

7KH'HWHUPLQDQWMRI□

&KLOGDQG◀RXWK#HDOWK

LQ&RXQWLHM0DQXNDX□

□

The Determinants of Child and Youth Health in Counties Manukau 2006

Report prepared for Counties Manukau DHB, November 2006

By Dr Elizabeth Craig and Dr Catherine Jackson



This Report was produced as a result of a contract with the Paediatric Society of NZ. While every endeavour has been made to use accurate data in this Report, there are currently some variations in the way data is collected from District Health Boards and other agencies that may result in errors, omissions and inaccuracies in the information contained in this Report. The Paediatric Society does not accept liability for any inaccuracies arising from the use of this data in the production of these reports, or for any losses arising as a consequence thereof.

Cover Artwork by Heidi Baker

The *Gentiana bellidifolia* var. *australis* is a small native plant which grows in the high alpine regions of the South Island, mainly in fellfields, on rock faces or on bluffs. Yet despite its harsh environment, it manages to produce small delicate white flowers between January and March each year.

FOREWORD

The NZ Child Health Strategy lists six new directions for child health services, including better information, increasing services' focus on early intervention and prevention, workforce development, leadership and advocacy. My District Health Board has relied on detailed local paediatric epidemiology to guide service development and purchasing for the last four years. We believe that if we are to reduce health inequalities for children and young people the link between local epidemiology, strategy and purchasing must be explicit. Over that time we have invested in services for children in the community, built the capacity of our paediatric assessment unit, and shifted resource from inpatient to outpatient services and to cultural liaison positions. We have invested in workforce development, particularly in family violence and discharge planning. We have had little new funding to do this with, so much of the changes have been redirection of existing resource. Since the winter of 2002 we have seen our inpatient volumes and caseweights fall by over 20%. We believe our changing investments account for at least some of this change.

This second report of the NZ Child and Youth Epidemiology Service is a reminder of the power of focused, modern epidemiology. By broadening the focus of child and youth health to include data from the Police, Work and Income, Child, Youth and Family and Education a rich description of both outcomes and determinants has been produced at a local level. The authors have included a brief literature review on how determinants produce health outcomes and painted a picture for us of what the future might hold, were we to do nothing about these issues now. The picture is sobering.

But the authors have also reminded us that it is within our power to do a great deal that will benefit the health of children and young people not only now, but well into their futures. This is where we can truly impact on the health of our population – by investing in childhood. We should not accept that poverty, crowding and school failure is inevitable for a minority of children. We should also not throw money at the problem willy-nilly. There is a substantial and growing evidence base for interventions that improve language and pre-literacy outcomes for preschoolers, reduce the risk of child abuse and improve parenting. We have the knowledge to reduce child injuries, asthma symptoms and admissions and teenage pregnancy. Now we can know with some precision whether the interventions we choose to invest in are having the impact we expect, or not. We also have a powerful tool with which to talk to the funders in other sectors, so we can invest jointly and get the maximum return from our investment. With reliable, local data and a joint approach we have the opportunity to make a real difference to the health of children in New Zealand.

Russell Wills FRACP, MPH
General and Community Paediatrician
Clinical Director
Maternal, Children and Youth Continuum
Hawke's Bay District Health Board

TABLE OF CONTENTS

FOREWORD	3
Table of Contents	5
List of Figures	6
List of Tables.....	11
INTRODUCTION.....	13
EXECUTIVE SUMMARY.....	15
CHILDREN 0-14 YEARS	27
FAMILY FACTORS.....	28
Introduction	29
Family Composition.....	30
Benefit Dependent Families.....	35
Family Violence	40
CYFS Notifications	47
ENVIRONMENTAL FACTORS	51
Household Crowding.....	52
Exposure to Cigarette Smoke In Childhood.....	57
OBESITY, NUTRITION & PHYSICAL ACTIVITY.....	64
Introduction	65
Overweight and Obesity.....	66
Nutrition	75
Physical Activity and Exercise.....	82
DISABILITY	91
Introduction and Common Issues.....	92
Congenital Anomalies Evident at Birth	95
Prevalence Estimates for Other Disabilities.....	100
Permanent Hearing Loss	105
Blindness and low vision.....	112
BUFFERS & PROTECTIVE FACTORS	117
Early Childhood Education	118
Kura Kaupapa Māori & Kura Teina.....	124
YOUNG PEOPLE 15-24 YEARS	129
LIFESTYLE AND BEHAVIOURAL FACTORS	130
Smoking in Young People.....	131
Alcohol Use.....	138
EDUCATION.....	144
Introduction	145
Educational Attainment at School Leaving.....	146
Senior Secondary School Retention.....	152
Suspensions, Exclusions & Expulsions.....	159
YOUNG PEOPLE ON BENEFITS	165
Young People on Benefits.....	166
APPENDICES AND REFERENCES	175
Appendix 1. Police Area Boundaries	176
Appendix 2: SPARC Regional Sports Trusts.....	179
References	180

LIST OF FIGURES

- Figure 1. Families with Dependent Children by Family Type, NZ 1976-2001 32
- Figure 2. Proportion of Children <15 Years Living in One and Two Parent Families by Ethnicity, Counties Manukau vs. NZ at the 2001 Census..... 32
- Figure 3. Proportion of Children <15 Years Living in One and Two Parent Families by NZ Deprivation Index Decile, Counties Manukau vs. NZ at the 2001 Census..... 33
- Figure 4. Proportion of NZ Children <15 Years Living in One and Two Parent Families by Ethnicity and NZ Deprivation Index Decile at the 2001 Census 33
- Figure 5. NZ Children <18 Years of Age who are Dependent on Benefit Recipients by Benefit Type, April 2000-2006 37
- Figure 6. NZ Children <18 Years of Age who are Dependent on Benefit Recipients by Benefit Type & Age, April 2006..... 38
- Figure 7. Relationship between Victim and Offender for Police Attendances at Family Violence Incidents, NZ 2005..... 43
- Figure 8. Ethnicity of Victim at POL400 Attendances, NZ 2005..... 43
- Figure 9. Number of POL400 Attendances Where Injuries Were Reported, Broken Down by Injury Type, NZ 2005..... 44
- Figure 10. Number of POL400 Attendances Where an Offence Was Disclosed by Offence Type, NZ 2005..... 44
- Figure 11. Police Attendances at Family Violence Related Incidents for Police Areas in the Counties Manukau Region 1996-2005*..... 45
- Figure 12. Percentage of Crowded Households in NZ by Ethnicity at the 1986, 1991, 1996 and 2001 Censuses 55
- Figure 13. Proportion of Children and Young People 0-24 Years Living in Crowded Households by Ethnicity, Counties Manukau vs. NZ at the 2001 Census..... 55
- Figure 14. Proportion of Children and Young People 0-24 Years Living in Crowded Households by NZ Deprivation Index Decile, Counties Manukau vs. NZ at the 2001 Census..... 56
- Figure 15. Proportion of NZ Children (0-14 yrs) and Young People (15-24 yrs) Living in Crowded Households by Ethnicity and NZ Deprivation Index Decile at the 2001 Census..... 56
- Figure 16. Proportion of Year 10 Students with Parents Who Smoke and Who Live in a Home with Smoking Inside by Ethnicity, NZ ASH Surveys 2001-2005..... 59
- Figure 17. Proportion of Year 10 Students with Parents Who Smoke and Who Live in a Home with Smoking Inside by School Socioeconomic Decile, NZ ASH Surveys 2001-2005 60
- Figure 18. Proportion of Year 10 Students with Parents Who Smoke and Who Live a Home with Smoking Inside, Counties Manukau vs. NZ ASH Surveys 2001-2005 60
- Figure 19. Proportion of Children <15 Years Living in a Household with a Smoker by Ethnicity, Counties Manukau vs. NZ at the 1996 Census..... 61

Figure 20. Proportion of Children <15 Years Living in a Household with a Smoker by NZ Deprivation Index Decile, Counties Manukau vs. NZ at the 1996 Census.....	62
Figure 21. Percentage of Children < 15 Years Living in a Household with a Smoker by Ethnicity and NZDep Index Decile, NZ at the 1996 Census	62
Figure 22. Proportion of Children Aged 5-14 Years Who Were Either Overweight or Obese by Gender and Age, NZ National Children's Nutrition Survey 2002.....	69
Figure 23. Proportion of Children Aged 5-14 Years Who Are Either Overweight or Obese, by Gender and Ethnicity, NZ National Children's Nutrition Survey 2002.....	70
Figure 24. Proportion of Children Aged 5-14 Years Who Are Either Overweight or Obese by Gender and NZ Deprivation Index Quintile, NZ National Children's Nutrition Survey 2002.....	70
Figure 25. Proportion of Children Aged 5-14 Years Who Are Either Overweight or Obese by Gender and School Type (Rural / Urban), NZ National Children's Nutrition Survey 2002.....	71
Figure 26. Proportion of Children Who Were Overweight and Obese by Age and Gender, Project Energize Waikato 2004.....	72
Figure 27. Proportion of Children Who Were Overweight and Obese by Age, Gender & Ethnicity, Project Energize Waikato 2004	73
Figure 28. Proportion of Children Who Were Overweight or Obese by Age, Gender and School Socioeconomic Decile (1-3 Most Deprived; 8-10 Most Affluent), Project Energize Waikato 2004	73
Figure 29. Mean Energy Intake (kJ) for Children 5-14 Years by Gender, Age, NZDep Index Decile and Ethnicity, NZ National Children's Nutrition Survey 2002.....	77
Figure 30. Percentage of Energy Intake from Total Fat Amongst Children 5-14 Years by Gender, Age, NZDep Index Decile and Ethnicity, NZ National Children's Nutrition Survey 2002.....	78
Figure 31. Proportion of Households with Children 5-14 Years who Reported they Could Afford to Eat Properly Always or Only Sometimes, NZ National Children's Nutrition Survey 2002	78
Figure 32. Proportion of Households with Children 5-14 Years who Reported that Food Runs Out Often or Sometimes Due to a Lack of Money, NZ National Children's Nutrition Survey 2002	79
Figure 33. Source of Food Eaten at School by Gender, Age and Ethnicity, NZ National Children's Nutrition Survey 2002.....	79
Figure 34. Source of Food Eaten at School by NZ Deprivation Index Decile, NZ National Children's Nutrition Survey 2002.....	80
Figure 35. Proportion of Children 5-14 Years in the Least and Most Active Physical Activity Quartiles by Gender, Age and Ethnicity, NZ National Children's Nutrition Survey 2002	84
Figure 36. % of Children 5-14 Years Who Did Not Travel to School by Active Means, by Gender, Age, NZDep Index Decile and Ethnicity, NZ National Children's Nutrition Survey 2002.....	85

