.0 – 86.8)
Broome	570	(340 – 940)	70.7	(50.6 – 85.3)
South Hedland	1 490	(1 070 – 1 980)	82.7	(76.6 – 87.9)
Derby	1 180	(800 – 1 650)	89.5	(83.5 – 93.7)
Kununurra	1 180	(800 – 1 650)	85.0	(78.0 – 90.9)
Warburton	1 260	(910 – 1 670)	92.4	(84.2 – 97.2)
Total WA	13 400	(12 900 – 13 800)	68.6	(66.3 – 70.8)
Attended Aboriginal ceremonies				
Perth	720	(570 – 920)	10.2	(7.9 – 12.7)
Narrogin	270	(200 – 360)	9.4	(6.8 – 12.2)
Kalgoorlie	90	(40 – 170)	9.0	(4.1 – 15.9)
Geraldton	200	(140 – 300)	10.7	(7.4 – 14.6)
Broome	190	(60 – 420)	23.2	(9.9 – 42.3)
South Hedland	770	(530 – 1 070)	42.7	(33.5 – 51.9)
Derby	570	(380 – 830)	43.4	(35.0 – 51.9)
Kununurra	580	(343 – 930)	41.4	(29.4 – 54.4)
Warburton	960	(690 – 1 310)	69.8	(59.5 – 79.0)
Total WA	4 340	(3 940 – 4 760)	22.2	(20.2 – 24.4)
Attended Aboriginal festivals/carnivals involving arts or sports				
Perth	3 150	(2 850 – 3 450)	44.2	(40.1 – 48.5)
Narrogin	1 040	(850 – 1 240)	36.2	(30.7 – 41.7)
Kalgoorlie	580	(370 – 890)	61.3	(48.2 – 73.9)
Geraldton	660	(480 – 860)	35.0	(28.6 – 42.2)
Broome	470	(260 – 790)	59.0	(48.4 – 68.9)
South Hedland	970	(700 – 1 320)	53.9	(47.4 – 60.0)
Derby	1 000	(700 – 1 400)	75.7	(69.3 – 81.4)
Kununurra	740	(490 – 1 100)	53.0	(40.9 – 64.0)
Warburton	1 040	(730 – 1 410)	76.0	(68.4 – 82.9)
Total WA	9 640	(9 200 – 10 100)	49.5	(47.1 – 51.9)
Participated in Aboriginal organisations				
Perth	2 570	(2 300 – 2 850)	36.1	(32.3 – 39.9)
Narrogin	1 090	(930 – 1290)	38.1	(32.6 – 43.6)
Kalgoorlie	420	(250 – 670)	44.6	(32.1 – 56.7)
Geraldton	610	(440 – 820)	32.2	(26.3 – 38.8)
Broome	440	(270 – 690)	54.7	(42.7 – 66.8)
South Hedland	660	(450 – 910)	36.7	(29.4 – 45.2)
Derby	600	(400 – 870)	45.3	(38.0 – 52.9)
Kununurra	670	(440 – 1010)	48.2	(38.2 – 58.1)
Warburton	520	(360 – 730)	38.3	(32.7 – 43.9)
Total WA	7 580	(7 160 – 8 020)	38.9	(36.7 – 41.1)

Table 2.22: All Carers — Participation in selected Aboriginal cultural activities in the last 12 months, by Level of Relative Isolation (LORI)

LORI	Number	95% CI	%	95% CI
Attended an Aboriginal funeral				
None	3 460	(3 170 – 3 750)	51.4	(47.2 – 55.7)
Low	3 240	(2 880 – 3 620)	65.4	(60.3 – 70.0)
Moderate	3 230	(2 720 – 3 770)	79.0	(75.5 – 82.3)
High	1 640	(1 190 – 2 200)	91.2	(79.2 – 97.6)
Extreme	1 800	(1 350 – 2 380)	93.8	(87.5 – 97.5)
Total WA	13 400	(12 900 – 13 800)	68.6	(66.3 – 70.8)
Attended Aboriginal ceremonies				
None	700	(550 – 880)	10.4	(8.1 – 13.0)
Low	450	(350 – 580)	9.1	(7.0 – 11.7)
Moderate	1 090	(880 – 1 330)	26.5	(22.7 – 30.8)
High	880	(580 – 1 240)	48.7	(38.7 – 59.3)
Extreme	1 220	(880 – 1 640)	63.7	(54.5 – 71.6)
Total WA	4 340	(3 940 – 4 760)	22.2	(20.2 – 24.4)

Table 2.23: Households — Classification by usual residents, by Level of Relative Isolation (LORI)

Household classification type	Number	95% CI	%	95% CI
LORI — None				
Two parent family–nuclear type	1 300	(1 130 – 1 480)	30.1	(26.1 – 34.1)
Two parent–blended family	440	(340 – 560)	10.3	(7.8 – 13.0)
Two parent–extended family	120	(60 – 240)	2.8	(1.2 – 5.2)
Sole mother family	1 330	(1 170 – 1 510)	31.0	(27.2 – 35.0)
Sole mother step family	70	(40 – 140)	1.7	(0.8 – 3.2)
Sole mother extended family	500	(390 – 630)	11.6	(9.0 – 14.6)
Sole father	60	(20 – 130)	1.4	(0.4 – 3.1)
Sole father step family	10	(0 – 10)	0.2	(0.1 – 0.3)
Sole father other	20	(0 – 80)	0.4	(0.0 – 1.9)
Two parent step family	160	(100 – 240)	3.6	(2.2 – 5.5)
Two parent step family–extended type	40	(10 – 100)	0.8	(0.2 – 2.3)
No parent aunt–grandparent family	170	(90 – 280)	3.8	(2.1 – 6.2)
Other household types	80	(40 – 140)	1.8	(1.0 – 3.2)
Independent	10	(0 – 50)	0.3	(0.0 – 1.2)
Unclassified	10	(0 – 30)	0.2	(0.0 – 0.7)
Total	4 310	(4 230 – 4 390)	100.0	
LORI — Low				
Two parent family–nuclear type	1 090	(930 – 1 260)	36.7	(32.0 – 41.4)
Two parent–blended family	260	(200 – 350)	8.9	(6.7 – 11.4)
Two parent–extended family	170	(100 – 270)	5.7	(3.3 – 9.1)
Sole mother family	690	(570 – 840)	23.2	(19.3 – 27.5)
Sole mother step family	30	(10 – 50)	1.0	(0.5 – 1.8)
Sole mother extended family	240	(190 – 310)	8.1	(6.4 – 10.2)
Sole father	60	(30 – 90)	1.9	(1.2 – 3.0)
Sole father step family	0	(0 – 60)	0.0	(0.0 – 1.9)
Sole father other	40	(20 – 80)	1.5	(0.6 – 2.8)
Two parent step family	130	(90 – 190)	4.5	(3.1 – 6.3)
Two parent step family–extended type	20	(10 – 40)	0.7	(0.4 – 1.3)
No parent aunt–grandparent family	150	(110 – 200)	5.0	(3.7 – 6.5)
Other household types	80	(40 – 150)	2.6	(1.2 – 4.8)
Independent	0	(0 – 60)	0.0	(0.0 – 1.9)
Unclassified	0	(0 – 20)	0.2	(0.0 – 0.7)
Total	2 970	(2 740 – 3 220)	100.0	

Table 2.23: Households — Classification by usual residents, by Level of Relative Isolation (LORI) (Continued)

Household classification type	Number	95% CI	%	95% CI
		LORI — Moderate		
Two parent family–nuclear type	710	(580 – 850)	30.7	(27.2 – 34.4)
Two parent–blended family	280	(210 – 350)	11.9	(9.5 – 14.7)
Two parent–extended family	140	(90 – 200)	5.9	(3.8 – 8.5)
Sole mother family	350	(270 – 440)	15.0	(12.1 – 18.3)
Sole mother step family	40	(10 – 110)	1.9	(0.5 – 4.7)
Sole mother extended family	310	(230 – 390)	13.2	(10.6 – 16.0)
Sole father	60	(30 – 130)	2.8	(1.2 – 5.4)
Sole father step family	10	(10 – 30)	0.6	(0.3 – 1.1)
Sole father other	50	(20 – 90)	2.2	(1.1 – 4.0)
Two parent step family	110	(70 – 170)	4.9	(3.0 – 7.4)
Two parent step family–extended type	40	(20 – 70)	1.7	(0.8 – 3.1)
No parent aunt–grandparent family	190	(130 – 250)	8.0	(6.0 – 10.6)
Other household types	20	(10 – 50)	0.8	(0.3 – 2.0)
Independent	0	(0 – 10)	0.2	(0.0 – 0.4)
Unclassified	10	(0 – 30)	0.3	(0.0 – 1.1)
Total	2 320	(1 990 – 2 680)	100.0	
		LORI — High		
Two parent family–nuclear type	200	(120 – 300)	23.2	(16.8 – 30.9)
Two parent–blended family	180	(100 – 300)	20.8	(12.6 – 31.1)
Two parent–extended family	140	(70 – 250)	16.7	(9.4 – 25.5)
Sole mother family	50	(20 – 100)	5.8	(2.3 – 12.7)
Sole mother step family	10	(0 – 30)	1.2	(0.3 – 4.0)
Sole mother extended family	150	(90 – 250)	17.7	(12.5 – 24.2)
Sole father	10	(0 – 80)	1.6	(0.0 – 8.5)
Sole father step family	0	(0 – 60)	0.0	(0.0 – 6.3)
Sole father other	10	(0 – 50)	0.7	(0.0 – 5.6)
Two parent step family	20	(0 – 70)	2.5	(0.3 – 8.1)
Two parent step family–extended type	0	(0 – 60)	0.0	(0.0 – 6.3)
No parent aunt–grandparent family	80	(30 – 140)	9.1	(4.8 – 15.5)
Other household types	10	(0 – 20)	0.7	(0.1 – 2.0)
Independent	0	(0 – 60)	0.0	(0.0 – 6.3)
Unclassified	0	(0 – 60)	0.0	(0.0 – 6.3)
Total	860	(600 – 1 210)	100.0	
		LORI — Extreme		
Two parent family–nuclear type	240	(150 – 350)	26.5	(19.7 – 34.8)
Two parent–blended family	110	(50 – 250)	12.6	(5.8 – 24.2)
Two parent–extended family	210	(130 – 320)	23.2	(16.4 – 31.4)
Sole mother family	60	(30 – 100)	6.3	(2.9 – 10.8)
Sole mother step family	0	(0 – 20)	0.4	(0.1 – 1.8)
Sole mother extended family	90	(50 – 140)	9.5	(5.7 – 15.0)
Sole father	10	(0 – 30)	1.3	(0.1 – 3.9)
Sole father step family	0	(0 – 60)	0.0	(0.0 – 6.1)
Sole father other	0	(0 – 10)	0.5	(0.1 – 1.0)
Two parent step family	30	(10 – 70)	3.2	(1.0 – 6.7)
Two parent step family–extended type	30	(0 – 70)	2.8	(0.5 – 7.1)
No parent aunt–grandparent family	90	(40 – 190)	10.5	(5.4 – 19.3)
Other household types	20	(10 – 40)	1.9	(0.7 – 4.2)
Independent	10	(0 – 20)	0.6	(0.1 – 1.9)
Unclassified	10	(0 – 40)	0.7	(0.0 – 4.6)
Total	900	(620 – 1 220)	100.0	

Table 2.23: Households — Classification by usual residents, by Level of Relative Isolation (LORI) (Continued)

Household classification type	Number	95% CI	%	95% CI
		Total WA		
Two parent family–nuclear type	3 540	(3 290 – 3 790)	31.1	(28.9 – 33.4)
Two parent–blended family	1 280	(1 100 – 1 460)	11.2	(9.7 – 12.9)
Two parent–extended family	780	(620 – 960)	6.9	(5.5 – 8.4)
Sole mother family	2 480	(2 250 – 2 710)	21.8	(19.8 – 23.9)
Sole mother step family	160	(100 – 240)	1.4	(0.9 – 2.1)
Sole mother extended family	1 280	(1 130 – 1 450)	11.3	(10.0 – 12.8)
Sole father	210	(140 – 310)	1.8	(1.2 – 2.7)
Sole father step family	20	(10 – 30)	0.2	(0.1 – 0.3)
Sole father other	120	(70 – 190)	1.1	(0.7 – 1.7)
Two parent step family	460	(360 – 570)	4.0	(3.2 – 5.0)
Two parent step family–extended type	120	(80 – 190)	1.1	(0.7 – 1.7)
No parent aunt–grandparent family	670	(550 – 810)	5.9	(4.8 – 7.1)
Other household types	200	(130 – 280)	1.8	(1.2 – 2.5)
Independent	20	(10 – 50)	0.2	(0.0 – 0.5)
Unclassified	20	(10 – 50)	0.2	(0.1 – 0.5)
Total	11 400	(11 300 – 11 400)	100.0	

Table 2.24: Children — Carers of children, detailed description

Carer/s of child	Number	95% CI	%	95% CI
Both original parents	12 100	(11 400 – 12 800)	40.6	(38.3 – 42.9)
Both original parents & grandparent(s)	720	(560 – 920)	2.4	(1.9 – 3.1)
Both original parents & aunts/uncles & grandparents	530	(390 – 710)	1.8	(1.3 – 2.4)
Both original parents & aunts/uncles	470	(320 – 680)	1.6	(1.0 – 2.2)
Both original parents & other	100	(40 – 230)	0.3	(0.1 – 0.8)
Total both original parents care arrangement	*13 900*	*(13 300 – 14 600)*	*46.7*	*(44.5 – 48.9)*
Sole mother	7 200	(6 570 – 7 840)	24.1	(22.0 – 26.3)
Sole mother & grandparent	1 020	(790 – 1 280)	3.4	(2.7 – 4.3)
Sole mother & aunts/uncles & grandparents	440	(280 – 680)	1.5	(0.9 – 2.3)
Sole mother & aunts/uncles	410	(310 – 540)	1.4	(1.0 – 1.8)
Sole mother & other	160	(70 – 310)	0.5	(0.2 – 1.1)
Total sole mother care arrangement	*9 220*	*(8 580 – 9 890)*	*30.9*	*(28.8 – 33.2)*
Sole father only	530	(330 – 810)	1.8	(1.1 – 2.7)
Sole father & grandparent(s)	110	(40 – 220)	0.4	(0.1 – 0.8)
Sole father & other	110	(50 – 190)	0.4	(0.2 – 0.6)
Total sole father care arrangement	*740*	*(510 – 1 020)*	*2.5*	*(1.7– 3.4)*
One parent & new partner	1 980	(1 700 – 2 290)	6.6	(5.7 – 7.7)
One parent & new partner & other	150	(70 – 260)	0.5	(0.2 – 0.9)
Total one parent & new partner care arrangement	*2 130*	*(1 840 – 2 440)*	*7.1*	*(6.2 – 8.2)*
Aunts/uncles	1 020	(780 – 1 320)	3.4	(2.6 – 4.4)
Aunts/uncles & grandparents	690	(520 – 900)	2.3	(1.7 – 3.0)
Aunts/uncles & other	50	(25 – 90)	0.2	(0.1 – 0.4)
Total extended family care arrangement	*1 770*	*(1 480 – 2 100)*	*5.9*	*(5.0 – 7.0)*
Grandparent(s) only	1 310	(1 060 – 1 600)	4.4	(3.6 – 5.4)
Foster parents	270	(150 – 450)	0.9	(0.5 – 1.5)
Family member same generation as child	120	(50 – 270)	0.4	(0.2 – 0.9)
Great grandparents	20	(10 – 40)	0.1	(0.0 – 0.2)
Friends	150	(70 – 320)	0.5	(0.2 – 1.0)
Child living independently	140	(80 – 220)	0.5	(0.3 – 0.7)
Unclassified	40	(10 – 130)	0.1	(0.0 – 0.4)
Total children	29 800	(29 800 – 29 800)	100.0	

Table 2.25: Children — Carers of children, by Level of Relative Isolation (LORI)

Carer/s of child	Number	95% CI	%	95% CI
	LORI — None			
Both original parents	4 240	(3 830 – 4 690)	41.7	(37.5 – 45.8)
Sole mother	4 090	(3 670 – 4 540)	40.2	(36.2 – 44.6)
Sole father	170	(70 – 330)	1.7	(0.7 – 3.3)
One parent & new partner	810	(600 – 1 050)	7.9	(6.0 – 10.4)
Extended family(a)	270	(150 – 460)	2.7	(1.5 – 4.5)
Grandparents only	330	(180 – 540)	3.3	(1.9 – 5.4)
Foster parents	130	(40 – 260)	1.2	(0.4 – 2.5)
Other	130	(80 – 180)	1.2	(0.8 – 1.8)
Total	10 200	(10 000 – 10 400)	100.0	
	LORI — Low			
Both original parents	3 690	(3 240 – 4 190)	50.9	(46.0 – 55.6)
Sole mother	2 210	(1 840 – 2 610)	30.4	(26.2 – 35.0)
Sole father	220	(130 – 350)	3.0	(1.8 – 4.9)
One parent & new partner	420	(310 – 540)	5.7	(4.3 – 7.3)
Extended family(a)	240	(170 – 340)	3.3	(2.3 – 4.6)
Grandparents only	320	(220 – 460)	4.4	(3.0 – 6.1)
Foster parents	70	(10 – 250)	0.9	(0.1 – 3.4)
Other	100	(50 – 160)	1.3	(0.7 – 2.2)
Total	7 270	(6 640 – 7 930)	100.0	
	LORI — Moderate			
Both original parents	2 870	(2 380 – 3 410)	45.0	(40.7 – 49.2)
Sole mother	1 820	(1 430 – 2 280)	28.5	(23.8 – 33.5)
Sole father	260	(120 – 500)	4.1	(1.8 – 7.5)
One parent & new partner	480	(340 – 660)	7.6	(5.6 – 10.0)
Extended family(a)	510	(350 – 740)	8.0	(5.6 – 11.0)
Grandparents only	280	(190 – 380)	4.3	(3.1 – 5.8)
Foster parents	40	(20 – 80)	0.6	(0.2 – 1.3)
Other	120	(40 – 300)	1.9	(0.7 – 4.6)
Total	6 390	(5 400 – 7 420)	100.0	
	LORI — High			
Both original parents	1 570	(1 150 – 2 080)	49.5	(44.5 – 54.8)
Sole mother	680	(460 – 950)	21.6	(17.3 – 26.7)
Sole father	40	(0 – 210)	1.2	(0.0 – 6.4)
One parent & new partner	230	(150 – 340)	7.2	(5.0 – 9.9)
Extended family(a)	410	(280 – 590)	12.9	(9.8 – 16.7)
Grandparents only	190	(90 – 370)	6.0	(2.8 – 10.4)
Foster parents	20	(0 – 40)	0.5	(0.2 – 1.2)
Other	40	(20 – 80)	1.2	(0.5 – 2.4)
Total	3 170	(2 360 – 4 160)	100.0	

Table 2.25: Children — Carers of children, by Level of Relative Isolation (LORI) (Continued)

Carer/s of child	Number	95% CI	%	95% CI
		LORI — Extreme		
Both original parents	1 540	(1 070 – 2 090)	54.4	(47.5 – 61.3)
Sole mother	410	(270 – 600)	14.6	(10.8 – 19.0)
Sole father	50	(10 – 120)	1.7	(0.5 – 4.4)
One parent & new partner	190	(110 – 310)	6.9	(4.4 – 10.4)
Extended family(a)	330	(160 – 570)	11.6	(6.4 – 18.4)
Grandparents only	190	(90 – 350)	6.7	(3.4 – 11.1)
Foster parents	30	(10 – 50)	0.9	(0.3 – 1.9)
Other	90	(20 – 260)	3.3	(0.6 – 8.4)
Total	2 830	(2 040 – 3 800)	100.0	
		Total WA		
Both original parents	13 900	(13 300 – 14 600)	46.7	(44.5 – 48.9)
Sole mother	9 220	(8 580 – 9 890)	30.9	(28.8 – 33.2)
Sole father	740	(510 – 1 020)	2.5	(1.7 – 3.4)
One parent & new partner	2 130	(1 840 – 2 440)	7.1	(6.2 – 8.2)
Extended family(a)	1 770	(1 480 – 2 100)	5.9	(5.0 – 7.0)
Grandparents only	1 310	(1 060 – 1 600)	4.4	(3.6 – 5.4)
Foster parents	270	(150 – 450)	0.9	(0.5 – 1.5)
Other	470	(320 – 660)	1.6	(1.1 – 2.2)
Total	29 800	(29 800 – 29 800)	100.0	

(a) Extended family is care by aunts and uncles only or aunts and uncles in combination with grandparents or other extended family members

Table 2.26: Children — Carers of children, by age group

Carer/s of child	Number	95% CI	%	95% CI
	0–3 Years			
Both original parents	4 210	(3 860 – 4 600)	61.0	(57.3 – 64.7)
Sole mother	2 150	(1 870 – 2 450)	31.1	(27.5 – 34.7)
Sole father	40	(20 – 80)	0.6	(0.3 – 1.1)
One parent & new partner	90	(40 – 170)	1.3	(0.6 – 2.4)
Extended family(a)	160	(70 – 300)	2.3	(1.0 – 4.3)
Grandparents only	150	(90 – 220)	2.2	(1.4 – 3.3)
Foster parents	60	(20 – 170)	0.9	(0.3 – 2.5)
Other	40	(20 – 70)	0.6	(0.3 – 1.0)
Total	6 910	(6 470 – 7 360)	100.0	
	4–11 Years			
Both original parents	6 150	(5 710 – 6 600)	44.5	(41.7 – 47.5)
Sole mother	4 600	(4 160 – 5 060)	33.3	(30.5 – 36.3)
Sole father	350	(250 – 480)	2.5	(1.8 – 3.5)
One parent & new partner	1 090	(900 – 1 310)	7.9	(6.5 – 9.5)
Extended family(a)	740	(580 – 910)	5.3	(4.3 – 6.7)
Grandparents only	670	(520 – 840)	4.9	(3.9 – 6.1)
Foster parents	110	(40 – 230)	0.8	(0.3 – 1.6)
Other	90	(30 – 210)	0.7	(0.2 – 1.6)
Total	13 800	(13 300 – 14 300)	100.0	
	12–17 Years			
Both original parents	3 550	(3 160 – 3 980)	39.0	(35.5 – 42.7)
Sole mother	2 480	(2 200 – 2 770)	27.2	(24.2 – 30.4)
Sole father	350	(180 – 640)	3.8	(1.9 – 6.8)
One parent & new partner	940	(750 – 1 150)	10.3	(8.4 – 12.7)
Extended family(a)	870	(700 – 1 050)	9.5	(7.8 – 11.6)
Grandparents only	480	(330 – 670)	5.3	(3.7 – 7.3)
Foster parents	100	(30 – 210)	1.1	(0.3 – 2.3)
Other	340	(250 – 460)	3.7	(2.7 – 5.0)
Total	9 100	(8 580 – 9 630)	100.0	
	Total			
Both original parents	13 900	(13 300 – 14 600)	46.7	(44.5 – 48.9)
Sole mother	9 220	(8 580 – 9 890)	30.9	(28.8 – 33.2)
Sole father	740	(510 – 1 020)	2.5	(1.7 – 3.4)
One parent & new partner	2 130	(1 840 – 2 440)	7.1	(6.2 – 8.2)
Extended family(a)	1 770	(1 480 – 2 100)	5.9	(5.0 – 7.0)
Grandparents only	1 310	(1 060 – 1 600)	4.4	(3.6 – 5.4)
Foster parents	270	(150 – 450)	0.9	(0.5 – 1.5)
Other	470	(320 – 660)	1.6	(1.1 – 2.2)
Total	29 800	(29 800 – 29 800)	100.0	

(a) Extended family is care by aunts and uncles only or aunts and uncles in combination with grandparents or other extended family members

Table 2.27: All Carers — Relative money situation

Whether better off this year	Number	95% CI	%	95% CI
Primary Carers				
Not better off	2 730	(2 490 – 2 980)	21.7	(19.8 – 23.7)
Better off	4 790	(4 490 – 5 100)	38.1	(35.8 – 40.6)
Same	5 050	(4 730 – 5 360)	40.2	(37.7 – 42.7)
Total Primary Carers	12 600	(12 500 – 12 600)	100.0	
Secondary Carers				
Not better off	1 380	(1 200 – 1 570)	19.9	(17.3 – 22.7)
Better off	2 470	(2 230 – 2 700)	35.6	(32.2 – 39.0)
Same	3 080	(2 850 – 3 320)	44.5	(41.1 – 47.9)
Total Secondary Carers	6 930	(6 870 – 6 930)	100.0	

Table 2.28: All Carers — Financial strain

Family money situation	Number	95% CI	%	95% CI
Primary Carers				
Spending more money than we get	1 200	(1 030 – 1 390)	9.5	(8.2 – 11.0)
Just enough money to get through to next pay day	5 520	(5 220 – 5 830)	43.9	(41.6 – 46.4)
Some money left over each week but we just spend it	1 690	(1 460 – 1 930)	13.4	(11.6 – 15.3)
Can save a bit now and again	3 590	(3 330 – 3 850)	28.6	(26.5 – 30.6)
Can save a lot	570	(440 – 730)	4.6	(3.5 – 5.8)
Total	12 600	(12 500 – 12 600)	100.0	
Secondary Carers(a)				
Spending more money than we get	520	(410 – 650)	10.1	(7.9 – 12.6)
Just enough money to get through to next pay day	2 140	(1 930 – 2 350)	42.0	(38.2 – 45.7)
Some money left over each week but we just spend it	720	(590 – 880)	14.2	(11.6 – 17.1)
Can save a bit now and again	1 560	(1 370 –1 780)	30.7	(27.0 – 34.5)
Can save a lot	160	(90 – 250)	3.1	(1.7 – 4 8)
Total	5 090	(4 860 – 5 310)	100.0	

(a) Data only reported for Secondary Carers who were available for personal interview.

Table 2.29: All Carers — Fortnightly income from all sources

Fortnightly income	Number	95% CI	%	95% CI
Primary Carers				
None	220	(150 – 310)	1.7	(1.2 – 2.5)
$1–$199	640	(500 – 810)	5.1	(4.0 – 6.4)
$200–$399	3 230	(2 980 – 3 480)	25.7	(23.8 – 27.7)
$400–$599	3 260	(3 010 – 3 520)	26.0	(24.0 – 28.0)
$600–$799	2 620	(2 380 – 2 870)	20.9	(18.9 – 22.8)
$800–$1,999	2 420	(2 170 – 2 690)	19.3	(17.3 – 21.4)
$2,000+	180	(100 – 300)	1.4	(0.8 – 2.4)
Total	12 600	(12 500 – 12 600)	100.0	
Secondary Carers(a)				
None	100	(60 – 170)	2.0	(1.1 – 3.4)
$1–$199	340	(260 – 440)	6.7	(5.1 – 8.6)
$200–$399	1 990	(1 780 – 2 200)	39.0	(35.3 – 42.8)
$400–$599	720	(580 – 870)	14.1	(11.4 – 17.0)
$600–$799	620	(490 – 760)	12.1	(9.7 – 14.8)
$800–$1,999	1 150	(980 – 1 340)	22.6	(19.3 – 26.1)
$2,000+	180	(110 – 290)	3.4	(1.9 – 5.4)
Total(a)	5 090	(4 860 – 5 310)	100.0	

(a) Data only reported for Secondary Carers who were available for personal interview.

Table 2.30: All Carers — Health care or concession cards held(a)

Concession card	Number	95% CI	%	95% CI
	Primary Carer (N = 12 600)			
Veterans affairs	30	(10 – 90)	0.2	(0.0 – 0.7)
Centrelink/Social security	8 990	(8 690 – 9 290)	71.6	(69.1 – 74.0)
Disability services	140	(100 – 190)	1.1	(0.8 – 1.5)
Health Insurance commission	730	(590 – 900)	5.8	(4.7 – 7.1)
Other health care card	130	(90 – 200)	1.1	(0.7 – 1.6)
No health care card	2 870	(2 600 – 3 160)	22.9	(20.7 – 25.1)
	Secondary Carer (N = 6 900)			
Veterans affairs	30	(10 – 70)	0.4	(0.1 – 0.9)
Centrelink/Social security	3 690	(3 460 – 3 930)	53.3	(49.9 – 56.7)
Disability services	150	(100 – 230)	2.2	(1.4 – 3.3)
Health Insurance commission	270	(170 – 390)	3.8	(2.5 – 5.6)
Other health care card	110	(60 – 170)	1.6	(0.9 – 2.5)
No health care card	2 810	(2 580 – 3 050)	40.6	(37.3 – 44.1)

(a) Carers may hold more than one concession card

Table 2.31: All Carers — Benefits received(a)

	Primary carer			
Benefit received	Number	95% CI	%	95% CI
	Primary carer			
Family allowance	9 030	(8 730 – 9 310)	71.9	(69.5 – 74.1)
Parenting payment	7 150	(6 760 – 7 550)	56.9	(54.2 – 59.6)
Partner allowance	610	(490 – 750)	4.9	(3.9 – 6.0)
Disability support pension	540	(410 – 700)	4.3	(3.2 – 5.5)
AUSTUDY/ABSTUDY	770	(560 – 1 030)	6.1	(4.4 – 8.1)
Child disability allowance	380	(280 – 510)	3.1	(2.2 – 4.1)
Other allowance	1 420	(1 210 – 1 650)	11.3	(9.7 – 13.1)
None	1 390	(1 180 – 1 620)	11.0	(9.4 – 12.8)
	Secondary carer			
Family allowance	600	(480 – 740)	8.6	(7.0 – 10.6)
Parenting payment	600	(490 – 720)	8.7	(7.1 – 10.4)
Partner allowance	110	(70 – 180)	1.6	(1.0 – 2.5)
Disability support pension	470	(360 – 600)	6.7	(5.2 – 8.5)
AUSTUDY/ABSTUDY	270	(190 – 370)	3.9	(2.8 – 5.3)
Child disability allowance	60	(20 – 120)	0.9	(0.3 – 1.8)
Other allowance	1 580	(1420 – 1 770)	22.9	(20.6 – 25.3)
None	3 870	(3 610 – 4 140)	55.9	(52.8 – 59.0)

(a) Carers may receive more than one benefit

Table 2.32: All Carers — Benefits received(a), by Level of Relative Isolation (LORI)

Benefit received	Primary carer				Secondary carer			
	Number	95% CI	%	95% CI	Number	95% CI	%	95% CI
LORI — None								
Family allowance	3 170	(2 920 – 3 420)	70.1	(65.1 – 74.9)	180	(120 – 280)	8.3	(5.1 – 12.2)
Parenting payment	2 820	(2 560 – 3 100)	62.4	(57.4 – 67.1)	190	(130 – 270)	8.6	(5.7 – 12.3)
Partner allowance	210	(120 – 330)	4.6	(2.7 – 7.4)	40	(10 – 90)	1.9	(0.6 – 4.1)
Disability support pension	220	(140 – 340)	4.9	(3.1 – 7.6)	170	(110 – 260)	7.8	(5.1 – 11.7)
AUSTUDY/ABSTUDY	330	(210 – 490)	7.2	(4.6 – 10.6)	90	(50 – 170)	4.1	(1.9 – 7.1)
Child disability allowance	240	(160 – 360)	5.4	(3.5 – 8.0)	50	(20 – 110)	2.0	(0.7 – 4.9)
Other allowance	530	(390 – 710)	11.6	(8.6 – 15.6)	480	(390 – 600)	21.8	(17.6 – 26.5)
None	490	(360 – 650)	10.9	(7.9 – 14.4)	1 190	(1 040 – 1 340)	53.4	(48.0 – 59.1)
LORI — Low								
Family allowance	2 380	(2 100 – 2 670)	75.7	(70.7 – 80.2)	130	(70 – 210)	6.9	(4.0 – 11.2)
Parenting payment	1 900	(1 660 – 2 180)	60.6	(54.8 – 66.0)	160	(110 – 220)	8.8	(6.1 – 12.0)
Partner allowance	220	(140 – 330)	7.0	(4.4 – 10.2)	30	(10 – 60)	1.4	(0.5 – 2.7)
Disability support pension	140	(70 – 240)	4.4	(2.2 – 7.4)	150	(90 – 230)	8.3	(5.0 – 12.6)
AUSTUDY/ABSTUDY	270	(160 – 410)	8.5	(5.2 – 12.9)	150	(90 – 220)	8.1	(5.2 – 12.2)
Child disability allowance	80	(40 – 140)	2.5	(1.3 – 4.4)	10	(0 – 30)	0.4	(0.0 – 1.4)
Other allowance	340	(260 – 440)	10.9	(8.3 – 14.0)	450	(350 – 570)	24.9	(20.1 – 30.6)
None	260	(190 – 350)	8.2	(6.0 – 11.0)	900	(770 – 1 040)	49.5	(43.4 – 55.8)
LORI — Moderate								
Family allowance	1 840	(1 530 – 2 200)	68.6	(62.7 – 74.1)	140	(100 – 210)	10.1	(4.0 – 11.2)
Parenting payment	1 450	(1 210 – 1 720)	53.9	(50.0 – 58.0)	130	(90 – 180)	9.2	(6.1 – 12.0)
Partner allowance	130	(90 – 180)	4.7	(3.4 – 6.5)	30	(10 – 70)	2.3	(0.5 – 2.7)
Disability support pension	120	(70 – 190)	4.5	(2.8 – 7.1)	80	(40 – 150)	5.5	(5.0 – 12.6)
AUSTUDY/ABSTUDY	100	(70 – 160)	3.8	(2.5 – 5.7)	20	(0 – 80)	1.5	(5.2 – 12.2)
Child disability allowance	50	(20 – 90)	1.8	(0.9 – 3.3)	0	(0 – 60)	0.0	(0.0 – 1.4)
Other allowance	290	(200 – 390)	10.7	(7.8 – 13.8)	330	(250 – 420)	23.2	(20.1 – 30.6)
None	400	(280 – 540)	14.8	(10.9 – 19.6)	820	(660 – 1 000)	58.3	(43.4 – 55.8)
LORI — High								
Family allowance	830	(550 – 1 190)	77.8	(70.9 – 84.3)	50	(20 – 110)	7.1	(3.2 – 14.0)
Parenting payment	560	(340 – 870)	51.9	(40.0 – 63.9)	60	(30 – 120)	8.6	(4.4 – 15.8)
Partner allowance	30	(10 – 60)	2.8	(1.0 – 5.8)	0	(0 – 60)	0.0	(0.0 – 7.4)
Disability support pension	30	(0 – 100)	2.7	(0.3 – 9.2)	30	(10 – 60)	4.3	(1.7 – 8.5)
AUSTUDY/ABSTUDY	50	(0 – 390)	4.2	(0.0 – 30.8)	0	(0 – 60)	0.0	(0.0 – 7.4)
Child disability allowance	10	(0 – 30)	0.9	(0.1 – 2.7)	0	(0 – 60)	0.0	(0.0 – 7.4)
Other allowance	120	(70– 200)	11.3	(6.8 – 17.2)	130	(80 – 200)	18.0	(12.6 – 24.9)
None	80	(40 – 160)	7.8	(3.8 – 13.1)	490	(350 – 670)	66.9	(57.3 – 76.3)
LORI — Extreme								
Family allowance	810	(570 – 1 100)	70.2	(63.6 – 76.5)	100	(50 – 160)	12.6	(7.4 – 20.3)
Parenting payment	430	(280 – 610)	37.0	(28.6 – 45.6)	60	(20 – 120)	7.7	(2.8 – 15.6)
Partner allowance	30	(10 – 70)	2.2	(0.4 – 5.6)	20	(0 – 40)	1.9	(0.7 – 4.8)
Disability support pension	30	(10 – 60)	2.4	(0.9 – 5.4)	40	(10 – 70)	4.6	(1.9 – 9.4)
AUSTUDY/ABSTUDY	20	(0 – 80)	2.1	(0.5 – 6.7)	10	(0 – 20)	1.2	(0.6 – 2.3)
Child disability allowance	0	(0 – 10)	0.4	(0.2 – 0.8)	10	(0 – 50)	1.0	(0.0 – 6.3)
Other allowance	140	(70 – 250)	12.5	(6.5 – 21.5)	190	(140 – 270)	25.1	(18.8 – 31.7)
None	160	(90 – 260)	13.7	(8.8 – 20.3)	480	(340 – 660)	62.8	(54.2 – 71.4)

(a) Carers may receive more than one benefit

Table 2.33: All Carers — Receipt of disability support pension or child disability allowance, by Level of Relative Isolation (LORI)

Pension or allowance received	Number	95% CI	%	95% CI
LORI — None (N = 6 730)				
Disability support pension	400	(280 – 540)	5.9	(4.2 – 8.1)
Child disability allowance	290	(190 – 410)	4.3	(2.8 – 6.0)
LORI — Low (N = 4 950)				
Disability support pension	290	(200 – 420)	5.8	(3.9 – 8.2)
Child disability allowance	90	(50 – 150)	1.8	(1.0 – 3.0)
LORI — Moderate (N = 4 090)				
Disability support pension	200	(130 – 290)	4.9	(3.4 – 6.8)
Child disability allowance	50	(20 – 90)	1.2	(0.6 – 2.1)
LORI — High (N = 1 800)				
Disability support pension	60	(20 – 120)	3.4	(1.3 – 6.6)
Child disability allowance	10	(0 – 30)	0.5	(0.1 – 1.6)
LORI — Extreme (N = 1 920)				
Disability support pension	60	(30 – 110)	3.3	(1.9 – 5.5)
Child disability allowance	10	(0 – 40)	0.6	(0.1 – 2.2)
Total WA — (N = 19 500)				
Disability support pension	1 010	(840 – 1 210)	5.2	(4.3 – 6.2)
Child disability allowance	440	(330 – 580)	2.3	(1.7 – 3.0)

Table 2.34: All Carers — Labour force participation and employment status, by sex

Employment status	Number	95% CI	%	95% CI
Males				
Employed	4 570	(4 300 – 4 860)	66.8	(63.9 – 69.7)
Unemployed	1 340	(1 180 – 1 520)	19.6	(17.3 – 22.1)
Not in labour force	930	(790 – 1 090)	13.6	(11.5 – 15.8)
Total	6 840	(6 570 – 7 120	100.0	
Females				
Employed	4 740	(4 370 – 5 120)	37.4	(34.6 – 40.3)
Unemployed	1 660	(1 430 – 1 910)	13.2	(11.3 – 15.1)
Not in labour force	6 250	(5 890 – 6 620)	49.4	(46.7 – 52.2)
Total	12 700	(12 400 – 12 900	100.0	
Total				
Employed	9 310	(8 870 – 9 740)	47.8	(45.5 – 50.0)
Unemployed	3 010	(2 720 – 3 310)	15.4	(14.0 – 17.0)
Not in labour force	7 180	(6 790 – 7 580)	36.8	(34.8 – 38.9)
Total	19 500	(19 400 – 19 500)	100.0	

Table 2.35: All Carers in Labour Force — Employment status, by ATSIC region

ATSIC region	Number	95% CI	%	95% CI
Employed				
Perth	2 820	(2 560 – 3 100)	67.1	(62.2 – 71.9)
Narrogin	1 530	(1 320 – 1 750)	79.9	(74.6 – 84.6)
Kalgoorlie	390	(220 – 620)	71.6	(53.0 – 84.1)
Geraldton	840	(630 – 1 080)	70.8	(63.6 – 77.8)
Broome	480	(270 – 780)	86.3	(76.9 – 92.6)
South Hedland	870	(600 – 1 180)	77.5	(68.4 – 84.5)
Derby	860	(570 – 1 220)	88.5	(82.5 – 92.9)
Kununurra	750	(480 – 1 120)	80.9	(72.1 – 87.7)
Warburton	780	(560 – 1 080)	86.3	(79.8 – 91.5)
Total WA	9 310	(8 870 – 9 740)	75.6	(73.2 – 77.8)
Unemployed				
Perth	1 380	(1 180 – 1 610)	32.9	(28.1 – 37.8)
Narrogin	380	(280 – 500)	20.1	(15.4 – 25.4)
Kalgoorlie	160	(80 – 290)	28.4	(15.9 – 47.0)
Geraldton	350	(240 – 490)	29.2	(22.2 – 36.4)
Broome	80	(30 – 140)	13.7	(7.4 – 23.1)
South Hedland	250	(160 – 390)	22.5	(15.5 – 31.6)
Derby	110	(60 – 180)	11.5	(7.1 – 17.5)
Kununurra	180	(110 – 270)	19.1	(12.3 – 27.9)
Warburton	120	(60 – 230)	13.7	(8.5 – 20.2)
Total WA	3 010	(2 720 – 3 310)	24.4	(22.2 – 26.8)

Table 2.36: Employed Carers — Main source of employment, by ATSIC region

ATSIC region	Number	95% CI	%	95% CI
	Work for an employer (excluding CDEP)			
Perth	2 140	(1 890 – 2 400)	75.8	(70.0 – 81.2)
Narrogin	830	(660 – 1 020)	54.4	(46.6 – 62.4)
Kalgoorlie	290	(150 – 510)	74.1	(60.9 – 83.7)
Geraldton	510	(370 – 690)	60.3	(48.4 – 70.8)
Broome	230	(130 – 360)	47.4	(24.4 – 67.8)
South Hedland	500	(330 – 710)	57.6	(45.4 – 69.4)
Derby	270	(140 – 450)	31.6	(18.7 – 46.3)
Kununurra	320	(180 – 520)	42.4	(25.5 – 62.6)
Warburton	190	(90 – 330)	23.8	(14.1 – 37.8)
Total WA	5 260	(4 860 – 5 680)	56.5	(52.8 – 60.1)
	Work for a CDEP scheme			
Perth	50	(30 – 100)	1.9	(1.0 – 3.5)
Narrogin	490	(380 – 630)	32.1	(25.6 – 39.5)
Kalgoorlie	50	(30 – 100)	13.7	(6.4 – 26.2)
Geraldton	200	(130 – 280)	23.3	(16.7 – 31.6)
Broome	210	(100 – 370)	43.5	(23.1 – 68.5)
South Hedland	290	(170 – 460)	33.3	(22.7 – 45.4)
Derby	500	(307 – 770)	58.8	(44.1 – 71.3)
Kununurra	390	(200 – 710)	51.7	(29.1 – 70.9)
Warburton	440	(300 – 590)	55.5	(44.1 – 66.1)
Total WA	2 610	(2 300 – 2 960)	28.1	(24.9 – 31.5)
	Work in own business			
Perth	290	(190 – 430)	10.3	(6.6 – 14.6)
Narrogin	60	(20 – 160)	4.1	(1.0 – 9.2)
Kalgoorlie	10	(0 – 30)	2.9	(0.3 – 9.1)
Geraldton	30	(0 – 250)	3.6	(0.0 – 24.7)
Broome	20	(0 – 80)	3.8	(0.1 – 16.2)
South Hedland	10	(0 – 30)	0.9	(0.2 – 3.1)
Derby	30	(10 – 60)	3.3	(1.0 – 6.9)
Kununurra	10	(0 – 40)	1.8	(0.5 – 5.0)
Warburton	0	(0 – 60)	0.0	(0.0 – 6.8)
Total WA	460	(320 – 650)	5.0	(3.4 – 6.9)
	Away from work last week			
Perth	310	(220 – 450)	11.1	(7.5 – 15.3)
Narrogin	130	(80 – 200)	8.3	(5.2 – 12.9)
Kalgoorlie	40	(20 – 70)	9.3	(4.4 – 17.2)
Geraldton	100	(60 – 160)	12.2	(7.0 – 18.8)
Broome	30	(0 – 670)	5.4	(0.0 – 7.8)
South Hedland	70	(40 – 120)	8.2	(5.0 – 12.2)
Derby	50	(30 – 90)	6.3	(3.8 – 9.5)
Kununurra	30	(10 – 70)	4.1	(1.5 – 8.7)
Warburton	160	(90 – 270)	20.7	(12.9 – 31.8)
Total WA	920	(730 – 1 160)	9.9	(7.8 – 12.3)

Table 2.37: Employed Carers who attended work last week — Employment status, by ATSIC region and sex

	Part time (1 – 34 hours)				Full time (35+ hours)			
ATSIC region	Number	95% CI	%	95% CI	Number	95% CI	%	95% CI
	Male							
Perth	240	(160 – 340)	19.1	(13.3 – 25.9)	1 020	(880 – 1 180)	80.9	(74.1 – 86.7)
Narrogin	300	(230 – 390)	42.7	(34.9 – 51.3)	410	(330 – 490)	57.3	(48.7 – 65.1)
Kalgoorlie	50	(20 – 120)	27.7	(7.3 – 52.4)	130	(60 – 250)	72.3	(47.6 – 92.7)
Geraldton	100	(70 – 150)	27.3	(18.1 – 38.6)	270	(190 – 380)	72.7	(61.4 – 81.9)
Broome	60	(30 – 110)	26.4	(13.4 – 43.1)	170	(90 – 290)	73.6	(56.9 – 86.6)
South Hedland	170	(110 – 250)	41.5	(32.4 – 50.6)	230	(150 – 330)	58.5	(49.4 – 67.6)
Derby	200	(110 – 350)	48.5	(31.0 – 64.2)	220	(140 – 340)	51.5	(35.8 – 69.0)
Kununurra	180	(100 – 300)	52.7	(33.9 – 72.5)	160	(90 – 280)	47.3	(27.5 – 66.1)
Warburton	200	(140 – 280)	65.5	(38.4 – 88.2)	110	(30 – 280)	34.5	(11.8 – 61.6)
Total WA	1 510	(1 330 – 1 710)	35.6	(31.8 – 39.7)	2 720	(2 480 – 2 980)	64.4	(60.3 – 68.2)
	Females							
Perth	720	(550 – 930)	57.5	(47.2 – 67.5)	530	(400 – 700)	42.5	(32.5 – 52.8)
Narrogin	550	(410 – 700)	79.3	(68.3 – 88.4)	140	(80 – 240)	20.7	(11.6 – 31.7)
Kalgoorlie	120	(60 – 240)	71.7	(34.8 – 93.3)	50	(10 – 150)	28.3	(6.7 – 65.2)
Geraldton	250	(150 – 390)	70.2	(55.4 – 82.1)	110	(70 – 170)	29.8	(17.9 – 44.6)
Broome	90	(50 – 160)	38.8	(24.9 – 56.7)	140	(80 – 220)	61.2	(43.3 – 75.1)
South Hedland	270	(160 – 400)	67.0	(54.6 – 77.3)	130	(80 – 200)	33.0	(22.7 – 45.4)
Derby	310	(190 – 480)	79.6	(69.9 – 87.9)	80	(50 – 130)	20.4	(12.1 – 30.1)
Kununurra	280	(130 – 520)	73.1	(54.1 – 87.7)	100	(50 – 170)	26.9	(12.3 – 45.9)
Warburton	270	(180 – 380)	83.8	(75.8 – 90.8)	50	(30 – 80)	16.2	(9.2 – 24.2)
Total WA	2 840	(2 520 – 3 170)	68.2	(63.5 – 72.5)	1 320	(1 130 – 1 540)	31.8	(27.5 – 36.5)

Table 2.38: All Carers — Highest school year completed, by sex

	Number	95% CI	%	95% CI
Highest school year completed	Males			
Did not attend	210	(140 – 310)	3.1	(2.0 – 4.4)
Year 7 or less	650	(540 – 780)	9.5	(7.9 – 11.2)
Year 8	650	(540 – 790)	9.6	(7.9 – 11.4)
Year 9	1 180	(1 030 – 1 340)	17.2	(15.1 – 19.4)
Year 10	2 460	(2 230 – 2 700)	36.0	(32.9 – 39.1)
Year 11	790	(670 – 920)	11.5	(9.8 – 13.4)
Year 12	900	(750 – 1 060)	13.1	(11 – 15.4)
Total	6 840	(6 570 – 7 120)	100.0	
	Females			
Did not attend	440	(330 – 570)	3.5	(2.6 – 4.5)
Year 7 or less	980	(830 – 1 140)	7.7	(6.5 – 8.9)
Year 8	830	(670 – 1 010)	6.5	(5.4 – 8.0)
Year 9	1 560	(1 350 – 1 800)	12.3	(10.7 – 14.1)
Year 10	5 220	(4 890 – 5 580)	41.3	(38.7 – 43.9)
Year 11	2 190	(1 940 – 2 460)	17.3	(15.4 – 19.5)
Year 12	1 440	(1 210 – 1 680)	11.4	(9.6 – 13.3)
Total	12 700	(12 400 – 12 900)	100.0	
	Total			
Did not attend	650	(500 – 830)	3.3	(2.6 – 4.3)
Year 7 or less	1 630	(1 440 – 1 840)	8.3	(7.4 – 9.4)
Year 8	1 480	(1 270 – 1 700)	7.6	(6.5 – 8.7)
Year 9	2 740	(2 480 – 3 010)	14.1	(12.7 – 15.4)
Year 10	7 680	(7 270 – 8 100)	39.4	(37.3 – 41.6)
Year 11	2 980	(2 700 – 3 280)	15.3	(13.8 – 16.8)
Year 12	2 330	(2 060 – 2 640)	12.0	(10.6 – 13.6)
Total	19 500	(19 400 – 19 500)	100.0	

Table 2.39: All Carers — Highest school year completed, by age group

Highest school year completed	Number	95% CI	%	95% CI
	29 years and under			
Did not attend	70	(40 – 130)	1.1	(0.6 – 1.9)
Year 7 or less	210	(160 – 260)	3.1	(2.3 – 3.9)
Year 8	420	(320 – 550)	6.3	(4.8 – 8.2)
Year 9	860	(730 – 1 000)	12.9	(11.1 – 15.0)
Year 10	2 720	(2 430 – 3 020)	40.8	(37.3 – 44.4)
Year 11	1 440	(1 250 – 1 640)	21.6	(19.1 – 24.3)
Year 12	950	(810 – 1 100)	14.2	(12.1 – 16.4)
Total	6 660	(6 260 – 7 070)	100.0	
	30–39 years			
Did not attend	120	(80 – 180)	1.7	(1.1 – 2.6)
Year 7 or less	290	(210 – 380)	4.0	(3.0 – 5.4)
Year 8	400	(310 – 510)	5.6	(4.3 – 7.1)
Year 9	1 020	(850 – 1 200)	14.1	(11.9 – 16.6)
Year 10	3 310	(2 980 – 3 660)	46.0	(42.3 – 49.7)
Year 11	1 220	(1 030 – 1 440)	17.0	(14.4 – 19.8)
Year 12	830	(640 – 1 070)	11.5	(8.9 – 14.6)
Total	7 190	(6 770 – 7 640)	100.0	
	40–49 years			
Did not attend	70	(20 – 160)	2.0	(0.6 – 4.3)
Year 7 or less	450	(360 – 560)	12.4	(9.9 – 15.4)
Year 8	360	(240 – 520)	9.9	(6.7 – 14.0)
Year 9	630	(480 – 810)	17.3	(13.6 – 21.9)
Year 10	1 370	(1 170 – 1 600)	37.6	(32.9 – 42.7)
Year 11	300	(200 – 430)	8.2	(5.6 – 11.6)
Year 12	460	(330 – 630)	12.6	(9.2 – 16.9)
Total	3 640	(3 290 – 4 020)	100.0	
	50 years and over			
Did not attend	290	(170 – 440)	17.3	(11.0 – 25.1)
Year 7 or less	610	(500 – 750)	36.6	(30.3 – 42.8)
Year 8	260	(180 – 370)	15.7	(10.9 – 20.9)
Year 9	200	(140 – 270)	11.7	(8.4 – 15.6)
Year 10	210	(140 – 300)	12.5	(8.6 – 17.2)
Year 11	20	(10 – 40)	1.1	(0.5 – 2.4)
Year 12	90	(30 – 190)	5.2	(1.9 – 11.0)
Total	1 680	(1 450 – 1 940)	100.0	
	Age unknown			
Did not attend	90	(50 – 140)	29.3	(19.4 – 41.0)
Year 7 or less	60	(30 – 100)	19.5	(11.5 – 30.5)
Year 8	30	(10 – 60)	9.7	(4.2 – 19.8)
Year 9	40	(20 – 60)	11.4	(5.8 – 18.4)
Year 10	80	(40 – 140)	25.5	(13.2 – 40.3)
Year 11	0	(0 – 60)	0.0	(0.0 – 16.1)
Year 12	10	(0 – 50)	4.6	(1.1 – 15.1)
Total	320	(230 – 420)	100.0	

Table 2.40: All Carers — Highest school year completed by Level of Relative Isolation (LORI)

Highest school year completed	Number	95% CI	%	95% CI
LORI — None				
Did not attend	120	(60 – 230)	1.7	(0.8 – 3.4)
Year 7 or less	400	(290 – 530)	5.9	(4.3 – 7.8)
Year 8	380	(260 – 510)	5.6	(4.0 – 7.6)
Year 9	970	(780 – 1 170)	14.3	(11.7 – 17.4)
Year 10	3 010	(2 750 – 3 290)	44.8	(40.8 – 48.8)
Year 11	1 000	(820 – 1 210)	14.9	(12.1 – 17.9)
Year 12	860	(710 – 1 040)	12.8	(10.5 – 15.4)
Total	6 730	(6 610 – 6 860)	100.0	
LORI — Low				
Did not attend	50	(30 – 100)	1.1	(0.5 – 2.0)
Year 7 or less	300	(220 – 400)	6.0	(4.4 – 8.1)
Year 8	410	(290 – 550)	8.3	(6.1 – 11.2)
Year 9	740	(610 – 880)	14.9	(12.5 – 17.6)
Year 10	2 110	(1 840 – 2 410)	42.7	(38.5 – 47.0)
Year 11	820	(660 – 1 020)	16.6	(13.5 – 20.0)
Year 12	510	(380 – 680)	10.4	(7.7 – 13.5)
Total	4 950	(4 530 – 5 390)	100.0	
LORI — Moderate				
Did not attend	200	(140 – 280)	4.9	(3.5 – 6.7)
Year 7 or less	300	(230 – 380)	7.3	(5.8 – 9.0)
Year 8	300	(220 – 400)	7.4	(5.6 – 9.3)
Year 9	610	(470 – 770)	14.8	(12.2 – 17.6)
Year 10	1 430	(1 170 – 1 720)	34.9	(31.1 – 38.7)
Year 11	730	(590 – 890)	17.8	(15.4 – 20.4)
Year 12	530	(400 – 700)	13.0	(10.1 – 16.1)
Total	4 090	(3 500 – 4 760)	100.0	
LORI — High				
Did not attend	70	(40 – 140)	4.1	(1.9 – 7.2)
Year 7 or less	310	(210 – 430)	17.0	(12.8 – 21.7)
Year 8	120	(60 – 220)	6.6	(3.3 – 10.8)
Year 9	220	(140 – 320)	12.2	(9.4 – 15.5)
Year 10	580	(390 – 810)	32.2	(26.3 – 38.5)
Year 11	260	(160 – 390)	14.6	(10.0 – 19.8)
Year 12	240	(110 – 480)	13.4	(6.6 – 23.2)
Total	1 800	(1 310 – 2 440)	100.0	
LORI — Extreme				
Did not attend	210	(100 – 370)	10.7	(5.7 – 17.3)
Year 7 or less	320	(230 – 440)	16.9	(12.7 – 21.3)
Year 8	270	(180 – 400)	14.2	(10.6 – 18.3)
Year 9	210	(150 – 300)	11.1	(8.2 – 14.3)
Year 10	550	(340 – 810)	28.6	(21.1 – 37.0)
Year 11	170	(100 – 270)	8.7	(5.7 – 12.8)
Year 12	190	(120 – 280)	9.8	(6.9 – 13.5)
Total	1 920	(1 430 – 2 530)	100.0	

Table 2.41: All Carers — Whether ever enrolled in post–school courses

Whether enrolled in post–school courses	Number	95% CI	%	95% CI
Not enrolled in post school courses	7 300	(6 900 – 7 700)	37.5	(35.4 – 39.5)
Enrolled in post–school courses	11 500	(11 100 – 12 000)	59.2	(57.0 – 61.3)
Did not go to school	650	(500 – 830)	3.3	(2.6 – 4.3)
Total	19 500	(19 400 – 19 500)	100.0	

Table 2.42: All Carers — Whether ever received any post–school qualifications, by sex

Whether received post school qualifications	Number	95% CI	%	95% CI
Males				
No post school qualifications	1 270	(1 130 – 1 430)	18.6	(16.6 – 20.8)
Have post school qualifications	2 940	(2 690 – 3 200)	43.0	(39.9 – 46.2)
Never enrolled in post school courses (a)	2 620	(2 400 – 2 860)	38.4	(35.4 – 41.4)
Total Males	6 840	(6 570 – 7 120)	100.0	
Females				
No post school qualifications	3 020	(2 740 – 3 320)	23.9	(21.7 – 26.2)
Have post school qualifications	4 310	(3 940 – 4 690)	34.0	(31.3 – 36.8)
Never enrolled in post school courses (a)	5 320	(4 980 – 5 680)	42.1	(39.4 – 44.8)
Total Females	12 700	(12 400 – 12 900)	100.0	
Total				
No post school qualifications	4 290	(3 970 – 4 630)	22.0	(20.4 – 23.8)
Have post school qualifications	7 250	(6 820 – 7 680)	37.2	(35.0 – 39.4)
Never enrolled in post school courses (a)	7 950	(7 540 – 8 380)	40.8	(38.7 – 43.0)
Total Carers	19 500	(19 400 – 19 500)	100.0	

(a) Includes Carers who have never attended school

Table 2.43: All Carers — Post school qualifications, by sex

Post school qualification type	Number	95% CI	%	95% CI
Males				
Trade/apprenticeship	920	(770 – 1 100)	13.5	(11.4 – 15.9)
College certificate	1 100	(950 – 1 270)	16.1	(13.9 – 18.5)
Diploma (> year 12)	170	(100 – 240)	2.4	(1.5 – 3.6)
Bachelor degree	140	(90 – 210)	2.1	(1.3 – 3.1)
Higher degree	70	(30 – 130)	1.0	(0.5 – 1.9)
Other	540	(440 – 660)	7.9	(6.5 – 9.6)
No post school qualifications	3 900	(3 640 – 4 160)	57.0	(53.8 – 60.1)
Total Males	6 840	(6 570 – 7 120)	100.0	
Females				
Trade/apprenticeship	150	(80 – 250)	1.2	(0.7 – 2.0)
College certificate	2 790	(2 500 – 3 090)	22.0	(19.9 – 24.4)
Diploma (> year 12)	410	(280 – 570)	3.2	(2.2 – 4.5)
Bachelor degree	320	(210 – 450)	2.5	(1.7 – 3.6)
Higher degree	50	(20 – 120)	0.4	(0.1 – 1.0)
Other	590	(400 – 860)	4.7	(3.1 – 6.7)
No post school qualifications	8 350	(7 980 – 8 720)	66.0	(63.2 – 68.7)
Total Females	12 700	(12 400 – 12 900)	100.0	
Total				
Trade/apprenticeship	1 080	(910 – 1 280)	5.5	(4.7 – 6.5)
College certificate	3 890	(3 570 – 4 230)	20.0	(18.3 – 21.7)
Diploma (> year 12)	570	(430 – 750)	2.9	(2.2 – 3.8)
Bachelor degree	460	(330 – 620)	2.4	(1.7 – 3.2)
Higher degree	110	(60 – 190)	0.6	(0.3 – 1.0)
Other	1 130	(900 – 1 390)	5.8	(4.6 – 7.2)
No post school qualifications	12 200	(11 800 – 12 700)	62.8	(60.6 – 65.0)
Total Carers	19 500	(19 400 – 19 500)	100.0	

Table 2.44: All Carers — Post school qualifications by Level of Relative Isolation (LORI)

Post school qualification type	Number	95% CI	%	95% CI
LORI — None (N = 6 730)				
Trade/apprenticeship	390	(290 – 520)	5.7	(4.2 – 7.6)
College certificate	1 540	(1 330 – 1 780)	22.8	(19.7 – 26.3)
Diploma (>yr12)	350	(240 – 480)	5.1	(3.5 – 7.1)
Bachelors Degree	220	(130 – 360)	3.3	(1.9 – 5.4)
Higher degree	60	(20 – 130)	0.9	(0.3 – 2.0)
Other	370	(260 – 510)	5.4	(3.8 – 7.4)
No post school qualifications	3 810	(3 540 – 4 090)	56.6	(52.6 – 60.6)
LORI — Low (N = 4 950)				
Trade/apprenticeship	310	(210 – 430)	6.2	(4.5 – 8.6)
College certificate	1 030	(850 – 1 210)	20.7	(17.6 – 24.2)
Diploma (>yr12)	100	(50 – 170)	2.0	(1.0 – 3.5)
Bachelors Degree	60	(30 – 130)	1.2	(0.5 – 2.6)
Higher degree	30	(10 – 90)	0.6	(0.1 – 1.8)
Other	330	(210 – 480)	6.6	(4.3 – 9.5)
No post school qualifications	3 100	(2 770 – 3 460)	62.7	(58.4 – 66.8)
LORI — Moderate (N = 4 090)				
Trade/apprenticeship	260	(170 – 380)	6.5	(4.4 – 8.9)
College certificate	780	(630 – 960)	19.1	(16.2 – 22.2)
Diploma (>yr12)	80	(40 – 140)	2.0	(1.1 – 3.3)
Bachelors Degree	160	(100 – 240)	3.9	(2.5 – 5.8)
Higher degree	20	(10 – 50)	0.6	(0.2 – 1.1)
Other	260	(170 – 370)	6.3	(4.3 – 8.6)
No post school qualifications	2 530	(2 130 – 2 960)	61.7	(57.9 – 65.5)
LORI — High (N = 1 800)				
Trade/apprenticeship	90	(50 – 150)	4.8	(2.8 – 7.7)
College certificate	270	(170 – 400)	15.0	(10.4 – 20.4)
Diploma (>yr12)	30	(10 – 70)	1.6	(0.5 – 3.7)
Bachelors Degree	20	(0 – 40)	0.8	(0.1 – 2.4)
Higher degree	0	(0 – 60)	0.0	(0.0 – 3.1)
Other	140	(30 – 360)	8.0	(2.4 – 20.8)
No post school qualifications	1 260	(890 – 1 720)	69.8	(61.3 – 78.0)
LORI — Extreme (N = 1 920)				
Trade/apprenticeship	30	(10 – 70)	1.7	(0.6 – 3.5)
College certificate	280	(160 – 480)	14.5	(8.5 – 21.7)
Diploma (>yr12)	20	(0 – 250)	1.0	(0.0 – 12.3)
Bachelors Degree	0	(0 – 60)	0.0	(0.0 – 2.9)
Higher degree	0	(0 – 60)	0.0	(0.0 – 2.9)
Other	40	(20 – 70)	2.2	(1.2 – 3.6)
No post school qualifications	1 550	(1 140 – 2 030)	80.7	(71.1 – 87.8)

Table 2.45: Employed carers who worked last week — Occupation(a), by sex

ASCO Major occupation group(b)	Number	95% CI	%	95% CI
Males				
Managers and administrators (1)	150	(100 – 220)	3.5	(2.3 – 5.1)
Professionals (1)	290	(200 – 410)	6.8	(4.6 – 9.4)
Associate professionals (2)	340	(260 – 440)	8.1	(6.1 – 10.5)
Tradespersons and related workers (3)	710	(590 – 830)	16.7	(14.2 – 19.5)
Advanced clerical and service workers (3)	10	(0 – 20)	0.2	(0.0 – 0.5)
Intermediate clerical, sales and service workers (4)	400	(310 – 510)	9.4	(7.3 – 11.8)
Intermediate production and transport workers (4)	740	(610 – 880)	17.5	(14.6 – 20.8)
Elementary clerical, sales and service workers (5)	190	(130 – 270)	4.5	(3.2 – 6.3)
Labourers and related workers (5)	1 410	(1 230 – 1 610)	33.4	(29.5 – 37.3)
Total employed male carers	4 230	(3 950 – 4 500)	100.0	
Females				
Managers and administrators (1)	40	(20 – 70)	1.0	(0.5 – 1.9)
Professionals (1)	490	(350 – 660)	11.7	(8.6 – 15.5)
Associate professionals (2)	430	(310 – 560)	10.3	(7.7 – 13.5)
Tradespersons and related workers (3)	230	(160 – 300)	5.4	(3.9 – 7.3)
Advanced clerical and service workers (3)	100	(40 – 190)	2.4	(1.0 – 4.5)
Intermediate clerical, sales and service workers (4)	1 560	(1 340 – 1 820)	37.6	(33.0 – 42.1)
Intermediate production and transport workers (4)	120	(60 – 230)	3.0	(1.3 – 5.4)
Elementary clerical, sales and service workers (5)	400	(290 – 530)	9.6	(7.0 – 12.5)
Labourers and related workers (5)	800	(650 – 970)	19.2	(15.8 – 22.8)
Total employed female carers	4 160	(3 820 – 4 530)	100.0	

(a) Numbers in parentheses represent the skill level of the categories – see ‘Australian Qualifications Framework’ in *Glossary*

(b) Australian Standard Classification of Occupations

Table 2.46: Dwellings — Dwelling type

Dwelling type	Number	95% CI	%	95% CI
Separate house	10 400	(10 200 – 10 600)	91.4	(89.6 – 93.0)
Semi–detached, row or terrace house, townhouse	470	(350 – 600)	4.1	(3.1 – 5.3)
Flat, unit, apartment	260	(160 – 420)	2.3	(1.4 – 3.7)
Caravan, cabin	70	(30 – 110)	0.6	(0.3 – 1.0)
Improvised home, tent, sleepers out	60	(30 – 110)	0.6	(0.3 – 0.9)
Not stated	120	(70 – 200)	1.0	(0.6 – 1.7)
Total Dwellings	11 400		100.0	

Table 2.47: Dwellings — Tenure type

Tenure type	Number	95% CI	%	95% CI
Owned	840	(690 – 1 030)	7.4	(6.0 – 9.1)
Being paid off	1 810	(1 600 – 2 040)	15.9	(14.1 – 17.9)
Rented	8 030	(7 750 – 8 300)	70.7	(68.2 – 73.1)
None of these	410	(300 – 550)	3.6	(2.6 – 4.8)
Not stated	260	(190 – 350)	2.3	(1.7 – 3.1)
Total	11 400		100.0	

Table 2.48: Dwellings — Provider of Rental accommodation

Provider of rental accommodation	Number	95% CI	% of all dwellings	95% CI	% of rented dwellings	95% CI
A private rental	1 620	(1 410 – 1 860)	14.3	(12.4 – 16.4)	20.2	(17.6 – 23.0)
Homeswest	4 390	(4 050 – 4 720)	38.6	(35.7 – 41.6)	54.6	(50.8 – 58.5)
Aboriginal Housing Authority	260	(180 – 390)	2.3	(1.6 – 3.4)	3.3	(2.2 – 4.8)
Family's place	120	(60 – 190)	1.0	(0.6 – 1.7)	1.4	(0.8 – 2.4)
Community housing	1 250	(990 – 1 530)	11.0	(8.7 – 13.5)	15.5	(12.5 – 19.1)
Other	400	(280 – 560)	3.6	(2.4 – 4.9)	5.0	(3.5 – 7.0)
Not renting	3 060	(2 800 – 3 350)	27.0	(24.6 – 29.5)		
Not stated	260	(190 – 350)	2.3	(1.7 – 3.1)		
Total dwellings	11 400		100.0		100.0	

Table 2.49: Dwellings — Tenure type, by Level of Relative Isolation (LORI)

Tenure type		LORI				
		None	Low	Moderate	High	Extreme
Owned	%	6.7	6.3	12.4	4.9	4.3
	95% CI	(4.6 – 9.2)	(3.6 – 10.1)	(8.7 – 16.7)	(1.9 – 10.9)	(0.9 – 11.7)
Being paid off	%	26.9	14.3	9.2	1.2	0.0
	95% CI	(22.9 – 31.2)	(10.9 – 18.2)	(7.2 – 11.6)	(0.4 – 3.5)	(0.0 – 6.1)
Rented	%	62.4	75.4	73.1	85.1	75.4
	95% CI	(58.0 – 66.8)	(71.0 – 79.6)	(68.2 – 77.8)	(74.2 – 93.1)	(63.5 – 84.9)
None of these	%	1.5	1.8	3.8	6.5	16.7
	95% CI	(0.7 – 2.9)	(1.0 – 2.9)	(1.8 – 6.7)	(1.9 – 16.5)	(9.4 – 26.4)
Not stated	%	2.4	2.3	1.6	2.2	3.7
	95% CI	(1.6 – 3.5)	(1.3 – 3.5)	(0.8 – 3.0)	(0.1 – 19.6)	(1.4 – 8.0)
Total Dwellings	%	100.0	100.0	100.0	100.0	100.0

Table 2.50: Dwellings — Provider of rental accommodation, by Level of Relative Isolation (LORI)

Provider of rental accommodation		LORI				
		None	Low	Moderate	High	Extreme
A private rental	%	19.1	19.6	7.2	3.4	1.7
	95% CI	(15.5 – 23.3)	(15.4 – 24.4)	(5.0 – 10.3)	(1.1 – 7.6)	(0.6 – 3.9)
Homeswest	%	39.5	44.7	51.2	15.1	4.3
	95% CI	(35.1 – 44.2)	(39.5 – 49.9)	(45.0 – 57.7)	(6.2 – 32.0)	(1.7 – 9.6)
Aboriginal Housing Authority	%	0.5	2.2	2.5	11.6	1.8
	95% CI	(0.1 – 2.4)	(1.1 – 3.8)	(1.3 – 4.3)	(4.7 – 25.2)	(0.8 – 3.6)
Family's place	%	1.4	1.1	0.9	0.0	0.0
	95% CI	(0.5 – 3.3)	(0.6 – 2.0)	(0.3 – 1.9)	(0.0 – 6.3)	(0.0 – 6.1)
Community housing	%	0.1	3.0	6.1	50.0	64.2
	95% CI	(0.0 – 0.4)	(1.5 – 5.2)	(2.9 – 10.6)	(35.5 – 66.7)	(50.1 – 76.0)
Other	%	1.7	4.8	5.0	4.9	3.5
	95% CI	(0.9 – 3.0)	(2.9 – 7.2)	(2.1 – 10.3)	(1.7 – 9.8)	(0.1 – 26.0)
Not renting	%	35.2	22.3	25.4	12.7	20.9
	95% CI	(30.9 – 39.7)	(18.1 – 26.9)	(20.8 – 30.2)	(6.4 – 22.6)	(12.1 – 33.0)
Not stated	%	2.4	2.3	1.6	2.2	3.7
	95% CI	(1.6 – 3.5)	(1.3 – 3.5)	(0.8 – 3.0)	(0.1 – 19.6)	(1.4 – 8.0)
Total Dwellings	%	100.0	100.0	100.0	100.0	100.0

Table 2.51: Households renting — Difficulty finding current accommodation, reasons.

Reasons for difficulty renting	Number	95% CI	%	95% CI
Couldn't find the bond money	110	(60 – 190)	1.4	(0.8 – 2.3)
Needed house with lots of bedrooms	110	(60 – 190)	1.4	(0.7 – 2.4)
Owners/Agents don't want/like Aboriginal tenants	50	(30 – 90)	0.7	(0.4 – 1.1)
Other	460	(370 – 570)	5.7	(4.6 – 7.1)
Total having difficulty finding rental accommodation	*740*	*(610 – 870)*	*9.2*	*(7.6 – 10.9)*
No difficulty finding rental accommodation	7 300	(7 160 – 7 420)	90.8	(89.1 – 92.4)
Total rented dwellings	8 030	(7 980 – 8 030)	100.0	

Table 2.52: Primary Carers — Whether had housing choice when first moved to current dwelling, by Indigenous status

Whether had housing choice	Number	95% CI	%	95% CI
		Indigenous		
Did not have a choice	5 890	(5 570 – 6 220)	56.8	(53.9 – 59.6)
Had a choice	4 480	(4 170 – 4 800)	43.2	(40.4 – 46.1)
Total	10 400	(10 100 – 10 600)	100.0	
		Non–Indigenous		
Did not have a choice	820	(650 – 1 000)	38.7	(32.2 – 45.1)
Had a choice	1 290	(1 100 – 1 490)	61.3	(54.9 – 67.8)
Total	2 110	(1 870 – 2 360)	100.0	
		Not stated		
Did not have a choice	60	(30 – 90)	71.9	(44.9 – 92.2)
Had a choice	20	(10 – 60)	28.1	(8.4 – 58.1)
Total	80	(50 – 120)	100.0	
		Total		
Did not have a choice	6 770	(6 440 – 7 100)	53.9	(51.3 – 56.5)
Had a choice	5 800	(5 460 – 6 120)	46.1	(43.5 – 48.7)
Total Primary Carers	12 600	(12 500 – 12 600)	100.0	

Table 2.53: Primary Carers — Whether has another place to live during the year

Whether has another place to live during the year	Number	95% CI	%	95% CI
No other place to live	11 400	(11 200 – 11 500)	90.4	(89.0 – 91.7)
Has another place to live	1 200	(1 040 – 1 380)	9.6	(8.3 – 11.0)
Total Primary Carers	12 600	(12 500 – 12 600)	100.0	

Table 2.54: Primary Carers — Number of months of the year carer lived in current dwelling

Number of months lived in current dwelling	Number	95% CI	%	95% CI
1 month	60	(30 – 120)	0.5	(0.2 – 0.9)
2 months	90	(40 – 170)	0.7	(0.3 – 1.3)
3 months	70	(40 – 120)	0.6	(0.3 – 0.9)
4 months	70	(40 – 110)	0.6	(0.3 – 0.8)
5 months	20	(0 – 60)	0.2	(0.0 – 0.5)
6 months	190	(130 – 260)	1.5	(1.1 – 2.1)
6 months or less	*500*	*(400 – 620)*	*4.0*	*(3.2 – 5.0)*
7 months	30	(20 – 50)	0.2	(0.1 – 0.4)
8 months	60	(40 – 110)	0.5	(0.3 – 0.9)
9 months	100	(60 – 150)	0.8	(0.5 – 1.2)
10 months	270	(210 – 340)	2.1	(1.6 – 2.7)
11 months	430	(320 – 570)	3.4	(2.5 – 4.5)
12 months	11 200	(11 000 – 11 300)	88.9	(87.4 – 90.3)
More than 6 months	*12 100*	*(11 900 – 12 200)*	*96.0*	*(95.0 – 96.8)*
Total Primary Carers	12 600	(12 500 – 12 600)	100.0	

Table 2.55: Dwellings — Number of people sleeping in dwelling, by number of bedrooms

Number people sleeping in dwelling	Number	95% CI	%	95% CI
	1 or 2 bedrooms			
One or two	180	(120 – 260)	14.7	(9.5 – 21.0)
Three	300	(200 – 410)	24.5	(17.8 – 32.3)
Four	260	(180 – 350)	21.3	(15.7 – 28.1)
Five	190	(120 – 280)	15.9	(10.7 – 22.5)
Six	90	(40 – 160)	7.5	(3.9 – 12.7)
Seven to nine	140	(80 – 230)	11.6	(6.9 – 19.0)
10 or more	50	(30 – 100)	4.5	(2.1 – 7.5)
Total	1 210	(1 020 – 1 430)	100.0	
	3 bedrooms			
One or two	510	(400 – 640)	7.8	(6.0 – 9.7)
Three	1 460	(1 290 – 1 660)	22.1	(19.6 – 24.8)
Four	1 720	(1 530 – 1 910)	26.0	(23.3 – 28.7)
Five	1 310	(1 150 – 1 490)	19.8	(17.6 – 22.3)
Six	650	(550 – 770)	9.9	(8.4 – 11.6)
Seven to nine	720	(570 – 910)	11.0	(8.7 – 13.6)
10 or more	230	(160 – 300)	3.4	(2.5 – 4.6)
Total	6 610	(6 320 – 6 910)	100.0	
	4 bedrooms			
One or two	90	(50 – 140)	3.2	(1.9 – 4.9)
Three	290	(210 – 400)	10.6	(7.7 – 14.3)
Four	710	(580 – 850)	25.9	(21.7 – 30.4)
Five	640	(510 – 770)	23.2	(19.2 – 27.6)
Six	360	(270 – 460)	13.0	(9.9 – 16.4)
Seven to nine	500	(390 – 620)	18.1	(14.6 – 22.2)
10 or more	160	(110 – 240)	6.0	(4.0 – 8.7)
Total	2 740	(2 500 – 2 990)	100.0	
	5 or more bedrooms			
One or two	0	(0 – 60)	0.0	(0.0 – 6.8)
Three	50	(20 – 100)	5.9	(2.4 – 11.7)
Four	90	(50 – 150)	11.1	(6.2 – 18.7)
Five	130	(90 – 190)	16.9	(11.1 – 23.9)
Six	60	(20 – 140)	8.0	(3.0 – 16.6)
Seven to nine	150	(80 – 250)	18.7	(10.3 – 28.6)
10 or more	310	(230 – 410)	39.4	(30.2 – 49.3)
Total	790	(650 – 960)	100.0	
	Total			
One or two	780	(640 – 930)	6.9	(5.7 – 8.2)
Three	2 100	(1 880 – 2 320)	18.5	(16.6 – 20.5)
Four	2 770	(2 550 – 3 000)	24.4	(22.5 – 26.4)
Five	2 280	(2 070 – 2 490)	20.0	(18.2 – 21.9)
Six	1 160	(1 020 – 1 320)	10.2	(8.9 – 11.6)
Seven to nine	1 510	(1 300 – 1 730)	13.3	(11.4 – 15.3)
10 or more	760	(620 – 910)	6.7	(5.5 – 8.0)
Total	11 400	(11 300 – 11 400)	100.0	

CHAPTER 3
PHYSICAL HEALTH

CHAPTER 3

PHYSICAL HEALTH

Physical health is a critical prerequisite for good development. It is determined by genetic inheritance and the social and environmental circumstances influencing the course of the mother's pregnancy, delivery and patterns of care of infants and children. When illness, injury or disability occurs, their severity and persistence threatens functional adaptation, growth and development and can place a burden on carers, other family members, the wider community and service agencies. This chapter details the findings on the physical health and levels of disability of Western Australian Aboriginal and Torres Strait Islander children and young people. These findings include health information gathered on children from carers who were interviewed during the survey. Where carers consented to allow data from the Western Australian Data Linkage System to be linked to their interview data, these data are also described.

SUMMARY

This chapter describes the distribution of several health issues found among Western Australian Aboriginal infants, children and young people together with some of the social, environmental and behavioural determinants behind these health issues.

The principal findings of this chapter are:

- *Encouragingly high rates of breastfeeding during infancy and early childhood*
  The mothers of Aboriginal children, particularly those living in more isolated areas, were both more likely to initiate breast feeding and to breast feed for longer than mothers in the general population. This offers a positive basis from which to build health promotion programs in the post-natal period.

- *High rates of maternal tobacco use*
  The proportion of mothers of Aboriginal infants who used tobacco during their pregnancy is twice that of mothers in the general population across all levels of relative isolation, despite more than a decade of anti-smoking campaigns. The use of tobacco by virtually half of all women giving birth to Aboriginal children is in urgent need of concerted attention.

- *High rates of early teenage pregnancy*
  Almost one in eight Aboriginal infants were born to mothers aged 17 years or less. This is more than six times the rate found in the general population. The care of children born to early teenaged mothers was more likely to be transferred, and to be transferred earlier, to a person other than the birth mother, which may pose long term risks for poorer outcomes later in life.

- *High rates of premature birth and low birth weight were confirmed*
  The rate of low birth weight (<2500g) was almost double that of the total population, the result of higher rates of both premature birth and poor intrauterine growth.

- *Inadequate consumption of fresh vegetables throughout the State*
  While consumption of fresh vegetables tended to vary a little by level of relative

isolation, it was inadequate for a high proportion of children in all areas of the state, particularly for older children.

- *High rates of recurrent infections in Aboriginal children*
  There was substantial co-morbidity of recurrent skin, ear, chest and gastrointestinal infection, particularly in areas of extreme isolation. The co-existence of different types of recurrent infections was associated with financial strain. Recurrent and discharging ear infections, which affected one in eight Aboriginal children, had a very significant impact on rates of hearing loss and of speech, language and learning problems.

- *Low prevalence of asthma in children living in extremely isolated localities*
  The four-fold reduction in the prevalence of asthma in extremely isolated Aboriginal children confirms other reports observing this effect. The basis for this reduction, if better understood, may suggest strategies for prevention of this burdensome condition.

- *Rate of functional disability, as measured by a limitation in self care, is comparable to that found in the total population*
  Higher rates of disability were observed in more urban areas, which may reflect the movement of families with disabled children into areas with better access to specialised services.

UNDERSTANDING WAACHS DATA

The data published here are derived from either the WAACHS survey reports or administrative data sets linked to the WAACHS data. These are then used to estimate data at the population level for Aboriginal children and their carers in Western Australia. Other supporting data are also used for comparison purposes and are taken from a variety of different sources.

CARER REPORTED DATA

The data from the WAACHS survey reports used in this volume of findings were provided by carers of Aboriginal children. Information was obtained during household interviews via questions asked by an individual trained by the WAACHS administration team to conduct such an interview. Carers provided information regarding themselves and those Aboriginal children under 18 years of age who were in their care at the time of the survey.

Although the interviewers were trained to assist the carer in understanding each question, they were not in a position to validate responses. Carers' responses were accepted as given. Trained medical practitioners were not involved at any stage to either diagnose conditions or validate carer reports of existing conditions.

With this knowledge in mind, where WAACHS data have been used to estimate either the prevalence, severity or lifetime occurrence of a health related problem, a discrepancy may exist between the reported value and the actual value. This can occur for a number of reasons:

- The carer did not understand the question, possibly due to difficulty with terminology and/or English not being the first language (although interpreters were used where necessary).

- The carer was unaware that they or the children in their care suffered from a particular condition.

- The carer had not looked after the child continually since birth and therefore was not aware of the child's complete history.

- The carer did not remember, for either themselves or the child, that an event or condition had occurred. This may be more likely to occur where 'lifetime occurrence' was requested for older children.

As linkage to the WA Record Linkage System was possible for 87 percent of the children (see Chapter one), it was possible to investigate the effects of some of these issues first hand. It was found that discrepancies did exist between what carers reported and what was recorded by the WA hospital system. While there will always be differences between diagnoses made by medical professionals according to the International Classification of Diseases and carer reports based on common language names of diseases and conditions, there were several items from the survey that should have had a strong correlation between the two data sources. It was clear that carers were much more likely to report a condition or event if it had occurred within the last five years than if it had taken place more than five years prior to the survey.

AGE GROUP PRESENTATION

WAACHS data are often divided into separate age groupings for more meaningful analysis of certain data. For children, these groupings are typically 0–3 years, 4–11 years and 12–17 years, but may be different depending on the subject or population being investigated.

Where age groupings such as these are used, it is important to note that they refer to different individual children in each age group at the time of the survey interview for each child. Each household was the subject of only one interview, and each child is represented within the age range that corresponds to their age at time of interview. This is known as a cross-sectional survey.

This is in contrast to a longitudinal survey of a cohort, where the *same* group of children may be followed through time and interviewed at different points (e.g. once per year for 10 years) as they grow older. In this arrangement results for the same children are compared at different points in their lives. The WAACHS is a cross-sectional survey, *not* a longitudinal survey.

CHARACTERISTICS OF CHILDREN AT BIRTH

A healthy start to life is an important predictor of later health, well-being and development. Good maternal health leading to a full term pregnancy and the delivery of an infant that is of optimal weight and vigour is a desirable beginning to healthy development. The survey used data linkage methods to permit the assessment of some of the characteristics of Aboriginal children at birth.

MCHRDB LINKAGE

The Maternal and Child Health Research Data Base (See Chapter 1 for more detail) is based on the Western Australian Midwives Notification of Births database for births since 1980. For every midwife-attended birth in Western Australia, the midwife submits a completed form indicating the characteristics of the infant, its condition at birth, details of the pregnancy and delivery together with some demographic details. This database is linked to several other databases, including the WA Registrar General’s registrations of births and deaths and hospital discharge notifications, which detail morbidity that resulted in a hospital admission.