Figure 37. Proportion of Children and Young People 5-17 Years Who Were Either Sedentary or Relatively Inactive by Gender, Compared to Older Age Groups*, NZ SPARC Surveys 1997-2001	86
Figure 38. Proportion of Children and Young People 5-24 Years Who Were Either Sedentary or Relatively Inactive by Age and Ethnicity, NZ SPARC Surveys 1997-2001	87
Figure 39. Proportion of Children and Young People 5-17 Years Who Were Either Sedentary or Relatively Inactive vs. Their Parent's Activity Level, NZ SPARC Surveys 1997-2001	87
Figure 40. Proportion of Children and Young People Who Were Either Sedentary or Relatively Inactive by Age, Counties Manukau vs. NZ, SPARC Surveys 1997-2001	88
Figure 41. Proportion of Children & Young People 5-17 Yrs Who Were Either Sedentary or Relatively Inactive by Ethnicity, Counties Manukau vs. NZ, SPARC Surveys 1997-2001	89
Figure 42. Prevalence at Birth of Down Syndrome & Neural Tube Defects*, NZ 1980-05 ...	98
Figure 43. Prevalence of Neural Tube Defects at Birth, NZ 1996-2005	98
Figure 44. Prevalence of Down Syndrome at Birth, Counties Manukau vs. NZ 1996-2005*.	99
Figure 45. Age at Admission for Cochlear Implant Surgery, NZ 2001-2005.....	110
Figure 46. Visual Status of Blind and Low Vision Learners Receiving Education Services and Enrolled on National Database*, New Zealand June 2006	114
Figure 47. Communication Modes of Blind and Low Vision Learners Receiving Education Services and Enrolled on National Database*, New Zealand June 2006.....	115
Figure 48. Licensed and License Exempt Early Childhood Education Enrolments by Service Type, NZ 1990-2005	120
Figure 49. Proportion of New Entrants Who Had Previously Attended Early Childhood Education by Ethnicity, NZ 2000-2005.....	122
Figure 50. Proportion of New Entrants Who Had Previously Attended Early Childhood Education by School Socioeconomic Decile, NZ 2005	122
Figure 51. Proportion of New Entrants (Year 1) Who Had Previously Attended Early Childhood Education Services, Counties Manukau vs. NZ 2000-2005.....	123
Figure 52. Proportion of New Entrants (Year 1) Who Had Previously Attended Early Childhood Education Services by Ethnicity, Counties Manukau vs. NZ 2000-2005	123
Figure 53. Number of Funded Kura Kaupapa Māori and Kura Teina*, NZ 1992-2005	125
Figure 54. Daily Smoking Rates amongst Year 10 Students by Gender and Ethnicity, NZ ASH Surveys 1999-2005	133
Figure 55. Daily Smoking Rates in Year 10 Students by Gender and School Decile, NZ ASH Surveys 1999-2005	133
Figure 56. Daily Smoking Rates in Year 10 Students by Parents Smoking Status, NZ ASH Surveys 2001-2005	134
Figure 57. Daily vs. Never Smoking Rates in Year 10 Students, Counties Manukau vs. NZ ASH Surveys 1999-2005	134

Figure 58. Proportion of Young People 15-24 Years who Smoked by Ethnicity, Counties Manukau vs. NZ at the 1996 Census.....	135
Figure 59. Proportion of Young People 15-24 Years who Smoked by NZ Deprivation Index Decile, Counties Manukau vs. NZ at the 1996 Census.....	136
Figure 60. Proportion of Young People 15-24 yrs who Smoked by Ethnicity and NZ Deprivation Index Decile, NZ at the 1996 Census.....	136
Figure 61. Alcohol Related Hospital Admissions* by Age, NZ Children and Young People 0-24 Years 2001-2005	141
Figure 62. Alcohol Related Hospital Admissions* Amongst Young People 15-24 Years, Counties Manukau vs. NZ 1990-2005.....	143
Figure 63. Highest Educational Attainment of School Leavers, NZ 1993-2005	148
Figure 64. Highest Educational Attainment of School Leavers by Ethnic Group, NZ 1993-2005	149
Figure 65. Highest Educational Attainment of School Leavers by Ethnic Group and School Socioeconomic Decile, NZ 2005.....	149
Figure 66. Highest Attainment of School Leavers, Counties Manukau vs. NZ 1995-2005 ..	150
Figure 67. Highest Attainment of School Leavers by Ethnic Group, Counties Manukau 1995-05	150
Figure 68. School Retention Rates at 16, 17 & 18 yrs by Ethnic Group, NZ 1992-2005.....	154
Figure 69. School Retention Rates at 16 & 17 yrs by Ethnic Group, NZ 2002-2005.....	155
Figure 70. School Retention Rates at 16 & 17 yrs by School Socioeconomic Decile, NZ 2005	155
Figure 71. Age Standardized Tertiary Education Participation Rates by Ethnicity and Type of Qualification, NZ 1994-2004 (all age groups)	156
Figure 72. School Retention Rates at Age 16 & 17 yrs, Counties Manukau vs. NZ 2002-2005	157
Figure 73. School Retention Rates at 16 & 17 yrs by Ethnic Group, Counties Manukau vs. NZ 2002-2005.....	157
Figure 74. Age Standardised School Stand-Down, Suspension, Exclusion and Expulsion Rates by Ethnicity, NZ 2000-2005	162
Figure 75. Age Standardized School Suspension, Exclusion and Expulsion Rates, Counties Manukau vs. NZ 2000-2005.....	163
Figure 76. Age Standardized School Suspension Rates by Ethnicity, Counties Manukau vs. NZ 2000-2005	163
Figure 77. Unemployment Benefit and Training Related Unemployment Benefit Recipients by Ethnicity, NZ Young People 16-24 Years, April 2000-2006.....	169
Figure 78. DPB and Emergency Maintenance Allowance Recipients by Ethnicity, NZ Young People 16-24 Years, April 2000-2006.....	169
Figure 79. Sickness and Invalid Benefit Recipients by Ethnicity, NZ Young People 16-24 Years, April 2000-2006.....	170

Figure 80. Sickness Benefit Recipients Aged 16-24 Yrs by Cause of Incapacity, NZ April 2006	171
Figure 81. Invalid Benefit Recipients Aged 16-24 Years by Cause of Incapacity, NZ April 2006	171
Figure 82. Police Area Boundaries in the Auckland Region	176
Figure 83. Police Area Boundaries in the North Island	177
Figure 84. Police Area Boundaries in the South Island	178
Figure 85. SPARC Regional Sports Trusts	179

LIST OF TABLES

Table 1. Children <18 Yrs Included in a Benefit in the Counties Manukau Region by Service Centre as at 28 April 2006.....	39
Table 2. Number of POL400 Attendances Where Children Were Present, New Zealand 2005	41
Table 3. Number of Attendances at Family Violence Incidents in the 4 Police Areas within the Counties Manukau Region during 1995-2005	45
Table 4. No. of Children Notified to CYFS Offices in the Counties Manukau Region, 2001-05	49
Table 5. Outcome of Assessment for Children Notified to CYFS, Counties Manukau 2001-05	49
Table 6. Definition of Physical Activity used in SPARC's 1997-2001 Surveys	85
Table 7. Number of Other Congenital Anomalies Listed at the Time of Birth for Babies with Down Syndrome, NZ 2001-2005	99
Table 8. Estimated Number of Children and Young People 2-24 Years with Autism, Counties Manukau vs. NZ at the 2001 Census.....	101
Table 9. Estimated Number of Children and Young People 2-24 Years with Cerebral Palsy, Counties Manukau vs. NZ at the time of the 2001 Census	102
Table 10. Classification of Mental Retardation Based on Severity and IQ Score	103
Table 11. Degrees of Hearing Loss & Associated Functional Impairment, NZ Notifications 2004	107
Table 12. Age at Suspicion & Confirmation of Moderate or Greater Hearing Loss, NZ 2001-04	108
Table 13. Age of Identification of Moderate or Greater Hearing Loss by Region, NZ 1998-2004	108
Table 14. Number of Notifications Meeting Criteria for Inclusion in Deafness Notification Database by Region of Residence, NZ 1998-2004	109
Table 15. Number* of Admissions for Cochlear Implant Surgery by DHB, NZ 1990-2005	111
Table 16. Number of Blind and Low Vision Learners Receiving Education Services by Region, New Zealand June 2006.....	116
Table 17. Average Number of Hours of Attendance in Early Childhood Education Services by Service Type, NZ 1996-2005	119
Table 18. Enrolments in Māori Medium Early Childhood Education, NZ 1992-2005	120
Table 19. Number of MOE Funded Kura Kaupapa Māori and Kura Teina by DHB Region, 2005	126
Table 20. Number of Full-time Equivalent students involved in Māori Medium Education by School Sector and Form of Education as at 1 March (2002-06).....	127
Table 21. Number of Full-Time Equivalent Students in Māori Medium Education by Level of Learning & Region, March 2006.....	128

Table 22. Ethnicity, NZDep Index Decile and Risk of Alcohol Related Hospital Admission*, NZ Young People 15-24 Years, 2001-2005	141
Table 23. Alcohol Related Hospital Admissions* by Primary Diagnosis, NZ Young People 15-24 Yrs, 2001-2005.....	142
Table 24. Primary Cause of Alcohol Related Admissions* Resulting in Injury, NZ Young People 15-24 Years, 2001-2005	142
Table 25. Number of Exclusions in NZ State Schools during 2005 by Type of Behaviour ..	161
Table 26. Proportion of NZ Young People 16-24 Yrs Reliant on Benefits, April 2000-2006	167
Table 27. Number of Young People 16-24 Yrs in New Zealand on Benefits by Type, April 2000-06.....	173
Table 28. Number of Young People 16-24 Yrs in Counties Manukau Region* on Benefits, April 2000-06	173

INTRODUCTION

The environments in which children and young people grow up profoundly influence their health and wellbeing, with the Ministry of MOH's 1998 Child Health Strategy [1] noting that:

“the health status of our children is not as good, or improving as fast as that of many other OECD countries. Within NZ there are large disparities in health status between population groups, with tamariki Māori, Pacific children and children from low income families experiencing comparatively poorer health outcomes than the overall child population. Achieving good child health is vital for later adult health, as both the risk factors for many adult diseases and the opportunities for preventing these diseases arise in childhood. Poor child health and development also have an adverse impact on broader social outcomes including sexual and reproductive health, mental health, violence, crime and unemployment”.

In the 8 years since the Child Health Strategy was released, another cohort of NZ children have come to experience the *comparatively poorer health outcomes* described above, with last year's report on the Health Status of Children and Young People in Counties Manukau highlighting the often marked disparities in health outcome that exist between children of different socioeconomic and ethnic groups. Yet in the current health environment, where DHBs are charged with improving the health of the populations they serve, the way forward in terms of addressing these disparities is not always clear, with many of the factors underlying the current state of child and youth health lying outside the domain of the health sector itself.

This report is Part 2 of a 3 part series which explores the health and wellbeing of children and young people in the Counties Manukau Region. While Part 1 focused on health status and the large disparities that often exist between different groups of children and young people, this year's report brings together information on the underlying determinants of child and youth health from a variety of different sources (e.g. CYFS, the Police, Work and Income, Education), which primarily lie outside of the health sector. The report also provides new information on a number of other issues (e.g. obesity, disability) which, in addition to the underlying social and economic determinants, significantly influence health and wellbeing. Overall, the aims of this year's report are twofold:

1. To provide an overview of some of the underlying determinants which may have contributed to the health disparities highlighted in last year's report, as well as to identify potential intervention points for future strategy development.
2. To bring together information from a variety of different sources, so that DHBs can consider some of the other Agencies who influence the health status of the children and young people in their regions. It is hoped that this report may provide a catalyst for opening discussions with some of these agencies in areas of mutual interest.

In achieving these aims, this report is broken into 8 Streams, each of which contains a number of sections exploring related determinants of child and youth wellbeing (e.g. Obesity, Nutrition and Physical Activity) and while not being designed to be read in sequence, it is suggested that each section be considered in the context of the others within its Stream. In addition, it is suggested that the sections contained in Part 2 of this series be read in conjunction with those contained in Part 1, as in many cases the development of successful long term strategies to reduce disparities in child and youth health requires consideration being given to the underlying social and economic determinants. For example:

1. The marked socioeconomic and ethnic disparities in hospital admissions for bronchiolitis, asthma and pneumonia highlighted in last year's report need to be considered within the context of this year's sections on exposure to second hand cigarette smoke and household crowding. Similarly, household crowding is an important risk factor for meningococcal disease and serious skin infections.
2. The disparities in hospital admission rates for child abuse, neglect and maltreatment highlighted in last year's reports need to be considered within the context of this year's sections on family violence and CYFS notifications.
3. For the majority of the health disparities highlighted in last year's report, the development of successful long term strategies may also need to consider key intervention points in the intergenerational transmission of socioeconomic disadvantage. For example, unless the current disparities in educational attainment at school leaving (highlighted in the Youth Section of this Report) are addressed, it is likely that many of the next generation of Counties Manukau children will grow up exposed to relative socioeconomic disadvantage, as a consequence of the more limited employment opportunities available to their parents.
4. In addition, while not being explicitly considered within any one section of this report, the reader is urged to consider the impact that serial exposure to socioeconomic disadvantage has as a child passes from birth→ infancy→ childhood→ adolescence and the fact that for nearly all of the determinants explored in this report (e.g. household crowding, exposure to second hand cigarette smoke, growing up in a sole parent family, leaving school without formal qualifications), the groups at greatest risk are almost identical. While it is not possible, using the data sources available, to track the serial consequences of exposure to multiple disadvantage across the lifecourse from birth→ 24 years, it is likely that cumulative exposures of this nature contributed significantly to the disparities in health outcome seen in last year's report.

While reducing the large burden of morbidity and mortality associated with childhood respiratory infections may appear at first an unachievable goal, interventions aimed at reducing disparities in children's exposure to cigarette smoke and household crowding may provide tangible starting points. Similarly, while attempting to address the underlying socioeconomic determinants of health across the board may seem a formidable task, initiatives aimed at improving the educational outcomes of young people who are at risk of leaving school without formal qualifications may better equip the next generation of Counties Manukau parents to bring up their own children in the context of adequate socioeconomic resources. Yet such goals are only likely to be achieved in partnership with some of the other Agencies whose data appears in this report. Thus it is hoped that the information contained in this report will provide the reader with a better understanding of the reasons for the marked socioeconomic and ethnic disparities seen in last year's report, as well as some logical starting points and potential partners for future strategy development.

EXECUTIVE SUMMARY

CHILDREN 0-14 YEARS

FAMILY FACTORS

At a regional level, an awareness of the extent of family under-resourcing is important, as while most NZ children live with their families and experience positive family relationships, a significant minority experience a variety of adverse outcomes, either as a result of their families having insufficient resources with which to meet their physical and emotional needs, or as a result of family conflict. The following sections explore four overlapping groups of children who may experience higher rates of adverse outcomes as a result of the family contexts in which they live and who, as a result, may require greater prioritisation in regional strategy development.

Family Composition

In NZ during the past 25 years, there has been a marked shift away from two-parent families, with the proportion of single parent families increasing from 10.4% in 1976 to 29.2% in 2001. In Counties Manukau during 2001, 28.5% of children <15 years lived in sole parent families, as compared to 26.4% for NZ as a whole. There were also marked socioeconomic and ethnic disparities in Counties Manukau during this period, with the proportion of children living in sole parent families rising progressively from 8.5% amongst those in the most affluent areas (NZDep Decile 1), to 41.4% amongst those in the most deprived areas (NZDep Decile 10). In addition, 46.8% of Māori and 30.9% of Pacific children lived in sole parent families, as compared to 17.7% of European and 17.8% of Asian children.

Care must be taken when interpreting these figures, as the dichotomous breakdown into “Couple with Children” and “One Parent with Children” utilised by Statistics NZ is made without regard to the relationship between the child and caregiver (e.g. couple with children includes both married and de-facto couples, grandparents caring for dependent grandchildren, a mother living with a partner who is not a child’s biological parent) and thus these figures may underestimate the number of children experiencing parental separation or living in blended family settings.

Benefit Dependent Families

Even once the effects of low income are taken into account, children who are dependent on beneficiaries are vulnerable to poorer outcomes, either as a result of their family’s stricter economising behaviour, or the accumulation of other disadvantage. In NZ during 2000-06, the proportion of children <18 years dependent on beneficiaries fell, from 27.7% in 2000 → 22.6% in 2006. Much of this decrease was due to a fall in the number relying on unemployment benefit recipients (4.9% in 2000 → 1.2% in 2006). While the proportion of children reliant on DPB recipients also fell slightly (18.8% in 2000 → 17.0% in 2006), more rapid declines in those reliant on unemployment benefits meant that in relative terms, the proportion of benefit dependent children relying on DPB recipients actually increased, from 67.6% in 2000 to 74.9% in 2006. During 2006, the proportion of children reliant on a beneficiary was highest for those <6 years, with numbers tapering off gradually through late childhood and early adolescence and then very rapidly >15 years of age.

In April 2006, there were 49,694 children <18 years reliant on beneficiaries who received their benefits from Service Centres in or adjacent to the Counties Manukau catchment. Of these, the majority (61.7%) were reliant on DPB recipients, with smaller proportions reliant on unemployment (5.6%), sickness (5.8%) and invalid’s (3.5%) benefits and other benefit and

non-benefit forms of income support (23.3%). While the numbers of benefit dependent children in Counties Manukau may not correlate precisely with the number living below the poverty line, they do reflect a particularly vulnerable group with higher personal health and support needs and tracking changes in their number over time (as labour market and other economic circumstances change) may be of value in predicting future health service demand.

Family Violence

For children, exposure to family violence is of particular concern, not only because of the long term consequences such exposures have for their psychological wellbeing, but also because of the potential overlaps between the occurrence of child abuse and partner abuse in families. In NZ during 2005, children were present at 52.9% of the family violence incidents attended by Police. Of attendances where this information was available, in 51% of cases the victim was the spouse / partner of the offender, with a further 22% having been in a previous relationship and in 14% of cases the conflict was between a parent and child. Overall, 40% of the victims were Māori, 39% were Caucasian, 9% were Pacific and 2% were Asian and Indian respectively. While in 82% injuries were not reported, in a significant minority of cases minor bruising (12.1%), cuts (2.9%) and serious bruising (1.5%) were noted. In 435 cases (0.8%) a hospital attendance was required and in 29 cases (0.1%) the incident resulted in a death. Finally, Police attendances at family violence incidents during 2005 resulted in a total of 23,414 offences being disclosed, with 52% of these relating to assaults, 14% relating to the Domestic Violence Act and a further 7% relating to threats or intimidation.

While it is difficult to use Police data to comment on trends in the prevalence of family violence in Counties Manukau during 1995-05, (due to changes in the way in which the Police have recognised and recorded family violence over time), what Police data does suggest is that a large number of family violence incidents are occurring in Counties Manukau each year and that children are likely to be present at a large proportion of these. In addition, for 3 out of the 4 Police Areas within Counties Manukau, Police attendances at family violence were higher than the NZ average, potentially suggesting that exposure to family violence is an issue of particular concern for a significant minority of Counties Manukau children and young people.

CYFS Notifications

Research suggests that 4-10% of NZ children experience physical abuse and 11-20% experience sexual abuse during childhood. In NZ, the agency with the statutory responsibility for protecting children from recurrent abuse is Child Youth and Family Services (CYFS), who receive notifications from a variety of sources including the police, the education and health sectors, families / whanau and the general public. In NZ since 2001, notifications to CYFS have doubled and while it is often assumed that this reflects an increase in the underlying rate of child abuse, recent research would suggest that changes in the behaviour of the child protection system itself may also have played a significant role.

During 2005, there were a total of 9,194 notifications to CYFS Offices within the Counties Manukau region and of these 81.5% were thought to require further investigation. While these figures reflect a progressive increase in notifications since 2001, when 3,181 notifications were received, the proportion requiring further investigation declined during this period (92.6% required further investigation in 2001). Nevertheless, in absolute terms the number of cases requiring further investigation increased, from 2,945 in 2001 to 7,490 in 2005. Of those notifications which were investigated further during 2001-05, a large proportion resulted in no abuse being found, with the numbers in this category increasing progressively as the period progressed. Where abuse was found, neglect and behavioural and relationship difficulties were particularly prominent, as were physical and emotional abuse.

ENVIRONMENTAL FACTORS

Household Crowding

The associations between substandard housing and poor health have been known for several centuries, with reports from as early as the 1830s attributing high rates of infectious disease to overcrowded, damp, and poorly ventilated housing. In NZ, crowding is strongly correlated with meningococcal disease, while overseas reports also demonstrate correlations with a number of infectious diseases and mental health issues.

In Counties Manukau during 2001, 28.1% of children and young people (0-24 yrs) lived in crowded households, as compared to 15.4% nationally. There were also marked socioeconomic and ethnic disparities evident, with crowding rates being higher for Pacific > Māori > Asian / Indian / European children and young people and those living in the most deprived areas. While similar disparities were seen nationally, crowding rates for Counties Manukau Māori, Pacific and Asian / Indian children and young people were higher than their respective NZ ethnic specific averages and at each level of NZDep deprivation, crowding rates in Counties Manukau were higher than the NZ average. With the strong correlations between crowding, infectious disease and mental health issues, such figures potentially suggest that household crowding makes a significant contribution to health disparities in the Counties Manukau region.