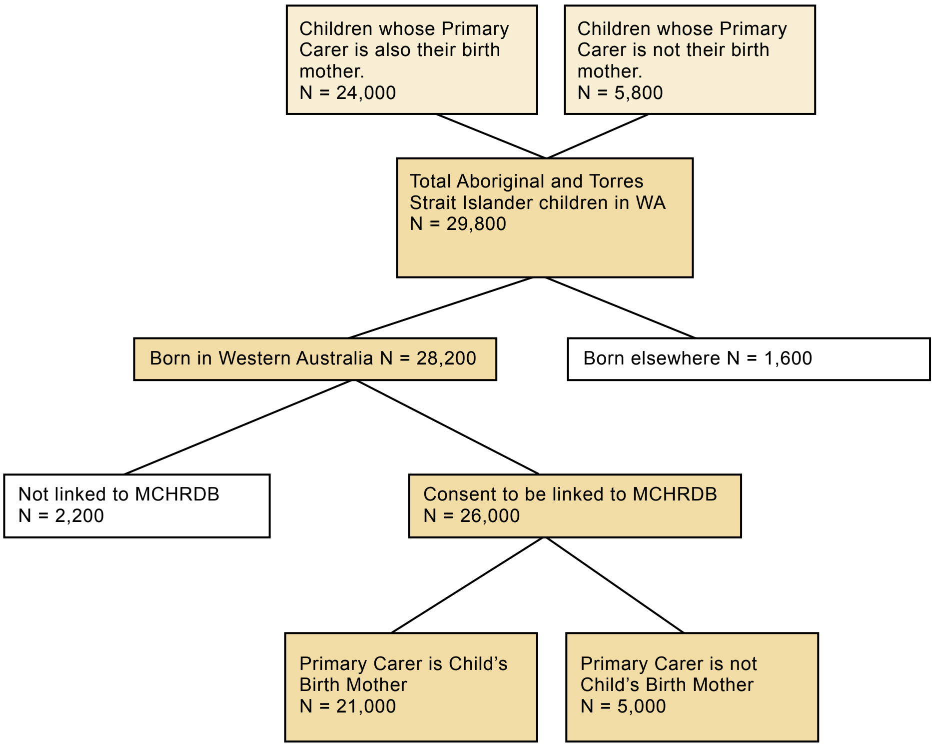
Of the estimated 29,800 Aboriginal children under the age of 18 living in Western Australia in 2001, about 28,200 were born in this state (CI: 27,900–28,500). The birth records for approximately 87 per cent of the survey children were linked to the survey interview data (*see Chapter 1)* representing a population of 26,000 (CI: 25,400–26,400) Aboriginal children. (Figure 3.1)

Birth records contain extensive information about the characteristics of the infant and mother at the time of the birth including:

- type of delivery and time to spontaneous respiration
- Apgar score at 5 minutes (indicating condition at birth)
- infant birth weight
- gestational age
- maternal height, age and parity.

From these characteristics, the proportions of children born prematurely (less than 37 completed weeks gestation) and poorly grown (less than 85% of optimal birth weight) were estimated.

FIGURE 3.1: SIZE OF GROUPS REFERRED TO IN THIS CHAPTER, ESTIMATED BY WEIGHTED EXTRAPOLATION OF THE SURVEY DATA



Where appropriate, data describing the entire Western Australian population of births (Aboriginal and non-Aboriginal) for the period 1982–2001 (N = 496,286) are provided for comparison.

LINKED DATA — BIRTH WEIGHT AND GESTATIONAL AGE

The mean birth weight of the 26,000 children was 3,170g (CI: 3,140g–3,200g).

About 13.3 per cent (CI: 12.0%–14.7%) of all Aboriginal infants were premature – that is, they were born at less than 37 weeks gestation. This is significantly higher than the proportion of premature births in the total population of 8.2 per cent (Table 3.1).

Premature birth is one possible cause of low birth weight (<2,500 g) that affects 11.4 per cent (CI: 10.0%–12.8%) of Aboriginal children, almost twice the proportion observed in the total population of 6.6 per cent (Table 3.1).

Low birth weight infants are more likely to have health problems early in life than infants of normal birth weight and more likely to develop chronic diseases in adult life. Birth weight depends not only on the conditions experienced during the pregnancy but also on the mother's own intrauterine and childhood environments. Thus birth weight is a sentinel indicator of human development and the population proportion of infants that are of low birth weight is a reliable indicator of human poverty.[1]

STRATEGIES TO IMPROVE BIRTH WEIGHT

While the provision of health care and antenatal services are vital to the reduction of low birth weight outcomes, strategies that reduce the proportion of low birth weight infants are inevitably tied to changes in human and social capital – that is, changes in the economic and educational capacities of parents (particularly mothers) and improvements in social and environmental circumstances directly affecting them. Health services alone cannot tackle the burden of low birth weight in Australian Aboriginal children. The responsibilities for this span many jurisdictions and government portfolios.

An example of a program set up to improve the birth weight of Aboriginal babies is the *Strong Women, Strong Babies, Strong Culture* program. This program was initially established in 1993 as a pilot project in three communities in the Northern Territory. The program had specific goals to increase infant birth weight by earlier maternal attendance for antenatal care and improved maternal weight status.

The program relies on, and supports, senior women in participating communities to provide direct support to pregnant women and their families. The senior women (Strong Women Workers) encourage attendance at antenatal care clinics and provide advice on nutrition. Support for involvement in cultural events is an important part of the program.

Data from the Northern Territory Perinatal Data Collection show that, for those communities that participated in the pilot, the mean birth weight of infants of Aboriginal women increased by 171g between 1990/91and 1994/95 and by 92g in the surrounding three rural regions.[1]

In a more recent study of the program it was found that improvements in birth weight had been maintained in the original groups.[2] Analysis of an intervention group covering the period 1988–93 (pre-intervention) to 2001 found that the mean birth weight increased by 135g from 2,979g (CI: 2,925g–3,032g) to 3,114g (CI: 3,075g–3,154g). However, increases in birth weight in a second group of communities with more recent implementation were less convincing. The program has also been implemented in the Pilbara region in Western Australia, funded for three years by the St John of God Health Care group. Additional sites are proposed in the Kimberley, Gascoyne and Midwest regions.[3]

It is important not to rely exclusively on birth weight as a measure of well-being. Birth weight is pathologically increased by maternal diabetes, a condition to which Aboriginal people are particularly prone, which is detrimental to the foetus.[4] An increase in the incidence of maternal diabetes would also cause a rise in the mean birth weight.

1 Mackerras D, (2001). Birthweight changes in the pilot phase of the Strong Women Strong Babies Strong Culture Program in the Northern Territory. *Aust NZ J Public Health* 25; 34–40.

2 D'Espaignet ET, Measey ML, Carnegie MA, and Mackerras D, (2003). Monitoring the 'Strong Women, Strong Babies, Strong Culture Program': The first eight years, *J Paediatr Child Health* 39; 668–672.

3 Kim Snowball, CEO, St John of God Health Care Group, Geraldton. Personal Communication. January 2004.

4 Jolly MC, Seibre NJ, Harris JP, Regan L, Robinson S, (2003). Risk factors for macrosomia and its clinical consequences: a study of 350,311 pregnancies. *European Journal of Obstetrics, Gynecology, & Reproductive Biology*. 111; 9–14.

PROPORTION OF OPTIMAL BIRTH WEIGHT (POBW)

Of the estimated 26,000 Aboriginal births where linked birth records were available. for data linkage, there were complete data for about 24,800 (CI: 24,600–25,000) births to allow the calculation of their percentage of optimal birth weight (POBW).

About 20.9 per cent (CI: 19.2%–22.6%) of Aboriginal infants were considered to have sub-optimal foetal growth compared with 12.9 per cent of births in the total population (Table 3.1).

PROPORTION OF OPTIMAL BIRTH WEIGHT (POBW)

An infant's weight at birth depends both on the length of gestation and the rate at which it has grown before birth. Not all foetuses should grow at the same rate. Boys grow faster than girls, children of tall mothers faster than those of small mothers and a woman's first child grows more slowly than her subsequent children. However growth rate is also affected by a number of pathological conditions, most of which decrease growth rate: the exception being maternal diabetes, which increases growth rate. In order to assess whether a newborn is appropriately grown, an estimation has been made of how median birth weight varies with the non-pathological determinants of birth weight (gestational duration, infant gender and maternal height and parity) in a population based cohort of Western Australian Caucasian births who had no risk factors for inappropriate foetal growth (including smoking) and were thus considered to represent optimal intrauterine growth rates. The appropriateness of an infant's growth can then be estimated as the ratio of the infant's observed birth weight to the median estimated for an infant of the same non-pathological characteristics and without pathological determinants of birth weight (i.e. this infant's optimal birth weight). Infants that have grown normally have a proportion (POBW) close to 1 and in these analyses ratios below 0.85 are taken to infer suboptimal intrauterine growth. POBW for Aboriginal infants is consistently lower than in Caucasian infants, but the difference is almost entirely accounted for by the increased burden of reported growth-restricting pathology.[1] It is therefore considered that optimal intrauterine growth rates do not differ between Australian Aboriginal and Caucasian births.

[1] Blair E, (1996). Why do Aboriginal neonates weigh less? II. Determinants of birthweight for gestation. *Journal of Pediatrics and Child Health* 32; 498–503.

TIME TO SPONTANEOUS BREATHING AND INTUBATION

An estimated 13.5 per cent (CI: 12.2%–14.8%) of Aboriginal infants failed to establish spontaneous breathing within 2 minutes of birth compared with 10.8 per cent of the total population. Furthermore, 2.5 per cent (CI: 1.8%–3.3%) of Aboriginal infants required intubation for ventilation compared with 1.7 per cent of the total population (Table 3.1).

TIME TO SPONTANEOUS BREATHING AND INTUBATION

Traditionally, a child has to start breathing very soon after birth if it is to survive. A healthy newborn will spontaneously commence regular breathing before it is two minutes of age. However, premature infants, particularly very premature infants (less than 32 weeks gestation) and infants in poor condition, may take two minutes or longer, or may fail to satisfactorily establish or even attempt respiration. These infants can now be assisted artificially by intubation (introducing a tube into the trachea) and ventilation (mechanically assisting the intake of air). Thus intubation suggests either extreme prematurity or a seriously compromised condition at birth.

APGAR SCORE AT FIVE MINUTES

About 2.2 per cent (CI: 1.7%–2.9%) of Aboriginal newborns have five minute Apgar scores below 7 compared with 2.4 per cent in the total population (Table 3.1).

APGAR SCORE AT FIVE MINUTES

Published in 1953 by Dr. Virginia Apgar, this score seeks to identify newborns that would benefit from resuscitation. The test assigns a score of 0, 1 or 2 for each of 5 characteristics of the newborn: colour, muscle tone, heart rate, respiration and reflex activity. These sub-scores are summed for a maximum total score of 10. Infants are scored at 1 minute and 5 minutes after delivery for all deliveries attended by a midwife. In healthy newborns, the total score may be slightly depressed at 1 minute but increases to 7 or more by 5 minutes. Thus an Apgar score below 7 at 5 minutes denotes an infant in a relatively compromised condition at birth and is associated with, but a poor predictor of, developmental abnormalities.

MATERNAL AGE

Although all children in the survey were identified as Aboriginal by their carers, not all birth mothers identified as Aboriginal (*see Chapter 2*). About 27.8 per cent (CI: 26.3%–29.4%) of Aboriginal infants were born to mothers aged 19 years or less compared with 6.3 per cent of the total population (Table 3.1). An estimated 13.1 per cent (CI: 12.0%–14.3%) of Aboriginal children were born to mothers aged 17 years or less, compared with 2.1 per cent of the total population (Table 3.2).

TYPE OF DELIVERY

Almost three–quarters (74.5 per cent; CI: 72.6%–76.3%) of Aboriginal infants were born via normal vaginal delivery. About 9.2 per cent (CI: 8.0%–10.6%) of infants were born following emergency caesarean section and 6.4 per cent (CI: 5.5%–7.4%) following elective caesarean section. This compares with 62.5 per cent, 9.1 per cent and 10.4 per cent respectively in the total population (Table 3.3).

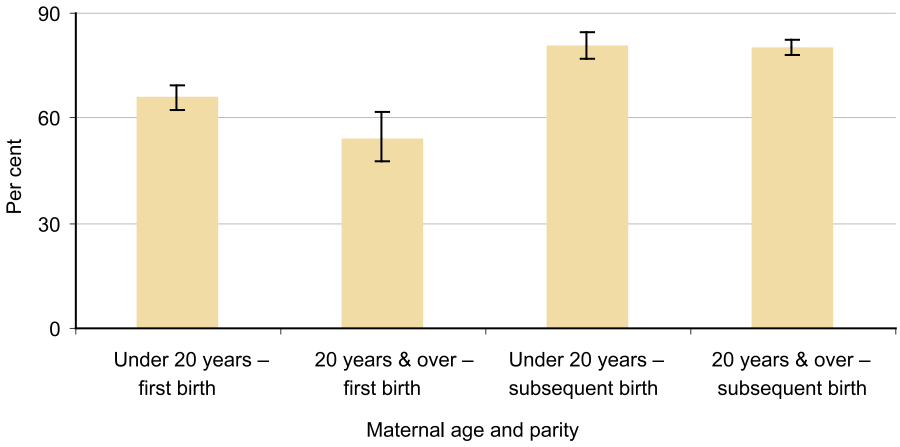
For biological reasons, the distribution of type of delivery differs markedly between first and subsequent births. First births are more likely to require mechanical assistance, and since a previous caesarean section is the most frequent indication for an elective section, elective sections are performed less frequently for first births. The type of delivery is also determined by the physical fitness of the mother, which tends to correlate with maternal age. Since younger mothers tend to be fitter, they are therefore less likely to require operative assistance for delivery.

In Table 3.4 the distribution of type of delivery is given separately for first and subsequent births to teenaged and older mothers in both Aboriginal births and the total population. There was no significant difference in the rate of operative delivery between teenaged mothers of Aboriginal children and teenaged mothers in the total population. Of all Aboriginal first births to women aged less than 20 years, 65.9 per cent (CI: 62.2%–69.5%) had a normal (non-operative) delivery compared with 66.1 per cent of all first births. The proportion of unassisted births to teenaged mothers for subsequent Aboriginal births was 81.0 per cent (CI: 77.1%–84.6%) compared with 82.9 per cent of subsequent births to all teenaged mothers (Table 3.4).

Aboriginal women aged 20 years or more also tend to give birth at younger ages and to be of higher parity than women in the total population because they tend to have a larger completed family size. It is therefore biologically appropriate that Aboriginal women experience a smaller proportion of operative deliveries. Thus, at least some part of the lower rate of operative delivery reflects demographic differences between Aboriginal and non-Aboriginal mothers.[2]

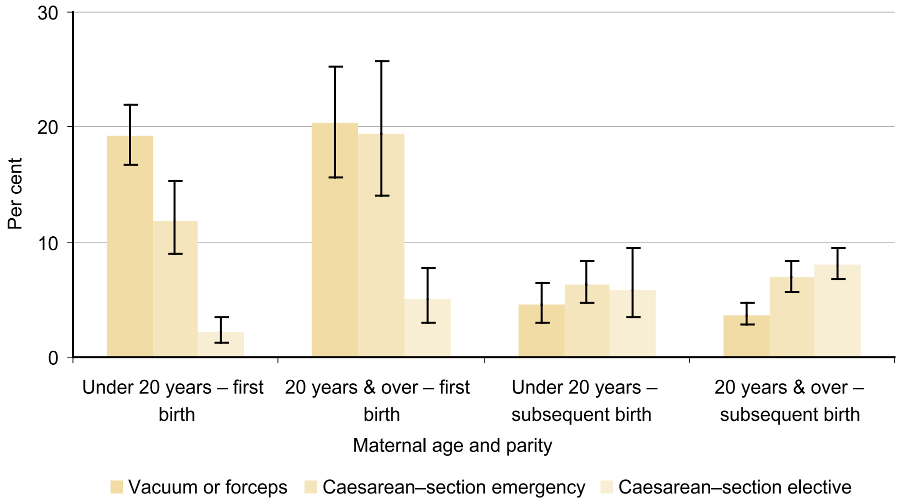
Teenaged mothers of Aboriginal children are more likely to be delivering their first baby (68.2 per cent; CI: 65.7%–70.6%) than are mothers over the age of 20 (15.5 per cent; CI: 13.7%–17.5%) (Table 3.5). Figure 3.2 shows that women delivering their first child were more likely to have a normal delivery (without operative assistance) if they were under 20 years of age (65.9 per cent; CI: 62.2%–69.5%) than if they were 20 years or older (54.4 per cent; CI: 47.5%–61.4%) while Figure 3.3 shows a tendency to less emergency sections. The distribution of type of delivery for teenaged mothers delivering subsequent children did not differ from that of older women.

FIGURE 3.2: BIRTHS — PERCENTAGE OF NORMAL BIRTHS, BY AGE AND PARITY



Source: Table 3.4

FIGURE 3.3: BIRTHS — SELECTED DELIVERY TYPES, BY AGE AND PARITY



Source: Table 3.4

Furthermore, there is no difference either in the appropriateness of intrauterine growth or in the condition of birth of children born to mothers aged less than 20 years, compared with those born to older mothers (Figure 3.4). Thus any disadvantages of teenaged birth must be social rather than biological.

FIGURE 3.4: GROWTH AND CONDITION AT BIRTH BY MATERNAL AGE

Birth characteristics	Less than 20 years		20 years or more	
Growth				
Mean POBW	95.6	(94.0 – 96.5)	95.3	(94.6 – 96.0)
POBW < 85% (%)	18.6	(15.9 –21.7)	21.8	(19.7 – 23.9)
Condition at birth				
Mean Apgar score at 5 minutes	8.93	(8.88 – 8.98)	8.99	(8.94 – 9.03)
Apgar score at 5 minutes < 7 (%)	2.1	(1.3 – 3.2)	2.3	(1.6 – 3.1)

Source: Tables 3.6, 3.7, 3.8 and 3.9

BIRTH CHARACTERISTICS AND CARER STATUS

Of the estimated 26,000 children for whom birth data were available, 21,200 (CI: 20,600–21,800) were estimated to be cared for by their birth mother. A person who was not the birth mother cared for an estimated 4,750 (CI: 4,290–5,240) children (Table 3.10).

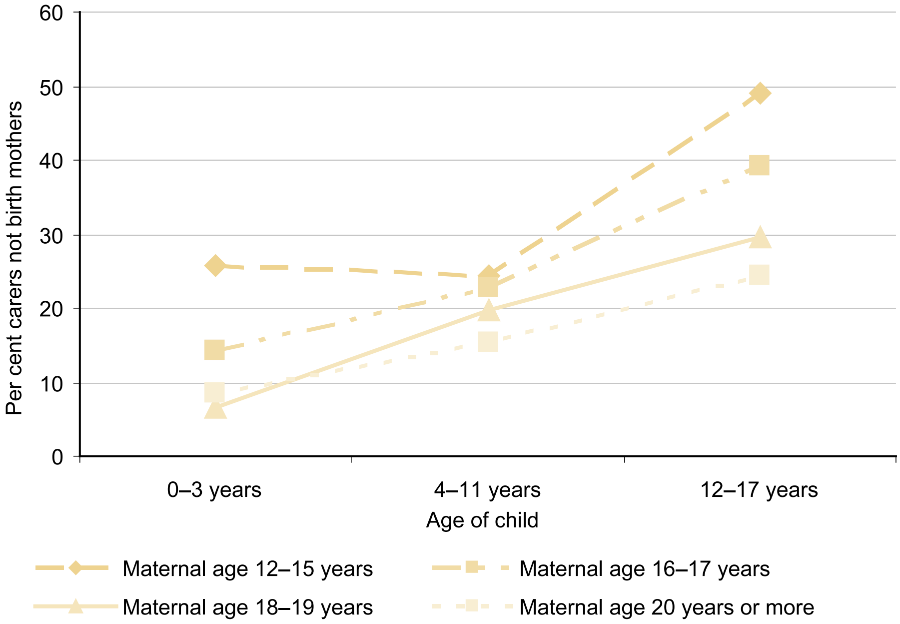
Table 3.11 compares the neonatal characteristics of children whose primary carers were their birth mothers at the time of the survey and those who were not. Although children not being cared for by their birth mother were more likely to be born prematurely, less well grown, of lower mean birth weight and more likely to weigh less than 2500g, their condition at birth was similar to those that were cared for by their birth mothers.

Of those children whose birth mothers were not their primary carer at the time of their interview, 20.0 per cent (CI: 16.9%–23.5%) were born to mothers aged less than 18 years. This compares with 11.6 per cent (CI: 10.5%–12.8%) of children whose primary carer was their birth mother at the time of the interview (Table 3.10). The age at which mothers gave up the care of their children was not collected in the survey. The age of the child at the time of the survey is the best available proxy measure.

Not surprisingly, older children were less likely to be cared for by their birth mother (Figure 3.5) and the proportion of teenaged motherhood increased slightly with child's age, creating the possibility of confounding by a cohort effect. Furthermore, the social and biological implications of motherhood vary throughout the teenaged years. Motherhood under 16 years is less socially and biologically desirable than motherhood at 18 years or 19 years because both education and physical growth are interrupted.

Figure 3.5 therefore stratifies by both child age and maternal age at delivery within the teenaged category and shows that 18–19 year old mothers were as likely as older women to be caring for their children, particularly for children under 3 years. Mothers delivering before 18 years of age were less likely to be caring for their children at the time of the interview, particularly mothers under 16 years of whom 25.8 per cent (CI: 12.9%–44.4%) were not caring for their 0–3 year olds at the time of the survey interview.

FIGURE 3.5: CARER STATUS BY AGE OF CHILD AND AGE OF MOTHER(a)



(a) The confidence intervals of all point estimates are given in Table 3.12

Source: Table 3.12

TEENAGE PREGNANCY AND CONTINUITY OF MATERNAL CARE

Children whose primary carer was not their birth mother were significantly more likely to have been born to mothers under the age of 18 years. Reducing early teenage pregnancy could increase the likelihood of an infant or child being cared for in the long term by their birth mother.

BIRTH CHARACTERISTICS AND MATERNAL ABORIGINAL STATUS

All of the children in the survey were identified by their carers to be of Aboriginal and/or Torres Strait Islander origin. With respect to the mother's Aboriginal status, two sources of information were potentially available. First, the attending midwife recorded the Aboriginal status of the birth mother on the Midwives Notification Form (see *Glossary*) at the time of the birth of child. Second, when the birth mother was the child's primary carer, her Aboriginal status was established by direct interview at the time of the survey.

Table 3.13 shows the relationship between the midwife's report of the birth mother's Aboriginal status and the survey interview response. For children whose mothers were reported to be of Aboriginal and/or Torres Strait Islander origin at the time of the birth of their child, 98.7 per cent (CI: 98.1%–99.2%) reported that they were of Aboriginal and/or Torres Strait Islander origin at the time of the interview.

Of those mothers of Aboriginal children who were recorded as non-Aboriginal on the Midwives Notification Form at the time of the child's birth, 37.8 per cent (CI: 31.9%–44.0%) identified as Aboriginal at the time of the survey.

Table 3.14 compares the neonatal characteristics of Aboriginal children derived from information obtained from linked birth records where the birth mother was a primary carer at the time of the interview, by Aboriginal status of the mother. While the infants of Aboriginal mothers tended to be born earlier, lighter and in less optimal condition, none of these differences were statistically significant.

CONSISTENCY IN REPORTING AND RECORDING ABORIGINAL STATUS

Consistency in reporting Aboriginal status reflects the circumstances and the manner in which the information is gathered as well as personal awareness and motivation that may lead to self-identification.

Despite promotional efforts to improve data quality and reminders that it is not possible to determine who is an Aboriginal or Torres Strait Islander without asking the person, mothers of newborns may not be directly asked about their own racial identity and data may be based on the perceptions of others.

Similarly, self-identification as an Aboriginal person or a Torres Strait Islander may be based upon perception of the need for this information and upon perceptions about the manner of service delivery that may follow disclosure.

TOBACCO, ALCOHOL AND DRUG USE DURING PREGNANCY

Mothers of Aboriginal and Torres Strait Islander children often have multiple risk factors that contribute to low birth weight and impaired growth of their babies. Among these are cigarette smoking, alcohol consumption and other drug use during pregnancy. To maximise the reliability of reporting of tobacco, alcohol, marijuana (gunjah) and/or other drug use during pregnancy, the following analyses have been confined to the 80.5 per cent of children in the survey for whom information was provided by their birth mother at the time of the household interview. The corresponding estimate of the number of Western Australian Aboriginal and Torres Strait Islander children who would meet this criterion is 24,000.

TOBACCO SMOKING

The mothers of 46.5 per cent (CI: 43.9%–49.0%) of Aboriginal children (whose primary carer was also their birth mother) had smoked tobacco during pregnancy. In comparison, 22 per cent of infants were born to mothers in the total population who had smoked during pregnancy.[3] There was a tendency for the prevalence of smoking to decrease with increasing isolation (Table 3.15).

CHEWING TOBACCO

Birth mothers (who were also primary carers) of 3.5 per cent (CI: 2.7%–4.6%) of children reported chewing tobacco during pregnancy. There was a strong association between the prevalence of chewing tobacco during pregnancy and levels of relative isolation. In the Perth metropolitan area, 0.6 per cent (CI: 0.1%–1.5%) of children had mothers who had chewed tobacco compared with 21.0 per cent (CI: 13.9%–30.0%) in extremely isolated areas (Table 3.15). This perhaps reflects traditional usage as well as the fact that cigarettes are not as readily available in areas of extreme isolation.

ALL TOBACCO PRODUCTS COMBINED

Table 3.15 also shows the use of all tobacco products (smoking and chewing tobacco) by birth mothers during their pregnancy. The mothers of almost half (49.3

per cent; CI: 46.9%–51.8%) of the children (whose primary carer was also their birth mother) reported using tobacco during pregnancy. There was no significant difference in the proportion of women who reported using tobacco during their pregnancy by level of relative isolation.

ABORIGINAL TOBACCO USE AND ITS EFFECTS

Contemporary use of tobacco by Aboriginal and Torres Strait Islander people is the outcome of many historical and social circumstances. Long before European contact, and in addition to the traditional use of native tobaccos, Aboriginal and Torres Strait Islander people had contact with tobacco through trade with the Macassans. Following European settlement, tobacco was regularly used in 'rations' for Aboriginal people by both the government and on missions. Today, tobacco is widely available and consumed.[1]

In Australia, pregnant Aboriginal and Torres Strait Islander women smoke cigarettes at twice the rate of their non-Aboriginal counterparts. While there has been some evidence that links traditional Aboriginal lifestyle to higher rates of tobacco use[2], the data here show consistently high rates of tobacco use regardless of levels of relative isolation. Notably, as cigarette use declines with increasing levels of isolation, the rates of chewing tobacco increase.

About 80 per cent of Western Australian Aboriginal infants in a metropolitan sample were exposed to environmental tobacco smoke.[3] Direct and passive exposure to smoke poses risks to pregnant mothers, babies and young children. These risks include complications of pregnancy, sudden infant death syndrome, premature birth, low birth weight, asthma, middle ear disease and lower respiratory tract infections. Western Australian epidemiologists recently noted that life expectancy for Aboriginal men would increase from 58.5 to 61 years and for women from 65.3 to 67 years if tobacco related deaths were eliminated[4], an effect considerably greater than that estimated for the elimination of all infectious disease.

In the WA Aboriginal Child Health Survey, the rate of tobacco smoking by Aboriginal women during pregnancy was 46.5 per cent (CI: 43.9%–49.0%). The 1994 National Aboriginal and Torres Strait Islander Survey showed rates of tobacco smoking for Western Australian women aged 13 years and over to be 45.4 per cent (CI: 40.5%–50.2%) and for men, 51.1 per cent (CI: 46.1%–56.1%).[5] These findings would suggest that rates of tobacco smoking have remained persistently high for the past decade.

Evidence of specific interventions for reducing tobacco use in pregnant Aboriginal women is scant. A systematic review of smoking cessation programs for pregnant women in the general population concluded that they were effective in reducing smoking, low birth weight and pre-term birth.[6] However, demonstrations of their effectiveness in Australian Aboriginal populations are yet to be undertaken.

[1] Ivers R, (2001). Indigenous Australians and tobacco: A literature review. Menzies School of Health Research and the Cooperative Research Centre for Aboriginal and Tropical Health, Darwin.

[2] Cunningham J, (1994). Cigarette smoking among Indigenous Australians. Australian Bureau of Statistics, (Catalogue 4701.0) Canberra.

[3] Eades S, and Read A, (1999). Infant care practices in a metropolitan Aboriginal population: Bibbulung Gnarneep Team. *Journal of Paediatric Child Health* 35(6); 541–544.

[4] Arnold-Reed DE, Holman CD, Codde J, and Unwin E, (1998). Effects of smoking and unsafe alcohol consumption on Aboriginal life expectancy [letter]. *Medical Journal of Australia* 168(2); 95.

[5] Australian Bureau of Statistics, (1996). National Aboriginal and Torres Strait Islander Survey 1994 Western Australia. (Catalogue 4190.5) Canberra.

[6] Lumley J, Oliver S, Waters E, (2003). Interventions for promoting smoking cessation during pregnancy (Cochrane Review). *The Cochrane Library*, Issue 3. Oxford: Update Software.

ALCOHOL CONSUMPTION

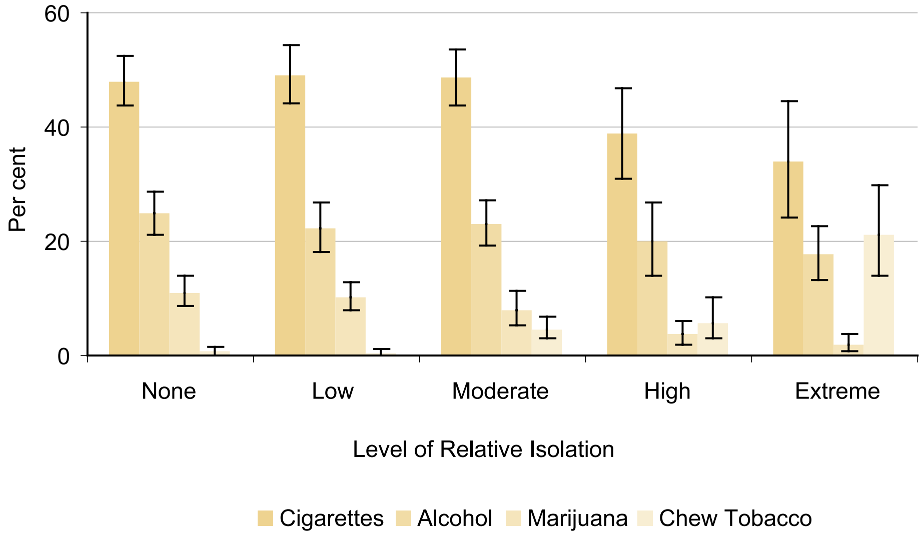
The birth mothers of an estimated 22.8 per cent (CI: 20.8%–24.9%) of Aboriginal children drank alcohol during their pregnancy (Table 3.15). This is very significantly lower than estimates of the proportion of pregnant women that drink alcohol in the total population; 40–50 per cent[4] and 75 per cent.[5]

Across levels of relative isolation there were no significant differences in the prevalence of alcohol use during pregnancy.

No measures of frequency or quantity of alcohol intake were available, as these may be unreliable from questionnaire data without further validation, so the proportion of mothers of Aboriginal infants who abused alcohol cannot be estimated. However it is known that although Aboriginal women are less likely to consume any alcohol than are other Australian women, those that do consume alcohol are more likely to do so at hazardous levels, particularly women of child bearing age.[6,7,8]

Consuming alcohol at hazardous levels is associated with adverse perinatal outcomes such as foetal alcohol syndrome, alcohol withdrawal in the newborn, and increased risk of perinatal mortality.[9]

FIGURE 3.6: CHILDREN(a) — SUBSTANCE USE BY MOTHER DURING PREGNANCY, BY LEVEL OF RELATIVE ISOLATION



(a) Children whose primary carer was also their birth mother

Source: Table 3.15

MARIJUANA AND OTHER DRUG USE

Mothers of 8.8 per cent (CI: 7.5%–10.2%) of children (whose primary carer was also their birth mother) reported having used marijuana (gunjah) during pregnancy. Marijuana usage declined with level of isolation: from 11.1 per cent (CI: 8.7%–14.0%) in metropolitan areas to 1.8 per cent (CI: 0.8%–3.7%) in areas of extreme isolation (Table 3.15).

The mothers of less than 1.0 per cent (CI: 0.3%–1.3%) of children whose primary carer was their birth mother reported using other drugs during pregnancy.

NATIONAL DRUG STRATEGY

The National Drug Strategy Aboriginal and Torres Strait Islander Peoples' Complementary Action Plan 2003–2006[1] was endorsed by the Ministerial Council on Drug Strategy in August 2003 to help provide a nationally co-ordinated and integrated approach to reduce drug-related harm among Aboriginal and Torres Strait Islander People. The complementary action plan has six key result areas:

- Enhanced capacity to address issues of substance misuse
- Whole of government effort in collaboration
- Improved access to services
- Provision of holistic services
- Workforce initiatives to enhance capacity to provide services
- Increased Aboriginal ownership of research, monitoring, evaluation and dissemination of information.

The action plan also identifies some issues that are especially significant in the remote and isolated communities such as traditional practices, the level of local services, and the use of harmful substances such as kava and petrol sniffing.

Examples of actions include:

- encouraging health services to implement home visit schemes as part of early childhood development programs
- establishing a youth website that includes messages relating to the use of alcohol, tobacco and other drugs
- running blue light discos and film nights and other alternatives to drug usage
- the Strong Mothers, Strong Babies, Strong Culture Program
- developing and disseminating community-targeted materials on foetal alcohol syndrome (FAS) and foetal alcohol effects (FAE).

[1] Ministerial Council on Drug Strategy, (2003). National Drug Strategy. Aboriginal and Torres Strait Peoples Complementary Action Plan 2003-2006. National Drug Strategy Unit. Canberra.

USE OF MULTIPLE SUBSTANCES

Women who use one substance may also use others. In order to understand the effects of substance use on birth weight, it is necessary to consider substances together, so that isolated and combined usage can be differentiated.

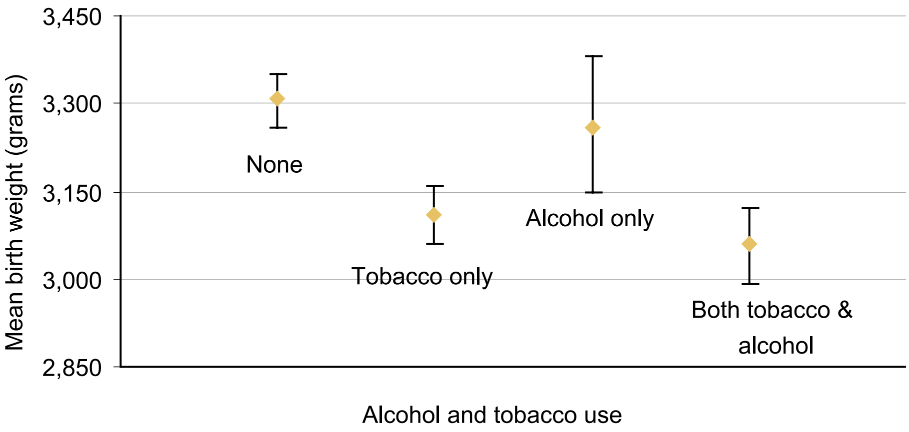
EFFECT ON BIRTH WEIGHT OF SUBSTANCE USE IN PREGNANCY

The effects on birth weight of tobacco, alcohol and marijuana use during pregnancy were examined by linking survey data to birth records on the Maternal and Child Health Research Data Base (MCHRDB). This linkage resulted in estimates for 21,200 (CI: 20,700–21,700) Aboriginal and Torres Strait Islander children whose primary carer was their birth mother.

TOBACCO AND ALCOHOL USE

Table 3.16 shows mean birth weight and proportion of low birth weight by alcohol and tobacco use. It can be seen, as in other studies, that tobacco use was associated with a significant 200g reduction in mean birth weight.[3] The effect of alcohol use on mean birth weight was much smaller at an estimated reduction of 40g and was not statistically significant. The effect on mean birth weight of combined usage appears additive (Figure 3.7).

FIGURE 3.7: CHILDREN(a)— MEAN BIRTH WEIGHTS, BY ALCOHOL AND TOBACCO USE BY MOTHER DURING PREGNANCY

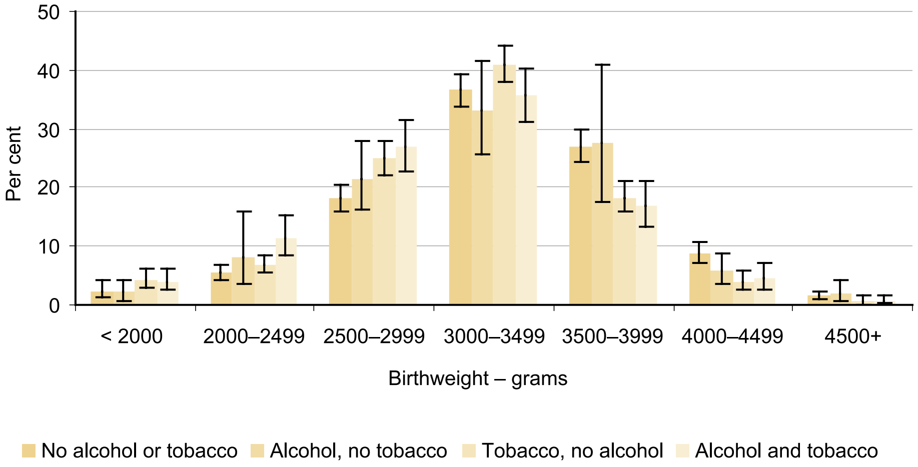


(a) Children whose birth mother is also their primary carer

Source: Table 3.16

The effect of substance use on proportion of low birth weight babies differs from the effect on mean birth weight. Mothers who used both alcohol and tobacco during pregnancy were almost twice as likely to have a low birth weight baby (15.4 per cent; CI: 11.9%–19.3%) compared to mothers who did not use tobacco or alcohol (7.8 per cent; CI: 6.1%–9.8%). There were no significant differences for mothers who used only alcohol or tobacco, but not both (Table 3.16). These differences occur because maternal tobacco use tends to reduce the birth weight of all exposed infants shifting their whole birth weight distribution by 200g, significantly increasing the proportion with a birth weight of 2,500–2,999g and decreasing the proportion with a birth weight of 3,500g–3,999g (Figure 3.8). In contrast, the effect of alcohol use is found primarily in those who abuse alcohol, but this smaller proportion of affected infants is likely to have a much larger reduction in birth weight, whereas birth weight is little affected in low and moderate alcohol users. Thus, Figure 3.8 shows that there was an increased proportion of infants in the 2,000–2,499g birth weight category among alcohol users.

FIGURE 3.8: BIRTH WEIGHT DISTRIBUTION(a), BY MATERNAL TOBACCO AND ALCOHOL USE DURING PREGNANCY



Source: Table 3.17

CHEWING AND SMOKING TOBACCO

It was not previously known whether chewing tobacco has the same effect on birth weight as smoking tobacco. Since the great majority of mothers chewing tobacco lived in more isolated areas, where birth weights tended to be lower, this analysis was limited to infants born in LORI areas moderate to extreme. Table 3.18 shows the mean birth weight and proportion of low birth weight infants, by type of tobacco use. The small numbers of women who chewed tobacco only or both chewed and smoked tobacco result in wide confidence intervals, however estimated mean values suggest that there is no important difference in effect on birth weight between chewing and smoking tobacco.

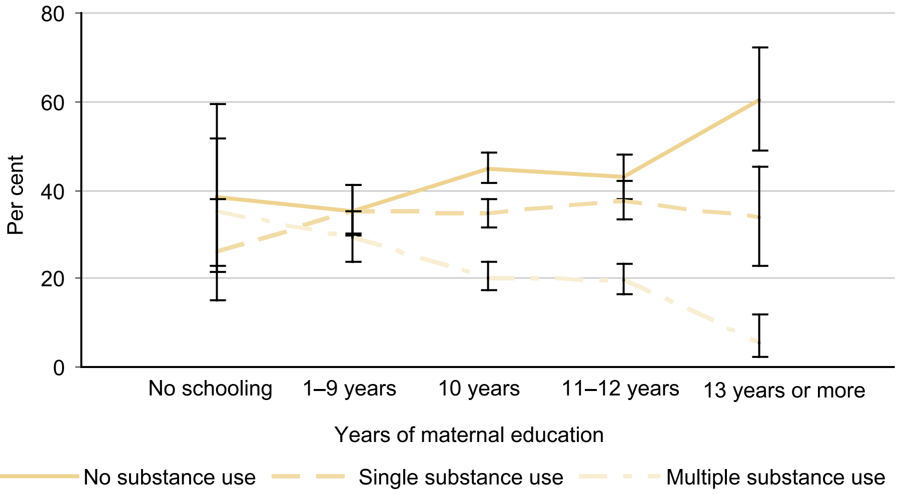
MARIJUANA USE

Table 3.19 isolates the effect of marijuana use on birth weight. The number of marijuana users is small, so again confidence intervals are wide, but the central estimates of mean birth weight suggest that infants exposed to marijuana alone weigh 210g less than those not exposed to any maternal alcohol, tobacco or marijuana, supporting previously published data.[9] This is similar to the effect of tobacco use alone. Table 3.19 suggests that the effects on birth weight of marijuana, tobacco and alcohol use may be additive.

SUBSTANCE USE BY DURATION OF MATERNAL EDUCATION

The distribution of single and multiple substance use, by duration of maternal education is shown in Figure 3.9. The Figure shows that duration of maternal education has a strong negative correlation with the proportion of mothers using multiple substances, a strong positive correlation with the proportion of mothers using no substances but little correlation with the proportion of mothers using a single substance.

FIGURE 3.9: CHILDREN(a) — SUBSTANCE USE BY DURATION OF MATERNAL EDUCATION



(a) Children whose birth mothers were also their carers

Source: Table 3.21

Table 3.22 shows that women who use multiple substances during pregnancy are more likely to experience financial strain — spending more money than they receive. They are also less likely to save than those who use no substances or who use a single substance during pregnancy. This may be largely due to prospects for employment and remuneration being highly correlated with educational duration that is in turn correlated with substance use.

EFFECTS OF TOBACCO, ALCOHOL AND DRUG USAGE ON BIRTH WEIGHTS

The use of tobacco and alcohol during pregnancy is one of a number of factors that increase the likelihood of low birth weight babies (i.e. birth weight of less than 2,500 grams), and lower the mean birth weight of babies born. Low birth weight babies are more susceptible to infections and other adverse developmental outcomes. Other factors influencing low birth weight include socioeconomic disadvantage, size and age of the mother, the number of babies previously borne, mother's nutritional status, illness during pregnancy, presence of a multiple birth and duration of pregnancy.[1,2]

[1] Alberman E, (1994) Low birth weight and prematurity, in *The Epidemiology of Childhood Disorders*, ed. Pless IB, Oxford University Press. New York.

[2] Barmer DJP, and Clark PM, (1997). Fetal undernutrition and disease in later life. *Reviews of Reproduction 2;* 105–112.

BREASTFEEDING

RECOMMENDATIONS FOR BREASTFEEDING

Although the health benefits of breastfeeding are widely acknowledged, opinions and recommendations have been strongly divided on the optimal duration of exclusive breastfeeding. The current World Health Organisation guidelines based on a review of over 3,000 scientific studies recommended exclusive breastfeeding to the age of six months before the introduction of nutritionally safe and appropriate complementary foods in conjunction with continued breastfeeding.[1] Exclusive breastfeeding to six months is also recommended by the National Health and Medical Research Council.[2] These Australian guidelines recommend that breastfeeding be continued well beyond the age of 12 months because of the benefits to both infant and mother. They also recommend that, where for any reason breast-milk is discontinued before 12 months of age, a commercial infant formula should be used in preference to cow's milk as the main source of milk.

1 World Health Organisation, (2001). Expert consultation on the optimal duration of exclusive breastfeeding. WHO. Geneva.

2 NHMRC, (2003). Dietary Guidelines for Children and Adolescents in Australia – Incorporating the Infant Feeding Guidelines for Health Workers. NHMRC. Canberra.

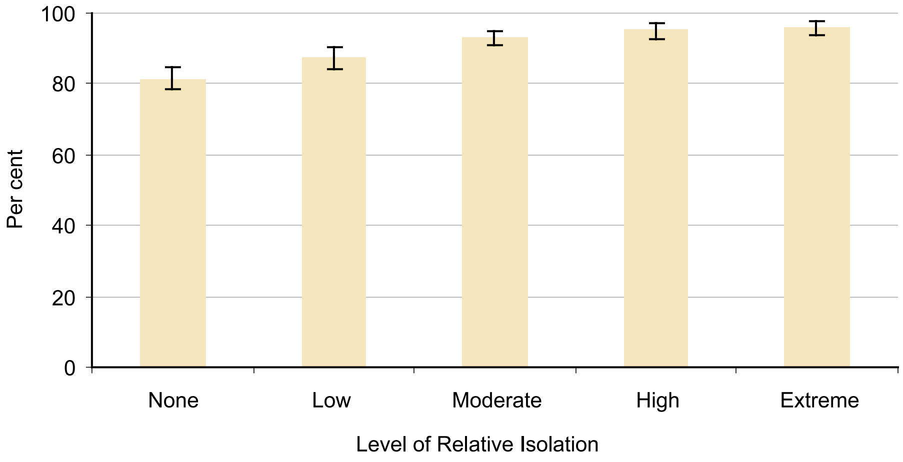
To maximise the reliability of reporting of breastfeeding history, the following analyses have been confined to the 80.5 per cent of children in the survey for whom information was provided by their birth mother at the time of the household interview. The corresponding estimate of the number of Western Australian Aboriginal and Torres Strait Islander children who would meet the criteria is 24,000 (Figure 3.1).

PROPORTION OF CHILDREN EVER BREASTFED (CHILDREN 0–17 YEARS)

At the time of the survey, 88.0 per cent (CI: 86.5%–89.4%) of Aboriginal children were reported ever to have been breastfed. This compares favourably with 84 per cent (CI: 82.2%–85.8%) of 4–16 year olds reported ever to have been breastfed for the total population by the 1993 WA Child Health Survey.[10]

Figure 3.10 shows that the proportion of children who had ever been breastfed increased steadily with isolation from 81.5 per cent (CI: 78.3%–84.6%) for children in the Perth metropolitan area to 96.3 per cent (CI: 94.0%–97.8%) in areas of extreme isolation.

FIGURE 3.10: CHILDREN AGED 0–17 YEARS(a) — PROPORTION EVER BREASTFED BY LEVEL OF RELATIVE ISOLATION



(a) Children whose birth mother is also their primary carer

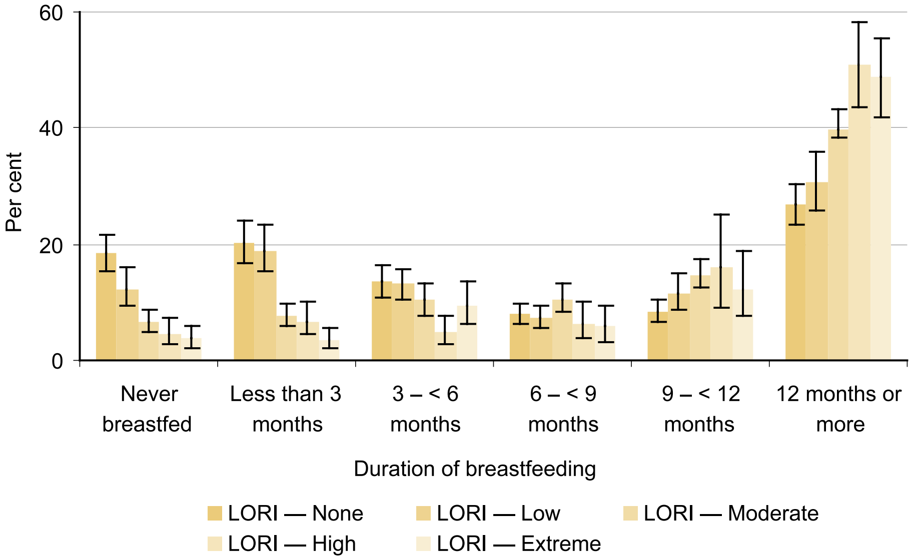
Source: Table 3.23

DURATION OF BREASTFEEDING (CHILDREN 0–17 YEARS)

An estimated 12.0 per cent (CI: 10.6%–13.5%) of Aboriginal children had never been breastfed, 14.7 per cent (CI: 13.1%–16.5%) were breastfed for up to three months, 11.6 per cent (CI: 10.3% –13.0%) were breastfed for three to six months, 8.0 per cent (CI: 7.0%–9.0%) were breastfed for six to nine months, 11.5 per cent (CI: 10.2%–13.0%) were breastfed for nine to twelve months and 34.5 per cent (CI: 32.3%–36.7%) were reported to have been breastfed for 12 months or more. This was significantly higher than the comparable figure for the total Western Australian population where 20 per cent (CI: 17.6%–22.4%) of children aged 4–16 years were reported to have been breastfed for 12 months or more.[10] The remaining 7.8 per cent (CI: 7.0%–8.7%) were still being breastfed at the time of the survey (Table 3.24).

Children living in more remote areas also tended to be breastfed for longer than those in more urbanised settings (Figure 3.11). Around one in four or 26.8 per cent (CI: 23.3%–30.5%) of all children in the Perth metropolitan area had been breastfed for a period of 12 months or more, compared with 48.7 per cent of children (CI: 41.9%–55.4%) living in areas of extreme isolation.

FIGURE 3.11: CHILDREN AGED 0–17 YEARS(a) — DURATION OF BREASTFEEDING BY LEVEL OF RELATIVE ISOLATION



(a) Children whose birth mother is also their primary carer

Source: Table 3.24

BREASTFEEDING HISTORY (CHILDREN AGED 0–3 YEARS)

More detailed information on breastfeeding was collected about children aged 0–3 years. The following analyses are confined to the estimated 6,210 Western Australian Aboriginal and Torres Strait Islander children within this age range who were still in the care of their natural mother. At the time of the survey, 29.3 per cent (CI: 26.4%–32.4%) of children aged 0–3 years were still receiving breast milk (Table 3.26).

Figure 3.12 shows the breast feeding status by age for Aboriginal children in Western Australia and compares this with figures from the 2001 National Health Survey relating to the total population. The key finding here relates to children aged 12 months or older, with Aboriginal children almost 5 times more likely to still be breastfeeding (19.6 per cent; CI: 16.2%–23.3%) at that age compared with 4.0 per cent (CI: 2.6%–5.4%) of children in the total Australian population.

FIGURE 3.12: CURRENT BREAST-FEEDING(a) STATUS, BY AGE

	2001 WAACHS		2001 National Health Survey(b)	
	%	95% CI	%	95% CI
Currently breast feeding				
Less than 6 months old	65.0	(57.2–72.1)	64.5	(56.3–72.7)
6 months to 11 months old	48.3	(39.7–56.8)	36.7	(28.3–45.2)
12 months to less than 4 years old	19.6	(16.2–23.3)	4.0	(2.6–5.4)
Never breast fed (Less than 4 years old)	12.6	(10.5–15.0)	13.2	(11.1–15.4)

(a) Any level of breastfeeding including partial, complementary and full breastfeeding.

(b) ABS (2001) National Health Survey, Summary of Results. Catalogue 4364.0

Source: Tables 3.25 and 3.26

Breastfeeding beyond 12 months varied considerably by levels of relative isolation. For example, 47.4 per cent (CI: 30.2%–66.9%) of Aboriginal children, aged more than 12 months and under four years, living in areas of extreme isolation were still being breastfed, compared with 11.6 per cent (CI: 7.4%–17.0%) of children in the same age group living in areas of low relative isolation (Table 3.26). This lower rate, however, was still significantly higher than the 4.0 per cent (CI: 2.6%–5.4%) measured by the 2001 National Health Survey for children in the same age group in the total Australian population (Figure 3.12).

EXCLUSIVE BREASTFEEDING (CHILDREN 0–3 YEARS)

An estimated 10.4 per cent (CI: 8.6%–12.4%) of Aboriginal children aged 0–3 years were currently being breastfed exclusively i.e. were not being given any other types of food such as cows milk, formula milk, baby food or cereals (Table 3.27).

When considered by age group, 53.0 per cent (CI: 45.5%–60.7%) of Aboriginal children aged less than six months were being exclusively breastfed, dropping to 7.0 per cent (CI: 3.8%–10.9%) for children aged six to eleven months and 3.1 per cent (CI: 1.7%–4.9%) for those who were 12 months and older (Table 3.27).

While there were statistically significant differences in the proportion of children still receiving any breast milk across the different levels of relative isolation within each age group, the same did not apply to the proportions of children still being exclusively breastfed, perhaps on account of the small numbers involved. However, similar trends were still discernible and children in remote areas are more likely to be exclusively breastfed for longer than those in Perth (Table 3.28).

INTRODUCTION OF SOLID FOODS (CHILDREN AGED 0–3 YEARS)

For the 5,380 children aged 0–3 years who had started on solid foods, the most common points for the introduction of these into the diets of Aboriginal children were four months (29.8 per cent; CI: 26.5%–33.1%) and six months (18.5 per cent; CI: 15.7%–21.6%). A further 16.1 per cent (CI: 13.5%–18.9%) had commenced solid foods at 3 months, whilst 3.7 per cent (CI: 2.3%–5.8%) started at one month of age (Table 3.29).

BENEFITS OF BREASTFEEDING

Several studies show the benefits of breastfeeding on children's growth, cognitive development and immunological functioning.[1,2,3]

While it is generally accepted that breast milk from a well-nourished mother is adequate as the sole source of nutrients for full-term infants until about six months, there has been considerable debate over whether to recommend exclusive breastfeeding for 'four to six months' versus 'about six months'. The debate has centred on the choice between the known protective effect of exclusive breastfeeding against infectious morbidity and the (theoretical) insufficiency of breast milk alone to satisfy the infant's energy and micronutrient requirements beyond four months of age. This issue has recently been examined by a Cochrane Collaboration systematic review.[4]

This review concluded that 'Infants who are exclusively breastfed for six months experience less morbidity from gastrointestinal infection than those who are mixed breastfed as of three or four months, and no deficits have been demonstrated in growth among infants from either developing or developed countries who are exclusively breastfed for six months or longer. Moreover, the mothers of such infants have more prolonged lactational amenorrhea. Although infants should still be managed individually so that insufficient growth or other adverse outcomes are not ignored and appropriate interventions are provided, the available evidence demonstrates no apparent risks in recommending, as a general policy, exclusive breastfeeding for the first six months of life in both developing and developed country settings'.

[1] Kramer MS, (2001). Health benefits of breastfeeding promotion. *Journal of the American Medical Association*, 285: 2446–2447.

[2] Oddy WE, Kendall GE, Blair E, deKlerk N, Stanley FJ, Landau LI, Silburn S, and Zubrick S, (2003). Breast feeding and cognitive development in childhood: a prospective birth cohort study. *Paediatric and Perinatal Epidemiology* 17; 81–90.

[3] Lawton JW, and Shortridge KF, (1997). Protective factors in human breastmilk and colostrum, *Lancet* I; 253–255.

[4] Kramer MS, and Kakuma R. (2003). Optimal duration of exclusive breastfeeding (Cochrane Review). The Cochrane Library, Issue 4. John Wiley & Sons, Ltd. Chichester. UK.

DIET AND NUTRITION

Aboriginal and Torres Strait Islander families face considerable challenges in providing their children access to a healthy diet. Those living in isolated areas may not have the same opportunities as people living in metropolitan areas to obtain affordable, nutritious food on a regular basis.

METHODOLOGICAL ISSUES IN ASSESSING DIETARY INTAKE

Accurate, quantitative assessment of dietary intake is notoriously difficult in any population. For example, two common approaches are the 24 hour recall and weighed dietary intake, but both have problems arising from the tendency of respondents to give more 'socially desirable' responses.[1] Furthermore, one fifth of Aboriginal children in this survey lived in areas of high or extreme isolation, where variability in food availability may render a 24–hour recall of limited value in assessing dietary intake. While 'store turnover' assessment has been successfully used to measure intake of entire isolated communities [1], it cannot differentiate child and youth intake, nor take into account the use of bush foods not obtained through the store. With these considerations in mind, the WA Aboriginal Child Health Survey collected a very limited amount of dietary information from carers of children aged from 4–17 years and from young people aged 12–17 years using questions developed for the 2001 National Health Survey.[2]

INDICATORS OF DIETARY QUALITY

The available data allowed some indicators of dietary quality to be devised. These indicators did not measure dietary intake, but were designed to reflect whether the principles of a healthy diet were being observed. It must be re-iterated that these indicators are based on interview responses, which were not further validated.

Indicator 1: met if water was usually drunk when thirsty.

Indicator 2: met if some form of unsweetened and unflavoured cow or soy milk was regularly consumed.

Indicator 3: met if fresh fruit was usually consumed on 6 or 7 days of the week.

Indicator 4: met if at least half a cup of a variety of at least 3 fresh vegetables, other than potato, were usually consumed on 6 or 7 days of the week.

The number of these indicators that were met was considered an overall indicator of dietary quality.

1 Lee A, Bonson A, Yarmirr D, O'Dea K and Matthews J, (1995). Sustainability of a successful health and nutrition program in a remote Aboriginal community, *Medical Journal of Australia* 162; 632–635.

2 Australian Bureau of Statistics, (2003). National Health Survey 2001. User Guide. (Catalogue 4363.0.55.001) Canberra.

THE SAMPLE CONTRIBUTING TO THE ASSESSMENT OF DIETARY INTAKE IN THIS SURVEY

For this section on Diet and Nutrition only, a somewhat different sample was used. While the carers of all children aged 4–17 years were asked the dietary questions at interview, the same questions were also asked of the children themselves if they were aged 12–17 years. On account of the increasing independence of teenagers, it was considered that these older children were better placed to accurately respond to questions concerning their diet than were their primary carers. However not all children of responding carers completed the youth self report questionnaire (YSR), thus these dietary data were missing for a proportion of 12–17 year old children. In order to generalise observations to the entire population of WA Aboriginal children, YSR respondents were weighted by age distribution to the same population (*see Sample Design, Appendix B)*. However the distribution of variables other than age among the YSR respondents may not be the same as those distributions among all carer reports. The population totals by factors other than age that are reported in this section may therefore not be the same as those reported elsewhere in this volume.

While the most accurate responses were sought, it must be borne in mind that the questions elicited only unvalidated *recall* of dietary intake which, for children aged 4–11 years, was by a third party. The aim of this part of the survey was therefore limited to obtaining an indication, rather than a measure, of dietary quality. Four criteria were selected as indicators of attempting to achieve a healthy diet: (1) drinking water when thirsty, (2) drinking some form of unflavoured and unsweetened milk, (3) eating more than half a cup of a variety of fresh vegetables on at least 6 days a week and (4) eating fresh fruit on at least 6 days a week, (*see commentary box 'Indicators of Dietary Quality'*).

SIGNIFICANCE OF DIET, NUTRITION AND HEALTH

The relationship between diet, nutrition and health is of particular significance to Aboriginal and Torres Strait Islander people for a number of important reasons.

First, the age profile of this population includes a larger proportion of mothers, babies and children than the general Australian population. Access to good nutrition is especially important for these groups as a key determinant of physical growth, cognitive and emotional development and staying healthy.

Second, there has been profound change in the diet of many Aboriginal and Torres Strait Islander people in a short period of time. The traditional Aboriginal diet was rich in fibre, high in protein and low in saturated fat. However, this has changed rapidly to a diet high in refined carbohydrates and saturated fats. This kind of diet is known to create a predisposition to obesity, Type 2 (adult-onset) diabetes, cardiovascular disease and renal disease.[1]

Third, the adequacy of nutrition during pregnancy and childhood is important for preventing a number of chronic diseases which may emerge later in life.Given the weight of evidence showing the importance of diet and nutrition for children's growth, resistance to infection and the prevention of chronic diseases, there is surprisingly little population data available to monitor changes in the dietary intake of Aboriginal and Torres Strait Islander children. This survey provides some of the first such data against which the progress of systematic efforts to improve children's nutritional status may be judged.

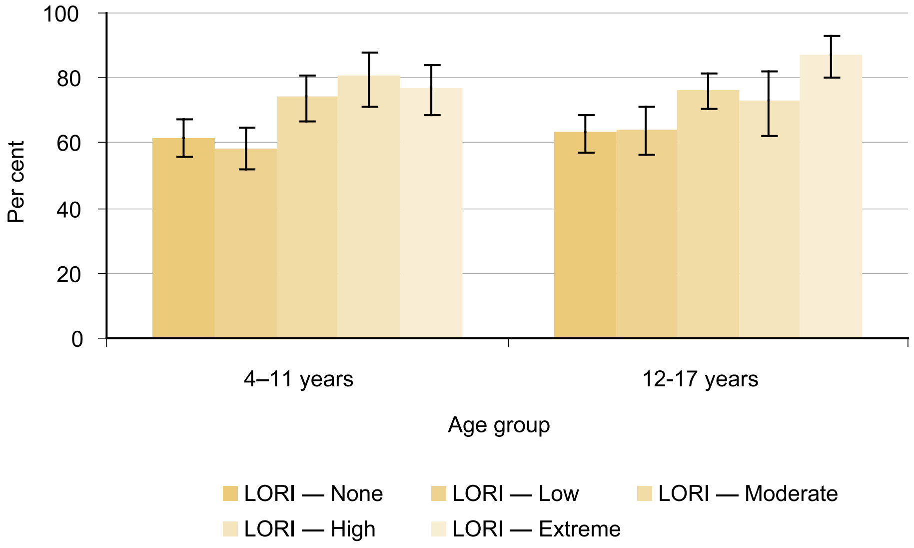
[1] Leonard D, McDermott R, O'Dea K, Rowley KG, Pensio P, Sambo E, Twist A, Toolis R, Lowson S, Best JD, (2002). Obesity, diabetes and associated cardiovascular risk factors among Torres Strait Islander people. *Australian and New Zealand Journal of Public Health*, 26(2); 144-149.

Compared with their traditional diets, the contemporary Aboriginal diet primarily consists of the now more readily available fatty meats and refined sugars and starches. Thus macronutrient requirements tend to be met or exceeded, with the attendant risks of adiposity, insulin resistance, diabetes and heart disease, while micronutrients tend to be lacking.[11] These chosen indicators of dietary quality therefore focus on fruit and vegetable intake, as providers of many important micronutrients, and milk, as the primary source of calcium.

CHOOSING WATER AS A DRINK WHEN THIRSTY

The dietary guidelines for Australian children and adolescents recommend choosing water as a drink.[12] Respondents were asked to select which drink was usually consumed when thirsty from a list of options: water, soft drink, fruit juice, cordial or other. Two thirds of all children (68.0 per cent; CI: 65.7%–70.2%) aged 4–17 years were reported to drink water, 15.3 per cent (CI: 13.6%–17.0%) were reported to drink cordial, 9.7 per cent (CI: 8.2%–11.3%) soft drinks, 4.4 per cent (CI: 3.5%–5.4%) fruit juice, and 2.7 per cent (CI: 1.9%–3.7%) some other drink. Children resident in areas of high or extreme isolation were significantly more likely to drink water when thirsty than children in the Perth metropolitan area or areas of low isolation (Figure 3.13). Older children (aged 12–17 years) were not significantly more likely to drink water than younger children: 69.4 per cent (CI: 66.1%–72.5%) compared with 67.1 per cent (CI: 63.9%–70.0%) (Table 3.30). There were no significant differences in the proportion of children drinking water by carer's educational attainment. The most frequently selected reason for not drinking water when thirsty was that the taste of other drinks was preferred.

FIGURE 3.13: CHILDREN AGED 4–17 YEARS — PROPORTION IN EACH LEVEL OF RELATIVE ISOLATION (LORI) USUALLY DRINKING WATER WHEN THIRSTY, BY AGE GROUP



Source: Tables 3.32 and 3.33

TYPE OF MILK USUALLY CONSUMED

In Australia, cow's milk is the child's usual dietary source of calcium, which is an important component of a healthy diet, particularly for growing children. However, sweetened and flavoured milks are not recommended and, when consumed on a regular basis, do not suggest adherence to the principles of a healthy diet. Only a small proportion, 3.6 per cent (CI: 2.7%–4.5%), usually drank flavoured or sweetened milk. The majority usually drank some form of unflavoured and unsweetened cow's or soy milk, 92.7 per cent (CI: 91.5%–93.8%). A small proportion of children were reported to drink other forms of milk, 1.0 per cent (CI: 0.7%–1.3%), or no milk, 2.8 per cent (CI: 2.1%–3.6%) (Table 3.34).

There are healthy alternative sources of calcium which are important for children with intolerance to lactose (e.g. yoghurt or cheese), or cow's milk protein (e.g. goat milk, fish or almonds), and it is possible that those reported to be drinking other milks or no milk were doing so for such indications. However those drinking no milk tended to fail to meet other indicators of a healthy diet and the number drinking other types of milk was too small to reliably identify such associations. Somewhat arbitrarily therefore, the milk related indicator of a healthy diet was restricted to those who usually drank some form of unsweetened and unflavoured cow or soy milk.

A somewhat greater proportion of children aged 4–11 years met the milk indicator of dietary quality than of older children: 94.2 per cent (CI: 92.4%–95.7%) compared with 90.5 per cent (CI: 88.8%–91.9%). There was no difference in the proportion of children aged 4–11 years meeting the milk indicator by level of relative isolation, but there was a tendency for an increasing proportion of children aged 12–17 years to meet the milk indicator with increasing level of relative isolation (Tables 3.32 and 3.33).

There was a trend for an increasing proportion of children aged 4–11 years to meet the milk indicator with increasing carer's educational attainment, but there was no similar trend for children aged 12–17 years (Tables 3.36 and 3.37).

FRESH VEGETABLE CONSUMPTION

Frequency

Nearly two thirds of all children self-reported or were reported by carers to usually eat vegetables every day, 64.8 per cent (CI: 62.2%–67.3%) (Table 3.31). A greater proportion of children aged 12–17 years (73.8 per cent; CI: 70.4%–76.9%) than children aged 4–11 years (58.8 per cent; CI: 55.3%–62.2%) reported daily fresh vegetable consumption. There were no significant differences in the proportions of children meeting this criterion by level of relative isolation (Tables 3.32 and 3.33).

Quantity

Of the estimated 14,800 children who usually ate vegetables daily, 90.0 per cent (CI: 88.7%–91.3%) reportedly ate at least half a cup. Children aged 4–11 years were more likely to eat at least half a cup of vegetables daily (97.5 per cent; CI: 96.7%–98.2%) than children aged 12–17 years (81.0 per cent; CI: 78.2%–83.5%) (Table 3.38).

Variety

When measuring the variety of vegetables regularly consumed, potatoes, which were regularly eaten by almost 90 per cent of Aboriginal children, were not included. Potatoes provide primarily a healthy form of complex carbohydrate that includes fibre and vitamin C, but weight for weight potatoes are not as rich in other vitamins and minerals as are less starchy vegetables. Of the children who usually ate vegetables every day, only 39.2 per cent (CI: 36.4%–42.2%), reported regularly eating five or more different varieties of vegetable (other than potatoes) (Table 3.39). A greater proportion (71.0 per cent; CI: 66.9%–74.7%) of children aged 4–11 years were reported to regularly consume more than three types of vegetables (other than potatoes) than children of 12–17 years (43.6 per cent; CI: 40.0%–47.3%) (Table 3.40).

Thus although children aged 12–17 years reported that they ate fresh vegetables more regularly, they tended to eat both a smaller variety and smaller quantities.

Vegetable indicator of dietary quality

A composite criterion for vegetable intake was constructed as the vegetable indicator of dietary quality. This criterion was met if the child usually ate at least half a cup of more than three types of fresh vegetables (other than potato) on 6 or 7 days a week. This compares with the NHMRC recommendations for fresh vegetable intake for children which are to eat a variety of fresh vegetables daily, with quantities of more than 1 cup for children aged 4–7 years and more than 1.5 cups for older children.[12] Thus the quantity component of our vegetable indicator of dietary quality is much less stringent than NHMRC recommendations.

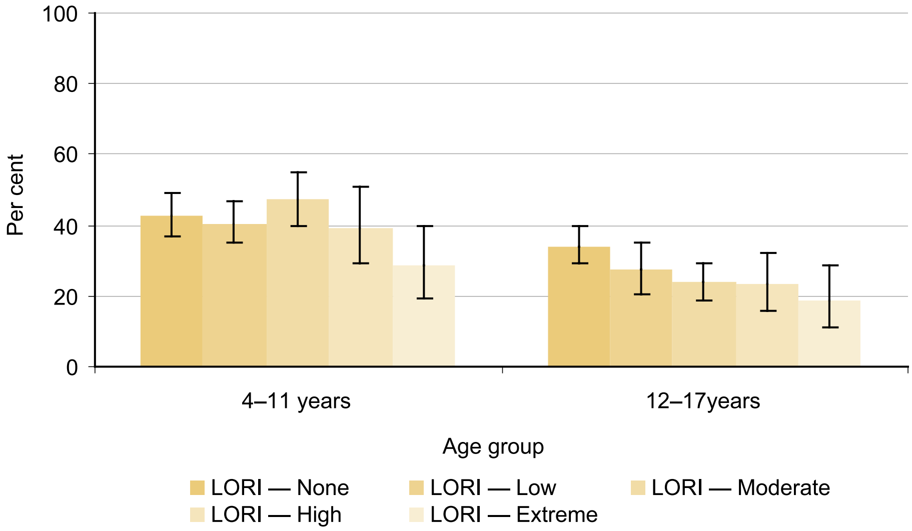
Children aged 4–11 years were significantly more likely to be reported to meet our composite vegetable criterion satisfactorily, (41.3 per cent; CI: 38.0%–44.7%), than were children aged 12–17 years (27.8 per cent; CI: 24.9%–30.9%) (Tables 3.32 and 3.33).

Thus most Aboriginal children were not even approaching the recommended vegetable intake, and for the majority this is not a result of fresh vegetables being unavailable. However, this is not a problem confined to Aboriginal children. The National Health Survey indicated that, compared with Aboriginal children, a greater proportion of non-Aboriginal children consumed no fresh vegetables and no fresh fruit at all.[13]

Vegetable indicator of dietary quality by level of relation isolation

The age of the child was more closely related to meeting the vegetable indicator of diet quality than was the level of relative isolation (Tables 3.31–3.33). In each LORI area, compared with children aged 4–11 years, there was a substantial reduction in the proportion of children aged 12–17 years meeting the vegetable indicator. Combining all ages, significantly more children in the metropolitan area (39.2 per cent; CI: 35.0%– 43.4%) met the criterion than children in extremely isolated areas (24.5 per cent; CI: 17.4%–33.5%) (Figure 3.14).

FIGURE 3.14: CHILDREN AGED 4–17 YEARS — PROPORTION IN EACH LEVEL OF RELATIVE ISOLATION (LORI) MEETING VEGETABLE INDICATOR OF DIETARY QUALITY, BY AGE GROUP



Source: Tables 3.32 and 3.33

Vegetable indicator of dietary quality by carer's educational attainment

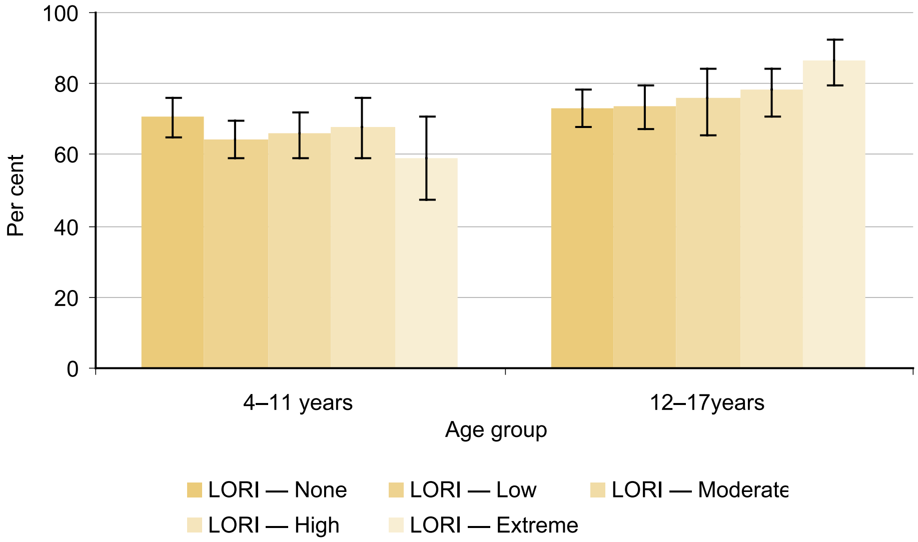
There was a trend to an increasing proportion of children meeting the fresh vegetable indicator with increasing carer's educational attainment (Table 3.35). When the child's age was considered, it was apparent that children aged 12–17 years were less likely to meet the vegetable indicator of quality in each stratum of carer's educational attainment (Tables 3.36 and 3.37).

FRESH FRUIT CONSUMPTION

An estimated 70.3 per cent (CI: 68.1%–72.5%) of Aboriginal children were reported to usually eat fresh fruit every day (Table 3.31). Although children usually eating fruit daily were significantly more likely to meet the vegetable indicator of dietary quality, significantly less than half (40.7 per cent; CI: 37.9%– 43.6%) of daily fruit eaters did so. This compared with 24.6 per cent (CI: 21.0%–28.5%) of those eating fruit on less than six days a week (Table 3.41). Children aged 4–11 years were less likely to usually eat fruit every day, (66.8 per cent; CI: 63.7%–69.7%), than were children aged 12–17 years (75.6 per cent; CI: 72.4%–78.5%) (Tables 3.32 and 3.33).

Although the proportion of all Aboriginal children usually eating fresh fruit daily did not vary with level of relative isolation, the difference in proportion between the two child age groups increased with increasing level of relative isolation. In the metropolitan area the proportions in the two age groups were very similar, but in extremely isolated areas 59.2 per cent (CI: 47.4%–70.7%) of children aged 4–11 years were reported to usually eat fruit on 6 or 7 days a week and 86.3 per cent (CI: 79.3%–92.2%) of children aged 12–17 years reported that they usually ate fruit every day (Figure 3.15).

FIGURE 3.15: CHILDREN AGED 4–17 YEARS — PROPORTION IN EACH LEVEL OF RELATIVE ISOLATION (LORI) HAVING AN ADEQUATE INTAKE OF FRUIT, BY AGE GROUP



Source: Tables 3.32 and 3.33

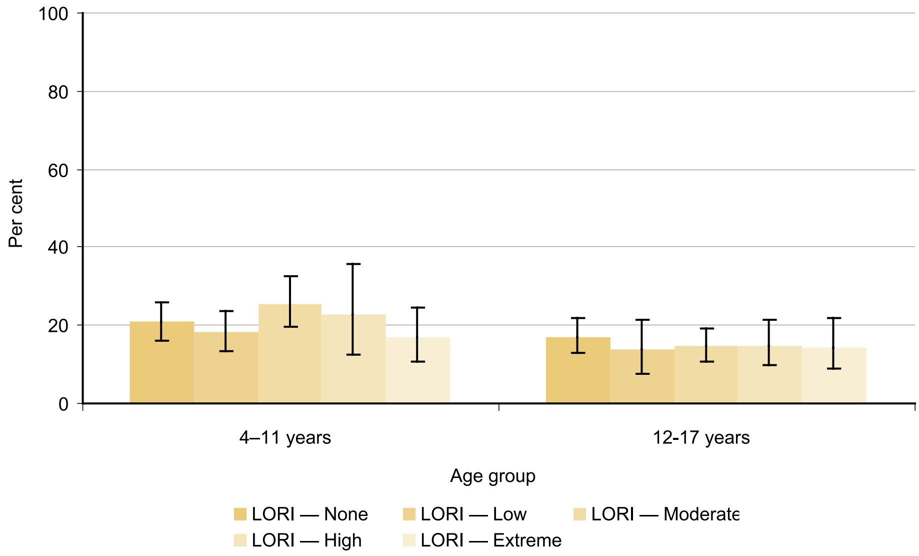
COMBINED INDICATORS OF DIETARY QUALITY AND RELATIVE ISOLATION

Only 18.7 per cent (CI: 16.7%–20.8%) of children met all four indicators of dietary quality, 40.0 per cent (CI: 37.8%–42.2%) met three and 31.7 per cent (CI: 29.5%–33.9%) met two indicators (Table 3.42).

Children aged 4–11 years were significantly more likely to meet all four indicators (21.0 per cent; CI: 18.3%–23.9%) than children aged 12–17 years (15.3 per cent; CI: 12.9%–17.9%). However, this difference was largely balanced by those meeting three indicators — 37.4 per cent (CI: 34.6%–40.3%) of children aged 4–11 years, compared with 43.9 per cent (CI: 40.7%–47.1%) of children aged 12–17 years (Tables 3.43 and 3.44).

All four indicators were more likely to be met by children aged 4–11 years living in areas of moderate or high isolation and one or fewer indicators were more likely to be met in the metropolitan area or areas of low isolation. However, within each age group there were no significant differences in the proportions of children meeting all four indicators of dietary quality between areas of different levels of relative isolation (Figure 3.16).

FIGURE 3.16: CHILDREN AGED 4–17 YEARS — PROPORTION IN EACH LEVEL OF RELATIVE ISOLATION MEETING ALL FOUR INDICATORS OF DIETARY QUALITY, BY AGE GROUP

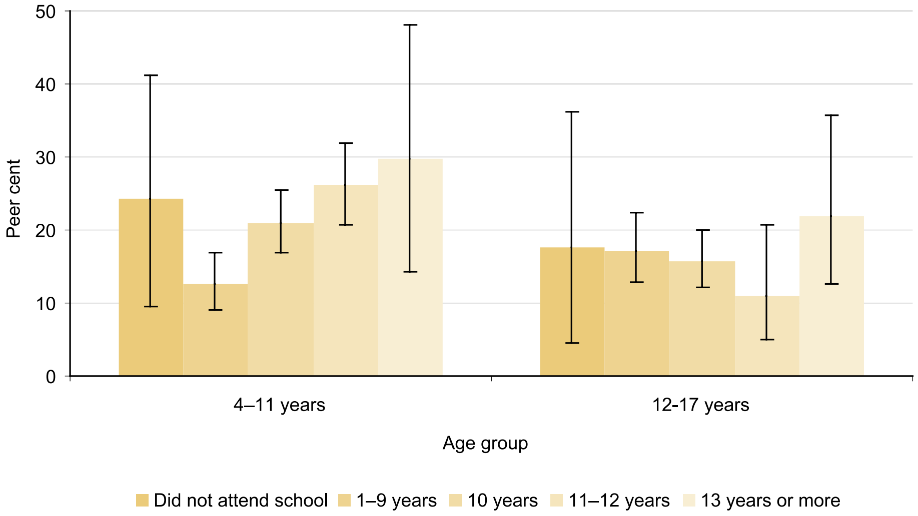


Source: Tables 3.43 and 3.43

COMBINED INDICATORS OF DIETARY QUALITY AND CARER'S EDUCATIONAL ATTAINMENT

It should be noted that carer's educational attainment is associated with available income and location of residence, both of which may be independent determinants of quality of diet. When all children are considered, there was only a weak correlation between carer's educational attainment and the number of indicators of dietary quality that were met (Table 3.45). Considering children aged 4–11 years and those aged 12–17 years separately, it can be seen that the correlation between meeting three or four indicators of dietary quality and carer's educational attainment is much stronger in children aged 4–11 years. For children aged 12–17 years the trend disappears, with a tendency for children of carers attaining less than the year 10 education level being more likely to meet three or four indicators of dietary quality than those with carers with greater educational attainments (Tables 3.48 and 3.49). Teenaged children have much greater control over what they eat. What they choose may be determined by factors such as their own nutritional education obtained outside the family, the value they assign to good health and their desire to demonstrate independence in addition to family customs, palatability and availability.

FIGURE 3.17: CHILDREN AGED 4–17 YEARS — PROPORTION MEETING ALL FOUR INDICATORS OF DIETARY QUALITY, BY CARER'S EDUCATIONAL ATTAINMENT AND AGE GROUP



Source: Tables 3.46 and 3.47

These indicators of quality of diet are simplistic, but they do suggest that there may be cause for concern. Compared with the NHMRC recommendations for children, the majority of Aboriginal children are not consuming sufficient fresh vegetables. The combinations of meeting each of the four indicators of dietary quality were examined. If an indicator is met primarily with the aim of achieving a healthy diet, it would be expected that those with the desire and knowledge to achieve a healthy diet would meet most or all of them, while those without such desire or knowledge would meet none or a few, for other reasons. If this were the case there would be a tendency to meet either all (or most) or none (or only a few) of the indicators. The proportion meeting each possible combination of indicators differed very little from what would be expected by chance alone, given the proportions of children meeting each of the individual indicators. This suggests that the primary impetus of meeting these indicators is unlikely to be the knowledge or desire to achieve a healthy diet on the part of many of the carers of children aged 4–11 years or on the part of children aged 12–17 years themselves.

ABORIGINAL CHILD AND YOUTH NUTRITION

There have been few well-conducted controlled intervention trials to examine the effectiveness of programs developed to improve the nutritional status of Aboriginal children.[1] An example of a successful community-based nutrition project was implemented at Kintore (Walungurru) in the Northern Territory during 1998–2001.[2] This project stemmed from a needs analysis study conducted in 1988, which identified a need to address the high hospitalisation rates of children under 2 years (principally a result of gastroenteritis and failure to thrive). The objectives of the Kintore project included decreasing the number of childhood nutrition-related hospital admissions, decreasing the number of underweight children and evaluating the cost effectiveness of the nutrition program.

The project had three components:

- Two meals were provided – breakfast and lunch, with parents paying costs
- Education sessions related to the children's growth were conducted for mothers
- A health clinic undertook monitoring and evaluation of children's growth.

Positive outcomes included:

Reduction in incidence of low birth weights (<2,500 grams). The incidence of low birth weight was 35 per cent between July 1995 June 1998 and dropped to 8 per cent for the period July 1998 to June 2001;

A reduction of 70 per cent in hospitalisation related to gastroenteritis and nutrition problems recorded over the project period;

The cost effectiveness of the program indicated that there were significant savings to be made. The study found that a reduction of 35 per cent in hospitalisation rates for a population of similar size and similar pattern of hospitalisation would result in a break-even point in relation to cost savings.

[1] National Health and Medical Research Council (NHMRC), (2000). Nutrition in Aboriginal and Torres Strait Islander Peoples: NHMRC. Canberra.

[2] Warchivker I, (2003). An analysis of a community response to child nutrition problems at Kintore (Walungurru) 1998–2001. Centre for Remote Health. Northern Territory.

ASTHMA

ASTHMA DEFINITION

Asthma has been defined by the *National Asthma Education and Prevention Program*[1] as '… a chronic inflammatory disorder of the airways which causes recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night or in the early morning. …These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an increase in bronchial hyper-responsiveness to a variety of stimuli.'

[1] National Institutes of Health, (1997). National Asthma Education and Prevention Program. NIH Publication No. 97–4051. Atlanta.

The occurrence of asthma and associated respiratory symptoms was measured in the WA Aboriginal Child Health Survey using survey questions that were developed for the International Study of Asthma and Allergies in Childhood (ISAAC). Using these standard questions allows comparisons with other population-based surveys conducted within Australia and other countries.[14] Asthma is more simply understood as repeated episodes of wheezing. The ISAAC questions selected for the survey were:

- whether the child has ever had asthma
- whether the child sounded wheezy during or after exercise or running around in the past 12 months
- whether the child has ever had wheezing or whistling in the chest
- whether the child has ever had hayfever
- whether the child has had a dry cough at night, apart from a cough associated with a cold or chest infection, in the past 12 months.

Additional non-ISAAC questions were asked about the use of asthma medications.

Note that a single occurrence of wheezing would not constitute having had asthma. Additionally, some children may have asthma symptoms without a diagnosis ever having been made by a medical professional, in which case the carer may not report asthma.

Most children who develop asthma have a family history of asthma, hayfever or eczema. Asthma and hayfever are allergic responses, and a dry cough can also be an allergic response and a possible indicator of more severe forms of asthma.

OCCURRENCE OF ASTHMA

The lifetime occurrence of asthma in Aboriginal children aged 0–17 years was found to be 23.2 per cent (CI: 21.6%–24.9%) (Table 3.50), with no significant differences observed between males and females. The proportion of children with asthma was lowest for younger children, with 16.8 per cent (CI: 14.3%–19.5%) of children aged 0–3 years reported to have had asthma compared with 25.6 per cent (CI: 23.2%–28.0%) of children 4–11 years and 24.4 per cent (CI: 21.4%–27.6%) of children aged 12–17 years (Tables 3.50–3.53).

The 1993 WA Child Health Survey found that 21.0 per cent (CI: 19.0%–23.0%) of children aged 4–11 years and 17.3 per cent (CI: 14.6%–20.0%) of children aged 12–16 years had asthma at the time of the survey.[10] Whilst the scope of the questions is not strictly comparable — the 1993 survey asked whether the child currently had asthma and the WAACHS asked for lifetime occurrence of asthma — asthma is usually a chronic condition. More recently, the ABS National Health Survey 2001 found that 15 per cent (CI: 10.9%–19.1%) of Australian Aboriginal and Torres Strait Islander children aged 0–14 years had asthma at the time of the survey which is similar to the 13 per cent (CI: 11.7%–14.3%) of non-Indigenous children of the same age who have asthma.[13]

Where people live is a factor influencing the occurrence of asthma. Asthma was found to be four times more common among Aboriginal and Torres Strait Islander children in the Perth metropolitan area than in extremely isolated areas of the state. An estimated 30.5 per cent (CI: 27.3%–33.8%) of children living in Perth were reported to have suffered the disease in contrast to 7.3 per cent (CI: 5.3%–9.7%) in areas of extreme isolation (Table 3.50). While children aged 0–3, 4–11 and 12–17 years had different rates of asthma, the distribution of asthma occurrence by age was spread across levels of relative isolation in the same way (Tables 3.51–3.53).