Exposure to Cigarette Smoke in Childhood

Exposure to second hand cigarette smoke is responsible for a large number of general practice visits and hospital admissions during childhood. In addition, exposure in utero has been associated with IUGR, SIDS, impaired cognitive development and childhood behavioural problems. Parental smoking also increases the likelihood children will take up smoking during adolescence, which if continued increases their risk of adverse health outcomes in later life.

In NZ during 2005, ASH Surveys suggested that 39.8% of Year 10 students had a parent that smoked and that parental smoking rates were higher for Māori > Pacific > European / Other > Asian students and those attending schools in the most deprived areas. While socioeconomic and ethnic disparities were also observed for exposure to smoke in the home, exposures were lower than parental smoking rates might predict, potentially suggesting the presence of in-house non-smoking policies among families of all socioeconomic and ethnic groups. In Counties Manukau during 2001-05, the proportion of Year 10 students reporting parental smoking remained relatively static (41.7% in 2001 → 41.1% in 2005), while the proportion reporting living in homes where people smoked inside declined (29.8% in 2001 → 26.0% in 2005). These figures were very similar to the NZ average and trends were consistent with those occurring nationally.

Data from the 1996 Census painted a similar picture, with 40.2% of NZ children 0-14 years living in a household with a smoker and exposures being higher for Māori > Pacific > European > Asian / Indian children and those living in the most deprived areas. In Counties Manukau, 45.2% of children lived in a household with a smoker, with socioeconomic and ethnic differences being very similar to those seen nationally. Given the significant associations between passive smoking and outcomes such as SIDS, bronchiolitis, and pneumonia during childhood, it is likely that exposure to second hand cigarette smoke made a significant contribution to disparities in child health outcomes in Counties Manukau during this period.

OBESITY, NUTRITION & PHYSICAL ACTIVITY

Recent estimates suggest that as many as 40% of the deaths in NZ each year may be attributable to the joint effects of sub-optimal diet and physical inactivity. These three related sections review the available NZ data on childhood obesity, nutrition and physical activity and highlight the findings which may be of value for planning interventions at a regional level.

Overweight and Obesity

Because there is no routine surveillance of overweight and obesity amongst NZ children and young people, information on obesity was collated from one off surveys and research project reports. A review of these data sources suggested that:

1. **Prevalence:** While estimates vary from study to study, NZ data collected since 2000 suggests that at least $\approx 20\%$ of NZ children are overweight and $\approx 10\%$ are obese.
2. **Trends Over Time:** Of the 2 studies which have tracked the pace of the obesity epidemic amongst NZ children, both suggest that it is progressing relatively rapidly, with the proportion of children who are overweight or obese increasing 2-3 fold over the past decade
3. **Ethnic Disparities:** All of the NZ studies reviewed demonstrated higher rates of overweight and obesity amongst Pacific > Māori > European children and adolescents. These findings must be viewed within the context of an earlier average age of puberty amongst Pacific and Māori girls, as well as ethnic differences in the ability of BMI to approximate total body fat composition. As these factors potentially alter the ability of internationally derived percentile charts to accurately identify overweight and obesity in Māori and Pacific groups, these findings must be viewed with caution.
4. **Socioeconomic Disparities:** Of the 2 studies which explored the impact of socioeconomic deprivation on overweight and obesity, both demonstrated socioeconomic gradients, with rates being highest amongst those in the most deprived areas.
5. **Age and Gender:** While gender differences were inconsistent from study to study, in general, rates of overweight and obesity increased with increasing age (although the statistical significance of these findings varied with the methodology used).

These findings suggest that the current levels of overweight and obesity amongst NZ children and adolescents are a significant public health concern and that unless sound policies and strategies are put in place to address this issue, the socioeconomic and ethnic disparities in overweight and obesity currently seen in NZ children and young people, will serve to exacerbate disparities in chronic disease burden as the current generation of NZ children and young people grows to maturity.

Nutrition

The 2002 Children's Nutrition Survey provided a number of insights into the nutritional intake of NZ children which may be of value in addressing the current obesity epidemic. These include:

1. On average, males have higher energy intakes than females and energy intakes increase with increasing age. Both findings are consistent with a larger body size and the need to consume more energy to maintain body mass and meet daily exercise requirements.
2. Total energy intake, when broken down by ethnicity and socioeconomic status did not precisely mirror current ethnic disparities in obesity rates, with Māori children having higher total caloric intakes than European and Pacific children, yet Pacific children having

the highest obesity rates. In addition, while socioeconomic gradients in obesity were prominent, socioeconomic gradients in total caloric intake were not. In contrast, the proportion of the daily intake derived from fat did correspond more closely with ethnic and socioeconomic gradients in obesity, with the % of daily intake from fat being higher amongst Pacific > Māori > European / Other children and those living in the most deprived areas.

3. Even in the context of the current obesity epidemic, food security remained an issue for larger families, those living in the most deprived areas and for Pacific > Māori > European families, with many saying that they could not always afford to eat properly, and that they often or sometimes ran out of food. That those with the greatest food security issues (Pacific > Māori > European / Other, Least Affluent > Most Affluent) were the same as those experiencing the highest rates of childhood overweight and obesity, suggests that further research is needed to assess the impact affordability of healthy food options has on the current obesity epidemic.
4. While the majority of children brought the food they consumed at school from home, this declined as children grew older. In addition, the proportion relying on school canteens or local food outlets was higher for Pacific > Māori > European / Other children and those living in the most deprived areas. Recent survey data has suggested that many items currently offered in school canteens may not support healthy food choices, thus potentially exposing a larger proportion of Pacific > Māori > European / Other children and those living in more deprived areas, to a range of unhealthy food choices (e.g. pies, sausage rolls), thereby exacerbating disparities in body mass index.

Thus at a regional level, a multifaceted approach to the obesity epidemic may be needed, which takes into account the environments in which children and young people make their food choices (e.g. school canteens, local food outlets), as well as the social and economic constraints (e.g. relative pricing of healthy vs. non healthy food options) which preclude the uptake of healthy food choices for some socioeconomic and ethnic groups.

Physical Activity and Exercise

While data limitations make it difficult to determine whether increases in total energy intake or decreases in physical activity have played the greatest role in the current obesity epidemic, increasing physical activity remains one of the mainstays of the NZ's Current Healthy Eating, Healthy Action Strategy and thus an understanding of its determinants is of value in identifying potential intervention points for future strategy development. In NZ the Children's Nutrition Survey (CNS02) provides a limited amount of information on physical activity in children, while SPARC surveys have monitored children's participation in active sport and leisure since 1997. On comparing the findings of these two surveys, a number of common themes emerge, as well as a number of contradictions. In general, the available evidence would suggest:

1. Approximately 32% of NZ children 5-17 years were inactive.
2. Girls were more likely to be inactive than boys.
3. The % of children and young people who were inactive increased with age, reaching a peak during late adolescence and thereafter declining. Changes in SPARC's definition of sedentary before and after 17 years however, make differences between adults and young people difficult to interpret.
4. The physical activity levels of children and young people in NZ are influenced by the activity levels of their parents.

Where differences between the two surveys emerge is in their conclusions relating to ethnic differences in physical inactivity. While the CNS02 suggested that European / Other children were the most inactive group, SPARC surveys suggested that Pacific children were at greatest risk. In interpreting these findings, it must be remembered that the two surveys utilised two totally different methodologies, with children in the CNS02 being interviewed about their daily activity levels and questions covering all aspects of physical activity, including travel to and from school. In contrast, SPARC's Surveys were based on parental report and focused on participation in sports and active leisure. As a consequence, it is possible that the CNS02 more successfully captured elements of children's day to day activity, while SPARC Surveys emphasised those elements relating to organised sport. In addition, the CNS02 combined European and Asian children into a single ethnic group, whereas SPARC's Surveys suggested that in terms of active leisure, these two groups were quite different. Despite these limitations, what these findings do suggest, is that at least a third of NZ children and young people are either sedentary or relatively inactive and thus there is significant potential to achieve gains in physical activity within the context of the current obesity epidemic.

DISABILITY

As in NZ at present, it is very difficult to access useful regional information on the nature and prevalence of disabilities amongst NZ children and young people. Nevertheless, the provision of health and disability support services remains a key role of those working at a regional level and it is undesirable that a lack of local level data should preclude the coverage of disability issues in this report. The following four sections bring together some of the available information on childhood disability and where data is readily available (e.g. congenital anomalies evident at birth, deafness notification data, and children with visual impairments) this is included in the sections which follow. Where local data is not available, but an issue is nevertheless perceived to be important, estimates of its prevalence are made based on extrapolations from overseas figures. In this way, it is hoped that some of the key issues for children and young people with disabilities can be highlighted, even in the absence of local level data.

Congenital Anomalies Evident at Birth

It has been estimated that of the 11% of NZ children <15 years with a disability, 41% were present from the time of birth. Of these, a significant proportion is likely to be congenital anomalies, with overseas estimates suggesting that ~2-3% of births are associated with a major congenital anomaly. In NZ, while a large number of the minor congenital anomalies documented at the time of birth are likely to be either of little functional consequence, or readily repaired during the early years of life, a significant minority may lead to long term disability and a variable need for disability support services.

In NZ the number of children born with Down Syndrome has remained relatively static during the past 25 years, while the number with Neural Tube Defects has declined dramatically. In reality, both trends reflect the complex interplay between opposing factors including access to prenatal diagnosis and the selective termination of pregnancy, the personal choices of parents and population level shifts in known (e.g. maternal age) and unknown risk factors. While it is likely that prenatal diagnosis has also reduced the number of children being born with other major congenital anomalies, at a regional level a small number of children are still born each year with major congenital anomalies and these children require an integrated approach to their health and disability support needs, if they are to reach their full potential.

Permanent Hearing Loss

Hearing loss during the early years of life is of significant concern, as delays in intervention may lead to impaired language development and, long term, may impact negatively on

cognitive development, academic performance and subsequent career choice. Evidence would suggest that NZ's current high risk approach to detection is resulting in significant delays, with the average age of detection of moderate or greater loss in NZ being 45.3 months in 2004.

In the Auckland Region each year, approximately 40 children meet the inclusion criteria for the Deafness Notification Database and while there are no figures available for Counties Manukau, approximately 2-3 Counties Manukau children each year are admitted to hospital for cochlear implant surgery. It is hoped that the roll out of a Universal Newborn Hearing Programme in NZ over the next few years will lead to a decline in the age at first detection of hearing loss and significantly earlier intervention for these children.

Blindness and Low Vision

While it is difficult to precisely estimate the number of NZ children and young people who are blind or have low vision, estimates from the Vision Education Agency suggest that around 1,332 children and young people in NZ each year require educational support as a result of a visual impairment. In the Auckland Region during 2006, 459 children and young people received educational support by means of enrolment at the Auckland Visual Resource Centre, Manurewa High Resource Room or Homai Campus School.

Children and young people enrolled at Visual Resource Centres across the country had a variety of visual impairments during 2006, ranging from low vision→ blindness→ deafblindness→ cortical visual impairments and used a variety of communication modalities including large print, visual aids, Braille and signing systems. In addition, 60.4% had other disabilities which had minor→ major impacts on their functional ability. Irrespective of the underlying cause of their visual impairment however, at a regional level children and young people with visual impairments require a range of education, health and disability support services, the coordination of which is vital to ensuring they reach their full developmental potential.

BUFFERS AND PROTECTIVE FACTORS

Early Childhood Education

Research suggests that participation in high quality early childhood education (ECE) has significant long term benefits. In NZ, ECE is provided in a variety of contexts ranging from the more traditional Kindergartens and Te Kohanga Reo, to services that cater for the needs of working parents. In NZ during 1990-05 the number of children enrolled in ECE increased by 56.7%, with the largest increases being in Education and Care Services, Home Based Services and License Exempt Playgroups. In addition, during 1996-05 the number of hours children spent in ECE increased for all Service types, with the exception of Playcentres and Te Kohanga Reo.

In NZ during 2000-05, the percentage of new entrants (Year 1) reporting prior participation in ECE increased from 91.0% in 2000 to 94.3% in 2005 and while rates remained highest amongst European > Asian / Indian > Māori > Pacific children and those attending the most affluent schools, in absolute terms rates increased most rapidly for Māori and Pacific children. In Counties Manukau during 2000-05, while there was a gradual increase in prior participation rates in line with NZ wide trends, prior participation rates in Counties Manukau remained lower than the NZ average. While prior participation rates for European and Asian / Indian children were similar to or slightly lower than the NZ European and Asian / Indian averages, rates for Māori and Pacific children were consistently lower than their respective NZ ethnic specific averages.

Kura Kaupapa Māori & Kura Teina

Cultural identity is a critical component of positive Māori development and has been positively linked to health status, educational achievement and emotional and social adjustment. In NZ, kura kaupapa Māori are total immersion schools which follow a curriculum that validates Māori knowledge, processes, learning styles and practices and are regarded as a key part of the strategy to revitalise the Māori language and to improve the participation and achievement levels of Māori in education. Since 1992, there has been a 5.6-fold increase in the number of kura kaupapa Māori and kura teina, with the number of children enrolled increasing from 4,964 in 2000 to 6,181 in 2005. In Counties Manukau during 2005, there were 4 kura kaupapa Māori and 2 kura teina, catering for a total of 542 students. It is hoped that the ongoing growth of kura kaupapa Māori and other schools incorporating Māori language in their teaching, will continue to foster the use of Māori language amongst NZ children and young people and as a consequence, further enhance positive cultural identity.

YOUNG PEOPLE 15-24 YEARS

LIFESTYLE AND BEHAVIOURAL FACTORS

Smoking in Young People

High youth smoking rates are a cause for concern, as research suggests that 33-50% of young people who try smoking become regular smokers, with the transition taking on average 2-3 years. Once smoking regularly, the well documented signs of nicotine dependence and withdrawal become evident, as they do in the adult population. In NZ, the Census (1996 & 2006) and ASH collect information on youth smoking. ASH Surveys suggest that in NZ during 1999-05, daily smoking rates among Year 10 students were highest amongst females, Māori > Pacific > European / Other > Asian young people, those in the most deprived areas and those for whom one or both parents smoked. During 1999-05, daily smoking rates declined for all ethnic and socioeconomic groups, although declines were less rapid for students attending schools in the more deprived areas and for those for whom both parents smoked. In Counties Manukau, the proportion of Year 10 students who were daily smokers declined from 17.2% in 1999 → 8.8% in 2005, with smoking rates during this period being similar to the NZ average.

Data from the 1996 Census demonstrated a similar picture, with 23.7% of Counties Manukau young people (15-24 yrs) being regular smokers, as compared to 24.5% nationally. Rates were higher for Māori > Pacific > European > Asian / Indian young people and those living in the most deprived areas. Such disparities are of concern, as if left unaddressed they potentially signal ongoing disparities in later adult health outcomes (e.g. respiratory and ischaemic heart disease), as well as in-utero and early childhood exposures as the current generation of Counties Manukau young people begin their own families in future years.

Alcohol Use

The Alcohol Advisory Council's (ALAC) 2005 survey suggested that 80% of young people 12-17 years had tried alcohol, 53% were current drinkers and that 44% of males and 30% of females binge drank (≥5 drinks) on their last drinking occasion. The high proportion of binge drinkers has significant public health consequences, with the Youth 2000 Survey suggesting that of secondary school students who had ever drunk alcohol, a significant minority had got into trouble or fights, had an injury or accident, driven while potentially drunk or had sex while drunk and later regretted it.

During 2001-05, alcohol related hospital admissions were highest for those in their late teens / early 20s, for Māori young people and for those living in the most deprived areas. Reasons for

admission included acute intoxication, mental health issues and injuries, with the latter commonly arising from an assault or a motor vehicle crash. Significant methodological constraints however must be taken into consideration when interpreting these findings, as with the removal of emergency department cases, these figures reflect the more severe end of spectrum. In addition, it is likely that these figures represent an undercount, as they rely on hospital staff at the time of discharge listing alcohol use as a contributory cause, something which may be reported inconsistently over time and across the country. Nevertheless it is hoped that the figures presented in this section can act as a starting point when considering the range and extent of alcohol related harm amongst young people in Counties Manukau in recent years.

EDUCATION

While education has traditionally been regarded as an issue outside the control of the health sector, an understanding of the role education plays in the genesis of health inequalities is crucial if DHBs are to develop long term strategies to improve health status in their regions. The following three sections, using data from the Ministry of Education, explore indicators of educational performance and participation amongst young people during the past decade.

Educational Attainment at School Leaving

In NZ during the past decade, the proportion of students attaining a University Entrance Standard, or leaving school with little or no formal attainment have fluctuated, possibly in part as a result of changes in prevailing labour force conditions and the availability of alternative forms of tertiary education. While there have been marked improvements in the proportion of students achieving a University Entrance Standard, or leaving school with little or no formal attainment since the introduction of the NCEA in 2002, care must be taken when interpreting these figures, as the old and new qualification structures may not be strictly comparable.

In Counties Manukau during 1995-05, the proportion of young people leaving school with little or no formal attainment was generally higher than the NZ average, while the proportion leaving school with a University Entrance Standard was lower. There were also marked ethnic disparities in educational attainment, with the proportion of Counties Manukau young people leaving with little or no formal attainment being highest for Māori > Pacific > European > Asian / Indian young people. In contrast, rates for acquiring a University Entrance Standard were highest for Counties Manukau Asian / Indian > European > Māori and Pacific young people. For Counties Manukau the implications of these findings may be significant, as at a regional level, unless such disparities in educational attainment can be addressed, it is unlikely that interventions aimed at addressing the issue of health inequalities amongst the next generation of NZ children and young people, will achieve long term success.

Senior Secondary School Retention

While school retention rates for NZ young people <18 years have fluctuated over the past decade, marked socioeconomic and ethnic disparities have remained, with retention rates being lower for Māori students and those attending schools in the most deprived areas. In Counties Manukau during 2002-05, school retention rates at 16 and 17 years were very similar to the NZ average, although once broken down by ethnic group, marked disparities were evident, with lower retention rates being seen for Māori > Pacific and European > Asian / Indian students and in the case of Māori students, these retention rates were lower than the NZ Māori average.

The ethnic differences in school retention rates cited above however, need to be viewed within the context of the alternative educational opportunities available to students. In NZ

during 1998-04, there were large increases in tertiary participation rates, particularly amongst Māori students taking Certificate Level 1-3 courses. There were also steady longer term increases in the proportion of Māori students participating in bachelor level study during 1994-04. While the majority of these increases were in the 25+ age group, such figures suggest that for many, participation in formal education does not cease at school leaving, although the income premiums achieved for completing various types of study need to be taken into consideration when assessing the longer term impacts educational participation have on future socioeconomic security.

Suspensions, Exclusions and Expulsions

In NZ during 2000-05 the number of suspensions, exclusions and expulsions of students has declined, while the number of stand-downs has increased. In general, the main reasons for suspensions and exclusions were continual disobedience, physical assaults on other students or staff and drug use, with higher rates being reported amongst secondary school students, those aged 13-15 years, males and Māori students. In part, some of the decline in suspension rates during this period may be due to the Suspension Reduction Initiative, which has operated in a number of secondary schools with historically high suspension rates since 2001.

In Counties Manukau during 2000-05, suspension rates were generally lower than the NZ average, while exclusion and expulsion rates were similar. In addition, suspension rates amongst Counties Manukau Māori, Pacific and European students were generally lower than their respective NZ ethnic specific averages, while suspension rates for Counties Manukau Asian / Indian students were similar to the NZ average. Despite this, such figures potentially suggest that for a significant minority of students, conduct problems may alter their participation in secondary education and as a consequence, their future academic achievement and career aspirations.

YOUNG PEOPLE ON BENEFITS

While adolescence is for many young people, a time for investing in learning and acquiring new skills, it is also a time of vulnerability. While the majority of young people successfully complete their years of secondary education and continue on to further training and employment, a significant minority are unable to support themselves financially for a variety of reasons. For those who meet eligibility criteria, the NZ Government offers a range of benefits. While young people receiving a benefit comprise a heterogeneous group, including those temporarily out of work, those caring for young children and those unable to participate in the workforce for a variety of medical or other reasons, they may nevertheless share a number of experiences in common with other groups highlighted in earlier sections of this report.

In NZ during 2000-06, the number of young people (16-24 yrs) reliant on an unemployment benefit fell, from 40,732 in 2000 to 10,650 in 2006. While unemployment benefit uptake declined for all ethnic groups, marked disparities remained, with rates being higher for Māori > Pacific > European young people. Rates for those reliant on the DPB changed little, being 43.8 per 1,000 in 2000 and 43.7 per 1,000 in 2006. There were also marked ethnic disparities in DPB uptake, with rates being higher for Māori > Pacific > European young people. There was a gradual increase in the number of young people on sickness and invalid's benefits, with uptake rates being higher for Māori and lower for Pacific young people during most of this period.