The Perth component of the ISAAC study, conducted in 1994, included a sample of 3,650 school children aged 13 or 14 years from the Perth metropolitan area. The study found 30.2 per cent of children had ever had asthma.[15] This was very similar to the 33.0 per cent (CI: 27.2%–39.1%) of Aboriginal children aged 12–17 years in the Perth metropolitan area who were reported by their carers to have ever had asthma (Table 3.53).

Children with recurring chest infections were much more likely to have a history of asthma — 52.3 per cent (CI: 47.4%–57.1%) compared with 19.1 per cent (CI: 17.5%–20.9%) of children with no recurring chest infection (Table 3.54). Conversely, children reported to have ever had asthma were much more likely to have recurring chest infections (27.7 per cent; CI: 24.1%–31.4%) than non-asthmatic children (7.6 per cent; CI: 6.7%–8.7%) (Table 3.55). Children who suffered allergies also were more likely to have ever had asthma compared to children who do not have allergies — 44.9 per cent (CI: 37.6%–52.6%) compared with 21.4 per cent (CI: 19.8%–23.1%) (Table 3.56).

WHEEZING

Carers were asked if their children had ever had wheezing or whistling in the chest. Based on these reports, 28.0 per cent (CI: 26.2%–29.9%) of Aboriginal and Torres Strait Islander children have suffered wheezing at some point in their lives. This was found to be greater for younger than older children, with 32.5 per cent (CI: 29.5%–35.8%) of children aged 0–3 years, 28.4 per cent (CI: 25.9%–31.1%) of children aged 4–11 years and 24.0 per cent (CI: 21.0%–27.3%) of children aged 12–17 years having had wheezing or whistling in the chest (Tables 3.50–3.53).

The occurrence of wheezing was also found to be much lower in the most remote and isolated areas of the state. These geographical differences were evident among all age groups. For example, in the Perth metropolitan region 32.7 per cent (CI: 29.3%–36.2%) reported a history of wheezing. This proportion reduced to 15.1 per cent (CI: 11.4%–19.2%) in areas of extreme isolation (Table 3.50).

EXERCISE-INDUCED WHEEZING

Carers were asked if their children had experienced wheezing during exercise within the last 12 months. Although these proportions were lower than for wheezing reported above, they exhibited a similar pattern by level of relative isolation. Overall, 15.9 per cent (CI: 14.7%–17.3%) of Aboriginal children were reported to have suffered exercise-induced wheezing in the last 12 months. Within the Perth metropolitan area this was reported at 21.0 per cent (CI: 18.3%–23.9%), reducing to 8.3 per cent (CI: 5.7%–11.5%) for areas of extreme relative isolation (Table 3.50). No significant differences in exercise-induced wheezing were observed by age (Tables 3.51–3.53).

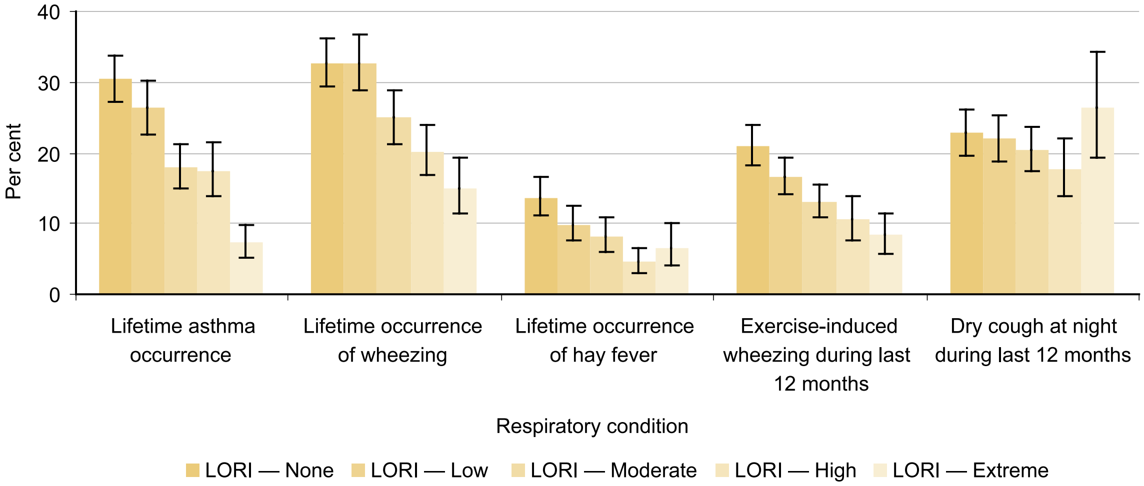
HAY FEVER

Carers were asked if their children had ever had hay fever. Overall, 9.9 per cent (CI: 8.7%–11.3%) of Aboriginal children were reported to have experienced hay fever at some time in their lives (Table 3.50). More than one in five or 21.1 per cent (CI: 16.5%–26.6%) of children aged 12–17 years living in the Perth metropolitan area were reported as having had hay fever. This is more than double the corresponding proportions observed in areas of high and extreme relative isolation where the proportions were 7.7 per cent (CI: 4.5%–11.8%) and 7.3 per cent (CI: 3.9%–12.2%) respectively (Table 3.53).

DRY COUGH AT NIGHT

A dry cough at night (not associated with a cold or chest infection) is a potential indicator of airway hyper-responsiveness to environmental irritants. These irritants include changes in air temperature and the higher levels of airborne pollen that occur at night. Disturbance of sleep because of dry coughing at night is generally associated with more severe and persistent forms of asthma.[16] Carers were asked if their children had experienced such coughing in the last 12 months. Over one in five or 21.9 per cent (CI: 20.3%–23.7%) of Aboriginal children had experienced a dry cough at night within the last 12 months (Table 3.50). This symptom was found to be lowest in the 12–17 years age group, at 16.2 per cent (CI: 13.9%–18.7%), possibly due to carers being less aware or able to report for this age group, and highest among 0–3 year olds at 26.5 per cent (CI: 23.2%–30.1%). However, in contrast to the other asthma symptoms reported above, no significant differences were found in proportions of children having a dry cough at night between each of the five categories of levels of relative isolation (Tables 3.51, 3,52 and 3.53).

FIGURE 3.18: CHILDREN — RESPIRATORY CONDITIONS, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 3.50

FACTORS ASSOCIATED WITH THE OCCURRENCE OF ASTHMA

The causes of asthma are not yet fully understood. The survey data were used to examine the relationship between the occurrence of asthma and a variety of child, family and community factors that have been hypothesised as potentially related to asthma in some way. Logistic regression models were used to explore factors that may be related to the occurrence of asthma. As described in Chapter 1, the modelling techniques used account for the use of survey weights and the hierarchical structure of the data with selection of children within families and communities.

Factors included in the model, apart from adjusting for age and sex of the child, were:

- level of relative isolation
- maternal substance use during pregnancy
- whether the primary carer of the child is the child's birth mother
- whether the primary carer currently smokes
- duration of breastfeeding for the child
- whether the family was affected by forced removal from family or forced relocation from traditional lands
- level of relative socio-economic disadvantage of the community where the child currently lives (measured using census collection districts) *(see Glossary).*

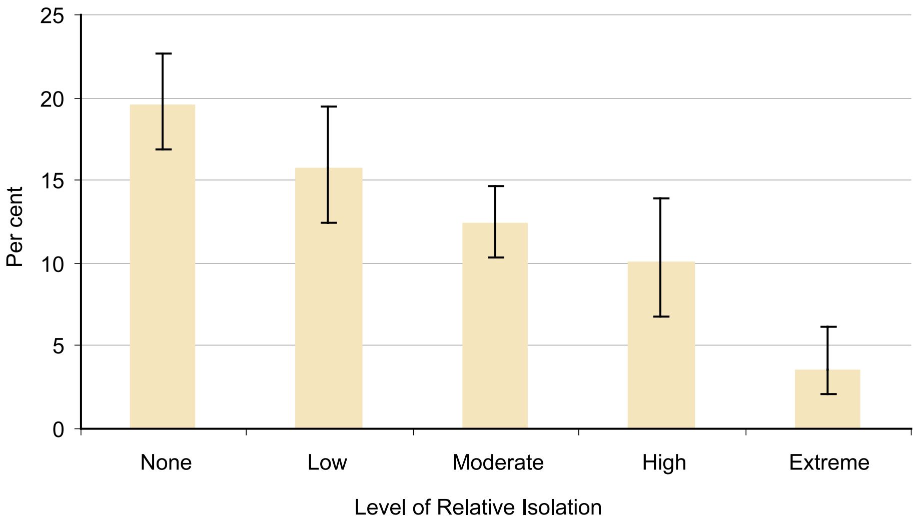
The lifetime occurrence of asthma was higher for older children, and strongly decreased with increasing levels of relative isolation.

However, no associations were found between asthma and duration of breastfeeding, whether the carers or their parents had been forcibly separated from their families or relocated from traditional lands, maternal substance use during pregnancy, whether the primary carer currently smokes or level of relative socio-economic disadvantage (Table 3.57).

USE OF ASTHMA MEDICATION

The proportion of all Western Australian Aboriginal and Torres Strait Islander children aged 0–17 years who took asthma medication in the past 12 months was 14.6 per cent (CI: 13.2%–16.1%). Significant differences were observed in the use of asthma medication by level of relative isolation. In the Perth metropolitan area, 19.6 per cent (CI: 16.9%–22.6%) of children had used asthma medication in the last 12 months. This proportion dropped steadily with increasing level of relative isolation to 3.6 per cent (CI: 2.1%–6.1%) in areas of extreme isolation (Table 3.58). No differences in the use of asthma medication were found by age and sex.

FIGURE 3.19: USE OF ASTHMA MEDICATION IN THE PAST 12 MONTHS, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 3.58

Of the estimated 6,910 Aboriginal children in WA who had asthma, 42.0 per cent (CI: 37.6%–46.3%) manage without medication. There was little variation across levels of relative isolation ranging from 39.1 per cent (CI: 32.4%–45.9%) in the Perth metropolitan area to 53.5 per cent (CI: 30.6%–73.2%) in areas of extreme isolation. The lack of significant difference between the levels of relative isolation suggests that the higher levels of asthma medication used in more urbanised settings more likely reflects the actual pattern of disease occurrence than differences in the way asthma is diagnosed and treated across these settings (Table 3.59).

TYPES OF ASTHMA MEDICATION USED

Details were collected on up to three asthma medications that had been used in the past year *(see commentary box)*. Around 3,510 or 11.8 per cent (CI: 10.5%–13.2%) of Aboriginal children under the age of 18 years were estimated to have used ‘reliever’ asthma medications in the past 12 months. A further 780 or 2.6 per cent

(CI: 2.1%–3.3%) had used ‘preventer’ medications and too few children had used ‘controller’ medications to allow reliable estimation (Table 3.60). The proportion of children having used each of these asthma medication types did not vary significantly by the age groups 0–3, 4–11 and 12–17 years (Table 3.60).

ASTHMA MEDICATIONS

The particular asthma medications which children had used during the past 12 months were identified by showing the carers a set of prompt cards with full-colour illustrations of the most commonly prescribed asthma medications in their usual dispensing formats for inhalation (i.e. aerosol, spinhaler, rotahaler and nebuliser). As the dispensers are colour-coded, it was also possible to classify each medication by its general class of action as a ‘reliever’, ‘preventer’ or ‘controller’. When the asthma medication was available in the household to be viewed directly by the interviewer, details of the medication were also recorded from the label.

The medications shown on the ‘relievers’ prompt card included the bronchodilators Asmol, Bricanyl, Respolin, Atrovent, Airomir and Ventolin. These ‘relievers’ are used for relaxing the muscles lining the airways to allow the airways to expand to their normal size. The ‘preventers’ prompt card depicted the anti-inflammatory medications Respocort, Pulmicort, Becotide, Becloforte, Flixotide, Tilade and Intal. The ‘controllers’ prompt card included newer asthma medications Serevent, Oxis and Foradile, which have long-acting bronchodilatory and/or anti-inflammatory effects.

PATTERN OF MEDICATION USE

Information was sought regarding the survey children’s usual pattern of asthma medication use (Table 3.61). Carers were asked whether these medications were used *only* when the child was wheezing (i.e. as a ‘reliever’) or whether they were used regularly to prevent the onset or persistence of asthma symptoms (i.e. as a ‘preventer’ or ‘controller’).

Of those children who used ‘reliever’ medications, 73.2 per cent (CI: 67.9%–78.2%) used these medications only when wheezing and 16.8 per cent (CI: 12.5%–21.6%) used them regularly. ‘Preventer’ medications were equally likely to have been used ‘when wheezing’ (47.4 per cent; CI: 36.4%–58.9%) or ‘regularly’ (45.8 per cent; CI: 33.8%–57.3%). Meaningful analysis of the patterns of use of ‘controller’ medications was not possible because too few children had used these medications.

A small proportion of children had used more than one asthma medication in the past year (Table 3.62). Most commonly this involved use of a ‘preventer and a reliever’ (3.5 per cent; CI: 2.8%–4.3%). Other combinations included ‘two or more relievers’, ‘two preventers and a reliever’, and a ‘preventer and two relievers’ and occurred too infrequently to report reliably.

ASTHMA IN ABORIGINAL CHILDREN

The prevalence of asthma is believed to have increased among all Australian children over the past few decades.[1] This parallels worldwide trends reported by the International Study of Asthma and Allergies in Childhood (ISAAC) which show a rise in the proportion of children with asthma symptoms measured by objective tests such as spirometry, airway responsiveness by histamine inhalation tests, and atopy by skin prick tests.[2] While this may, in part, be due to changing definitions of asthma, it is now generally accepted that the reported increases in prevalence reflect

ASTHMA IN ABORIGINAL CHILDREN (Continued)

real differences.[3] Among the most likely reasons cited for these increases are gene interactions with changes in environmental and/or lifestyle factors. Current theories include the effects on the immune system of exposure to parasitic and other infection in early life, breastfeeding and diet, and the increased risks associated with exposure to indoor and outdoor pollutants and airborne allergens.[2]

The Western Australian Aboriginal Child Health Survey provides representative population level asthma prevalence estimates for Aboriginal and Torres Strait Islander children and youth. The relatively low prevalence of asthma in remote Aboriginal children is comparable to findings recently reported from a clinical and genetic study undertaken in two Western Australian Aboriginal communities (Warakurna and Kalumburu).[4] Of particular note was the survey finding that remote Aboriginal children exhibiting asthma symptoms were equally likely to have received a medical diagnosis and treatment for asthma as those living in urban areas. This suggests that the observed lower rates of asthma in remote communities genuinely reflect lower incidence and are not an artefact of non-diagnosis of the condition in these areas.

The difference in asthma prevalence between Aboriginal children in urban and remote areas of Western Australia are similar to those observed in earlier studies of Indigenous populations in Australia and countries such as Africa.[3, 5] However, the reasons for the increase in asthma which accompanies increasing urbanisation remain speculative. Asthma is now considered to be a classic example of gene-environment interaction with a host of environmental triggers, from cigarette smoke to house dust mites known to be implicated. At least five genes have been identified as playing a role in the development of asthma and related disorders such as eczema.[6, 7] Lifestyle changes in children's exposure to asthma-triggering factors and changes in protective factors such as breastfeeding have been suggested as key determinants of when and how genetic vulnerability might be expressed. One theory gaining support from evidence from several sources suggests that the immune system genes involved in asthma were originally evolved to fend off parasitic infections but are now being triggered by new environmental exposures. This hypothesis was tested in a gene-environment study in a remote Western Australian Aboriginal population heavily infected with hookworm and a stronger genetic effect was found among those individuals having this parasite.[8] This suggests that children raised in settings where there is less exposure to parasite infection are now susceptible to having these genes triggered by other allergens such as house-dust mites and airborne pollutants, and it is this which is contributing to the observed increases in asthma in urbanised settings.[8]

1 Peat JK, Van Den Berg RH, Green WF, Mellis CM, Leeder SR, Woolcock AJ, (1994). Changing prevalence of Asthma in Australian children. *British Medical Journal* 308; 1591–1596.

2 ISAAC Steering Committee, (1998). Worldwide variations in the prevalence of asthma symptoms: The International Study of Asthma and Allergies in Childhood (ISAAC). *European Respiratory Journal* 12; 315–335.

3 Veale AJ, Peat JK, Tovey ER, Salome CM, Thompson JE, Woolcock AJ, (1996). Asthma and Atopy in four rural Australian Aboriginal Communities. *Medical Journal of Australia* 165; 192–196.

4 Verheijden MW, Ton A, James AL, Wood M, Musk AW, (2002). Respiratory morbidity and lung function in two Aboriginal communities in Western Australia. *Respirology* 7; 247–53.

5 Yemaneberhan H, Bekele Z, Venn A, Lewis S, Parry E, Britton J, (1997) Prevalence of wheeze and asthma and relation to atopy in urban and rural Ethiopia. *Lancet* 350; 85–90.

6 Palmer LJ, Cookson WO, (2000). Genomic Approaches to Understanding Asthma. *Genome Research* 10; 1280–87.

7 Zhang Y, Leaves NI, Anderson GG *et al*, (2003). Positional cloning of a quantitative trait locus on Chromosome 13q14 that influences immunoglobulin E levels and asthma. *Nature Genetics* 34; 181–86.

8 Moffatt MF, Faux JA, Lester S, Pare P, McCluskey J, Spargo R, James A, Musk AW, Cookson WO, (2003). Atopy, respiratory function and HLA-DR genes in Aboriginal Australians. *Human Molecular Genetics*. 12; 625–30.

CHRONIC HEALTH CONDITIONS

Carers were asked if the children in their care suffered from any of a range of chronic health problems. The prevalence of selected health conditions was examined with reference to the child's age, sex, levels of relative isolation, levels of carer education and financial strain. Only statistically significant associations are reported here. Conditions of low prevalence, which include cerebral palsy, muscle stiffness or deformity, arthritis, rheumatism, missing limbs or digits, spina bifida, kidney/renal disease, diabetes, cancer or leukaemia and muscular dystrophy are not described in this section, but are the source of some of the disability described in a following section.

RECURRING INFECTIONS

Infections were the most common source of chronic health problems. Carers were asked if their child had any of a number of recurring infections.

Recurring chest infections

Recurring chest infections affected 12.3 per cent (CI: 11.1%–13.5%) of Aboriginal and Torres Strait Islander children aged 0–17 years. The prevalence of recurring chest infections tended to reduce with increasing age. For children aged 0–3 years the prevalence was 19.4 per cent (CI: 16.6%–22.7%) compared with 8.0 per cent (CI: 6.4%–9.7%) for children aged 12–17 years (Figure 3.20). There were no significant associations between prevalence of recurring chest infections and level of relative isolation (Figure 3.21).

Recurring skin infections

Carers were asked if their children had 'recurring skin infections, such as school sores or scabies', and were prompted that eczema is not an infection. An estimated 8.5 per cent (CI: 7.4%–9.7%) of all Aboriginal children aged 0–17 years were reported by their carers to have recurring skin infections. Children aged 4–11 years were more likely to have recurring skin infections (10.3 per cent; CI: 8.8%–11.9%) than 12–17 year olds (6.1 per cent; CI: 4.4%–8.1%) (Figure 3.20).

There was little variation in prevalence by level of relative isolation, with the exception that prevalence was doubled in extremely isolated areas, which had a reported prevalence of 17.6 per cent (CI: 12.4%–23.5%), significantly more prevalent than in any other LORI category (Figure 3.21).

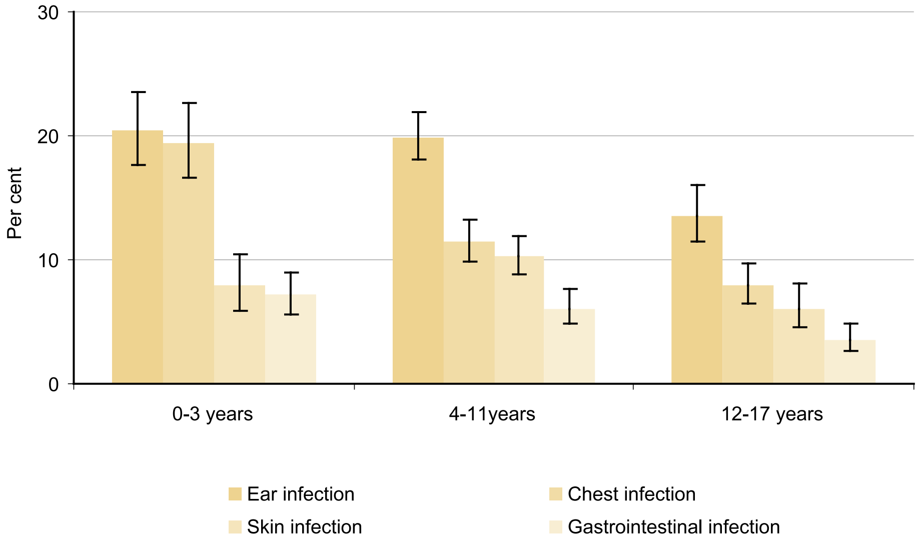
Recurring gastrointestinal infections

An estimated 5.6 per cent (CI: 4.7%–6.6%) of Aboriginal and Torres Strait Islander children were reported by their carers to suffer from recurring gastrointestinal infections. Prevalence decreased significantly after 12 years of age (Figure 3.20). Again, there was little variation in prevalence by degree of relative isolation, with the exception that prevalence doubled in extremely isolated areas (Figure 3.21).

Recurring ear infections

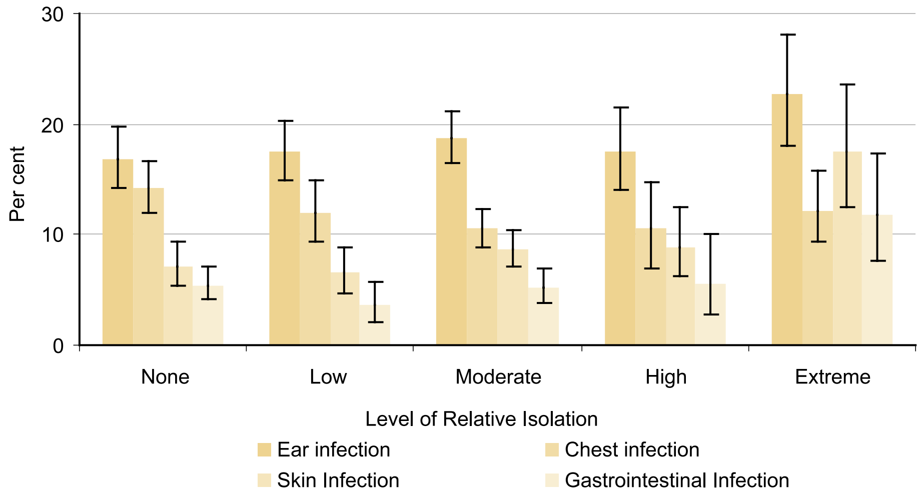
An estimated 18.1 per cent (CI: 16.8%–19.5%) of Aboriginal and Torres Strait Islander children aged 0–17 years were reported by their carers to have recurring ear infections. Older children aged 12–17 years were significantly less likely to have recurring ear infections (13.6 per cent; CI: 11.4%–16.0%) than children aged 0–3 years (20.4 per cent; CI: 17.6%–23.5%) and children aged 4–11 years (19.9 per cent; CI: 18.1%–21.9%) (Figure 3.20). Again, prevalence varied little by degree of relative isolation, with the exception that prevalence was somewhat, but not significantly, higher in extremely isolated areas (Figure 3.21).

FIGURE 3.20: CHILDREN — PREVALENCE OF RECURRING INFECTIONS, BY AGE



Source: Table 3.63

FIGURE 3.21: CHILDREN — PREVALENCE OF RECURRING INFECTIONS, BY LEVEL OF RELATIVE ISOLATION



Source: Table 3.64

Ear infections with discharge

In addition to recurring ear infections, carers were asked whether their child had ever had ‘runny ears’. Naturally the responses to these questions partially overlap. Of those children with recurring ear infections, 69.3 per cent (CI: 65.7%–72.9%) had had at least one instance in which the infection had been sufficiently severe to rupture the ear drum causing ear discharge (Table 3.65). Conversely 57.5 per cent (CI: 53.9%–61.0%) of children who have ever had discharging ears experienced recurring ear infections (Table 3.66).

For this survey, ear infections were classified as those that were:

- recurring, but never discharging
- a single episode of discharging ear(s)
- both recurring ear infections and at least one episode of discharging ear(s).

One in eight Aboriginal children (12.5 per cent; CI: 11.4%–13.7%) had recurring ear infections with at least one episode of discharging ears, a further 9.3 per cent (CI: 8.4%–10.3%) had had an isolated case of discharging ears, and a further 5.6 per cent (CI: 4.8%–6.4%) had recurring ear infections without drum rupture (Table 3.68). Figure 3.22 shows that the prevalence of the combined condition increases with increasing isolation and decreases with increasing age (bearing in mind that these data are likely to refer to approximately the last 5 years of a child’s life). This is not true of the isolated conditions, and the prevalence of recurring infection without rupture tends to decrease with increasing isolation.

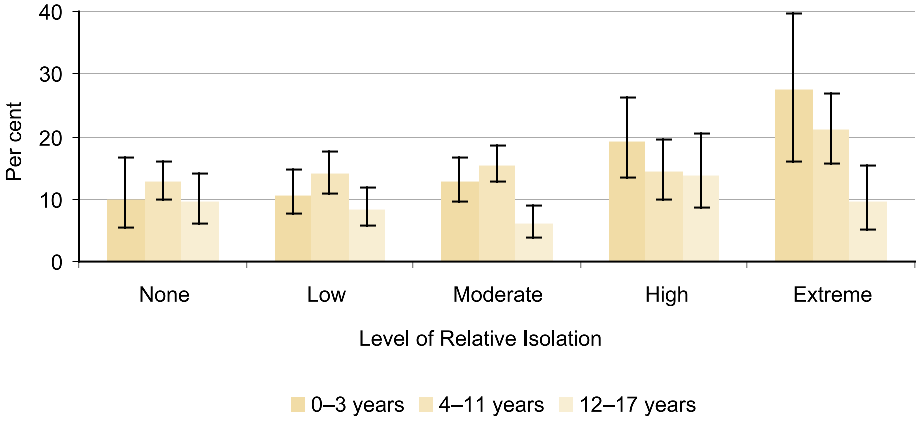
OTITIS MEDIA

Otitis media is an infection of the middle ear. It may occur in one or both ears and is the most common ear problem in children. The symptoms of otitis media vary. Mild cases may exhibit only irritability due to earache resulting from increased pressure in the middle ear. There may occasionally be cold and flu like symptoms with coughing and a runny nose accompanying the earache. If the pressure becomes too great, the ear drum may rupture which impairs hearing temporarily and results in a discharge from the ear. Thus ‘runny ears’ represent more severe forms of otitis media. The duration of infection also varies: if infection persists for longer than two weeks, it is referred to as *chronic*, and if an infectious discharge persists for more than two weeks it is referred to as *chronic suppurative otitis media*. The eardrum usually repairs itself once the infection has passed, but if infection and discharge occurs repeatedly, the ear drum loses its ability to repair itself and permanent hearing loss results.

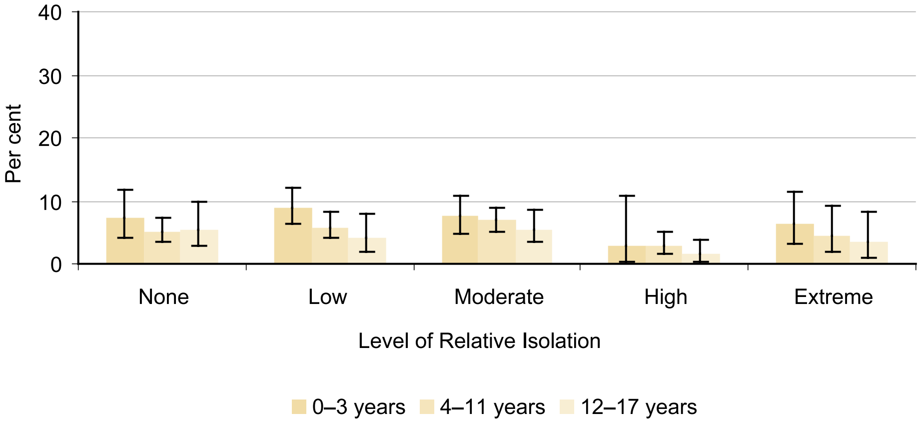
Otitis media frequently occurs early in life and may persist through the lengthy developmental period that encompasses the acquisition of speech and language, school enrolment and engagement in learning.

FIGURE 3.22: CHILDREN — RECURRING AND DISCHARGING EAR INFECTIONS BY CHILD'S AGE AND LEVEL OF RELATIVE ISOLATION

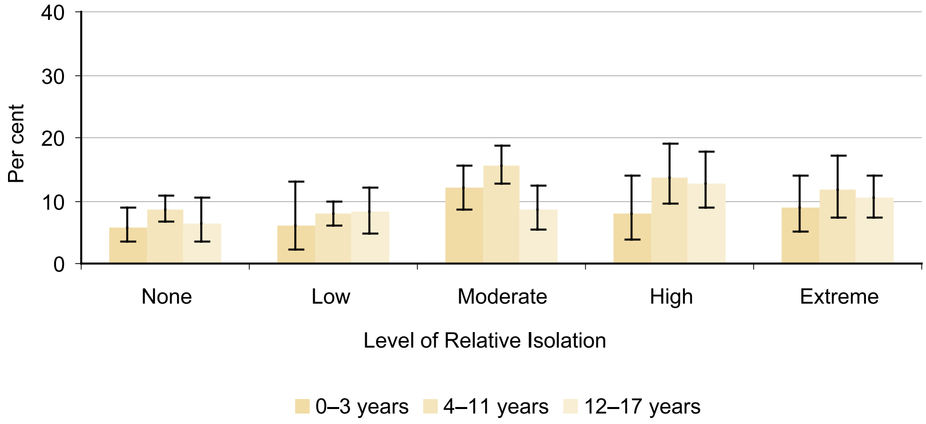
Recurrent and discharging



Recurrent, no discharge



Isolated discharge



Source: Tables 3.68, 3.69 and 3.70

The risk of discharging ears in children with recurring ear infections increases significantly in the most isolated areas, from 65.4 per cent (CI: 61.1%–69.6%) in areas of no, low or moderate isolation to 83.0 per cent (CI: 76.4%–88.3%) in areas of high and extreme isolation (Table 3.72). This risk remains the same across age groups in the more isolated areas, but peaks in the 4–11 year age group in less isolated areas. It can also be seen from Figure 3.22 that children in more isolated areas not only have a higher rate of ear infections, but acquire them earlier, with the combined infection having the highest prevalence in the 0–3 year age group in the most isolated areas, but in the 4–11 year age group in less isolated areas.

The occurrence of isolated eardrum rupture shows a rather different pattern, with prevalence peaking in all areas in the 4–11 year age group and being highest in areas of moderate isolation (Tables 3.68–3.70).

Associations with birth weight and gestation

Having more than one recurring infection tended to be associated with lower birth weight resulting from both poorer intrauterine growth and shorter gestation, but none reached statistical significance. Recurring and discharging ear infections were more strongly associated with preterm birth: 69.5 per cent (CI: 65.6%–73.3%) born at term compared with 75.6 per cent (CI: 73.4%–77.8%) of those without ear infections (Table 3.73). This shorter gestation was primarily responsible for the lower mean birth weight of 3,090 grams (CI: 3,030g–3,140g) compared with 3,190 grams (CI: 3,160g–3,220g) of those without ear infections (Table 3.74), though there was also a tendency to poorer intrauterine growth that did not reach statistical significance. Children with an isolated event of discharging ears were similar in birth weight and gestation to those without ear infections, while children with recurring ear infections without discharge were more likely to be born at term but have grown less well before birth than those whose recurring ear infections resulted in rupture (Tables 3.72 and 3.73).

Co-occurrence of recurring infections and discharging ears

Two thirds of the children, (68.6 per cent; CI: 66.7%–70.4%) reported none of the four types of recurring infections enquired about, while 21.7 percent (CI: 20.3%–23.1%) reported only one type of recurring infection. The remaining 9.7 per cent (CI: 8.6%–10.9%) reported more than one of the types of recurring infection. The majority (6.9 per cent; CI: 6.0%–7.9%) suffered from two types, 2.3 per cent (CI: 1.9%–2.8%) suffered from three types and 0.5 per cent (CI: 0.3%–0.9%) suffered from all four types of recurring infection. Multiple recurring infections were found in all age groups, but prevalence decreased with age: 36.0 per cent (CI: 30.4%–42.2%) of children aged 0–3 years had more than one recurring infection, compared with 24.1 per cent (CI: 18.9%–29.9%) of children aged 12–17 years. Significantly more children in areas of extreme isolation had more than one type of recurring infection, 17.9 per cent (CI: 12.3%–23.9%), than seen in less isolated areas (Tables 3.74—3.77).

When the individual combinations of recurring infections were examined, all types were found to occur more often in combination with other recurring infections than expected by chance. The strength of association between one type of infection and another can be described by the relative risk. For example, Figure 3.23 shows that the relative risk of recurring gastrointestinal infections in children with recurring ear infections is 3.6 (CI: 2.7–4.8). This means that children with recurring ear infections are 3.6 times more likely to have recurring gastrointestinal infections than are children who do not have recurring ear infections. Figure 3.23 shows that the risk of any recurring infection is significantly increased in the presence of any other recurring infection, although some are more strongly associated than others.

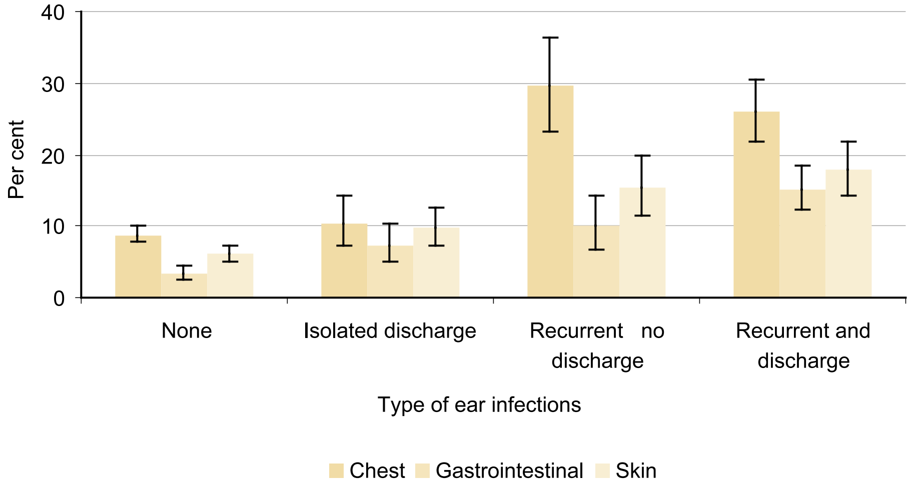
FIGURE 3.23: RELATIVE RISK (CONFIDENCE INTERVAL) OF ANOTHER RECURRING INFECTION, GIVEN THE PRESENCE OF EXISTING.RECURRING INFECTION

Current recurring infection	Relative risk of another recurring infection			
	Chest	Gastrointestinal	Skin	Ear
Chest		4.8 (3.6–6.4)	3.0 (2.3–3.8)	2.7 (2.3–3.1)
Gastrointestinal	3.8 (3.1–4.6)		4.0 (3.1–5.2)	2.6 (2.2–3.2)
Skin	2.8 (2.2–3.4)	4.4 (3.2–6.1)		2.2 (1.9–2.7)
Ear	3.0 (2.5–3.6)	3.6 (2.7–4.8)	2.6 (2.1–3.3)	

Source: Table 3.79

The additional effect of discharging ears is shown in Figure 3.24. Recurring ear infections with or without discharge have similarly strong associations with gastrointestinal, skin and particularly chest infections, but an isolated occasion of discharging ears has a much smaller effect on the risk of gastrointestinal and skin infections and does not significantly change the risk of recurring chest infections from that observed in children without recurring or discharging ear infections.

FIGURE 3.24: CHILDREN — PROPORTION WITH CHEST, GASTROINTESTINAL OR SKIN INFECTIONS BY TYPE OF EAR INFECTION.



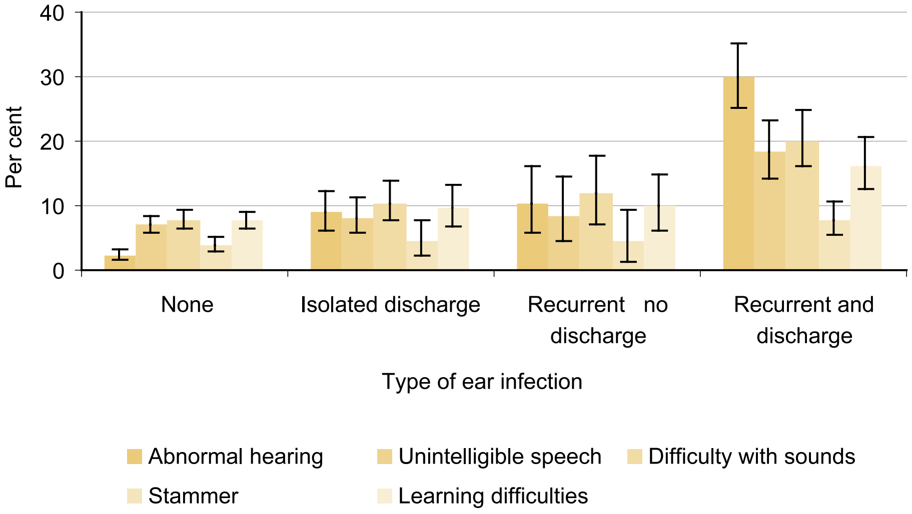
Source: Table 3.80

Functional impact of ear infections

Carers of children aged 4–17 years were asked whether their child's hearing was normal. The prevalence of abnormal hearing was 6.8 per cent (CI: 5.9%–7.8%) and did not differ by age group or by level of relative isolation. There was a very significant association between abnormal hearing and recurring ear infections with discharge (Table 3.81). Of children aged 4–11 years with recurring ear infections with discharge, 28.3 per cent (CI: 22.8%–34.3%) had abnormal hearing compared with 1.4 per cent (CI: 0.7%–2.4%) of those without ear infections (Table 3.82). The associations between abnormal hearing and either an isolated occasion of ear discharge or recurring infection without discharge were weaker although still very significant: 11.1 per cent (CI: 7.7%–15.7%) and 9.3 per cent (CI: 5.0%–15.9%) respectively. In children aged 12–17 years, there were similar associations but the prevalence of abnormal hearing was higher in all categories, including children with no reported ear infections (Table 3.83). This may have been because carers reported primarily ear infections that were considered current or recent and, simply because they are older, older children have a greater chance of having had earlier ear infections not reported at interview that may have damaged their hearing.

Loss of hearing has repercussions for language development and learning. It can be seen in Figure 3.25 that those with recurring ear infections with discharge not only had increased risk of abnormal hearing, but also a significantly greater risk of language problems and learning difficulties.

FIGURE 3.25: CHILDREN WITH EAR INFECTIONS — FUNCTIONAL IMPACT OF THE EAR INFECTION



Source: Table 3.81

OTITIS MEDIA – GLOBAL PERSPECTIVE

Chronic suppurative otitis media is a condition that occurs at frequencies in excess of two per cent in developing countries compared with less than one per cent in developed countries. However in some ethnic groups, notably Canadian Inuit and Australian Aboriginal people, rates in excess of 12 per cent have been observed.[1] For reference, the World Health Organisation regards a prevalence of chronic suppurative otitis media of greater than one per cent to present an avoidable health burden and rates of greater than four per cent to indicate a massive public health problem needing urgent attention. The additional risk in Inuit and Aboriginal people may be attributable to a slightly different architecture of the Eustachian tube that renders the middle ear more accessible to infections in the nose and throat[1], thereby increasing their need for effective primary preventive health care.

A survey of Aboriginal people living in the Pilbara region of Western Australia observed signs of otitis media (of unspecified duration or severity) in 25.6 per cent of children aged 10 years or less compared with 3.2 per cent in non-Aboriginal children of the same age.[2] These rates are distressingly high and compatible with the rates of ear infection observed in this survey.

1 World Health Organisation, (2002). Prevention of hearing impairment from chronic otitis media. Report of a WHO/CIBA foundation workshop,London, (19–21 November 1996). WHO. Geneva, <http://www.who.int/pbd/pdh/Docs/COMREP-8A.pdf >.

2 Torzillo PJ, Waterford JE, Hollows FC, Jones DL, (1983). Respiratory disease amongst Aborigines in the Pilbara. International. *Journal of Epidemiology* 12 (1); 105–106.

Associations with primary carer financial strain and educational attainment

An estimated 16.3 per cent (CI: 11.7%–22.0%) of children in households where the primary carer reported that they were ‘spending more money than we get’ suffered from more than one type of recurring infection. This is significantly higher than the prevalence in children in households where the primary carer reported that they ‘can save a bit now and again’ (8.4 per cent; CI: 6.7%–10.3%), or ‘can save a lot’ (7.2 per cent; CI: 3.7%–12.0%) (Table 3.84).

There was no association between either recurring infections or ear infections and the primary carer’s educational attainment (Table 3.85).

RECURRING INFECTIONS

Recurring infections are the dominant illnesses faced by Aboriginal and Torres Strait Islander children. Some of these infections are also associated with the occurrence of other acute and chronic illnesses through the life course. For example, recurring ear infection (e.g. otitis media) and recurring skin infection (e.g. pyoderma) are particularly burdensome with the latter in some Aboriginal communities being associated with the highest worldwide rates of acute rheumatic fever[1]. The major pathogen of skin infection, group A streptococcus, is also associated with chronic renal failure – a prevalent and highly burdensome condition of Aboriginal adults.

While levels of relative isolation have been shown to be associated with rates of recurring infection, this is particularly true for areas of extreme isolation.

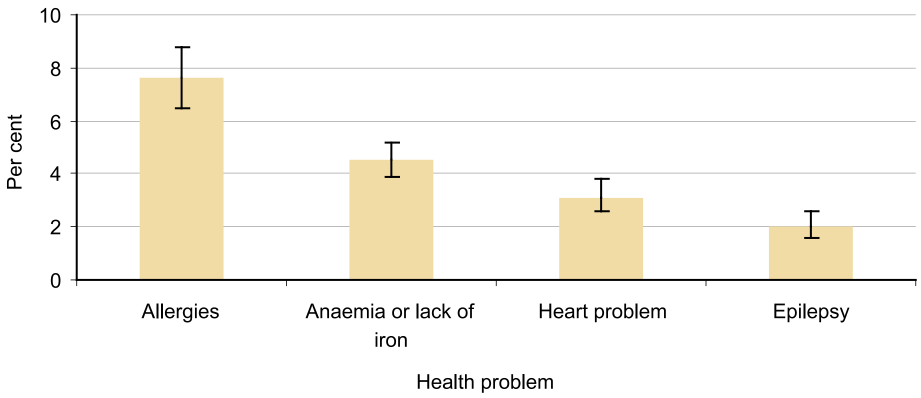
The reduction of the level of recurring infections in children is a principal performance indicator of progress in Aboriginal health. These high levels of recurring infections are related to the broad spectrum of disadvantage that Aboriginal people experience. Provision of basic public health, sanitation, nutrition, as well as access to health care and education, remain central to the effective reduction of these illnesses.

[1] Currie BJ, Carapetis JR, (2000). Skin infection and infestations in Aboriginal communities in northern Australia. *Australasian Journal of Dermatology* 41; 139–145.

OTHER CHRONIC HEALTH CONDITIONS — CHILDREN AGED 0–17 YEARS

All carers were asked whether their children had ‘allergies’, ‘anaemia or lack of iron (thin blood)’, a ‘heart problem’ and ‘epilepsy’. Of these conditions, the most prevalent was allergies, reported by carers of 7.6 per cent (CI: 6.5%–8.8%) of children. Anaemia or lack of iron was the next most prevalent of these health conditions with a reported rate of 4.5 per cent (CI: 3.9%–5.2%), followed respectively by heart problems (3.1 per cent; CI: 2.6%–3.8%) and epilepsy (2.0 per cent; CI: 1.6%–2.6%) (Table 3.86).

FIGURE 3.26: CHILDREN 0–17 YEARS — OTHER CHRONIC HEALTH CONDITIONS



Source: Table 3.86

OTHER CHRONIC HEALTH CONDITIONS — CHILDREN AGED 4–17 YEARS

Carers of children aged 4–17 years were also asked whether their children had ‘migraines or severe headaches’ and ‘developmental delay or lag (difficulty in learning)’, hereafter referred to as *learning difficulties* (Table 3.87). An estimated 12.4 per cent (CI: 11.1%–13.8%) of these children were reported by their carers to have had migraines or severe headaches, while 9.0 per cent (CI: 7.8%–10.4%) were reported as having learning difficulties.

As stated previously, children with recurring and discharging ear infections had a significantly greater risk of learning difficulties (Figure 3.25).

CHILDHOOD INJURY

Children of all ages participate in activities that involve rigorous play and risk behaviour that occasionally results in injuries being sustained. This section details carer reported prevalence of broken bones, head injuries resulting in loss of consciousness, accidental burns and accidental poisonings. The distribution of these injuries was examined with respect to age, sex, levels of relative isolation, and to levels of carer education and financial strain. Since lifetime occurrence was requested and, for more serious injuries such as broken bones and head injuries with loss of consciousness, likely to be remembered and reported, it is to be expected that older children would report higher rates as they had had more time to acquire an injury (Tables 3.87 and 3.88).

BROKEN BONES

These were the most commonly occurring type of injury. The proportion of children aged 12–17 years who had experienced at least one bone fracture was 18.3 per cent (CI: 15.7%–21.1%), almost one child in five (Table 3.88). This was lower than the proportion of 12–16 year olds who had ever broken a bone as reported in the 1993 WA Child Health Survey of the total population where the proportion was 25.6 per cent (CI: 22.2%–29.0%), just over one in four children.[10]

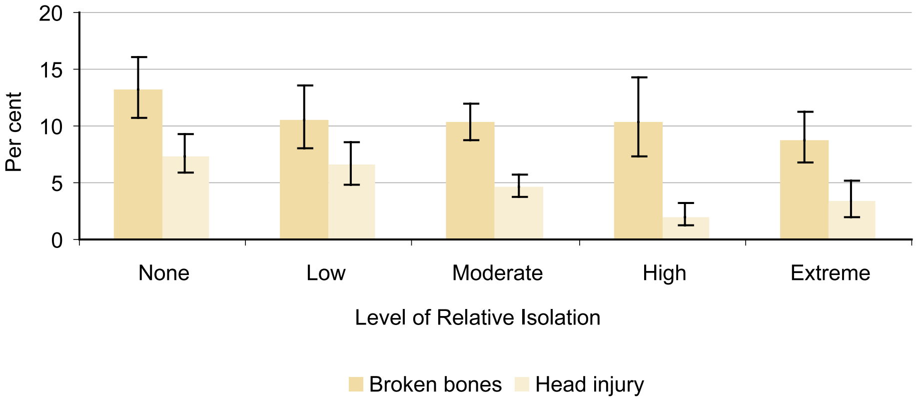
There was no significant association between reported bone fractures and levels of relative isolation, nor were there statistically significant differences between males and females.

HEAD INJURIES

Almost one tenth of Aboriginal and Torres Strait Islander children aged 12–17 years had suffered head injuries that rendered them unconscious (9.7 per cent; CI: 7.9%–11.7%), compared with 4.5 per cent (CI: 3.7%–5.5%) of those aged 4–11 years (Table 3.88). These figures are similar to those reported for the general population in the 1993 WA Child Health Survey, 8 per cent for adolescents and 3 per cent for 4–11 year olds.[10]

As shown in Figure 3.27, Aboriginal and Torres Strait Islander children in areas where the levels of relative isolation were moderate, high and extreme were significantly less likely to be reported to have sustained a head injury with loss of consciousness than their counterparts in the Perth metropolitan area. For example, in areas of extreme relative isolation, 3.4 per cent (CI: 2.0%–5.1%) of children had sustained a head injury with loss of consciousness compared with children living in Perth where the proportion was 7.4 per cent (CI: 5.9%–9.3%).

FIGURE 3.27: CHILDREN — INJURIES SUSTAINED, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 3.89

BURNS

Carers were asked whether any of their 4–17 year old children had ever been admitted to hospital due to a burn. An estimated 3.5 per cent (CI: 3.0%–4.1%) of Aboriginal and Torres Strait Islander children and adolescents were reported to have suffered such burns (Table 3.90). This is significantly more than the 2.0 per cent (CI: 1.5%–2.6%) reported for 4–16 year olds in the WA Child Health Survey.[10] There was no variation in proportion by level of relative isolation (Table 3.91).

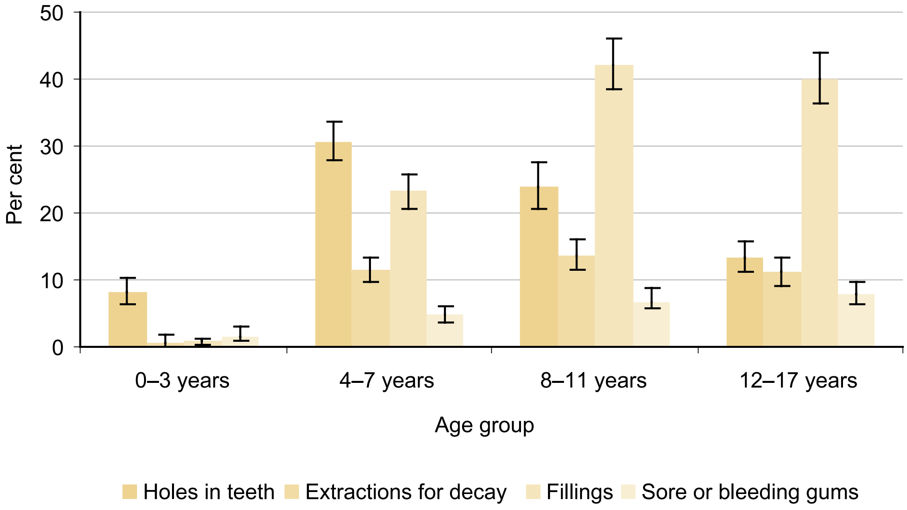
POISONING

Approximately 2.2 per cent (CI: 1.7%–2.9%) of Aboriginal and Torres Strait Islander children and adolescents aged 4–17 years were admitted to hospital due to an accidental poisoning (Table 3.90). This rate is slightly, but not significantly, lower than the 2.9 per cent (CI: 2.3%–3.7%) reported for 4–16 year olds in the WA Child Health Survey.[10] There was no variation in proportion by level of relative isolation (Table 3.91).

ORAL HEALTH

Carers were asked whether their child currently has holes in their teeth (cavities), has ever had teeth removed because they were bad, has had dental fillings or ever had a problem with sore or bleeding gums.

FIGURE 3.28: ALL CHILDREN — SELECTED ORAL HEALTH PROBLEMS, BY AGE



Source: Table 3.93

PREVALENCE OF TOOTH CAVITIES IN CHILDREN

An estimated 18.6 per cent (CI: 17.1%–20.2%) of Aboriginal and Torres Strait Islander children were reported by their carers to have holes in their teeth.

As expected, the prevalence of cavities was lowest for children aged 0–3 years at 8.2 per cent (CI: 6.4%–10.2%), and highest for children aged 4–7 years at 30.6 per cent (CI: 27.8%–33.6%). Prevalence was lower for older children with 24.0 per cent (CI: 20.7%–27.6%) of 8–11 year olds and 13.3 per cent (CI: 11.1%–15.9%) of 12–17 year olds having holes in their teeth (Table 3.93).

As displayed in Figure 3.29 there was no difference in the proportion of children who had holes in their teeth in areas where the levels of relative isolation were None, Low or Moderate. However, the prevalence of cavities was significantly less in areas of extreme isolation. In the Perth metropolitan area the prevalence was 19.3 per cent (CI: 16.6%–22.2%) compared with 12.3 per cent (CI: 9.6%–15.4%) in areas of extreme isolation (Table 3.92).

TOOTH EXTRACTIONS

Almost one in ten (9.3 per cent; CI: 8.3%–10.4%) Aboriginal and Torres Strait Islander children were reported to have ever had a tooth removed because if was bad. Obviously, very young children (aged 0–3 years) were far less likely to have had a tooth extraction for dental decay, but the proportion of children who had ever had a tooth extraction for decay was approximately constant for children aged 4–7 years, 8–11 years and 12–17 years (Table 3.93).

DENTAL FILLINGS

Carers reported that 27.5 per cent (CI: 25.7%–29.4%) of children have ever had a tooth filled.

As might be expected a greater proportion of older children than younger children were reported by their carers to have ever had a dental filling. Less than 1 per cent (CI: 0.4%–1.3%) of 0–3 year olds were reported to have a filling while among 8–11 year olds and 12–17 year olds the proportions were 42.2 per cent (CI: 38.5%–46.0%) and 40.0 per cent (CI: 36.4%–43.8%) respectively (Table 3.93).

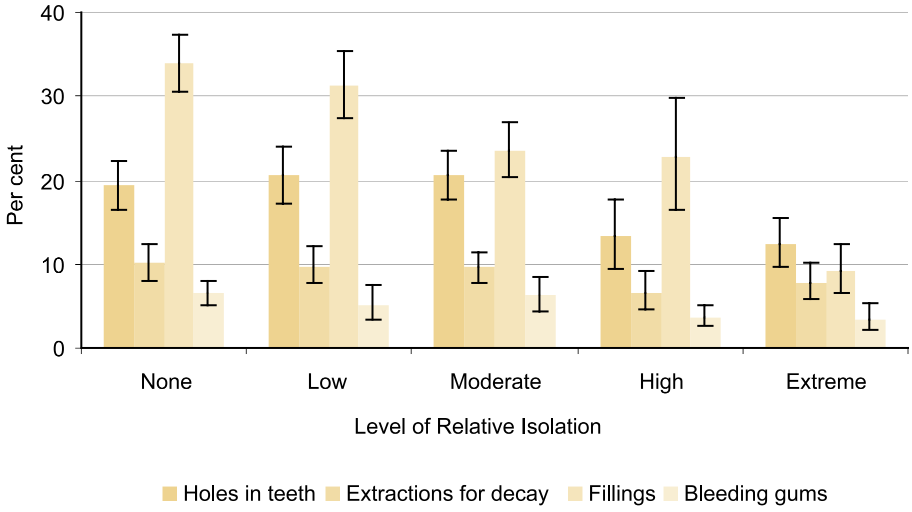
There was also a significant decrease in lifetime occurrence of fillings by level of relative isolation – from 33.9 per cent (CI: 30.6%–37.4%) in the Perth metropolitan areas to 9.2 per cent (CI: 6.6%–2.4%) in areas of extreme isolation (Table 3.92).

SORE OR BLEEDING GUMS

An estimated 5.5 per cent (CI: 4.7%–6.4%) of all children have had a problem with sore or bleeding gums. As shown in Figure 3.29, the prevalence of sore or bleeding gums was significantly higher among children aged 12–17 years (8.0 per cent; CI: 6.5%–9.7%) than in children aged 0–3 years and 4–7 years where the proportions of children with lifetime occurrence of sore or bleeding gums were 1.5 per cent (CI: 0.8%–2.9%) and 4.9 per cent (CI: 3.6%–6.2%) respectively (Table 3.93).

There was no significant difference in the lifetime occurrence of sore or bleeding gums according to the level of relative isolation in which the children live.

FIGURE 3.29: CHILDREN — SELECTED ORAL HEALTH PROBLEMS, BY LEVEL OF RELATIVE ISOLATION



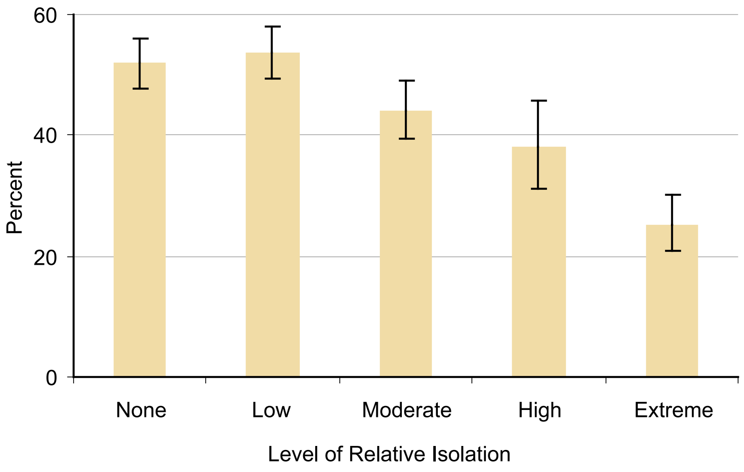
Source: Table 3.92

OVERALL OCCURRENCE OF DENTAL PROBLEMS

Data on holes in teeth, tooth removal for decay and fillings were combined to determine the overall occurrence of one or more of the dental problems. The problem of sore or bleeding gums was excluded from this analysis as it is symptomatic of periodontal (gum) disease. Overall, 37.8 per cent (CI: 35.9%–39.8%) of children had experienced tooth decay, tooth removals or fillings. As expected, very few children under 4 years of age had experienced these problems (8.7 per cent; CI: 6.9%–10.9%) (Table 3.94). Almost half of children aged 4–17 years have had at least one dental problem (46.6 per cent; CI: 44.3%–48.9%) (Table 3.95).

Among children aged 4–17 years, there was a substantial decrease in the proportion of children who had experienced one or more of these dental problems by level of relative isolation. Of children living in the Perth metropolitan area, 52.0 per cent (CI: 47.9%–56.1%) had experienced one or more dental problems. In areas of high and extreme relative isolation the figures were 38.2 per cent (CI: 31.3%–45.8%) and 25.2 per cent (CI: 20.8%–30.3%) (Table 3.95).

FIGURE 3.30: CHILDREN AGED 4–17 YEARS — PROPORTION WITH AT LEAST ONE DENTAL PROBLEM, BY LEVEL OF RELATIVE ISOLATION



Source: Table 3.95

DENTAL CARE

Aboriginal and Torres Strait Islanders are more likely than non–Indigenous Australians to have lost all their teeth or have gum disease but are less likely to receive caries treatment. The incidence of decayed, missing and filled teeth in Aboriginal children is almost double that of non–Aboriginal children.

Diet is an important determinant of poor oral health. The main risk factors for caries include frequency of carbohydrate intake, the number of meals and snacks per day, oral hygiene practices, fluoride intake, regularity of checkups and socio–economic status.[1]

The data reported here are based upon carer reports rather than administrative data documenting actual dental care provided to Aboriginal children under the age of 18 years. For this reason they must be regarded with some caution – it is not the case that carers are necessarily knowledgeable about the condition of their child's teeth. With these limitations in mind there are several features of the current data that merit comment.

Sore and bleeding gums can be symptomatic of periodontal (gum) disease. This is most often due to build-up of plaque along the gum line, which encourages the growth of bacteria. Periodontal disease, if untreated, can result in loss of teeth. It can be prevented by regular brushing and flossing of teeth, a balanced diet and abstinence from tobacco products. Regular dental checkups can detect early indicators of periodontal disease and advise on treatment before the disease progresses. The fact that five per cent of Aboriginal children have had sore or bleeding gums suggests a lack of proper oral hygiene among some Aboriginal children. This could be due to dental health promotion programmes not effectively reaching all Aboriginal children and their carers.

Historically, it is believed that Aboriginal children and adults enjoyed excellent dental health, with rates of dental caries among the lowest in the world.[2,3] In the 1950s, Aboriginal children had much better dental health than non-Aboriginal children.[2] The rise in the occurrence of tooth decay is directly related to loss of traditional lifestyles and diets and the increasing adoption of western style diets that include refined carbohydrates and sugars.[4]

The low level of dental problems in areas of extreme isolation where traditional Aboriginal culture remains strongest reflects a greater reliance on bush tucker and less reliance on diets high in energy derived from refined carbohydrates and saturated fats. Traditional diets are generally low in energy density but high in nutrient density, being high in protein, low in sugars, high in complex carbohydrate of low glycaemic index and high in micronutrients.[1]

While dental health has improved for non-Aboriginal children with improvements in dental health promotion and dental health service delivery, it appears that dental health of Aboriginal children has been deteriorating. This is most notable in areas where non-traditional lifestyles and diets are dominant.[5]

1 National Health and Medical Research Council, (2000) Nutrition in Aboriginal and Torres Strait Islander Peoples: An information paper; 183-188. NHMRC. Canberra.

2 Barrett MJ, (1953). Dental observations on Australian Aborigines: Yuendumu, Central Australia, 1951-52. *Australian Dental Journal* 57; 127–138.

3 Mattingly HV, (1915). *Community Dental Review* 12; 388-94.

4 Campbell TD, (1939). Food, food values and food habits of the Australian Aborigines in relation to their dental conditions. Part 1. *Australian Journal of Dentistry* 43; 1–15.

5 Davies MJ, Spencer AJ, Westwater A, Simmons B, (1997). Dental caries among Australian Aboriginal, non-Aboriginal Australian-born, and overseas-born children. *Bulletin of the World Health Organisation* 75; 197–203.

DISABILITY

Historically, disabilities were defined in terms of specific conditions, illnesses and injuries. Over recent decades the view of disability has evolved and the emphasis is now on functional impacts. Disabilities are defined in terms of functional limitations, or restrictions in participation in activities. The causes of disabilities are diverse. Disabilities impact on children's development by reducing the capacity of the individual for communication, learning and social interaction. Disabilities are often permanent and consequently there is a need for ongoing support services. This section describes the prevalence of disabilities within Aboriginal children and the burden disabilities place on carers.

There are limited data available relating to the prevalence of disability amongst Aboriginal and Torres Strait Islander peoples. Even where data are available, there are often issues with its quality – principally the lack of an adequate sample size for Aboriginal populations in mainstream surveys and the fact that the surveys are often not sensitive to cultural needs.[17]

The Western Australian Aboriginal Child Health Survey included questions about any restrictions to children's core activities that included self-care, mobility and communication.

LIMITATION OF INDEPENDENT FUNCTION

Self care

Carers of children aged 4–17 years were asked if children in their care needed physical help with activities of daily living such as eating, dressing, bathing and going to the toilet. An estimated 380 children, or 1.7 per cent (CI: 1.2%–2.2%) of children between the ages of 4 and 17 years required help with these basic activities. There was a higher reported prevalence of children needing this type of help in areas with little or no level of relative isolation (2.3 per cent; CI: 1.5%–3.3%), than in areas with moderate or greater levels of relative isolation (0.8 per cent; CI: 0.5%–1.1%). (Table 3.96)

There were no statistically significant differences found by sex or age (Table 3.97).

Mobility

The survey identified so few cases of children who were unable to walk or needed help to get around that meaningful analysis of this specific group was not possible.

OTHER LIMITATIONS

Vigorous activity

Carers were asked if there were any games or sports involving strong exercise that the children in their care could not do because of an illness or disability. Limitations were experienced by approximately 4.1 per cent of children aged 4–17 years (CI: 3.3%–5.0%) (Table 3.96). Limitations in active games or sports were reported more frequently in areas of little or no relative isolation (5.5 per cent; CI: 4.1%–7.0%) compared to areas of moderate or greater relative isolation (2.2 per cent; CI: 1.5%–3.0%). There were no statistically significant differences found by age or sex (Table 3.97).

The 1993 WA Child Health Survey of the general population found that 8 per cent

(CI: 6.3%–8.7%) of children aged 4–16 years experienced limitations in active games and sports.[10]

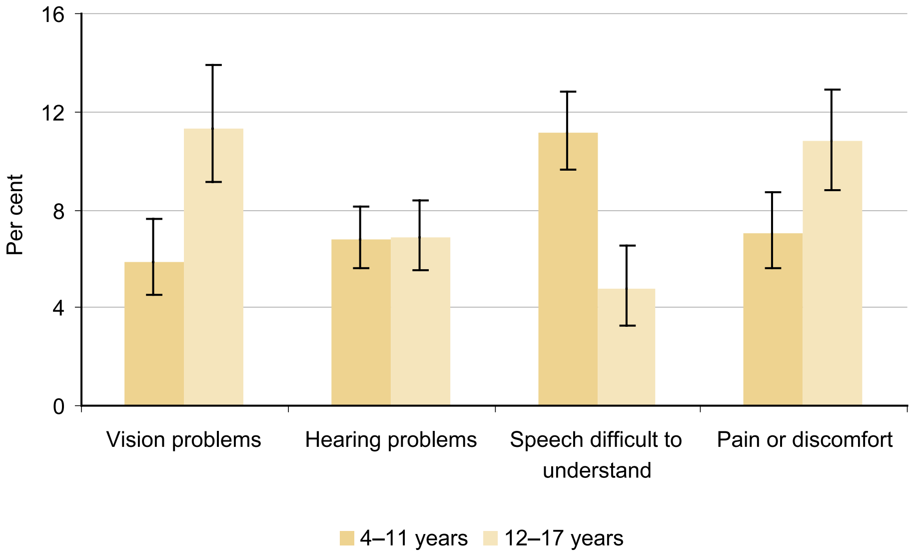
Schoolwork

Only 4.4 per cent (CI: 3.6%–5.4%) of children were reported by their carers to need special help at school because of illness or disability (Table 3.97). Most commonly, this special help took the form of a special class (26.7 per cent; CI: 18.5%–36.2%) or a teacher's aide (20.2 per cent; CI: 12.4%–29.2%) (Table 3.98).

SENSORY FUNCTIONS PROBLEMS AND PAIN

Over one in four (26.9 per cent; CI: 25.0%–28.9%) Aboriginal children in Western Australia aged 4–17 years were limited in one or more sensory functions or experienced pain (Tables 3.99, 3.100). The prevalence of selected problems is shown in Figure 3.31.

FIGURE 3.31: PREVALENCE OF INDIVIDUAL SENSORY FUNCTION PROBLEMS AND PAIN, BY AGE



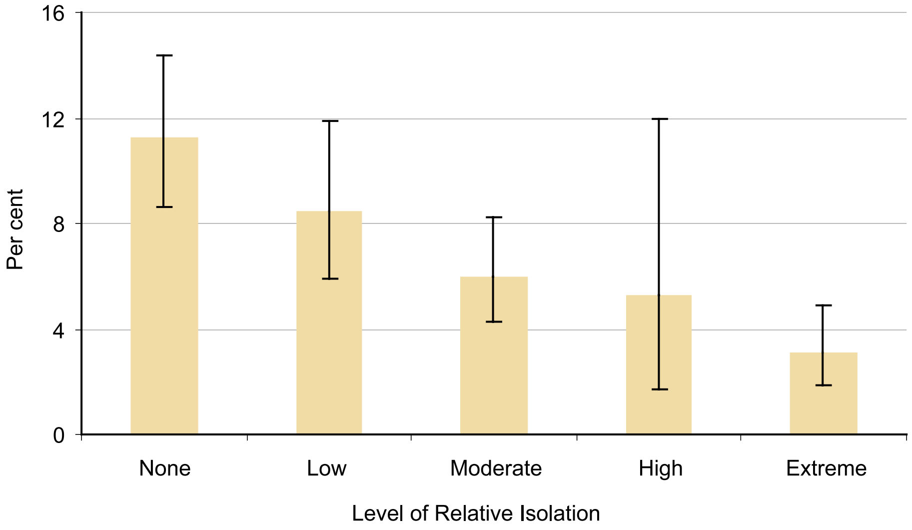
Source: Table 3.102

Vision

Some 8.1 per cent (CI: 6.8%–9.6%) of Aboriginal children aged 4–17 years did not have normal vision in both eyes (Table 3.101), This is significantly lower than the 14 per cent (CI: 12.4%–15.6%) of children aged 4–16 years in the general population found in the 1993 WA Child Health Survey not to have normal vision in both eyes.[10]

Impairment in vision was more common in older children, with 5.9 per cent (CI: 4.5%–7.6%) of 4–11 year-old Aboriginal children having some degree of visual impairment compared with 11.3 per cent of 12–17 year-olds (CI: 9.1%–13.9%). No statistically significant difference was found by sex (Table 3.102).

FIGURE 3.32: CHILDREN 4–17 YEARS — VISION PROBLEMS BY LEVEL OF RELATIVE ISOLATION



Source: Table 3.101

Figure 3.32 shows the reported prevalence of vision problems by level of relative isolation. The proportion decreased from 11.3 per cent (CI: 8.6%–14.4%) in the Perth Metropolitan area, where the level of relative isolation is none to 3.1 per cent (CI: 1.9%–4.9%) in the parts of Western Australia where the level of relative isolation is extreme.

At the time of the survey, 4.7 per cent (CI: 3.8%–5.6%) of 4–17 year-old children used prescribed glasses or contact lenses (Table 3.101) representing 58 per cent (CI: 48%–67%) of those children who did not have normal vision in both eyes. Usage increased with age with 2.6 per cent (CI: 1.9%–3.4%) of 4–11 year olds and 7.8 per cent (CI: 6.0%–9.9%) of 12–17 year olds wearing glasses or contact lenses (Table 3.102).

The proportion of children using prescribed glasses or contact lenses declined by level of relative isolation, falling from 6.2 per cent (CI: 4.3%–8.4%) in the Perth Metropolitan area to 1.1 per cent (CI: 0.5%–2.1%) in the parts of Western Australia with extreme level of relative isolation (Table 3.101).

IMPAIRMENTS OF VISION

The prevalence of carer reported visual impairment in Aboriginal children (8 per cent) is significantly lower than that reported by carers of non-Indigenous children (14 per cent).[1] The proportion of Aboriginal children with visual impairment declined significantly with increasing level of relative isolation. It is generally accepted that the development of myopia, the most commonly occurring visual impairment in children, is associated with the amount of close work undertaken. Myopia is less common in rural and remote areas, most likely because of lifestyles and the type of schooling undertaken.[2]

Australia is the only developed country that still has trachoma, an easily spread infection of the eye with symptoms resembling conjunctivitis. Repeated occurrences scar the upper eyelid, eventually turning it inward. The eyelashes then scratch the cornea, which can ultimately lead to blindness. The disease is easily spread by hands, clothing or flies that have come in contact with discharge from the eyes or nose of an infected person. The disease generally occurs in poor countries where people have limited access to water and health care. The prevalence of trachoma is high in Northern Australia. Reported rates of trachoma in children range from 26 per cent (CI: 17%–38%) in 7 communities in East Arnhem, 55 per cent in the Pilbara and 40 per cent (CI: 32%–46%) in Central Australia. [3,4,5]

In the Kimberley region, the Kimberley Public Health Unit has coordinated a school-based trachoma control program since 1989. The program has reduced the prevalence of trachoma among school–aged children. In 2002, 1,552 children were screened from 29 schools. The prevalence of trachoma has decreased from 16.9 per cent in 2000 to 10.5 per cent in 2002.[6]

The National Aboriginal and Torres Strait Islander Eye Health Program, through OATSIH, promotes the World Health Organisation's Surgery, Antibiotics, Facial cleanliness and Environmental Hygiene (SAFE) strategy for trachoma control. Major components of the program include the establishment of Eye Health Coordinator positions nationally within Aboriginal primary health care settings and the provision of ophthalmic equipment and training for coordinators and workers in identified Aboriginal Community Controlled Health Services. Nationally, six regional eye health program service areas have been selected, with one being the Kimberley region of WA.

1 Zubrick SR, Silburn SR, Garton A, Burton P, Dalby R, Carlton J, Shepherd C, Lawrence D, (1995). Western Australian Child Health Survey: Developing Health and Well being in the Nineties. Australian Bureau of Statistics and the Institute for Child Health Research. Perth, Western Australia.

2 Weale RA, (2003). Epidemiology of refractive errors and presbyopia. *Survey of Ophthalmology* 48; 515–543.

3 Paterson B, (2002). Trachoma: New problem or old dilemma? *Northern Territory disease Control Bulletin* 9.

4 Thomson N, Paterson B, (1998). Eye health of Aboriginal and Torres Strait Islander people, National Aboriginal and Torres Strait Islander Health Clearinghouse.

5 Ewald D, Hall G, Franks C, (2003). An evaluation of a SAFE-style trachoma control program in Central Australia. *Medical Journal of Australia* 178; 65–68.

6 Mahony A, (2003). Kimberley trachoma control program 2002. *Kimberley Public Health Bulletin* 18.

Hearing

Almost 6.8 per cent (CI: 5.9%–7.8%) of Aboriginal children aged 4–17 years did not have normal hearing in both ears (Table 3.101).

Rates did not appear to vary by age, sex or level of relative isolation, and were similar to those found in the 1993 WA Child Health Survey.[10] Almost half of these children were deaf or partially unable to hear in one ear only (49 per cent; CI: 42%–56%), and almost one quarter were deaf or partially unable to hear in both ears (24 per cent; CI: 18%–30%), while in 25 per cent of cases the type of hearing problem was not stated (Table 3.103). In the 1993 WA Child Health Survey, 53 per cent (CI: 40%–66%) of children were reported to be deaf or partially deaf in one ear only, and 34 per cent (CI: 23%–49%) were deaf or partially deaf in both ears.

SPECIALISED HEARING TRAINING AND EQUIPMENT

The Australian Government Department of Health and Ageing currently funds specialised hearing training and audiometric equipment for Aboriginal Community Controlled Health Services (ACCHS). Training is provided to at least two Aboriginal Health Workers from each of the participating ACCHS.

The training covers individual case management, screening using the audiometric equipment provided, program management, and community education. A review of hearing services provided to Aboriginal peoples found that this component of the national Aboriginal and Torres Strait Islander Hearing Strategy delivered sustained and consistent access to training, with 360 Aboriginal Health Workers successfully completing the training modules.[1]

[1] Department of Health and Ageing, (2002). Report on Commonwealth funded hearing services to Aboriginal and Torres Strait Islander Peoples: Strategies for future action.

Speech and language

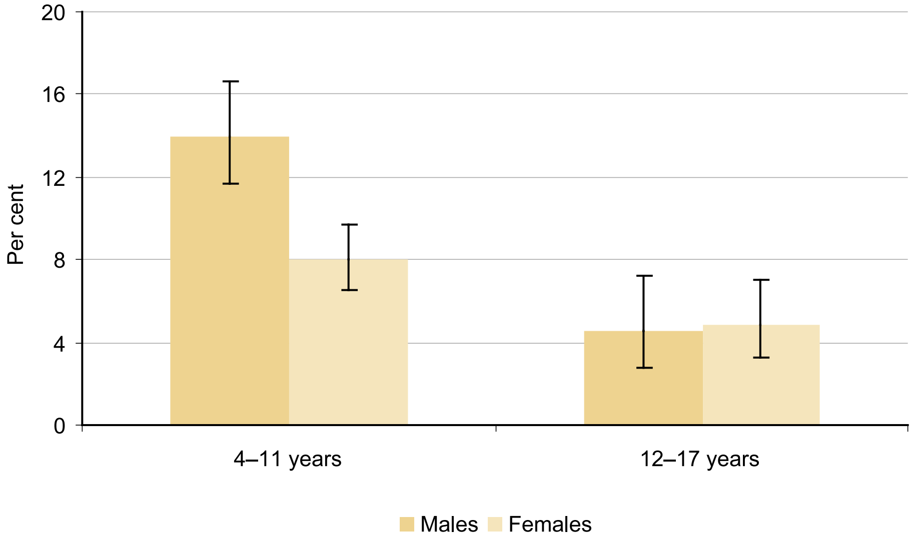
Approximately one in ten children were reported to have trouble saying certain sounds (9.8 per cent; CI: 8.6%–11.0%). As shown in table 3.101 this problem was experienced by 13.4 per cent (CI: 11.6%–15.2%) of 4–11 year-olds, but decreased to only 4.3 (CI: 3.4%–5.5%) per cent of the 12–17 year-olds (Table 3.102). Results were similar to the 1993 Child Health Survey.[10]

Males aged 4–11 years were more likely to have difficulty saying certain sounds (16.5 per cent; CI: 14.0%–19.4%), than females in this age group (9.9 per cent; CI: 7.7%–12.6%). At older ages no difference was observed between males and females (Table 3.102).

Stuttering was reported among 4.5 per cent of children aged 4–17 years (CI: 3.7%–5.4%) and was more common among males (6.4 per cent; CI: 5.3%–7.7%), than females (2.6 per cent; CI: 1.5%–4.0%) (Table 3.104).

There were functional consequences in some children who were reported to have these speech difficulties. For 8.5 per cent (CI: 7.5%–9.9%) of children, caregivers reported that people needed help to understand what the children were saying. As illustrated in Figure 3.33, carers reported that other people needed help to understand the speech of 4–11 year old males more frequently than females in the same age group.

FIGURE 3.33: CHILDREN AGED 4–17 YEARS — SPEECH WAS DIFFICULT TO UNDERSTAND



Source: Table 3.104

SPEECH AND LANGUAGE IMPAIRMENT

Speech and language are one of the principal developmental skills that infants and young children acquire. Once learned, these are skills that are built upon and used for the rest of life.

The data reported here provide a rare glimpse of carer reported perceptions of Aboriginal children with speech problems. These rates generally conform to those reported in the mainstream population where similar methods have been used.[1]

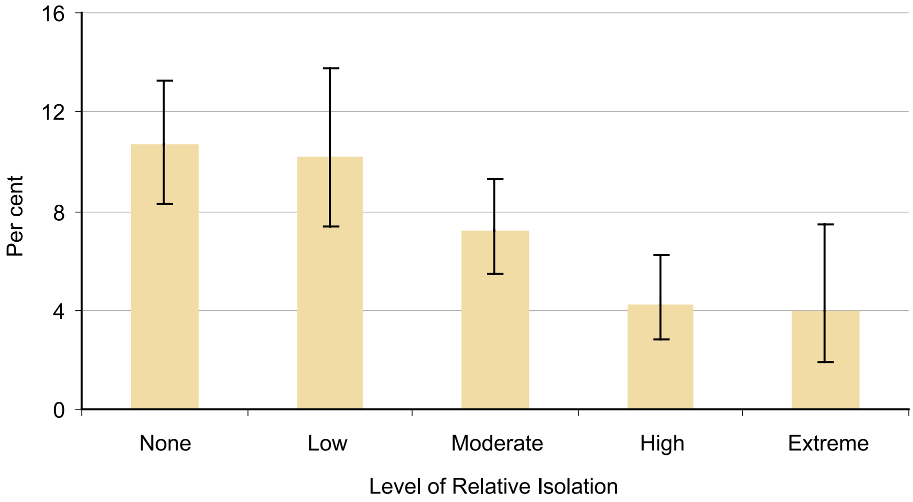
While carer-reported rates for Aboriginal children might be similar to those reported for non-Indigenous children, it is important to recognise that the underlying causes of these problems may differ in their onset, intensity and duration. Hearing difficulties for example, particularly those related to chronic middle ear infections, are strongly associated with speech and language problems.

[1] Zubrick SR, Silburn SR, Garton A, Burton P, Dalby R, Carlton J, Shepherd C, Lawrence D, (1995). Western Australian Child Health Survey: Developing Health and Well being in the Nineties. Australian Bureau of Statistics and the Institute for Child Health Research. Perth, Western Australia.

Pain

Carers reported that physical pain or discomfort was experienced by 8.5 per cent (CI: 7.3%–9.8%) of 4–17 year–olds. Figure 3.34 illustrates that the reported prevalence of pain varied by level of relative isolation.

FIGURE 3.34: CHILDREN 4–17 YEARS — EXPERIENCE OF PAIN OR DISCOMFORT, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 3.101

A significantly higher proportion of children aged 12–17 years experienced pain or discomfort, with 10.8 per cent (CI: 8.8%–12.9%) of these children experiencing some level of pain or discomfort compared with 7.0 per cent (CI: 5.6%–8.7%) of younger children (Table 3.101).

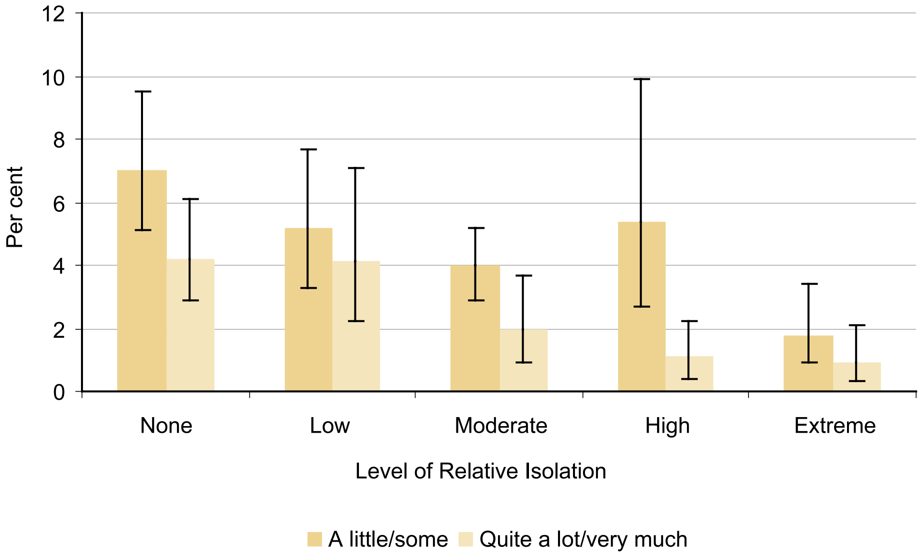
Figures were similar to the 1993 Child Health Survey.[10]

Among children with pain, equivalent proportions were reported to suffer ‘a little’, ‘some’, or ‘a lot’ of pain (Tables 3.105, 3.106).

BURDEN OF DISABILITY

Disabilities have the potential to place a significant burden on the carers and families of children with disabilities. Carers were asked if each child placed a burden on them and the family as a result of any disability, chronic illness or pain. Some 5.2 per cent (CI: 4.3%–6.3%) of children placed a ‘little or some’ burden on their carers and families, while 3.0 per cent (CI: 2.3%–3.9%) of children placed ‘quite a lot or very much’ burden on their carers and families. The experience of burden on carers and families declined with increasing level of relative isolation as illustrated in Figure 3.35.

FIGURE 3.35: CHILDREN 4–17 YEARS — BURDEN ON FAMILY AS A RESULT OF DISABILITY, CHRONIC ILLNESS OR PAIN



Source: Table 3.107

Burden was reported to be particularly high in families where children were reported to have impairments in self-care (e.g. activities of daily living). For example, just over half of the carers of the 380 (CI: 270–510) children who needed special help with eating, dressing, bathing or toileting reported that this placed ‘quite a lot or very much’ burden on the family (54 per cent; CI: 37%–68%) while another 23.3 per cent (CI: 11%–42%) reported a little or some level of burden.

DISABILITY IN ABORIGINAL CHILDREN

Good quality data about the level of disability in the Aboriginal population, and for Aboriginal children specifically, remains scarce and disability within this population is poorly described.[1] The data reported here provide some insights into aspects of disability in the Aboriginal population of children and young people. However, they have their limitations.

These data are based upon parental reports in response to structured questions about the presence or absence of impairment and, where present, on questions that probed general impact on function. Direct examination of children by qualified professionals enabling a more objective assessment of disability was not used. Additionally, carers may differ in their ability to report the presence or absence of disability particularly where functional impairment is mild. In more remote regions there may be cultural differences affecting the reporting of a child’s levels of impairment of, for example, pain.

Notwithstanding these qualifications, in general the findings suggest that the reported rates of disability associated with significant impairment in activities of daily living for Aboriginal children are similar to those reported in the mainstream population, as too are rates of reported speech problems. In other areas, such as impairment of vision, reported prevalence rates are lower than those found in mainstream populations.

There was a general trend for disabilities to be less frequent in more isolated areas. While this may reflect a reduced incidence of disabilities, for example visual impairments, it may also suggest that children with special needs and their families move to areas where those needs can be best addressed, such as the metropolitan area or major regional centres.