In Counties Manukau during 2000-06, there was a gradual decline in the number of young people receiving unemployment benefits, although the numbers receiving the DPB remained relatively static and the numbers receiving sickness and invalid's benefits increased. Thus

while in 2000, unemployment benefits were the most frequent form of income support received by Counties Manukau young people, by 2006 the DPB was the predominant benefit type in the region. These trends were very similar to those occurring nationally and may in part be due to changes in the labour market and the greater employment opportunities available for young people in recent years.

CHILDREN 0-14 YEARS



FAMILY FACTORS



INTRODUCTION

The relationships children and young people have with their families significantly influence their health and wellbeing [2]. During infancy, interactions between infants and their caregivers promote bonding and set the tone for further development [3]. During the preschool years, a child's struggle to gain independence and autonomy is tempered by their need for continuing nurturing. Caregivers play a vital role in helping children gain a sense of competence and mastery, while at the same time establishing boundaries. Secure relationships established during this period serve as templates for relationships in future years [4]. As children grow into maturity, an increasingly larger portion of their time is spent away from family, yet maintaining family relationships remains vital for their physical and emotional wellbeing, with research suggesting that strong and healthy family relationships confer significant protective advantage (e.g. reduced substance use during adolescence [2]).

In NZ, the last 25 years have been characterised by increasing diversity and change in terms of what constitutes a family, with a marked shift away from two-parent families and an increase in the number of families headed by single parents [5]. Yet the majority of children and young people in NZ still live with their families and enjoy positive family relationships, with the Youth 2000 Survey noting that >98% of secondary school students lived with their family and >90% reported at least one of their parents cared about them a lot [2]. While such figures are reassuring, one of the key factors underpinning family wellbeing is adequate resources, with a large body of evidence suggesting that children's wellbeing is influenced by the socioeconomic circumstances in which their families live and their access to resources such as adequate income, good education, health services, housing and transport [6].

At a regional level, an awareness of the extent of family under-resourcing is important, as while most NZ children live with their families and experience positive family relationships, a significant minority experience a variety of adverse outcomes, either as a result of their families having insufficient resources with which to meet their physical and emotional needs, or as a result of family conflict. The following sections explore four overlapping groups of children in NZ and Counties Manukau who may experience higher rates of adverse outcomes as a result of the family contexts in which they live and who as a result, may require greater prioritisation in regional planning and strategy development. These are:

1. Children Living in Sole Parent Families
2. Children Reliant on Beneficiaries
3. Children Experiencing Family Violence
4. Children Referred to Child Youth and Family Services (CYFS)

FAMILY COMPOSITION

In NZ during the past 25 years, there has been a marked shift away from two-parent families, with the proportion of families headed by single parents increasing from 10% in 1976 to 29% in 2001 [5]. While the majority of single parent families are headed by women (84% in 2001), Census data suggests that sole parents are not a homogeneous group, but reflect a diversity of experience including those who have never been married (more commonly in their teens-20s), those who are separated or divorced (more commonly in their 30s-40s), those who are widowed (more commonly in their 50s-60s) and those who remain married but who do not live together for a variety of reasons (e.g. partner living overseas). In addition, for many children in sole parent families, both parents maintain an active parenting role through shared custody arrangements [7].

Family composition and the number of children growing up in sole parent families are important at a regional level for a number of reasons. Firstly, the role family composition plays in the socioeconomic resources available to dependent children was recently highlighted by the 2004 Living Standards Survey, which suggested that 42% of sole parent families lived in significant or severe hardship, as compared to only 14% of two parent families [8]. Such hardship resulted in families postponing children's doctors or dentists visits, children sharing a bed, wearing poorly fitting clothes or shoes, or going without wet weather clothing. In addition, the survey noted that sole parent families were more likely to be reliant on Benefits (sole-parent 62% vs. two-parent 6%) and that much of the differences in living standards between sole and two parent families was due to the former's greater reliance on benefits as their primary source of income [8].

Secondly, for a significant number of children, living in a sole-parent family has arisen out of parental separation. A large body of literature now suggests that children who experience parental separation during childhood do less well across a range of outcomes (e.g. educational attainment, mental and emotional health, social conduct, substance use, early onset sexual behaviour) [9] [10]. Others would argue however, that the magnitude of these differences is not large and that many children are not adversely affected [10], with those who are adversely affected being influenced by other exacerbating factors (e.g. a decline in family income, declines in the mental health of custodial parents, exposure to interparental conflict and compromised parenting). It is likely that many of these factors interact to influence children's wellbeing (e.g. income declines following separation → increased risk of material and economic deprivation → negative impacts on parent's mental health → compromised parenting behaviours). In addition, the associations are not always straight forward, with a number of studies suggesting that where parental relationships are highly conflicted and children are drawn into the conflict, or where a child's relationship with a parent is poor, children may actually benefit from parental separation [9] [10]. Further adding to this complexity is the finding that in situations where a sole parent remarries, the outcome for their children often differs little from those remaining in a sole parent family, even if their socioeconomic circumstances improve [10]. As a consequence, not only do sole-parent families reflect a diversity of experience, but the impacts that changes in family composition have on children's physical and psychological wellbeing may also vary, depending on individual family circumstances and the impact parental separation has on their socioeconomic position.

The following section uses Census data to explore the proportion of children <15 years in NZ and Counties Manukau living in sole parent families at the 2001 and 2006 Censuses. While the indicator used is crude (sole-parent vs. two-parent) and fails to take into account the

significant diversity of experience for children living in different family settings, it is hoped that it will nevertheless highlight the presence of a group of children in Counties Manukau who on average, may have higher physical and psychological health needs and as a result, may warrant further attention in health planning and strategy development.

Data Sources and Statistical Methods

The information contained in this section was derived from the 2001 and 2006 Censuses, as provided by Statistics NZ. It includes all households with dependent children <15 years who were at home on Census night (those who were away from home were excluded) and utilises Level 1 prioritised ethnicity of the child (see Appendix 6 of last year's Report) when reporting differences by ethnic group. The NZDep 2001 Index was used throughout. The dichotomous breakdown into "Couple with Children" and "One Parent with Children" is made without regard to the relationship between the child and caregiver (e.g. a couple with children may refer to a de-facto couple, a married couple, grandparents caring for a dependent grandchild, a mother living with a partner who is not the child's biological parent) and thus may underestimate the proportion of children who have experienced parental separation, as well as the proportion living in blended family settings.

Family Composition in NZ and Counties Manukau

NZ Trends During Past 25 Years

During 1976-2001, the proportion of sole-parent families with dependent children in NZ increased progressively, from 10.4% of families in 1976 to 29.2% in 2001. Similarly the proportion of two-parent families declined, from 89.6% in 1976 to 70.8% in 2001 (**Figure 1**).

Total and Ethnic Differences

In Counties Manukau during 2001, 28.5% of children <15 years of age lived in sole parent families, as compared to 26.4% in NZ as a whole. There were also marked ethnic disparities in Counties Manukau during this period, with 46.8% of Māori and 30.9% of Pacific children living in sole parent families, as compared to 17.7% of European and 17.8% of Asian children. These disparities were consistent with those occurring in the rest of NZ (**Figure 2**).

Socioeconomic Differences

There were also marked socioeconomic disparities in the proportion of Counties Manukau children living in sole parent households during 2001, with rates rising progressively from 8.5% amongst those living in the most affluent (Decile 1) areas, to 41.4% amongst those living in the most deprived (Decile 10) areas. These socioeconomic disparities were very similar to those occurring in the rest of NZ (NZ Decile 1, 7.9% vs. Decile 10, 46.2%) (**Figure 3**).

Relationship Between Socioeconomic Status and Ethnicity

While small numbers prevented an analysis of the relationship between ethnicity and NZDep deprivation at a DHB level, NZ level data suggested that for each of NZ's largest ethnic groups, the proportion of children living in sole parent households increased with increasing NZDep deprivation, but that at each level of deprivation, ethnic differences remained (**Figure 4**).

Figure 1. Families with Dependent Children by Family Type, NZ 1976-2001

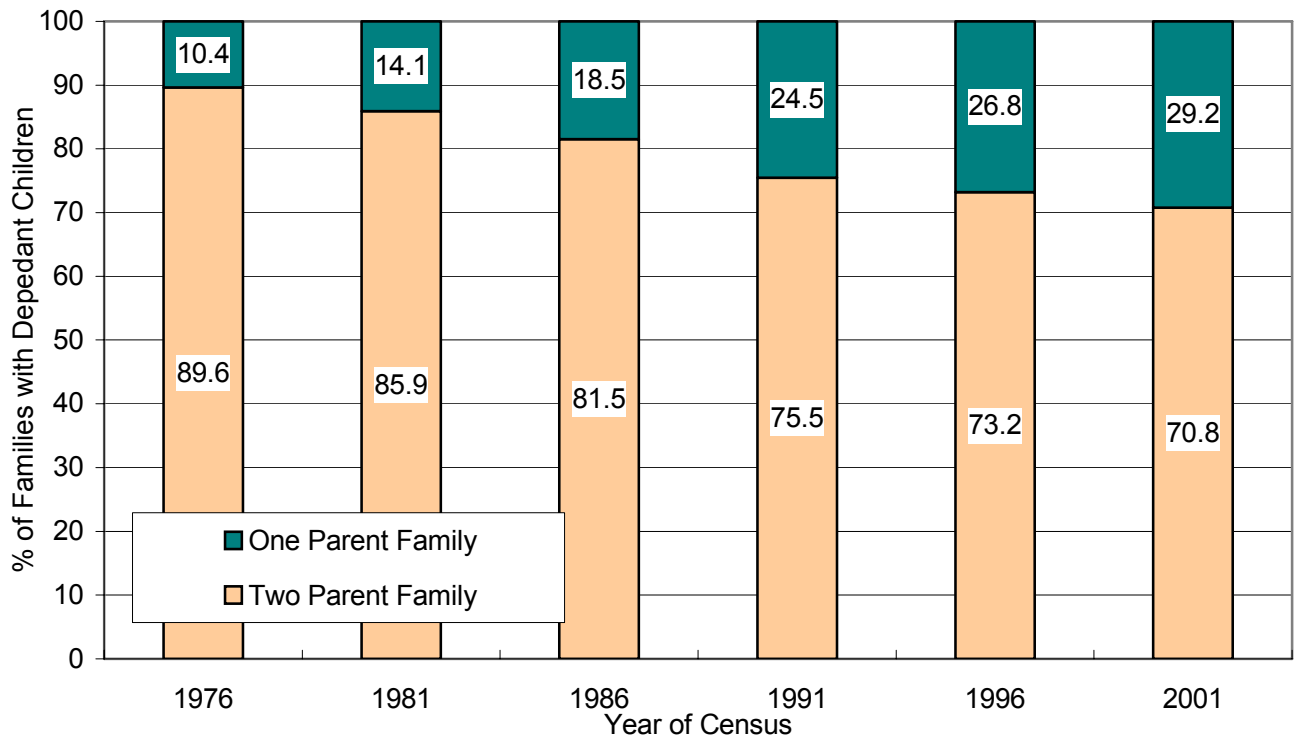


Figure 2. Proportion of Children <15 Years Living in One and Two Parent Families by Ethnicity, Counties Manukau vs. NZ at the 2001 Census

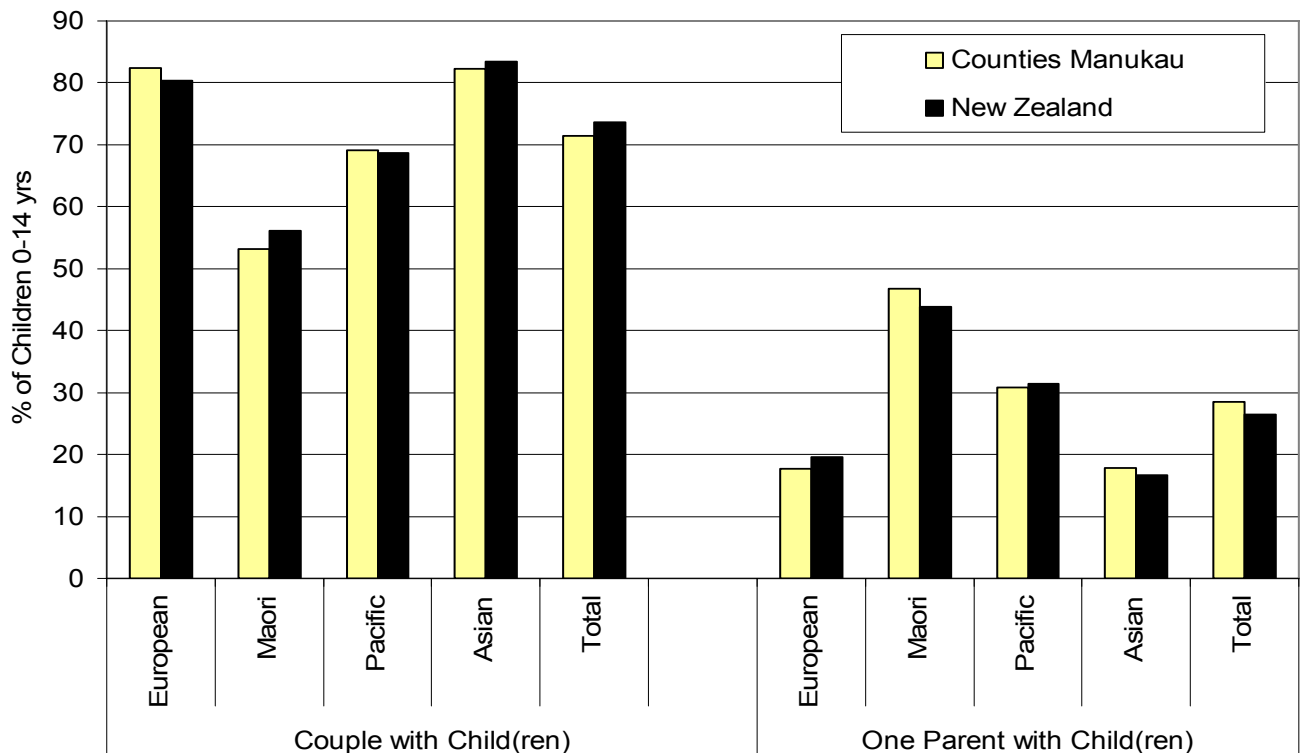


Figure 3. Proportion of Children <15 Years Living in One and Two Parent Families by NZ Deprivation Index Decile, Counties Manukau vs. NZ at the 2001 Census

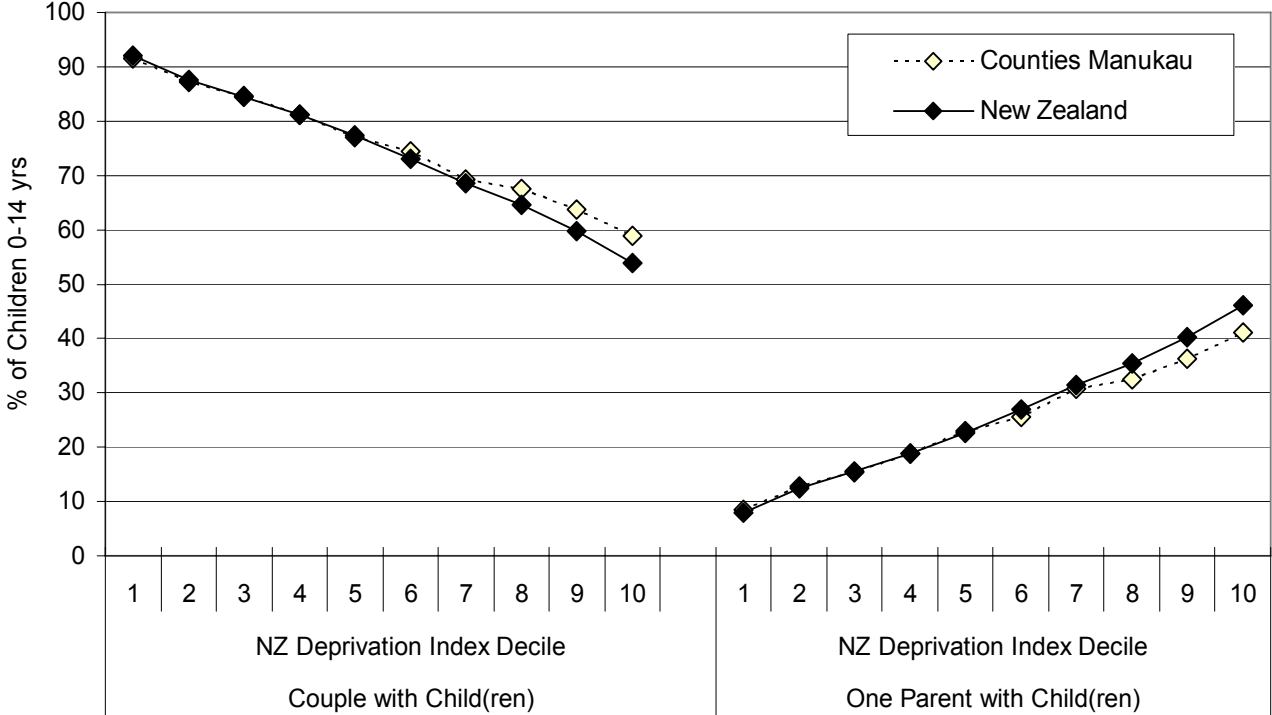
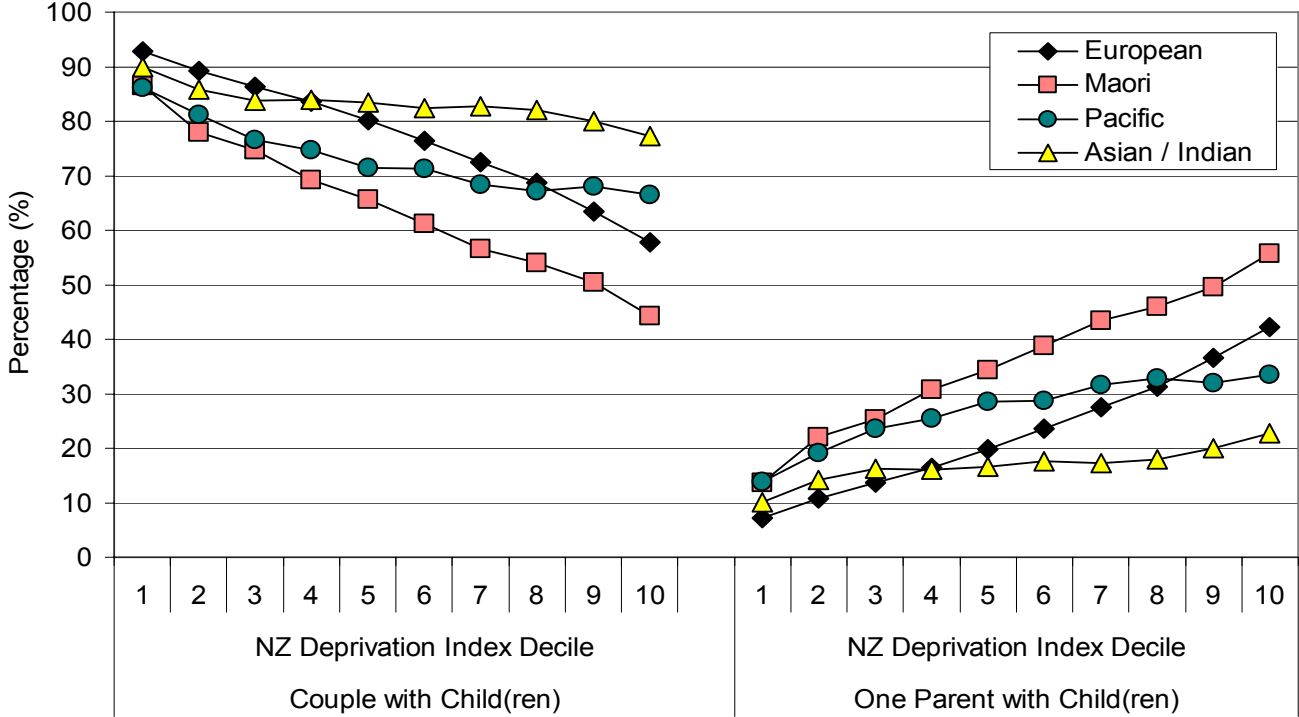


Figure 4. Proportion of NZ Children <15 Years Living in One and Two Parent Families by Ethnicity and NZ Deprivation Index Decile at the 2001 Census



In Summary

In NZ during the past 25 years, there has been a marked shift away from two-parent families, with the proportion of single parent families increasing from 10.4% in 1976 to 29.2% in 2001. In Counties Manukau during 2001, 28.5% of children <15 years lived in sole parent families, as compared to 26.4% for NZ as a whole. There were also marked socioeconomic and ethnic disparities in Counties Manukau during this period, with the proportion of children living in sole parent families rising progressively from 8.5% amongst those in the most affluent areas (NZDep Decile 1), to 41.4% amongst those in the most deprived areas (NZDep Decile 10). In addition, 46.8% of Māori and 30.9% of Pacific children lived in sole parent families, as compared to 17.7% of European and 17.8% of Asian children.