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Table 3.1: Births linked to MCHRDB — Birth weight, gestational age, time to spontaneous respiration, Apgar score and maternal age

	Aboriginal births				Total population(a) (N = 496,286)
Birth characteristics	Number	95% CI	%	95% CI	%
	Gestational age				
Less than 37 weeks	3 460	(3 110 – 3 830)	13.3	(12.0 – 14.7)	*8.2*
37 weeks or more	22 400	(21 800 – 23 000)	86.4	(85.0 – 87.7)	*91.6*
Not stated	80	(50 – 110)	0.3	(0.2 – 0.4)	*0.2*
Total	26 000	(25 400 – 26 400)	100.0		100.0
	Birthweight				
Less than 2500 grams	2 950	(2 600 – 3 320)	11.4	(10.0 – 12.8)	*6.6*
2500 grams or more	23 000	(22 400 – 23 600)	88.6	(87.2 – 90.0)	*93.4*
Total	26 000	(25 400 – 26 400)	100.0		100.0
	Percent of optimal birthweight (POBW)				
Less than 85%	5 420	(4 970 – 5 880)	20.9	(19.2 – 22.6)	*12.9*
85% or more	19 400	(18 800 – 20 000)	74.8	(73.0 – 76.5)	*84.8*
Not stated	1 120	(960 – 1 290)	4.3	(3.7 – 5.0)	2.3
Total	26 000	(25 400 – 26 400)	100.0		
	Time to spontaneous respiration				
Less than 2 minutes	21 700	(21 100 – 22 300)	83.6	(82.1 – 85.0)	*87.3*
2 minutes or more	3 490	(3 170 – 3 830)	13.5	(12.2 – 14.8)	*10.8*
Intubation	640	(470 – 850)	2.5	(1.8 – 3.3)	*1.7*
Not stated	120	(80 – 170)	0.4	(0.3 – 0.6)	*0.2*
Total	26 000	(25 400 – 26 400)	100.0		100.0
	Five minute APGAR score				
Less than 7	570	(440 – 750)	2.2	(1.7 – 2.9)	*2.4*
7 or more	25 200	(24 700 – 25 700)	97.1	(96.5 – 97.7)	*97.3*
Not stated	170	(120 – 220)	0.6	(0.5 – 0.9)	*0.3*
Total	26 000	(25 400 – 26 400)	100.0		100.0
	Maternal age				
19 years or less	7 220	(6 800 – 7 660)	27.8	(26.3 – 29.4)	*6.3*
20–34 years	17 700	(17 100 – 18 300)	68.2	(66.5 – 69.9)	*82.9*
35 years or more	990	(800 – 1 300)	3.8	(3.1 – 4.7)	*10.8*
Not stated	40	(10 – 90)	0.1	(0.1 – 0.3)	*0.1*
Total	26 000	(25 400 – 26 400)	100.0		100.0

(a) All Western Australian births from 1982 to 2001 inclusive.

Table 3.2: Births linked to MCHRDB — Maternal age

	Aboriginal births				*Total population(a) (N = 496,286)*
Maternal age	Number	95% CI	%	95% CI	*%*
Less than 18 years	3 410	(3 120 – 3 720)	13.1	(12.0 – 14.3)	*2.1*
18 years or more	22 500	(22 000 – 23 000)	86.7	(85.5– 87.8)	*97.8*
Not stated	40	(10 – 90)	0.1	(0.1 – 0.3)	*0.1*
Total	26 000	(25 400 – 26 400)	100.0		*100.0*

(a) All Western Australian births from 1982 to 2001 inclusive.

Table 3.3: Births linked to MCHRDB — Mode of delivery

	Aboriginal births				*Total population(a) (N = 496,286)*
Delivery type	Number	95% CI	%	95% CI	*%*
Normal	19 300	(18 700 – 19 900)	74.5	(72.6 – 76.3)	*62.5*
Vacuum	1 070	(920 – 1 230)	4.1	(3.5 – 4.7)	*8.7*
Breech	290	(220 – 370)	1.1	(0.9 – 1.4)	*1.1*
Caesarian section:					
– emergency	2 390	(2 070 – 2 730)	9.2	(8.0 – 10.6)	*9.1*
–elective	1 660	(1 420 – 1 920)	6.4	(5.5 – 7.4)	*10.4*
Forceps	1 150	(960 – 1 350)	4.4	(3.7 – 5.2)	*7.8*
Other	20	(10 – 30)	0.1	(0.0 – 0.1)	*0.1*
Not stated	60	(30 – 100)	0.2	(0.1 – 0.4)	*0.3*
Total	26 000	(25 400 – 26 400)	100.0		*100.0*

(a) All Western Australian births from 1982 to 2001 inclusive.

Table 3.4: Births linked to MCHRDB — Mode of delivery, by age of mother and parity

Delivery type	Number	95% CI	%	95% CI	*Total population 1982—2001(a)*
	First births – mother aged less than 20 years				
Normal	3 250	(2 970 – 3 540)	65.9	(62.2 – 69.5)	*66.1*
Vacuum	450	(370 – 550)	9.2	(7.5 – 11.1)	*9.6*
Breech	40	(20 – 70)	0.8	(0.4 – 1.5)	*1.1*
Caesarian section:					
– emergency	590	(440 – 770)	11.9	(9.0 – 15.3)	*9.3*
–elective	110	(60 – 180)	2.2	(1.2 – 3.5)	*3.2*
Forceps	500	(400 – 610)	10.1	(8.2 – 12.3)	*10.5*
Other	0	(0 – 60)	0.0	(0.0 – 1.1)	*0.1*
Not stated	0	(0 – 60)	0.0	(0.0 – 1.1)	*0.0*
Total	4 930	(4 600 – 5 260)	100.0		*100.0*
	First births – mother aged 20 years or more				
Normal	1 580	(1 300 – 1 890)	54.4	(47.5 – 61.4)	*45.3*
Vacuum	270	(190 – 390)	9.3	(6.5 – 13.0)	*15.8*
Breech	30	(0 – 110)	0.9	(0.1 – 3.7)	*1.0*
Caesarian section:					
– emergency	560	(400 – 790)	19.4	(14.0 – 25.7)	*14.7*
–elective	150	(90 – 230)	5.0	(3.0 – 7.8)	*7.5*
Forceps	320	(220 – 430)	10.9	(7.6 – 14.7)	*15.1*
Other	0	(0 – 60)	0.0	(0.0 – 1.9)	*0.1*
Not stated	0	(0 – 60)	0.0	(0.0 – 1.9)	*0.0*
Total	2 900	(2 550 – 3 300)	100.0		*100.0*
	First births – total				
Normal	4 820	(4 450 – 5 210)	61.6	(58.0 – 65.0)	*48.0*
Vacuum	720	(600 – 870)	9.2	(7.6 – 11.0)	*15.0*
Breech	70	(30 – 130)	0.8	(0.4 – 1.6)	*1.0*
Caesarian section:					
– emergency	1 150	(930 – 1 420)	14.7	(11.9 – 17.8)	*14.1*
–elective	250	(170 – 350)	3.2	(2.2 – 4.5)	*7.0*
Forceps	810	(680 – 970)	10.4	(8.7 – 12.3)	*14.7*
Other	0	(0 – 60)	0.0	(0.0 – 0.7)	*0.0*
Not stated	0	(0 – 60)	0.0	(0.0 – 0.7)	*0.0*
Total	7 830	(7 410 – 8 260)	100.0		*100.0*

Table 3.4: Births linked to MCHRDB — Mode of delivery, by age of mother and parity (Continued)

Delivery type	Number	95% CI	%	95% CI	*Total population 1982—2001 (a)*
	Subsequent births – mother aged less than 20 years				
Normal	1 850	(1 650 – 2 060)	81.0	(77.1 – 84.6)	*82.9*
Vacuum	50	(30 – 90)	2.4	(1.3 – 3.9)	*2.0*
Breech	30	(20 – 50)	1.4	(0.8 – 2.3)	*1.8*
Caesarian section:					
– emergency	140	(110 – 190)	6.3	(4.7 – 8.4)	*5.2*
–elective	140	(80 – 220)	5.9	(3.5 – 9.5)	*6.0*
Forceps	50	(30 – 80)	2.2	(1.2 – 3.8)	*2.1*
Other	20	(10 – 30)	0.7	(0.3 – 1.4)	*0.1*
Not stated	0	(0 – 60)	0.0	(0.0 – 2.4)	*0.0*
Total	2 280	(2 060 – 2 510)	100.0		*100.0*
	Subsequent births – mother aged 20 years or more				
Normal	12 700	(12 100 – 13 200)	80.2	(78.0 – 82.2)	*72.0*
Vacuum	290	(220 – 370)	1.9	(1.4 – 2.4)	*4.7*
Breech	190	(140 – 250)	1.2	(0.9 – 1.6)	*1.2*
Caesarian section:					
– emergency	1 090	(890 – 1 330)	6.9	(5.7 – 8.4)	*5.9*
–elective	1 270	(1 070 – 1 490)	8.0	(6.8 – 9.4)	*12.9*
Forceps	280	(170 – 430)	1.8	(1.1 – 2.7)	*3.3*
Other	0	(0 – 10)	0.0	(0.0 – 0.1)	*0.0*
Not stated	0	(0 – 60)	0.0	(0.0 – 0.4)	*0.0*
Total	15 800	(15 200 – 16 300)	100.0		*100.0*
	Subsequent births – total				
Normal	14 500	(14 000 – 15 100)	80.3	(78.3 – 82.2)	*72.2*
Vacuum	350	(270 – 440)	1.9	(1.5 – 2.4)	*4.6*
Breech	220	(170 – 280)	1.2	(1.0 – 1.6)	*1.2*
Caesarian section:					
– emergency	1 240	(1 030 – 1 470)	6.8	(5.7 – 8.1)	*5.9*
–elective	1 400	(1 190 – 1 640)	7.8	(6.6 – 9.1)	*12.7*
Forceps	330	(220 – 480)	1.8	(1.2 – 2.7)	*3.3*
Other	20	(10 – 30)	0.1	(0.0 – 0.2)	*0.0*
Not stated	0	(0 – 60)	0.0	(0.0 – 0.3)	*0.0*
Total	18 100	(17 500 – 18 600)	100.0		*100.0*

(a) All Western Australian births from 1982 to 2001 inclusive.

Table 3.5: Children linked to MCHRDB — Parity, by age of mother

Parity	Number	95% CI	%	95% CI
	Less than 20 years			
First birth	4 930	(4 600 – 5 260)	68.2	(65.7 – 70.6)
Subsequent birth	2 280	(2 060 – 2 510)	31.6	(29.2 – 34.0)
Not stated	10	(10 – 30)	0.2	(0.1 – 0.4)
Total	7 220	(6 800 – 7 660)	100.0	
	20 years or more			
First birth	2 900	(2 550 – 3 300)	15.5	(13.7 – 17.5)
Subsequent birth	15 800	(15 200 – 16 300)	84.4	(82.5 – 86.3)
Not stated	10	(0 – 20)	0.0	(0.0 – 0.1)
Total	18 700	(18 100 – 19 200)	100.0	
	Not stated			
First birth	0	(0 – 60)	0.0	(0.0 – 70.8)
Subsequent birth	0	(0 – 60)	0.0	(0.0 – 70.8)
Not stated	40	(10 – 90)	100.0	(29.2 – 100.0)
Total	40	(10 – 90)	100.0	
	Total			
First birth	7 830	(7 410 – 8 260)	30.2	(28.6 – 31.7)
Subsequent birth	18 100	(17 500 – 18 600)	69.6	(68.0 – 71.1)
Not stated	60	(30 – 100)	0.2	(0.1 – 0.4)
Total	26 000	(25 400 – 26 400)	100.0	

Table 3.6: Births linked to MCHRDB — Mean proportion of optimal birth weight (POBW) and age of mother

Age of mother	Mean	95% CI
Less than 20 years	95.6	(94.6 – 96.5)
20 years or more	95.3	(94.6 – 96.0)
Total	95.4	(94.8 – 96.0)

Table 3.7: Births linked to MCHRDB — Proportion of optimal birth weight (POBW), by maternal age

POBW	Number	95% CI	%	95% CI
	Less than 20 years			
Less than 85%	1 350	(1 130 – 1 610)	18.6	(15.9 – 21.7)
85% or more	5 490	(5 140 – 5 840)	75.9	(72.9 – 78.9)
Not stated	390	(300 – 510)	5.4	(4.1 – 7.0)
Total	7 220	(6 800 – 7 660)	100.0	
	20 years or more			
Less than 85%	4 070	(3 680 – 4 500)	21.8	(19.7 – 23.9)
85% or more	13 900	(13 400 – 14 500)	74.5	(72.3 – 76.6)
Not stated	690	(580 – 830)	3.7	(3.1 – 4.4)
Total	18 700	(18 100 – 19 200)	100.0	
	Not stated			
Less than 85%	0	(0 – 60)	0.0	(0.0 – 70.8)
85% or more	0	(0 – 60)	0.0	(0.0 – 70.8)
Not stated	40	(10 – 90)	100.0	(29.2 – 100.0)
Total	40	(10 – 90)	100.0	
	Total			
Less than 85%	5 420	(4 970 – 5 880)	20.9	(19.2 – 22.6)
85% or more	19 400	(18 800 – 20 000)	74.8	(73.0 – 76.5)
Not stated	1 120	(960 – 1 290)	4.3	(3.7 – 5.0)
Total	26 000	(25 400 – 26 400)	100.0	

Table 3.8: Births linked to MCHRDB — Mean Apgar score at five minutes, by age of mother

Age of mother	Mean	95% CI
Less than 20 years	8.93	(8.88 – 8.98)
20 years or more	8.99	(8.94 – 9.03)
Total	8.97	(8.93 – 9.01)

Table 3.9: Births linked to MCHRDB — Apgar score at five minutes, by age of mother

Apgar score	Number	95% CI	%	95% CI
	Mother aged less than 20 years			
Less than 7	150	(90 – 230)	2.1	(1.3 – 3.2)
7 or above	7 020	(6 610 – 7 440)	97.2	(96.1 – 98.0)
Not stated	50	(30 – 80)	0.7	(0.5 – 1.1)
Total	7 220	(6 800 – 7 660)	100.0	
	Mother aged 20 years or more			
Less than 7	420	(300 – 590)	2.3	(1.6 – 3.1)
7 or above	18 200	(17 600 – 18 700)	97.3	(96.5 – 98.0)
Not stated	80	(50 – 110)	0.4	(0.3 – 0.6)
Total	18 700	(18 100 – 19 200)	100.0	
	Mother's age not stated			
Less than 7	0	(0 – 60)	0	(0.0 – 70.8)
7 or above	0	(0 – 60)	0.0	(0.0 – 70.8)
Not stated	40	(10 – 90)	100.0	(29.2 – 100.0)
Total	40	(10 – 90)	100.0	
	Total			
Less than 7	570	(440 – 750)	2.2	(1.7 – 2.9)
7 or above	25 200	(24 700 – 25 700)	97.1	(96.5 – 97.7)
Not stated	170	(120 – 220)	0.6	(0.5 – 0.9)
Total	26 000	(25 400 – 26 400)	100.0	

Table 3.10: Children linked to MCHRDB — Maternal age, by birth mother status

Maternal age	Number	95% CI	%	95% CI
	Child's carer is not birth mother			
Less than 18 years	950	(790 – 1 140)	20.0	(16.9 – 23.5)
18 years and over	3 790	(3 390 – 4 230)	79.8	(76.4 – 83.0)
Not stated	10	(0 – 20)	0.2	(0.1 – 0.5)
Total	4 750	(4 290 – 5 240)	100.0	
	Child's carer is birth mother			
Less than 18 years	2 460	(2 210 – 2 720)	11.6	(10.5 – 12.8)
18 years and over	18 700	(18 100 – 19 300)	88.3	(87.1 – 89.4)
Not stated	30	(10 – 70)	0.1	(0.0 – 0.3)
Total	21 200	(20 600 – 21 800)	100.0	
	Total			
Less than 18 years	3 410	(3 120 – 3 720)	13.1	(12.0 – 14.3)
18 years and over	22 500	(22 000 – 23 000)	86.7	(85.5 – 87.8)
Not stated	40	(10 – 90)	0.1	(0.1 – 0.3)
Total	26 000	(25 400 – 26 400)	100.0	

Table 3.11: Births linked to MCHRDB — Birth characteristics(a), by Carer status

	%	95% CI	%	95% CI
Birth characteristics	Carer is Birth Mother (N = 21 200)		Carer is not Birth mother (N = 4 750)	
Gestation and growth				
Less than 37 weeks gestation	12.8	(11.5 – 14.2)	17.5	(13.3 – 22.3)
Less than 2,500 g birth weight	10.3	(9.0 – 11.7)	16.2	(12.1 – 20.6)
POBW < 85%	19.9	(18.1 – 21.8)	25.1	(21.0 – 29.7)
Condition at birth				
Time to spontaneous respiration more than > 2 minutes	13.2	(11.9 – 14.6)	14.5	(11.5 – 17.9)
Intubated	2.5	(1.8 – 3.4)	2.2	(1.0 – 4.3)
Still born	0.1	(0.1 – 0.2)	0.2	(0.1 – 0.6)
Apgar at 5 minutes less than 7	2.2	(1.6 – 3.0)	2.2	(1.5 – 2.9)
Maternal age				
Less than 20 years	26.0	(24.2 – 27.7)	36.1	(32.1 – 40.2)
20–34 years	69.7	(67.9 – 71.5)	61.5	(57.2 – 65.6)
35 years or more	4.2	(3.4 – 5.1)	2.2	(0.8 – 5.3)
	Mean (g)	95% CI	Mean (g)	95% CI
Birthweight	3 200	(3 170 – 3 230)	3 060	(2 990– 3 120)

(a) See Chapter 3 for terminology explanations

Table 3.12: Children linked to MCHRDB — Proportion whose carer is not their birth mother, by maternal age of birth mother, by age of child

Maternal age of birth mother	Number	95% CI	%	95% CI
	Age of child — 0–3 years			
12 – 15 years	40	(20 – 80)	25.8	(12.9 – 44.4)
16 – 17 years	80	(50 – 110)	14.3	(9.2 – 21.3)
18 – 19 years	50	(30 – 100)	6.5	(3.5 – 11.5)
20 years or more	410	(290 – 580)	8.6	(5.9 – 11.6)
Total	580	(440 – 750)	9.2	(7.1 – 11.9)
	Age of child — 4–11 years			
12 – 15 years	90	(50 – 140)	24.3	(13.3 – 38.9)
16 – 17 years	280	(180 – 400)	22.7	(15.4 – 30.7)
18 – 19 years	330	(260 – 400)	19.6	(15.9 – 24.1)
20 years or more	1 350	(1 140 – 1 590)	15.4	(13.0 – 18.1)
Total	2 040	(1 770 – 2 340)	17.0	(14.8 – 19.3)
	Age of child — 12–17 years			
12 – 15 years	100	(60 – 150)	49.1	(32.4 – 65.2)
16 – 17 years	370	(270 – 500)	39.2	(30.6 – 48.3)
18 – 19 years	390	(270 – 530)	29.5	(22.2 – 37.6)
20 years or more	1 280	(1 010 – 1 580)	24.4	(20.0 – 29.2)
Total	2 130	(1 820 – 2 470)	27.7	(24.2 – 31.4)
	All children			
12 – 15 years	220	(170 – 300)	31.4	(23.3 – 40.9)
16 – 17 years	730	(570 – 900)	26.9	(22.0 – 32.1)
18 – 19 years	770	(620 – 930)	20.1	(16.7 – 24.0)
20 years or more	3 030	(2 660 – 3 430)	16.2	(14.3 – 18.3)
Total	4 750	(4 290 – 5 240)	18.3	(16.6 – 20.1)

Table 3.13: Children whose primary carer is their birth mother, births linked to MCHRDB — Aboriginal status of the birth mother at the time of interview, by Aboriginal status on Midwives Notification form

Aboriginal status of birth mother at time of interview	Number	95% CI	%	95% CI
	Not Aboriginal or Torres Strait Islander on Midwives Notification form			
Not Aboriginal	2 940	(2 460 – 3 460)	61.6	(55.2 – 67.5)
Aboriginal	1 810	(1 500 – 2 140)	37.8	(31.9 – 44.2)
Not stated	30	(0 – 130)	0.6	(0.1 – 2.8)
Total	4 780	(4 240 – 5 340)	100.0	
	Aboriginal and Torres Strait Islander on Midwives Notification form			
Not Aboriginal	90	(40 – 170)	0.5	(0.2 – 1.0)
Aboriginal	16 200	(15 500 – 16 900)	98.7	(98.1 – 99.2)
Not stated	130	(70 – 210)	0.8	(0.4 – 1.3)
Total	16 400	(15 700 – 17 100)	100.0	
	Aboriginal status – not stated on Midwives Notification form			
Not Aboriginal	0	(0 – 60)	0.0	(0.0 – 84.2)
Aboriginal	30	(10 – 70)	100.0	(15.8 – 100.0)
Not stated	0	(0 – 60)	0.0	(0.0 – 84.2)
Total	30	(10 – 70)	100.0	
	Total			
Not Aboriginal	3 030	(2 560 – 3 570)	14.3	(12.1 – 16.7)
Aboriginal	18 000	(17 300 – 18 700)	85.0	(82.4 – 87.2)
Not stated	160	(80 – 270)	0.7	(0.4 – 1.3)
Total	21 200	(20 600 – 21 800)	100.0	

Table 3.14: Births linked to MCHRDB, birth mothers also carers — Birth characteristics, by Aboriginal status

	%	95% CI	%	95% CI
Birth characteristics	Aboriginal N = 18 000		Non–Aboriginal N = 3 030	
Gestation < 37 weeks	13.2	(11.8 – 14.8)	10.0	(6.9 – 13.7)
Birth weight < 2 500 g	10.9	(9.4 – 12.4)	7.1	(4.6 – 10.2)
POBW < 85%	20.5	(18.5 – 22.6)	16.8	(12.3 – 21.7
Time to Spontaneous Respiration > 2 minutes	13.5	(12.2 – 14.9)	11.3	(7.2 – 16.3)
5 minute Apgar score < 7	2.3	(1.7 – 3.1)	2.1	(0.2 – 6.4)
Maternal age < 20 years	26.1	(24.3 – 28.0)	25.3	(20.2 – 31.1)

Table 3.15: Children whose primary carer is their birth mother — Substances consumed by birth mother during pregnancy

Substance used	Number	95% CI	%	95% CI
	LORI — None (N = 8 780)			
Smoked cigarettes	4 230	(3 820 – 4 660)	48.1	(43.8 – 52.5)
Chewed tobacco	50	(10 – 130)	0.6	(0.1 – 1.5)
All tobacco products	4 240	(3 830 – 4 670)	48.2	(43.9 – 52.7)
Alcohol	2 180	(1 860 – 2 550)	24.9	(21.2 – 28.7)
Marijuana	980	(750 – 1 230)	11.1	(8.7 – 14.0)
	LORI — Low (N = 6 050)			
Smoked cigarettes	2 970	(2 580 – 3 400)	49.1	(44.0 – 54.2)
Chewed tobacco	20	(10 – 60)	0.4	(0.1 – 1.0)
All tobacco products	2 980	(2 590 – 3 420)	49.4	(44.2 – 54.5)
Alcohol	1 350	(1 070 – 1 670)	22.3	(18.1 – 26.9)
Marijuana	620	(470 – 790)	10.2	(7.9 – 13.0)
	LORI — Moderate (N = 4 920)			
Smoked cigarettes	2 400	(1 980 – 2 880)	48.7	(43.6 – 53.6)
Chewed tobacco	220	(140 – 330)	4.5	(2.9 – 6.8)
All tobacco products	2 610	(2 180 – 3 100)	52.9	(48.3 – 57.5)
Alcohol	1 130	(890 – 1 410)	23.0	(19.2 – 27.3)
Marijuana	400	(250 – 580)	8.1	(5.3 – 11.5)
	LORI — High (N = 2 240)			
Smoked cigarettes	870	(600 – 1 200)	38.8	(30.5 – 47.4)
Chewed tobacco	130	(60 – 250)	5.8	(3.0 – 10.3)
All tobacco products	980	(680 – 1 330)	43.6	(35.5 – 52.5)
Alcohol	450	(280 – 670)	20.0	(14.0 – 26.9)
Marijuana	90	(40 – 140)	3.8	(2.0 – 6.2)
	LORI — Extreme (N = 1 970)			
Smoked cigarettes	670	(440 – 990)	33.9	(24.7 – 43.6)
Chewed tobacco	410	(250 – 660)	21.0	(13.9 – 30.0)
All tobacco products	1 010	(710 – 1 390)	51.3	(43.5 – 58.7)
Alcohol	350	(240 – 490)	17.7	(13.1 – 22.8)
Marijuana	40	(20 – 70)	1.8	(0.8 – 3.7)
	Total WA (N = 24 000)			
Smoked cigarettes	11 100	(10 500 – 11 800)	46.5	(43.9 – 49.0)
Chewed tobacco	840	(630 – 1 100)	3.5	(2.7 – 4.6)
All tobacco products	11 800	(11 200 – 12 500)	49.3	(46.9 – 51.8)
Alcohol	5 460	(4 970 – 5 980)	22.8	(20.8 – 24.9)
Marijuana	2 110	(1 800 – 2 450)	8.8	(7.5 – 10.2)

Table 3.16: Children whose primary carer is their birth mother, linked to MCHRDB — Mean birth weight (grams) and proportion of low birth weight babies, by substance use during pregnancy

Substance used	Mean birth weight (grams)	95% CI	% less than 2,500 grams	95% CI
No alcohol or tobacco	3 310	(3 260 – 3 350)	7.8	(6.1 – 9.8)
Alcohol, no tobacco	3 270	(3 150 – 3 380)	10.2	(5.5 – 17.5)
Tobacco, no alcohol	3 110	(3 060 – 3 160)	11.1	(8.8 – 13.7)
Both tobacco & alcohol	3 060	(2 990 – 3 120)	15.4	(11.9 – 19.4)
Total	3 200	(3 170 – 3 230)	10.3	(9.0 – 11.7)

Table 3.17: Linked births where carer is birth mother – Birth weight distribution, by use of alcohol or tobacco during pregnancy

Birth weight	Number	95% CI	%	95% CI
	No alcohol or tobacco			
Less than 2,000 grams	230	(120 – 410)	2.4	(1.3 – 4.2)
2,000 – 2,499 grams	510	(400 – 650)	5.4	(4.2 – 6.7)
2,500 – 2,999 grams	1 720	(1 480 – 1 980)	18.1	(15.8 – 20.6)
3,000 – 3,499 grams	3 460	(3 130 – 3 830)	36.6	(33.8 – 39.4)
3,500 – 3,999 grams	2 560	(2 260 – 2 880)	27.0	(24.2 – 30.0)
4,000 – 4,499 grams	840	(680 – 1 020)	8.9	(7.3 – 10.7)
4,500 grams and over	150	(100 – 210)	1.6	(1.1 – 2.3)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.6)
Total	9 460	(8 900 – 10 100)	100.0	
	Alcohol, no tobacco			
Less than 2,000 grams	30	(10 – 60)	2.2	(0.7 – 4.3)
2,000 – 2,499 grams	100	(50 – 210)	8.0	(3.7 – 15.8)
2,500 – 2,999 grams	270	(200 – 360)	21.5	(16.2 – 27.9)
3,000 – 3,499 grams	420	(310 – 560)	33.1	(25.7 – 41.7)
3,500 – 3,999 grams	350	(200 – 580)	27.7	(17.6 – 40.8)
4,000 – 4,499 grams	70	(40 – 110)	5.7	(3.5 – 8.7)
4,500 grams and over	20	(10 – 60)	1.9	(0.7 – 4.1)
Not stated	0	(0 – 60)	0.0	(0.0 – 4.3)
Total	1 270	(1 020 – 1 570)	100.0	
	Tobacco, no alcohol			
Less than 2,000 grams	290	(190 – 430)	4.2	(2.8 – 6.3)
2,000 – 2,499 grams	470	(360 – 590)	6.8	(5.4 – 8.6)
2,500 – 2,999 grams	1 710	(1 490 – 1 950)	25.0	(22.2 – 28.0)
3,000 – 3,499 grams	2 800	(2 500 – 3 100)	41.0	(38.0 – 44.1)
3,500 – 3,999 grams	1 250	(1 040 – 1 480)	18.3	(15.8 – 21.1)
4,000 – 4,499 grams	270	(170 – 400)	4.0	(2.6 – 5.9)
4,500 grams and over	40	(10 – 100)	0.6	(0.1 – 1.5)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.8)
Total	6 810	(6 290 – 7 360)	100.0	
	Alcohol and tobacco			
Less than 2,000 grams	150	(90 – 230)	4.0	(2.6 – 6.2)
2,000 – 2,499 grams	420	(300 – 550)	11.4	(8.5 – 15.1)
2,500 – 2,999 grams	990	(810 – 1 200)	27.0	(22.7 – 31.5)
3,000 – 3,499 grams	1 310	(1 100 – 1 540)	35.7	(31.1 – 40.4)
3,500 – 3,999 grams	620	(470 – 790)	16.9	(13.2 – 21.0)
4,000 – 4,499 grams	160	(90 – 270)	4.5	(2.6 – 7.2)
4,500 grams and over	20	(10 – 60)	0.5	(0.2 – 1.5)
Not stated	0	(0 – 60)	0.0	(0.0 – 1.5)
Total	3 660	(3 260 – 4 100)	100.0	
	Total			
Less than 2,000 grams	690	(520 – 900)	3.3	(2.5 – 4.2)
2,000 – 2,499 grams	1 490	(1 290 – 1 710)	7.0	(6.1 – 8.1)
2,500 – 2,999 grams	4 690	(4 330 – 5 050)	22.1	(20.5 – 23.8)
3,000 – 3,499 grams	7 990	(7 540 – 8 450)	37.7	(35.8 – 39.5)
3,500 – 3,999 grams	4 770	(4 370 – 5 200)	22.5	(20.7 – 24.4)
4,000 – 4,499 grams	1 350	(1 150 – 1 580)	6.4	(5.4 – 7.4)
4,500 grams and over	230	(170 – 330)	1.1	(0.8 – 1.5)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.3)
Total	21 200	(20 600 – 21 800)	100.0	

Table 3.18: Children whose primary carer is their birth mother living in areas of moderate, high and extreme levels of relative isolation, linked to MCHRDB — Tobacco use during pregnancy and mean birthweight (grams)

Substance usage during pregnancy	Mean birthweight (grams)	95% CI
No tobacco	3 260	(3 210 – 3 320)
Smoked tobacco only	3 110	(3 050 – 3 160)
Chewed tobacco only	3 050	(2 920 – 3 180)
Smoked and chewed tobacco	3 130	(2 910 – 3 340)
Total	3 180	(3 140 – 3 220)

Table 3.19: Children whose primary carer is their birth mother, linked to MCHRDB — Mean birthweight (grams), by maternal substance use during pregnancy

Substance usage during pregnancy	Mean birthweight (grams)	95% CI
No marijuana, alcohol or tobacco	3 310	(3 260 – 3 360)
Marijuana only	3 100	(2 910 – 3 290)
Marijuana and alcohol	3 130	(2 960 – 3 300)
Marijuana and tobacco	3 000	(2 770 – 3 220)
Marijuana, alcohol and tobacco	2 940	(2 800 – 3 070)
Alchol and/or tobacco, no marijuana	3 130	(3 100 – 3 170)
Total	3 200	(3 170 – 3 230)

Table 3.20: Children whose primary carer is their birth mother — Use of tobacco and alcohol during pregnancy

Tobacco or alcohol use during pregnancy	Number	95% CI	%	95% CI
No alcohol or tobacco	10 700	(10 100 – 11 400)	44.8	(42.2 – 47.3)
Alcohol, no tobacco	1 420	(1 150 – 1 720)	5.9	(4.8 – 7.2)
Tobacco, no alcohol	7 770	(7 210 – 8 340)	32.4	(30.2 – 34.7)
Both tobacco & alcohol	4 040	(3 620 – 4 500)	16.9	(15.1 – 18.8)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.21: Birth mothers — Multiple substance use during pregnancy, by years of maternal formal education

Substance use	Number	95% CI	%	95% CI
	Did not attend			
None	130	(60 – 230)	38.5	(21.5 – 59.4)
Single substance use	90	(50 – 150)	26.1	(15.3 – 37.9)
Multiple substance use	120	(70 – 190)	35.4	(22.7 – 51.5)
Total	340	(230 – 500)	100.0	
	1 – 9 years			
None	1 520	(1 250 – 1 810)	35.4	(30.1 – 41.2)
Single substance use	1 510	(1 220 – 1 850)	35.4	(29.8 – 41.1)
Multiple substance use	1 250	(990 – 1 560)	29.2	(23.9 – 35.3)
Total	4 280	(3 800 – 4 800)	100.0	
	10 years			
None	4 990	(4 500 – 5 510)	45.0	(41.6 – 48.5)
Single substance use	3 840	(3 460 – 4 240)	34.6	(31.6 – 37.8)
Multiple substance use	2 250	(1 910 – 2 650)	20.3	(17.3 – 23.6)
Total	11 100	(10 400 – 11 700)	100.0	
	11 – 12 years			
None	2 760	(2 360 – 3 190)	42.9	(38.1 – 47.8)
Single substance use	2 410	(2 070 – 2 790)	37.5	(33.2 – 42.0)
Multiple substance use	1 260	(1 050 – 1 510)	19.6	(16.5 – 23.2)
Total	6 430	(5 880 – 7 010)	100.0	
	13 years or more			
None	800	(560 – 1 120)	60.5	(48.9 – 72.4)
Single substance use	450	(290 – 670)	33.8	(22.7 – 45.4)
Multiple substance use	80	(30 – 170)	5.7	(2.1 – 11.8)
Total	1 330	(1 000 – 1 700)	100.0	
	Not stated			
None	200	(130 – 290)	39.8	(26.5 – 53.2)
Single substance use	210	(110 – 370)	42.0	(27.0 – 59.1)
Multiple substance use	90	(60 – 140)	18.2	(10.6 – 27.5)
Total	500	(350 – 680)	100.0	
	Total birth mothers			
None	10 400	(9 800 – 11 000)	43.4	(41.0 – 45.9)
Single substance use	8 510	(7 950 – 9 090)	35.5	(33.3 – 37.8)
Multiple substance use	5 050	(4 580 – 5 550)	21.1	(19.1 – 23.1)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.22: All birth mothers – Multiple substance use during pregnancy, by financial strain

Substance use	Number	95% CI	%	95% CI
	Spending more money than we get			
None	730	(550 – 970)	35.8	(27.8 – 44.2)
Single substance use	780	(580 – 1 000)	38.1	(30.6 – 46.1)
Multiple substance use	530	(370 – 720)	26.1	(19.2 – 33.2)
Total	2 040	(1 700 – 2 420)	100.0	
	Have just enough to get through to next pay			
None	4 320	(3 880 – 4 800)	40.4	(36.9 – 43.9)
Single substance use	3 980	(3 570 – 4 440)	37.2	(33.9 – 40.6)
Multiple substance use	2 400	(2 070 – 2 780)	22.4	(19.6 – 25.5)
Total	10 700	(10 100 – 11 400)	100.0	
	Some money left over each week but spend it			
None	1 280	(1 010 – 1 580)	39.9	(33.1 – 46.8)
Single substance use	1 060	(810 – 1 340)	33.0	(26.7 – 40.1)
Multiple substance use	860	(650 – 1 130)	27.1	(21.0 – 33.4)
Total	3 190	(2 750 – 3 690)	100.0	
	Can save a bit now and again			
None	3 220	(2 780 – 3 700)	49.9	(44.9 – 55.1)
Single substance use	2 200	(1 890 – 2 530)	34.1	(29.8 – 38.5)
Multiple substance use	1 030	(790 – 1 310)	16.0	(12.5 – 20.0)
Total	6 440	(5 870 – 7 040)	100.0	
	Can save a lot			
None	650	(460 – 900)	60.4	(48.0 – 71.1)
Single substance use	290	(200 – 390)	26.7	(18.8 – 36.2)
Multiple substance use	140	(50 – 270)	12.9	(5.8 – 24.2)
Total	1 080	(830 – 1 370)	100.0	
	Financial strain not stated			
None	200	(130 – 290)	39.8	(26.5 – 53.2)
Single substance use	210	(110 – 370)	42.0	(27.0 – 59.1)
Multiple substance use	90	(60 – 140)	18.2	(10.6 – 27.5)
Total	500	(350 – 680)	100.0	
	Total			
None	10 400	(9 800 – 11 000)	43.4	(41.0 – 45.9)
Single substance use	8 510	(7 950 – 9 090)	35.5	(33.3 – 37.8)
Multiple substance use	5 050	(4 580 – 5 550)	21.1	(19.1 – 23.1)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.23: Children aged 0–17 years, for whom primary carer is birth mother — Proportion within each Level of Relative Isolation (LORI) ever breastfed

Whether ever breastfed	Number	95% CI	%	95% CI
LORI — None				
Never breastfed	1 620	(1 360 – 1 920)	18.5	(15.4 – 21.7)
Breastfed	7 160	(6 780 – 7 560)	81.5	(78.3 – 84.6)
Total	8 780	(8 450 – 9 120)	100.0	
LORI — Low				
Never breastfed	740	(540 – 980)	12.3	(9.4 – 16.0)
Breastfed	5 300	(4 790 – 5 860)	87.7	(84.0 – 90.6)
Total	6 050	(5 460 – 6 650)	100.0	
LORI — Moderate				
Never breastfed	330	(230 – 440)	6.7	(5.0 – 8.8)
Breastfed	4 600	(3 880 – 5 400)	93.3	(91.2 – 95.0)
Total	4 920	(4 170 – 5 780)	100.0	
LORI — High				
Never breastfed	100	(60 – 180)	4.7	(2.7 – 7.3)
Breastfed	2 130	(1 560 – 2 800)	95.3	(92.7 – 97.3)
Total	2 240	(1 670 – 2 980)	100.0	
LORI — Extreme				
Never breastfed	70	(40 – 120)	3.7	(2.2 – 6.0)
Breastfed	1 890	(1 370 – 2 570)	96.3	(94.0 – 97.8)
Total	1 970	(1 420 – 2 670)	100.0	
Total				
Never breastfed	2 870	(2 520 – 3 240)	12.0	(10.6 – 13.5)
Breastfed	21 100	(20 500 – 21 600)	88.0	(86.5 – 89.4)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.24: Children aged 0–17 years, for whom primary carer is birth mother — Duration of breastfeeding, by Level of Relative Isolation (LORI)

Months child breastfed	Number	95% CI	%	95% CI
LORI — None				
Never breastfed	1 620	(1 360 – 1 920)	18.5	(15.4 – 21.7)
0 – less than 3 months	1 770	(1 460 – 2 130)	20.2	(16.7 – 24.0)
3 – less than 6 months	1 180	(940 – 1 450)	13.5	(10.8 – 16.5)
6 – less than 9 months	700	(560 – 860)	8.0	(6.4 – 9.7)
9 – less than 12 months	730	(590 – 920)	8.4	(6.7 – 10.4)
12 months or more	2 350	(2 040 – 2 690)	26.8	(23.3 – 30.5)
Still being breastfed	420	(310 – 550)	4.8	(3.6 – 6.3)
Total	8 780	(8 450 – 9 120)	100.0	
LORI — Low				
Never breastfed	740	(540 – 980)	12.3	(9.4 – 16.0)
0 – less than 3 months	1 150	(910 – 1 420)	19.0	(15.5 – 23.2)
3 – less than 6 months	790	(640 – 970)	13.1	(10.6 – 15.8)
6 – less than 9 months	440	(330 – 570)	7.2	(5.5 – 9.4)
9 – less than 12 months	700	(510 – 920)	11.6	(8.8 – 15.1)
12 months or more	1 850	(1 510 – 2 230)	30.6	(25.7 – 36.0)
Still being breastfed	370	(290 – 470)	6.1	(4.8 – 7.6)
Total	6 050	(5 460 – 6 650)	100.0	
LORI — Moderate				
Never breastfed	330	(230 – 440)	6.7	(5.0 – 8.8)
0 – less than 3 months	380	(280 – 500)	7.6	(5.8 – 9.7)
3 – less than 6 months	510	(350 – 690)	10.3	(7.6 – 13.2)
6 – less than 9 months	520	(390 – 680)	10.6	(8.3 – 13.3)
9 – less than 12 months	730	(580 – 910)	14.8	(12.4 – 17.4)
12 months or more	1 950	(1 600 – 2 360)	39.7	(36.2 – 43.3)
Still being breastfed	510	(380 – 660)	10.3	(8.2 – 12.8)
Total	4 920	(4 170 – 5 780)	100.0	
LORI — High				
Never breastfed	100	(60 – 180)	4.7	(2.7 – 7.3)
0 – less than 3 months	150	(100 – 230)	6.8	(4.4 – 10.0)
3 – less than 6 months	110	(60 – 180)	4.9	(2.8 – 7.6)
6 – less than 9 months	140	(70 – 240)	6.2	(3.7 – 10.2)
9 – less than 12 months	360	(190 – 630)	16.0	(9.2 – 25.0)
12 months or more	1 140	(810 – 1 530)	51.0	(43.7 – 58.4)
Still being breastfed	230	(160 – 320)	10.4	(8.3 – 12.7)
Total	2 240	(1 670 – 2 980)	100.0	
LORI — Extreme				
Never breastfed	70	(40 – 120)	3.7	(2.2 – 6.0)
0 – less than 3 months	70	(40 – 110)	3.4	(2.0 – 5.6)
3 – less than 6 months	190	(110 – 280)	9.4	(6.4 – 13.6)
6 – less than 9 months	110	(60 – 190)	5.8	(3.3 – 9.3)
9 – less than 12 months	240	(140 – 400)	12.1	(7.6 – 18.7)
12 months or more	960	(660 – 1 360)	48.7	(41.9 – 55.4)
Still being breastfed	330	(220 – 480)	16.9	(13.6 – 20.4)
Total	1 970	(1 420 – 2 670)	100.0	
Total				
Never breastfed	2 870	(2 520 – 3 240)	12.0	(10.6 – 13.5)
0 – less than 3 months	3 520	(3 110 – 3 950)	14.7	(13.1 – 16.5)
3 – less than 6 months	2 780	(2 440 – 3 130)	11.6	(10.3 – 13.0)
6 – less than 9 months	1 910	(1 680 – 2 160)	8.0	(7.0 – 9.0)
9 – less than 12 months	2 760	(2 430 – 3 120)	11.5	(10.2 – 13.0)
12 months or more	8 250	(7 710 – 8 810)	34.5	(32.3 – 36.7)
Still being breastfed	1 860	(1 670 – 2 070)	7.8	(7.0 – 8.7)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.25: Children aged 0–3 years, for whom primary carer is birth mother — Proportion ever breastfed

Whether ever breastfed	Number	95% CI	%	95% CI
Never breastfed	780	(650 – 930)	12.6	(10.5 – 15.0)
Been breastfed	5 430	(5 240 – 5 610)	87.4	(85.0 – 89.5)
Total	6 210	(6 060 – 6 350)	100.0	

Table 3.26: Children aged 0–3 years for whom primary carer is birth–mother — Proportion still being breastfed, by Level of Relative Isolation (LORI), by child's age

LORI	Number	95% CI	%	95% CI
Less than 6 months old				
None	120	(80 – 190)	44.9	(31.4 – 60.8)
Low	150	(100 – 200)	63.3	(47.2 – 78.8)
Moderate	130	(90 – 190)	74.4	(63.7 – 84.2)
High	50	(30 – 100)	76.7	(44.4 – 97.5)
Extreme	100	(50 – 190)	100.0	(59.0 – 100.0)
Total WA	550	(450 – 660)	65.0	(57.2 – 72.1)
6 months to 11 months old				
None	70	(30 – 130)	25.0	(11.5 – 43.4)
Low	80	(40 – 130)	49.0	(32.4 – 67.6)
Moderate	130	(90 – 190)	59.3	(43.2 – 73.7)
High	20	(10 – 60)	89.9	(64.0 – 99.8)
Extreme	60	(30 – 110)	81.7	(61.2 – 95.0)
Total WA	360	(280 – 450)	48.3	(39.7 – 56.8)
12 months or older				
None	220	(150 – 320)	14.2	(9.2 – 19.9)
Low	140	(80 – 200)	11.6	(7.4 – 17.0)
Moderate	230	(160 – 320)	21.7	(16.5 – 27.4)
High	150	(60 – 300)	33.5	(17.9 – 54.3)
Extreme	170	(80 – 300)	47.4	(30.2 – 66.9)
Total WA	910	(740 – 1 090)	19.6	(16.2 – 23.3)
Total 0–3 year olds				
None	410	(320 – 530)	19.5	(14.8 – 24.7)
Low	360	(280 – 450)	23.0	(18.4 – 28.1)
Moderate	490	(390 – 620)	33.8	(28.9 – 39.0)
High	230	(120 – 380)	42.1	(27.7 – 57.8)
Extreme	330	(200 – 500)	62.1	(50.7 – 72.3)
Total WA	1 820	(1 630 – 2 020)	29.3	(26.4 – 32.4)

Table 3.27: Children aged 0–3 years for whom primary carer is birth mother — Age still exclusively being breastfed

Age	Number	95% CI	%	95% CI
Less than 6 months	450	(360 – 550)	53.0	(45.5 – 60.7)
6 months to 11 months	50	(30 – 80)	7.0	(3.8 – 10.9)
12 months or older	140	(80 – 230)	3.1	(1.7 – 4.9)
Total 0–3 year olds	650	(540 – 770)	10.4	(8.6 – 12.4)

Table 3.28: Children 0–3 years, for whom primary carer is birth mother — Length of time child exclusively breastfed, by Level of Relative Isolation (LORI)

Period exclusively breastfed	Number	95% CI	%	95% CI
	LORI — None			
Never breastfed	480	(380 – 600)	22.6	(17.7 – 28.2)
1 month	270	(180 – 370)	12.5	(8.5 – 17.2)
2 months	160	(100 – 260)	7.6	(4.6 – 11.9)
3 months	250	(170 – 340)	11.6	(8.2 – 16.0)
4 months	330	(250 – 410)	15.3	(11.8 – 19.3)
5 months	170	(90 – 270)	7.8	(4.2 – 12.4)
6 months	240	(160 – 320)	11.1	(7.9 – 15.3)
7 months or longer	90	(50 – 140)	4.2	(2.6 – 6.6)
Still being breastfed	150	(100 – 220)	7.3	(4.6 – 10.5)
Total	2 130	(2 020 – 2 230)	100.0	
	LORI — Low			
Never breastfed	170	(110 – 240)	10.6	(7.3 – 15.2)
1 month	190	(130 – 260)	12.0	(8.6 – 16.4)
2 months	110	(60 – 170)	6.9	(4.0 – 10.7)
3 months	270	(200 – 350)	17.1	(12.8 – 22.1)
4 months	360	(280 – 450)	22.9	(17.9 – 28.3)
5 months	90	(50 – 170)	5.9	(3.0 – 10.9)
6 months	140	(90 – 230)	9.2	(5.7 – 14.4)
7 months and longer	100	(60 – 140)	6.4	(4.1 – 9.2)
Still being breastfed	140	(100 – 190)	9.0	(6.5 – 11.9)
Total	1 560	(1 410 – 1 720)	100.0	
	LORI — Moderate			
Never breastfed	110	(70 – 180)	7.8	(4.5 – 12.0)
1 month	110	(50 – 200)	7.6	(3.8 – 13.7)
2 months	80	(20 – 160)	5.2	(1.6 – 10.8)
3 months	290	(220 – 370)	19.7	(15.7 – 24.2)
4 months	250	(170 – 370)	17.3	(12.1 – 24.0)
5 months	140	(90 – 210)	9.5	(6.6 – 13.6)
6 months	210	(150 – 270)	14.1	(10.6 – 18.4)
7 months and longer	120	(70 – 180)	8.0	(4.9 – 12.0)
Still being breastfed	160	(120 – 210)	10.8	(8.1 – 14.0)
Total	1 470	(1 240 – 1 710)	100.0	
	LORI — High			
Never breastfed	10	(0 – 50)	1.7	(0.0 – 8.7)
1 month	60	(30 – 90)	10.7	(6.1 – 17.7)
2 months	40	(0 – 100)	6.6	(1.6 – 20.9)
3 months	70	(30 – 120)	12.4	(6.4 – 22.6)
4 months	100	(40 – 210)	19.2	(9.1 – 35.6)
5 months	30	(0 – 100)	6.4	(1.5 – 19.9)
6 months	100	(50 – 170)	17.9	(10.5 – 28.0)
7 months and longer	50	(10 – 160)	9.0	(1.0 – 26.0)
Still being breastfed	90	(40 – 170)	16.3	(7.9 – 27.3)
Total	530	(350 – 770)	100.0	

Table 3.28: Children 0–3 years, for whom primary carer is birth mother — Length of time child exclusively breastfed, by Level of Relative Isolation (LORI) (Continued)

Period exclusively breastfed	Number	95% CI	%	95% CI
		LORI — Extreme		
Never breastfed	10	(10 – 30)	2.6	(0.8 – 5.7)
1 month	20	(0 – 50)	3.1	(0.3 – 9.4)
2 months	20	(10 – 50)	4.0	(1.4 – 9.8)
3 months	60	(20 – 140)	11.1	(4.1 – 26.2)
4 months	70	(40 – 120)	13.2	(7.7 – 20.4)
5 months	50	(20 – 110)	9.0	(3.6 – 19.9)
6 months	100	(40 – 180)	18.5	(8.8 – 32.0)
7 months and longer	100	(40 – 170)	18.3	(9.2 – 29.5)
Still being breastfed	110	(50 – 210)	20.2	(10.0 – 31.9)
Total	520	(350 – 770)	100.0	
		Total WA		
Never breastfed	780	(650 – 930)	12.6	(10.5 – 15.0)
1 month	640	(510 – 780)	10.3	(8.3 – 12.6)
2 months	400	(290 – 540)	6.5	(4.7 – 8.6)
3 months	930	(790 – 1 080)	14.9	(12.7 – 17.2)
4 months	1 110	(950 – 1 280)	17.9	(15.4 – 20.5)
5 months	480	(360 – 610)	7.7	(5.8 – 9.9)
6 months	780	(650 – 920)	12.5	(10.5 – 14.8)
7 months and longer	450	(350 – 570)	7.2	(5.6 – 9.1)
Still being breastfed	650	(540 – 770)	10.4	(8.6 – 12.4)
Total	6 210	(6 060 – 6 350)	100.0	

Table 3.29: Children 0–3 years, for whom primary carer is birth mother, and who have started on solid food — Age child first given solid food, by Level of Relative Isolation (LORI)

Age child first given solid food	Number	95% CI	%	95% CI
	LORI — None			
1 month	80	(30 – 160)	4.2	(1.8 – 8.7)
2 months	130	(70 – 210)	6.8	(3.8 – 10.9)
3 months	270	(180 – 380)	14.4	(10.0 – 20.5)
4 months	600	(490 – 730)	32.2	(26.5 – 38.7)
5 months	300	(210 – 410)	16.0	(11.2 – 21.4)
6 months	320	(230 – 430)	17.1	(12.6 – 22.6)
7 months or older	170	(120 – 240)	9.3	(6.5 – 12.9)
Total	1 870	(1 760 – 1 990)	100.0	
	LORI — Low			
1 month	60	(40 – 100)	4.6	(2.7 – 7.4)
2 months	70	(30 – 120)	4.7	(2.3 – 8.5)
3 months	300	(230 – 400)	21.7	(16.6 – 27.7)
4 months	440	(350 – 530)	31.6	(25.7 – 37.6)
5 months	130	(60 – 210)	9.0	(4.6 – 14.9)
6 months	210	(140 – 290)	15.2	(10.6 – 21.0)
7 months or older	180	(130 – 240)	13.1	(9.4 – 17.3)
Total	1 390	(1 240 – 1 540)	100.0	
	LORI — Moderate			
1 month	50	(10 – 160)	4.0	(0.9 – 12.4)
2 months	60	(30 – 110)	4.9	(2.4 – 8.4)
3 months	210	(150 – 280)	16.5	(12.3 – 21.7)
4 months	350	(260 – 460)	27.0	(21.3 – 33.4)
5 months	150	(100 – 220)	11.5	(7.4 – 16.5)
6 months	250	(180 – 360)	19.7	(13.8 – 26.3)
7 months or older	210	(150 – 290)	16.3	(12.1 – 21.7)
Total	1 280	(1 080 – 1 510)	100.0	
	LORI — High			
1 month	0	(0 – 10)	0.9	(0.3 – 2.6)
2 months	20	(0 – 70)	5.5	(0.6 – 15.5)
3 months	50	(20 – 100)	12.0	(4.4 – 23.9)
4 months	120	(60 – 230)	26.9	(12.9 – 44.4)
5 months	50	(10 – 140)	12.2	(3.8 – 30.7)
6 months	100	(50 – 180)	22.8	(13.2 – 37.0)
7 months or older	80	(30 – 190)	19.7	(7.2 – 36.4)
Total	430	(280 – 630)	100.0	
	LORI — Extreme			
1 month	0	(0 – 10)	0.7	(0.1 – 2.1)
2 months	20	(10 – 50)	5.2	(1.3 – 11.4)
3 months	30	(10 – 80)	7.1	(2.1 – 18.2)
4 months	100	(50 – 170)	23.6	(13.1 – 38.2)
5 months	40	(10 – 110)	9.9	(2.5 – 21.7)
6 months	110	(60 – 210)	28.2	(15.4 – 45.9)
7 months or older	100	(50 – 180)	25.3	(12.9 – 39.5)
Total	400	(260 – 590)	100.0	
	Total WA			
1 month	200	(120 – 310)	3.7	(2.3 – 5.8)
2 months	300	(220 – 400)	5.6	(4.0 – 7.4)
3 months	860	(720 – 1 020)	16.1	(13.5 – 18.9)
4 months	1 600	(1 420 – 1 790)	29.8	(26.5 – 33.1)
5 months	670	(530 – 820)	12.4	(9.9 – 15.3)
6 months	1 000	(840 – 1 160)	18.5	(15.7 – 21.6)
7 months or older	750	(630 – 890)	14.0	(11.7 – 16.5)
Total	5 380	(5 200 – 5 540)	100.0	

Table 3.30: Children aged 4–17 years — Drink usually drunk to quench thirst, by age group

Drink	Number	95% CI	%	95% CI
		4–11 years		
Water only	9 260	(8 730 – 9 790)	67.1	(63.9 – 70.0)
Soft drink	1 030	(770 – 1 320)	7.4	(5.6 – 9.5)
Fruit juice	610	(430 – 850)	4.4	(3.1 – 6.1)
Cordial	2 560	(2 250 – 2 900)	18.6	(16.3 – 21.0)
Other	350	(210 – 530)	2.5	(1.5 – 3.8)
Total	13 800	(13 300 – 14 300)	100.0	
		12–17 years		
Water only	6 320	(5 890 – 6 760)	69.4	(66.1 – 72.5)
Soft drink	1 200	(990 – 1 450)	13.2	(10.9 – 15.7)
Fruit juice	390	(300 – 510)	4.3	(3.3 – 5.5)
Cordial	930	(740 – 1 170)	10.3	(8.2 – 12.8)
Other	260	(140 – 410)	2.8	(1.7 – 4.7)
Total	9 100	(8 620 – 9 590)	100.0	
		Total		
Water only	15 600	(15 000 – 16 100)	68.0	(65.7 – 70.2)
Soft drink	2 230	(1 890 – 2 590)	9.7	(8.2 – 11.3)
Fruit juice	1 000	(790 – 1 250)	4.4	(3.5 – 5.4)
Cordial	3 500	(3 120 – 3 900)	15.3	(13.6 – 17.0)
Other	610	(430 – 850)	2.7	(1.9 – 3.7)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.31: All children aged 4–17 years — Dietary indicators, by LORI

Dietary Indicators	Number	95% CI	%	95% CI
LORI — None (N = 7 830)				
Unsweetened milk	7 200	(6 980 – 7 420)	91.9	(89.5 – 94.0)
Daily vegetable intake	5 050	(4 700 – 5 410)	64.5	(60.0 – 68.7)
Adequate vegetable intake	3 070	(2 740 – 3 400)	39.2	(35.0 – 43.4)
Adequate fruit intake	5 610	(5 290 – 5 940)	71.6	(67.4 – 75.4)
Drinks water when thirsty	4 880	(4 550 – 5 230)	62.3	(57.9 – 66.4)
LORI — Low (N = 5 740)				
Unsweetened milk	5 330	(4 850 – 5 830)	92.7	(90.5 – 94.5)
Daily vegetable intake	3 680	(3 280 – 4 110)	64.1	(59.6 – 68.5)
Adequate vegetable intake	2 030	(1 730 – 2 380)	35.4	(30.9 – 40.2)
Adequate fruit intake	3 920	(3 530 – 4 330)	68.2	(64.0 – 72.1)
Drinks water when thirsty	3 480	(3 100 – 3 900)	60.6	(56.0 – 65.1)
LORI — Moderate (N = 4 630)				
Unsweetened milk	4 310	(3 600 – 5 060)	93.1	(91.1 – 94.7)
Daily vegetable intake	3 140	(2 590 – 3 750)	67.8	(61.4 – 73.7)
Adequate vegetable intake	1 750	(1 390 – 2 190)	37.9	(32.4 – 44.0)
Adequate fruit intake	3 230	(2 680 – 3 840)	69.8	(64.7 – 74.6)
Drinks water when thirsty	3 480	(2 870 – 4 130)	75.1	(70.2 – 79.7)
LORI — High (N = 2 530)				
Unsweetened milk	2 340	(1 780 – 3 060)	92.5	(85.1 – 96.9)
Daily vegetable intake	1 710	(1 270 – 2 240)	67.6	(60.3 – 74.7)
Adequate vegetable intake	850	(580 – 1 200)	33.4	(25.9 – 41.9)
Adequate fruit intake	1 820	(1 370 – 2 380)	71.8	(64.8 – 78.0)
Drinks water when thirsty	1 970	(1 490 – 2 590)	77.9	(69.6 – 84.4)
LORI — Extreme (N = 2 170)				
Unsweetened milk	2 060	(1 510 – 2 790)	95.1	(91.6 – 97.6)
Daily vegetable intake	1 250	(910 – 1 730)	57.8	(47.7 – 67.8)
Adequate vegetable intake	530	(350 – 800)	24.5	(17.4 – 33.5)
Adequate fruit intake	1 530	(1 090 – 2 030)	70.4	(62.2 – 78.4)
Drinks water when thirsty	1 770	(1 250 – 2 360)	81.4	(76.4 – 86.0)
Total WA (N = 22 900)				
Unsweetened milk	21 200	(21 000 – 21 500)	92.7	(91.5 – 93.8)
Daily vegetable intake	14 800	(14 200 – 15 400)	64.8	(62.2 – 67.3)
Adequate vegetable intake	8 230	(7 680 – 8 800)	35.9	(33.5 – 38.4)
Adequate fruit intake	16 100	(15 600 – 16 600)	70.3	(68.1 – 72.5)
Drinks water when thirsty	15 600	(15 000 – 16 100)	68.0	(65.7 – 70.2)

Table 3.32: Children aged 4–11 years — Dietary indicators, by LORI

Dietary Indicators	Number	95% CI	%	95% CI
LORI — None (N = 4 670)				
Unsweetened milk	4 390	(4 060 – 4 740)	94.0	(89.8 – 96.7)
Daily vegetable intake	2 700	(2 380 – 3 050)	57.9	(51.7 – 64.0)
Adequate vegetable intake	1 990	(1 690 – 2 330)	42.6	(36.7 – 48.9)
Adequate fruit intake	3 300	(2 970 – 3 650)	70.7	(64.7 – 76.1)
Drinks water when thirsty	2 880	(2 540 – 3 230)	61.6	(55.5 – 67.3)
LORI — Low (N = 3 460)				
Unsweetened milk	3 300	(2 930 – 3 680)	95.3	(92.8 – 97.2)
Daily vegetable intake	1 990	(1 710 – 2 290)	57.4	(51.6 – 63.0)
Adequate vegetable intake	1 400	(1 160 – 1 680)	40.6	(34.9 – 46.5)
Adequate fruit intake	2 230	(1 940 – 2 560)	64.5	(59.2 – 69.6)
Drinks water when thirsty	2 020	(1 730 – 2 340)	58.4	(52.2 – 64.5)
LORI — Moderate (N = 2 800)				
Unsweetened milk	2 650	(2 160 – 3 190)	94.3	(91.6 – 96.6)
Daily vegetable intake	1 810	(1 440 – 2 260)	64.4	(56.0 – 71.6)
Adequate vegetable intake	1 320	(1 020 – 1 680)	47.1	(39.5 – 55.2)
Adequate fruit intake	1 850	(1 460 – 2 300)	65.9	(59.3 – 71.9)
Drinks water when thirsty	2 080	(1 680 – 2 530)	74.3	(66.6 – 80.6)
LORI — High (N = 1 600)				
Unsweetened milk	1 470	(1 060 – 1 970)	92.1	(78.8 – 97.5)
Daily vegetable intake	1 000	(700 – 1 420)	62.5	(51.7 – 71.5)
Adequate vegetable intake	630	(410 – 940)	39.2	(29.2 – 51.1)
Adequate fruit intake	1 090	(780 – 1 480)	67.9	(59.1 – 76.1)
Drinks water when thirsty	1 290	(930 – 1 750)	80.8	(71.1 – 88.1)
LORI — Extreme (N = 1 270)				
Unsweetened milk	1 200	(850 – 1 660)	94.3	(90.0 – 97.3)
Daily vegetable intake	630	(400 – 930)	49.3	(34.8 – 63.4)
Adequate vegetable intake	360	(220–560)	28.5	(19.2–40.0)
Adequate fruit intake	750	(510 – 1 060)	59.2	(47.4 – 70.7
Drinks water when thirsty	980	(660 – 1 360)	77.2	(68.8 – 83.7)
Total WA (N = 13 800)				
Unsweetened milk	13 000	(12 500 – 13 500)	94.2	(92.4 – 95.7)
Daily vegetable intake	8 120	(7 570 – 8 690)	58.8	(55.3 – 62.2)
Adequate vegetable intake	5 700	(5 210 – 6 230)	41.3	(38.0 – 44.7)
Adequate fruit intake	9 220	(8 680 – 9 760)	66.8	(63.7 – 69.7)
Drinks water when thirsty	9 260	(8 730 – 9 790)	67.1	(63.9 – 70.0)

Table 3.33: Children aged 12–17 years — Dietary indicators, by LORI

Dietary Indicators	Number	95% CI	%	95% CI
LORI — None (N = 3 160)				
Unsweetened milk	2 810	(2 510 – 3 130)	88.8	(85.9 – 91.3)
Daily vegetable intake	2 350	(2 080 – 2 640)	74.3	(68.3 – 79.7)
Adequate vegetable intake	1 080	(900 – 1 290)	34.1	(29.1 – 39.7)
Adequate fruit intake	2 310	(2 040 – 2 600)	73.0	(67.7 – 78.1)
Drinks water when thirsty	2 000	(1 760 – 2 270)	63.3	(57.3 – 68.9)
LORI — Low (N = 2 280)				
Unsweetened milk	2 030	(1 750 – 2 340)	88.8	(84.6 – 92.2)
Daily vegetable intake	1 700	(1 430 – 1 990)	74.2	(67.8 – 80.1)
Adequate vegetable intake	630	(450 – 850)	27.4	(20.7 – 35.1)
Adequate fruit intake	1 690	(1 430 – 1 970)	73.8	(67.5 – 79.3)
Drinks water when thirsty	1 460	(1 230 – 1 720)	63.8	(56.4 – 70.9)
LORI — Moderate (N = 1 820)				
Unsweetened milk	1 660	(1 340 – 2 040)	91.1	(88.1 – 93.4)
Daily vegetable intake	1 330	(1 080 – 1 630)	73.0	(62.6 – 81.6)
Adequate vegetable intake	430	(320 – 560)	23.7	(18.9 – 29.0)
Adequate fruit intake	1 380	(1 130 – 1 680)	75.8	(65.4 – 84.0)
Drinks water when thirsty	1 390	(1 100 – 1 730)	76.3	(70.8 – 81.4)
LORI — High (N = 930)				
Unsweetened milk	870	(640 – 1 140)	93.3	(84.7 – 97.7)
Daily vegetable intake	710	(530 – 940)	76.4	(68.6 – 82.6)
Adequate vegetable intake	220	(130 – 340)	23.5	(15.6 – 32.2)
Adequate fruit intake	730	(550 – 970)	78.3	(70.5 – 84.5)
Drinks water when thirsty	680	(500 – 910)	73.0	(62.2 – 82.0)
LORI — Extreme (N = 900)				
Unsweetened milk	870	(620 – 1 190)	96.4	(90.8 – 99.3)
Daily vegetable intake	630	(440 – 870)	69.9	(59.2 – 78.5)
Adequate vegetable intake	170	(100 – 280)	19.0	(11.4 – 28.5)
Adequate fruit intake	780	(540 – 1 070)	86.3	(79.3 – 92.2)
Drinks water when thirsty	790	(540 – 1 090)	87.4	(80.4 – 92.9)
Total WA (N = 9 100)				
Unsweetened milk	8 230	(7 760 – 8 710)	90.5	(88.8 – 91.9)
Daily vegetable intake	6 720	(6 290 – 7 160)	73.8	(70.4 – 76.9)
Adequate vegetable intake	2 530	(2 230 – 2 840)	27.8	(24.9 – 30.9)
Adequate fruit intake	6 880	(6 450 – 7 320)	75.6	(72.4 – 78.5)
Drinks water when thirsty	6 320	(5 890 – 6 760)	69.4	(66.1 – 72.5)

Table 3.34: Children aged 4–17 years — Types of milk drunk

Type of milk	Number	95% CI	%	95% CI
Unsweetened, unflavoured cow or soy	21 200	(21 000 – 21 500)	92.7	(91.5 – 93.8)
Sweetened &/or flavoured	810	(620 – 1 040)	3.6	(2.7 – 4.5)
Other	220	(160 – 310)	1.0	(0.7 – 1.3)
None	630	(480 – 810)	2.8	(2.1 – 3.6)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.35: Children aged 4–17 years — Dietary indicators, by carer education

Dietary Indicators	Number	95% CI	%	95% CI
Did not attend school (N = 670)				
Unsweetened milk	610	(410 – 890)	91.6	(78.8 – 97.5)
Adequate vegetable intake	180	(100 – 300)	27.6	(13.4 – 43.1)
Adequate fruit intake	380	(240 – 560)	56.1	(43.3 – 67.9)
Drinks water when thirsty	570	(390 – 810)	84.3	(67.3 – 96.0)
1–9 years (N = 5 180)				
Unsweetened milk	4 780	(4 320 – 5 280)	92.4	(89.9 – 94.5)
Adequate vegetable intake	1 560	(1 350 – 1 810)	30.2	(26.3 – 34.3)
Adequate fruit intake	3 400	(3 010 – 3 820)	65.7	(61.2 – 70.1)
Drinks water when thirsty	3 660	(3 280 – 4 070)	70.7	(66.5 – 74.5)
10 years (N = 9 840)				
Unsweetened milk	9 060	(8 460 – 9 680)	92.0	(90.4 – 93.4)
Adequate vegetable intake	3 680	(3 260 – 4 130)	37.4	(33.7 – 41.0)
Adequate fruit intake	7 080	(6 540 – 7 640)	71.9	(68.5 – 75.4)
Drinks water when thirsty	6 400	(5 870 – 6 950)	65.1	(61.4 – 68.6)
11–12 years (N = 5 010)				
Unsweetened milk	4 720	(4 250 – 5 230)	94.0	(91.0 – 96.3)
Adequate vegetable intake	1 990	(1 700 – 2 330)	39.7	(34.8 – 45.0)
Adequate fruit intake	3 630	(3 220 – 4 090)	72.4	(67.7 – 76.7)
Drinks water when thirsty	3 400	(3 010 – 3 820)	67.8	(63.0 – 72.4)
13 years or more (N = 1 380)				
Unsweetened milk	1 270	(960 – 1 650)	91.8	(83.8 – 96.2)
Adequate vegetable intake	590	(400 – 830)	42.5	(30.7 – 55.2)
Adequate fruit intake	1 000	(750 – 1 280)	72.4	(63.1 – 80.4)
Drinks water when thirsty	990	(700 – 1 310)	71.3	(59.6 – 80.3)
Not stated (N = 810)				
Unsweetened milk	790	(590 – 1 060)	97.2	(89.8 – 99.6)
Adequate vegetable intake	230	(110 – 410)	27.7	(14.6 – 43.9)
Adequate fruit intake	600	(420 – 840)	74.1	(61.4 – 83.5)
Drinks water when thirsty	560	(380 – 810)	68.7	(56.1 – 80.8)
Total (N = 22 900)				
Unsweetened milk	21 200	(21 000 – 21 500)	92.7	(91.5 – 93.8)
Adequate vegetable intake	8 230	(7 680 – 8 800)	35.9	(33.5 – 38.4)
Adequate fruit intake	16 100	(15 600 – 16 600)	70.3	(68.1 – 72.5)
Drinks water when thirsty	15 600	(15 000 – 16 100)	68.0	(65.7 – 70.2)

Table 3.36: Children aged 4–11 years — Dietary indicators, by carer education

Dietary Indicators	Number	95% CI	%	95% CI
Did not attend school (N = 360)				
Unsweetened milk	330	(220 – 470)	90.9	(66.9 – 98.7)
Adequate vegetable intake	120	(60 – 200)	33.0	(18.6 – 53.2)
Adequate fruit intake	140	(80 – 250)	39.7	(21.8 – 57.8)
Drinks water when thirsty	310	(210 – 420)	84.4	(51.6 – 97.9)
1–9 years (N = 2 850)				
Unsweetened milk	2 660	(2 340 – 3 000)	93.1	(89.1 – 95.8)
Adequate vegetable intake	960	(800 – 1 140)	33.6	(28.0 – 39.2)
Adequate fruit intake	1 570	(1 330 – 1 840)	55.0	(48.8 – 60.9)
Drinks water when thirsty	1 890	(1 620 – 2 180)	66.3	(60.2 – 72.0)
10 years (N = 6 050)				
Unsweetened milk	5 700	(5 230 – 6 190)	94.2	(92.0 – 96.1)
Adequate vegetable intake	2 550	(2 200 – 2 950)	42.1	(37.1 – 47.1)
Adequate fruit intake	4 290	(3 830 – 4 750)	70.9	(66.3 – 75.0)
Drinks water when thirsty	3 870	(3 480 – 4 300)	64.1	(58.8 – 68.9)
11–12 years (N = 3 490)				
Unsweetened milk	3 300	(2 930 – 3 710)	94.4	(90.0 – 97.5)
Adequate vegetable intake	1 620	(1 360 – 1 920)	46.5	(40.1 – 52.8)
Adequate fruit intake	2 520	(2 170 – 2 890)	72.1	(65.8 – 77.6)
Drinks water when thirsty	2 410	(2 090 – 2 780)	69.1	(63.6 – 74.2)
13 years or more (N = 720)				
Unsweetened milk	700	(490 – 950)	96.3	(77.2 – 99.9)
Adequate vegetable intake	340	(180 – 560)	46.6	(28.1 – 63.6)
Adequate fruit intake	470	(310 – 690)	64.4	(46.9 – 77.9)
Drinks water when thirsty	560	(370 – 810)	77.4	(65.0 – 88.2)
Not stated (N = 330)				
Unsweetened milk	330	(180 – 530)	100.0	(84.6 – 100.0)
Adequate vegetable intake	120	(20 – 310)	36.3	(12.2 – 73.8)
Adequate fruit intake	230	(110 – 430)	72.2	(47.6 – 92.7)
Drinks water when thirsty	210	(90 – 400)	65.5	(38.3 – 85.8)
Total (N = 13 800)				
Unsweetened milk	13 000	(12 500 – 13 500)	94.2	(92.4 – 95.7)
Adequate vegetable intake	5 700	(5 210 – 6 230)	41.3	(38.0 – 44.7)
Adequate fruit intake	9 220	(8 680 – 9 760)	66.8	(63.7 – 69.7)
Drinks water when thirsty	9 260	(8 730 – 9 790)	67.1	(63.9 – 70.0)

Table 3.37: Children aged 12–17 years — Dietary indicators, by carer education

Dietary Indicators	Number	95% CI	%	95% CI
Did not attend school (N = 310)				
Unsweetened milk	290	(150 – 470)	92.5	(76.3 – 98.1)
Adequate vegetable intake	70	(20 – 130)	21.2	(7.8 – 45.4)
Adequate fruit intake	230	(110 – 400)	75.3	(58.8 – 89.3)
Drinks water when thirsty	260	(140 – 420)	84.1	(67.2 – 94.7)
1–9 years (N = 2 320)				
Unsweetened milk	2 130	(1 840 – 2 460)	91.5	(87.7 – 94.2)
Adequate vegetable intake	600	(470 – 760)	26.0	(20.8 – 31.5)
Adequate fruit intake	1 840	(1 570 – 2 140)	79.0	(73.5 – 83.8)
Drinks water when thirsty	1 770	(1 510 – 2 050)	76.1	(70.0 – 81.5)
10 years (N = 3 800)				
Unsweetened milk	3 360	(2 990 – 3 760)	88.5	(86.1 – 90.8)
Adequate vegetable intake	1 130	(930 – 1 370)	29.8	(25.1 – 34.9)
Adequate fruit intake	2 790	(2 500 – 3 110)	73.6	(67.7 – 79.1)
Drinks water when thirsty	2 530	(2 200 – 2 880)	66.7	(61.8 – 71.1)
11–12 years (N = 1 520)				
Unsweetened milk	1 420	(1 160 – 1 720)	93.2	(90.4 – 95.5)
Adequate vegetable intake	370	(230 – 540)	24.2	(16.8 – 32.8)
Adequate fruit intake	1 120	(890 – 1 390)	73.2	(66.1 – 79.7)
Drinks water when thirsty	990	(800 – 1 210)	64.8	(55.0 – 73.8)
13 years or more (N = 660)				
Unsweetened milk	570	(400 – 790)	87.0	(77.6 – 94.1)
Adequate vegetable intake	250	(160 – 370)	38.0	(24.1 – 51.9)
Adequate fruit intake	540	(380 – 760)	81.1	(66.7 – 90.9)
Drinks water when thirsty	430	(280 – 610)	64.6	(48.0 – 78.4)
Not stated (N = 490)				
Unsweetened milk	470	(330 – 640)	95.4	(83.5 – 99.4)
Adequate vegetable intake	110	(60 – 190)	22.0	(11.9 – 33.7)
Adequate fruit intake	370	(250 – 520)	75.4	(65.0 – 84.9)
Drinks water when thirsty	350	(220 – 510)	70.9	(54.8 – 83.2)
Total (N = 9 100)				
Unsweetened milk	8 230	(7 760 – 8 710)	90.5	(88.8 – 91.9)
Adequate vegetable intake	2 530	(2 230 – 2 840)	27.8	(24.9 – 30.9)
Adequate fruit intake	6 880	(6 450 – 7 320)	75.6	(72.4 – 78.5)
Drinks water when thirsty	6 320	(5 890 – 6 760)	69.4	(66.1 – 72.5)

Table 3.38: Children aged 4–17 years who eat fresh vegetables daily — Whether quantity exceeds half a cup

Exceeds half cup	Number	95% CI	%	95% CI
4–11 years				
No	200	(140 – 270)	2.5	(1.8 – 3.3)
Yes	7 920	(7 360 – 8 470)	97.5	(96.7 – 98.2)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.7)
Total	8 120	(7 570 – 8 690)	100.0	
12–17 years				
No	1 280	(1 100 – 1 480)	19.0	(16.5 – 21.8)
Yes	5 440	(5 040 – 5 860)	81.0	(78.2 – 83.5)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.8)
Total	6 720	(6 290 – 7 160)	100.0	
Total children 4–17 years				
No	1 480	(1 290 – 1 680)	10.0	(8.7 – 11.3)
Yes	13 400	(12 800 – 13 900)	90.0	(88.7 – 91.3)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.4)
Total	14 800	(14 200 – 15 400)	100.0	

Table 3.39: Children aged 4–17 who usually ate fresh vegetables daily — Number of types of vegetables consumed regularly (excluding potatoes) by age

Number of vegetables excluding potatoes consumed regularly	Number	95% CI	%	95% CI
4–11 years				
None	120	(70 – 190)	1.4	(0.8 – 2.4)
One	220	(150 – 330)	2.7	(1.8 – 4.0)
Two	630	(480 – 820)	7.8	(5.9 – 10.0)
Three	1 390	(1 110 – 1 700)	17.1	(13.8 – 20.7)
Four	1 740	(1 460 – 2 070)	21.5	(18.2 – 25.0)
Five or more	4 020	(3 580 – 4 490)	49.5	(45.2 – 53.9)
Total	8 120	(7 570 – 8 690)	100.0	
12–17 years				
None	170	(120 – 220)	2.5	(1.8 – 3.3)
One	1 400	(1 180 – 1 650)	20.8	(17.8 – 24.2)
Two	830	(670 – 1 000)	12.3	(10.1 – 14.8)
Three	1 400	(1 220 – 1 600)	20.8	(18.3 – 23.5)
Four	1 130	(950 – 1 330)	16.8	(14.3 – 19.6)
Five or more	1 800	(1 550 – 2 090)	26.8	(23.5 – 30.4)
Total	6 720	(6 290 – 7 160)	100.0	
Total children 4–17 years				
None	280	(210 – 370)	1.9	(1.4 – 2.5)
One	1 620	(1 390 – 1 880)	10.9	(9.3 – 12.6)
Two	1 460	(1 230 – 1 700)	9.8	(8.3 – 11.5)
Three	2 790	(2 470 – 3 140)	18.8	(16.7 – 21.1)
Four	2 870	(2 530 – 3 240)	19.4	(17.2 – 21.6)
Five or more	5 820	(5 330 – 6 340)	39.2	(36.4 – 42.2)
Total	14 800	(14 200 – 15 400)	100.0	

Table 3.40: Children aged 4–17 years who eat fresh vegetables daily — Number of different types other than potato

Number of different types	Number	95% CI	%	95% CI
		4–11 years		
Three or less	2 360	(2 030 – 2 730)	29.0	(25.3 – 33.1)
More than three	5 760	(5 260 – 6 290)	71.0	(66.9 – 74.7)
Total	8 120	(7 570 – 8 690)	100.0	
		12–17 years		
Three or less	3 790	(3 460 – 4 120)	56.4	(52.7 – 60.0)
More than three	2 930	(2 620 – 3 260)	43.6	(40.0 – 47.3)
Total	6 720	(6 290 – 7 160)	100.0	
		Total children 4–17 years		
Three or less	6 150	(5 700 – 6 610)	41.4	(38.6 – 44.3)
More than three	8 690	(8 120 – 9 260)	58.6	(55.7 – 61.4)
Total	14 800	(14 200 – 15 400)	100.0	

Table 3.41: Children aged 4–17 years — Adequacy of vegetable intake, by adequacy of fruit intake

Adequacy of vegetable intake	Number	95% CI	%	95% CI
		Inadequate fruit intake		
Inadequate	5 130	(4 670 – 5 620)	75.4	(71.5 – 79.0)
Adequate	1 680	(1 420 – 1 960)	24.6	(21.0 – 28.5)
Total	6 810	(6 300 – 7 310)	100.0	
		Adequate fruit intake		
Inadequate	9 540	(9 000 – 10 100)	59.3	(56.4 – 62.1)
Adequate	6 550	(6 040 – 7 090)	40.7	(37.9 – 43.6)
Total	16 100	(15 600 – 16 600)	100.0	
		Total		
Inadequate	14 700	(14 100 – 15 200)	64.1	(61.6 – 66.5)
Adequate	8 230	(7 680 – 8 800)	35.9	(33.5 – 38.4)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.42: Children aged 4–17 years — Number of dietary quality indicators met, by Level of Relative Isolation (LORI)

Number of dietary quality indicators met	Number	95% CI	%	95% CI
	LORI — None			
None	70	(20 – 180)	0.8	(0.2 – 2.3)
One	760	(560 – 1 020)	9.7	(7.1 – 12.9)
Two	2 540	(2 250 – 2 850)	32.4	(28.7 – 36.2)
Three	2 960	(2 660 – 3 270)	37.8	(34.0 – 41.8)
Four	1 510	(1 260 – 1 800)	19.3	(16.1 – 23.0)
Total	7 830	(7 680 – 7 980)	100.0	
	LORI — Low			
None	70	(30 – 140)	1.3	(0.5 – 2.4)
One	670	(540 – 840)	11.7	(9.5 – 14.3)
Two	1 860	(1 570 – 2 190)	32.3	(28.3 – 36.6)
Three	2 190	(1 920 – 2 480)	38.1	(34.0 – 42.3)
Four	950	(720 – 1 220)	16.5	(12.7 – 20.9)
Total	5 740	(5 240 – 6 250)	100.0	
	LORI — Moderate			
None	10	(0 – 30)	0.3	(0.1 – 0.7)
One	310	(220 – 430)	6.7	(4.8 – 8.8)
Two	1 450	(1 130 – 1 850)	31.3	(26.1 – 37.1)
Three	1 870	(1 530 – 2 250)	40.4	(36.1 – 44.9)
Four	990	(740 – 1 290)	21.3	(17.0 – 26.3)
Total	4 630	(3 910 – 5 450)	100.0	
	LORI — High			
None	30	(0 – 160)	1.3	(0.0 – 6.2)
One	150	(70 – 300)	6.0	(2.8 – 11.1)
Two	710	(490 – 990)	28.2	(22.4 – 34.4)
Three	1 130	(820 – 1 520)	44.7	(36.4 – 52.7)
Four	500	(310 – 790)	19.8	(12.7 – 28.2)
Total	2 530	(1 890 – 3 260)	100.0	
	LORI — Extreme			
None	30	(0 – 100)	1.3	(0.2 – 4.6)
One	90	(30 – 200)	4.1	(1.4 – 8.3)
Two	700	(450 – 1 020)	32.1	(25.5 – 39.3)
Three	1 010	(720 – 1 380)	46.6	(39.4 – 53.9)
Four	340	(210 – 520)	15.8	(10.7 – 22.5)
Total	2 170	(1 550 – 2 890)	100.0	
	Total WA			
None	210	(110 – 350)	0.9	(0.5 – 1.5)
One	1 980	(1 690 – 2 300)	8.7	(7.4 – 10.1)
Two	7 250	(6 770 – 7 760)	31.7	(29.5 – 33.9)
Three	9 170	(8 670 – 9 670)	40.0	(37.8 – 42.2)
Four	4 290	(3 830 – 4 770)	18.7	(16.7 – 20.8)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.43: Children aged 4–11 years — Number of dietary quality indicators met, by Level of Relative Isolation (LORI)

Number of dietary quality indicators met	Number	95% CI	%	95% CI
		LORI — None		
None	30	(0 – 170)	0.6	(0.0 – 3.6)
One	400	(240 – 640)	8.6	(5.0 – 13.1)
Two	1 520	(1 270 – 1 800)	32.6	(27.6 – 38.2)
Three	1 740	(1 470 – 2 030)	37.3	(32.0 – 42.9)
Four	970	(750 – 1 240)	20.8	(16.0 – 25.9)
Total	4 670	(4 340 – 5 010)	100.0	
		LORI — Low		
None	40	(20 – 70)	1.1	(0.6 – 2.3)
One	430	(310 – 580)	12.4	(9.1 – 16.4)
Two	1 080	(860 – 1 340)	31.1	(25.5 – 37.0)
Three	1 280	(1 080 – 1 500)	37.1	(31.9 – 42.7)
Four	630	(460 – 860)	18.2	(13.3 – 23.7)
Total	3 460	(3 090 – 3 860)	100.0	
		LORI — Moderate		
None	10	(0 – 30)	0.2	(0.0 – 0.9)
One	170	(110 – 240)	5.9	(4.1 – 8.4)
Two	890	(640 – 1 180)	31.6	(24.8 – 39.1)
Three	1 030	(810 – 1 270)	36.7	(31.2 – 42.3)
Four	720	(500 – 970)	25.6	(19.8 – 32.4)
Total	2 800	(2 300 – 3 360)	100.0	
		LORI — High		
None	20	(0 – 190)	1.1	(0.0 – 11.2)
One	100	(50 – 190)	6.0	(3.0 – 11.0)
Two	440	(300 – 620)	27.4	(21.2 – 33.8)
Three	690	(470 – 990)	42.9	(32.9 – 53.3)
Four	360	(190 – 620)	22.7	(12.7 – 35.8)
Total	1 600	(1 150 – 2 120)	100.0	
		LORI — Extreme		
None	20	(0 – 120)	1.2	(0.0 – 9.2)
One	80	(30 – 150)	6.1	(2.4 – 11.6)
Two	530	(320 – 810)	41.9	(31.5 – 52.6)
Three	430	(290 – 620)	33.9	(25.6 – 43.7)
Four	210	(120 – 350)	16.9	(10.5 – 24.6)
Total	1 270	(900 – 1 760)	100.0	
		Total WA		
None	110	(40 – 260)	0.8	(0.3 – 1.8)
One	1 170	(940 – 1 430)	8.5	(6.9 – 10.4)
Two	4 460	(4 030 – 4 900)	32.3	(29.4 – 35.3)
Three	5 170	(4 750 – 5 600)	37.4	(34.6 – 40.3)
Four	2 900	(2 500 – 3 320)	21.0	(18.3 – 23.9)
Total	13 800	(13 300 – 14 300)	100.0	

Table 3.44: Children aged 12–17 years — Number of dietary quality indicators met, by Level of Relative Isolation (LORI)

Number of dietary quality indicators met	Number	95% CI	%	95% CI
LORI — None				
None	40	(10 – 80)	1.1	(0.4 – 2.5)
One	360	(230 – 510)	11.2	(7.6 – 16.1)
Two	1 010	(830 – 1 210)	32.0	(27.0 – 37.3)
Three	1 220	(1 020 – 1 440)	38.6	(33.1 – 44.2)
Four	540	(410 – 700)	17.1	(13.1 – 21.8)
Total	3 160	(2 850 – 3 490)	100.0	
LORI — Low				
None	40	(10 – 120)	1.5	(0.4 – 5.2)
One	240	(180 – 320)	10.6	(8.0 – 13.8)
Two	780	(600 – 990)	34.2	(28.0 – 41.0)
Three	910	(760 – 1 080)	39.8	(33.9 – 46.0)
Four	320	(180 – 530)	13.9	(7.8 – 21.5)
Total	2 280	(1 990 – 2 600)	100.0	
LORI — Moderate				
None	10	(0 – 20)	0.4	(0.1 – 1.0)
One	140	(70 – 240)	7.9	(4.4 – 13.4)
Two	560	(380 – 820)	30.8	(22.6 – 40.4)
Three	840	(660 – 1 060)	46.2	(38.8 – 53.7)
Four	270	(190 – 360)	14.7	(10.8 – 19.3)
Total	1 820	(1 490 – 2 230)	100.0	
LORI — High				
None	10	(10 – 30)	1.6	(0.5 – 3.3)
One	60	(20 – 140)	6.1	(1.7 – 14.8)
Two	280	(170 – 450)	29.6	(19.7 – 41.5)
Three	450	(320 – 610)	47.9	(38.0 – 58.2)
Four	140	(80 – 210)	14.8	(9.9 – 21.6)
Total	930	(690 – 1 230)	100.0	
LORI — Extreme				
None	10	(0 – 40)	1.4	(0.3 – 4.5)
One	10	(0 – 90)	1.4	(0.0 – 9.6)
Two	160	(110 – 240)	18.3	(12.1 – 25.3)
Three	580	(390 – 830)	64.6	(55.4 – 73.6)
Four	130	(70 – 210)	14.3	(9.0 – 21.7)
Total	900	(640 – 1 230)	100.0	
Total WA				
None	110	(60 – 180)	1.2	(0.6 – 2.0)
One	810	(640 – 1 010)	8.9	(7.1 – 11.0)
Two	2 800	(2 460 – 3 160)	30.7	(27.6 – 34.1)
Three	4 000	(3 670 – 4 350)	43.9	(40.7 – 47.1)
Four	1 390	(1 170 – 1 650)	15.3	(12.9 – 17.9)
Total	9 100	(8 620 – 9 590)	100.0	

Table 3.45: Children aged 4–17 years — Number of dietary quality indicators met, by age group, education level of primary carer

Number of dietary quality indicators met	Number	95% CI	%	95% CI
	Did not attend school			
None	20	(0 – 120)	3.3	(0.1 – 16.2)
One	40	(0 – 230)	6.1	(0.1 – 28.7)
Two	270	(180 – 370)	39.5	(28.0 – 52.3)
Three	200	(100 – 370)	29.9	(17.9 – 44.6)
Four	140	(80 – 240)	21.2	(10.5 – 35.0)
Total	670	(440 – 950)	100.0	
	1–9 years			
None	40	(20 – 70)	0.8	(0.4 – 1.3)
One	480	(330 – 660)	9.4	(6.8 – 12.7)
Two	1 790	(1 530 – 2 080)	34.6	(30.9 – 38.6)
Three	2 100	(1 820 – 2 400)	40.5	(36.5 – 44.7)
Four	760	(610 – 940)	14.7	(11.8 – 17.9)
Total	5 180	(4 690 – 5 690)	100.0	
	10 years			
None	90	(60 – 130)	0.9	(0.6 – 1.4)
One	940	(760 – 1 160)	9.6	(7.7 – 11.6)
Two	3 010	(2 630 – 3 440)	30.6	(27.2 – 34.1)
Three	3 940	(3 540 – 4 360)	40.0	(36.5 – 43.7)
Four	1 860	(1 550 – 2 210)	18.9	(16.0 – 22.1)
Total	9 840	(9 200 – 10 500)	100.0	
	11–12 years			
None	40	(0 – 230)	0.9	(0.0 – 4.4)
One	350	(240 – 490)	6.9	(4.8 – 9.7)
Two	1 560	(1 290 – 1 850)	31.1	(26.6 – 36.0)
Three	1 980	(1 700 – 2 290)	39.6	(35.1 – 44.2)
Four	1 080	(850 – 1 360)	21.6	(17.4 – 26.2)
Total	5 010	(4 520 – 5 520)	100.0	
	13 years or more			
None	20	(0 – 150)	1.3	(0.0 – 10.3)
One	110	(50 – 230)	7.8	(3.0 – 14.4)
Two	400	(240 – 600)	28.6	(19.1 – 38.6)
Three	500	(350 – 680)	36.2	(27.5 – 45.4)
Four	360	(220 – 580)	26.1	(16.0 – 37.6)
Total	1 380	(1 060 – 1 770)	100.0	
	Not stated			
None	0	(0 – 60)	0.0	(0.0 – 6.6)
One	60	(20 – 170)	7.6	(2.4 – 20.4)
Two	220	(150 – 330)	27.7	(18.1 – 38.6)
Three	440	(310 – 620)	54.2	(40.4 – 68.4)
Four	90	(10 – 340)	10.6	(1.4 – 34.7)
Total	810	(600 – 1 070)	100.0	
	Total			
None	210	(110 – 350)	0.9	(0.5 – 1.5)
One	1 980	(1 690 – 2 300)	8.7	(7.4 – 10.1)
Two	7 250	(6 770 – 7 760)	31.7	(29.5 – 33.9)
Three	9 170	(8 670 – 9 670)	40.0	(37.8 – 42.2)
Four	4 290	(3 830 – 4 770)	18.7	(16.7 – 20.8)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.46: Children aged 4–11 years — Number of dietary quality indicators met, education level of primary carer

Number of dietary quality indicators met	Number	95% CI	%	95% CI
	Did not attend school			
None	20	(0 – 120)	4.3	(0.1 – 28.7)
One	30	(0 – 300)	7.8	(0.4 – 57.9)
Two	170	(110 – 270)	47.8	(27.8 – 68.7)
Three	60	(30 – 110)	16.0	(6.8 – 30.7)
Four	90	(40 – 180)	24.2	(9.6 – 41.1)
Total	360	(240 – 530)	100.0	
	1–9 years			
None	20	(10 – 40)	0.7	(0.3 – 1.5)
One	300	(190 – 480)	10.6	(6.5 – 16.0)
Two	1 180	(970 – 1 420)	41.4	(35.8 – 47.2)
Three	990	(810 – 1 190)	34.6	(29.4 – 40.1)
Four	360	(260 – 490)	12.7	(9.1 – 16.9)
Total	2 850	(2 530 – 3 210)	100.0	
	10 years			
None	40	(20 – 80)	0.6	(0.3 – 1.3)
One	520	(390 – 670)	8.6	(6.5 – 11.0)
Two	1 840	(1 520 – 2 200)	30.5	(25.9 – 35.3)
Three	2 380	(2 080 – 2 720)	39.4	(34.8 – 44.2)
Four	1 260	(1 010 – 1 580)	20.9	(16.8 – 25.4)
Total	6 050	(5 570 – 6 550)	100.0	
	11–12 years			
None	40	(0 – 280)	1.0	(0.0 – 7.8)
One	230	(140 – 350)	6.6	(4.3 – 10.1)
Two	970	(770 – 1 210)	27.8	(22.5 – 33.6)
Three	1 340	(1 100 – 1 610)	38.4	(32.8 – 44.2)
Four	920	(710 – 1 150)	26.2	(20.8 – 31.9)
Total	3 490	(3 110 – 3 910)	100.0	
	13 years or more			
None	0	(0 – 60)	0.0	(0.0 – 7.4)
One	70	(20 – 170)	9.1	(2.7 – 23.1)
Two	190	(90 – 350)	26.8	(13.8 – 44.1)
Three	250	(160 – 370)	34.3	(22.7 – 49.4)
Four	220	(100 – 430)	29.8	(14.2 – 48.0)
Total	720	(510 – 990)	100.0	
	Not stated			
None	0	(0 – 60)	0.0	(0.0 – 15.4)
One	20	(0 – 160)	6.7	(0.0 – 41.0)
Two	100	(50 – 170)	29.5	(10.7 – 50.2)
Three	150	(90 – 240)	47.0	(23.0 – 77.0)
Four	50	(0 – 400)	16.8	(0.6 – 80.6)
Total	330	(180 – 530)	100.0	
	Total			
None	110	(40 – 260)	0.8	(0.3 – 1.8)
One	1 170	(940 – 1 430)	8.5	(6.9 – 10.4)
Two	4 460	(4 030 – 4 900)	32.3	(29.4 – 35.3)
Three	5 170	(4 750 – 5 600)	37.4	(34.6 – 40.3)
Four	2 900	(2 500 – 3 320)	21.0	(18.3 – 23.9)
Total	13 800	(13 300 – 14 300)	100.0	

Table 3.47: Children aged 12–17 years — Number of dietary quality indicators met, by education level of primary carer

Number of dietary quality indicators met	Number	95% CI	%	95% CI
	Did not attend school			
None	10	(0 – 70)	2.1	(0.0 – 20.6)
One	10	(0 – 90)	4.1	(0.1 – 27.3)
Two	90	(50 – 150)	29.9	(13.9 – 54.9)
Three	140	(40 – 310)	46.2	(24.4 – 71.1)
Four	50	(20 – 110)	17.7	(4.5 – 36.1)
Total	310	(170 – 510)	100.0	
	1–9 years			
None	20	(10 – 40)	0.9	(0.4 – 1.8)
One	180	(110 – 280)	7.8	(4.9 – 12.0)
Two	610	(460 – 790)	26.3	(20.8 – 32.3)
Three	1 110	(910 – 1 330)	47.8	(41.4 – 54.0)
Four	400	(290 – 530)	17.2	(12.8 – 22.3)
Total	2 320	(2 020 – 2 660)	100.0	
	10 years			
None	50	(30 – 80)	1.4	(0.8 – 2.2)
One	420	(290 – 580)	11.1	(7.9 – 14.9)
Two	1 170	(930 – 1 440)	30.9	(26.0 – 36.3)
Three	1 560	(1 340 – 1 790)	41.0	(36.1 – 46.0)
Four	600	(450 – 770)	15.7	(12.2 – 20.0)
Total	3 800	(3 410 – 4 220)	100.0	
	11–12 years			
None	10	(10 – 10)	0.6	(0.3 – 0.9)
One	120	(60 – 220)	7.6	(3.7 – 13.5)
Two	590	(430 – 770)	38.6	(30.3 – 47.1)
Three	640	(510 – 790)	42.3	(35.0 – 50.0)
Four	170	(60 – 330)	10.9	(4.9 – 20.7)
Total	1 520	(1 260 – 1 830)	100.0	
	13 years or more			
None	20	(0 – 150)	2.7	(0.1 – 20.4)
One	40	(10 – 100)	6.3	(1.8 – 15.7)
Two	200	(110 – 340)	30.6	(18.2 – 46.6)
Three	250	(150 – 410)	38.4	(23.8 – 53.5)
Four	140	(80 – 250)	21.9	(12.7 – 35.8)
Total	660	(480 – 900)	100.0	
	Not stated			
None	0	(0 – 60)	0.0	(0.0 – 10.9)
One	40	(20 – 70)	8.1	(4.0 – 13.7)
Two	130	(70 – 210)	26.4	(16.6 – 39.7)
Three	290	(180 – 430)	59.0	(46.1 – 69.8)
Four	30	(20 – 50)	6.4	(3.1 – 11.3)
Total	490	(350 – 670)	100.0	
	Total			
None	110	(60 – 180)	1.2	(0.6 – 2.0)
One	810	(640 – 1 010)	8.9	(7.1 – 11.0)
Two	2 800	(2 460 – 3 160)	30.7	(27.6 – 34.1)
Three	4 000	(3 670 – 4 350)	43.9	(40.7 – 47.1)
Four	1 390	(1 170 – 1 650)	15.3	(12.9 – 17.9)
Total	9 100	(8 620 – 9 590)	100.0	

Table 3.48: Children aged 4–17 years — Proportion meeting three or more indicators of dietary quality, by age group of child, by Level of Relative Isolation (LORI)

Age of child	Number	95% CI	%	95% CI
	LORI — None			
4–11 years	2 710	(2 390 – 3 060)	58.1	(52.0 – 63.8)
12–17 years	1 760	(1 520 – 2 010)	55.6	(50.0 – 61.2)
Total	4 470	(4 140 – 4 810)	57.1	(52.9 – 61.2)
	LORI — Low			
4–11 years	1 910	(1 630 – 2 220)	55.3	(48.8 – 61.4)
12–17 years	1 230	(1 020 – 1 470)	53.6	(46.8 – 60.1)
Total	3 140	(2 790 – 3 520)	54.6	(49.9 – 59.2)
	LORI — Moderate			
4–11 years	1 750	(1 400 – 2 150)	62.3	(54.8 – 68.9)
12–17 years	1 110	(890 – 1 380)	60.9	(52.0 – 69.0)
Total	2 860	(2 370 – 3 430)	61.7	(56.3 – 66.8)
	LORI — High			
4–11 years	1 050	(740 – 1 420)	65.6	(57.2 – 73.9)
12–17 years	590	(430 – 770)	62.7	(52.0 – 72.9)
Total	1 630	(1 210 – 2 130)	64.5	(56.5 – 71.5)
	LORI — Extreme			
4–11 years	640	(440 – 920)	50.8	(39.7 – 62.8)
12–17 years	710	(490 – 990)	78.9	(71.4 – 85.0)
Total	1 350	(980 – 1 830)	62.4	(55.0 – 70.0)
	Total			
4–11 years	8 060	(7 540 – 8 600)	58.4	(55.2 – 61.7)
12–17 years	5 390	(5 000 – 5 790)	59.2	(55.9 – 62.5)
Total	13 500	(12 900 – 14 000)	58.7	(56.3 – 61.1)

Table 3.49: Children aged 4–17 years — Proportion meeting three or more indicators of dietary quality, by age group of child, by education level of primary carer

Age of child	Number	95% CI	%	95% CI
	Did not attend school			
4–11 years	150	(80 – 230)	40.2	(24.6 – 59.3)
12–17 years	200	(90 – 370)	63.9	(45.4 – 80.8)
Total	340	(220 – 530)	51.1	(38.7 – 62.6)
	1–9 years			
4–11 years	1 350	(1 140 – 1 570)	47.3	(41.5 – 53.0)
12–17 years	1 510	(1 280 – 1 770)	65.0	(58.7 – 70.8)
Total	2 860	(2 540 – 3 210)	55.2	(50.9 – 59.4)
	10 years			
4–11 years	3 650	(3 250 – 4 060)	60.3	(55.2 – 65.2)
12–17 years	2 150	(1 890 – 2 440)	56.7	(51.3 – 61.7)
Total	5 800	(5 310 – 6 320)	58.9	(55.2 – 62.6)
	11–12 years			
4–11 years	2 250	(1 930 – 2 610)	64.6	(58.4 – 70.6)
12–17 years	810	(640 – 1 030)	53.2	(45.0 – 61.7)
Total	3 060	(2 690 – 3 470)	61.1	(56.0 – 65.8)
	13 years or more			
4–11 years	460	(290 – 690)	64.1	(46.2 – 79.2)
12–17 years	400	(260 – 580)	60.4	(44.3 – 74.3)
Total	860	(630 – 1 130)	62.3	(51.9 – 72.6)
	Not stated			
4–11 years	210	(90 – 400)	63.8	(35.4 – 84.8)
12–17 years	320	(210 – 470)	65.4	(52.5 – 75.8)
Total	530	(350 – 750)	64.8	(52.4 – 76.5)
	Total			
4–11 years	8 060	(7 540 – 8 600)	58.4	(55.2 – 61.7)
12–17 years	5 390	(5 000 – 5 790)	59.2	(55.9 – 62.5)
Total	13 500	(12 900 – 14 000)	58.7	(56.3 – 61.1)

Table 3.50: All Children — Respiratory conditions, by Level of Relative Isolation (LORI)

Respiratory condition	Number	95% CI	%	95% CI
	LORI — None (N = 10 200)			
Ever had asthma	3 100	(2 780 – 3 450)	30.5	(27.3 – 33.8)
Ever had wheezing or whistling in chest	3 330	(2 980 – 3 690)	32.7	(29.3 – 36.2)
Ever had hayfever	1 390	(1 130 – 1 700)	13.7	(11.1 – 16.6)
In past 12 months has :				
Sounded wheezy after exercise	2 140	(1 860 – 2 450)	21.0	(18.3 – 23.9)
Had medication for wheezing/asthma	2 000	(1 710 – 2 300)	19.6	(16.9 – 22.6)
Had dry cough at night	2 320	(2 000 – 2 670)	22.9	(19.6 – 26.2)
	LORI — Low (N = 7 270)			
Ever had asthma	1 910	(1 610 – 2 260)	26.3	(22.7 – 30.2)
Ever had wheezing or whistling in chest	2 370	(2 030 – 2 740)	32.6	(28.8 – 36.6)
Ever had hayfever	720	(540 – 930)	9.9	(7.6 – 12.6)
In past 12 months has :				
Sounded wheezy after exercise	1 220	(1 010 – 1 450)	16.7	(14.2 – 19.4)
Had medication for wheezing/asthma	1 150	(890 – 1 450)	15.8	(12.4 – 19.5)
Had dry cough at night	1 600	(1 330 – 1 900)	22.1	(18.9 – 25.4)
	LORI — Moderate (N = 6 390)			
Ever had asthma	1 140	(890 – 1 460)	17.9	(14.9 – 21.1)
Ever had wheezing or whistling in chest	1 590	(1 240 – 1 980)	24.9	(21.3 – 28.9)
Ever had hayfever	530	(370 – 720)	8.2	(6.1 – 10.8)
In past 12 months has :				
Sounded wheezy after exercise	830	(650 – 1 050)	13.0	(10.8 – 15.4)
Had medication for wheezing/asthma	790	(620 – 1 000)	12.4	(10.3 – 14.7)
Had dry cough at night	1 310	(1 040 – 1 630)	20.4	(17.5 – 23.7)
	LORI — High (N = 3 170)			
Ever had asthma	550	(390 – 750)	17.4	(14.0 – 21.4)
Ever had wheezing or whistling in chest	640	(460 – 870)	20.2	(16.9 – 23.9)
Ever had hayfever	140	(90 – 220)	4.5	(3.0 – 6.5)
In past 12 months has :				
Sounded wheezy after exercise	330	(220 – 490)	10.5	(7.7 – 13.8)
Had medication for wheezing/asthma	320	(200 – 490)	10.1	(6.8 – 13.9)
Had dry cough at night	560	(380 – 790)	17.7	(13.8 – 22.1)
	LORI — Extreme (N = 2 830)			
Ever had asthma	210	(130 – 320)	7.3	(5.3 – 9.7)
Ever had wheezing or whistling in chest	430	(280 – 640)	15.1	(11.4 – 19.2)
Ever had hayfever	190	(100 – 310)	6.6	(4.0 – 10.0)
In past 12 months has :				
Sounded wheezy after exercise	240	(140 – 360)	8.3	(5.7 – 11.5)
Had medication for wheezing/asthma	100	(50 – 190)	3.6	(2.1 – 6.1)
Had dry cough at night	750	(470 – 1 100)	26.4	(19.4 – 34.4)
	Total (N = 29 800)			
Ever had asthma	6 910	(6 430 – 7 420)	23.2	(21.6 – 24.9)
Ever had wheezing or whistling in chest	8 350	(7 810 – 8 900)	28.0	(26.2 – 29.9)
Ever had hayfever	2 960	(2 600 – 3 360)	9.9	(8.7 – 11.3)
In past 12 months has :				
Sounded wheezy after exercise	4 760	(4 370 – 5 160)	15.9	(14.7 – 17.3)
Had medication for wheezing/asthma	4 360	(3 930 – 4 800)	14.6	(13.2 – 16.1)
Had dry cough at night	6 540	(6 040 – 7 060)	21.9	(20.3 – 23.7)

Table 3.51: Children aged 0–3 years — Respiratory conditions, by Level of Relative Isolation (LORI)

Respiratory condition	Number	95% CI	%	95% CI
LORI — None (N = 2 340)				
Ever had asthma	510	(380 – 660)	21.8	(16.9 – 27.6)
Ever had wheezing or whistling in chest	850	(680 – 1 030)	36.1	(29.7 – 42.6)
Ever had hayfever	200	(90 – 390)	8.4	(4.0 – 15.8)
In past 12 months has :				
Sounded wheezy after exercise	530	(400 – 690)	22.5	(17.0 – 28.6)
Had medication for wheezing/asthma	420	(300 – 570)	18.0	(13.1 – 24.0)
Had dry cough at night	570	(390 – 800)	24.3	(17.7 – 32.4)
LORI — Low (N = 1 680)				
Ever had asthma	290	(190 – 420)	17.4	(11.9 – 24.1)
Ever had wheezing or whistling in chest	630	(500 – 790)	37.7	(31.4 – 44.1)
Ever had hayfever	140	(60 – 260)	8.4	(4.2 – 15.3)
In past 12 months has :				
Sounded wheezy after exercise	310	(220 – 420)	18.3	(13.6 – 24.1)
Had medication for wheezing/asthma	240	(140 – 380)	14.5	(8.7 – 21.6)
Had dry cough at night	420	(300 – 570)	24.9	(18.9 – 31.9)
LORI — Moderate (N = 1710)				
Ever had asthma	250	(160 – 350)	14.4	(10.8 – 18.9)
Ever had wheezing or whistling in chest	520	(380 – 690)	30.7	(25.2 – 36.4)
Ever had hayfever	140	(80 – 220)	8.2	(4.8 – 12.7)
In past 12 months has :				
Sounded wheezy after exercise	220	(150 – 310)	12.7	(9.2 – 16.9)
Had medication for wheezing/asthma	290	(200 – 410)	17.0	(13.1 – 21.6)
Had dry cough at night	520	(390 – 680)	30.3	(24.2 – 37.2)
LORI — High (N = 610)				
Ever had asthma	70	(30 – 140)	11.6	(5.9 – 20.8)
Ever had wheezing or whistling in chest	140	(80 – 230)	23.0	(15.0 – 32.6)
Ever had hayfever	20	(10 – 40)	3.3	(1.5 – 6.8)
In past 12 months has :				
Sounded wheezy after exercise	60	(20 – 110)	9.3	(4.6 – 17.8)
Had medication for wheezing/asthma	50	(30 – 100)	9.0	(4.6 – 15.7)
Had dry cough at night	100	(50 – 160)	15.6	(10.0 – 23.4)
LORI — Extreme (N = 580)				
Ever had asthma	40	(10 – 90)	7.5	(2.9 – 14.0)
Ever had wheezing or whistling in chest	110	(60 – 190)	18.6	(11.4 – 27.1)
Ever had hayfever	40	(20 – 90)	7.3	(3.3 – 14.5)
In past 12 months has :				
Sounded wheezy after exercise	60	(20 – 150)	11.1	(4.4 – 20.6)
Had medication for wheezing/asthma	30	(10 – 80)	5.7	(1.5 – 13.1)
Had dry cough at night	230	(130 – 380)	40.3	(29.9 – 51.3)
Total 0–3 year olds (N = 6 910)				
Ever had asthma	1 160	(970 – 1 380)	16.8	(14.3 – 19.5)
Ever had wheezing or whistling in chest	2 250	(1 990 – 2 520)	32.5	(29.5 – 35.8)
Ever had hayfever	540	(380 – 750)	7.8	(5.5 – 10.5)
In past 12 months has :				
Sounded wheezy after exercise	1 170	(990 – 1 380)	17.0	(14.5 – 19.7)
Had medication for wheezing/asthma	1 040	(850 – 1 260)	15.1	(12.5 – 17.9)
Had dry cough at night	1 830	(1 570 – 2 130)	26.5	(23.2 – 30.1)

Table 3.52: Children aged 4–11 years — Respiratory conditions, by Level of Relative Isolation (LORI)

Respiratory condition	Number	95% CI	%	95% CI
LORI — None (N = 4 670)				
Ever had asthma	1 550	(1 310 – 1 830)	33.2	(28.4 – 38.4)
Ever had wheezing or whistling in chest	1 580	(1 320 – 1 870)	33.8	(28.8 – 39.2)
Ever had hayfever	530	(360 – 750)	11.3	(7.7 – 15.5)
In past 12 months has :				
Sounded wheezy after exercise	980	(800 – 1 200)	21.0	(17.0 – 25.3)
Had medication for wheezing/asthma	970	(790 – 1 200)	20.9	(17.0 – 25.4)
Had dry cough at night	1 130	(930 – 1 370)	24.2	(19.9 – 28.8)
LORI — Low (N = 3 460)				
Ever had asthma	960	(740 – 1 230)	27.9	(22.9 – 33.6)
Ever had wheezing or whistling in chest	1 070	(840 – 1 340)	31.0	(25.7 – 36.5)
Ever had hayfever	260	(160 – 390)	7.4	(4.7 – 11.0)
In past 12 months has :				
Sounded wheezy after exercise	560	(420 – 730)	16.1	(12.7 – 20.0)
Had medication for wheezing/asthma	600	(400 – 840)	17.3	(12.4 – 23.3)
Had dry cough at night	810	(630 – 1 010)	23.4	(19.0 – 28.4)
LORI — Moderate (N = 2 800)				
Ever had asthma	570	(430 – 720)	20.2	(17.0 – 23.9)
Ever had wheezing or whistling in chest	670	(510 – 870)	23.9	(19.4 – 28.8)
Ever had hayfever	190	(120 – 290)	6.8	(4.4 – 9.9)
In past 12 months has :				
Sounded wheezy after exercise	350	(270 – 460)	12.6	(10.0 – 15.7)
Had medication for wheezing/asthma	330	(240 – 430)	11.6	(8.9 – 14.5)
Had dry cough at night	600	(470 – 750)	21.4	(18.0 – 25.0)
LORI — High (N = 1 600)				
Ever had asthma	340	(230 – 480)	21.5	(16.5 – 27.3)
Ever had wheezing or whistling in chest	370	(230 – 540)	22.9	(17.1 – 29.7)
Ever had hayfever	50	(20 – 100)	3.1	(1.6 – 5.9)
In past 12 months has :				
Sounded wheezy after exercise	190	(90 – 330)	11.9	(6.6 – 18.3)
Had medication for wheezing/asthma	190	(90 – 350)	11.7	(6.1 – 19.3)
Had dry cough at night	360	(220 – 560)	22.2	(15.1 – 30.5)
LORI — Extreme (N = 1 270)				
Ever had asthma	100	(50 – 210)	8.2	(4.0 – 14.7)
Ever had wheezing or whistling in chest	240	(140 – 370)	18.7	(13.0 – 25.9)
Ever had hayfever	70	(30 – 130)	5.6	(2.8 – 9.6)
In past 12 months has :				
Sounded wheezy after exercise	80	(40 – 150)	6.7	(3.6 – 11.7)
Had medication for wheezing/asthma	60	(30 – 110)	4.6	(2.3 – 7.6)
Had dry cough at night	340	(210 – 510)	26.5	(18.4 – 35.6)
Total 4–11 year olds (N = 13 800)				
Ever had asthma	3 530	(3 170 – 3 920)	25.6	(23.2 – 28.0)
Ever had wheezing or whistling in chest	3 920	(3 540 – 4 340)	28.4	(25.9 – 31.1)
Ever had hayfever	1 100	(880 – 1 360)	7.9	(6.4 – 9.7)
In past 12 months has :				
Sounded wheezy after exercise	2 170	(1 910 – 2 460)	15.7	(13.9 – 17.7)
Had medication for wheezing/asthma	2 140	(1 840 – 2 490)	15.5	(13.4 – 17.8)
Had dry cough at night	3 230	(2 910 – 3 580)	23.4	(21.2 – 25.8)

Table 3 53: Children aged 12–17 years — Respiratory conditions, by Level of Relative Isolation (LORI)

Respiratory condition	Number	95% CI	%	95% CI
LORI — None (N = 3 160)				
Ever had asthma	1 040	(820 – 1 290)	33.0	(27.2 – 39.1)
Ever had wheezing or whistling in chest	900	(700 – 1 150)	28.6	(22.6 – 34.8)
Ever had hayfever	670	(510 – 850)	21.1	(16.5 – 26.6)
In past 12 months has :				
Sounded wheezy after exercise	630	(450 – 840)	20.0	(14.9 – 25.7)
Had medication for wheezing/asthma	600	(440 – 800)	19.0	(14.1 – 24.4)
Had dry cough at night	630	(470 – 810)	19.8	(15.2 – 25.4)
LORI — Low (N = 2 130)				
Ever had asthma	650	(510 – 810)	30.7	(24.4 – 37.8)
Ever had wheezing or whistling in chest	660	(540 – 820)	31.2	(24.7 – 37.9)
Ever had hayfever	320	(220 – 440)	15.0	(10.4 – 20.5)
In past 12 months has :				
Sounded wheezy after exercise	350	(280 – 430)	16.5	(12.8 – 20.9)
Had medication for wheezing/asthma	310	(230 – 410)	14.4	(10.6 – 19.4)
Had dry cough at night	380	(290 – 480)	17.6	(13.4 – 22.9)
LORI — Moderate (N = 1 870)				
Ever had asthma	330	(170 – 550)	17.6	(10.7 – 26.8)
Ever had wheezing or whistling in chest	390	(230 – 660)	21.1	(13.8 – 30.9)
Ever had hayfever	200	(100 – 340)	10.4	(6.0 – 16.7)
In past 12 months has :				
Sounded wheezy after exercise	260	(170 – 380)	13.9	(9.4 – 20.0)
Had medication for wheezing/asthma	180	(110 – 270)	9.4	(5.8 – 14.1)
Had dry cough at night	190	(120 – 290)	9.9	(6.4 – 15.0)
LORI — High (N = 960)				
Ever had asthma	140	(80 – 210)	14.3	(9.6 – 20.7)
Ever had wheezing or whistling in chest	130	(90 – 200)	14.1	(10.3 – 18.4)
Ever had hayfever	70	(40 – 120)	7.7	(4.5 – 11.8)
In past 12 months has :				
Sounded wheezy after exercise	80	(50 – 120)	8.8	(6.2 – 11.8)
Had medication for wheezing/asthma	80	(50 – 120)	8.0	(5.4 – 11.3)
Had dry cough at night	110	(70 – 170)	11.5	(7.7 – 16.2)
LORI — Extreme (N = 990)				
Ever had asthma	60	(30 – 110)	6.1	(3.6 – 10.0)
Ever had wheezing or whistling in chest	80	(50 – 140)	8.4	(5.3 – 12.3)
Ever had hayfever	70	(40 – 130)	7.3	(3.9 – 12.2)
In past 12 months has :				
Sounded wheezy after exercise	90	(50 – 140)	8.8	(5.8 – 13.1)
Had medication for wheezing/asthma	10	(0 – 30)	1.3	(0.4 – 3.1)
Had dry cough at night	180	(110 – 290)	18.1	(11.0 – 27.6)
Total 12–17 year olds (N = 9 100)				
Ever had asthma	2 220	(1 910 – 2 560)	24.4	(21.4 – 27.6)
Ever had wheezing or whistling in chest	2 180	(1 880 – 2 530)	24.0	(21.0 – 27.3)
Ever had hayfever	1 330	(1 100 – 1 570)	14.6	(12.3 – 17.0)
In past 12 months has :				
Sounded wheezy after exercise	1 410	(1 200 – 1 650)	15.5	(13.2 – 18.0)
Had medication for wheezing/asthma	1 170	(970 – 1 400)	12.9	(10.8 – 15.3)
Had dry cough at night	1 480	(1 260 – 1 710)	16.2	(13.9 – 18.7)

Table 3.54: Children — Ever had asthma, by ever had recurring chest infection

Ever had asthma	Number	95% CI	%	95% CI
	No recurring chest infection			
Never had asthma	21 200	(20 600 – 21 700)	80.9	(79.1 – 82.5)
Has had asthma	5 000	(4 550 – 5 470)	19.1	(17.5 – 20.9)
Total	26 200	(25 800 – 26 500)	100.0	
	Has recurring chest infection			
Never had asthma	1 750	(1 520 – 1 990)	47.7	(42.9 – 52.6)
Has had asthma	1 910	(1 650 – 2 190)	52.3	(47.4 – 57.1)
Total	3 660	(3 310 – 4 030)	100.0	
	Total			
Never had asthma	22 900	(22 400 – 23 400)	76.8	(75.1 – 78.4)
Has had asthma	6 910	(6 430 – 7 420)	23.2	(21.6 – 24.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.55: Children — Child has recurring chest infections, by whether ever had asthma

Whether has recurring chest infection	Number	95% CI	%	95% CI
	Child has never had asthma			
No recurring chest infection	21 200	(20 600 – 21 700)	92.4	(91.3 – 93.3)
Has recurring chest infection	1 750	(1 520 – 1 990)	7.6	(6.7 – 8.7)
Total	22 900	(22 400 – 23 400)	100.0	
	Child has had asthma			
No recurring chest infection	5 000	(4 550 – 5 470)	72.3	(68.6 – 75.9)
Has recurring chest infection	1 910	(1 650 – 2 190)	27.7	(24.1 – 31.4)
Total	6 910	(6 430 – 7 420)	100.0	
	Total			
No recurring chest infection	26 200	(25 800 – 26 500)	87.7	(86.5 – 88.9)
Has recurring chest infection	3 660	(3 310 – 4 030)	12.3	(11.1 – 13.5)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.56: Children — Ever had asthma, by whether suffers allergies

Whether has asthma	Number	95% CI	%	95% CI
	Child does not have allergies			
Never had asthma	21 700	(21 100 – 22 200)	78.6	(76.9 – 80.2)
Has had asthma	5 900	(5 460 – 6 350)	21.4	(19.8 – 23.1)
Total	27 600	(27 200 – 27 900)	100.0	
	Child has allergies			
Never had asthma	1 250	(1 050 – 1 470)	55.1	(47.4 – 62.4)
Has had asthma	1 020	(780 – 1 300)	44.9	(37.6 – 52.6)
Total	2 260	(1 950 – 2 620)	100.0	
	Total			
Never had asthma	22 900	(22 400 – 23 400)	76.8	(75.1 – 78.4)
Has had asthma	6 910	(6 430 – 7 420)	23.2	(21.6 – 24.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.57: All children — Predicted likelihood of ever having had asthma, associated with selected family and community variables (a)

	Lifetime occurrence of asthma		
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of relative isolation—			
None		1	
Low	0.0132	0.74	(0.58 – 0.94)
Moderate	<.0001	0.49	(0.35 – 0.68)
High	0.0016	0.44	(0.27 – 0.73)
Extreme	<.0001	0.21	(0.11 – 0.39)
Primary carer is birth mother?—	0.8585	1.03	(0.76 – 1.39)
No			
Yes		1	
Mother smoked cigarettes during pregnancy—			
No		1	
Yes	0.7936	0.97	(0.78 – 1.21)
Mother chewed tobacco during pregnancy—			
No		1	
Yes	0.0829	0.4	(0.14 – 1.13)
Mother smoked marijuana during pregnancy—			
No		1	
Yes	0.3771	1.18	(0.82 – 1.70)
Mother drank alcohol during pregnancy—			
No		1	
Yes	0.9196	0.99	(0.77 – 1.27)
Mother used other drugs during pregnancy—			
No		1	
Yes	0.2256	1.73	(0.71 – 4.18)
Primary carer currently smokes?—			
No		1	
Yes	0.6145	0.94	(0.74 – 1.20)
Duration of breastfeeding—			
Not breastfed		1	
< 6 months	0.2828	1.15	(0.89 – 1.50)
6 months or more	0.9186	1.01	(0.77 – 1.34)
Not stated	0.0038	0.48	(0.29 – 0.79)
Family affected by forced removal from family or relocation from lands—			
No		1	
Yes	0.2404	1.13	(0.92 – 1.40)
Not known	0.589	0.9	(0.62 – 1.31)
Not applicable	0.0045	1.68	(1.17 – 2.40)
Categories of Socio-economic disadvantage—			
Bottom 5%		1	
5% - 10%	0.5198	1.14	(0.77 – 1.68)
10% - 25%	0.6806	1.08	(0.76 – 1.53)
25% - 50%	0.1284	1.3	(0.93 – 1.83)
Top 50%	0.2055	1.32	(0.86 – 2.02)

(a) Model also adjusts for age and sex of the child

Table 3.58: Children —Used medication for wheezing or asthma in past 12 months, by Level of Relative Isolation (LORI)

Whether had medication in past 12 months	Number	95% CI	%	95% CI
	LORI — None			
No medication	8 170	(7 850 – 8 500)	80.4	(77.4 – 83.1)
Has used medication	2 000	(1 710 – 2 300)	19.6	(16.9 – 22.6)
Total	10 200	(10 000 – 10 400)	100.0	
	LORI — Low			
No medication	6 120	(5 540 – 6 720)	84.2	(80.5 – 87.6)
Has used medication	1 150	(890 – 1 450)	15.8	(12.4 – 19.5)
Total	7 270	(6 640 – 7 930)	100.0	
	LORI — Moderate			
No medication	5 600	(4 740 – 6 510)	87.6	(85.3 – 89.7)
Has used medication	790	(620 – 1 000)	12.4	(10.3 – 14.7)
Total	6 390	(5 400 – 7 420)	100.0	
	LORI — High			
No medication	2 850	(2 090 – 3 720)	89.9	(86.1 – 93.2)
Has used medication	320	(200 – 490)	10.1	(6.8 – 13.9)
Total	3 170	(2 360 – 4 160)	100.0	
	LORI — Extreme			
No medication	2 730	(1 940 – 3 630)	96.4	(93.9 – 97.9)
Has used medication	100	(50 – 190)	3.6	(2.1 – 6.1)
Total	2 830	(2 040 – 3 800)	100.0	
	Total WA			
No medication	25 500	(25 000 – 25 900)	85.4	(83.9 – 86.8)
Has used medication	4 360	(3 930 – 4 800)	14.6	(13.2 – 16.1)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.59: Children who ever had asthma — Whether used medication for wheezing or asthma in past 12 months, by Level of Relative Isolation (LORI)

Whether had medication in past 12 months	Number	95% CI	%	95% CI
	LORI — None			
No medication	1 210	(980 – 1 490)	39.1	(32.4 – 45.9)
Has had medication	1 890	(1 630 – 2 190)	60.9	(54.1 – 67.6)
Total	3 100	(2 780 – 3 450)	100.0	
	LORI — Low			
No medication	860	(680 – 1 070)	44.9	(36.3 – 54.0)
Has had medication	1 050	(810 – 1 360)	55.1	(46.0 – 63.7)
Total	1 910	(1 610 – 2 260)	100.0	
	LORI — Moderate			
No medication	450	(290 – 690)	39.4	(28.5 – 51.9)
Has had medication	690	(520 – 890)	60.6	(48.1 – 71.5)
Total	1 140	(890 – 1 460)	100.0	
	LORI — High			
No medication	270	(180 – 390)	49.5	(39.8 – 59.3)
Has had medication	280	(190 – 390)	50.5	(40.7 – 60.2)
Total	550	(390 – 750)	100.0	
	LORI — Extreme			
No medication	110	(50 – 210)	53.5	(30.6 – 73.2)
Has had medication	100	(50 – 170)	46.5	(26.8 – 69.4)
Total	210	(130 – 320)	100.0	
	Total WA			
No medication	2 900	(2 550 – 3 290)	42.0	(37.6 – 46.3)
Has had medication	4 010	(3 610 – 4 440)	58.0	(53.7 – 62.4)
Total	6 910	(6 430 – 7 420)	100.0	

Table 3.60: Children — Primary asthma medication type, by age group

Asthma medication type	Number	95% CI	%	95% CI
	0–3 years			
Preventer	110	(40 – 270)	1.6	(0.5 – 3.8)
Reliever	920	(750 – 1 120)	13.3	(11.0 – 15.8)
Controller	20	(10 – 30)	0.2	(0.1 – 0.5)
No medication	5 870	(5 480 – 6 270)	84.9	(82.1 – 87.5)
Total	6 910	(6 470 – 7 360)	100.0	
	4–11 years			
Preventer	480	(370 – 610)	3.5	(2.7 – 4.4)
Reliever	1 630	(1 350 – 1 950)	11.8	(9.9 – 14.0)
Controller	30	(10 – 50)	0.2	(0.1 – 0.4)
No medication	11 700	(11 200 – 12 200)	84.5	(82.2 – 86.6)
Total	13 800	(13 300 – 14 300)	100.0	
	12–17 years			
Preventer	190	(140 – 260)	2.1	(1.5 – 2.9)
Reliever	960	(780 – 1 160)	10.5	(8.6 – 12.7)
Controller	20	(0 – 230)	0.2	(0.0 – 2.5)
No medication	7 930	(7 430 – 8 450)	87.1	(84.7 – 89.2)
Total	9 100	(8 580 – 9 630)	100.0	
	All children			
Preventer	780	(620 – 970)	2.6	(2.1 – 3.3)
Reliever	3 510	(3 120 – 3 930)	11.8	(10.5 – 13.2)
Controller	70	(10 – 200)	0.2	(0.0 – 0.7)
No medication	25 500	(25 000 – 25 900)	85.4	(83.9 – 86.8)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.61: Children — Usage of primary asthma medication, by medication type

When medication used	Number	95% CI	%	95% CI
	As a Preventer			
When wheezing	370	(270 – 480)	47.4	(36.4 – 58.9)
Regularly	360	(240 – 520)	45.8	(33.8 – 57.3)
Usage not stated	50	(20 – 110)	6.8	(2.8 – 13.5)
No medication	0	(0 – 60)	0.0	(0.0 – 7.0)
Total	780	(620 – 970)	100.0	
	As a Reliever			
When wheezing	2 570	(2 220 – 2 960)	73.2	(67.9 – 78.2)
Regularly	590	(440 – 780)	16.8	(12.5 – 21.6)
Usage not stated	350	(250 – 480)	10.0	(7.1 – 13.4)
No medication	0	(0 – 60)	0.0	(0.0 – 1.6)
Total	3 510	(3 120 – 3 930)	100.0	
	As a Controller			
When wheezing	30	(20 – 60)	49.5	(1.3 – 98.7)
Regularly	30	(0 – 270)	43.2	(1.3 – 98.7)
Usage not stated	0	(0 – 20)	7.3	(0.2 – 30.2)
No medication	0	(0 – 60)	0.0	(0.0 – 60.2)
Total	70	(10 – 200)	100.0	
No medication	No medication			
	25 500	(25 000 – 25 900)	100.0	
	Total			
When wheezing	2 970	(2 610 – 3 360)	10.0	(8.7 – 11.3)
Regularly	970	(770 – 1 220)	3.3	(2.6 – 4.1)
Usage not stated	410	(290 – 540)	1.4	(1.0 – 1.8)
No medication	25 500	(25 000 – 25 900)	85.4	(83.9 – 86.8)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.62: Asthma medications — Single and multiple types per child, by age group

Medication types used	Number	95% CI	%	95% CI
0–3 years				
Preventer & reliever	180	(80 – 330)	2.6	(1.2 – 4.7)
Two preventers & a reliever	10	(0 – 20)	0.2	(0.1 – 0.4)
Preventer & two relievers	0	(0 – 60)	0.0	(0.0 – 0.8)
Two or more preventers	0	(0 – 60)	0.0	(0.0 – 0.8)
One preventer	50	(0 – 150)	0.7	(0.1 – 2.1)
Two or more relievers	70	(40 – 120)	1.0	(0.5 – 1.7)
One reliever	720	(570 – 890)	10.4	(8.4 – 12.6)
Other	20	(10 – 30)	0.2	(0.1 – 0.5)
No medication	5 870	(5 480 – 6 270)	84.9	(82.1 – 87.5)
Total	6 910	(6 470 – 7 360)	100.0	
4–11 years				
Preventer & reliever	570	(430 – 730)	4.1	(3.2 – 5.3)
Two preventers & a reliever	50	(30 – 90)	0.4	(0.2 – 0.6)
Preventer & two relievers	70	(40 – 110)	0.5	(0.3 – 0.8)
Two or more preventers	30	(20 – 50)	0.2	(0.1 – 0.4)
One preventer	140	(90 – 220)	1.0	(0.6 – 1.5)
Two or more relievers	160	(80 – 280)	1.2	(0.6 – 2.0)
One reliever	1 090	(840 – 1 390)	7.9	(6.2 – 10.0)
Other	20	(10 – 40)	0.1	(0.1 – 0.3)
No medication	11 700	(11 200 – 12 200)	84.5	(82.2 – 86.6)
Total	13 800	(13 300 – 14 300)	100.0	
12–17 years				
Preventer & reliever	290	(220 – 380)	3.2	(2.4 – 4.1)
Two preventers & a reliever	40	(20 – 70)	0.4	(0.2 – 0.7)
Preventer & two relievers	30	(10 – 80)	0.4	(0.1 – 0.9)
Two or more preventers	10	(0 – 30)	0.1	(0.0 – 0.4)
One preventer	40	(20 – 50)	0.4	(0.2 – 0.6)
Two or more relievers	80	(40 – 140)	0.9	(0.4 – 1.5)
One reliever	670	(510 – 870)	7.4	(5.6 – 9.4)
Other	10	(0 – 350)	0.1	(0.0 – 3.8)
No medication	7 930	(7 430 – 8 450)	87.1	(84.7 – 89.2)
Total	9 100	(8 580 – 9 630)	100.0	
All children				
Preventer & reliever	1 040	(850 – 1 280)	3.5	(2.8 – 4.3)
Two preventers & a reliever	100	(70 – 150)	0.3	(0.2 – 0.5)
Preventer & two relievers	110	(70 – 160)	0.4	(0.2 – 0.5)
Two or more preventers	40	(20 – 70)	0.1	(0.1 – 0.2)
One preventer	220	(140 – 330)	0.7	(0.5 – 1.1)
Two or more relievers	310	(210 – 460)	1.1	(0.7 – 1.5)
One reliever	2 480	(2 150 – 2 870)	8.3	(7.2 – 9.6)
Other	50	(10 – 210)	0.2	(0.0 – 0.7)
No medication	25 500	(25 000 – 25 900)	85.4	(83.9 – 86.8)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.63: Children — Recurring infections, by age group

Recurring infection type	Number	95% CI	%	95% CI
0–3 years (N = 6 910)				
Chest infection	1 340	(1 130 – 1 590)	19.4	(16.6 – 22.7)
Gastrointestinal infection	500	(390 – 630)	7.2	(5.6 – 9.0)
Skin infection	550	(410 – 740)	8.0	(5.9 – 10.4)
Ear infection	1 410	(1 200 – 1 640)	20.4	(17.6 – 23.5)
4–11 years (N = 13 800)				
Chest infection	1 590	(1 360 – 1 840)	11.5	(9.9 – 13.3)
Gastrointestinal infection	850	(660 – 1 080)	6.1	(4.8 – 7.7)
Skin infection	1 420	(1 200 – 1 650)	10.3	(8.8 – 11.9)
Ear infection	2 750	(2 490 – 3 030)	19.9	(18.1 – 21.9)
12–17 years (N = 9 100)				
Chest infection	730	(580 – 890)	8.0	(6.4 – 9.7)
Gastrointestinal infection	320	(230 – 430)	3.5	(2.6 – 4.8)
Skin infection	560	(400 – 740)	6.1	(4.5 – 8.1)
Ear infection	1 240	(1 040 – 1 460)	13.6	(11.4 – 16.0)
All children (N = 29 800)				
Chest infection	3 660	(3 310 – 4 030)	12.3	(11.1 – 13.5)
Gastrointestinal infection	1 670	(1 410 – 1 970)	5.6	(4.7 – 6.6)
Skin infection	2 530	(2 210 – 2 890)	8.5	(7.4 – 9.7)
Ear infection	5 400	(5 000 – 5 810)	18.1	(16.8 – 19.5)

Table 3.64: Children — Recurring infections, by Level of Relative Isolation (LORI)

Recurring Infection type	Number	95% CI	%	95% CI
LORI — None (N = 10 200)				
Chest infection	1 450	(1 220 – 1 710)	14.2	(11.9 – 16.7)
Gastrointestinal infection	550	(420 – 720)	5.4	(4.1 – 7.1)
Skin infection	720	(530 – 960)	7.1	(5.3 – 9.4)
Ear infection	1 720	(1 460 – 2 010)	16.9	(14.3 – 19.7)
LORI — Low (N = 7 270)				
Chest infection	860	(670 – 1 100)	11.9	(9.4 – 14.9)
Gastrointestinal infection	270	(160 – 420)	3.7	(2.1 – 5.8)
Skin infection	480	(330 – 660)	6.6	(4.6 – 8.9)
Ear infection	1 280	(1 070 – 1 510)	17.6	(15.0 – 20.3)
LORI — Moderate (N = 6 390)				
Chest infection	670	(540 – 830)	10.5	(8.9 – 12.3)
Gastrointestinal infection	330	(240 – 450)	5.2	(3.9 – 6.9)
Skin infection	550	(430 – 690)	8.6	(7.1 – 10.4)
Ear infection	1 190	(980 – 1 440)	18.7	(16.5 – 21.1)
LORI — High (N = 3 170)				
Chest infection	330	(210 – 520)	10.5	(6.9 – 14.7)
Gastrointestinal infection	180	(80 – 330)	5.6	(2.7 – 10.1)
Skin infection	280	(180 – 430)	8.9	(6.3 – 12.4)
Ear infection	550	(390 – 770)	17.5	(14.0 – 21.5)
LORI — Extreme (N = 2 830)				
Chest infection	350	(230 – 510)	12.2	(9.3 – 15.7)
Gastrointestinal infection	330	(190 – 540)	11.8	(7.6 – 17.4)
Skin infection	500	(310 – 770)	17.6	(12.4 – 23.5)
Ear infection	650	(420 – 920)	22.8	(18.1 – 28.1)
Total WA (N = 29 800)				
Chest infection	3 660	(3 310 – 4 030)	12.3	(11.1 – 13.5)
Gastrointestinal infection	1 670	(1 410 – 1 970)	5.6	(4.7 – 6.6)
Skin infection	2 530	(2 210 – 2 890)	8.5	(7.4 – 9.7)
Ear infection	5 400	(5 000 – 5 810)	18.1	(16.8 – 19.5)

Table 3.65: Children — Relationship between recurring ear infections and runny ears

Whether ever had discharging ears	Number	95% CI	%	95% CI
	No recurring ear infection			
No	21 600	(21 100 – 22 100)	88.5	(87.3 – 89.7)
Yes	2 770	(2 490 – 3 060)	11.3	(10.2 – 12.5)
Not stated	30	(20 – 60)	0.1	(0.1 – 0.3)
Total	24 400	(24 000 – 24 800)	100.0	
	Has recurring ear infection			
No	1 650	(1 430 – 1 890)	30.6	(27.1 – 34.3)
Yes	3 740	(3 410 – 4 090)	69.3	(65.7 – 72.9)
Not stated	10	(0 – 40)	0.1	(0.0 – 0.7)
Total	5 400	(5 000 – 5 810)	100.0	
	Total			
No	23 300	(22 800 – 23 700)	78.0	(76.6 – 79.4)
Yes	6 510	(6 090 – 6 940)	21.8	(20.4 – 23.3)
Not stated	40	(20 – 70)	0.1	(0.1 – 0.2)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.66: Children — Child suffers from recurring ear infections, by ever had discharging ears

Whether has recurring ear infection	Number	95% CI	%	95% CI
	Never had discharging ears			
No recurring ear infection	21 600	(21 100 – 22 100)	92.9	(91.9 – 93.9)
Has recurring ear infection	1 650	(1 430 – 1 890)	7.1	(6.1 – 8.1)
Total	23 300	(22 800 – 23 700)	100.0	
	Has had discharging ears			
No recurring ear infection	2 770	(2 490 – 3 060)	42.5	(39.0 – 46.1)
Has recurring ear infection	3 740	(3 410 – 4 090)	57.5	(53.9 – 61.0)
Total	6 510	(6 090 – 6 940)	100.0	
	Total			
No recurring ear infection	24 400	(24 000 – 24 800)	81.9	(80.5 – 83.2)
Has recurring ear infection	5 400	(5 000 – 5 810)	18.1	(16.8 – 19.5)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.67: Children — Type of ear infection, by age group

Type of ear infection	Number	95% CI	%	95% CI
0–3 years				
None	4 960	(4 560 – 5 370)	71.8	(68.5 – 74.8)
Recurrent, no discharge	510	(390 – 630)	7.3	(5.7 – 9.1)
Isolated discharge	540	(430 – 680)	7.8	(6.2 – 9.7)
Recurrent and discharging	910	(740 – 1 100)	13.1	(10.8 – 15.8)
Total	6 910	(6 470 – 7 360)	100.0	
4–11 years				
None	9 580	(9 100 – 10 100)	69.4	(67.2 – 71.5)
Recurrent, no discharge	740	(610 – 880)	5.3	(4.4 – 6.4)
Isolated discharge	1 470	(1 310 – 1 660)	10.7	(9.5 – 12.0)
Recurrent and discharging	2 010	(1 790 – 2 250)	14.6	(13.0 – 16.2)
Total	13 800	(13 300 – 14 300)	100.0	
12–17 years				
None	7 110	(6 610 – 7 620)	78.1	(75.3 – 80.7)
Recurrent, no discharge	410	(290 – 560)	4.6	(3.2 – 6.2)
Isolated discharge	750	(610 – 930)	8.3	(6.7 – 10.1)
Recurrent and discharging	820	(670 – 1 000)	9.0	(7.4 – 11.0)
Total	9 100	(8 580 – 9 630)	100.0	
Total				
None	21 700	(21 200 – 22 100)	72.6	(71.0 – 74.2)
Recurrent, no discharge	1 660	(1 440 – 1 900)	5.6	(4.8 – 6.4)
Isolated discharge	2 770	(2 490 – 3 060)	9.3	(8.4 – 10.3)
Recurrent and discharging	3 740	(3 410 – 4 090)	12.5	(11.4 – 13.7)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.68: Children aged 0–17 years — Type of ear infection experienced by Level of Relative Isolation (LORI)

Type of ear infection	Number	95% CI	%	95% CI
LORI — None				
None	7 720	(7 390 – 8 050)	75.9	(72.9 – 78.7)
Recurrent, no discharge	590	(430 – 780)	5.8	(4.3 – 7.7)
Isolated discharge	730	(580 – 910)	7.2	(5.7 – 8.9)
Recurrent and discharging	1 130	(920 – 1 370)	11.2	(9.1 – 13.6)
Total	10 200	(10 000 – 10 400)	100.0	
LORI — Low				
None	5 440	(4 920 – 5 980)	74.9	(71.9 – 77.7)
Recurrent, no discharge	440	(340 – 570)	6.0	(4.6 – 7.6)
Isolated discharge	550	(420 – 700)	7.5	(5.9 – 9.5)
Recurrent and discharging	840	(680 – 1 020)	11.6	(9.6 – 13.9)
Total	7 270	(6 640 – 7 930)	100.0	
LORI — Moderate				
None	4 390	(3 680 – 5 150)	68.8	(65.5 – 71.9)
Recurrent, no discharge	430	(330 – 530)	6.7	(5.4 – 8.1)
Isolated discharge	800	(620 – 1 010)	12.5	(10.3 – 15.0)
Recurrent and discharging	770	(620 – 950)	12.0	(10.4 – 13.9)
Total	6 390	(5 400 – 7 420)	100.0	
LORI — High				
None	2 220	(1 640 – 2 980)	70.1	(65.1 – 74.7)
Recurrent, no discharge	80	(50 – 130)	2.5	(1.5 – 3.9)
Isolated discharge	390	(270 – 550)	12.4	(9.5 – 15.8)
Recurrent and discharging	480	(320 – 660)	15.1	(11.8 – 18.9)
Total	3 170	(2 360 – 4 160)	100.0	
LORI — Extreme				
None	1 880	(1 360 – 2 580)	66.5	(60.7 – 71.8)
Recurrent, no discharge	130	(60 – 220)	4.5	(2.4 – 7.5)
Isolated discharge	300	(200 – 440)	10.6	(7.8 – 14.0)
Recurrent and discharging	520	(340 – 760)	18.4	(14.3 – 22.8)
Total	2 830	(2 040 – 3 800)	100.0	
Total				
None	21 700	(21 200 – 22 100)	72.6	(71.0 – 74.2)
Recurrent, no discharge	1 660	(1 440 – 1 900)	5.6	(4.8 – 6.4)
Isolated discharge	2 770	(2 490 – 3 060)	9.3	(8.4 – 10.3)
Recurrent and discharging	3 740	(3 410 – 4 090)	12.5	(11.4 – 13.7)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.69: Children aged 0–3 years — Type of ear infection experienced by Level of Relative Isolation (LORI) `

Type of ear infection	Number	95% CI	%	95% CI
LORI — None				
None	1 800	(1 540 – 2 080)	76.8	(69.9 – 82.8)
Recurrent, no discharge	170	(100 – 290)	7.4	(4.0 – 11.9)
Isolated discharge	130	(80 – 210)	5.8	(3.6 – 9.0)
Recurrent and discharging	230	(130 – 410)	10.0	(5.5 – 16.6)
Total	2 340	(2 050 – 2 650)	100.0	
LORI — Low				
None	1 250	(1 050 – 1 470)	74.4	(68.2 – 80.0)
Recurrent, no discharge	150	(110 – 210)	8.9	(6.5 – 12.1)
Isolated discharge	100	(40 – 230)	5.9	(2.3 – 13.1)
Recurrent and discharging	180	(120 – 250)	10.7	(7.6 – 14.8)
Total	1 680	(1 430 – 1 940)	100.0	
LORI — Moderate				
None	1 160	(910 – 1 480)	67.9	(61.8 – 73.4)
Recurrent, no discharge	130	(90 – 190)	7.5	(4.9 – 10.8)
Isolated discharge	210	(150 – 280)	12.0	(8.7 – 15.7)
Recurrent and discharging	220	(160 – 290)	12.7	(9.6 – 16.5)
Total	1 710	(1 390 – 2 090)	100.0	
LORI — High				
None	430	(290 – 600)	69.9	(61.9 – 77.6)
Recurrent, no discharge	20	(0 – 70)	2.8	(0.4 – 10.8)
Isolated discharge	50	(20 – 90)	8.0	(3.8 – 14.0)
Recurrent and discharging	120	(70 – 180)	19.2	(13.3 – 26.1)
Total	610	(440 – 830)	100.0	
LORI — Extreme				
None	330	(200 – 510)	57.2	(44.1 – 70.9)
Recurrent, no discharge	40	(20 – 70)	6.5	(3.1 – 11.4)
Isolated discharge	50	(30 – 90)	8.9	(5.0 – 14.1)
Recurrent and discharging	160	(80 – 280)	27.4	(16.1 – 39.7)
Total	580	(370 – 840)	100.0	
Total				
None	4 960	(4 560 – 5 370)	71.8	(68.5 – 74.8)
Recurrent, no discharge	510	(390 – 630)	7.3	(5.7 – 9.1)
Isolated discharge	540	(430 – 680)	7.8	(6.2 – 9.7)
Recurrent and discharging	910	(740 – 1 100)	13.1	(10.8 – 15.8)
Total	6 910	(6 470 – 7 360)	100.0	

Table 3.70: Children aged 4–11 years — Type of ear infection experienced, by Level of Relative Isolation (LORI)

Type of ear infection	Number	95% CI	%	95% CI
	LORI — None			
None	3 430	(3 110 – 3 780)	73.6	(69.6 – 77.4)
Recurrent, no discharge	240	(160 – 350)	5.2	(3.4 – 7.4)
Isolated discharge	400	(310 – 500)	8.5	(6.7 – 10.7)
Recurrent and discharging	600	(470 – 750)	12.7	(10.0 – 15.9)
Total	4 670	(4 330 – 5 030)	100.0	
	LORI — Low			
None	2 500	(2 200 – 2 820)	72.4	(68.1 – 76.3)
Recurrent, no discharge	200	(130 – 290)	5.8	(4.0 – 8.3)
Isolated discharge	270	(210 – 350)	7.9	(6.1 – 10.0)
Recurrent and discharging	480	(370 – 630)	14.0	(10.9 – 17.5)
Total	3 460	(3 080 – 3 860)	100.0	
	LORI — Moderate			
None	1 740	(1 440 – 2 070)	62.0	(57.7 – 66.2)
Recurrent, no discharge	190	(140 – 260)	6.9	(5.2 – 9.0)
Isolated discharge	440	(330 – 560)	15.5	(12.7 – 18.8)
Recurrent and discharging	440	(340 – 560)	15.5	(12.8 – 18.6)
Total	2 800	(2 370 – 3 290)	100.0	
	LORI — High			
None	1 100	(770 – 1 530)	69.1	(62.0 – 75.6)
Recurrent, no discharge	50	(20 – 80)	2.9	(1.6 – 5.0)
Isolated discharge	220	(130 – 340)	13.8	(9.5 – 19.1)
Recurrent and discharging	230	(150 – 340)	14.3	(9.8 – 19.4)
Total	1 600	(1 150 – 2 140)	100.0	
	LORI — Extreme			
None	800	(550 – 1 110)	62.9	(55.3 – 70.2)
Recurrent, no discharge	60	(20 – 120)	4.4	(1.9 – 9.3)
Isolated discharge	150	(80 – 230)	11.6	(7.2 – 17.0)
Recurrent and discharging	270	(180 – 400)	21.1	(15.6 – 27.0)
Total	1 270	(910 – 1 740)	100.0	
	Total			
None	9 580	(9 100 – 10 100)	69.4	(67.2 – 71.5)
Recurrent, no discharge	740	(610 – 880)	5.3	(4.4 – 6.4)
Isolated discharge	1 470	(1 310 – 1 660)	10.7	(9.5 – 12.0)
Recurrent and discharging	2 010	(1 790 – 2 250)	14.6	(13.0 – 16.2)
Total	13 800	(13 300 – 14 300)	100.0	

Table 3.71: Children aged 12–17 years — Type of ear infection experienced, by Level of Relative Isolation (LORI)

Type of ear infection	Number	95% CI	%	95% CI
LORI — None				
None	2 480	(2 170 – 2 820)	78.6	(72.5 – 83.8)
Recurrent, no discharge	170	(90 – 320)	5.5	(2.8 – 9.9)
Isolated discharge	200	(100 – 330)	6.2	(3.4 – 10.5)
Recurrent and discharging	300	(190 – 450)	9.6	(6.2 – 14.1)
Total	3 160	(2 820 – 3 530)	100.0	
LORI — Low				
None	1 690	(1 390 – 2 030)	79.3	(73.7 – 84.0)
Recurrent, no discharge	90	(40 – 170)	4.2	(2.0 – 7.9)
Isolated discharge	170	(110 – 270)	8.1	(4.9 – 12.2)
Recurrent and discharging	180	(130 – 250)	8.3	(5.8 – 11.7)
Total	2 130	(1 810 – 2 480)	100.0	
LORI — Moderate				
None	1 490	(1 160 – 1 860)	79.8	(74.2 – 84.7)
Recurrent, no discharge	100	(60 – 160)	5.5	(3.5 – 8.6)
Isolated discharge	160	(100 – 240)	8.5	(5.3 – 12.4)
Recurrent and discharging	120	(70 – 170)	6.2	(4.0 – 9.1)
Total	1 870	(1 510 – 2 280)	100.0	
LORI — High				
None	690	(490 – 930)	72.0	(64.7 – 79.0)
Recurrent, no discharge	10	(0 – 40)	1.5	(0.4 – 3.7)
Isolated discharge	120	(80 – 180)	12.8	(8.9 – 17.8)
Recurrent and discharging	130	(70 – 210)	13.7	(8.7 – 20.6)
Total	960	(700 – 1 290)	100.0	
LORI — Extreme				
None	760	(540 – 1 060)	76.7	(69.6 – 82.5)
Recurrent, no discharge	30	(10 – 90)	3.4	(0.9 – 8.1)
Isolated discharge	100	(60 – 150)	10.4	(7.2 – 14.1)
Recurrent and discharging	90	(50 – 170)	9.5	(5.0 – 15.3)
Total	990	(700 – 1 350)	100.0	
Total				
None	7 110	(6 610 – 7 620)	78.1	(75.3 – 80.7)
Recurrent, no discharge	410	(290 – 560)	4.6	(3.2 – 6.2)
Isolated discharge	750	(610 – 930)	8.3	(6.7 – 10.1)
Recurrent and discharging	820	(670 – 1 000)	9.0	(7.4 – 11.0)
Total	9 100	(8 580 – 9 630)	100.0	

Table 3.72: Children — Proportion with recurrent and discharging ear infections, by child's age and Level of Relative Isolation (LORI)

Child's Age (years)	Number	95% CI	%	95% CI
	LORI — None, Low and Moderate			
0–3	630	(490 – 810)	58.3	(49.3 – 66.5)
4–11	1 510	(1 310 – 1 740)	70.4	(65.4 – 75.4)
12–17	600	(460 – 750)	62.0	(51.4 – 72.2)
Total	2 740	(2 440 – 3 070)	65.4	(61.1 – 69.6)
	LORI — High and Extreme			
0–3	280	(180 – 390)	83.4	(72.0 – 90.8)
4–11	500	(380 – 640)	82.9	(73.8 – 89.3)
12–17	230	(150 – 320)	82.4	(69.8 – 92.5)
Total	1 000	(780 – 1 250)	83.0	(76.4 – 88.3)
	Total			
0–3	910	(740 – 1 100)	64.2	(57.0 – 71.0)
4–11	2 010	(1 790 – 2 250)	73.2	(68.8 – 77.3)
12–17	820	(670 – 1 000)	66.5	(57.4 – 74.6)
Total	3 740	(3 410 – 4 090)	69.3	(65.7 – 72.9)

Table 3.73: Children — Gestational age, by type of ear infection

Gestational age	Number	95% CI	%	95% CI
	No ear infections			
<32 weeks	350	(230 – 510)	1.6	(1.1 – 2.4)
32–36 weeks	2 040	(1 780 – 2 340)	9.4	(8.2 – 10.8)
>=37 weeks	16 400	(15 800 – 17 000)	75.6	(73.4 – 77.8)
Not stated	2 880	(2 480 – 3 330)	13.3	(11.4 – 15.3)
Total	21 700	(21 200 – 22 100)	100.0	
	Recurrent, no discharge			
<32 weeks	30	(0 – 270)	1.6	(0.1 – 15.3)
32–36 weeks	110	(50 – 200)	6.5	(3.1 – 11.5)
>=37 weeks	1 370	(1 170 – 1 580)	82.5	(75.5 – 88.1)
Not stated	150	(100 – 220)	9.3	(6.2 – 13.3)
Total	1 660	(1 440 – 1 900)	100.0	
	Isolated discharge			
<32 weeks	10	(0 – 30)	0.5	(0.2 – 1.1)
32–36 weeks	300	(230 – 400)	10.9	(8.2 – 14.0)
>=37 weeks	2 080	(1 850 – 2 320)	75.2	(70.5 – 79.4)
Not stated	370	(270 – 510)	13.5	(9.9 – 18.1)
Total	2 770	(2 490 – 3 060)	100.0	
	Recurrent and discharging			
<32 weeks	80	(50 – 130)	2.2	(1.4 – 3.4)
32–36 weeks	530	(430 – 660)	14.3	(11.6 – 17.3)
>=37 weeks	2 600	(2 330 – 2 880)	69.5	(65.6 – 73.3)
Not stated	520	(400 – 680)	14.0	(10.8 – 17.8)
Total	3 740	(3 410 – 4 090)	100.0	
	Total			
<32 weeks	470	(330 – 660)	1.6	(1.1 – 2.2)
32–36 weeks	2 990	(2 680 – 3 320)	10.0	(9.0 – 11.1)
>=37 weeks	22 400	(21 800 – 23 000)	75.2	(73.3 – 77.1)
Not stated	3 930	(3 450 – 4 440)	13.2	(11.6 – 14.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.74: All children — Mean birth weight, by type of ear infection

Type of ear infection	Mean birth weight (grams)	95% CI
None	3 190	(3 160 – 3 220)
Isolated discharge	3 190	(3 120 – 3 250)
Recurrent, no discharge	3 150	(3 020 – 3 290)
Recurrent and discharging	3 090	(3 030 – 3 140)
Total	3 170	(3 140 – 3 200)

Table 3.75: All children — Number of types of recurrent infections, by Level of Relative Isolation (LORI)

Number of types of recurrent infections	Number	95% CI	%	95% CI
		LORI — None		
None	6 940	(6 580 – 7 320)	68.3	(64.7 – 71.7)
One	2 330	(2 050 – 2 650)	22.9	(20.0 – 25.9)
More than one	900	(700 – 1 120)	8.8	(6.9 – 11.0)
Total	10 200	(10 000 – 10 400)	100.0	
		LORI — Low		
None	5 100	(4 600 – 5 630)	70.2	(66.5 – 73.7)
One	1 630	(1 380 – 1 910)	22.4	(19.5 – 25.6)
More than one	540	(400 – 720)	7.4	(5.5 – 9.8)
Total	7 270	(6 640 – 7 930)	100.0	
		LORI — Moderate		
None	4 500	(3 790 – 5 300)	70.4	(67.2 – 73.4)
One	1 250	(1 030 – 1 510)	19.6	(17.5 – 22.0)
More than one	630	(500 – 800)	9.9	(8.2 – 12.0)
Total	6 390	(5 400 – 7 420)	100.0	
		LORI — High		
None	2 190	(1 600 – 2 930)	69.3	(62.9 – 75.1)
One	650	(470 – 890)	20.5	(16.9 – 24.2)
More than one	320	(200 – 500)	10.3	(6.9 – 14.7)
Total	3 170	(2 360 – 4 160)	100.0	
		LORI — Extreme		
None	1 720	(1 240 – 2 350)	60.6	(54.0 – 66.7)
One	610	(410 – 860)	21.5	(17.8 – 25.7)
More than one	510	(320 – 790)	17.9	(12.3 – 23.9)
Total	2 830	(2 040 – 3 800)	100.0	
		Total		
None	20 400	(19 900 – 21 000)	68.6	(66.7 – 70.4)
One	6 470	(6 050 – 6 900)	21.7	(20.3 – 23.1)
More than one	2 900	(2 560 – 3 250)	9.7	(8.6 – 10.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.76: Children with recurrent infections — Number of types of recurrent infections, by Level of Relative Isolation (LORI)

Number of types of recurrent infections	Number	95% CI	%	95% CI
	LORI — None			
One	2 330	(2 050 – 2 650)	72.3	(66.4 – 77.4)
Two	610	(450 – 810)	19.0	(14.3 – 24.2)
Three	250	(180 – 330)	7.6	(5.5 – 10.3)
Four	40	(10 – 90)	1.1	(0.3 – 2.6)
Total	3 230	(2 890 – 3 600)	100.0	
	LORI — Low			
One	1 630	(1 380 – 1 910)	75.2	(68.8 – 81.0)
Two	390	(280 – 530)	18.0	(13.6 – 23.3)
Three	110	(50 – 190)	4.9	(2.2 – 8.7)
Four	40	(10 – 160)	1.9	(0.2 – 7.1)
Total	2 170	(1 850 – 2 510)	100.0	
	LORI — Moderate			
One	1 250	(1 030 – 1 510)	66.4	(61.6 – 71.0)
Two	440	(340 – 570)	23.6	(19.7 – 27.7)
Three	150	(100 – 220)	8.1	(5.6 – 11.3)
Four	40	(20 – 60)	1.9	(1.1 – 3.2)
Total	1 890	(1 560 – 2 250)	100.0	
	LORI — High			
One	650	(470 – 890)	66.6	(58.1 – 74.1)
Two	280	(160 – 430)	28.8	(20.7 – 37.3)
Three	40	(10 – 80)	4.1	(1.6 – 8.0)
Four	10	(0 – 20)	0.6	(0.1 – 2.3)
Total	970	(690 – 1 340)	100.0	
	LORI — Extreme			
One	610	(410 – 860)	54.7	(44.7 – 65.0)
Two	330	(210 – 510)	29.9	(23.9 – 36.1)
Three	140	(80 – 240)	12.6	(7.8 – 18.6)
Four	30	(10 – 100)	2.8	(0.6 – 8.5)
Total	1 110	(760 – 1 570)	100.0	
	Total			
One	6 470	(6 050 – 6 900)	69.1	(66.1 – 72.0)
Two	2 060	(1 790 – 2 350)	22.0	(19.7 – 24.5)
Three	690	(560 – 840)	7.3	(6.0 – 8.9)
Four	150	(80 – 260)	1.6	(0.9 – 2.7)
Total	9 370	(8 820 – 9 920)	100.0	

Table 3.77: All children — Number of types of recurrent infections, by age

Number of types of recurrent infections	Number	95% CI	%	95% CI
0–3 years				
None	4 330	(3 970 – 4 730)	62.7	(58.8 – 66.3)
One	1 650	(1 410 – 1 910)	23.9	(20.8 – 27.3)
Two	680	(520 – 860)	9.9	(7.7 – 12.5)
Three	190	(140 – 260)	2.8	(2.1 – 3.7)
Four	50	(20 – 110)	0.8	(0.3 – 1.6)
Total	6 910	(6 470 – 7 360)	100.0	
4–11 years				
None	9 160	(8 670 – 9 660)	66.4	(63.8 – 68.9)
One	3 190	(2 920 – 3 490)	23.1	(21.2 – 25.1)
Two	1 020	(850 – 1 210)	7.4	(6.2 – 8.8)
Three	350	(260 – 450)	2.5	(1.9 – 3.3)
Four	80	(20 – 170)	0.6	(0.2 – 1.2)
Total	13 800	(13 300 – 14 300)	100.0	
12–17 years				
None	6 950	(6 450 – 7 470)	76.4	(73.4 – 79.3)
One	1 630	(1 400 – 1 880)	17.9	(15.5 – 20.6)
Two	360	(250 – 490)	3.9	(2.8 – 5.3)
Three	140	(80 – 220)	1.5	(0.9 – 2.4)
Four	20	(10 – 40)	0.2	(0.1 – 0.5)
Total	9 100	(8 580 – 9 630)	100.0	
Total				
None	20 400	(19 900 – 21 000)	68.6	(66.7 – 70.4)
One	6 470	(6 050 – 6 900)	21.7	(20.3 – 23.1)
Two	2 060	(1 790 – 2 350)	6.9	(6.0 – 7.9)
Three	690	(560 – 840)	2.3	(1.9 – 2.8)
Four	150	(80 – 260)	0.5	(0.3 – 0.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.78: Children with recurrent infections — Number of types, by age group

Number of types of recurrent infections	Number	95% CI	%	95% CI
0–3 years				
One	1 650	(1 410 – 1 910)	64.0	(57.8 – 69.6)
More than one	930	(760 – 1 130)	36.0	(30.4 – 42.2)
Total	2 580	(2 280 – 2 900)	100.0	
4– 11 years				
One	3 190	(2 920 – 3 490)	68.8	(64.8 – 72.6)
More than one	1 450	(1 220 – 1 700)	31.2	(27.4 – 35.2)
Total	4 640	(4 270 – 5 030)	100.0	
12–17 years				
One	1 630	(1 400 – 1 880)	75.9	(70.1 – 81.1)
More than one	520	(390 – 670)	24.1	(18.9 – 29.9)
Total	2 150	(1 880 – 2 440)	100.0	
Total				
One	6 470	(6 050 – 6 900)	69.1	(66.1 – 72.0)
More than one	2 900	(2 560 – 3 250)	30.9	(28.0 – 33.9)
Total	9 370	(8 820 – 9 920)	100.0	

Table 3.79: All children — Relative risk of each recurring infection, given presence of another

	Numerator rate	Denominator rate	Relative risk	95% CI
	Has chest infection			
Likelihood of –				
gastrointestinal infection	18.3	3.8	4.8	(3.6 – 6.4)
skin infection	20.4	6.8	3.0	(2.3 – 3.8)
ear infection	40.0	15.0	2.7	(2.3 – 3.1)
	Has gastrointestinal infection			
Likelihood of –				
chest infection	40.0	10.6	3.8	(3.1– 4.6)
skin infection	29.1	7.3	4.0	(3.1 – 5.2)
ear infection	43.9	16.6	2.6	(2.2 – 3.2)
	Has skin infection			
Likelihood of –				
chest infection	29.5	10.7	2.8	(2.2 – 3.4)
gastrointestinal infection	19.2	4.3	4.4	(3.2 – 6.1)
ear infection	36.6	16.4	2.2	(1.9 – 2.7)
	Has ear infection			
Likelihood of –				
chest infection	27.1	9.0	3.0	(2.5 – 3.6)
gastrointestinal infection	13.6	3.8	3.6	(2.7 – 4.8)
skin infection	17.1	6.6	2.6	(2.1 – 3.3)

Table 3.80: All children — Recurring infections, by type of ear infection

Type of recurring infection	Number	95% CI	%	95% CI
	No ear infections (N = 21 700)			
Chest	1 910	(1 670 – 2 180)	8.8	(7.7 – 10.0)
Gastrointestinal	730	(560 – 940)	3.4	(2.6 – 4.4)
Skin infection	1 330	(1 100 – 1 620)	6.2	(5.1 – 7.4)
	Isolated discharge (N = 2 770)			
Chest	290	(200 – 400)	10.4	(7.3 – 14.4)
Gastrointestinal	200	(140 – 290)	7.4	(4.9 – 10.3)
Skin infection	270	(210 – 350)	9.8	(7.4 – 12.6)
	Recurrent, no discharge (N = 1 660)			
Chest	490	(370 – 640)	29.6	(23.2 – 36.3)
Gastrointestinal	170	(110 – 240)	10.1	(6.8 – 14.3)
Skin infection	260	(190 – 340)	15.5	(11.4 – 20.0)
	Recurrent and discharging (N = 3 740)			
Chest	970	(790 – 1 180)	26.0	(21.9 – 30.5)
Gastrointestinal	570	(440 – 700)	15.1	(12.2 – 18.5)
Skin infection	670	(530 – 830)	17.9	(14.4 – 21.8)
	Total (N = 29 800)			
Chest	3 660	(3 310 – 4 030)	12.3	(11.1 – 13.5)
Gastrointestinal	1 670	(1 410 – 1 970)	5.6	(4.7 – 6.6)
Skin infection	2 530	(2 210 – 2 890)	8.5	(7.4 – 9.7)

Table 3.81: Children aged 4–17 years — Impact of ear infections, by type of infection

Impact of ear infections	Number	95% CI	%	95% CI
No ear infections (N = 16 700)				
Abnormal hearing	390	(270 – 530)	2.3	(1.6 – 3.2)
Speech unintelligible	1 170	(960 – 1 400)	7.0	(5.8 – 8.4)
Difficulty with sounds	1 300	(1 080 – 1 540)	7.8	(6.5 – 9.3)
Stammer	660	(510 – 860)	4.0	(3.0 – 5.1)
Learning difficulties	1 280	(1 050 – 1 530)	7.6	(6.3 – 9.1)
Isolated discharge (N = 2 230)				
Abnormal hearing	200	(130 – 280)	9.0	(6.2 – 12.4)
Speech unintelligible	180	(130 – 260)	8.2	(5.8 – 11.2)
Difficulty with sounds	230	(170 – 310)	10.4	(7.8 – 13.8)
Stammer	100	(50 – 170)	4.6	(2.4 – 7.6)
Learning difficulties	220	(150 – 300)	9.8	(6.8 – 13.2)
Recurrent, no discharge (N = 1 150)				
Abnormal hearing	120	(70 – 190)	10.4	(5.9 – 16.0)
Speech unintelligible	100	(50 – 170)	8.5	(4.5 – 14.5)
Difficulty with sounds	140	(80 – 210)	11.9	(7.2 – 17.6)
Stammer	50	(20 – 110)	4.5	(1.4 – 9.5)
Learning difficulties	120	(70 – 180)	10.0	(6.1 – 14.7)
Recurrent and discharging (N = 2 830)				
Abnormal hearing	850	(700 – 1 020)	30.0	(25.1 – 35.2)
Speech unintelligible	520	(390 – 680)	18.4	(14.3 – 23.3)
Difficulty with sounds	570	(440 – 720)	20.1	(16.1 – 24.7)
Stammer	220	(150 – 310)	7.9	(5.6 – 10.7)
Learning difficulties	460	(350 – 590)	16.2	(12.6 – 20.5)
Total (N = 22 900)				
Abnormal hearing	1 560	(1 350 – 1 790)	6.8	(5.9 – 7.8)
Speech unintelligible	1 970	(1 710 – 2 260)	8.6	(7.5 – 9.9)
Difficulty with sounds	2 240	(1 970 – 2 520)	9.8	(8.6 – 11.0)
Stammer	1 040	(850 – 1 250)	4.5	(3.7 – 5.4)
Learning difficulties	2 070	(1 800 – 2 370)	9.0	(7.8 – 10.4)

Table 3.82: Children aged 4–11 years — Impact of ear infections, by type of infection

Impact of ear infections	Number	95% CI	%	95% CI
No ear infections (N = 9 580)				
Abnormal hearing	130	(60 – 230)	1.4	(0.7 – 2.4)
Speech unintelligible	880	(730 – 1 060)	9.2	(7.7 – 11.0)
Difficulty with sounds	1 060	(860 – 1 300)	11.1	(9.1 – 13.4)
Stammer	460	(310 – 630)	4.8	(3.3 – 6.6)
Learning difficulties	660	(510 – 830)	6.9	(5.4 – 8.7)
Isolated discharge (N = 1 470)				
Abnormal hearing	160	(110 – 240)	11.1	(7.7 – 15.7)
Speech unintelligible	150	(100 – 210)	10.2	(7.2 – 14.2)
Difficulty with sounds	210	(150 – 280)	14.0	(10.3 – 18.4)
Stammer	100	(50 – 170)	6.9	(3.6 – 11.2)
Learning difficulties	140	(80 – 200)	9.2	(6.2 – 13.5)
Recurrent, no discharge (N =740)				
Abnormal hearing	70	(40 – 120)	9.3	(5.0 – 15.9)
Speech unintelligible	80	(30 – 140)	10.6	(5.3 – 18.9)
Difficulty with sounds	120	(70 – 200)	16.2	(9.2 – 24.2)
Stammer	40	(10 – 100)	5.0	(1.0 – 13.3)
Learning difficulties	90	(50 – 150)	11.6	(6.3 – 19.0)
Recurrent and discharging (N = 2 010)				
Abnormal hearing	570	(440 – 720)	28.3	(22.8 – 34.3)
Speech unintelligible	420	(310 – 570)	21.1	(16.0 – 27.0)
Difficulty with sounds	450	(340 – 600)	22.6	(17.4 – 28.3)
Stammer	160	(100 – 230)	7.7	(5.1 – 10.9)
Learning difficulties	310	(220 – 430)	15.5	(11.2 – 20.7)
Total (N = 13 800)				
Abnormal hearing	930	(780 – 1 110)	6.8	(5.6 – 8.1)
Speech unintelligible	1 540	(1 320 – 1 770)	11.1	(9.6 – 12.8)
Difficulty with sounds	1 840	(1 600 – 2 110)	13.4	(11.6 – 15.2)
Stammer	750	(590 – 940)	5.4	(4.3 – 6.8)
Learning difficulties	1 190	(990 – 1 410)	8.7	(7.3 – 10.3)

Table 3.83: Children aged 12–17 years — Impact of ear infections, by type of infection

Impact of ear infections	Number	95% CI	%	95% CI
No ear infections (N = 7 110)				
Abnormal hearing	260	(180 – 360)	3.6	(2.6 – 5.1)
Speech unintelligible	280	(170 – 440)	4.0	(2.5 – 6.1)
Difficulty with sounds	230	(160 – 330)	3.3	(2.3 – 4.6)
Stammer	210	(130 – 300)	2.9	(1.9 – 4.3)
Learning difficulties	620	(450 – 810)	8.7	(6.4 – 11.2)
Isolated discharge (N = 750)				
Abnormal hearing	40	(10 – 90)	4.8	(1.3 – 11.4)
Speech unintelligible	30	(10 – 80)	4.2	(1.4 – 9.8)
Difficulty with sounds	30	(0 – 70)	3.5	(0.6 – 8.8)
Stammer	0	(0 – 60)	0.0	(0.0 – 7.1)
Learning difficulties	80	(40 – 150)	10.9	(5.8 – 19.4)
Recurrent, no discharge (N = 410)				
Abnormal hearing	50	(20 – 120)	12.5	(3.8 – 24.6)
Speech unintelligible	20	(0 – 60)	4.8	(0.5 – 14.3)
Difficulty with sounds	20	(0 – 40)	4.4	(1.3 – 11.4)
Stammer	10	(0 – 40)	3.6	(0.6 – 8.9)
Learning difficulties	30	(20 – 50)	7.1	(3.5 – 11.9)
Recurrent and discharging (N = 820)				
Abnormal hearing	280	(200 – 380)	34.2	(24.3 – 45.0)
Speech unintelligible	100	(50 – 160)	11.9	(6.8 – 19.4)
Difficulty with sounds	110	(80 – 170)	13.9	(8.8 – 20.3)
Stammer	70	(30 – 130)	8.4	(3.9 – 15.4)
Learning difficulties	150	(100 – 220)	18.0	(11.4 – 25.9)
Total (N = 9 100)				
Abnormal hearing	630	(500 – 770)	6.9	(5.5 – 8.4)
Speech unintelligible	430	(310 – 600)	4.8	(3.3 – 6.5)
Difficulty with sounds	390	(300 – 500)	4.3	(3.4 – 5.5)
Stammer	290	(210 – 400)	3.2	(2.3 – 4.4)
Learning difficulties	870	(690 – 1 080)	9.6	(7.7 – 11.9)

Table 3.84: All children — Number of types of recurrent infection, by family financial strain

Number of types of recurrent infection	Number	95% CI	%	95% CI
	Spending more money than we get			
None	1 660	(1 340 – 2 030)	63.2	(56.9 – 69.3)
One	540	(430 – 670)	20.5	(16.7 – 24.6)
More than one	430	(300 – 590)	16.3	(11.7 – 22.0)
Total	2 630	(2 230 – 3 090)	100.0	
	Have just enough to get through to next pay			
None	8 940	(8 350 – 9 550)	67.4	(64.8 – 70.0)
One	3 090	(2 790 – 3 400)	23.3	(21.3 – 25.4)
More than one	1 240	(1 020 – 1 480)	9.3	(7.8 – 11.1)
Total	13 300	(12 600 – 14 000)	100.0	
	Some money left over each week but spend it			
None	2 830	(2 410 – 3 280)	70.5	(65.4 – 75.1)
One	830	(660 – 1 050)	20.8	(17.1 – 24.9)
More than one	350	(230 – 520)	8.8	(5.8 – 12.6)
Total	4 010	(3 490 – 4 570)	100.0	
	Can save a bit now and again			
None	5 480	(4 960 – 6 030)	71.3	(68.0 – 74.7)
One	1 550	(1 310 – 1 830)	20.2	(17.3 – 23.4)
More than one	650	(510 – 800)	8.4	(6.7 – 10.3)
Total	7 680	(7 070 – 8 330)	100.0	
	Can save a lot			
None	980	(760 – 1 240)	68.9	(59.8 – 76.9)
One	340	(210 – 500)	23.9	(17.7 – 31.4)
More than one	100	(50 – 190)	7.2	(3.7 – 12.0)
Total	1 420	(1 100 – 1 820)	100.0	
	Not stated			
None	560	(390 – 770)	69.3	(56.6 – 80.1)
One	120	(50 – 230)	14.9	(7.5 – 27.9)
More than one	130	(70 – 210)	15.8	(9.0 – 25.2)
Total	810	(590 – 1 050)	100.0	
	Total			
None	20 400	(19 900 – 21 000)	68.6	(66.7 – 70.4)
One	6 470	(6 050 – 6 900)	21.7	(20.3 – 23.1)
More than one	2 900	(2 560 – 3 250)	9.7	(8.6 – 10.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.85: All children — Number of types of recurrent infection, by level of education of primary carer

Number of types of recurrent infection	Number	95% CI	%	95% CI
Did not attend school				
None	450	(300 – 650)	60.6	(49.6 – 71.6)
One	190	(110 – 300)	25.6	(15.8 – 36.3)
More than one	100	(50 – 190)	13.9	(7.1 – 22.1)
Total	740	(520 – 1 030)	100.0	
1–9 years				
None	4 510	(4 030 – 5 010)	68.0	(64.4 – 71.6)
One	1 430	(1 200 – 1 670)	21.5	(18.7 – 24.6)
More than one	690	(570 – 850)	10.5	(8.6 – 12.6)
Total	6 630	(6 040 – 7 230)	100.0	
10 years				
None	9 010	(8 420 – 9 620)	70.4	(67.8 – 72.9)
One	2 660	(2 390 – 2 960)	20.8	(18.9 – 22.8)
More than one	1 130	(920 – 1 380)	8.8	(7.3 – 10.7)
Total	12 800	(12 100 – 13 500)	100.0	
11–12 years				
None	4 810	(4 320 – 5 340)	66.4	(62.6 – 70.0)
One	1 710	(1 460 – 1 970)	23.5	(20.6 – 26.7)
More than one	730	(560 – 940)	10.1	(7.8 – 12.7)
Total	7 240	(6 650 – 7 880)	100.0	
13 years or more				
None	1 120	(820 – 1 450)	69.7	(59.6 – 78.7)
One	370	(240 – 580)	23.4	(15.9 – 32.0)
More than one	110	(40 – 220)	7.0	(3.3 – 13.1)
Total	1 600	(1 200 – 2 060)	100.0	
Not stated				
None	560	(390 – 770)	69.3	(56.6 – 80.1)
One	120	(50 – 230)	14.9	(7.5 – 27.9)
More than one	130	(70 – 210)	15.8	(9.0 – 25.2)
Total	810	(590 – 1 050)	100.0	
Total				
None	20 400	(19 900 – 21 000)	68.6	(66.7 – 70.4)
One	6 470	(6 050 – 6 900)	21.7	(20.3 – 23.1)
More than one	2 900	(2 560 – 3 250)	9.7	(8.6 – 10.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.86: Children — Health conditions, by age group

Health condition	Number	95% CI	%	95% CI
0–3 years (N = 6 910)				
Heart problem	190	(120 – 280)	2.8	(1.8 – 4.1)
Epilepsy	80	(60 – 120)	1.2	(0.8 – 1.8)
Anaemia or lack of iron	370	(270 – 480)	5.4	(4.0 – 7.0)
Allergies	390	(290 – 510)	5.7	(4.3 – 7.5)
4–11 years (N = 13 800)				
Heart problem	410	(300 – 550)	3.0	(2.2 – 4.0)
Epilepsy	300	(210 – 430)	2.2	(1.5 – 3.1)
Anaemia or lack of iron	520	(400 – 660)	3.8	(2.9 – 4.8)
Allergies	1 060	(830 – 1 320)	7.7	(6.0 – 9.5)
12–17 years (N = 9 100)				
Heart problem	330	(260 – 430)	3.7	(2.8 – 4.7)
Epilepsy	220	(160 – 320)	2.5	(1.7 – 3.5)
Anaemia or lack of iron	450	(350 – 570)	4.9	(3.8 – 6.1)
Allergies	810	(640 – 1 020)	8.9	(7.1 – 11.1)
All children (N = 29 800)				
Heart problem	940	(780 – 1 120)	3.1	(2.6 – 3.8)
Epilepsy	610	(470 – 770)	2.0	(1.6 – 2.6)
Anaemia or lack of iron	1 340	(1 150 – 1 560)	4.5	(3.9 – 5.2)
Allergies	2 260	(1 950 – 2 620)	7.6	(6.5 – 8.8)

Table 3.87: Children aged 4–17 years — Health conditions, by age group

Health condition	Number	95% CI	%	95% CI
4–11 years (N = 13 800)				
Migraine or severe headache	1 230	(1 040 – 1 430)	8.9	(7.6 – 10.4)
Learning difficulties	1 190	(990 – 1 410)	8.7	(7.3 – 10.3)
12–17 years (N = 9 100)				
Migraine or severe headache	1 600	(1 370 – 1 850)	17.6	(15.2 – 20.3)
Learning difficulties	870	(690 – 1 080)	9.6	(7.7 – 11.9)
Total years (N = 22 900)				
Migraine or severe headache	2 830	(2 530 – 3 170)	12.4	(11.1 – 13.8)
Learning difficulties	2 070	(1 800 – 2 370)	9.0	(7.8 – 10.4)

Table 3.88: Children — Broken bones and head injuries, by age group

Type of Injury	Number	95% CI	%	95% CI
0–3 years (N = 6 910)				
Broken bones	190	(140 – 250)	2.7	(2.0 – 3.6)
Head injury/knocked out	180	(100 – 310)	2.6	(1.4 – 4.4)
4–11 years (N = 13 800)				
Broken bones	1 490	(1 240 – 1 770)	10.8	(9.1 – 12.7)
Head injury/knocked out	620	(510 – 750)	4.5	(3.7 – 5.5)
12–17 years (N = 9 100)				
Broken bones	1 660	(1 410 – 1 950)	18.3	(15.7 – 21.1)
Head injury/knocked out	880	(720 – 1 070)	9.7	(7.9 – 11.7)
Total (N = 29 800)				
Broken bones	3 350	(3 000 – 3 730)	11.2	(10.1 – 12.5)
Head injury/knocked out	1 690	(1 460 – 1 930)	5.7	(4.9 – 6.5)

Table 3.89: Children — Broken bones and head injuries, by Level of Relative Isolation (LORI)

Type of injury	Number	95% CI	%	95% CI
LORI — None (N = 10 200)				
Broken bones	1 340	(1 090 – 1 630)	13.2	(10.7 – 16.0)
Head injury/knocked out	750	(600 – 940)	7.4	(5.9 – 9.3)
LORI — Low (N = 7 270)				
Broken bones	770	(580 – 1 010)	10.6	(8.1 – 13.5)
Head injury/knocked out	480	(350 – 640)	6.6	(4.9 – 8.6)
LORI — Moderate (N = 6 390)				
Broken bones	660	(520 – 810)	10.3	(8.8 – 12.0)
Head injury/knocked out	300	(220 – 380)	4.6	(3.7 – 5.7)
LORI — High (N = 3 170)				
Broken bones	330	(210 – 500)	10.3	(7.4 – 14.2)
Head injury/knocked out	60	(40 – 100)	2.0	(1.2 – 3.2)
LORI — Extreme (N = 2 830)				
Broken bones	250	(170 – 350)	8.8	(6.7 – 11.3)
Head injury/knocked out	100	(50 – 160)	3.4	(2.0 – 5.1)
Total WA (N = 29 800)				
Broken bones	3 350	(3 000 – 3 730)	11.2	(10.1 – 12.5)
Head injury/knocked out	1 690	(1 460 – 1 930)	5.7	(4.9 – 6.5)

Table 3.90: Children aged 4–17 years — Ever hospitalised for burns or poisoning, by age group

Reason for hospitalisation	Number	95% CI	%	95% CI
4–11 years (N = 13 800)				
Accidental burns	470	(390 – 570)	3.4	(2.8 – 4.1)
Accidental poisoning	300	(210 – 440)	2.2	(1.5 – 3.2)
12–17 years (N = 9 100)				
Accidental burns	340	(260 – 420)	3.7	(2.9 – 4.6)
Accidental poisoning	200	(120 – 320)	2.2	(1.4 – 3.5)
Total (N = 22 900)				
Accidental burns	810	(690 – 930)	3.5	(3.0 – 4.1)
Accidental poisoning	510	(380 – 670)	2.2	(1.7 – 2.9)

Table 3.91: Children aged 4–17 years — Ever hospitalised for burns or poisoning, by Level of Relative Isolation (LORI)

Reason for hospitalisation	Number	95% CI	%	95% CI
LORI — None (N = 7 830)				
Accidental burns	300	(230 – 400)	3.9	(2.9 – 5.1)
Accidental poisoning	230	(140 – 370)	2.9	(1.6 – 4.6)
LORI — Low (N = 5 590)				
Accidental burns	220	(160 – 290)	4.0	(2.9 – 5.2)
Accidental poisoning	120	(70 – 190)	2.2	(1.4 – 3.4)
LORI — Moderate (N = 4 680)				
Accidental burns	150	(110 – 210)	3.2	(2.4 – 4.3)
Accidental poisoning	90	(50 – 150)	2.0	(1.2 – 3.1)
LORI — High (N = 2 550)				
Accidental burns	50	(30 – 100)	2.1	(1.0 – 3.7)
Accidental poisoning	20	(10 – 50)	0.8	(0.3 – 2.0)
LORI — Extreme (N = 2 260)				
Accidental burns	80	(50 – 120)	3.5	(2.3 – 5.0)
Accidental poisoning	40	(10 – 160)	1.9	(0.2 – 6.4)
Total WA (N = 22 900)				
Accidental burns	810	(690 – 930)	3.5	(3.0 – 4.1)
Accidental poisoning	510	(380 – 670)	2.2	(1.7 – 2.9)

Table 3.92: Children — Carer reports of dental health, by Level of Relative Isolation (LORI)

Dental health	Number	95% CI	%	95% CI
LORI — None (N = 10 200)				
Holes in teeth	1 970	(1 690 – 2 270)	19.3	(16.6 – 22.2)
Teeth removed	1 030	(830 – 1 270)	10.1	(8.1 – 12.4)
Dental fillings	3 450	(3 110 – 3 810)	33.9	(30.6 – 37.4)
Sore and bleeding gums	660	(520 – 810)	6.5	(5.1 – 8.0)
LORI — Low (N = 7 270)				
Holes in teeth	1 490	(1 230 – 1 800)	20.6	(17.3 – 24.1)
Teeth removed	710	(560 – 890)	9.8	(7.8 – 12.1)
Dental fillings	2 270	(1 950 – 2 640)	31.3	(27.5 – 35.3)
Sore and bleeding gums	370	(250 – 550)	5.1	(3.4 – 7.4)
LORI — Moderate (N = 6 390)				
Holes in teeth	1 320	(1 070 – 1 620)	20.6	(17.8 – 23.6)
Teeth removed	610	(480 – 770)	9.6	(7.8 – 11.5)
Dental fillings	1 510	(1 210 – 1 860)	23.6	(20.4 – 27.0)
Sore and bleeding gums	390	(270 – 550)	6.2	(4.4 – 8.4)
LORI — High (N = 3 170)				
Holes in teeth	420	(260 – 610)	13.3	(9.4 – 17.7)
Teeth removed	210	(130 – 310)	6.6	(4.6 – 9.3)
Dental fillings	720	(450 – 1 060)	22.7	(16.5 – 29.9)
Sore and bleeding gums	120	(70 – 170)	3.7	(2.6 – 5.1)
LORI — Extreme (N = 2 830)				
Holes in teeth	350	(240 – 500)	12.3	(9.6 – 15.4)
Teeth removed	220	(140 – 330)	7.7	(5.8 – 10.2)
Dental fillings	260	(160 – 400)	9.2	(6.6 – 12.4)
Sore and bleeding gums	100	(60 – 160)	3.5	(2.2 – 5.4)
Total WA (N = 29 800)				
Holes in teeth	5 550	(5 110 – 6 010)	18.6	(17.1 – 20.2)
Teeth removed	2 780	(2 480 – 3 090)	9.3	(8.3 – 10.4)
Dental fillings	8 210	(7 670 – 8 770)	27.5	(25.7 – 29.4)
Sore and bleeding gums	1 640	(1 410 – 1 900)	5.5	(4.7 – 6.4)

Table 3.93: Children — Carer reports of dental health, by age group

Dental health	Number	95% CI	%	95% CI
0–3 years (N = 6 910)				
Holes in teeth	560	(430 – 710)	8.2	(6.4 – 10.2)
Teeth removed	40	(10 – 120)	0.5	(0.1 – 1.7)
Dental fillings	50	(30 – 90)	0.8	(0.4 – 1.3)
Sore and bleeding gums	110	(50 – 200)	1.5	(0.8 – 2.9)
4–7 years (N = 6 920)				
Holes in teeth	2120	(1 900 – 2 350)	30.6	(27.8 – 33.6)
Teeth removed	790	(660 – 940)	11.4	(9.7 – 13.4)
Dental fillings	1 610	(1 420 – 1 820)	23.2	(20.7 – 25.9)
Sore and bleeding gums	340	(250 – 430)	4.9	(3.6 – 6.2)
8–11 years (N = 6 880)				
Holes in teeth	1650	(1 410 – 1 930)	24.0	(20.7 – 27.6)
Teeth removed	940	(780 – 1 130)	13.7	(11.4 – 16.2)
Dental fillings	2 900	(2 600 – 3 210)	42.2	(38.5 – 46.0)
Sore and bleeding gums	470	(350 – 610)	6.8	(5.0 – 8.7)
12–17 years (N = 9 100)				
Holes in teeth	1210	(1 000 – 1 460)	13.3	(11.1 – 15.9)
Teeth removed	1 010	(820 – 1 220)	11.1	(9.2 – 13.3)
Dental fillings	3 640	(3 250 – 4 080)	40.0	(36.4 – 43.8)
Sore and bleeding gums	730	(600 – 890)	8.0	(6.5 – 9.7)
All children (N = 29 800)				
Holes in teeth	5550	(5 110 – 6 010)	18.6	(17.1 – 20.2)
Teeth removed	2 780	(2 480 – 3 090)	9.3	(8.3 – 10.4)
Dental fillings	8 210	(7 670 – 8 770)	27.5	(25.7 – 29.4)
Sore and bleeding gums	1 640	(1 410 – 1 900)	5.5	(4.7 – 6.4)

Table 3.94: All children — Occurrence of one or more dental problems (dental decay, tooth removal, dental fillings), by age group

Any tooth problem	Number	95% CI	%	95% CI
0–3 years				
None	6 070	(5 660 – 6 500)	87.8	(85.6 – 89.8)
One or more	600	(460 – 750)	8.7	(6.9 – 10.9)
Too young	240	(190 – 310)	3.5	(2.7 – 4.5)
Total	6 910	(6 470 – 7 360)	100.0	
4–7 years				
None	3 940	(3 620 – 4 280)	56.9	(53.6 – 60.1)
One or more	2 980	(2 720 – 3 250)	43.1	(39.9 – 46.4)
Total	6 920	(6 540 – 7 310)	100.0	
8–11 years				
None	3 340	(3 030 – 3 680)	48.6	(44.8 – 52.3)
One or more	3 540	(3 210 – 3 880)	51.4	(47.7 – 55.2)
Total	6 880	(6 480 – 7 290)	100.0	
12–17 years				
None	4 950	(4 550 – 5 370)	54.4	(50.8 – 57.9)
One or more	4 150	(3 750 – 4 590)	45.6	(42.1 – 49.2)
Total	9 100	(8 580 – 9 630)	100.0	
Total				
None	18 300	(17 700 – 18 900)	61.4	(59.4 – 63.3)
One or more	11 300	(10 700 – 11 900)	37.8	(35.9 – 39.8)
Too young	240	(190 – 310)	0.8	(0.6 – 1.0)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.95: Children 4–17 years — Occurrence of one or more dental problems (dental decay, tooth removal, dental fillings), by Level of Relative Isolation (LORI)

Any tooth problem	Number	95% CI	%	95% CI
LORI — None				
None	3 760	(3 440 – 4 090)	48.0	(43.9 – 52.1)
One or more	4 070	(3 750 – 4 410)	52.0	(47.9 – 56.1)
Total	7 830	(7 680 – 7 980)	100.0	
LORI — Low				
None	2 590	(2 270 – 2 950)	46.4	(42.0 – 50.7)
One or more	2 990	(2 640 – 3 370)	53.6	(49.3 – 58.0)
Total	5 590	(5 100 – 6 100)	100.0	
LORI — Moderate				
None	2 620	(2 150 – 3 130)	56.0	(51.1 – 60.6)
One or more	2 060	(1 690 – 2 490)	44.0	(39.4 – 48.9)
Total	4 680	(3 940 – 5 480)	100.0	
LORI — High				
None	1 580	(1 180 – 2 100)	61.8	(54.2 – 68.7)
One or more	980	(700 – 1 340)	38.2	(31.3 – 45.8)
Total	2 550	(1 910 – 3 270)	100.0	
LORI — Extreme				
None	1 690	(1 250 – 2 270)	74.8	(69.7 – 79.2)
One or more	570	(390 – 800)	25.2	(20.8 – 30.3)
Total	2 260	(1 670 – 3 020)	100.0	
Total				
None	12 200	(11 700 – 12 700)	53.4	(51.1 – 55.7)
One or more	10 700	(10 200 – 11 200)	46.6	(44.3 – 48.9)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.96: Children aged 4–17 years — Functional difficulties due to illness or disability, by Level of Relative Isolation (LORI)

Functional difficulties	Number	95% CI	%	95% CI
LORI — None or Low (N = 13 400)				
Need help in activities of daily living	300	(200 – 440)	2.3	(1.5 – 3.3)
Can’t do sporting activities involving strong exercise	730	(560 – 950)	5.5	(4.1 – 7.0)
LORI — Moderate, High or Extreme (N = 9 490)				
Need help in activities of daily living	80	(50 – 110)	0.8	(0.5 – 1.1)
Can’t do sporting activities involving strong exercise	210	(140 – 280)	2.2	(1.5 – 3.0)
Total WA (N = 22 900)				
Need help in activities of daily living	380	(270 – 510)	1.7	(1.2 – 2.2)
Can’t do sporting activities involving strong exercise	940	(750 – 1 160)	4.1	(3.3 – 5.0)

Table 3.97: Children aged 4–17 years — Functional difficulties due to illness or disability, by age and sex

Functional difficulties	Number	95% CI	%	95% CI
Males 4–11 years (N = 7 190)				
Need help in activities of daily living	190	(110 – 290)	2.7	(1.6 – 4.1)
Can't do sporting activities involving strong exercise	290	(190 – 430)	4.0	(2.6 – 5.9)
Need special help at school	420	(300 – 570)	5.8	(4.2 – 7.9)
Males 12–17 years (N = 4 540)				
Need help in activities of daily living	30	(13 – 61)	0.7	(0.3 – 1.4)
Can't do sporting activities involving strong exercise	240	(170 – 340)	5.4	(3.7 – 7.6)
Need special help at school	200	(120 – 320)	4.4	(2.6 – 6.8)
Total Males (N = 11 700)				
Need help in activities of daily living	220	(140 – 320)	1.9	(1.2 – 2.7)
Can't do sporting activities involving strong exercise	530	(400 – 690)	4.5	(3.4 – 5.9)
Need special help at school	620	(460 – 810)	5.3	(4.0 – 6.9)
Females 4–11 years (N = 6 610)				
Need help in activities of daily living	110	(80 – 170)	1.7	(1.2 – 2.5)
Can't do sporting activities involving strong exercise	180	(120 – 260)	2.7	(1.7 – 3.9)
Need special help at school	270	(200 – 350)	4.1	(3.1 – 5.4)
Females 12–17 years (N = 4 560)				
Need help in activities of daily living	40	(0 – 150)	1.0	(0.1 – 3.1)
Can't do sporting activities involving strong exercise	230	(140 – 370)	5.0	(3.0 – 8.0)
Need special help at school	130	(80 – 190)	2.8	(1.8 – 4.1)
Total females (N = 11 200)				
Need help in activities of daily living	160	(90 – 250)	1.4	(0.8 – 2.2)
Can't do sporting activities involving strong exercise	410	(290 – 560)	3.6	(2.6 – 5.0)
Need special help at school	400	(310 – 490)	3.6	(2.8 – 4.4)
Total 4–11 years (N = 13 800)				
Need help in activities of daily living	300	(210 – 420)	2.2	(1.5 – 3.0)
Limited in strong exercise	470	(350 – 620)	3.4	(2.5 – 4.4)
Need special help at school	690	(540 – 870)	5.0	(3.9 – 6.3)
Total 12–17 years (N = 9 100)				
Need help in activities of daily living	70	(20 – 160)	0.8	(0.2 – 1.7)
Can't do sporting activities involving strong exercise	470	(340 – 630)	5.2	(3.8 – 7.0)
Need special help at school	330	(230 – 440)	3.6	(2.6 – 4.9)
Total (N = 22 900)				
Need help in activities of daily living	380	(270 – 510)	1.7	(1.2 – 2.2)
Can't do sporting activities involving strong exercise	940	(750 – 1 160)	4.1	(3.3 – 5.0)
Need special help at school	1 010	(820 – 1 240)	4.4	(3.6 – 5.4)

Table 3.98: Children aged 4–17 years who need special help at school due to illness or disability — Type of help required

Type of help required at school	Number	95% CI	%	95% CI
Special teacher	120	(70 – 200)	12.2	(7.5 – 19.3)
Special class	270	(180 – 390)	26.7	(18.5 – 36.2)
Help doing homework	30	(10 – 70)	3.2	(1.4 – 6.8)
Special programmes at school	90	(20 – 200)	8.7	(3.1 – 20.3)
Teacher aide	200	(130 – 320)	20.2	(12.4 – 29.2)
Special furniture	0	(0 – 80)	0.4	(0.0 – 8.0)
Speech pathology	20	(0 – 60)	1.7	(0.2 – 5.5)
Don’t know	90	(40 – 180)	8.9	(4.1 – 17.3)
Other	80	(50 – 130)	8.1	(4.6 – 12.7)
Not stated	100	(50 – 190)	9.9	(5.1 – 18.3)
Total	1 010	(820 – 1240)	100.0	

Table 3.99: Children aged 4–17 years — Number of sensory and motor function problems, by Level of Relative Isolation (LORI)

Number of problems	Number	95% CI	%	95% CI
	LORI — None			
None	5 330	(5 040 – 5 630)	68.1	(64.4 – 71.6)
One	1 970	(1 730 – 2 230)	25.1	(22.1 – 28.4)
Two or more	530	(390 – 720)	6.8	(4.9 – 9.1)
Total	7 830	(7 680 – 7 980)	100.0	
	LORI — Low			
None	3 950	(3 560 – 4 380)	70.7	(66.7 – 74.7)
One	1 300	(1 090 – 1 560)	23.3	(19.8 – 27.0)
Two or more	330	(210 – 490)	6.0	(3.9 – 8.7)
Total	5 590	(5 100 – 6 100)	100.0	
	LORI — Moderate			
None	3 550	(2 980 – 4 200)	76.0	(71.0 – 80.7)
One	920	(680 – 1 220)	19.7	(15.4 – 24.3)
Two or more	200	(130 – 290)	4.3	(2.8 – 6.1)
Total	4 680	(3 940 – 5 480)	100.0	
	LORI — High			
None	2 030	(1 530 – 2 610)	79.6	(74.6 – 84.0)
One	430	(290 – 600)	16.6	(13.2 – 20.5)
Two or more	90	(50 – 160)	3.7	(2.2 – 5.6)
Total	2 550	(1 910 – 3 270)	100.0	
	LORI — Extreme			
None	1 860	(1 360 – 2 470)	82.7	(79.2 – 85.9)
One	330	(220 – 460)	14.7	(12.0 – 17.7)
Two or more	60	(30 – 110)	2.7	(1.4 – 4.7)
Total	2 260	(1 670 – 3 020)	100.0	
	Total WA			
None	16 700	(16 300 – 17 200)	73.1	(71.1 – 75.0)
One	4 950	(4 560 – 5 350)	21.6	(19.9 – 23.3)
Two or more	1 220	(1 010 – 1 460)	5.3	(4.4 – 6.4)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.100: Children aged 4–17 years — Number of sensory and motor function problems, by sex and age

Number of problems	Number	95% CI	%	95% CI
Males 4–11 years				
None	5 130	(4 780 – 5 490)	71.4	(67.8 – 74.8)
One	1 650	(1 400 – 1 920)	23.0	(19.9 – 26.4)
Two or more	400	(280 – 580)	5.6	(3.9 – 8.0)
Total	7 190	(6 790 – 7 590)	100.0	
Males 12–17 years				
None	3 390	(3 050 – 3 730)	74.6	(70.4 – 78.6)
One	920	(750 – 1 100)	20.2	(16.7 – 23.9)
Two or more	240	(140 – 360)	5.2	(3.1 – 7.9)
Total	4 540	(4 180 – 4 920)	100.0	
Total males				
None	8 520	(8 080 – 8 950)	72.6	(69.8 – 75.3)
One	2 570	(2 270 – 2 880)	21.9	(19.5 – 24.4)
Two or more	640	(480 – 850)	5.5	(4.1 – 7.2)
Total	11 700	(11 300 – 12 200)	100.0	
Females 4–11 years				
None	4 920	(4 590 – 5 270)	74.4	(71.2 – 77.5)
One	1 380	(1 170 – 1 630)	20.9	(18.0 – 24.2)
Two or more	310	(240 – 390)	4.7	(3.6 – 5.9)
Total	6 610	(6 220 – 7 010)	100.0	
Females 12–17 years				
None	3 300	(3 000 – 3 630)	72.3	(68.2 – 76.2)
One	990	(820 – 1 180)	21.8	(18.3 – 25.6)
Two or more	270	(190 – 390)	6.0	(4.2 – 8.5)
Total	4 560	(4 230 – 4 910)	100.0	
Total females				
None	8 220	(7 810 – 8 630)	73.5	(70.9 – 75.9)
One	2 380	(2 110 – 2 670)	21.3	(19.0 – 23.6)
Two or more	580	(460 – 730)	5.2	(4.1 – 6.5)
Total	11 200	(10 800 – 11 600)	100.0	
Total 4–11 years				
None	10 100	(9 600 – 10 500)	72.8	(70.4 – 75.1)
One	3 040	(2 720 – 3 380)	22.0	(19.9 – 24.3)
Two or more	710	(560 – 900)	5.2	(4.1 – 6.5)
Total	13 800	(13 300 – 14 200)	100.0	
Total 12–17 years				
None	6 680	(6 260 – 7 120)	73.4	(70.4 – 76.4)
One	1 910	(1 670 – 2 180)	21.0	(18.5 – 23.7)
Two or more	510	(380 – 680)	5.6	(4.2 – 7.4)
Total	9 100	(8 660 – 9 560)	100.0	
Total				
None	16 700	(16 300 – 17 200)	73.1	(71.1 – 75.0)
One	4 950	(4 560 – 5 350)	21.6	(19.9 – 23.3)
Two or more	1 220	(1 010 – 1 460)	5.3	(4.4 – 6.4)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.101: Children aged 4–17 years — Sensory and motor problems, by Level of Relative Isolation (LORI)

Sensory or motor problem	Number	95% CI	%	95% CI
LORI — None (N = 7 830)				
Does not have normal vision in both eyes	890	(680 – 1 140)	11.3	(8.6 – 14.4)
Wears glasses or contact lenses	480	(340 – 670)	6.2	(4.3 – 8.4)
Does not have normal hearing in both ears	540	(400 – 710)	6.9	(5.1 – 9.1)
Has difficulty saying certain sounds	860	(690 – 1 040)	10.9	(8.8 – 13.3)
Has pain or discomfort	840	(660 – 1 050)	10.7	(8.3 – 13.3)
LORI — Low (N = 5 590)				
Does not have normal vision	470	(320 – 670)	8.5	(5.9 – 11.9)
Wears glasses or contact lenses	310	(210 – 440)	5.6	(3.7 – 7.8)
Does not have normal hearing in both ears	320	(230 – 430)	5.8	(4.2 – 7.6)
Has difficulty saying certain sounds	660	(520 – 830)	11.9	(9.5 – 14.6)
Has pain or discomfort	570	(410 – 790)	10.2	(7.4 – 13.8)
LORI — Moderate (N = 4 680)				
Does not have normal vision	280	(190 – 390)	6.0	(4.3 – 8.2)
Wears glasses or contact lenses	200	(130 – 300)	4.2	(2.7 – 6.1)
Does not have normal hearing in both ears	360	(260 – 490)	7.7	(5.8 – 10.0)
Has difficulty saying certain sounds	390	(240 – 600)	8.4	(5.6 – 12.3)
Has pain or discomfort	340	(250 – 460)	7.2	(5.5 – 9.3)
LORI — High (N = 2 550)				
Does not have normal vision	130	(50 – 320)	5.3	(1.7 – 12.0)
Wears glasses or contact lenses	50	(30 – 80)	2.0	(1.1 – 3.1)
Does not have normal hearing in both ears	160	(100 – 240)	6.4	(4.6 – 8.7)
Has difficulty saying certain sounds	210	(140 – 300)	8.2	(6.3 – 10.6)
Has pain or discomfort	110	(60 – 170)	4.2	(2.8 – 6.2)
LORI — Extreme (N = 2 260)				
Does not have normal vision	70	(40 – 110)	3.1	(1.9 – 4.9)
Wears glasses or contact lenses	20	(10 – 50)	1.1	(0.5 – 2.1)
Does not have normal hearing in both ears	180	(100 – 280)	7.8	(5.0 – 11.7)
Has difficulty saying certain sounds	120	(70 – 170)	5.1	(3.3 – 7.3)
Has pain or discomfort	90	(30 – 180)	4.0	(1.9 – 7.5)
Total WA (N = 22 900)				
Does not have normal vision	1 850	(1 550 – 2 190)	8.1	(6.8 – 9.6)
Wears glasses or contact lenses	1 070	(860 – 1 290)	4.7	(3.8 – 5.6)
Does not have normal hearing in both ears	1 560	(1 350 – 1 790)	6.8	(5.9 – 7.8)
Has difficulty saying certain sounds	2 240	(1 970 – 2 520)	9.8	(8.6 – 11.0)
Has pain or discomfort	1 940	(1 670 – 2 240)	8.5	(7.3 – 9.8)

Table 3.102: Children aged 4–17 years — Sensory and motor problems, by age group and sex

Sensory or motor problem	Number	95% CI	%	95% CI
Males 4–11 years (N = 7 190)				
Does not have normal vision	380	(240 – 550)	5.2	(3.4 – 7.7)
Wears glasses or contact lenses	190	(110 – 300)	2.7	(1.6 – 4.1)
Does not have normal hearing in both ears	500	(360 – 670)	7.0	(5.1 – 9.3)
Has difficulty saying certain sounds	1 190	(1 000 – 1 410)	16.5	(14.0 – 19.4)
Has pain or discomfort	460	(300 – 670)	6.4	(4.3 – 9.3)
Males 12–17 years (N = 4 540)				
Does not have normal vision	430	(290 – 610)	9.5	(6.4 – 13.2)
Wears glasses or contact lenses	300	(180 – 470)	6.7	(4.0 – 10.1)
Does not have normal hearing in both ears	300	(200 – 420)	6.6	(4.6 – 9.4)
Has difficulty saying certain sounds	240	(170 – 340)	5.3	(3.7 – 7.5)
Has pain or discomfort	450	(330 – 610)	10.0	(7.3 – 13.2)
Total Males (N = 11 700)				
Does not have normal vision	810	(610 – 1 060)	6.9	(5.1 – 8.9)
Wears glasses or contact lenses	500	(340 – 690)	4.2	(2.9 – 5.8)
Does not have normal hearing in both ears	800	(640 – 1 000)	6.9	(5.4 – 8.5)
Has difficulty saying certain sounds	1 430	(1 210 – 1 670)	12.2	(10.4 – 14.1)
Has pain or discomfort	910	(710 – 1 160)	7.8	(6.1 – 9.8)
Females 4–11 years (N = 6 610)				
Does not have normal vision	440	(320 – 580)	6.7	(4.9 – 8.8)
Wears glasses or contact lenses	170	(120 – 220)	2.5	(1.9 – 3.3)
Does not have normal hearing in both ears	430	(350 – 520)	6.5	(5.4 – 7.8)
Has difficulty saying certain sounds	660	(500 – 850)	9.9	(7.7 – 12.6)
Has pain or discomfort	500	(400 – 630)	7.6	(6.0 – 9.4)
Females 12–17 years (N = 4 560)				
Does not have normal vision	600	(460 – 760)	13.2	(10.4 – 16.6)
Wears glasses or contact lenses	400	(290 – 530)	8.8	(6.6 – 11.6)
Does not have normal hearing in both ears	330	(250 – 410)	7.2	(5.6 – 9.0)
Has difficulty saying certain sounds	150	(110 – 200)	3.3	(2.3 – 4.5)
Has pain or discomfort	530	(400 – 670)	11.5	(8.9 – 14.5)
Total females (N = 11 200)				
Does not have normal vision	1 040	(860 – 1 260)	9.3	(7.7 – 11.2)
Wears glasses or contact lenses	570	(450 – 710)	5.1	(4.1 – 6.3)
Does not have normal hearing in both ears	760	(640 – 880)	6.8	(5.7 – 7.9)
Has difficulty saying certain sounds	810	(640 – 1 000)	7.2	(5.8 – 8.9)
Has pain or discomfort	1 030	(860 – 1 220)	9.2	(7.7 – 10.8)
Total 4–11 years (N = 13 800)				
Does not have normal vision	820	(620 – 1 050)	5.9	(4.5 – 7.6)
Wears glasses or contact lenses	360	(260 – 470)	2.6	(1.9 – 3.4)
Does not have normal hearing in both ears	930	(780 – 1 110)	6.8	(5.6 – 8.1)
Has difficulty saying certain sounds	1 840	(1 600 – 2 110)	13.4	(11.6 – 15.2)
Has pain or discomfort	960	(760 – 1 190)	7.0	(5.6 – 8.7)
Total 12–17 years (N = 9 100)				
Does not have normal vision	1 030	(810 – 1 280)	11.3	(9.1 – 13.9)
Wears glasses or contact lenses	710	(540 – 910)	7.8	(6.0 – 9.9)
Does not have normal hearing in both ears	630	(500 – 770)	6.9	(5.5 – 8.4)
Has difficulty saying certain sounds	390	(300 – 500)	4.3	(3.4 – 5.5)
Has pain or discomfort	980	(800 – 1 180)	10.8	(8.8 – 12.9)
Total (N = 22900)				
Does not have normal vision	1 850	(1 550 – 2 190)	8.1	(6.8 – 9.6)
Wears glasses or contact lenses	1 070	(860 – 1 290)	4.7	(3.8 – 5.6)
Does not have normal hearing in both ears	1 560	(1 350 – 1 790)	6.8	(5.9 – 7.8)
Has difficulty saying certain sounds	2 240	(1 970 – 2 520)	9.8	(8.6 – 11.0)
Has pain or discomfort	1 940	(1 670 – 2 240)	8.5	(7.3 – 9.8)

Table 3.103: Children aged 4–17 years who do not have normal hearing — Type of hearing problem

Type of hearing problem	Number	95% CI	%	95% CI
Deaf in both ears	370	(270 – 480)	24	(18 – 30)
Deaf in one ear	760	(620 – 910)	49	(42 – 56)
Other	40	(20 – 90)	3	(1 – 5)
Not stated	390	(270 – 550)	25	(18 – 33)
Total	1 560	(1 350 – 1 790)	100	

Table 3.104: Children aged 4–17 years — Speech problems, by age group and sex

Type of speech problem	Number	95% CI	%	95% CI
Males 4–11 years (N = 7 190)				
Speech difficult to understand	1 010	(830 – 1 220)	14.0	(11.7 – 16.6)
Stutters or stammers	560	(450 – 690)	7.8	(6.3 – 9.5)
Males 12–17 years (N = 4 540)				
Speech difficult to understand	210	(120 – 330)	4.6	(2.8 – 7.2)
Stutters or stammers	190	(120 – 300)	4.2	(2.6 – 6.4)
Total Males (N = 11 700)				
Speech difficult to understand	1 220	(1 020 – 1 450)	10.4	(8.7 – 12.3)
Stutters or stammers	750	(630 – 910)	6.4	(5.3 – 7.7)
Females 4–11 years (N = 6 610)				
Speech difficult to understand	530	(430 – 650)	8.0	(6.5 – 9.7)
Stutters or stammers	190	(90 – 370)	2.9	(1.4 – 5.5)
Females 12–17 years (N = 4 560)				
Speech difficult to understand	220	(150 – 320)	4.9	(3.3 – 7.0)
Stutters or stammers	100	(60 – 150)	2.1	(1.3 – 3.4)
Total females (N = 11 200)				
Speech difficult to understand	750	(620 – 900)	6.7	(5.6 – 8.0)
Stutters or stammers	290	(170 – 450)	2.6	(1.5 – 4.0)
Total 4–11 years (N = 13 800)				
Speech difficult to understand	1 540	(1 320 – 1 770)	11.1	(9.6 – 12.8)
Stutters or stammers	750	(590 – 940)	5.4	(4.3 – 6.8)
Total 12–17 years (N = 9 100)				
Speech difficult to understand	430	(310 – 600)	4.8	(3.3 – 6.5)
Stutters or stammers	290	(210 – 400)	3.2	(2.3 – 4.4)
Total (N = 22,900)				
Speech difficult to understand	1 970	(1 710 – 2 260)	8.6	(7.5 – 9.9)
Stutters or stammers	1 040	(850 – 1 250)	4.5	(3.7 – 5.4)

Table 3.105: Children aged 4–17 years who have physical pain or discomfort — Severity of pain, by Level of Relative Isolation (LORI)

Severity of pain	Number	95% CI	%	95% CI
		LORI — None		
A little pain or discomfort	270	(170 – 430)	32.7	(20.9 – 45.3)
Some pain or discomfort	280	(200 – 390)	33.7	(24.0 – 45.4)
A lot of pain or discomfort	280	(170 – 430)	33.5	(22.8 – 46.3)
Total	840	(660 – 1 050)	100.0	
		LORI — Low		
A little pain or discomfort	150	(50 – 360)	26.9	(10.7 – 50.2)
Some pain or discomfort	200	(120 – 310)	35.6	(21.9 – 51.2)
A lot of pain or discomfort	210	(140 – 310)	37.5	(23.8 – 53.5)
Total	570	(410 – 790)	100.0	
		LORI — Moderate		
A little pain or discomfort	130	(90 – 180)	38.6	(28.1 – 50.3)
Some pain or discomfort	90	(40 – 160)	25.6	(12.1 – 42.2)
A lot of pain or discomfort	120	(80 – 190)	35.8	(24.3 – 48.9)
Total	340	(250 – 460)	100.0	
		LORI — High		
A little pain or discomfort	50	(30 – 90)	49.0	(24.7 – 75.3)
Some pain or discomfort	30	(10 – 100)	29.9	(6.7 – 65.2)
A lot of pain or discomfort	20	(10 – 40)	21.1	(9.0 – 38.9)
Total	110	(60 – 170)	100.0	
		LORI — Extreme		
A little pain or discomfort	60	(20 – 110)	63.4	(31.6 – 86.1)
Some pain or discomfort	20	(0 – 60)	20.2	(3.8 – 43.4)
A lot of pain or discomfort	10	(0 – 80)	16.4	(0.4 – 64.1)
Total	90	(30 – 180)	100.0	
		Total WA		
A little pain or discomfort	670	(490 – 890)	34.4	(26.9 – 42.6)
Some pain or discomfort	620	(490 – 780)	32.0	(25.4 – 39.1)
A lot of pain or discomfort	650	(510 – 830)	33.6	(26.8 – 40.7)
Total	1 940	(1 670 – 2 240)	100.0	

Table 3.106: Children aged 4–17 years who have physical pain or discomfort — Severity of pain, by age and sex

Severity of pain	Number	95% CI	%	95% CI
	Males 4–11 years			
A little pain or discomfort	180	(50 – 390)	38.1	(16.3 – 61.6)
Some pain or discomfort	130	(60 – 230)	28.8	(14.2 – 48.0)
A lot of pain or discomfort	150	(100 – 220)	33.1	(19.6 – 51.4)
Total	460	(300 – 670)	100.0	
	Males 12–17 years			
A little pain or discomfort	120	(70 – 210)	26.6	(15.3 – 41.8)
Some pain or discomfort	190	(120 – 300)	42.5	(28.8 – 57.8)
A lot of pain or discomfort	140	(70 – 240)	30.9	(18.6 – 47.6)
Total	450	(330 – 610)	100.0	
	Total males			
A little pain or discomfort	300	(160 – 510)	32.4	(20.4 – 48.4)
Some pain or discomfort	330	(220 – 460)	35.6	(25.3 – 47.6)
A lot of pain or discomfort	290	(200 – 400)	32.0	(22.8 – 43.5)
Total	910	(710 – 1 160)	100.0	
	Females 4–11 years			
A little pain or discomfort	180	(140 – 240)	36.5	(26.8 – 47.5)
Some pain or discomfort	140	(90 – 210)	27.7	(18.6 – 39.5)
A lot of pain or discomfort	180	(110 – 290)	35.8	(24.0 – 49.9)
Total	500	(400 – 630)	100.0	
	Females 12–17 years			
A little pain or discomfort	190	(120 – 290)	35.6	(23.7 – 48.7)
Some pain or discomfort	160	(100 – 230)	30.0	(19.6 – 42.1)
A lot of pain or discomfort	180	(110 – 290)	34.3	(22.2 – 48.6)
Total	530	(400 – 670)	100.0	
	Total females			
A little pain or discomfort	370	(280 – 480)	36.1	(28.5 – 45.0)
Some pain or discomfort	300	(220 – 400)	28.9	(21.6 – 37.1)
A lot of pain or discomfort	360	(250 – 500)	35.1	(26.4 – 44.6)
Total	1 030	(860 – 1 220)	100.0	
	Total 4–11 years			
A little pain or discomfort	360	(220 – 560)	37.3	(26.2 – 50.7)
Some pain or discomfort	270	(180 – 390)	28.2	(19.1 – 38.6)
A lot of pain or discomfort	330	(230 – 450)	34.5	(25.0 – 45.7)
Total	960	(760 – 1 190)	100.0	
	Total 12–17 years			
A little pain or discomfort	310	(210 – 420)	31.5	(23.1 – 41.5)
Some pain or discomfort	350	(250 – 470)	35.8	(27.0 – 46.1)
A lot of pain or discomfort	320	(220 – 460)	32.7	(23.8 – 43.3)
Total	980	(800 – 1 180)	100.0	
	Total			
A little pain or discomfort	670	(490 – 890)	34.4	(26.9 – 42.6)
Some pain or discomfort	620	(490 – 780)	32.0	(25.4 – 39.1)
A lot of pain or discomfort	650	(510 – 830)	33.6	(26.8 – 40.7)
Total	1 940	(1 670 – 2 240)	100.0	

Table 3.107: Children aged 4–17 years — Level of burden placed on family due to chronic illness, disability or pain, by Level of Relative Isolation (LORI)

Level of burden	Number	95% CI	%	95% CI
	LORI — None			
None	6 950	(6 720 – 7 190)	88.8	(86.1 – 91.3)
A little or some	550	(400 – 750)	7.0	(5.1 – 9.5)
Quite a lot or very much	330	(220 – 460)	4.2	(2.9 – 6.1)
Total	7 830	(7 680 – 7 980)	100.0	(99.3 – 100.0)
	LORI — Low			
None	5 070	(4 600 – 5 560)	90.8	(87.4 – 93.7)
A little or some	290	(180 – 430)	5.2	(3.3 – 7.7)
Quite a lot or very much	230	(120 – 400)	4.1	(2.2 – 7.1)
Total	5 590	(5 100 – 6 100)	100.0	(99.0 – 100.0)
	LORI — Moderate			
None	4 400	(3 700 – 5 160)	94.0	(92.2 – 95.5)
A little or some	180	(130 – 250)	4.0	(2.9 – 5.2)
Quite a lot or very much	90	(40 – 180)	2.0	(0.9 – 3.7)
Total	4 680	(3 940 – 5 480)	100.0	(. – 100.0)
	LORI — High			
None	2 390	(1 780 – 3 070)	93.5	(88.2 – 96.8)
A little or some	140	(60 – 260)	5.4	(2.7 – 9.9)
Quite a lot or very much	30	(10 – 60)	1.1	(0.4 – 2.2)
Total	2 550	(1 910 – 3 270)	100.0	(97.8 – 100.0)
	LORI — Extreme			
None	2 190	(1 600 – 2 920)	97.3	(95.6 – 98.4)
A little or some	40	(20 – 80)	1.8	(0.9 – 3.4)
Quite a lot or very much	20	(10 – 40)	0.9	(0.3 – 2.1)
Total	2 260	(1 670 – 3 020)	100.0	(97.6 – 100.0)
	Total WA			
None	21 000	(20 700 – 21 300)	91.7	(90.4 – 92.9)
A little or some	1 200	(990 – 1 450)	5.2	(4.3 – 6.3)
Quite a lot or very much	700	(520 – 900)	3.0	(2.3 – 3.9)
Total	22 900	(22 800 – 22 900)	100.0	(99.8 – 100.0)

Table 3.108: Children aged 4–17 years with impairments in activities of dailing living — Level of family burden associated with impairment

Level of burden	Number	95% CI	%	95% CI
None	90	(50 – 130)	22.8	(13.5 – 34.0)
A little or some	90	(40 – 180)	23.3	(11.1 – 42.3)
Quite a lot or very much	200	(120 – 310)	54.0	(37.7 – 68.8)
Total	380	(270 – 510)	100.0	

CHAPTER 4
USE OF HEALTH SERVICES

CHAPTER 4

USE OF HEALTH SERVICES

Maintaining good physical health requires a wide range of health care services. For Aboriginal and Torres Strait Islander children and their carers, the types of health care services available and their accessibility and affordability vary greatly over the geographic diversity of the state. There are substantial barriers to providing adequate health services for Aboriginal children. These barriers include the location of services, low Medicare enrolments among Aboriginal and Torres Strait Islander people, financial barriers such as up-front costs, culturally inappropriate services and poor linkages between the various health sectors.[1]

The WAACHS collected information from carers about their children's use of a range of health services, as well as seeking consent from carers to access the hospital records of their children. These two data sources are combined to describe the health services experience of the children, a picture that is markedly different from that seen in the 1993 WA Child Health Survey of the mainstream population. This chapter also includes an overview of the major components of primary health care in Western Australia, in particular, the medical labour force and Aboriginal Medical Services (also known as Aboriginal Community Controlled Health Services).

SUMMARY

The main findings in this chapter indicate the problems of access to services faced by children and carers, particularly in areas of higher relative isolation. The findings show:

- *Poor access to doctors*
  Aboriginal children have fewer contacts with doctors when compared with children in the general population. This level of contact is particularly low in areas of high and extreme isolation and is supported by the fact that there are relatively lower numbers of doctors in remote areas. Only 4.1 per cent of all doctors and specialists in WA are located in the ARIA localities of remote and very remote, even though 45.2 per cent of the Aboriginal population and 8.3 per cent of the total population live in these areas. This shortage is compounded by the low number of doctors in culturally appropriate settings, for instance Aboriginal Medical Services (AMSs). Of the five AMSs located in areas of high and extreme isolation in Western Australia there was a total of 5.8 full time equivalent (FTE) doctors. Despite initiatives under Commonwealth and State government programmes there are still low numbers of doctors in remote areas. Cultural, locational and financial barriers still need to be addressed to enable more Aboriginal people access to mainstream General Practices.

- *Location of health services*
  Children in isolated areas are significantly disadvantaged in their access to health services. They are more likely to see a nurse or Aboriginal Health Worker, and much less likely to see a doctor than children in less isolated parts of the state.

- *Low number of contacts with dentists*
  Aboriginal children showed a low rate of dental attendances in the previous six months, suggesting that many are not seeing a dentist at the recommended intervals.

- *Aboriginal children's use of hospital emergency services is comparable with the general population*
  The same findings suggest that, regardless of location, most Aboriginal children have access to emergency hospital treatment if required. However some children may need to travel long distances to access these services.

- *Aboriginal children are more likely to be admitted to hospital*
  While hospital admission rates are higher for Aboriginal children than for non-Aboriginal children, the main causes of hospitalisation are similar. The most common causes of hospitalisation for all children are respiratory illnesses, other infections and injuries.

- *Social and cultural factors affect service use*
  Children of carers with higher levels of education are more likely to see a doctor or a dentist. Children living in areas with greatest relative socio-economic disadvantage or in families reporting high levels of financial strain are more likely to see a nurse or an Aboriginal Health Worker.

CONTACTS WITH HEALTH PROFESSIONALS

This section describes the frequency and type of contact that children had with health services. Carers were asked how many times in the previous six months they or their partner had had any contact with a range of health professionals in relation to each child. These included doctors, dentists, specialists, nurses, Aboriginal Health Workers and speech pathologists. In addition, carers were asked if each child had attended a hospital emergency department or outpatients clinic, or an Aboriginal Medical Service (AMS).

The survey did not ask about where the health professional was seen and therefore does not differentiate between whether a doctor was seen in an AMS, a private practice, a government funded clinic or a hospital. In light of this, it should be noted that the health professionals seen are not necessarily mutually exclusive of the health services attended.

CONTACTS WITH DOCTORS

Just under half (48.7 per cent; CI: 46.7%–50.7%) of all Aboriginal and Torres Strait Islander children had contact with a doctor in the six months prior to the survey. The rate of contact was lower for each successive age group, with 69.2 per cent (CI: 66.3%–72.1%) of 0–3 year olds, 44.9 per cent (CI: 42.2%–47.6%) of 4–11 year olds and 39.0 per cent (CI: 35.5%–42.5%) of 12–17 year olds having seen a doctor in the last six months (Table 4.1).

The proportion of Aboriginal and Torres Strait Islander children aged 4–17 years who had seen a doctor in the previous six months was significantly below that reported for the total population in the 1993 WA Child Health Survey which found that 58.8 per cent (CI: 56.1%–61.6%) of all children aged 4–16 years had contact with a doctor during the six months prior to the survey.[2]

There was an inverse relationship between the number of contacts with a doctor and the level of relative isolation. The number of children who had at least one contact with a doctor in the last six months decreased from 56.6 per cent (CI: 52.9%–60.2%) for children in areas of no isolation to 37.1 per cent (CI: 30.0%–45.2%) for children in areas of extreme isolation (Figure 4.1).

Carers were asked how far away they lived from the nearest doctor or Aboriginal Medical Service (AMS). Children were more likely to have seen a doctor in the last six months if they were located close to a doctor or AMS. Some 51.4 per cent (CI: 49.0%–53.8%) of children located less than 5 kilometres from a doctor or AMS had seen a doctor in the last six months compared with 34.5 per cent (CI: 27.5%–42.0%) of children who were located more than 100 kilometres from a doctor or AMS (Table 4.3).

Children whose primary carer was Aboriginal were less likely to have had contact with a doctor as compared with those children whose primary carer was non-Aboriginal, 46.6 per cent (CI: 44.5%–48.8%) and 62.0 per cent (CI: 55.5%–68.4%) respectively (Figure 4.5).

Children with primary carers who had 13 or more years of education (i.e. carers who had gone on to further study beyond year 12 or who had completed a postgraduate qualification) were more likely to have seen a doctor in the past six months (60.3 per cent; CI: 48.9%–70.8%) than children whose carers had 1–9 years of education (41.2 per cent; CI: 37.6%–45.0%) (Figure 4.4).

DISTRIBUTION OF THE MEDICAL LABOUR FORCE IN WESTERN AUSTRALIA

There are well-identified shortages of practitioners in rural and remote parts of Australia as well as shortages of Aboriginal and Torres Strait Islander doctors and of all doctors working in Aboriginal health care. The shortage of doctors means that people often have to travel great distances to get treatment. In Western Australia, for example, 17 per cent of all discrete Aboriginal and Torres Strait Islander communities were located more than 100 kilometres from the nearest community health centre.[1] Access is often further complicated by road conditions as dirt roads can become impassable at certain times of the year.

A recent AIHW publication, *Medical Labour Force 2001*[2], analysed the distribution of medical practitioners by ARIA+, an index of remoteness. Note that ARIA+ differs from the ARIA++ used in this survey (see Chapter 1). ARIA+ does not have the same degree of discrimination of very remote areas as does ARIA++, and a much larger proportion of WA is classified as ’very remote‘ under ARIA+. Nonetheless the data show that there is a decrease in the number of practitioners per capita from areas of low to high remoteness. The rate of practitioners per 100,000 people in Western Australia was lowest in the ARIA+ category of ‘very remote’. Other findings included:

- There were an estimated 53,384 registered medical practitioners currently working in medicine in Australia in 2001, with 4,529 (8.5 per cent) in Western Australia.

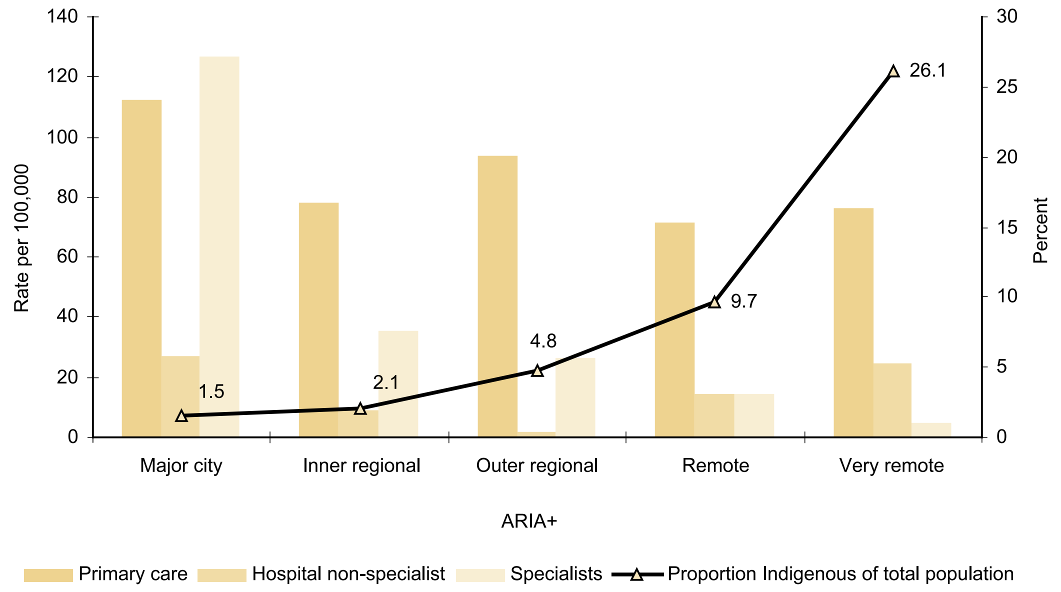
- Of the Western Australian medical practitioners, 4,215 (93.1 per cent) were clinicians, of whom 1,957 (46.4 per cent) were primary care practitioners, 1,412 (33.5 per cent) were specialists, and the remainder were either specialists-in-training or hospital non-specialists (10.2 per cent and 9.8 per cent respectively).

- Western Australia, along with Queensland, has the lowest full-time equivalent (FTE) rate of medical practitioners in Australia (305 per 100,000 people based on a 35 hour week). The Australian average was 357 per 100,000 people.

- The FTE rate for primary care practitioners in Western Australia was 121 per 100,000 people. The Australian average was 134 per 100,000 people.

DISTRIBUTION OF THE MEDICAL LABOUR FORCE IN WESTERN AUSTRALIA (Continued)

DISTRIBUTION OF SELECTED MEDICAL PRACTITIONERS, ABORIGINAL POPULATION AS A PROPORTION OF THE TOTAL POPULATION BY ARIA+ [2,3,4]



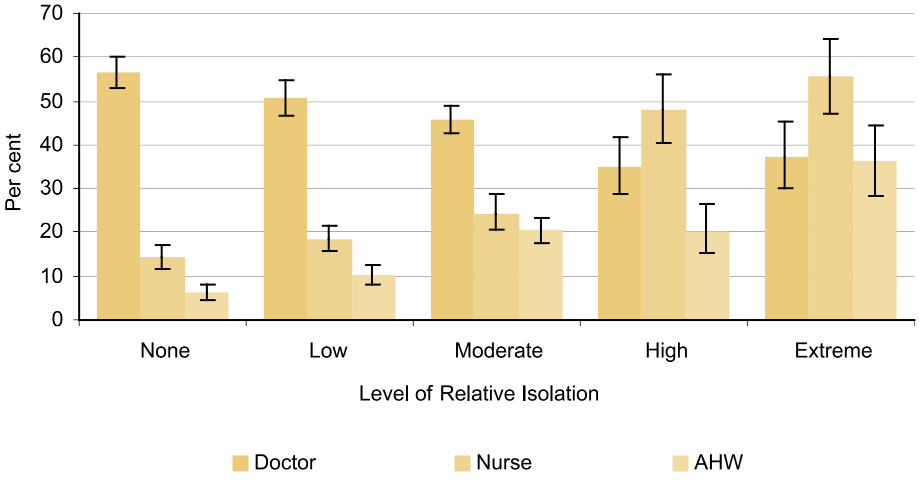
1 Steering Committee for the Review of Government Service Provision, (2003). Overcoming Indigenous Disadvantage: Key Indicators 2003, Productivity Commission: Canberra.

2 Australian Institute of Health and Welfare, (2003). Medical Labour Force 2001. AIHW cat. no. HWL 28. (National Health Labour Force Series No. 28). AIHW. Canberra.

3 Australian Institute of Health and Welfare, (2003). Medical Labour Force 2001. Unpublished data.

4 Australian Bureau of Statistics. 2001 Census of Population and Housing. Unpublished data.

FIGURE 4.1: CHILDREN — PROPORTION ACCESSING A DOCTOR, NURSE OR ABORIGINAL HEALTH WORKER AT LEAST ONCE IN THE LAST SIX MONTHS, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 4.2

CONTACTS WITH NURSES

In the six months prior to the survey, 24.9 per cent (CI: 22.9%–27.1%) of children had at least one contact with a nurse. The percentage of children having one or more contacts with a nurse decreased with age: from 41.8 per cent (CI: 38.0%–45.7%) of children aged 0–3 years to 17.4 per cent (CI: 14.8%–20.2%) of children aged 12–17 years (Table 4.1).

Contacts increased with the level of relative isolation. The proportion of children who had one or more contacts with a nurse increased from 14.2 per cent (CI: 11.7%–16.9%) in areas of no isolation to 55.8 per cent (CI: 47.1%–64.0%) in areas of extreme isolation (Figure 4.1).

PROFILE OF NURSING IN REMOTE COMMUNITIES IN THE KIMBERLEY REGION

The major focus of population health is primary prevention health care (incorporating strategies to protect, promote and restore people's health). However, in remote Aboriginal communities, where the residents have multiple and chronic health problems, Community Health staff (administered by the Population Health Unit of the WA Department of Health) generally also deliver acute medical services. As many of these communities do not have easy access to an Aboriginal Medical Service (AMS) or hospital, Community Health staff are often their only contact with health services.

The work of Community Health staff complements the activities of AMSs and the Royal Flying Doctor Service. The following provides a profile of Community Health staff (Remote Area Nurses (RANs) and Aboriginal Health Workers (AHWs)) primarily of state government funded Community Health services provided to remote Kimberley communities.[1]

- Six remote communities have both a resident RAN and an AHW (One Arm Point, Lombadina, Looma, Warmun, Oombulgurri, Kalumburu) and one community has an AHW (Noonkanbah).

PROFILE OF NURSING IN REMOTE COMMUNITIES IN THE KIMBERLEY REGION (Continued)

- Eight remote communities (Beagle Bay, Bidyadanga, Mowanjum, Noonkanbah, Bayulu, Wungatjungka, Yiyili, Koonjie Park) are regularly visited by nurses based in towns. School Health nurses visit the Beagle Bay and Bidyadanga communities.

- Four remote communities in the Kutjungka (Balgo) region have 24-hour clinics run by Mercy Community Health RANs and AHWs.

- Four remote communities have clinics served by resident AMS nurses (Beagle Bay, Bidyadanga, Jarlmadangah, Ringers Soak).

- Community Health provides child health services to all 0–5 year olds and school aged children in the region.

There are approximately 30 remote Aboriginal communities in the Fitzroy Valley *(see Appendix F, Map 2)*. Most of these communities are not served regularly by any health service. People from these communities visit Fitzroy Crossing Hospital (which has eight beds) for health care. At the hospital, the Community Health Child Health Nurse and Community Midwife see children and infants when possible.

In the Fitzroy Valley, an alliance has been developed between the state funded Kimberley Health Service and the Western Australian Aboriginal Community Controlled Health Organisation (WAACCHO) affiliated Nindillingarri Cultural Health Service through Fitzroy Crossing Hospital service. One current issue is the shortage of AHWs in the region in both state government and community-controlled services.[2]

[1] Anne Mahony, Kimberley Population Health Unit, Department of Health WA. (Personal communication).

[2] Kevin Cox, Senior Aboriginal Health Consultant, Kimberley. (Personal communication).

CONTACTS WITH DENTISTS

An estimated 20.9 per cent (CI: 19.0%–22.8%) of children in the survey had visited a dentist in the six months prior to the survey. As expected, the level of contact with dentists was particularly low for younger children with attendance for children aged 0–3 years, 4–11 years and 12–17 years being 2.8 per cent (CI: 1.7%–4.2%), 32.4 per cent (CI: 29.5%–35.4%) and 17.1 per cent (CI: 14.5%–19.8%) respectively (Table 4.1). In the 1993 WA Child Health Survey, 56.3 per cent (CI: 53.0%–59.6%) of all children aged 4–16 years had seen a dentist in the six months prior to the survey.[2]

Contact with dentists was most common in areas of high relative isolation, where 31.7 per cent (CI: 23.8%–41.0%) of children had seen a dentist in the previous six months, and lowest in areas of extreme isolation where only 14.2 per cent (CI: 9.8%–19.6%) of children had contact with a dentist (Figure 4.2).

The proportion of children who had seen a dentist in the previous six months increased with the level of education of primary carers. The proportion of children who had seen a dentist in the previous six months whose primary carers had at least 13 years of education was nearly twice that of children whose primary carers had 1–9 years of education (36.8 per cent; CI: 25.4%–49.3% compared with 18.8 per cent; CI: 15.6%–22.3%) (Table 4.5).

DENTAL SERVICES

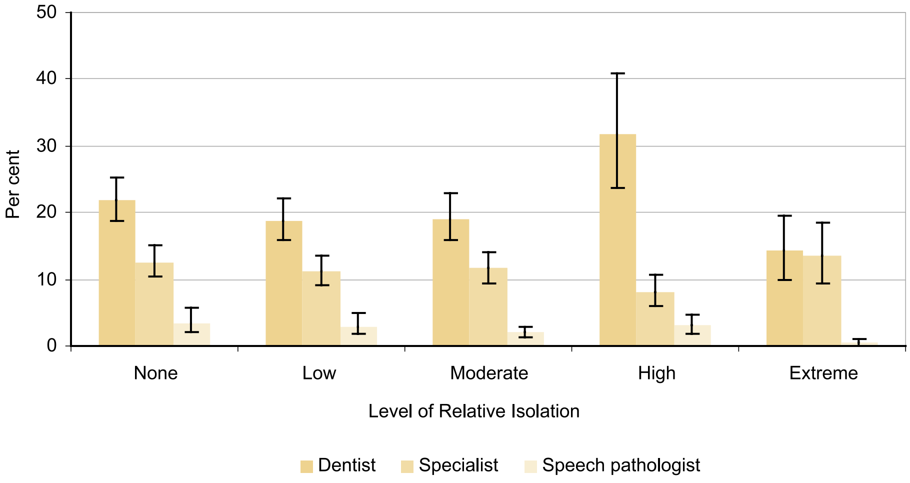
Free basic dental care is provided to all school children from pre-primary to year 11 (year 12 in remote localities) through services provided in schools. Care is provided by dental therapists under the supervision of dental officers from fixed and mobile School Dental Therapy Clinics located throughout the state. Dental care is provided by approximately 140 full time equivalent dental therapists and a similar number of dental clinic assistants under the supervision of about 30 dental officers. To be eligible, a child must attend a school and the parent/guardian give consent and enrol the child. Around 90 per cent of primary school children and 65 per cent of high school children use these services.

The higher rate of dental contacts in areas of high relative isolation reflects the use of the mobile Dental Therapy Centres. However, the much lower rate in areas of extreme isolation suggests that these mobile centres are not as effective in reaching the most isolated communities in the state.

The large difference in rates of seeing a dentist between the survey results and the findings in the general community from the 1993 WA Child Health Survey, suggests there are significant barriers to be overcome in providing regular dental care to Aboriginal children. The number of contacts with a dentist for Aboriginal children also appears low when considering the frequency of School Dental Service examinations. The service undertakes examinations in the Perth metropolitan area on a 15–month interval and in the country on a 12–month interval basis.[1]

[1] Martin Glick, Department of Health WA. (Personal communication).

FIGURE 4.2: CHILDREN — PROPORTION ACCESSING DENTIST, SPECIALIST OR SPEECH PATHOLOGIST AT LEAST ONCE IN THE LAST SIX MONTHS, BY LEVEL OF RELATIVE ISOLATION



Source: Table 4.2

CONTACTS WITH SPECIALISTS

Just over one in ten (11.7 per cent; CI: 10.5%–12.9%) children had seen a specialist in the 6 months prior to the survey. There was an age-associated decline for contacts with a specialist and the proportion of children aged 0–3 years, 4–11 years and 12–17 years who had contact with a specialist was 14.6 per cent (CI: 12.3%–17.2%), 11.8 per cent (CI: 10.2%–13.6%) and 9.3 per cent (CI: 7.2%–11.7%) respectively (Table 4.1).

CONTACTS WITH SPEECH PATHOLOGISTS

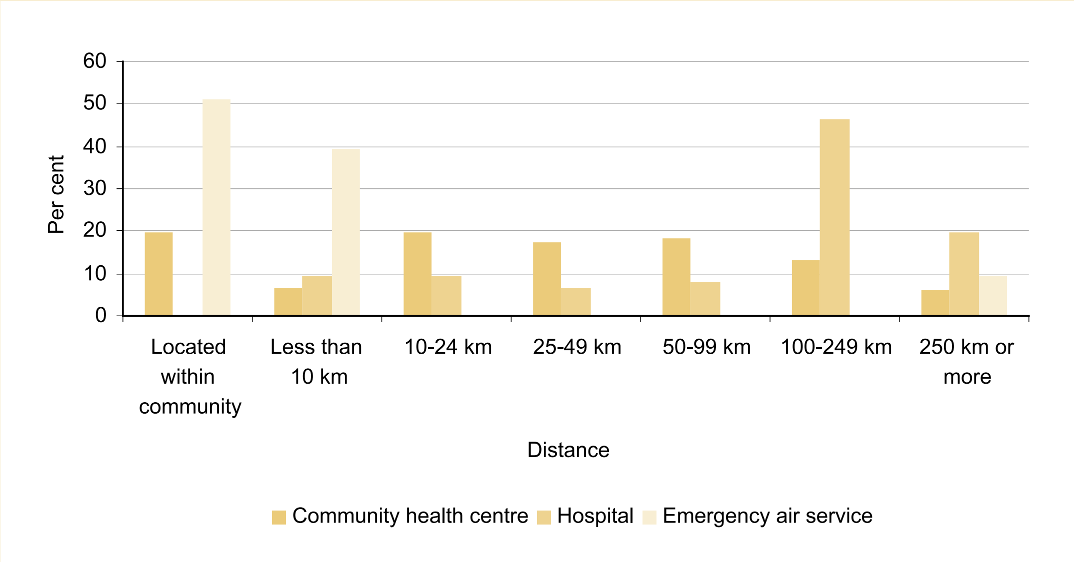
A total of 2.7 per cent (CI: 2.0%–3.5%) of children had seen a speech pathologist in the six months prior to the survey. Low level of contacts was particularly pronounced in areas of extreme isolation where just 0.4 per cent (CI: 0.1%–1.1%) of children had contact with a speech pathologist compared with 3.5 per cent (CI: 2.0%–5.7%) in the Perth metropolitan area (Table 4.2).

DISTANCE TO HEALTH SERVICES — 2001 COMMUNITY HOUSING INFRASTRUCTURE NEEDS SURVEY

The following data on service utilisation and access comes from the 2001 Community Housing and Infrastructure Needs Survey (CHINS).[1] This survey was conducted by ABS on behalf of ATSIC. CHINS was a survey of discrete Aboriginal communities. CHINS data was linked with survey data *(See Chapter 1 — record linkage)* and it was found that only 20 per cent of the WAACHS children lived in CHINS communities. These communities are predominantly located in areas of high and extreme LORI.

CHINS data reveal that there are strong locational disadvantages for Aboriginal communities in Western Australia. Two-thirds (66.4 per cent) of all discrete Aboriginal communities in WA are located more than 100 kilometres from the nearest hospital and over half (54.3 per cent) of all communities are located more than 25 kilometres from the nearest community health centre. However it should be noted that over 90 per cent of communities reported having access to medical emergency air services within 10 kilometres of their community.

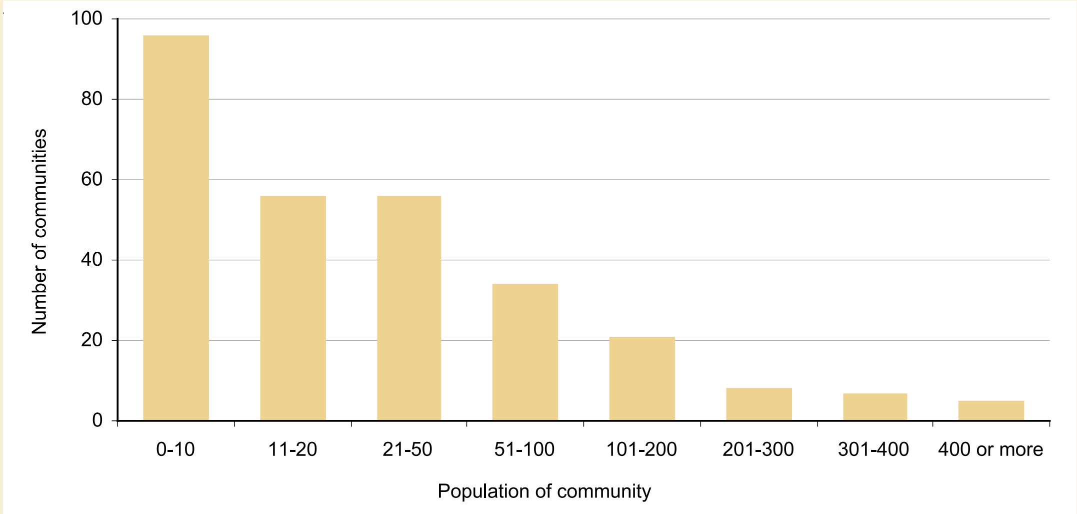
WESTERN AUSTRALIAN DISCRETE ABORIGINAL COMMUNITIES — DISTANCE TO NEAREST HOSPITAL, COMMUNITY HEALTH CENTRE OR MEDICAL EMERGENCY AIR SERVICE



The CHINS data highlight the small size of many of the communities in WA. Of the 283 discrete communities in WA, just under half (46 per cent) had a reported usual population of less than 20 people (some of these communities are seasonal). While it is not certain what proportion of children aged 0–17 years are represented in these communities, it is clear that there are little economies of scale available to communities of such size to ensure adequate health services. Even in larger communities there may still be inadequate levels of health service infrastructure.

DISTANCE TO HEALTH SERVICES — 2001 COMMUNITY HOUSING INFRASTRUCTURE NEEDS SURVEY (Continued)

WESTERN AUSTRALIAN DISCRETE ABORIGINAL COMMUNITIES — REPORTED USUAL POPULATION 2001



1 Australian Bureau of Statistics, 2001 Community Housing and Infrastructure Needs Survey, Unpublished data, ABS. Canberra.

CONTACTS WITH ABORIGINAL MEDICAL SERVICES

The Aboriginal Medical Services (AMSs), also known as Aboriginal Community Controlled Health Services, are a major means of health service delivery for Aboriginal and Torres Strait Islander communities, particularly in more isolated areas of Western Australia. They deliver holistic and culturally appropriate primary health services and health-related activities that include general health, screening services (sexual health, hearing and eye tests), substance misuse services, emotional and social wellbeing, and transport.

An AMS was attended by 15.1 per cent (CI: 13.5%–16.9%) of children in the six months prior to the survey. There was an age-associated decline for contacts with an AMS. Rates of attendance for 0–3, 4–11 and 12–17 year olds were 20.1 per cent (CI: 17.3%–23.3%), 14.9 per cent (CI: 12.9%–17.0%) and 11.7 per cent (CI: 9.8%–13.9%) respectively (Table 4.1).

The proportion of children who have had contact with an AMS was highest in areas of moderate and high isolation (25.9 per cent; CI: 21.6%–30.6% and 17.5 per cent; CI: 10.9%–24.9% respectively). The Perth metropolitan area had the lowest proportion of children using an AMS (9.0 per cent; CI: 7.0%–11.3%) (Figure 4.3). The majority of AMSs also provide outreach clinic services such as health care at outstation visits, park clinics, and satellite clinics.

Carers of 82.1 per cent (CI: 78.4%–85.4%) of the estimated 4,510 children who accessed the services of AMSs reported that they were happy with the service (Table 4.6).

Children whose primary carer was Aboriginal were more likely to have had a contact with an AMS than children whose primary carer was non-Aboriginal (16.5 per cent; CI: 14.7%–18.5% and 6.5 per cent; CI: 4.3%–9.9% respectively) (Figure 4.5).

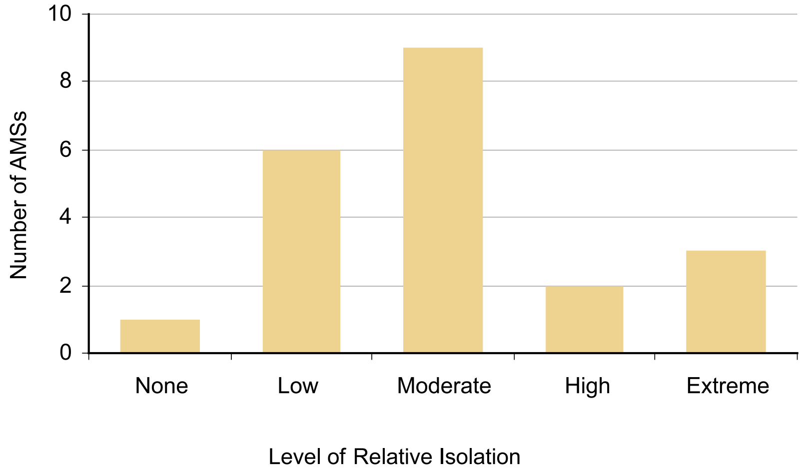
Nearly two-thirds of children lived within 5 kilometres of their nearest doctor or AMS (64.0 per cent; CI: 60.4%–67.4%). Some 12.2 per cent (CI: 9.5%–15.3%) of all children lived over 100 kilometres from their local doctor or AMS. In areas of extreme isolation, 66.2 per cent (CI: 52.1%–79.2%) of children were more than 100 kilometres from the nearest doctor or AMS (Table 4.7). There was no significant difference in the proportion of children who had seen an AMS in the last six months by distance from the nearest doctor or AMS (Table 4.8).

SERVICES PROVIDED BY ABORIGINAL MEDICAL SERVICES IN 2000-01

Aboriginal Medical Services (AMS) are an important source of primary health care provision for Aboriginal Australians. The following data come from the Service Activity Report (SAR) questionnaire for 2000-01 provided by all AMSs funded by the Australian Government.[1] The data pertain to all age groups and not just children. Key findings were:

- There were 129 Commonwealth funded AMSs in Australia in 2001 of which 21 were in Western Australia. In Western Australia, 7 AMSs were located in areas where the levels of relative isolation were none or low, 9 were in areas of moderate relative isolation and 5 in areas of high or extreme relative isolation.

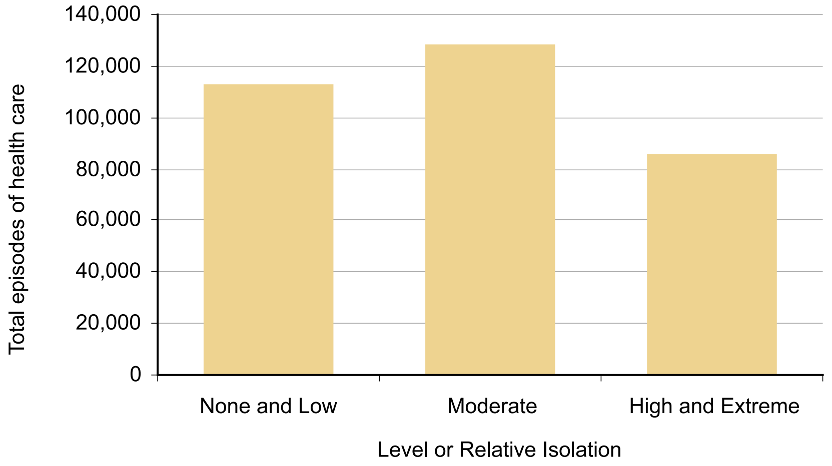
NUMBER OF ABORIGINAL MEDICAL SERVICES IN WESTERN AUSTRALIA, BY LEVEL OF RELATIVE ISOLATION



- Nationally there were a total of 1,340,000 episodes of care (defined as contact with an individual client by one or more staff to provide health care) provided in 2000–01, of which 59 per cent were for female clients. There were a total of 326,700 episodes of care in Western Australia. These were concentrated in areas of moderate relative isolation, representing 128,200 or 39 per cent of the state total. A total of 10 per cent of all episodes in WA were from people who normally resided outside the designated catchment area for that health service.

SERVICES PROVIDED BY ABORIGINAL MEDICAL SERVICES IN 2000-01 (Continued)

ABORIGINAL MEDICAL SERVICES — NUMBER OF EPISODES OF CARE 2001, BY LEVEL OF RELATIVE ISOLATION



- The median Aboriginal and Torres Strait Islander population of the health service areas in Western Australia was 3,000. This ranged from 569 in areas where the levels of relative isolation were high and extreme to 5,500 in areas of where the levels of relative isolation were low and none.

- There were a total 2,300 full time equivalent staff employed by the Australian Government funded AMSs of whom 624 (27 per cent) were Aboriginal Health Workers (AHWs). In Western Australia there were a total of 39 doctors, 64 nurses and 152 AHWs.

- Most AMSs in Western Australia undertake preventative care and screening which includes monitoring child growth, providing eye health screening and hearing screening, and providing child immunisation.

- Most AMSs provide strong advocacy and community roles, roles that are not normally provided by general practice. Services provided by various AMSs include school-based activities, parenting programmes, support for public housing, homelessness support, services for people with disabilities, welfare services and food provision.

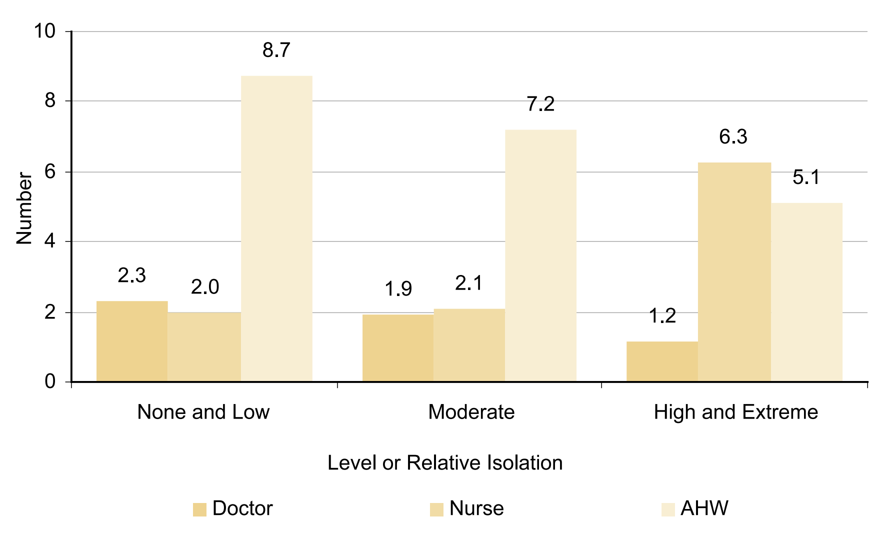
- Clinical health care was provided by most AMSs in Western Australia. Of 21 AMSs, 19 provided diagnosis and treatment of illnesses, 8 provided dental care, 11 provided audiology services, 10 provided optometry services, and 17 provided clinical consultations in the home.

- All AMSs in Western Australia refer and/or admit patients to hospitals and 60 per cent liaise with Aboriginal Liaison Officers at hospitals. Effective shared antenatal care arrangements between the hospital(s) and the AMSs are conducted by 30 per cent of the AMSs.

- The average number of staff per AMS varied by the level of relative isolation. In the case of doctors, it decreased from an average 2.3 doctors per AMS in areas where the level of relative isolation was none and low to 1.2 in areas of high and extreme isolation. In contrast, nurse numbers rose from an average of 2 per AMS in areas where the level of relative isolation was none and low to 6.3 per AMS in areas of high and extreme isolation.

SERVICES PROVIDED BY ABORIGINAL MEDICAL SERVICES IN 2000-01 (Continued)

ABORIGINAL MEDICAL SERVICES — AVERAGE NUMBER OF DOCTORS, AHWS AND NURSES, BY LEVEL OF RELATIVE ISOLATION



1 Department of Health and Ageing, OATSIH Central Office, Service Activity Report 2000-01. Unpublished data.

CONTACTS WITH ABORIGINAL HEALTH WORKERS

Aboriginal Health Workers (AHWs) are usually the first point of contact for a client at an AMS. AHWs liaise on behalf of clients and other health workers. They provide various services to clients in a variety of settings including health education and health promotion, community involvement and support counselling, and referral for clients with crisis problems. They also maintain health records and statistics.

About 14.7 per cent (CI: 13.2 %–16.2%) of all children had at least one contact with an Aboriginal Health Worker (AHW) in the six month period prior to the survey. As with visits to doctors and nurses, the percentage of children having one or more contacts with an AHW decreased with increasing age: from 21.7 per cent (CI: 18.9%–24.8%) for children aged 0–3 years, to 9.4 per cent (CI: 8.1%–11.0%) for children aged 12–17 years (Table 4.1).

The percentage of children who had seen an AHW in the preceding six months increased with the level of relative isolation: from 6.4 per cent (CI: 4.7%–8.3%) in areas of no isolation to 36.4 per cent (CI: 28.3%–44.5%) in areas of extreme isolation (Figure 4.1).

The higher level of contact with AHWs in more isolated areas is reflected in the lower availablity of doctors in these areas. A total of 152 full-time equivalent AHWs worked in Aboriginal Medical Services in Western Australia in 2000-01. There were 61 AHWs in areas where the level of relative isolation was none or low, 65 in areas where the level was moderate and 26 in areas of high or extreme relative isolation.[3]

Children whose primary carer was Aboriginal were much more likely to have had a contact with an AHW than children whose primary carer was non-Aboriginal: 16.2 per cent (CI: 14.6%–18.0%) and 4.8 per cent (CI: 3.5%–6.7%) respectively (Figure 4.5).

TRADITIONAL BUSH MEDICINE

Before European colonisation, Australian Aboriginal and Torres Strait Islander people had their own sophisticated medical system based on thousands of years of learning and interaction with the flora, fauna and lands of their region. Cultural practices dictated how a remedy or treatment would be administered. For minor ailments, such as a headache or an insect sting, individuals would be able to locate and apply an appropriate remedy. For a more serious medical condition the traditional healer would be consulted. The traditional healer was somebody who had been initiated into the role over some years by an elder who had held the role himself, and to whom all the secrets of medicine and the spiritual world were passed.[1]

Bush medicine is still practiced by Aboriginal people today, especially in the more isolated regions where traditional culture remains strong. It is not uncommon for community members to receive a combination of traditional and contemporary treatments for various ailments in these regions. Aboriginal Medical Services (AMSs) that cater to these regions now support bush medicine programmes alongside western medicine, and this helps to assure a more culturally appropriate service.[2]

The Northern Territory Government has taken a pro-active role in ensuring the survival of bush medicine knowledge across northern and central Australia by sponsoring a community assisted record of bush medicines and remedies across the region. This helps preserve and spread knowledge that would otherwise fade like it has in areas with fewer traditional cultural ties.[3]

1 Devanesen D, (2000). Traditional Aboriginal Medicine Practice in the Northern Territory. International Symposium on Traditional Medicine. Awaji Island, Japan. 11–13 September 2000.

2 Department of Health and Ageing, OATSIH Central Office, Service Activity Report 2000–01. Unpublished data.

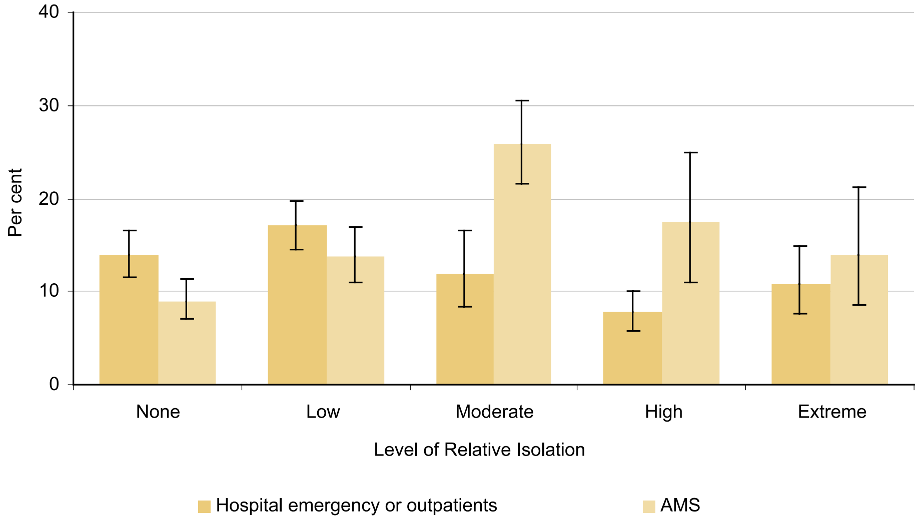
3 Conservation Commission of the Northern Territory, (1993). Traditional Aboriginal medicines in the Northern Territory of Australia. CCNT. Darwin.

HOSPITAL SERVICES

CONTACTS WITH HOSPITAL EMERGENCY DEPARTMENT OR OUTPATIENTS CLINIC

In the six months prior to the survey, 13.3 per cent (CI: 11.9%–14.7%) of children had attended a hospital emergency department or outpatients clinic. Contacts with a hospital emergency department were higher for younger children. The proportion of children who had attended a hospital emergency department or outpatients clinic in the previous six months was 22.5 per cent (CI: 19.6%–25.5%) for children aged 0–3 years, 11.2 per cent (CI: 9.6%–12.9%) for children aged 4–11 years and 9.3 per cent (CI: 6.5%–12.7%) for children aged 12–17 years (Table 4.1). By way of comparison 16.5 per cent (CI: 14.5%–18.6%) of 4–11 year old children and 11.2 per cent (CI: 9.1%–13.6%) of 12–16 year old children in the general population had attended a hospital emergency department or outpatient clinic in the six months prior to the 1993 WA Child Health Survey.[2]

FIGURE 4.3: CHILDREN — PROPORTION ACCESSING HOSPITAL EMERGENCY OR OUTPATIENTS SERVICES AND ABORIGINAL MEDICAL SERVICES IN THE PREVIOUS SIX MONTHS, BY LEVEL OF RELATIVE ISOLATION



Source: Table 4.2

HOSPITAL SERVICES

In 2001-02 there were 37,000 separations of Aboriginal people (all age groups) from private and public hospitals in WA, representing 6.0 per cent of all separations in WA and 19.6 per cent of all Aboriginal separations in Australia. Overall, 14.3 per cent of the Aboriginal population of Australia live in WA.[1,2]

There are nine major regional hospitals in Western Australia: Albany, Narrogin, Bunbury, Northam, Kalgoorlie, Geraldton, Carnarvon, Port Hedland and Derby, and sixty-eight smaller hospitals located in country areas. These public hospitals provide a broad range of services including emergency, medical, surgical, paediatric, obstetric and rehabilitation services, but do not provide tertiary level or super-speciality services (i.e. specialities within specialities such as neo-natal intensive care).[3]

1 Australian Institute for Health and Welfare, (2003). Australian Hospital Statistics 2001-02, AIHW Cat. No. HSE 25. AIHW. Canberra

2 Australian Bureau of Statistics, (2002). Population Distribution. Aboriginal and Torres Strait Islander Australians 2001. ABS Cat. No. 4705.0. Canberra.

3 WA Department of Health website <http://www.health.wa.gov.au/about/hospitals.cfm>

ADMISSIONS TO HOSPITAL

Carers were asked for their consent to access their children's hospital records. It was possible to link the hospital records for 87 per cent of the survey children, resulting in estimates for 26,000 children *(See Chapter 1)*. Hospitalisations in the year prior to the survey interview were extracted. For children born in hospital, the birth was not regarded as a hospital admission unless complications of the birth required the infant to be admitted in its own right. Overall, 16.3 per cent of (CI: 15.0%–17.6%)

children had been hospitalised in the year prior to the survey. There was no variation in hospitalisation rates by level of relative isolation (Table 4.10). Children aged 0–3 years were most likely to be hospitalised, with 29.8 per cent (CI: 26.6%–33.1%) of young children being hospitalised in the previous year, compared with 12.1 per cent (CI: 10.5%–13.8%) of 4–11 year olds and 11.7 per cent (CI: 9.5%–14.0%) of 12–17 year olds (Table 4.9).

Most children who were admitted to hospital had one admission in the previous year. Of those who had been admitted to hospital, 20.0 per cent (CI: 17.0%–23.3%) had been admitted twice and 9.6 per cent (CI: 7.5%–12.1%) had been admitted three or more times (Table 4.11). Lengths of stay in hospital were generally short. Of those children admitted to hospital in the previous year, 53.3 per cent (CI: 49.2%–57.2%) spent a total of 1–2 days in hospital, 24.4 per cent (CI: 21.2%–27.9%) spent 3–5 days in hospital and 22.4 per cent (CI: 19.3%–25.6%) spent a total of 6 days or more in hospital in the previous year (Table 4.12).

Almost one quarter (23.5 per cent; CI: 20.5%–26.7%) of children were admitted to hospital for respiratory conditions, with 16.0 per cent (CI: 13.2%–19.2%) of children admitted for injuries and 12.2 per cent (CI: 9.8%–15.1%) admitted with infectious diseases (Table 4.13). Note that the ICD-10 chapter on Infectious Diseases includes conditions that are generally recognised as communicable or transmissible, but excludes influenza and other acute respiratory infections, and localised infections, such as otitis media, that are classified to body system-related chapters (Table 4.13).

No directly comparable information on hospitalisations is available for non-Aboriginal children that take into account the possibility of multiple admissions per child. Figures are available for all hospital separations (Table 4.14). However, these do not take account of the fact that some children may be admitted to hospital more than once in a 12 month period. For 2001–02, there were 250 hospital separations per 1,000 children aged 0–4 in Western Australia, and 88 separations per 1,000 children aged 5–14.[4] Equivalent figures were calculated from the WAACHS, based on the total number of hospital admissions in the year prior to the survey, rather than the number of children admitted. From the survey, there were 404 hospital separations per 1,000 children aged 0–4 years (CI: 357–452), 136 separations per 1,000 children aged 5–14 years (CI: 117–155) and 213 separations per 1,000 children aged 15–17 years (CI: 171–255). These rates are significantly higher than the corresponding rates in the general population (Table 4.14). The rate of hospital separations rises in the 15–17 year age group because of obstetric-related admissions for teenage girls. Excluding obstetric admissions, the rate of separations per 1,000 children aged 15–17 years was 149 (CI: 114–184).

USE OF HOSPITAL SERVICES BY ABORIGINAL CHILDREN

Compared with the 1993 WA Child Health Survey, where these data were collected by the same method, rates of attendance at a hospital emergency department or outpatients clinic were lower for Aboriginal children aged 4–11 years and similar for Aboriginal children aged 12–17 years. As primary care doctors are less available for Aboriginal children, it might be expected that Aboriginal children would be more likely, in cases of need, to go directly to a hospital emergency department or outpatient clinic. However, the survey did not find this to be the case. The percentage of children attending outpatient and emergency departments did not vary by level of relative isolation. This suggests that for children living in areas of extreme isolation, the larger distance to hospitals cannot explain the lower rates of attendance at hospital emergency departments. In contrast, Aboriginal children were more likely to be admitted to hospital than non-Aboriginal children.

USE OF HOSPITAL SERVICES BY ABORIGINAL CHILDREN (Continued)

Rates of hospital admissions and emergency department attendance did not vary significantly by level of relative isolation. This suggests that wherever children are located they have access to emergency medical treatment if it is required. However, children living in more remote areas may have to travel long distances to receive hospital care. This may place additional burdens upon the family in supporting a child during a hospital stay.

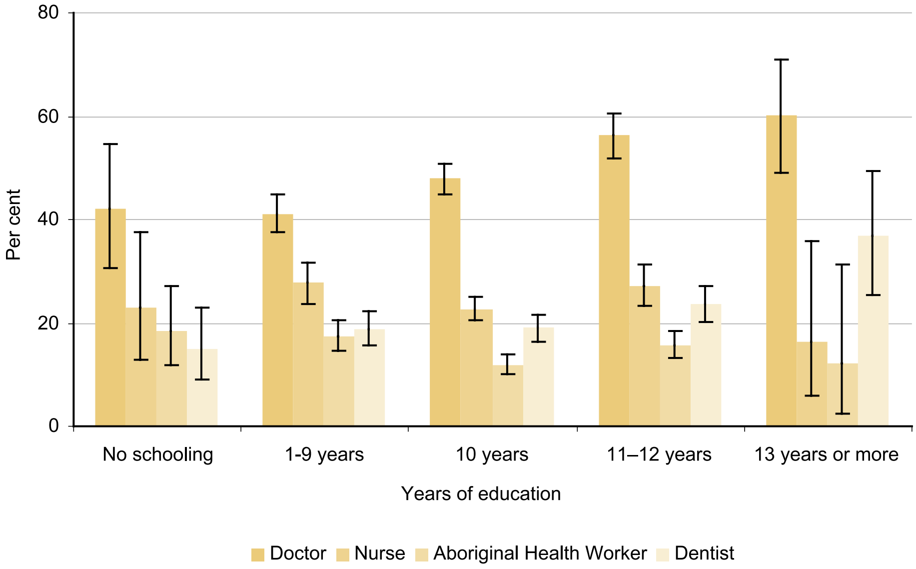
The hospital admissions data used here are based on linkage to hospital records, while the information on attendance at outpatient and emergency units was collected from interviews with the primary carers. It was only possible to link 87 per cent of the survey children to birth and hospital records (see Chapter 1). Some carers did not give consent for record linkage to occur, some children were born outside of WA and some children's records were not found during the record linkage process. No evidence was found of any systematic bias among the 13 per cent of children whose records could not be linked, and there is no reason to believe the 87 per cent of survey children do not represent a random sample of Aboriginal children in WA.

While there are no directly comparable data on hospitalisations for non-Aboriginal children, data based on hospital separations suggest that the main reasons for hospitalisation were broadly similar between Aboriginal and non-Aboriginal children, with respiratory illnesses, injuries and other infections representing the most common causes of hospitalisation.[1]

The burden of otitis media is unacceptably high among Aboriginal and Torres Strait Islander children. Some 5.1 per cent of Aboriginal children (CI: 3.1%–7.8%) had been hospitalised with a primary diagnosis of otitis media in the year prior to the survey.

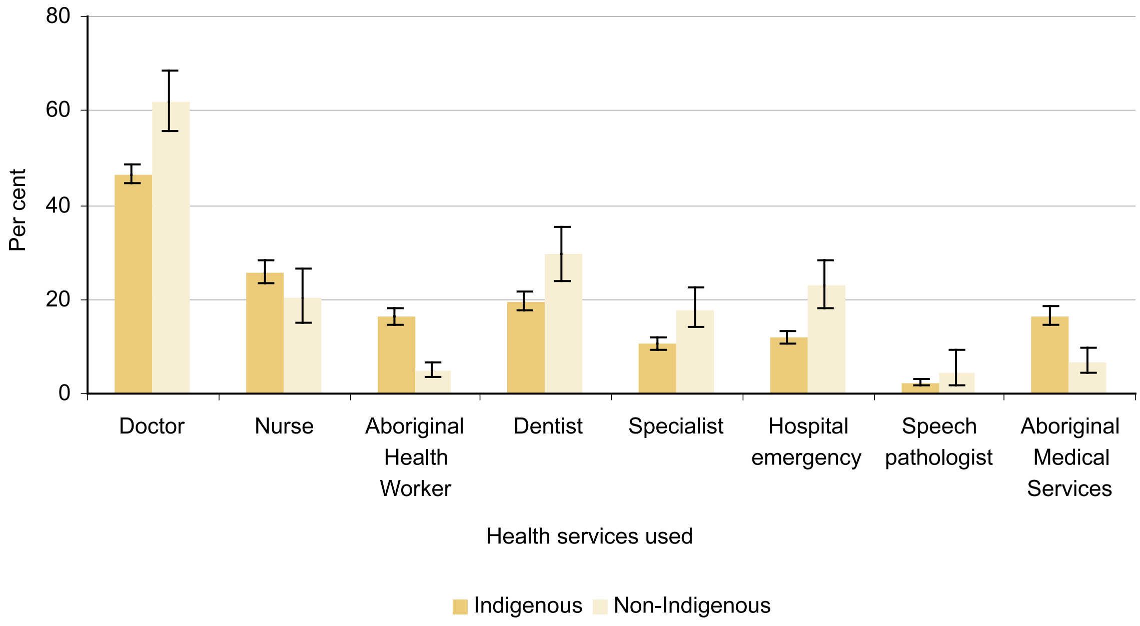
[1] Al-Yaman F, Bryant M, and Sargeant H, (2002). Australia's Children: Their health and wellbeing 2002. AIHW Cat. No. PHE 36. AIHW. Canberra.

FIGURE 4.4: CHILDREN — CONTACT WITH SELECTED HEALTH SERVICES, BY YEARS OF EDUCATION OF PRIMARY CARER



Source: Table 4.5

FIGURE 4.5: CHILDREN — CONTACT WITH SELECTED HEALTH SERVICES, BY INDIGENOUS STATUS OF PRIMARY CARER



Source: Table 4.4

ROYAL FLYING DOCTOR SERVICE

In the most isolated areas, the Royal Flying Doctor Service (RFDS) provides regular primary health care clinics conducted by RFDS doctors, flight nurses and other specialised health professionals. Services include immunisations, child health care, dental, eye and ear care. The service reaches into many remote Aboriginal communities from bases in Perth, Derby, Kalgoorlie, Meekatharra and Port Hedland.

The RFDS also assists in the Rural Women's General Practice (GP) Service. The service, funded by the Australian Government Department of Health and Ageing, aims to improve access to primary and secondary health care services for women in rural Australia who currently have little or no access to a female GP. This is of particular concern for those Aboriginal communities in which it is considered to be culturally inappropriate for women to be examined by male doctors. The services offered include cervical cancer screening, breast and skin examinations, preventive health care and self-help information. The RFDS reported that this service provided 1,838 patient consultations with female doctors throughout rural and remote WA in 2000-01. This increased to 4,878 consultations in 2002-03.[1]

In total, over 36,000 patients were attended by RFDS services in Western Australia in 2000-01.

[1] Royal Flying Doctor Service Annual Report 2000–01 and 2002–03 <http://www.rfds.org.au >

Carers were asked if their community had an airstrip that was both long enough and in good enough condition for the Flying Doctor to land their plane. In areas of moderate, high or extreme relative isolation, 6.6 per cent (CI: 4.4%–9.3%) of children lived in communities where there was no airstrip suitable for the plane to land. This proportion varied from 2.6 per cent (CI: 1.3%–5.0%) of children living in areas of moderate relative isolation to 15.3 per cent (CI: 7.8%–25.4%) of children living in areas of extreme relative isolation (Table 4.15).

FUNDING OF HEALTH SERVICES FOR ABORIGINAL PEOPLE

An individual's level of health service utilisation is determined in part by the adequacy and availability of services. These factors in turn are dependent on the level of resources available to support a service. Estimated per capita funding by Australian governments on health services to Aboriginal and Torres Strait Islander people in the 1998-99 financial year was $3,065 per person compared with $2,518 per person for non-Aboriginal people.[1] Some 48 per cent of expenditure on Indigenous health is through State-based programmes with Commonwealth funding to states providing a further 25 per cent. Commonwealth programmes make up 23 per cent of funding, local governments provide 0.5 per cent, and 5 per cent is provided through private sector programmes. In contrast, 36 per cent of funding of health services for non-Aboriginal people comes from State based programmes, 37 per cent from Commonwealth programmes and 26 per cent from private sector programmes. However when considering these differences it is necessary to take into account the relative income and health status of Aboriginal and Torres Strait people. Funding per person is similar when comparing Aboriginal and non-Aboriginal persons of similar income status.[1]

Aboriginal and Torres Strait Islander people's use of Medicare and the Pharmaceutical Benefits Scheme was less than half that of non-Aboriginal people and also showed great variation by region.[1] For example, in the combined ARIA regions of remote and very remote the average Medicare benefit paid was $84 per Aboriginal and Torres Strait Islander person. In contrast the non-Indigenous benefit was 2.3 times higher at $197 per person. Note these data were not available by ARIA++, although the categories of remote and very remote include most areas classified to moderate, high and extreme relative isolation in ARIA++ *(see Chapter 1).*

It is estimated that only 15 per cent of Aboriginal Australians in urban areas and 38 per cent of Aboriginal Australians in more remote areas have an effective Medicare number or card. A significant number of people have either never been enrolled, or their enrolment has expired.[2]

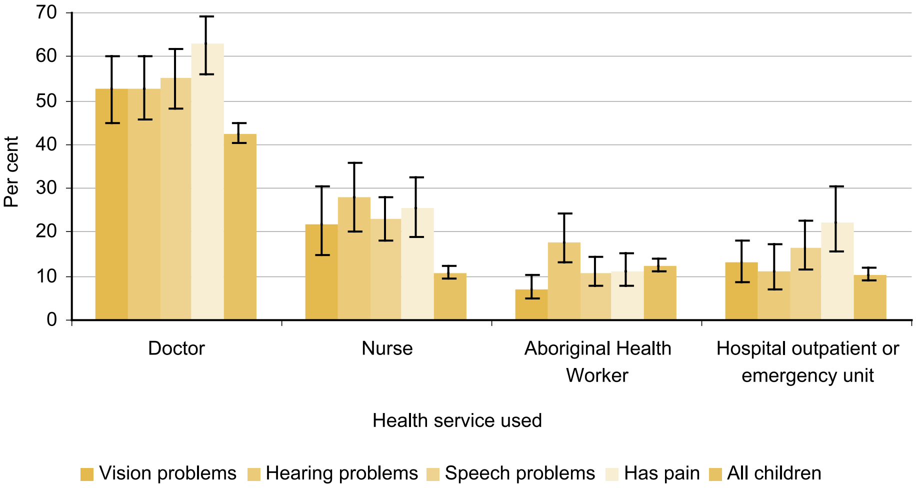
[1] Australian Institute of Health and Welfare, (2001). Expenditures on health services for Aboriginal and Torres Strait Islander people, 1998-99. AIHW Cat. No. IHW 7. Australian Institute of Health and Welfare and Commonwealth Department of Health and Aged Care. Canberra.

[2] House of Representatives Standing Committee on Family and Community Affairs, (2000). Health is Life. Report on the Inquiry into Indigenous Health. Canberra.

USE OF HEALTH SERVICES BY PEOPLE WITH DISABILITIES

Figure 4.6 illustrates the proportion of 4–17 year olds with specific disabilities who had utilised hospital and other services during the preceding six months. In general, there was a higher level of use of health services as a result of problems with vision, hearing, speech and pain.

FIGURE 4.6: CHILDREN 4–17 YEARS WITH SELECTED SENSORY AND MOTOR FUNCTION PROBLEMS — PROPORTION WHO HAVE USED SELECTED HEALTH SERVICES IN THE PREVIOUS SIX MONTHS



Source: Table 4.16

FACTORS INFLUENCING CONTACTS WITH HEALTH SERVICES

In addition to physical illness, a range of factors can influence children's use of health services. These include availability and accessibility of services, and financial and cultural issues. Four models were fitted to describe each child's contacts with a doctor, a nurse, an Aboriginal Health Worker (AHW) or a dentist in the six months prior to the survey. Each model adjusts for the age and sex of the child. Factors considered in each model included Level of Relative Isolation, family structure, financial strain, education level of the primary carer, distance to nearest doctor or Aboriginal Medical Service, the SEIFA score for the area *(see Glossary)* which measures socio-economic disadvantage at the community level, and whether the child's primary carer identified as being an Aboriginal or Torres Strait Islander person.

As few children under 4 years of age had visited a dentist, the model for dental care was restricted to children in the age range 4–17 years.

EXPLORING RELATIONSHIPS WITH MODELLING

Previous sections have explored the relationship between use of health services and various factors such as level of relative isolation or primary carer education level, where each factor is considered separately. As seen in Chapter Two, there are relationships between many of the factors. For instance, the proportion of carers who have a level of education beyond year 12 fell with increasing isolation. It is possible, therefore, that a relationship between education level of the primary carer and use of a health service may merely reflect the relationship between education and isolation, and between isolation and health service use.

This issue can be addressed using statistical modelling. Models can be used to determine the individual effects of several factors. For example, a model can be used to test if the relationship between education level and service use is a result of the relationship with relative isolation, or is an important factor in addition to relative isolation.

EXPLORING RELATIONSHIPS WITH MODELLING (Continued)

Logistic regression models *(see Glossary)* were used to explore factors other than illness that may be related to children's use of health services. As described in Chapter 1, the modelling techniques used account for the use of survey weights and the hierarchical structure of the data with selection of children within families and communities.

The results of the models are expressed in terms of odds ratios *(see Glossary)*. The odds ratios are calculated relative to an index category for each variable. For instance, in the model describing contacts with a doctor, for primary carer education level the category 1–9 years of education has been used as the index category. Where the primary carer has 13 or more years of education the odds ratio is 2.4 (CI: 1.5–3.9). This can be interpreted as saying that children whose carers have 13 or more years of education were 2.4 times more likely to have seen a doctor in the preceding six months than children whose primary carers have only 1–9 years of formal education. The statistical significance of an odds ratio can be judged by whether the confidence interval includes the reference value of one *(see Appendix D – Reliability of Estimates, for more information on confidence intervals)*.

Each model adjusts for the independent effects of the other variables in the model so that, for example, the association between education level of the primary carer and visits to the doctor by the child is not an artifact of different education levels in areas of different levels of relative isolation. The results in earlier sections show the relationship between service use and each characteristic considered separately. The modelling results shown below adjust for the effects of all characteristics considered simultaneously and thus shed more light on the interaction between characteristics.

FIGURE 4.7: ALL CHILDREN — PREDICTED LIKELIHOOD OF USING SELECTED HEALTH SERVICES IN PREVIOUS SIX MONTHS, ASSOCIATED WITH SELECTED FAMILY AND COMMUNITY VARIABLES (a)

	Doctor		Nurse		AHW		Dentist	
Parameter	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
Level of relative isolation— None	1.00		1.00		1.00		1.00	
Low	0.61	(0.5 – 0.8)	1.94	(1.3 – 3.0)	2.01	(1.3 – 3.1)	0.77	(0.6 – 1.0)
Moderate	0.56	(0.4 – 0.8)	3.96	(2.6 – 6.1)	4.27	(2.8 – 6.5)	0.85	(0.6 – 1.2)
High	0.34	(0.2 – 0.5)	4.82	(2.9 – 7.9)	6.95	(4.1 – 11.9)	1.43	(0.9 – 2.4)
Extreme	0.34	(0.2 – 0.5)	6.73	(3.6 – 12.7)	11.40	(5.8 – 22.6)	0.50	(0.3 – 0.8)
Primary carer education level— 1 – 9 years	1.00						1.00	
10 years	1.14	(0.9 – 1.5)					0.95	(0.7 – 1.3)
11 – 12 years	1.67	(1.2 – 2.3)					1.28	(0.9 – 1.7)
13+ years	2.38	(1.5 – 3.9)					1.95	(1.2 – 3.1)
No schooling	1.42	(0.8 – 2.4)					0.58	(0.3 – 1.0)
Not stated	1.00	(0.4 – 2.5)					1.44	(0.7 – 2.9)
Use of a vehicle— No			1.00				1.00	
Yes			0.66	(0.5 – 0.9)			1.82	(1.4 – 2.4)
Categories of SEIFA— Bottom 5%			1.00		1.00			
5% – 10%			0.64	(0.4 – 1.1)	0.65	(0.4 – 1.1)		
10% – 25%			0.63	(0.4 – 1.0)	0.61	(0.4 – 1.0)		
25% – 50%			0.62	(0.4 – 1.0)	0.60	(0.4 – 0.9)		
Top 50%			0.39	(0.2 – 0.7)	0.37	(0.2 – 0.7)		
Distance to doctor/AMS— 0 – 5 kms					1.00			
6 – 20 kms					1.28	(0.9 – 1.9)		
21 – 50 kms					0.58	(0.4 – 0.9)		
> 50 kms					0.60	(0.4 – 1.0)		
Family’s financial strain— Spending more money than we get					1.00			
Have just enough to get through to next pay					0.57	(0.4 – 0.9)		
Some money left over each week but spend it					0.57	(0.3 – 1.0)		
Can save a bit now and again					0.62	(0.4 – 1.0)		
Can save a lot					0.37	(0.2 – 0.9)		
Indigenous status of primary carer— Non–indigenous	1.71	(1.3 – 2.2)	0.47	(0.3 – 0.8)	0.43	(0.3 – 0.7)	1.85	(1.3 – 2.6)
Aboriginal or Torres Strait Islander	1.00		1.00		1.00		1.00	

(a) Model adjusts for age and sex of child. Results are left blank where there is no association between parameters and selected services.

Source: Tables 4.17–4.20

CONTACTS WITH DOCTORS

Having seen a doctor in the preceding six months is strongly linked with remoteness, with children living in areas of high or extreme relative isolation only one third as likely to have seen a doctor than children living in metropolitan Perth. Beyond the effect of isolation, no further association was found with distance from the nearest doctor or AMS, or whether the carer had access to a vehicle. Neither reported financial strain, or the socio-economic index value of the area was linked with visits to the doctor. However, the education level of the primary carer was associated with doctor's visits. Children whose carers have 13 or more years of education were 2.4 times (CI: 1.5–3.9) more likely to have seen a doctor in the preceding six months than children whose primary carers have only 1–9 years of formal education. Whether the primary carer of the child was Aboriginal or Torres Strait Islander was also found to be associated with children seeing a doctor, independently of the effect of relative isolation, education or financial strain. Children whose primary carers were non-Indigenous were 1.7 times (CI: 1.3–2.2) more likely to have seen a doctor than children whose primary carers were Aboriginal or Torres Strait Islander (Figure 4.7). It should be noted that most non-Indigenous primary carers were the natural mother of the child (see Chapter 2).

CONTACTS WITH NURSES

Contacts with a nurse in the preceding six months showed the reverse pattern to that seen with contacts with a doctor. As level of relative isolation increases, children are much more likely to have seen a nurse. Children in areas of extreme isolation were 6.7 times (CI: 3.6–12.7) more likely to have seen a nurse in the preceding six months than children in metropolitan Perth. Also, children whose primary carers were non-Indigenous were less than half as likely to have seen a nurse (odds ratio 0.47; CI: 0.3–0.8).

No association was found with the education level of the primary carer or the reported level of financial strain in the family. However, children living in areas classified in the bottom 5 per cent of the index of relative socio-economic disadvantage (*see Glossary*) were the most likely to have seen a nurse. Children living in areas classified in the top 50 per cent on the index of relative socio-economic disadvantage were less than half as likely to have seen a nurse (odds ratio 0.39; CI: 0.22–0.69) compared to children in the bottom 5 per cent. Children whose primary carers had access to a vehicle were also less likely to have seen a nurse (odds ratio 0.66; CI: 0.46–0.94) (Figure 4.7).

CONTACTS WITH ABORIGINAL HEALTH WORKERS

The association between contacts with an AHW and relative isolation was even stronger than with contacts with a nurse. Children living in areas of extreme relative isolation were more than 10 times more likely to have seen an AHW in the previous six months (odds ratio 11.4; CI: 5.8–22.6). There were significant associations with both the index of relative socio-economic disadvantage and the family's reported level of financial strain, with children living in areas of lower socio-economic status and children living in families reporting high levels of financial strain being most likely to have seen an AHW. Also, children whose primary carers were non-Indigenous were less than half as likely to have seen an AHW (odds ratio 0.43; CI: 0.3–0.7). No association was found between family structure or vehicle access and contacts with AHWs (Figure 4.7).

CONTACTS WITH DENTISTS

In addition to relative isolation, the education level of the primary carer, whether the carer had use of a vehicle and whether the primary carer was Aboriginal or Torres Strait Islander were the factors found to be associated with children seeing a dentist in the six months prior to the survey. Family structure, family financial strain and socio-economic status were not associated with dental visits. Children whose carers had 13 or more years of education were almost twice as likely to see a dentist as children of carers with only 1–9 years of education (odds ratio 1.9; CI: 1.2–3.1). In addition, when the carer had access to a vehicle the child was almost twice as likely to have seen a dentist (odds ratio 1.8; CI: 1.4–2.4). Children whose primary carers were non-Indigenous were also almost twice as likely to see a dentist (odds ratio 1.9; CI: 1.3–2.6) (Figure 4.7).

UNDERSTANDING ACCESS TO AND USE OF HEALTH SERVICES USING MODELLING TECHNIQUES

Modelling is a powerful tool that allows for the effects of multiple factors to be disentangled. The modelling results shown in this section adjust for the effects of all factors considered simultaneously. It highlights the independent effect of each factor. The models provide an integrated description of the interplay between a range of descriptive factors and the types of health services that Aboriginal children use.

Isolation is strongly related to service use, as location of services is affected by level of relative isolation. As previously noted, doctors are concentrated in the Perth metropolitan area and areas of low relative isolation. Despite programmes such as the General Practice Registrars Rural Incentive Payment Scheme and the Rural Retention Program administered by the Australian Government Department of Health and Ageing, at the time of the survey, children in remote and isolated areas had limited access to general practitioners. Instead, children in remote and isolated areas were much more likely to be seen by a nurse or an Aboriginal Health Worker. Community nursing posts and AMSs provide the first point of contact for the families of many Aboriginal children, particularly in remote areas.

Even in areas of none or low relative isolation, Aboriginal children were less likely to see a doctor than reported in the 1993 WA Child Health Survey for the general population. Cultural and financial barriers limit children's access to medical care in addition to the effects of physical isolation.

Access to dental care was least strongly related to remoteness, with only children in areas of extreme isolation being disadvantaged. For children of school age, free dental care is provided through the school dental service that operates both fixed and mobile dental health clinics. The mobile clinics appear to be effective in reaching all but the most isolated communities. However, it must be noted that the rate of dental visits is significantly lower than found in the general population in the 1993 WA Child Health Survey. The school dental service aims to see children every 15 months, or every 12 months in remote areas. With only 32 per cent of children aged 4–11 years and 17 per cent of children aged 12–17 years having seen a dentist in the last six months this suggests that these rates are not being achieved for Aboriginal children.

Throughout this chapter, comparisons have been made between rates of service use for Aboriginal children and rates for non-Aboriginal children, often using the 1993 WA Child Health Survey as a source of comparative data. It should be noted that 7–8 years elapsed between the data collection for the 1993 WA Child Health

UNDERSTANDING ACCESS TO AND USE OF HEALTH SERVICES USING MODELLING TECHNIQUES (Continued)

Survey and this survey. Patterns of service use can change over time, with changes in policy and service delivery.

Although comparisons with service use by non-Aboriginal children have been made, the rate of services use by non-Aboriginal children should not be regarded as the appropriate standard to which Aboriginal children should be compared. Service use should be in proportion to need. The higher rate of many physical illnesses among Aboriginal children would suggest that higher service use, as seen in the higher rate of hospital admissions, is appropriate. In this context, the lower rate of contacts with other services, such as doctors and dentists, is suggestive of unmet demand.

Indigenous status of the primary carer was associated with contacts with doctors, nurses, AHWs and dentists, independently of the effects of relative isolation, family finances, socio-economic status, education level, vehicle access or distance from services. Children whose primary carer was Aboriginal or Torres Strait Islander were more likely to have seen a nurse or an AHW, while children whose primary carer was non-Aboriginal were more likely to have seen a doctor or a dentist. This raises the question of whether general practice and dental services are being provided that Aboriginal carers find culturally appropriate, affordable and accessible.

ENDNOTES

1. National Aboriginal and Torres Strait Islander Health Council, (2003). National Strategic Framework for Aboriginal and Torres Strait Islander Health: Framework for action by Governments. NATSIHC. Canberra,
2. Zubrick SR, Silburn SR, Garton A, Burton P, Carlton J, Dalby R, Shepherd C, Lawrence D (1995). Western Australian Child Health Survey: Developing Health and Well-being in the Nineties. Australian Bureau of Statistics and Telethon Institute for Child Health Research. Perth.
3. Department of Health and Ageing, OATSIH Central Office, Service Activity Report 2000-01 (Unpublished data).
4. Australian Institute for Health and Welfare, (2003). Australian Hospital Statistics 2001-02, AIHW Cat. No. HSE 25. AIHW. Canberra.

Table 4.1: Children — Health services used at least once in previous six months, by age

Health service	Number	95% CI	%	95% CI
		0–3 years (N = 6 910)		
Doctor	4 790	(4 420 – 5 170)	69.2	(66.3 – 72.1)
Nurse	2 890	(2 580 – 3 210)	41.8	(38.0 – 45.7)
Dentist	190	(120 – 290)	2.8	(1.7 – 4.2)
Specialist	1 010	(850 – 1 200)	14.6	(12.3 – 17.2)
Speech pathologist	120	(50 – 230)	1.7	(0.7 – 3.3)
Aboriginal Medical Service	1 390	(1 180 – 1 620)	20.1	(17.3 – 23.3)
Aboriginal Health Worker	1 500	(1 300 – 1 720)	21.7	(18.9 – 24.8)
Hospital emergency department or outpatient clinic	1 560	(1 340 – 1 780)	22.5	(19.6 – 25.5)
		4–11 years (N = 13 800)		
Doctor	6 190	(5 760 – 6 650)	44.9	(42.2 – 47.6)
Nurse	2 970	(2 630 – 3 350)	21.5	(19.1 – 24.1)
Dentist	4 470	(4 040 – 4 940)	32.4	(29.5 – 35.4)
Specialist	1 630	(1 400 – 1 880)	11.8	(10.2 – 13.6)
Speech pathologist	610	(450 – 820)	4.5	(3.3 – 5.9)
Aboriginal Medical Service	2 060	(1 780 – 2 350)	14.9	(12.9 – 17.0)
Aboriginal Health Worker	2 020	(1 760 – 2 300)	14.6	(12.7 – 16.6)
Hospital emergency department or outpatient clinic	1 550	(1 330 – 1 790)	11.2	(9.6 – 12.9)
		12–17 years (N = 9 100)		
Doctor	3 550	(3 160 – 3 960)	39.0	(35.5 – 42.5)
Nurse	1 580	(1 340 – 1 850)	17.4	(14.8 – 20.2)
Dentist	1 560	(1 320 – 1 830)	17.1	(14.5 – 19.8)
Specialist	840	(650 – 1 090)	9.3	(7.2 – 11.7)
Speech pathologist	70	(20 – 230)	0.8	(0.2 – 2.5)
Aboriginal Medical Service	1 070	(900 – 1 260)	11.7	(9.8 – 13.9)
Aboriginal Health Worker	860	(740 – 990)	9.4	(8.1 – 11.0)
Hospital emergency department or outpatient clinic	850	(580 – 1 180	9.3	(6.5 – 12.7)
		Total children (N = 29 800)		
Doctor	14 500	(13 900 – 15 100)	48.7	(46.7 – 50.7)
Nurse	7 440	(6 830 – 8 070)	24.9	(22.9 – 27.1)
Dentist	6 220	(5 680 – 6 800)	20.9	(19.0 – 22.8)
Specialist	3 480	(3 140 – 3 850)	11.7	(10.5 – 12.9)
Speech pathologist	810	(610 – 1 060)	2.7	(2.0 – 3.5)
Aboriginal Medical Service	4 510	(4 030 – 5 040)	15.1	(13.5 – 16.9)
Aboriginal Health Worker	4 370	(3 940 – 4 840)	14.7	(13.2 – 16.2)
Hospital emergency department or outpatient clinic	3 950	(3 550 – 4 390)	13.3	(11.9 – 14.7)

Table 4.2: Children — Health services used at least once in previous six months, by Level of Relative Isolation (LORI)

Health service	Number	95% CI	%	95% CI
	LORI — None (N = 10 200)			
Doctor	5 760	(5 380 – 6 150)	56.6	(52.9 – 60.2)
Nurse	1 440	(1 190 – 1 730)	14.2	(11.7 – 16.9)
Dentist	2 230	(1 900 – 2 570)	21.9	(18.8 – 25.3)
Specialist	1 290	(1 060 – 1 550)	12.6	(10.4 – 15.1)
Speech pathologist	360	(200 – 570)	3.5	(2.0 – 5.7)
Aboriginal Medical Service	910	(710 – 1 150)	9.0	(7.0 – 11.3)
Aboriginal Health Worker	650	(480 – 840)	6.4	(4.7 – 8.3)
Hospital emergency department or outpatient clinic	1 410	(1 170 – 1 690)	13.9	(11.5 – 16.6)
	LORI — Low (N = 7 270)			
Doctor	3 700	(3 290 – 4 150)	50.9	(46.7 – 54.9)
Nurse	1 330	(1 110 – 1 580)	18.4	(15.6 – 21.4)
Dentist	1 370	(1 140 – 1 620)	18.8	(15.8 – 22.1)
Specialist	820	(650 – 1 020)	11.3	(9.1 – 13.6)
Speech pathologist	210	(120 – 360)	2.9	(1.7 – 4.9)
Aboriginal Medical Service	1 000	(780 – 1 270)	13.8	(10.9 – 17.0)
Aboriginal Health Worker	740	(580 – 930)	10.2	(8.1 – 12.6)
Hospital emergency department or outpatient clinic	1 240	(1 040 – 1 470)	17.0	(14.6 – 19.7)
	LORI — Moderate (N = 6 390)			
Doctor	2 910	(2 430 – 3 460)	45.6	(42.5 – 48.8)
Nurse	1 560	(1 220 – 1 950)	24.4	(20.6 – 28.6)
Dentist	1 220	(950 – 1 520)	19.1	(15.8 – 22.9)
Specialist	740	(560 – 950)	11.6	(9.3 – 14.1)
Speech pathologist	130	(80 – 200)	2.0	(1.3 – 2.9)
Aboriginal Medical Service	1 650	(1 300 – 2 050)	25.9	(21.6 – 30.6)
Aboriginal Health Worker	1 310	(1 070 – 1 590)	20.5	(17.7 – 23.3)
Hospital emergency department or outpatient clinic	760	(500 – 1 100)	11.9	(8.4 – 16.5)
	LORI — High (N = 3 170)			
Doctor	1 110	(790 – 1 510)	35.1	(28.7 – 41.8)
Nurse	1 520	(1 080 – 2 100)	48.2	(40.4 – 56.1)
Dentist	1 000	(660 – 1 480)	31.7	(23.8 – 41.0)
Specialist	260	(170 – 380)	8.1	(6.0 – 10.7)
Speech pathologist	90	(50 – 160)	3.0	(1.8 – 4.6)
Aboriginal Medical Service	550	(340 – 890)	17.5	(10.9 – 24.9)
Aboriginal Health Worker	640	(420 – 920)	20.4	(15.4 – 26.4)
Hospital emergency department or outpatient clinic	240	(160 – 360)	7.7	(5.7 – 10.0)
	LORI — Extreme (N = 2 830)			
Doctor	1 050	(700 – 1 530)	37.1	(30.0 – 45.2)
Nurse	1 580	(1 100 – 2 250)	55.8	(47.1 – 64.0)
Dentist	400	(250 – 610)	14.2	(9.8 – 19.6)
Specialist	380	(230 – 590)	13.5	(9.5 – 18.4)
Speech pathologist	10	(0 – 30)	0.4	(0.1 – 1.1)
Aboriginal Medical Service	400	(220 – 630)	14.0	(8.6 – 21.3)
Aboriginal Health Worker	1 030	(650 – 1 500)	36.4	(28.3 – 44.5)
Hospital emergency department or outpatient clinic	300	(190 – 450)	10.7	(7.6 – 14.8)

Table 4.2: Children — Health services used at least once in previous six months, by Level of Relative Isolation (LORI) (Continued)

Health service	Number	95% CI	%	95% CI
	Total WA (N = 29 800)			
Doctor	14 500	(13 900 – 15 100)	48.7	(46.7 – 50.7)
Nurse	7 440	(6 830 – 8 070)	24.9	(22.9 – 27.1)
Dentist	6 220	(5 680 – 6 800)	20.9	(19.0 – 22.8)
Specialist	3 480	(3 140 – 3 850)	11.7	(10.5 – 12.9)
Speech pathologist	810	(610 – 1 060)	2.7	(2.0 – 3.5)
Aboriginal Medical Service	4 510	(4 030 – 5 040)	15.1	(13.5 – 16.9)
Aboriginal Health Worker	4 370	(3 940 – 4 840)	14.7	(13.2 – 16.2)
Hospital emergency department or outpatient clinic	3 950	(3 550 – 4 390)	13.3	(11.9 – 14.7)

Table 4.3: Children — Number of times seen a doctor in last six months, by distance from nearest doctor or AMS

Times doctor seen	Number	95% CI	%	95% CI
	0–5 kilometres			
None	9 280	(8 610 – 9 980)	48.6	(46.2 – 51.0)
Once or more	9 810	(9 100 – 10 500)	51.4	(49.0 – 53.8)
Total	19 100	(18 000 – 20 100)	100.0	
	6–20 kilometres			
None	1 970	(1 590 – 2 390)	47.0	(41.5 – 52.4)
Once or more	2 220	(1 820 – 2 660)	53.0	(47.6 – 58.5)
Total	4 180	(3 520 – 4 890)	100.0	
	21–100 kilometres			
None	1 160	(820 – 1 630)	55.7	(49.1 – 62.5)
Once or more	930	(680 – 1 240)	44.3	(37.5 – 50.9)
Total	2 090	(1 530 – 2 770)	100.0	
	Over 100 kilometres			
None	2 390	(1 830 – 3 030)	65.5	(58.0 – 72.5)
Once or more	1 260	(890 – 1 730)	34.5	(27.5 – 42.0)
Total	3 650	(2 840 – 4 570)	100.0	
	Distance not stated			
None	480	(320 – 690)	59.8	(46.9 – 71.1)
Once or more	320	(220 – 450)	40.2	(28.9 – 53.1)
Total	810	(590 – 1 050)	100.0	
	Total			
None	15 300	(14 700 – 15 900)	51.3	(49.3 – 53.3)
Once or more	14 500	(13 900 – 15 100)	48.7	(46.7 – 50.7)
Total	29 800	(29 800 – 29 800)	100.0	

Table 4.4: Children — Health services used at least once in previous six months, by Indigenous status of primary carer

Health service	Number	95% CI	%	95% CI
	Primary carer – Indigenous (N = 25 500)			
Doctor	11 900	(11 300 – 12 500)	46.6	(44.5 – 48.8)
Nurse	6 560	(5 950 – 7 180)	25.7	(23.4 – 28.1)
Dentist	5 000	(4 490 – 5 530)	19.6	(17.7 – 21.6)
Specialist	2 730	(2 430 – 3 080)	10.7	(9.5 – 12.0)
Speech pathologist	620	(470 – 800)	2.4	(1.9 – 3.2)
Aboriginal Medical Service	4 220	(3 750 – 4 720)	16.5	(14.7 – 18.5)
Aboriginal Health Worker	4 150	(3 710 – 4 610)	16.2	(14.6 – 18.0)
Hospital emergency department or outpatient clinic	3 000	(2 640 – 3 390)	11.8	(10.4 – 13.3)
	Primary carer – Non–Indigenous (N = 4 070)			
Doctor	2 520	(2 120 – 2 980)	62.0	(55.5 – 68.4)
Nurse	830	(590 – 1 110)	20.3	(15.1 – 26.3)
Dentist	1 200	(940 – 1 510)	29.5	(24.0 – 35.4)
Specialist	730	(550 – 940)	17.8	(14.0 – 22.4)
Speech pathologist	180	(70 – 410)	4.4	(1.6 – 9.4)
Aboriginal Medical Service	270	(170 – 400)	6.5	(4.3 – 9.9)
Aboriginal Health Worker	200	(140 – 270)	4.8	(3.5 – 6.7)
Hospital emergency department or outpatient clinic	930	(710 – 1 180)	22.8	(18.1 – 28.3)
	Primary carer – Indigenous status not stated (N = 200)			
Doctor	90	(60 – 160)	46.8	(25.7 – 70.2)
Nurse	50	(20 – 90)	25.5	(11.6 – 47.8)
Dentist	20	(10 – 40)	9.8	(3.8 – 20.5)
Specialist	20	(10 – 70)	10.7	(1.1 – 28.0)
Speech pathologist	0	(0 – 10)	1.9	(0.5 – 4.2)
Aboriginal Medical Service	30	(10 – 70)	14.5	(3.6 – 41.4)
Aboriginal Health Worker	30	(10 – 80)	15.8	(4.7 – 37.4)
Hospital emergency department or outpatient clinic	20	(10 – 40)	9.7	(2.9 – 24.2)
	Total children (N = 29 800)			
Doctor	14 500	(13 900 – 15 100)	48.7	(46.7 – 50.7)
Nurse	7 440	(6 830 – 8 070)	24.9	(22.9 – 27.1)
Dentist	6 220	(5 680 – 6 800)	20.9	(19.0 – 22.8)
Specialist	3 480	(3 140 – 3 850)	11.7	(10.5 – 12.9)
Speech pathologist	810	(610 – 1 060)	2.7	(2.0 – 3.5)
Aboriginal Medical Service	4 510	(4 030 – 5 040)	15.1	(13.5 – 16.9)
Aboriginal Health Worker	4 370	(3 940 – 4 840)	14.7	(13.2 – 16.2)
Hospital emergency department or outpatient clinic	3 950	(3 550 – 4 390)	13.3	(11.9 – 14.7)

Table 4.5: Children — Health services used at least once in previous six months, by primary carer years of education

Health Service	Number	95% CI	%	95% CI
	Children whose carer did not attend school (N = 740)			
Doctor	310	(200 – 470)	42.1	(30.6 – 54.6)
Nurse	170	(80 – 300)	22.8	(12.8 – 37.5)
Dentist	110	(70 – 170)	15.0	(8.9 – 22.8)
Specialist	120	(50 – 240)	16.8	(8.2 – 30.3)
Speech pathologist	20	(0 – 250)	2.6	(0.0 – 28.5)
Aboriginal Medical Service	120	(60 – 200)	16.1	(9.3 – 25.2)
Aboriginal Health Worker	140	(80 – 220)	18.5	(12.0 – 27.2)
Hospital emergency department or outpatient clinic	80	(20 – 200)	11.3	(2.9 – 24.8)
	Children whose carer had 1–9 years of education (N = 6,630)			
Doctor	2 730	(2 400 – 3 080)	41.2	(37.6 – 45.0)
Nurse	1 840	(1 540 – 2 170)	27.7	(23.8 – 31.7)
Dentist	1 240	(1 010 – 1 510)	18.8	(15.6 – 22.3)
Specialist	640	(500 – 810)	9.7	(7.7 – 12.0)
Speech pathologist	120	(90 – 170)	1.9	(1.3 – 2.5)
Aboriginal Medical Service	1 030	(850 – 1 250)	15.6	(12.8 – 18.6)
Aboriginal Health Worker	1 160	(950 – 1 390)	17.4	(14.6 – 20.5)
Hospital emergency department or outpatient clinic	750	(620 – 890)	11.2	(9.5 – 13.3)
	Children whose carer had 10 years of education (N = 12,800)			
Doctor	6 130	(5 640 – 6 650)	47.9	(44.9 – 50.8)
Nurse	2 910	(2 590 – 3 250)	22.7	(20.4 – 25.2)
Dentist	2 430	(2 090 – 2 820)	19.0	(16.5 – 21.6)
Specialist	1 360	(1 140 – 1 590)	10.6	(9.0 – 12.3)
Speech pathologist	370	(220 – 600)	2.9	(1.7 – 4.6)
Aboriginal Medical Service	1 750	(1 480 – 2 040)	13.6	(11.6 – 15.8)
Aboriginal Health Worker	1 510	(1 270 – 1 790)	11.8	(10.0 – 13.9)
Hospital emergency department or outpatient clinic	1 590	(1 350 – 1 870)	12.4	(10.6 – 14.4)
	Children whose carer had 11–12 years of education (N = 7,240)			
Doctor	4 070	(3 610 – 4 590)	56.2	(51.8 – 60.5)
Nurse	1 960	(1 650 – 2 290)	27.0	(23.2 – 31.2)
Dentist	1 710	(1 450 – 2 020)	23.6	(20.3 – 27.3)
Specialist	1 000	(780 – 1 270)	13.9	(11.1 – 17.0)
Speech pathologist	200	(140 – 290)	2.8	(1.9 – 4.0)
Aboriginal Medical Service	1 230	(980 – 1 540)	17.0	(13.6 – 20.8)
Aboriginal Health Worker	1 130	(950 – 1 350)	15.7	(13.1 – 18.6)
Hospital emergency department or outpatient clinic	1 210	(940 – 1 510)	16.6	(13.3 – 20.2)
	Children whose carer had 13 or more years of education (N = 1,600)			
Doctor	970	(660 – 1 380)	60.3	(48.9 – 70.8)
Nurse	260	(70 – 630)	16.3	(5.8 – 35.8)
Dentist	590	(380 – 850)	36.8	(25.4 – 49.3)
Specialist	260	(160 – 420)	16.3	(10.3 – 23.1)
Speech pathologist	70	(20 – 160)	4.5	(1.1 – 10.1)
Aboriginal Medical Service	250	(170 – 370)	15.6	(9.7 – 22.9)
Aboriginal Health Worker	200	(40 – 600)	12.2	(2.5 – 31.2)
Hospital emergency department or outpatient clinic	260	(160 – 410)	16.4	(10.2 – 24.4)

Table 4.5: Children — Health services used at least once in previous six months, by primary carer years of education (Continued)

Health Service	Number	95% CI	%	95% CI
	Children whose carer's education not stated (N = 810)			
Doctor	320	(220 – 450)	40.2	(28.9 – 53.1)
Nurse	300	(180 – 520)	37.7	(24.4 – 54.5)
Dentist	130	(50 – 330)	16.3	(5.5 – 33.7)
Specialist	90	(50 – 160)	11.3	(6.7 – 17.3)
Speech pathologist	10	(0 – 30)	1.5	(0.5 – 4.2)
Aboriginal Medical Service	130	(70 – 210)	16.5	(8.8 – 25.9)
Aboriginal Health Worker	240	(160 – 340)	29.6	(20.3 – 39.3)
Hospital emergency department or outpatient clinic	60	(30 – 110)	7.7	(4.1 – 12.6)

Table 4.6: Children whose carers needed to contact AMS in last six months — Whether carer is happy with the service provided for each child

AMS service satisfaction	Number	95% CI	%	95% CI
Not happy with AMS service	810	(650 – 990)	17.9	(14.6 – 21.6)
Happy with AMS	3 700	(3 260 – 4 190)	82.1	(78.4 – 85.4)
Total	4 510	(4 030 – 5 040)	100	

Table 4.7: All children — Distance from nearest doctor or AMS, by Level of Relative Isolation (LORI)

Distance to nearest Doctor/AMS – kilometres	Number	95% CI	%	95% CI
	LORI — None			
0 – 5	7 630	(7 210 – 8 050)	75.0	(70.9 – 78.7)
6 – 20	2 000	(1 660 – 2 400)	19.7	(16.1 – 23.4)
21 – 100	320	(170 – 540)	3.2	(1.7 – 5.3)
101 and over	0	(0 – 60)	0.0	(0.0 – 0.5)
Not stated	220	(150 – 310)	2.2	(1.5 – 3.1)
Total	10 200	(10 000 – 10 400)	100.0	
	LORI — Low			
0 – 5	5 490	(4 890 – 6 140)	75.5	(69.4 – 80.8)
6 – 20	1 070	(750 – 1 460)	14.8	(10.8 – 20.1)
21 – 100	520	(310 – 840)	7.1	(4.1 – 11.3)
101 and over	50	(0 – 540)	0.7	(0.0 – 7.2)
Not stated	140	(50 – 270)	1.9	(0.7 – 3.7)
Total	7 270	(6 640 – 7 930)	100.0	
	LORI — Moderate			
0 – 5	4 870	(4 040 – 5 790)	76.2	(67.7 – 83.1)
6 – 20	1 050	(660 – 1 630)	16.5	(10.5 – 24.6)
21 – 100	150	(20 – 500)	2.4	(0.3 – 7.6)
101 and over	70	(10 – 210)	1.1	(0.2 – 3.3)
Not stated	240	(150 – 380)	3.8	(2.3 – 5.7)
Total	6 390	(5 400 – 7 420)	100.0	
	LORI — High			
0 – 5	780	(430 – 1 290)	24.5	(14.4 – 38.4)
6 – 20	40	(0 – 220)	1.2	(0.0 – 7.0)
21 – 100	610	(270 – 1 100)	19.3	(8.4 – 33.4)
101 and over	1 660	(1 100 – 2 420)	52.3	(37.8 – 65.7)
Not stated	80	(10 – 390)	2.6	(0.4 – 11.7)
Total	3 170	(2 360 – 4 160)	100.0	
	LORI — Extreme			
0 – 5	330	(80 – 740)	11.6	(3.0 – 25.4)
6 – 20	20	(0 – 70)	0.7	(0.1 – 2.7)
21 – 100	480	(210 – 870)	17.1	(8.6 – 31.4)
101 and over	1 870	(1 280 – 2 680)	66.2	(52.1 – 79.2)
Not stated	120	(50 – 270)	4.4	(1.8 – 8.8)
Total	2 830	(2 040 – 3 800)	100.0	
	Total			
0 – 5	19 100	(18 000 – 20 100)	64.0	(60.4 – 67.4)
6 – 20	4 180	(3 520 – 4 890)	14.0	(11.8 – 16.4)
21 – 100	2 090	(1 530 – 2 770)	7.0	(5.1 – 9.3)
101 and over	3 650	(2 840 – 4 570)	12.2	(9.5 – 15.3)
Not stated	810	(590 – 1 050)	2.7	(2.0 – 3.5)
Total	29 800	(29 800 – 29 800)	100.0	

Table 4.8: All children — Number of times seen AMS in last six months, by distance from nearest doctor or AMS

Times seen AMS	Number	95% CI	%	95% CI
0–5 kilometres				
None	16 100	(15 200 – 17 000)	84.3	(82.0 – 86.3)
Once or more	3 010	(2 550 – 3 510)	15.7	(13.7 – 18.0)
Total	19 100	(18 000 – 20 100)	100.0	
6–20 kilometres				
None	3 470	(2 890 – 4 100)	83.0	(78.2 – 86.9)
Once or more	710	(520 – 940)	17.0	(13.1 – 21.8)
Total	4 180	(3 520 – 4 890)	100.0	
21–100 kilometres				
None	1 830	(1 340 – 2 440)	87.6	(82.1 – 91.6)
Once or more	260	(160 – 410)	12.4	(8.4 – 17.9)
Total	2 090	(1 530 – 2 770)	100.0	
101 kilometres and over				
None	3 240	(2 530 – 4 110)	88.9	(84.0 – 92.6)
Once or more	410	(250 – 610)	11.1	(7.4 – 16.0)
Total	3 650	(2 840 – 4 570)	100.0	
Distance not stated				
None	670	(480 – 920)	83.5	(74.1 – 91.2)
Once or more	130	(70 – 210)	16.5	(8.8 – 25.9)
Total	810	(590 – 1 050)	100.0	
Total				
None	25 300	(24 800 – 25 800)	84.9	(83.1 – 86.5)
Once or more	4 510	(4 030 – 5 040)	15.1	(13.5 – 16.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 4.9: All Children — whether admitted to hospital in previous year, by age and sex

Admitted to hospital in last year	Number	95% CI	%	95% CI
Males 0–3 years				
No	2 320	(2 040 – 2 610)	69.8	(65.1 – 74.0)
Yes	1 000	(850 – 1 170)	30.2	(26.0 – 34.9)
Total	3 320	(3 010 – 3 640)	100.0	
Males 4–11 years				
No	5 460	(5 110 – 5 810)	86.8	(84.4 – 89.0)
Yes	830	(690 – 990)	13.2	(11.0 – 15.6)
Total	6 280	(5 920 – 6 660)	100.0	
Males 12–17 years				
No	3 390	(3 010 – 3 800)	90.5	(86.3 – 93.6)
Yes	360	(230 – 510)	9.5	(6.4 – 13.7)
Total	3 750	(3 350 – 4 170)	100.0	
Total Males				
No	11 200	(10 700 – 11 700)	83.6	(81.7 – 85.4)
Yes	2 190	(1 950 – 2 460)	16.4	(14.6 – 18.3)
Total	13 400	(12 800 – 13 900)	100.0	
Females 0–3 years				
No	2 110	(1 850 – 2 400)	70.7	(66.0 – 74.9)
Yes	870	(740 – 1 030)	29.3	(25.1 – 34.0)
Total	2 990	(2 680 – 3 300)	100.0	
Females 4–11 years				
No	5 060	(4 690 – 5 450)	89.1	(86.7 – 91.3)
Yes	620	(490 – 760)	10.9	(8.7 – 13.3)
Total	5 690	(5 310 – 6 090)	100.0	
Females 12–17 years				
No	3 390	(3 080 – 3 730)	86.3	(83.4 – 88.9)
Yes	540	(430 – 660)	13.7	(11.1 – 16.6)
Total	3 930	(3 590 – 4 290)	100.0	
Total Females				
No	10 600	(10 100 – 11 100)	83.9	(82.0 – 85.6)
Yes	2 040	(1 810 – 2 280)	16.1	(14.4 – 18.0)
Total	12 600	(12 100 – 13 100)	100.0	
Total 0–3 years				
No	4 430	(4 050 – 4 830)	70.2	(66.9 – 73.4)
Yes	1 880	(1 660 – 2 130)	29.8	(26.6 – 33.1)
Total	6 310	(5 880 – 6 770)	100.0	
Total 4–11 years				
No	10 500	(10 000 – 11 000)	87.9	(86.2 – 89.5)
Yes	1 450	(1 250 – 1 670)	12.1	(10.5 – 13.8)
Total	12 000	(11 500 – 12 500)	100.0	
Total 12–17 years				
No	6 790	(6 290 – 7 290)	88.3	(86.0 – 90.5)
Yes	900	(730 – 1 080)	11.7	(9.5 – 14.0)
Total	7 680	(7 170 – 8 210)	100.0	
Total children				
No	21 700	(21 200 – 22 300)	83.7	(82.4 – 85.0)
Yes	4 220	(3 890 – 4 590)	16.3	(15.0 – 17.6)
Total	26 000	(25 400 – 26 400)	100.0	

Table 4.10: All Children — whether admitted to hospital in previous year, by Level of Relative Isolation (LORI)

Admitted to hospital in last year	Number	95% CI	%	95% CI
LORI — None				
No	7 690	(7 360 – 8 030)	85.7	(82.9 – 88.1)
Yes	1 280	(1 070 – 1 540)	14.3	(11.9 – 17.1)
Total	8 970	(8 680 – 9 270)	100.0	
LORI — Low				
No	5 600	(5 070 – 6 170)	84.3	(81.9 – 86.6)
Yes	1 040	(870 – 1 240)	15.7	(13.4 – 18.1)
Total	6 640	(6 030 – 7 290)	100.0	
LORI — Moderate				
No	4 620	(3 880 – 5 430)	82.7	(79.9 – 85.2)
Yes	970	(770 – 1 200)	17.3	(14.8 – 20.1)
Total	5 590	(4 700 – 6 530)	100.0	
LORI — High				
No	2 100	(1 560 – 2 760)	80.3	(75.6 – 84.3)
Yes	520	(350 – 730)	19.7	(15.7 – 24.4)
Total	2 610	(1 960 – 3 460)	100.0	
LORI — Extreme				
No	1 730	(1 190 – 2 360)	80.6	(75.9 – 84.9)
Yes	420	(280 – 600)	19.4	(15.1 – 24.1)
Total	2 150	(1 530 – 2 950)	100.0	
Total				
No	21 700	(21 200 – 22 300)	83.7	(82.4 – 85.0)
Yes	4 220	(3 890 – 4 590)	16.3	(15.0 – 17.6)
Total	26 000	(25 400 – 26 400)	100.0	

Table 4.11: Children admitted to hospital in last year — Number of admissions in last year

Number of admissions	Number	95% CI	%	95% CI
One	2 970	(2 690 – 3 290)	70.4	(66.8 – 73.8)
Two	850	(720 – 1 000)	20.0	(17.0 – 23.3)
Three or more	400	(310 – 520)	9.6	(7.5 – 12.1)
Total	4 220	(3 890 – 4 590)	100.0	

Table 4.12: Children admitted to hospital in last year — Total length of stay in hospital

Total length of stay	Number	95% CI	%	95% CI
1 – 2 days	2 250	(2 000 – 2 510)	53.3	(49.2 – 57.2)
3 – 5 days	1 030	(880 – 1 210)	24.4	(21.2 – 27.9)
6 days or more	940	(800 – 1 110)	22.4	(19.3 – 25.6)
Total	4 220	(3 890 – 4 590)	100.0	

Table 4.13: Children admitted to hospital in last year — Principal diagnosis on most recent admission

Principal diagnosis	Number	95% CI	%	95% CI
Respiratory system diseases	990	(850 – 1 150)	23.5	(20.5 – 26.7)
Influenza and pneumonia	280	(230 – 360)	6.7	(5.4 – 8.4)
Acute respiratory infections	490	(380 – 610)	11.5	(9.2 – 14.1)
Asthma	110	(70 – 170)	2.6	(1.6 – 4.0)
Injuries	670	(550 – 830)	16.0	(13.2 – 19.2)
Head injuries	180	(130 – 250)	4.3	(3.1 – 5.7)
Fractures	110	(60 – 170)	2.6	(1.5 – 4.1)
Infectious diseases	520	(400 – 650)	12.2	(9.8 – 15.1)
Ear disorders	280	(190 – 400)	6.7	(4.6 – 9.5)
Otitis media	220	(130 – 340)	5.1	(3.1 – 7.8)
Skin diseases	310	(220 – 430)	7.4	(5.4 – 9.9)
Digestive system diseases	270	(170 – 410)	6.4	(4.1 – 9.5)
Other signs and symptoms	200	(140 – 270)	4.6	(3.2 – 6.3)
Perinatal conditions	200	(150 – 260)	4.7	(3.6 – 6.1)
Urinary system diseases	100	(60 – 150)	2.3	(1.4 – 3.6)
Other	690	(550 – 860)	16.3	(13.2 – 19.9)
Total	4 220	(3 890 – 4 590)	100.0	

Table 4.14: Children linked to birth records — Rate of hospital admissions, by age group and sex

	WAACHS Children		All WA Children 2001–02 (a)
Sex	Rate per 1,000	95% CI	Rate per 1,000
	0 – 4 years		
Male	408	(347 – 469)	287
Female	400	(333 – 468)	212
Total	404	(357 – 452)	250
	5 – 14 years		
Male	149	(120 – 177)	96
Female	122	(97 – 147)	80
Total	136	(117 – 155)	88
	15 – 17 years		
Male	123	(73 – 174)	na
Female	299	(232 – 366)	na
Total	213	(171 – 255)	na
	Total		
Male	224	(199 – 250)	na
Female	229	(200 – 257)	na
Total	226	(207 – 246)	na

(a) Source: Australian Institute for Health and Welfare. Australian Hospital Statistics 2001–02. AIHW Cat. No. HSE 25. Canberra: AIHW.

Table 4.15: Children in areas of moderate, high or extreme relative isolation — whether landing strip long enough and in suitable condition for flying doctor to land plane

Flying doctor able to land plane	Number	95% CI	%	95% CI
LORI — Moderate				
No	170	(70 – 310)	2.6	(1.3 – 5.0)
Yes	5 490	(4 600 – 6 430)	86.0	(81.5 – 89.8)
Not applicable	480	(280 – 770)	7.5	(4.4 – 11.6)
Not stated	240	(150 – 380)	3.8	(2.3 – 5.7)
Total	6 390	(5 400 – 7 420)	100.0	
LORI — High				
No	220	(110 – 400)	6.8	(3.4 – 11.8)
Yes	2 570	(1 860 – 3 370)	81.1	(71.4 – 88.2)
Not applicable	300	(140 – 570)	9.4	(4.4 – 17.1)
Not stated	80	(10 – 390)	2.6	(0.4 – 11.7)
Total	3 170	(2 360 – 4 160)	100.0	
LORI — Extreme				
No	430	(210 – 740)	15.3	(7.8 – 25.4)
Yes	2 220	(1 540 – 3 030)	78.6	(67.8 – 86.9)
Not applicable	50	(20 – 100)	1.7	(0.6 – 3.5)
Not stated	120	(50 – 270)	4.4	(1.8 – 8.8)
Total	2 830	(2 040 – 3 800)	100.0	
Total				
No	820	(550 – 1 150)	6.6	(4.4 – 9.3)
Yes	10 300	(9 600 – 11 000)	83.1	(79.2 – 86.4)
Not applicable	830	(570 – 1 170)	6.7	(4.6 – 9.5)
Not stated	450	(290 – 680)	3.6	(2.3 – 5.4)
Total	12 400	(11 800 – 13 000)	100.0	

Table 4.16: Children with selected sensory and motor function problems — Use of services in previous six months

Sensory and motor function problems	Number	95% CI	%	95% CI
Hospital emergency department or outpatient clinic				
Vision problems	240	(160 – 340)	13.0	(8.7 – 18.3)
Hearing problems	180	(110 – 280)	11.2	(7.0 – 17.3)
Speech problems	370	(250 – 530)	16.4	(11.7 – 22.5)
Has pain	430	(290 – 630)	22.1	(15.6 – 30.4)
All children	2 400	(2 090 – 2 740)	10.5	(9.1 – 12.0)
Doctor				
Vision problems	970	(760 – 1 220)	52.7	(44.9 – 60.2)
Hearing problems	830	(670 – 1 020)	52.9	(45.6 – 60.0)
Speech problems	1 230	(1 040 – 1 460)	55.1	(48.3 – 61.7)
Has pain	1 220	(980 – 1 500)	63.0	(56.2 – 69.3)
All children	9 740	(9 200 – 10 300)	42.5	(40.3 – 44.8)
Nurse				
Vision problems	410	(250 – 600)	22.0	(14.9 – 30.6)
Hearing problems	440	(310 – 610)	28.0	(20.2 – 36.0)
Speech problems	510	(400 – 650)	23.0	(18.3 – 28.1)
Has pain	490	(350 – 660)	25.4	(18.8 – 32.7)
All children	2 470	(2 190 – 2 790)	10.8	(9.6 – 12.2)
Aboriginal Health Worker				
Vision problems	130	(90 – 190)	7.2	(4.8 – 10.3)
Hearing problems	280	(200 – 380)	17.9	(13.0 – 24.2)
Speech problems	240	(170 – 320)	10.7	(7.7 – 14.5)
Has pain	220	(160 – 300)	11.2	(7.8 – 15.1)
All children	2 870	(2 540 – 3 230)	12.5	(11.1 – 14.1)

Table 4.17: All children — Predicted likelihood of having seen a doctor in previous six months, associated with selected family and community variables (a)

Child has seen a doctor in the previous six months			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of Relative Isolation			
None		1.00	
Low	<0.001	0.61	(0.47 – 0.79)
Moderate	<0.001	0.56	(0.41 – 0.76)
High	<0.001	0.34	(0.22 – 0.54)
Extreme	<0.001	0.34	(0.22 – 0.53)
Primary carer education level			
1– 9 years		1.00	
10 years	0.348	1.14	(0.87 – 1.49)
11–12 years	0.002	1.67	(1.22 – 2.31)
13 years or more	<0.001	2.38	(1.47 – 3.88)
No schooling	0.187	1.42	(0.84 – 2.38)
Not stated	0.998	1.00	(0.41 – 2.45)
Indigenous status of primary carer			
Non–indigenous	<0.001	1.71	(1.30 – 2.24)
Aboriginal or Torres Strait Islander		1.00	

(a) Model also adjusts for age and sex of the child.

Table 4.18: All children — Predicted likelihood of having seen a nurse in previous six months, associated with selected family and community variables (a)

Child has seen a nurse in the previous six months			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of Relative Isolation			
None		1.00	
Low	0.002	1.94	(1.27 – 2.96)
Moderate	<0.001	3.96	(2.57 – 6.10)
High	<0.001	4.82	(2.94 – 7.89)
Extreme	<0.001	6.73	(3.60 – 12.70)
Access to vehicle			
No		1.00	
Yes	0.023	0.66	(0.46 – 0.94)
Indigenous status of primary carer			
Non–indigenous	0.002	0.47	(0.29 – 0.76)
Aboriginal or Torres Strait Islander		1.00	(1.32 – 3.40)
Categories of Socio-economic disadvantage			
Bottom 5%		1.00	
5% – 10%	0.102	0.64	(0.37 – 1.09)
10% – 25%	0.043	0.63	(0.41 – 0.99)
25% – 50%	0.039	0.62	(0.40 – 0.98)
Top 50%	0.001	0.39	(0.22 – 0.69)

(a) Model also adjusts for age and sex of the child.

Table 4.19: All children — Predicted likelihood of having seen an Aboriginal Health Worker in previous six months, associated with selected family and community variables (a)

Child has seen an Aboriginal Health Worker in previous six months			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of Relative Isolation			
None		1.00	
Low	0.001	2.01	(1.33 – 3.05)
Moderate	<0.001	4.27	(2.81 – 6.48)
High	<0.001	6.95	(4.10 – 11.90)
Extreme	<0.001	11.40	(5.80 – 22.60)
Indigenous status of primary carer			
Non–Indigenous	<0.001	0.43	(0.27 – 0.69)
Aboriginal or Torres Strait Islander		1.00	
Categories of Socio-economic disadvantage			
Bottom 5%		1.00	
5% – 10%	0.112	0.65	(0.38 – 1.10)
10% – 25%	0.035	0.61	(0.39 – 0.97)
25% – 50%	0.027	0.60	(0.38 – 0.94)
Top 50%	<0.001	0.37	(0.21 – 0.65)
Distance to local doctor or AMS			
0–5 kms		1.00	
6–20 kms	0.237	1.28	(0.85 – 1.91)
21–50 kms	0.018	0.58	(0.36 – 0.91)
> 50 kms	0.038	0.60	(0.37 – 0.97)
Family's financial strain			
Spending more money than we get		1.00	
Have just enough to get through to next pay	0.016	0.57	(0.36 – 0.90)
Some money left over each week but spend it	0.041	0.57	(0.34 – 0.98)
Can save a bit now and again	0.042	0.62	(0.39 – 0.98)
Can save a lot	0.022	0.37	(0.16 – 0.87)

(a) Model also adjusts for age and sex of the child.

Table 4.20: Children 4–17 years — Predicted likelihood of having seen a dentist in previous six months, associated with selected family and community variables (a)

Child has seen a dentist in the previous six months			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of Relative Isolation			
None		1.00	
Low	0.052	0.77	(0.59 – 1.00)
Moderate	0.304	0.85	(0.62 – 1.16)
High	0.173	1.43	(0.86 – 2.38)
Extreme	0.008	0.50	(0.30 – 0.83)
Primary carer education level			
1– 9 years		1.00	
10 years	0.745	0.95	(0.70 – 1.29)
11–12 years	0.11	1.28	(0.95 – 1.73)
13 years or more	0.005	1.95	(1.23 – 3.08)
No schooling	0.034	0.58	(0.35 – 0.96)
Not stated	0.31	1.44	(0.71 – 2.92)
Access to vehicle			
No		1.00	
Yes	<0.001	1.82	(1.39 – 2.38)
Indigenous status of primary carer			
Non–Indigenous	<0.001	1.85	(1.33 – 2.57)
Aboriginal or Torres Strait Islander		1.00	

(a) Model also adjusts for age and sex of the child.

CHAPTER 5

IMPROVING THE HEALTH AND FUTURE OF ABORIGINAL CHILDREN

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Key findings about the physical health of Aboriginal children are reviewed in this chapter. Despite Aboriginal health being an important priority issue for governments, progress in improving Aboriginal health status has been poor. There is currently no national policy framework specific to the health of Aboriginal children. The current focus of Aboriginal health policy is directed to alleviating the principal causes of premature adult mortality and chronic disease. The significant findings from the Survey provide the first representative population data to underpin the development of policy and allocation of resources to improve the health and future of Aboriginal children.

The findings reported in this first volume of results largely concern key modifiable health risks that Aboriginal children, young people and their carers are exposed to, set amid striking geographic diversity and social disadvantage and in the presence of inadequate health services and barriers to their access. These findings may be summarised as follows:

MODIFIABLE HEALTH RISKS

- *High sustained rates of breastfeeding during infancy and early childhood.*
  The mothers of Aboriginal children, particularly those living in more isolated areas, were both more likely to initiate breastfeeding and to breast feed for longer, than mothers in the general population. This offers a positive basis from which to build health promotion programs in the post-natal period.

- *High rates of maternal tobacco use.*
  Despite a decade or more of intensive health promotion campaigns in the general population, the persistence of tobacco use by virtually half of all women giving birth to Aboriginal children remains unacceptably high and in urgent need of attention. These rates are uniform across all ATSIC regions and all levels of relative isolation.

- *High rates of early teenage pregnancy.*
  The high rate of early teenage pregnancy in Aboriginal women is a significant cause for concern. Early pregnancy imposes substantial biological and social risks to the infant and in very young mothers impairs her own growth and interrupts her schooling. Importantly, the care of children born to early teenaged mothers was more likely to be transferred, and to be transferred earlier, to a person other than the birth mother, which may pose long term risks for poorer outcomes later in life.

- *High rates of premature birth and low birth weight were confirmed.*
  The rate of low birth weight (<2500g) was almost double that of the total population, the result of higher rates of both premature birth and poor intrauterine growth.

- *Inadequate consumption of fresh vegetables throughout the State.*
  Of the four indicators of dietary quality, fresh vegetable intake was particularly deficient. This deficit occurred at *all* levels of relative isolation and was highest

for children 12–17 years. Within individual families, meeting the indicators of dietary quality was inconsistent, suggesting that food choices are seldom directed by a knowledge and desire for a healthy diet.

- *High rates of recurrent infections.*
  There was substantial co-morbidity of recurrent skin, ear, chest and gastrointestinal infection, particularly in areas of extreme isolation. The co-existence of different types of recurrent infections was associated with financial strain. Recurrent and discharging ear infections, which affected one in eight Aboriginal children, had a very significant impact on rates of hearing loss and rates of speech, language and learning problems.

- *Low prevalence of asthma in children living in extremely isolated localities.*
  The four-fold reduction in the prevalence of asthma in extremely isolated Aboriginal children confirms other reports observing this effect. The basis for this reduction, if better understood, may suggest strategies for prevention of this burdensome condition.

DEMOGRAPHIC DIVERSITY AND SOCIAL DISADVANTAGE

- In a population of about 66,000 Western Australian Aboriginal people, the median age for males is about 20 years and about 21 years for females and life expectancy 55 years and 63 years respectively.[1] In practical terms the impact of death, separation and divorce on the lives of Aboriginal children is striking: About 6 per cent of Aboriginal children under the age of three years are being cared for by someone other than their original parent(s) compared with 20 per cent for children aged between 12–17 years.

- Striking variations occur in the distribution of household family composition and in the care arrangements of children within these households across levels of relative isolation as well as age groups of Survey children.

- Within Western Australian ATSIC regions there are substantial variations in levels of isolation. This makes broad generalisations about Aboriginal families based on regional location hazardous without taking into account level of relative isolation.

- There are high levels of socioeconomic disadvantage within families as measured by carer education, employment, occupational skill level, and income. This is present across all family types whether sole parent, two parent or intergenerational extended families.

- The use of traditional Aboriginal languages is one marker of cultural preservation. The rates of inter-generational language loss appear to be in the order of 20 per cent in areas of moderate to extreme isolation. Rates of language loss appeared particularly high in areas of moderate isolation. This suggests that unless continued efforts are made to preserve, document, teach and encourage the use of Aboriginal languages, in a relatively short period this heritage will be lost to Aboriginal people and the world.

ACCESS AND BARRIERS TO HEALTH SERVICES

- Aboriginal children generally receive emergency health services if they need them. While there are variations in the immediacy of emergency service provision, this is an important confirmation that this aspect of service provision is broadly effective, considering the vastness of Western Australia.

- The overall rate of reported contact with doctors over a six month period is 10 per cent lower for Aboriginal children when compared with their non-Aboriginal counterparts in the Perth metropolitan area and 20 per cent lower in areas of high and extreme isolation.

- Isolation, carer education and carer Indigenous status are important, and *independent* predictors of a child's contact with a doctor. Compared with Aboriginal children living in Perth, Aboriginal children living in areas of high and extreme isolation are 66 per cent less likely to have had contact with a doctor in the previous six months. Carers with a higher level of education are more likely to have taken their child to see a doctor in the previous six months. Finally, Aboriginal children of non-Indigenous carers (85 per cent of whom were the birth mothers) were more likely to have had contact with a doctor in the last six months. No association was found between measures of financial strain and the likelihood of having contact with a doctor.

- The pattern of contact with dentists generally matched contact with doctors. Non-Indigenous carers and carers with higher levels of education were more likely to have taken their children to see a dentist in the previous six months. Children have access to dental services most commonly in areas of high (but not extreme) relative isolation and access to a vehicle was significantly associated with the likelihood of dental visits.

- As isolation increases, and the availability and access to doctors decreases, contact with nurses and Aboriginal Health Workers increases substantially. Children are more likely to be seen by nurses where their primary carer is Aboriginal, where there is no reported access to a vehicle, and where they are living in areas of increased socio-economic disadvantage. Contact with Aboriginal Health Workers followed this pattern and was also associated with high levels of family financial strain.

MAKING PROGRESS IN ABORIGINAL CHILD HEALTH POLICY

Many of the levels of morbidity and mortality in indigenous people of other nations are not as poor as those observed in Australia despite similar histories of colonisation.[2] For example, approximately thirty years ago indigenous peoples in Canada, New Zealand and the USA suffered similar high infant mortality rates to those observed in Australia. However, these countries have significantly reduced their rates of indigenous infant mortality relative to those in the Australian Aboriginal population and now the picture is different.

In Canada, the 1999 infant mortality rate in First Nations people was 8.0 per 1,000 live births – about 1.4 times higher than the total Canadian population. In the USA , these figures for American Indian and Alaskan Native populations are 9.3 per 1,000 live births, or about 1.2 times higher than the total USA population. In contrast, the infant mortality rate in Australian Aboriginal population was 13.0 per 1,000 live births or 4.6 times higher than the total Australian population.[3]

Although by no means on a par with the mainstream population, the health of populations of indigenous people in other countries similar to Australia has advanced for several reasons. For example, North American governments have a longer history of specialised health services for indigenous people, have spent more per capita, established better traditions of partnerships and involvement of indigenous people, and made genuine advances in recognising the past history of colonisation and dispossession. None of this has been perfect and much of it has occurred unnecessarily late. Much of this progress has been made over more extended post-colonial periods – Australian Aboriginal populations have, in relative terms, been colonised ‘recently’.

In Australia then, how should information about Aboriginal child health be translated into policies relevant to the future health and the health of the next generation of Aboriginal children? To address this question, data, the burden of its collection and policy environments that currently provide what is known about Aboriginal child health are discussed in this section along with models of health expenditure in light of the need for coordinated efforts by other sectors.

THE PROVISION OF BETTER AND MORE RELEVANT DATA ON ABORIGINAL HEALTH

Stemming from the 1991 recommendations of the Royal Commission into Aboriginal Deaths in Custody[4], it has now been a decade since the publication of the first national survey of Aboriginal and Torres Strait Islander people in 1994.[5-8] These data were notable for the inclusion of questions on a diversity of topics, including health. Since this first survey there has been an increasing effort to improve the quantity, timeliness and quality of information on Australia’s Aboriginal population.[9-11] Milestones in these efforts include the Indigenous components of the 1995 and 2001 National Health Surveys as well as the biennial reports on the health and welfare of Australia’s Aboriginal and Torres Strait Islander Peoples.[12-17]

THE BURDEN OF DATA COLLECTION

Amid developments in the provision of timely and better quality information, it remains the case that Australia’s Aboriginal and Torres Strait Islander people bear a disproportionately large burden of research and data collection relative to the non-Aboriginal population. Coupled with evidence of slow or negligible progress in achieving health outcomes that match those of the non-Aboriginal population, Aboriginal people have understandably questioned the value of both data collection efforts and, particularly, the efforts of researchers.[18] Tangible returns from data collection and research are either not seen or, when they are forthcoming, are seen to be unrelated to the initial data collection and research efforts.

In addressing this concern, government agencies have formulated policies governing health and medical research of Aboriginal Australians.[19, 20] These policies set out criteria for:

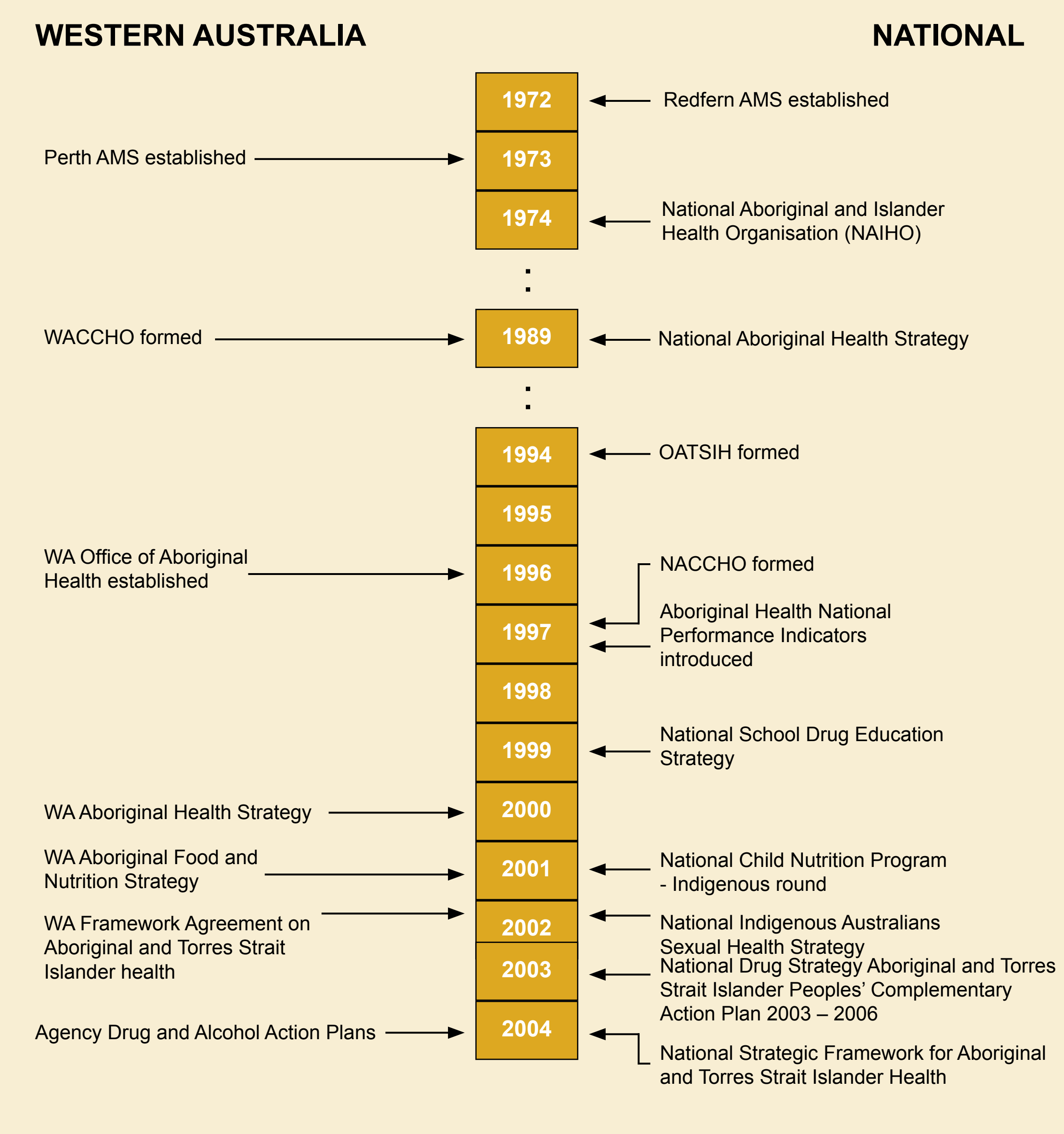
- the level and manner of engagement of Aboriginal individuals, communities and organisations in the creation, conduct and dissemination of research findings
- the demonstration of eventual benefits of the research
- the sustainability and transferability of the findings
- the proposed mechanisms that build Aboriginal capabilities through the conduct of and participation in the research
- the way in which the proposed research address priorities and significant health issues identified by Aboriginal people and their communities.[19]

With respect to the significance of any intended research, a strategic plan has been developed entailing appropriate leadership by, consultation with, and input from Aboriginal researchers, communities and leaders. This strategic research plan sets out a ‘roadmap’ of priorities to advance Indigenous research deemed relevant to Aboriginal and Torres Strait Islander peoples.[21]

POLICY FRAMEWORKS FOR ABORIGINAL CHILDREN

At present there is no national policy framework *specific* to Aboriginal child and adolescent health (see Appendix E). The Office for Aboriginal and Torres Strait Islander Health (OATSIH) is currently developing an Aboriginal and Torres Strait Islander Child and Maternal Health Policy in response to priority areas derived from the National Strategic Framework for Aboriginal and Torres Strait Islander Health. Currently, Aboriginal child and adolescent health strategies are covered under a number of generic frameworks developed by both Federal, and State and Territory jurisdictions (see Figure 5.1).

FIGURE 5.1: TIMELINE OF ABORIGINAL HEALTH FRAMEWORKS



Priority areas derived from the National Strategic Framework for Aboriginal and Torres Strait Islander Health are important because this framework represents the first systematic effort to address many of the factors that have prevented previous policies from achieving intended health gains.[22]

A key element of the National Strategic framework is the Primary Health Care Access Program (PHCAP). Because the Commonwealth, State and Territory Governments share responsibility for the provision of primary health care services, PHCAP was established as a mechanism for overcoming structural impediments in the equitable delivery of comprehensive primary health care for Aboriginal people. This has critical implications for child health because primary health care is the principal form of care that children receive and is the foundation on which prevention is built. The shortfall in health care service utilisation and access documented in the Western Australian Aboriginal Child Health Survey is one important indicator of why progress in prevention remains slow.

For most Aboriginal people, particularly those living in rural and remote areas, primary health care has traditionally been provided through Aboriginal Medical Services or through State public hospitals. Where the State Government has provided these services, it has generally been done in the absence of general practitioners and other private or community based providers. State hospitals are geared to provide acute and in-frequent episodes of care. They do not have the capacity and systems of care to ensure follow-up, ongoing monitoring for chronic disease management, protocols for opportunistic screening, and active recall to deliver comprehensive primary health care.

The Primary Health Care Access Program (PHCAP) is being progressively implemented in States and Territories in selected regions where regional planning forums have jointly completed a comprehensive primary health care plan, and in the four former Aboriginal Coordinated Care Trial Sites. Since the program was announced in the 1999–00 federal budget, its total annual recurrent funding has increased to $54.8 million in 2003–04. The PHCAP program was established in Western Australia through an Australian/State Government memorandum of understanding and is currently being implemented in two sites in the Kimberley region to address the following objectives:

- Increasing the availability of appropriate primary health care services where they are currently inadequate
- Reforming the local health care system to better meet the needs of Aboriginal people
- Empowering individuals and communities to take greater responsibility for their own health.

Finally, the National Strategic Framework is supported by two recent policy initiatives: 1) the NHMRC '*A Healthy Start to Life'* Policy Framework for Aboriginal and Torres Strait Islander Research [23], and 2) the report to the Council of Australian Governments (COAG) *Overcoming Indigenous Disadvantage: Key Indicators 2003.*[24] These initiatives share a common focus on the need for concerted action both across and beyond the health sector to address the complex and inter-related factors that contribute to the causes and persistence of health problems amongst Aboriginal and Torres Strait Islander Peoples.

HEALTH EXPENDITURE AND ABORIGINAL CHILD HEALTH

The most recent Indigenous health expenditure data estimated that in 1998-99 for each dollar spent on health services for other Australians, $1.22 was spent on Aboriginal and Torres Strait Islander people.[25] During 1998–99 an estimated total of $1,245 million was spent on health services used by Aboriginal and Torres Strait Islander peoples. This was 2.6 percent of the total expenditure on health by the Commonwealth, State and Local governments and private sources during the same period. A breakdown of this total funding for Aboriginal health showed that State Governments provided 48 per cent, Commonwealth funding to States provided a further 25 per cent, other Commonwealth programs provided 21.5 per cent and Local Governments provided 0.5 per cent. The remaining 5 per cent came from private funding sources including out-of-pocket payments by patients, health insurance funding and workers compensation through various State Commonwealth, Local Government and private sector programs.

Funding allocations by the WA State Government, to both mainstream and community controlled health services, have not been based on population and geographic cost factors. This poses a major impediment to progress in Aboriginal health. Furthermore, allocations for mainstream and community controlled services have been independently planned. These disconnected processes have resulted in allocations that are not based on relative need and have increased duplication of services and the risks of inadequate provision for those in greatest need.[26]

Significant funding inefficiencies do arise because of differences in the capacity of the community-controlled sector and State health services to charge Medicare for patients using primary health care services. State services are unable to make charges on Medicare where patients attend hospital outpatient services without referral or where the State provides community health services in remote communities.[27] It has been suggested that State and Commonwealth funds should form a single pool of resources allocated according to a model that reflects the Aboriginal population and their needs, geographic and other cost factors, and is linked to joint planning processes.[26]

A variety of weighted capitation formulae have been proposed which attach weights to Aboriginal and Torres Strait Islander and other populations with relatively poor health outcomes.[28, 29] However, putting this into practice has been difficult for two reasons. First, there is a critical lack of good population data on the distribution of Aboriginal and Torres Strait health needs within and between States and Territories; and second there are difficulties in determining the appropriate adjusting weights that respect the views and values of Indigenous and non-Indigenous Australians.

An innovative weighted capitation approach to Aboriginal and Torres Strait health resource allocation has recently been proposed and tested for future distributions to ATSIC regions within Western Australia.[30, 31] This model by Houston (2003) addresses a number of the recommendations of the 2001 Commonwealth Grants Commission Report on Indigenous Funding. Most particularly it provides a methodology that includes the participation of Aboriginal and Torres Strait Islander people in decisions affecting funding distribution and service delivery. It has a particular focus on outcomes, recognises the importance of capacity building within Indigenous communities and ensures a long-term perspective to the design and implementation of programs and services. Thus it provides a secure context for setting goals. It has demonstrated relevance and applicability and could be extended to take account of the specific provision for child health services needed to increase capacity to benefit in the longer-term. It could also be modified to take advantage of the developments of the Level Relative Isolation index (LORI) developed in the WA Aboriginal Child Health Survey.

RESOURCE ALLOCATION METHOD FOR ABORIGINAL HEALTH (2003)

Four components are weighted and aggregated to allow for the preference of Aboriginal Peoples to determine what is to be achieved and the good which is being sought with respect to expenditures in health.[30]

RESOURCE ALLOCATION METHOD FOR ABORIGINAL HEALTH (2003) (Continued)

- The first component is an efficiency measure that estimates the potential benefit that additional resources will provide i.e. the capacity to benefit (CTB).
- The second is an equity component that involves a weighting of CTB to reflect the fact that not all nominally equal benefits will be valued the same (and independently of the relative disadvantage) by all recipients. Weighting is achieved by considering local disease prevalence and environmental health data to establish three indices: an environmental and morbidity index (EMMI), a social mortality and morbidity index (SMMI), and a lifestyle mortality and morbidity index (LMMI).
- The third component then addresses the fact that some communities have more developed infrastructure (including management, economic, social and human resources) that gives them greater community capacity to benefit from additional resources.
- The fourth component is a weighting adjustment to reduce inequities in access arising through both geographic remoteness and cultural barriers to accessing health services. These include weightings based on SEIFA indicators of relative disadvantage, the costs associated with remoteness as measured by ARIA, primary care costs and hospital costs for Aboriginal and Torres Strait Islander people in different geographic regions, a regional price index based on the town index developed by the Department of Commerce and Trade and a travel cost index based on established travel costs for medical treatment.

RESOURCE DOMAINS FOR ABORIGINAL CHILD HEALTH AND DEVELOPMENT – THEIR CREATION AND MAINTENANCE

Aboriginal child health is inextricably tied to processes of human development and growth. Moving from better quality information to relevant and achievable Aboriginal child health policies demands understanding and commitment to this. As a result, any policy framework for Aboriginal child health (indeed, the health of all children) needs to influence several principal resource domains for child development:

- the physical environment (ie housing, clean water, sanitation and nutrition) to meet the basic necessities of living
- the levels of family income available to support the development of children
- the creation of human and psychological capital available to support child development
- the social capital available to individuals living in the community and wider society.

Findings in this current volume inform some, but not all, of these areas.

ADEQUACY OF THE PHYSICAL ENVIRONMENT

All Australians should have access to satisfactory living conditions. These conditions include appropriately maintained and safe housing, clean air and drinking water, suitable food preparation and storage facilities, heating and cooling, effective sewerage, safe removal of waste and control of pests. Within this volume the data show that significant levels of over-crowding exist, especially for families living in isolated areas. This and other aspects of housing and community infrastructure and their relationship to the health and well being of Aboriginal children and families will be detailed in future volumes of the Survey findings.

FAMILY INCOME TO SUPPORT THE DEVELOPMENT OF CHILDREN

Aboriginal people earn on average $221 per week less than their non-Aboriginal counterparts ($364 vs $585)[32] and Aboriginal children are more likely to be raised amid significant levels of financial strain relative to non-Aboriginal children.

Data from the Aboriginal Child Health Survey show only weak associations between measures of income and the health status of children. There are stronger associations between carer education and health status of children, consistent with other findings documenting the generally weak relationship between income and physical health.[33] However, some aspects of this relationship at a population level require further comment.

First, children born in low-income families are far more likely to grow up at increased risk for a range of poor developmental outcomes including chronic physical illnesses. Poor health is indisputably linked with absolute poverty and deprivation [34] and the WA Aboriginal Child Health Survey show considerable levels of poverty within Aboriginal households. Empirical evidence, however, also shows this relationship to be complex. Low income has more profound effects early in a child's development than later – particularly as this concerns access to and purchase of material goods and services used specifically for child development. This is underscored by observations that caregiver education, work experience, and parenting skills (i.e. human capital) show a stronger predictive relationship to child development and health than does income per se.[35] These observations underscore the importance of human capital and its relationship to child health and development (see below).

Second, there is a broader relationship between the income inequality experienced by Aboriginal families as it is set within the total population of Australia. The relationship between income inequality and health has been extensively investigated.[36-39] Income inequality is associated with higher population rates of mortality, infant mortality, death from cardiovascular disease and homicide. Exactly why this should be so remains uncertain. However recent research has shown income inequality is more likely to occur where there is low social capital.[37, 38] This again is a dynamic relevant to Aboriginal children in their families in their communities and to the broader Australian society.

THE CREATION OF HUMAN CAPITAL AVAILABLE TO SUPPORT CHILD DEVELOPMENT

A long life, individual physical capacity and health, education and acquired skills, experience and practical knowledge and parenting skills comprise what is commonly referred to as human capital.[40, 41] Stocks of human capital are measured in a variety of ways and are significantly related to child development.[42] There are critical differences in levels of human capital built in mainstream families and in Aboriginal families:

- *Life expectancy*. All resource domains are affected by premature death. Resources for child development in the mainstream Australian population have been built within the context of a steadily increasing lifespan.[32] It is difficult to underestimate the impact of early death particularly on the creation, sustainability and transmission of human capital within and between families. Australian life expectancy for a boy and girl born in 2001 is 77 and 83 years respectively – an increase since 1991 of three and two years. In contrast, at the beginning of the new millennium it is not possible, with any agreed precision, to state the life expectancy of Aboriginal Australians.[32] The estimate of the gap between the total life expectancy of the population and the Aboriginal population is not known precisely. However, there is no doubt that life expectancy for Aboriginal people is significantly shorter relative to life expectancy in the total population. Aboriginal death rates are higher than for the total population in all age groups, and highest, by a factor of five relative to the total population, in the age group 35–54.[32]

- *Infant mortality***.** Infant mortality in the Australian population between 1999–2001 was estimated at 6 deaths per thousand. In this same period Aboriginal infant mortality was 16 deaths per thousand – a rate similar to that of the Australian population over thirty years ago.[32]

- *Adult chronic health.* Over half of all Aboriginal people over 30 years of age already have chronic disease or one of the precursors to chronic disease, such as hypertension, impaired renal function or glucose intolerance. Three quarters of Western Australian Aboriginal deaths are accounted for by five conditions: circulatory disease (30 per cent), cancer (11 per cent), respiratory disease (10 per cent), injury and poisoning (15 per cent) and diabetes (8 per cent) and similar statistics are evident nationally.[26] The incidence of deaths from these diseases is significantly higher (6–8 times) than the rates for non-Aboriginal people.[43]

- *Education*. Education is a critical component of human capital for its role in enabling access to employment and income – particularly as modern economies move to emphasising the need for specialist knowledge and skills in technology and in industry. However, human capital also plays a role within the family and community. For example, higher education is associated with better parenting skills (particularly mothers) and better academic and mental health outcomes. Better knowledge and the use of income to improve the material circumstances relevant to a child's development (particularly language, cognitive and intellectual capacities) are significant benefits derived from human capital building.[35] About 48 per cent of Aboriginal people aged 15–19 years are not attending formal education. This compares with about 24 per cent of non-Aboriginal people.[32]

- *Health impacts on child rearing.* The health of adults is critically linked to the health and well being of their children. For Aboriginal children, available population data as well as data from this survey show that their carers are more likely to be young, to develop chronic diseases or experience injury and to succumb to an early death. For example, in the Western Australian Aboriginal Child Health Survey a total of 47 (2 per cent) birthmothers had died by the end of 2002. Additionally, in the approximately eighteen-month period after data collection for the Survey, fourteen primary carers and eleven secondary carers of the Survey children had died. In practical terms the direct impact of death, separation and divorce on the lives of Aboriginal children is striking: About 6 per cent of Aboriginal children under the age of three years and 20 per cent of children aged between 12–17 years are being cared for by carers other than their original parent(s).

Human capital resources and their role in the health of Aboriginal children are only partially described in this first volume. The interplay of carer human capital resources – particularly parenting, carer physical health and education – as well as the mental health status of carers and children (ie psychological capital) are components of potentially important developmental pathway to be explored in subsequent volumes.

SOCIAL CAPITAL

By social capital we mean the integrity of social structures that engender community safety, trust, reciprocity, and inclusion.[39, 44] Cultural traditions, practices and the networks also comprise part of social capital. Social capital operates at the community, regional and national level. As Lomas (1998, p.1181) pointed out, ' . . . the way we organise our society, the extent to which we encourage interaction among the citizenry and the degree to which we trust and associate with each other in caring communities is probably the most important determinant of our health'.

Despite their history and the extent and speed of change following colonisation, cultural heritage and traditions have imparted significant resiliency to some aspects of social capital for Aboriginal people. However there are significant threats and barriers to the creation of new social capital within and between Aboriginal and non-Aboriginal Australians.

Data from the WA Aboriginal Child Health Survey show marked variations in the preservation of cultural heritage – particularly when measured by traditional language preservation. There is an almost total cessation of the use of traditional Aboriginal languages in all but the more isolated areas. The intergenerational loss of traditional language use is marked, particularly in transition zones of moderate isolation – although even the most isolated areas show some decline in traditional Aboriginal language use. If traditional language use is considered as a measure of cultural integrity, and if cultural integrity is a critical component of the stocks of social capital available to Aboriginal people, then there is an urgent need to reverse this loss, and to restore and preserve Aboriginal cultural heritage through language.

A primary barrier to the creation of social capital is the level of violence some Aboriginal people experience within their families, within their own communities, and through contact with non-Aboriginal society. This fundamental barrier precludes the establishment of safety, trust, reciprocity, and inclusion. Beyond violence are the social and structural barriers that deny Aboriginal people full economic and social participation in Australian society. Some of this is apparent in the WA Aboriginal Child Health Survey data showing differential access to health services by Aboriginal and non-Aboriginal carers of Aboriginal children. These differences are not associated with education or location *per se*.

Finally there are symbolic barriers to the creation of social capital. This includes the recognition of the impact of colonisation and the lived experience of Aboriginal people in this history. It has been suggested that past colonial paternalism, an official policy of assimilation, and the lack of formal recognition through treaties have acted to create and reinforce a sense of powerlessness in Australian Aboriginal people to a greater extent than is seen in indigenous groups in other countries.[2] Ring and Firman point out that treaties offer a powerful means of affirming two important determinants of health which are linked to disadvantage: the collective sense of control that people have over their lives and the sense of hope that this creates.[45] These are fundamental to the creation of social capital.

SUMMARY

Mainstream policies have operated well to produce measurable advances in many of the key indicators of Australia's progress.[32] Policies governing access to safe and healthy housing, mandated education, equitable access to jobs and material benefits, ownership of land and housing, a stable and nutritious food supply, law and order, and access to and delivery of health services have led to real increases in resource domains for the development of children. At a population level, Australia has secured a safe and stable society with healthy, educated families in which to rear children and through which more (rather than less) developmental resources for children may be mobilised on their behalf. This has allowed developmental 'bootstrapping' from generation to generation.

Currently, such benefits are not being realised for Aboriginal children or, where they are, progress is too slow relative to the urgency of the need. Relationships among income, employment and education on one hand, and health outcomes on the other, show either negligible or modest associations. This is not to say that these social circumstances are unrelated to Aboriginal health, but instead reflects 1) the low average level of these resources and their low level of variability (i.e. 'spread') in measures such as income, and 2) circumstances in the social and physical environment that disrupt these associations for large segments of the Aboriginal population. Many of these latter aspects will be the focus of the next volume of findings.

SETTING POLICY DIRECTIONS

Breaking the cycle of Aboriginal poor health and disadvantage requires a strategic national focus on the importance of early child health and development. As Young notes, the reasons for this go beyond humanitarian concerns for those least able to look after themselves.[46] New insights from neuroscience, evidence from longitudinal studies and large scale intervention trials clearly demonstrate the benefits accruing from nurturing the health and development of children in their earliest years. Internationally, this is now recognised as possibly the single most effective strategy currently available to governments and communities for reducing the worst effects of poverty and breaking the cycle of inter-generational disadvantage.

Three issues have posed significant barriers to achieving gains in the population health of Aboriginal and Torres Strait Islander people. These include:

- deficiencies in Aboriginal health policy, planning and system coordination
- inadequate funding for Aboriginal health and inadequate accountability arrangements for delivering health progress at the national, state and regional levels
- too few, inadequate and un-coordinated levels of appropriate mainstream and community controlled services for Aboriginal people.

Over-arching all of these issues, is the slow progress in overcoming Indigenous disadvantage. This volume of findings from the Western Australian Aboriginal Child Health Survey shows the impact of this disadvantage on the human capital resources of Aboriginal people and their communities. Levels of disadvantage limit the change that can be expected from interventions seeking individual behaviour change without broader cultural, socio-political and other change *beyond the health system* to reduce Indigenous disadvantage.[47]

Policy makers frequently examine research findings and ask, 'What should we do?' Certainly the Survey findings describe important health goals to achieve better Aboriginal child health. These include: lowering the rate of early teenage pregnancy, improving maternal health and well being, lowering the rate of preterm and low birth weight infants, lowering rates of alcohol and tobacco use – particularly in pregnant women, reducing infection rates, improving nutritional knowledge and access to nutritious food – particularly fresh vegetables, and improving rates of contact of Aboriginal families and children with health services – particularly comprehensive primary health care services.

More importantly however, policy makers wishing to improve Aboriginal child health must ask 'How should we take action and with whom?' In the absence of an integrated Aboriginal child health policy based on sound theories of human development and measured against the population burden of disease, policy development and implementation will remain piecemeal and reactive.

Child health and development is a responsibility and obligation that is shared across the Australian population. The child health problems documented here are burdensome. They compromise not only the current generation of Aboriginal children and their entitlements to grow up well, but pose significant barriers to future generations of Aboriginal children and their families. Self-determination in how these problems are addressed is an essential step in their solution. However, recognising the importance of self-determination does not preclude opportunities for partnerships across the Australian health system and across the Australian community. The key is to focus on the interests of children, their families and communities and place these interests at the centre of initiatives required for progress to be achieved.

The Survey confirms many of the directions taken by the Council of Australian Governments' strategy for overcoming Indigenous disadvantage.[24] The findings show why no single government agency can be responsible for creating the policies and programs that will make for overall improvements. This means that where the health system takes action, it will need to do so with sectors other than health. This includes developing health policy for children.

With this in mind, actions are now required to:

- Develop and implement an evidence-based Aboriginal child health policy which targets early child development, identifies strategic areas for action.
- Acknowledge Aboriginal leadership and self determination in the long term planning, funding and implementation of this policy.
- Develop partnership arrangements between and within Aboriginal and mainstream communities based on mutual trust, respect and commitment.
- Increase primary health care services to address the documented shortfall in service provision to Aboriginal children.
- Implement prevention interventions that reflect the relationship between maternal and early child development, adult health and levels of human and social capital.
- Negotiate joint accountability across government departments for achieving policy based objectives.
- Develop funding models weighted both in proportion to the burden of illness and accounting for the costs of service delivery.
- Establish a culture of measuring and reporting progress against mutually defined objectives, benchmarks and indicators of performance.

CONCLUDING COMMENTS

Findings from the WA Aboriginal Child Health Survey present a comprehensive picture of the population prevalence of key health conditions and disabilities affecting children, their associated modifiable risk factors, along with rates of service use and barriers to their access. Importantly, these are observed in the context of new descriptions of the demographic diversity and social disadvantage that characterises the contemporary circumstances of Aboriginal children and young people living within urban to extremely isolated settings.

It is well recognised that underlying the main diseases affecting Aboriginal people is the history of colonisation and its inexorable destruction of Aboriginal people, their culture, and their society.[48] Introduced diseases, termination of ownership and removal from traditional lands and food sources and, for some, removal from families of origin, fuelled a consequent collapse of Aboriginal societies and economies. These forces are not simply a matter of past history but, in reality, they remain active in the current causal pathways to present day Aboriginal mortality and morbidity. This is seen clearly in assessing some of the critical resources for child development.

The population perspective that emerges through these data illustrates why health systems and health services alone cannot provide the traction for progress. The principal determinants of Aboriginal health, and Aboriginal child health specifically, lie outside the immediate influence of the health system. They are linked to the fundamental factors underpinning human development. This highlights why progress in Aboriginal health is critically dependent upon engagement of Aboriginal communities along with concerted, coordinated actions across governments and sectors to develop and implement policies that reflect this fundamental reality.

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Appendices

APPENDIX A – A GUIDE TO THE SURVEY FIELDWORK INSTRUMENTS

OVERVIEW OF SURVEY FORMS

Survey Form	Information about:	Information provided by:	Information collected by:	Number of forms required:
1 HOUSEHOLD RECORD FORM (HRF) Names, sex, age, date of birth, relationship to carers, State/Territory of birth and self–reported Indigenous status of each person in the household. Primary and secondary carer(s) of each child. Duration that each child has lived with primary carer. Relationships within the household. Any other children aged 3–17 years who usually live at that address but who are temporarily away.	Number of people in household and how they are related	Carer1	Filled in by interviewer	1 per family
2a CHILD HEALTH QUESTIONNAIRE (CHQLK) A form to collect information about children aged birth to 3 yrs 11 months.	Child health information on children 0–3 years	Carer1/Carer2	Filled in by interviewer	1 for each child 0–3 years
2b CHILD HEALTH QUESTIONNAIRE (CHQBK) A form to collect information about children aged 4 years to 17 yrs 11 months.	Child health information on children and youth 4–17yrs	Carer1/Carer2	Filled in by interviewer	1 for each child/ youth 4–17 years
3a. PRIMARY CARER'S FORM (CARER1) A form to collect information about a carer who is the main person looking after a given child.	Family and community circumstances. Family life & parent health. Carer's background and experiences.	Carer1	Filled in by interviewer	1 per family
3b SECONDARY CARER'S FORM (CARER2) A form to collect information about another carer of a given child.	Carer's background and experiences	Carer2 or Carer1	Filled in by interviewer	1 per family
4. YOUTH QUESTIONNAIRE (YSR–S/YSR–I)) A form to collect information about young people. Two administration methods are available: YSR–S (self administered) YSR–I (administered by interview)	Youth aged 12–17 years	Young people 12–17 years	Filled in by youth or interviewer	1 for each youth 12–17 years
5. SCHOOL & TEACHER QUESTIONNAIRES	Children & youth attending school	Teachers and school leadership team	Filled in by teachers & school leadership team	1 for each child at school (consent required)

CONTENT OF THE SURVEY INSTRUMENTS

1. Household Record Form (HRF)
Who is currently living in the household
Which children do we need to collect information on
Are there other children temporarily away

2a. Child Health Questionnaire 0–3 years (CHQLK)
Information about birth mother
Feeding, sleeping and early development
Immunisation and health care
Common chronic illnesses
Dental health
Breathing and asthma
Separations, accidents & hospitalisations
Disability and functional impairment
Emotional and behavioural problems
Use of medical and other services
Use of day care
Parenting practices

2b. Child Health Questionnaire 4–17 years (CHQBK)
Information about birth mother
Immunisation and health care
Common chronic illnesses
Dental health
Breathing and asthma
Separations, accidents & hospitalisations
Disability and functional impairments
Use of medical & other services
Use of day–care, kindergarten & preschool
School and educational progress
Emotions, problem behaviours and social development
Parenting practices
Diet and nutrition
Other concerns about this child

3. Carer’s Questionnaire (CARER1 and CARER2)
Language(s) spoken at home
Participation and involvement in Aboriginal activities and culture
Carer’s education
Employment and training
Benefits, pensions & income support
Family financial strain, carer’s income
Family stress from alcohol, gambling & violence

Experience of forced separation or relocation
Positive family interaction and family resilience*
Family life stress events (last 12 months)*
Personal and social supports*
Religious beliefs and practice of religion*
Housing arrangements and housing standards*
Perception of local community problems*
Adequacy of and access to community amenities and services*
(* Asked of Primary Carer only)

4. Youth Questionnaires (YSR–I and YSR–S)

Knowledge of Aboriginal language, culture and heritage
Health risk behaviour (smoking, sex, alcohol, drugs)
Diet and nutrition
Breathing and asthma
Strengths and difficulties questionnaire (social skills, ADHD, behaviour & emotional problems)
Depression and suicidal behaviour
Perceptions and experience of school
Experience of racism and bullying
Exposure to family violence, alcohol & gambling
Physical fitness and participation in sport
Religious beliefs and practice of religion
Special friends/mates and peer influence
Family support and encouragement
Anything else you would like to tell us

5a. Principal’s Questionnaire: School Details

School contact information, school system and year range
Student enrolment details (Aboriginal & non–Aboriginal)
Staff composition
Non–teaching staff (Aboriginal & non–Aboriginal)
Support staff external to the school (Aboriginal & non–Aboriginal)
Proportion of new (inexperienced) teachers
Implementation of Professional Development and curriculum activities for Aboriginal education
Principal’s ratings of:
  - School, social & community problems affecting the overall school environment
  - School morale and pastoral care arrangements
  - School’s resources for education of Aboriginal students

School has access to an Aboriginal Islander Education Officer (AIEO)
School has an Aboriginal Student Support and Parent Awareness Committee (ASSPA) Committee

5b. Principal's Questionnaire – Student Academic Details

Main language spoken – at home, in the playground, in the classroom

Rating of overall academic performance

Achievements in literacy and numeracy

Duration of current enrolment at this school

Attendance record this year

Boarding, hostel or day student

Removal from class for behaviour problems

School suspensions & exclusions

Use and need of educational support services:

(Visual impairment, hearing impairment, intellectual disability, emotional or behavioural disturbance, learning disability, talented & gifted, physical disabilities, speech &/or language disability)

5c. Teacher's Questionnaire – Student behaviour

Strengths & Difficulties Questionnaire (SDQ)

- Social skills
- Hyperactivity and attention problems
- Conduct problems
- Emotional problems

Duration and severity of emotional/behaviour problems

Functional impairment (peer relations, classroom learning)

Burden and need for professional help

5d. Teacher's Questionnaire* – Student Skills

Matrices – Non–verbal reasoning skills

Word Definitions – English language proficiency

(* For high school students, a school counsellor, form teacher, year head, or year coordinator completed this section)

APPENDIX B – SAMPLE DESIGN

INTRODUCTION

The WA Aboriginal Child Health Survey (WAACHS) was based on the WA Child Health Survey of mainstream children that was conducted in 1993. The sample design has a number of similarities to the design of the 1993 survey, but some changes have been necessary to restrict the scope of the survey to Aboriginal and Torres Strait Islander children.

The Australian Bureau of Statistics undertook the initial sample design work.

POPULATION

In scope for the survey were families in WA with one or more children under the age of 18 years who were identified as being of Aboriginal or Torres Strait Islander descent. The design used was a stratified multi-stage sample using an area-based frame. Area-based sampling had to be employed as there is no list of Aboriginal children from which a sample could be selected. The frame was compiled from the 1996 census and included all census collection districts (CDs) in WA where there were at least two children of Aboriginal or Torres Strait Islander descent enumerated in the 1996 census. CDs where less than two Aboriginal children were living at the time of the 1996 census were excluded to reduce enumeration costs. Of 3,480 CDs in WA in the 1996 census, only 1,690 (48.6 per cent) met this inclusion criterion. Based on 1996 census counts, this would have excluded 1.4 per cent of the population of in-scope children, who were living in CDs where there was only one Aboriginal child.

A special feature of the survey process was the need to search each sampled census district by going door to door to identify eligible families. This followed the National Aboriginal and Torres Strait Islander Survey (NATSIS) methodology and allowed a comprehensive identification of eligible families who lived in a wide range of circumstances, including those Aboriginal families living in areas with otherwise ‘low prevalence’ Aboriginal representation.

STRATIFICATION

The frame was stratified into four regions that were combinations of ABS Statistical Divisions (SDs):

Perth Metropolitan Area	(SD 505)
South West	(SD 510, 515, 520)
Central	(SD 525, 530, 535)
Far North	(SD 540, 545)

Within strata, CDs were selected with unequal probability without replacement, where selection probabilities were based on a cost model. This cost model took into account the number of Aboriginal or Torres Strait Islander children from the 1996 census, as well as the proportion of families that had one or more children as a measure of the screening load required to find in–scope children and families. The CD selection also excluded CDs that were selected in the ABS Monthly Population Survey.

Within selected CDs, dwellings were selected using systematic sampling without replacement. The field interviewers conducted the dwelling selection. The first step involved listing all the dwellings in a CD starting at a randomly chosen start point. A skip was run through the listing to select dwellings that were then screened in order to find in-scope households. The size of the skip depended on the number of families with Aboriginal children within the selected CD. Overall, 71 per cent of selected CDs had a skip of 1, i.e. where all listed dwellings were screened in search of in-scope families. These were CDs where the number of families with Aboriginal children was small. All in-scope children within selected in-scope families were then included in the sample. The survey interviewers knocked on 139,000 doors to find the survey sample families.

Although the survey team allowed for the possibility of multiple families or households living within a single dwelling, in accordance with standard ABS practice, the experience of the survey was that this distinction was not required in practice.

SAMPLE UNDER–ENUMERATION AND TOP–UP SAMPLES

The original sample included 360 CDs selected according to the above methodology. However, these CDs yielded significantly fewer than the expected number of in-scope families and children. As a result, two additional top-up samples were selected increasing the overall number of CDs selected to 786. The top-up samples were selected in a similar manner to the original selections.

Investigations into the undercount have suggested that one contributing factor was the mobility of the population and the time lag between the 1996 census and the field work for the survey which was carried out in 2000 and 2001. A study of movements in public housing stocks has suggested that perhaps somewhere between 12–15 per cent of the target population moved to CDs that were not included in the sampling frame and had no chance of being selected. Sample under-enumeration is the subject of a separate study and technical report.

TREATMENT OF NON–RESPONSE

The survey was conducted on a voluntary basis and achieved a high response rate, around 85 per cent. Non-response could occur at three levels — at the family level where a selected family could not be contacted or chose not to participate; at the individual form level where, for instance, completed questionnaires may be obtained from the parents but the youth self–report form was not obtained; or at the level of the individual question. Non–response at the first two levels were dealt with by means of weighting adjustments, with a separate set of weights being computed for each questionnaire. Item–level non–response was dealt with by means of imputation of missing values. A careful investigation of item non–response rates was undertaken, and forms that had a high proportion of data items with missing values were treated as non–respondents at the form level, and excluded from the analysis.

WEIGHTING

To assess overall non-response and under-coverage bias (due to possible migration of families out of the sampling frame) the distribution of the sample was compared with figures obtained from the 2001 census for a range of demographic variables, including sex, region, age, ability to speak an Aboriginal language, school attendance, carer education, carer income, household size, dwelling type, dwelling ownership and tenancy arrangements. Family structure was postulated to be an important variable, based on the experience of the 1993 WA Child Health Survey[1].

Unfortunately it was not possible to consider it in the weighting process due to limitations in census processing and output.

Of these factors, significant differences were found between sample and population distributions according to child's age, and number of persons living in the household. From age 12 years to age 17 years there was a continuing decline in representation in WAACHS. By age 17 years, participation in the survey was 40 per cent lower than expected based on census figures.

The survey also had a lower proportional representation of children living in small households. These factors were also found to be associated with survey participation in the 1993 WA Child Health Survey.[1] None of the other factors tested were found to be associated with response rate.

To adjust for differential non-response, post-stratification weighting was employed. However, because of the small size of the population and the number of factors involved, the weights were calculated using the generalised raking procedure of Deville and Särndal (1992).[2] Within survey strata (i.e. regions), weights were calculated to sum to marginal totals by age of child, sex and number of people living in the household. This procedure sets out to determine the set of weights that will sum to the correct benchmark population totals that minimise the difference between the final survey weights and the initial survey weights, based on the probabilities of selection.

Benchmark totals by age (in single years) and sex, by region were provided by the ABS from the Preliminary Estimated Indigenous Resident Population series, as at 30 June 2001 (ABS unpublished data). As estimated resident population benchmarks were not available by household size, these were estimated from 2001 census counts, by applying an adjustment procedure that included allowances for census under-enumeration and imputation for non-response on the census forms.

One set of weights was determined for the sample children, and a separate set of weights was calculated for the youth self-report data that achieved a lower response rate than the information collected from parents. The child weights were used as a basis for calculating the carer weights, with the harmonic mean of the child weights used to calculate the carer weight, after adjusting for non-response among carers. This procedure was necessary as there was no effective way to derive an independent population benchmark for carers of Aboriginal children.

Once weights were determined, estimates were produced as simple weighted sums of quantities of interest, and percentages and proportions of weighted sums as appropriate.

IMPUTATION

Almost all of the items collected in the WAACHS have some level of item non–response. Very few questionnaires are complete for every item. Item level non–response often arose in cases where the respondent did not know the answer to a particular question. While each survey form contained hundreds of data items, most forms only had missing or unknown responses for a handful of data items. In these cases it would be wasteful to exclude entire forms because of the lack of a small number of data items. For most of the data items there was only a small amount of item level non–response. It was decided to impute for non–response as generally speaking the low level of non–response has minimal substantive effect on the analysis, but the inclusion of a 'not stated' category in each table complicates the presentation or results, particularly when calculating ratios and percentages.

Random hot-deck imputation was used for imputing non-response at the item level. Imputation classes were formed based on age, sex and remoteness. Then within each imputation class, for each non–respondent a donor was chosen at random. The donor's response was then used to impute the value for the non–respondent (Kalton, 1983).[3]

This procedure doesn't add extra information about the non–respondents, but serves to fill out the data set to make analysis and interpretation of the results more straight forward. To prevent imputed values affecting the analysis in any substantive way, a maximum cut-off of 10 per cent of the applicable responses was set as a limit. If the level of non–response for any item exceeded this limit, no imputation for that item took place, and categories 'Don't know' and 'Not stated' were maintained and are presented in the published results. As sequencing of the questionnaires limits the sub-population answering some items on the survey, this cut–off was applied at the sub-population level. For instance, suppose that question one asks 'Are you the natural mother of the child?' and question two asks 'How long did you breast feed this child?'. If more than 10 per cent of the natural mothers either answered, 'Don't know' or didn't provide an answer no imputation would take place for this item. There was only a small number of items where this limit was exceeded.

No imputation was undertaken for basic demographic information recorded on the household record form (HRF). Also imputation was not performed for the percentage of cases that did not link to administrative records. Where linked administrative data are used in the analysis, figures relate only to the proportion of participants who were successfully linked to the relevant databases. Also no imputation was done for missing data where it existed within the administrative databases.

ESTIMATION

Because of the complex nature of the sample design it is not possible to derive a simple closed form for the variance of survey estimates. The survey has many features of modern complex survey designs with stratification, multiple stages of selection, and unequal selection probabilities. The survey design differs from many clustered survey designs in that, due to the nature of the distribution of the population, the sample size per CD varies significantly between CDs.

Wolter (1985)[4] described the ultimate cluster variance estimation method (UCV) and demonstrates that it produces unbiased variance estimates from multi-stage sample designs where the first stage of selection is performed with replacement. This method of variance estimation has been implemented in common statistical packages such as STATA and SAS, along with a finite population correction factor to adjust for bias where the first stage of selection is performed without replacement. These common implementations of the UCV make the assumption (as per Rao, Wu and Yue (1992)[5]) that the sample within each primary selection unit (PSU) is the same size, and that an unbiased estimate of population total can be produced from each PSU by multiplying the weighted sum from the PSU by the number of clusters selected in the sample. Unfortunately this assumption is violated in the WAACHS. Because of the population distribution, there are many CDs where the entire CD was enumerated but yielded only one in–scope family (23 per cent of CDs), while some CDs yielded up to 17 in-scope families.

Empirical testing of the SAS and STATA procedures for variance estimation from stratified multi-stage samples found that the large fluctuation in sample size per PSU caused the resulting variance estimates to be highly unreliable and effectively unusable for the survey.

For the survey a modified form of the UCV method was used for calculating variances of estimates of total numbers of children, carers and families in various categories. A modified form of the Jack-knife variance estimation method (Jones, 1974)[6] was used for calculating variances of proportions, percentages and ratios.

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APPENDIX C – DETERMINATION OF LEVELS OF RELATIVE ISOLATION (LORI) BASED ON ARIA++

INTRODUCTION

In 1997 the Commonwealth Department of Health and Aged Care (DHAC) commissioned the National Key Centre for Social Applications of Geographic Information Systems (GISCA) to develop an index of remoteness and accessibility to services. The result of this work was the ARIA index.[1] ARIA measures accessibility to services by calculating road distances to population centres of varying sizes. The ARIA index quickly became widely accepted within both research and policy settings. As a result, the ABS decided to incorporate ARIA into the Australian Standard Geographic Classification in time for the 2001 Census of Population and Housing.[2,3] The ABS did this based on a revised version of ARIA, which GISCA have called ARIA+. ARIA+ had two major changes compared to the original ARIA; the incorporation of an extra class of service centres, and changes to the cut–off scores that defined the 5 broad categories of remoteness.

It is clear that remoteness is a key part of describing the circumstances of Aboriginal children in Western Australia, and plays a key role in placing the well–being and development of Aboriginal children in the context of their environment. The WAACHS team looked to the ARIA index as a possible means of doing this. However, the ARIA has been defined in terms of the total population of Australia and was not specifically designed to describe the circumstances of Aboriginal children and families. In particular, the 'Very Remote' category of ARIA and ARIA+ contains only one per cent of the total population of Australia, but over 25 per cent of the WAACHS children were living in areas classified as 'Very Remote'. Analysis of the survey data showed that the families living in 'Very Remote' Western Australia could not be considered as a homogenous group in terms of their relative isolation and access to services.Geographically, the area classified as 'Very Remote' represents almost three–quarters of the land mass of Western Australia. As an example, within the Kimberley region of Western Australia only the area in the immediate vicinity of Broome is classified as Remote, the rest of the region is classified as 'Very Remote'. Even at the level of the underlying index values, there is no discrimination between, for example, Halls Creek which has a small hospital, and the much smaller community of Balgo, several hours drive south of Halls Creek and much more isolated. Both receive the maximum score of 12 under the original ARIA. While Halls Creek is a small town, it does act as a regional service centre for a number of communities in the East Kimberley. It was found that in terms of variables such as adherence to traditional culture and language, there was a considerable degree of variation within the Very Remote class that could not be described using ARIA.

The survey team approached GISCA who were already undertaking developmental work on a new product called ARIA++, which introduces another level of service centre and provides more flexibility in describing variations in isolation within the most remote regions of Australia. At the request of the survey team, GISCA produced a version of the ARIA++ based on the 1996 Census Collection Districts (CDs) that were used as the sampling frame for WAACHS. This has allowed a much greater degree of discrimination within the 'Very Remote' category. For the purposes of the survey, categories of relative isolation have been defined using the ARIA++ index that attempt to capture the diversity of locations where Aboriginal families live.

ARIA INDEX

The ARIA index measures remoteness by means of road distances from service centres of varying sizes. Four categories of service centre were defined based on population:

A: 250,000 and greater

B: 48,000 to 249,999

C: 18,000 to 47,999

D: 5,000 to 17,999

The calculations were based on a set of 11,340 populated localities as defined by the Australian Surveying and Land Information Group (AUSLIG). These localities include some locations that are not permanently settled. For each populated locality, the road distance to the nearest service centre in each category was calculated. Scores were assigned based on the ratio of the distance to the nearest service centre compared to the mean distance for that category. These scores were assigned on a scale of 0 to 3, and a total score derived by summing the component scores to give a score between 0 and 12. The four categories of service centre were chosen to represent different levels of service availability, with an expected strong correlation between number and type of services offered in a service centre and the population of that service centre.

Once ARIA scores are calculated for each populated locality, the scores are interpolated onto a 1 kilometre square grid. The scores on this grid are then averaged over specific areas to produce scores for these areas, for example CDs.

ARIA+ INDEX

There were two major differences between the ARIA and the ARIA+. The first is the inclusion of an extra category of service centre with population:

E: 1,000 to 4,999

This results in a score from 0 to 15. Also, the cut–off scores for defining the categories of remoteness were altered. This reduced the size of the ‘Highly Accessible’ category, while increasing the size of the ‘Remote’ and ‘Very Remote’ categories. The ABS felt that the categories of ‘Remote’ and ‘Very Remote’ needed to be enlarged to ensure sufficient sample would fall in these areas in population surveys to allow results to be tabulated at this level. Note that in the ABS adoption of ARIA+, slightly different labels have been given to the five categories of remoteness.

ARIA++ INDEX

The ARIA++ index includes a sixth category of service centre with population:

F: 200 to 999

This results in scores over the range 0–18. Category F service centres do play a role in Aboriginal life. For instance, the Warburton community, with population around 450, is the major regional centre for the central desert communities. Under the ARIA++ classification, Halls Creek receives a score of 12, and Warburton receives a score of 15, with the maximum score of 18 being reserved for truly remote, small and isolated communities (e.g. Balgo).

DEVELOPMENT OF CATEGORIES FOR LEVEL OF RELATIVE ISOLATION (LORI)

In order to use the ARIA++ index it was desired to produce a grouping of the index values into a small number of classes that have the following attributes:

- are sufficiently large in population to allow analysis of results
- are as internally homogeneous as possible with respect to variables that are likely to be associated with remoteness and isolation from services.

In order to determine suitable cut–off values an analysis was undertaken of survey data by ARIA++ for a range of variables that were potentially associated with access to services, and strength of adherence to traditional cultures. These included:

- whether carers can speak an Aboriginal language conversationally
- whether children can speak an Aboriginal language conversationally
- whether the carer has attended any Aboriginal ceremonies in the previous 12 months
- whether the carer has attended any Aboriginal festivals or carnivals in the previous 12 months
- whether the carer has been involved with any Aboriginal organisation in the previous 12 months
- carer reported distance to nearest doctor and nearest hospital
- carer reported condition of roads
- whether the community was classified as a remote Aboriginal community for the purposes of the survey. This was a binary classification determined at the time of the survey fieldwork that identified discrete Aboriginal communities that were isolated from medical services
- whether roads ever become unusable due to flooding.

The analysis involved producing detailed tables by fine classifications of ARIA++ as well as fitting spline curves to describe the shape of association between a variable and ARIA++. The method of Generalised Additive Models (GAM) was used to fit these spline curves (Hastie and Tibshirani, 1990)[4]. See, for example, Figure 2.8 in Chapter 2 which shows the proportion of children and carers who are conversant in Aboriginal languages by ARIA++.

A score of 0.2 was chosen as the cut–off for the most accessible category under ARIA+, and in WA this area corresponds with the Perth metropolitan area. It made sense to retain this category as the least isolated category, as it covers over 30 per cent of the Aboriginal population and matches well with other geographic classifications. However, for the purposes of describing the Aboriginal population of WA it did not make sense to try to maintain the other existing category boundaries. Table C1 shows the distribution of the WAACHS sample children by the five categories of ARIA and ARIA+. The geographical distribution of Aboriginal and Torres Strait Islander children is markedly different from non–Indigenous children and there are only modest populations of the three middle categories. It made sense to consider distributing the categories further towards the remote end of the scale.

TABLE C1: DISTRIBUTION WAACHS SURVEY CHILDREN BY ARIA AND ARIA+

Level of remoteness	ARIA	ARIA+(a)
	%	
Highly accessible	41.0	31.3
Accessible	10.3	10.5
Moderately accessible	11.2	17.9
Remote	11.5	13.8
Very remote	26.0	26.5

The results of these analyses suggested that there was a strong degree of homogeneity between ARIA++ values 0 and 8, another homogeneous group between 8 and 13, and a strong trend over the last few points of the scale, particularly between 17 and 18. As a result, the following groupings were proposed:

TABLE C2: RELATIONSHIP OF LEVEL OF RELATIVE ISOLATION AND ARIA++

Level of relative isolation	ARIA++ range
Highly accessible	0 – 0.2
Accessible	0.2 – 8
Moderately accessible	8 – 13
Remote	13 – 17
Very remote	17 – 18

Table C3 shows the distribution of the Aboriginal population of Western Australia, along with the survey sample, by these five levels of relative isolation. Although the size of each area, in terms of population numbers, declines with increasing level of relative isolation, the very strong differences between the ‘Moderate’, ‘High’ and ‘Extreme’ areas justified their establishment as separate regions. With almost 10 per cent of the population in areas of ‘Extreme’ relative isolation, the smallest of the five areas, there are still large enough numbers to allow proper analysis by this classification.

TABLE C3: WA ABORIGINAL POPULATION AND WAACHS SAMPLE, BY LEVEL OF RELATIVE ISOLATION (LORI)

	1996 Census – Children		1996 Census – Persons		WAACHS – Children		WAACHS – Carers	
LORI	Number	%	Number	%	Number	%	Number	%
None	7 818	33.6	16 509	32.5	1 636	30.9	983	31.1
Low	5 754	24.7	12 152	23.9	1 680	31.7	1 036	32.8
Moderate	4 987	21.4	11 218	22.1	971	18.3	556	17.6
High	2 800	12.0	6 325	12.4	520	9.8	275	8.7
Extreme	1 885	8.1	4 524	8.9	482	9.1	303	9.6
Total	23 244	100.0	50 728	100.0	5 289	100.0	3 153	100.0

Table C4 shows the distribution of selected characteristics used in the analysis, by level of relative isolation. While areas of 'None' or 'Low' relative isolation are very similar, there are strong differences between the remaining areas for these characteristics.

TABLE C4: SELECTED CHARACTERISTICS OF WAACHS CARERS, CHILDREN AND COMMUNITIES, BY LEVEL OF RELATIVE ISOLATION (LORI)

LORI	Remote community	Carer speaks Aboriginal language	Children speak Aboriginal language	Participate in Aboriginal cultural events	Roads ever become unusable	Roads in good condition
	%					
None	0.0	4.0	1.7	9.9	8.1	89.9
Low	0.0	6.0	3.3	9.4	13.2	87.8
Moderate	10.9	35.2	15.6	24.2	28.7	84.8
High	65.9	45.4	30.4	43.5	68.0	73.6
Extreme	100.0	80.0	59.6	61.7	82.2	69.0

To give an idea of how this index scores individual communities, values for selected localities in WA are shown in Table C5. The considerable differences between ARIA and ARIA++ can be clearly seen in this table. Under ARIA, small service centres such as Meekatharra and Derby are classified Very Remote, as well as the smaller and more outlying regions that these centres service.

SUMMARY

The ARIA++ index gives the opportunity to discriminate between grades of remoteness within remote Aboriginal communities. Compared to the original ARIA, which classified over one quarter of the WA Aboriginal population to the Very Remote category, the ARIA++ allows this group to be subdivided. These subdivisions reveal trends in Aboriginal culture and language, as well as trends in terms of access to medical services that would otherwise be obscured under the original ARIA. While ARIA can work well in describing non–Indigenous populations, ARIA++ is clearly superior in describing the Aboriginal population. It is the basis of much of the analysis presented in this publication and is the basis for our measure of Levels of Relative Isolation (LORI).

TABLE C5: ARIA++ AND ARIA VALUES FOR SELECTED LOCALITIES IN WA

Locality	ARIA++ Score	LORI	Original ARIA value	Original ARIA category
Perth	0	None	0	Perth
Rockingham	0.04	None	0.29	Highly Accessible
Mandurah	0.21	Low	0.47	Highly accessible
Bunbury	0.94	Low	1.14	Highly Accessible
Busselton	1.63	Low	1.84	Accessible
Albany	2.70	Low	2.69	Accessible
Geraldton	2.70	Low	2.76	Accessible
Kalgoorlie	3.97	Low	3.87	Moderately accessible
Merredin	5.32	Low	5.31	Moderately accessible
Kalbarri	6.61	Low	6.62	Remote
Esperance	7.51	Low	7.21	Remote
Carnarvon	8.15	Moderate	8.16	Remote
Port Hedland	9	Moderate	9	Remote
Broome	9	Moderate	9	Remote
Karratha	9	Moderate	9	Remote
Meekatharra	10.80	Moderate	10.79	Very Remote
Derby	11.10	Moderate	11.41	Very Remote
Newman	11.84	Moderate	8.8	Remote
Halls Creek	12	Moderate	12	Very Remote
Fitzroy Crossing	12	Moderate	12	Very Remote
Kununurra	12	Moderate	12	Very Remote
Laverton	13.07	High	10.17	Very Remote
Pannawonica	13.72	High	10.74	Very Remote
Wyndham	14.23	High	12	Very Remote
Coral Bay	14.44	High	12	Very Remote
Warburton	15	High	12	Very Remote
Oombulgurri	15.08	High	12	Very Remote
Kalumburu	15.10	High	12	Very Remote
Christmas Creek	17.12	Extreme	12	Very Remote
Jigalong	17.97	Extreme	10.52	Very Remote
Punmu	18	Extreme	12	Very Remote
Balgo	18	Extreme	12	Very Remote
Mulan	18	Extreme	12	Very Remote

ENDNOTES

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APPENDIX D – RELIABILITY OF ESTIMATES

MEASURING SAMPLING ERROR

Estimates from the WAACHS are based on information obtained from a sample of families, and are therefore subject to sampling variability. The figures from the sample may be different from the figures that would have been obtained had all families with Aboriginal Children in Western Australia been included in the collection, just by virtue of random chance. This variability is known as *sampling error*. The size of the survey sample and the way the sample is designed are factors in determining the amount of sampling error.

Sampling errors can be estimated from the survey data. One measure of the sampling error is given by the 95% confidence interval. The confidence interval measures the degree to which an estimate may vary from the value that would have been obtained from a complete enumeration of the entire population. There are about nineteen chances in twenty (i.e. a 95% chance) that the population value will lie in the range indicated by the confidence interval.

For example, the proportion of Aboriginal and Torres Strait Islander children who have ever had asthma was estimated to be 23.2 per cent with a 95% confidence interval (21.6%–24.9%). This means that there is a 95% chance that if the entire population had been enumerated, and not just the sample, that the population value would lie between 21.6 per cent and 24.9 per cent (a range of 3.3 percentage points).

The size of a confidence interval is a measure of the accuracy of an estimate. The smaller the confidence interval the more accurate the estimate. As a general rule, the smaller the sample size used for calculating an estimate, the less accurate that estimate will be. For instance, the proportion of Aboriginal and Torres Strait Islander children living in Perth who have ever had asthma was 30.5 per cent with a 95% confidence interval of (27.3%–33.8%). As only approximately 30 per cent of survey children live in Perth this estimate is based on a smaller sample size than the estimate for WA overall. For all of WA the confidence interval has a range of 3.3 percentage points. When restricted to Perth only, the confidence interval has a range of 6.5 percentage points.

ASSESSING STATISTICAL SIGNIFICANCE

Confidence intervals provide a means to assess the statistical significance of differences between figures. When comparing different estimates it is possible that differences could arise by chance alone, because the data is based on a random sample only. Differences between figures are said to be *statistically significant* when it is very unlikely that the difference could be attributed to random chance. The confidence interval gives a ready means of identifying the statistical significance of differences between figures.

For example, the estimated lifetime occurrence of asthma was 30.5 per cent among children living in Perth, and 7.3 per cent among children living in areas of extreme relative isolation. The respective 95% confidence intervals are (27.3%–33.8%) and (5.3%–9.7%). If two confidence intervals overlap it is concluded that there is a possibility the difference could be due to chance variation. When there is no overlap, as in this example, it is concluded that the difference is statistically significant. That is, it is likely to represent a real difference in the occurrence of asthma between the two areas that cannot be explained by random chance alone. However, the lifetime occurrence of asthma among children living in areas of low relative isolation was

26.3 per cent with a 95% confidence interval (22.7%–30.2%). As this confidence interval overlaps with the confidence interval for the figure from Perth it is possible that this difference could be due to chance variation. The difference between the figures for Perth and for areas of low relative isolation would be regarded as not statistically significant.

It is important to note that just because a difference is not statistically significant does not mean that there is no real difference between the groups being compared. Where there is a true, but small difference, it is possible that the difference is smaller than the accuracy of the estimates as measured by the confidence interval. For instance, if there was a one per cent difference in the true population estimates of the occurrence of asthma between Perth and areas of low relative isolation, the survey could not detect this, as the confidence intervals for the estimates are wider than this. This is referred to as the *power* of the survey. Generally speaking, the survey does not have the power to detect differences in figures less than two to three per cent, and the power of the survey is reduced for small subsets of the survey population.

NON–SAMPLING ERRORS

In addition to sampling error, survey estimates can be subject to other inaccuracies, which are referred to collectively as *non–sampling error*. Non–sampling errors can occur because of form design limitations, errors in reporting by respondents due to difficulties recalling certain data or lack of appropriate records for certain data, errors made in collection such as in recording and coding data by the interviewers, and errors in the processing of the data. Non–sampling errors may occur in any enumeration, whether it be a full census or a sample.

Every effort is made to reduce non–sampling error to a minimum by careful design and testing of questionnaires, thorough training for interviewers, efficient operating procedures including quality control procedures, and use of appropriate survey methodologies.

APPENDIX E – AUSTRALIAN GOVERNMENT AND WESTERN AUSTRALIAN GOVERNMENT ABORIGINAL HEALTH POLICIES

While there is currently no cohesive or discrete **Aboriginal Children's Health Policy Framework**, some of the existing national policy frameworks and strategies, which relate to Aboriginal health, are outlined here.

NATIONAL ABORIGINAL HEALTH STRATEGY (NAHS)[1]

The 1989 National Aboriginal Health Strategy (NAHS) was a landmark document. It is still extensively used by health services and continues to guide policy makers.

The main recommendations of the Strategy included:

- Improving health services (minimum standards, increased recurrent funding, and improved access to mainstream services)

- Improving essential services and community infrastructure

- Improving education, training and employment in Aboriginal health.

While the NAHS was a comprehensive statement of Aboriginal and Torres Strait Islander health objectives it was never fully implemented.

NATIONAL STRATEGIC FRAMEWORK FOR ABORIGINAL AND TORRES STRAIT ISLANDER HEALTH [2]

The National Strategic Framework for Aboriginal and Torres Strait Islander Health was endorsed by the Australian and State/Territory governments and signed by all Health Ministers in July 2003. It is a complementary document that builds on the 1989 NAHS. Framework Agreements are also in place in every State and Territory and in the Torres Strait. The main purpose of the Agreements is to have a common commitment in each jurisdiction to regional planning, data collection, increased resources and increased access to the mainstream health sector. Under the Agreements, partnership forums have been established to undertake regional planning and to provide a mechanism for the community sector to be involved in policy development and planning. The aims of the Strategy are measured against national performance indicators.

One of the priorities of the Framework is child and maternal health. The Framework recognises that the health of women during pregnancy has a major impact on young children, which in turn has an impact on the incidence of chronic disease later in life.

The Framework includes an action area to develop an Aboriginal and Torres Strait Islander maternal and child health framework that addresses the physical, emotional and social well-being of women and children (aged 0-5 years).

NATIONAL DRUG STRATEGY ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES' COMPLEMENTARY ACTION PLAN 2003 – 2006 [3]

Australia's National Drug Strategic Framework 1998-99 to 2002-03 was set up to improve health, and social and economic outcomes by reducing use of harmful drugs. It is an umbrella framework under which national plans tackling alcohol, tobacco and illicit drugs, and education about drugs have been formed. The Aboriginal and Torres Strait Islander Peoples Complementary Action Plan 2003–2006 was developed to complement the issues raised in these national plans and make them more applicable to Aboriginal and Torres Strait Islander peoples.

NATIONAL INDIGENOUS AUSTRALIANS SEXUAL HEALTH STRATEGY (NIASHS)[4]

The National Indigenous Australians Sexual Health Strategy (NIASHS) provides a comprehensive approach to preventing the spread of HIV and other sexually transmissible infections in Aboriginal and Torres Strait Islander communities. The NIASHS recommends action in four priority areas: prevention; treatment, care and support; workforce issues; and research and data collection. It aims to strengthen the capacity of the community controlled primary health care sector to respond to Indigenous sexual health and build partnerships with the mainstream health sector.

NATIONAL CHILD NUTRITION PROGRAM GRANTS - TARGETED INDIGENOUS PROJECTS [5]

The National Child Nutrition Program is a community grants program targeting the nutrition and long term eating patterns of children aged 0–12 years of age and pregnant women. A high priority has been given to projects in rural and remote communities, Aboriginal and Torres Strait Islander communities and communities with greater levels of socio-economic disadvantage. The Program was launched in December 1999.

The Program supports community-based projects aiming to improve nutrition-related knowledge and skills of children and their parents; the capacity of communities to promote better nutritional health; and access to, and availability of, nutritious foods.

An Indigenous specific round commenced in late 2001. Unlike the first round, this round included an education focus in support of the National Indigenous English Literacy and Numeracy Strategy. This strategy identifies poor nutrition as a primary cause of a child’s reduced capacity to concentrate and learn in the classroom setting. Six projects have been launched in Western Australian – mainly located in schools in remote regions (Yalgoo, Mt Magnet, Meekatharra, Onslow, Roebourne and Perth).

The Strategy notes that the health status of children is a powerful influence on their ability to come to school and when at school, on their capacity to learn and fully participate in schooling opportunities. The Strategy states that children who are hungry or deficient in nutrients, particularly iron, have diminished concentration and cognitive function.

NATIONAL PERFORMANCE INDICATORS FOR ABORIGINAL AND TORRES STRAIT ISLANDER HEALTH [6]

The Performance Indicators were developed through a collaboration of the State/Territory Aboriginal health units and the Commonwealth government on behalf of the Australian Health Ministers’ Health Advisory Council. The indicators are used to monitor and report progress in Aboriginal and Torres Strait Islander health. The Performance Indicators also include a set of emotional and social well being indicators which are currently being trialled.

Western Australian policy frameworks have mirrored many of the national initiatives but also reflect local emphasis and requirements. Among the important policy developments are:

WESTERN AUSTRALIAN ABORIGINAL HEALTH STRATEGY [7]

The Western Australian Aboriginal Health Strategy (WAAHS) is an initiative of the Joint Planning Forum (JPF), which holds representation from the Office of Aboriginal Health (OAH), the Office of Aboriginal and Torres Strait Islander Health (OATSIH), the Aboriginal and Torres Strait Islander Commission (ATSIC) and the Western Australian Aboriginal Community Controlled Health Organisation (WAACCHO). It has evolved from the work of six regional health-planning teams throughout WA and is based on the Regional Aboriginal Health Plans.

The strategy sets the strategic agenda for all components of the health system to achieve lasting improvements in Aboriginal health in Western Australia. The strategy has six domains of action. These are:

- Increasing access to health services
- Reforming the health system
- Reconciling community control and empowerment
- Improving health information management
- Strengthening intersectoral collaboration on health
- Improving health financing.

The first domain includes sub-strategies to decrease risk factors such as smoking, substance misuse, and lack of fresh vegetables, and to increase access to primary, specialist, mental and dental health services.

WESTERN AUSTRALIAN FRAMEWORK AGREEMENT ON ABORIGINAL AND TORRES STRAIT ISLANDER HEALTH[8]

This agreement underpins the way in which Aboriginal health strategies, programs and services are developed and delivered. Its objective is to improve health outcomes for Aboriginal and Torres Strait Islander peoples in Western Australia through a coordinated approach to the planning, funding and delivery of health and health related services. The WA framework agreement has incorporated the domains reflected in the WA Aboriginal Health Strategy 2000.

This partnership operates through the Joint Planning Forum and associated Regional Aboriginal Health Planning Forums in the six Aboriginal health regions covering the State.

ABORIGINAL FOOD AND NUTRITION STRATEGY[9]

The Office of Aboriginal Health in conjunction with the Nutrition Program, Department of Health (WA) has developed a Food and Nutrition Policy to:

- Raise Aboriginal people’s awareness of the importance of nutrition
- Identify specific Aboriginal concerns in this area
- Provide a focal point towards which a broad range of organisations can work to improve Aboriginal nutritional health in Western Australia.

The policy recognises that improvements in nutrition can reduce infections, hearing loss and learning problems among children.

WESTERN AUSTRALIAN AGENCY DRUG AND ALCOHOL ACTION PLANS[10]

The Western Australian government released the Government Agency and Area Drug and Alcohol Plans in 2003. The Plans were developed to provide a seamless system of care for those in need and a more coordinated approach from the many agencies involved in addressing drug and alcohol issues. The Plans include initiatives to reduce the incidence of alcohol and drug related harm in Aboriginal communities.

ENDNOTES

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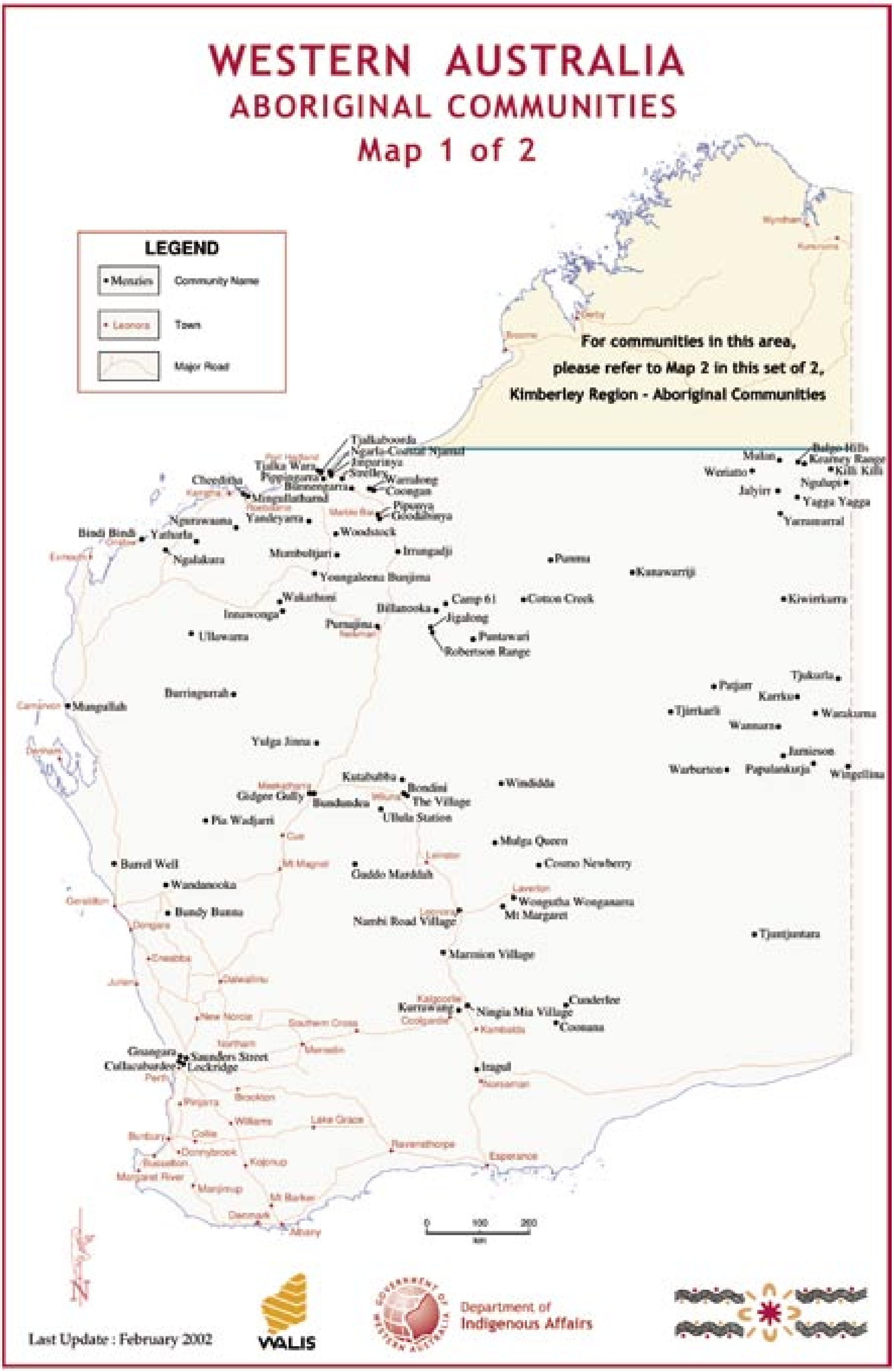
9 Office of Aboriginal Health and Nutrition and Physical Activity Program, (2001). Aboriginal Food and Nutrition Policy for Western Australia. Western Australia Department of Health. Perth.

10 Drug and Alcohol Office, (2002). Western Australian Agency Drug and Alcohol Action Plans. Government of Western Australia, Perth.

APPENDIX – F


WESTERN AUSTRALIA
ABORIGINAL COMMUNITIES
Map 1 of 2
LEGEND
Menzies
Community Name
Leonora
Town
Major Road
For communities in this area,
please refer to Map 2 in this set of 2,
Kimberley Region - Aboriginal Communities
Wyndham
Kununurra
Derby
Broome
Tjalkaboorda
Ngarla-Coastal Njamal
Jinparinya
Port Hedland
Tjalka Wara
Strelley
Pippingarra
Bilanyengarra
Warralong
Cheeditha
Coongan
Karratha
Mingullatharndi
Roebourne
Pipunya
Marble Bar
Goodabinya
Ngurrawaana
Yandeyarra
Woodstock
Bindi Bindi
Yathurla
Onslow
Exmouth
Ngalakara
Mumbultjari
Irrungadji
Punmu
Kunawarritji
Youngaleena Bunjima
Wakathuni
Camp 61
Cotton Creek
Kiwirrkurra
Innawonga
Billanooka
Jigalong
Parnpajinya
Newman
Puntawarri
Robertson Range
Ullawarra
Burringurrah
Carnarvon
Mungullah
Denham
Yulga Jinna
Malan
Balgo Hills
Kearney Range
Wirrimanu
Kilili Kilili
Jalyirr
Ngulupi
Yagga Yagga
Yarramurral
Patjarr
Tjukurla
Karrku
Tjirrkarli
Warakurna
Wannarn
Jameson
Warburton
Papulankutja
Wingellina
Katabulbba
Bondini
Windidda
Meekatharra
Gidgee Gully
Wiluna
The Village
Bunduhedra
Ululla Station
Pia Wadjarri
Mulga Queen
Cue
Barrel Well
Mt Magnet
Leinster
Cosmo Newberry
Guddo Marddah
Wandanooka
Laverton
Wongutha Wonganarra
Mt Margaret
Geraldton
Bundy Bunna
Leonora
Nambi Road Village
Tjuntjuntjara
Dongara
Marmion Village
Eneabba
Dalwallinu
Jurien
Kalgoorlie
Cundeelee
Kurrawang
Ningia Mia Village
Coolgardie
Coonana
New Norcia
Southern Cross
Kambalda
Northam
Merredin
Gnangara
Saunders Street
Cullacabardee
Lockridge
Perth
Ingaui
Norseman
Pinjarra
Brookton
Williams
Lake Grace
Bunbury
Collie
Donnybrook
Busselton
Kojonup
Ravensthorpe
Esperance
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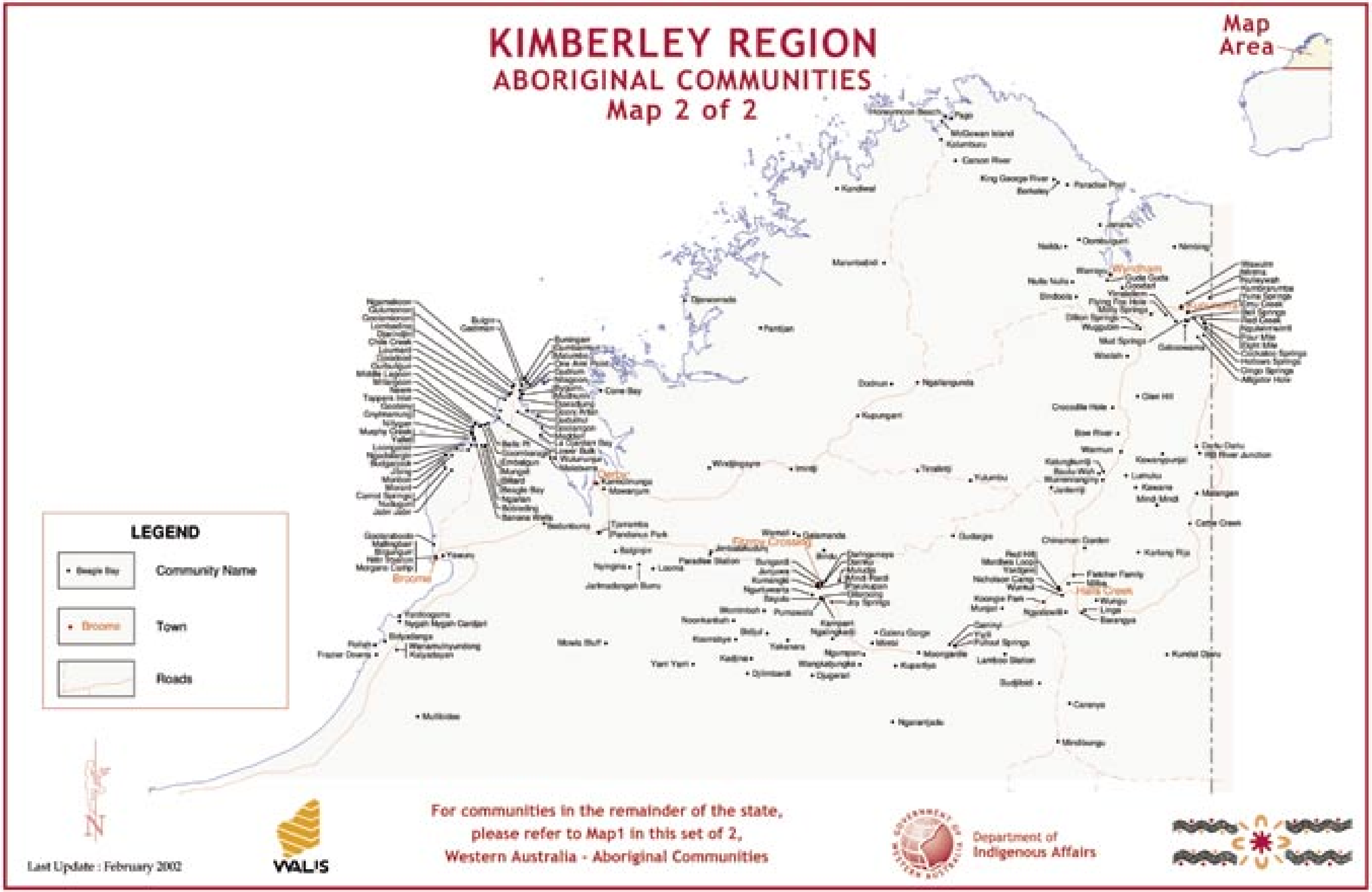
WALIS
GOVERNMENT OF WESTERN AUSTRALIA
Department of Indigenous Affairs



KIMBERLEY REGION
ABORIGINAL COMMUNITIES
Map 2 of 2

For communities in the remainder of the state, please refer to Map1 in this set of 2, Western Australia - Aboriginal Communities

Last Update : February 2002

GLOSSARY

APGAR SCORE

A score, determined by the five characteristics of colour, muscle tone, heart rate, respiration and reflex activity, which is assigned to newborn babies at one and five minutes after birth.

AUSTRALIAN QUALIFICATIONS FRAMEWORK

The Australian Qualifications Framework (AQF) is a unified framework for classifying all qualifications in post-compulsory education and training in Australia.[1] It covers schools, vocational education and training (TAFEs and private providers) and the higher education sector (mainly universities). The second edition of the Australian Standard Classification of Occupations (ASCO) assigned each major occupation group to one of five broad skill levels. These skill levels were defined in terms of the levels of qualifications as defined in the AQF that are generally required for the occupations in each group and years of relevant work experience.

The ASCO major occupation groups have been grouped into skill levels as described in the following table.[2]

Major Occupation Group		Skill Level	Definition (a)
1	Managers and Administrators	Level 1	Bachelor degree or higher qualification or at least 5 years relevant experience.
2	Professionals	Level 1	
3	Associate Professionals	Level 2	AQF Diploma or Advanced Diploma or at least 3 years relevant experience.
4	Tradespersons and Related Workers	Level 3	AQF Certificate III or IV or at least 3 years relevant experience.
5	Advanced Clerical and Service Workers	Level 3	
6	Intermediate Clerical, Sales and Service Workers	Level 4	AQF Certificate II or at least 1 year of relevant experience.
7	Intermediate Production and Transport Workers	Level 4	
8	Elementary Clerical, Sales and Service Workers	Level 5	Completion of compulsory secondary education or an AQF Certificate I.
9	Labourers and Related Workers	Level 5	

(a) In some instances relevant experience is required in addition to the formal qualification.

CARER EDUCATION

The level of educational attainment achieved by carers was determined from two survey questions: the highest grade finished at school, and what post-school qualifications have been achieved. Post-school qualifications were classified as:

- Trade/apprenticeship
- Certificate from college
- Diploma (beyond year 12)
- Bachelor Degree
- Post Graduate Diploma/higher degree
- Other

Carers who had completed a diploma, bachelor degree, post graduate diploma or higher degree were classified as having 13+ years education. Otherwise educational attainment was classified by highest grade finished at school. The following categories have been used in this publication:

- Did not attend school
- 1–9 years education
- 10 years education
- 11–12 years education
- 13+ years education

Note that educational attainment refers to highest level achieved, not the number of years taken to achieve the qualification.

COMMUNITY HOUSING

Carers who reported that their dwelling was rented were asked if their dwelling was a private rental, or rented from HomesWest, the Aboriginal Housing Authority or Community Housing. HomesWest and the Aboriginal Housing Authority are two schemes administered by the Department of Housing and Works, with HomesWest being the general public housing scheme for WA.

Community Housing generally refers to housing that is provided in discrete Aboriginal Communities where the housing comes under the control of an Aboriginal Housing Organisation. Funding for community housing organisations comes from a combination of Commonwealth and State government sources. One key difference with Community Housing is the degree of direct Aboriginal involvement in the planning and delivery of housing through Aboriginal Housing Organisations.

DWELLINGS

In household surveys a distinction is often made between dwellings, households and families as per the Census of Population and Housing, with allowance made for the possibility of more than one household living in a single dwelling, and for a household to comprise more than one family. In the census, a dwelling is a habitable structure, a household is a group of related or unrelated people who make common provision for food, while a family is a group of people related by blood, marriage, adoption, step or fostering who usually reside within a single family. Note that in a block of flats, for example, each flat is considered to be a separate dwelling.[3]

In practice, the distinction between dwellings, households and families was found to have little importance in the WAACHS. Aboriginal families living together often contain extended family relationships. However, there were hardly any cases where two or more unrelated families were found to be living in the same household and no cases were found where multiple households were residing in the same dwelling. In this volume, the terms household and family are used interchangeably, while the term dwelling is used to describe the physical structure in which a household or family is living.

Note that the survey only included private dwellings. Non-private dwellings, such as hotels or boarding schools, were not included in the scope of the survey. However, carers were asked if there were any children aged less than 18 years who usually live at this address but who are temporarily away. Information about these children was collected from the carers where appropriate.

FAMILY TREES

One of the first tasks for interviewers at the beginning of each interview was the completion of the Household Record Form which included listing all usual residents of the household and the relationships between them. To assist in describing these relationships interviewers also drew a family tree to summarise relationships within the household. The Household Record Forms were used in conjunction with the family trees to classify the household structure and the family care arrangements for each child.

HOUSEHOLD CARE ARRANGEMENTS

Two classifications have been used to describe the structure of each household. The first described the overall household structure (*See household composition below*). The second classification describes the care arrangements for each child and has been assigned at the child level. In many cases both classifications will be equivalent. For instance, for a family with two original parents and two children the household composition would be classified as 'Two parent household - nuclear type', and the care arrangement for each child would be classified as 'Both original parents'. However, for a blended household with, say, two parents and one child, plus a child from a previous union, the care arrangements for each child would not be the same. For one child the care arrangement would be classified as 'Both original parents', while for the other child the care arrangement would be classified as 'one parent and new partner'.

In the case of extended families, where say Aunts and Uncles, Grandparents and other relatives are living in the household, the household composition classification would describe all the usual residents of the household. In terms of the care arrangements for each child, extended family relationships are only classified as part of the care arrangements for the child if the extended family member was involved in caring for the child.

HOUSEHOLD COMPOSITION

Two separate classifications have been developed for describing the structure of each household. The first describes the composition of the household. Households were classified based on the information recorded on the Household Record Forms and the family trees that were drawn by interviewers describing each family. The household classification discriminates between nuclear and extended families and describes the generational complexity of extended families.

INDEX OF RELATIVE SOCIO-ECONOMIC DISADVANTAGE

The index of relative socio-economic disadvantage is one of five measures of socio-economic status calculated by the ABS in their SEIFA product.[4] The index is a summary measure calculated from census data which ranks the relative level of disadvantage of each census collection district (CD). As one of the factors included in the standard SEIFA product is proportion of Aboriginal and Torres Strait Islander people in each CD, the ABS produced a special version of the index for use in this survey that excluded this variable as a factor. The index is scaled to have a mean of 1,000 and a standard deviation of 100. Lower values indicate greater levels of disadvantage.

INDIGENOUS STATUS

To be included in the survey, carers had to identify their children as being of Aboriginal or Torres Strait Islander origin. Only Aboriginal or Torres Strait Islander children (under the age of 18 years) were included in the survey, even in those cases where there were both Aboriginal and non-Aboriginal children living in the same household. Note that the carers did not have to be Aboriginal for the family to be included in the survey.

Carers were also asked whether they were of Aboriginal or Torres Strait Islander descent. Approximately 17 per cent of primary carers and 21 per cent of secondary carers of Aboriginal and Torres Strait Islander children and young people were not of Aboriginal or Torres Strait Islander descent.

LEVEL OF RELATIVE ISOLATION (LORI)

A new classification of remoteness and isolation has been introduced in this survey – the Level of Relative Isolation (LORI). The LORI is based on a recently introduced product from the National Key Centre for Social Application of Geographic Information Systems at Adelaide University (GISCA) called ARIA++. The ARIA++ is an extension of ARIA (the Accessibility/Remoteness Index of Australia), which was first published in 1997 and has been widely adopted as the standard classification of remoteness in Australia. Because ARIA is based on describing the entire population of Australia, it has not been specifically designed to describe the circumstances of Aboriginal people living in remote areas. The ARIA++ gives much greater discrimination among more remote areas by including more service centres, of smaller sizes, in calculating its remoteness scores.

Based on the ARIA++ scores, five categories of isolation have been defined specifically for the survey that reflect differences in access to services for Aboriginal children. To avoid confusion with the original ARIA, the five categories are referred to as Levels Of Relative Isolation (LORI) and range from None (the Perth Metropolitan area) to Low (e.g. Albany), Moderate (e.g. Broome), High (e.g. Kalumburu) and Extreme (e.g. Yiyili).

See *A New Way of Looking at Remoteness and Isolation* in Chapter 1, and *Appendix C - Determination of Levels of Relative Isolation from ARIA++* for more details.

LOGISTIC REGRESSION

Logistic regression is a modelling technique that is used to investigate the relationship between the probability of a certain outcome (for example, a child having a particular health condition) and a set of explanatory variables. Logistic regression is discussed in several statistical publications – see, for example, Hosmer and Lemeshow (2000).[5] In this publication, logistic regression models have been fitted using a weighted version of multi-level modelling which allows for community level, family level and individual level factors to be included as explanatory variables in the models (see Pfeffermann *et al*, 1997).[6]

ODDS RATIO

The odds of a given event is the ratio of the probability of its occurrence to the probability of its non-occurrence. For instance the odds of obtaining heads in a coin toss are one to one, the odds of any given face in the roll of a die are one to five. The odds ratios used in this publication are a measure of relative risk, derived from a formula which examines the association between, in most of the survey cases, a risk factor (exposure), and an adverse health outcome. In this publication odds ratios have been estimated using logistic regression which estimates the effect of each risk factor included in a model after adjusting for the independent effects of all other factors included in the model.

OUTSTATIONS

Generally speaking outstations are small Aboriginal communities where families live in close connection with the natural environment. These outstation communities are often linked to a larger parent Aboriginal community for the provision and maintenance of services.

PRIMARY CARER

For each child in the survey, the family was asked to identify the primary carer of that child. This was the person who was considered to spend the most time with the child or who had primary responsibility for the upbringing of the child. In many cases, the primary carer was the child's mother. The primary carer was then asked to provide information about each of their children for the survey.

RELATIVE RISK

Relative risk is a measure of how much a particular factor influences the risk of a particular outcome. It is calculated as the ratio of the proportion of a particular group of individuals that have a condition to the proportion with the same condition in a reference group of individuals. In this survey the reference group is usually either the total WA population in the same age range, or the non-Aboriginal population in the same age range.

SECONDARY CARER

Each family was asked to identify the primary and secondary carer of each child. Often the secondary carer was the father of the child, but may also have been a grandparent or other relative of the child, or other person involved in the upbringing of the child.

TENURE TYPE

Tenure type describes the legal right of a household to occupy a dwelling (e.g. fully owned, being purchased, rented or some other arrangement).

USUAL RESIDENTS

The survey was conducted with interviewers going from door to door in search of Aboriginal families. Each family was asked "Are there any Aboriginal children or teenagers living at this address who are aged between 0 and 18 years?" Families answering yes to this question were included in the scope of the survey. Thus the survey was based on carers identifying their children as being of Aboriginal or

Torres Strait Islander origin. Note that the carers need not be Aboriginal for the family to be included in the survey.

The names of all people who usually live at the dwelling were listed on the Household Record Form. In addition carers were asked if there were any children under 18 years who usually live at this address but who were temporarily away. For example, if a child was away at boarding school, information about that child would still be collected from the carer.

ENDNOTES

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