Care must be taken when interpreting these figures, as the dichotomous breakdown into “Couple with Children” and “One Parent with Children” utilised by Statistics NZ is made without regard to the relationship between the child and caregiver (e.g. couple with children includes both married and de-facto couples, grandparents caring for dependent grandchildren, a mother living with a partner who is not a child’s biological parent) and thus these figures may underestimate the number of children experiencing parental separation or living in blended family settings.

BENEFIT DEPENDENT FAMILIES

High rates of child poverty are a cause for concern, as low family income has been associated with a range of negative outcomes including low birth weight, infant mortality, poorer mental health and cognitive development and hospital admissions from a variety of causes [11]. While there is much debate about the precise pathways via which lower family income leads to adverse outcomes, the relationship appears to be non-linear, with the effects increasing most rapidly across the range from partial to severe deprivation. In addition, persistently poor families are more likely to contain caregivers suffering from depression or other psychological problems, physical health problems, low cognitive skills and drug and alcohol problems [12].

In NZ, children reliant on beneficiaries are a particularly vulnerable group, with 51% of families relying on benefits as their main source of income during 2003-04, living below the poverty line (housing adjusted equivalent disposable income <60% median) [5]. This proportion has fluctuated markedly over the past two decades, rising from 25% of benefit dependent families in 1987-88, to a peak of 75% in 1992-93 and then gradually falling back again to 61% in 2000-01, with the fluctuations being attributed to 3 main factors: cuts in the level in income support during 1991, the growth in unemployment (which peaked at 11% in 1991) and escalating housing costs, particularly for those in rental accommodation [13]. Furthermore, benefit dependent children account for the majority of those living in poverty, with ~60% of children living below the poverty line in 2004 relying on Government benefits as their main source of family income [14].

The vulnerability of benefit dependent children was further highlighted by the 2000 Living Standards Survey, which noted that even once the level of family income was taken into account, families whose main source of income was Government benefits were more likely to be living in severe or significant hardship and as a consequence, more likely to buy cheaper cuts of meat, go without fruit and vegetables, put up with feeling cold to save on heating costs, make do without enough bedrooms, have children share a bed, postpone a child's visit to the doctor or dentist, go without a computer or internet access and limit their child's involvement in school trips, sports and extracurricular activities [13]. The recently released 2004 Living Standards Survey suggests that this picture may be worsening, with the proportion of benefit dependent families living in severe or significant hardship increasing from 39% in 2000 to 58% in 2004 [8]. Thus even once the effects of low income are taken into account, children who are dependent on a beneficiary are more vulnerable to poorer outcomes, either as a result of their families stricter economising behaviour, or the accumulation of other disadvantage [13].

The following section reviews the number of children (<18 years) dependent on beneficiaries in NZ and Counties Manukau, using information available from the Ministry of Social Development. While the number of benefit dependent children in an area does not precisely correlate with the number living below the poverty line (in 2004 they comprised 60% of those in poverty [14]), and the relationship between benefit dependence and child poverty is sensitive to changes in Government social policy and market forces (e.g. ↓↑ in levels of income support vs. housing and other costs), an awareness of large shifts in the number of benefit dependent children in an area (e.g. due to ↑ local unemployment rates) is of value in tracking changes in a particularly vulnerable group who well may have higher health needs, as well as for predicting future health service demand.

Data Sources and Statistical Methods

Ministry of Social Development (MSD) Work and Income Data [15]

The information in this section was provided by the MSD and is derived from their SWIFTT database, which records information on recipients of financial assistance through Work and Income for 2000-06. All figures, unless stated otherwise, refer to the number of children who were dependent on benefit recipients as at the end of April and thus provide no information on those receiving assistance at other times of the year. To be eligible for a benefit, clients must have insufficient income from all sources to support themselves and any dependents and meet the eligibility criteria for benefits. These are

Domestic Purposes Benefit (DPB): This group of benefits is mainly utilised by sole parents with dependant child(ren) <18 years who are not living with the child's other parent or another partner. To be eligible, a young person must be aged 18+ years, or be 16-17 years and legally married and must meet residency and income qualifications. An Emergency Maintenance Allowance is available to those who do not meet these criteria (e.g. who are <18 years of age) but who are alone and caring for children and unable to support themselves financially. This group also includes a small number (~1%) aged 16+ years who are caring full time for someone, other than a partner, that would otherwise be receiving hospital care and who meet residency and income qualifications.

Unemployment Related Benefits: Clients receiving unemployment benefits are subject to a full time work test. From April 1997 spouses or partners of clients receiving unemployment benefits have also been subject to a full time work test if they have no dependent children, or their youngest child is aged 14+ years. The unemployment benefit is available to people who are available and actively seeking full time work, not already in full time employment and willing and able to undertake full time work. Clients must be aged 18+ years or 16-17 years and living with a spouse or partner and dependent children. An Unemployment Benefit: Hardship is available to people who do not meet all of these criteria but who are unable to support themselves through paid employment or other means.

Sickness Benefit: Clients need to be 18 years of age, or 16-17 years of age and either 27+ weeks pregnant or living with a partner and children they support. Clients must also be in a job but have had to stop working or reduce hours because of sickness, injury, pregnancy or disability OR be unemployed or working part time and find it hard to look for and do full time work because of sickness, injury, pregnancy or disability AND be a NZ citizen or permanent resident. To qualify a client (and their partner's) income must be below a certain level and they must have a medical certificate, the first of which can last for only 4 weeks. For pregnant women the sickness benefit is available from 27 weeks or earlier if there are complications and may continue for up to 13 weeks after birth, if caring for a child.

Invalid's Benefit: Clients need to be 16+ years of age and unable to work 15 hours or more a week because of a sickness, injury or disability which is expected to last at least 2 years OR their life expectancy is <2 years and they are unable to regularly work 15 hours or more a week OR they are blind with a specified level of visual impairment. A doctor's certificate is required and clients need to be NZ citizens or permanent residents.

Notes on Geographic Location: As information on benefit recipients was not linked to domicile code, it was not possible to provide information on the number of children resident within Counties Manukau who were reliant on benefit recipients, although information was available on the number of beneficiaries receiving their benefits (by type) from Service Centres within / adjacent to the Counties Manukau catchment. A lack of a clearly delineated denominator precluded the calculation of rates at a regional level, although rates at a national level were calculated using denominators extrapolated from the 2001 census.

Children Dependent on a Beneficiary in NZ and Counties Manukau

New Zealand

NZ Trends During Past 7 Years

In NZ during 2000-06, the proportion of children <18 years who were dependent on a benefit recipient (excluding non beneficiaries) fell, from 27.7% in 2000 → 22.6% in 2006. A large proportion of this decrease was due to a fall in the number of children relying on unemployment benefit recipients (4.9% of children in 2000 → to 1.2% in 2006). While the proportion of children reliant on domestic purposes benefit (DPB) recipients also fell slightly

(18.8% of children in 2000 → 17.0% in 2006), more rapid declines in those reliant on unemployment benefits meant that in relative terms, the proportion of benefit dependent children reliant on DPB recipients actually increased, from 67.6% of benefit dependent children in 2000 to 74.9% in 2006 (Figure 5).

Age Distribution

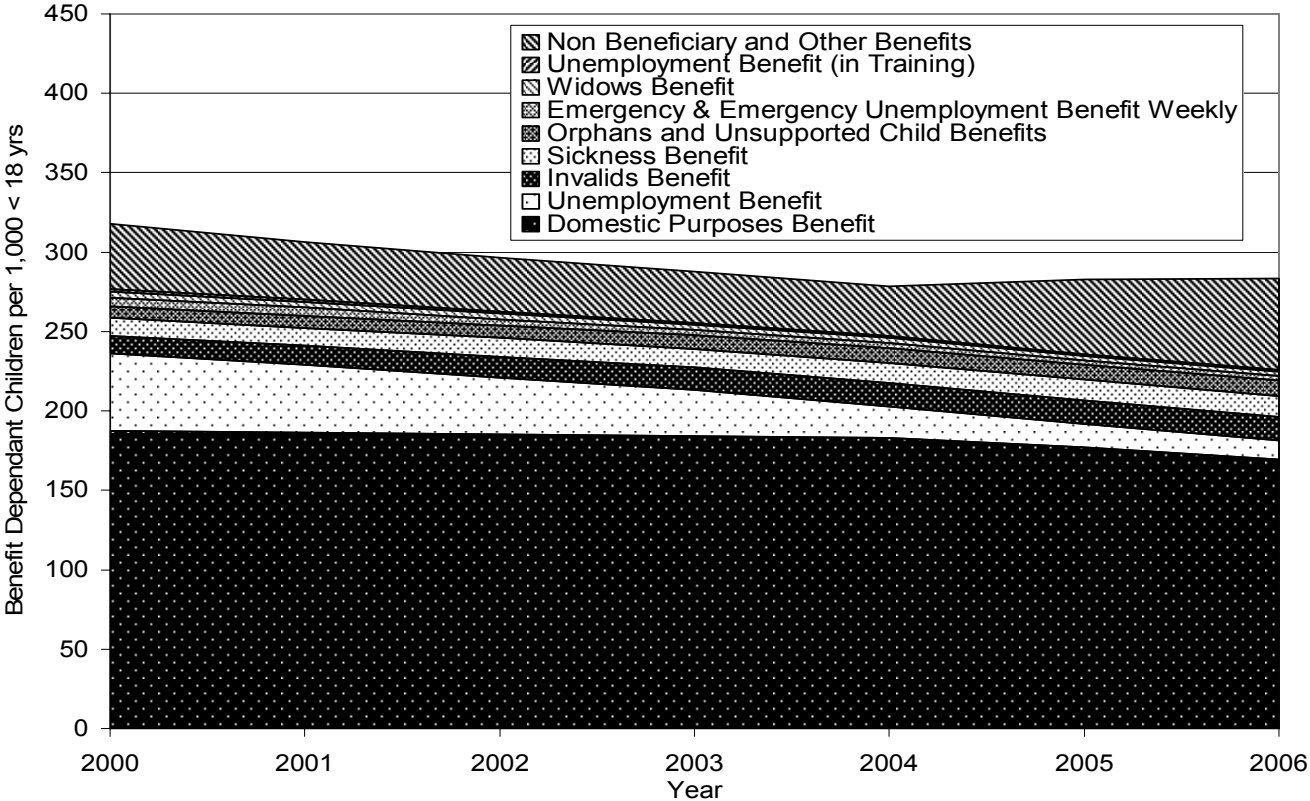
During April 2006, the proportion of children reliant on a beneficiary was highest amongst those <6 years of age, with numbers tapering off gradually throughout late childhood and early adolescence and then very steeply after 15 years of age (Figure 6).

Counties Manukau

Children Reliant on Beneficiaries in April 2006

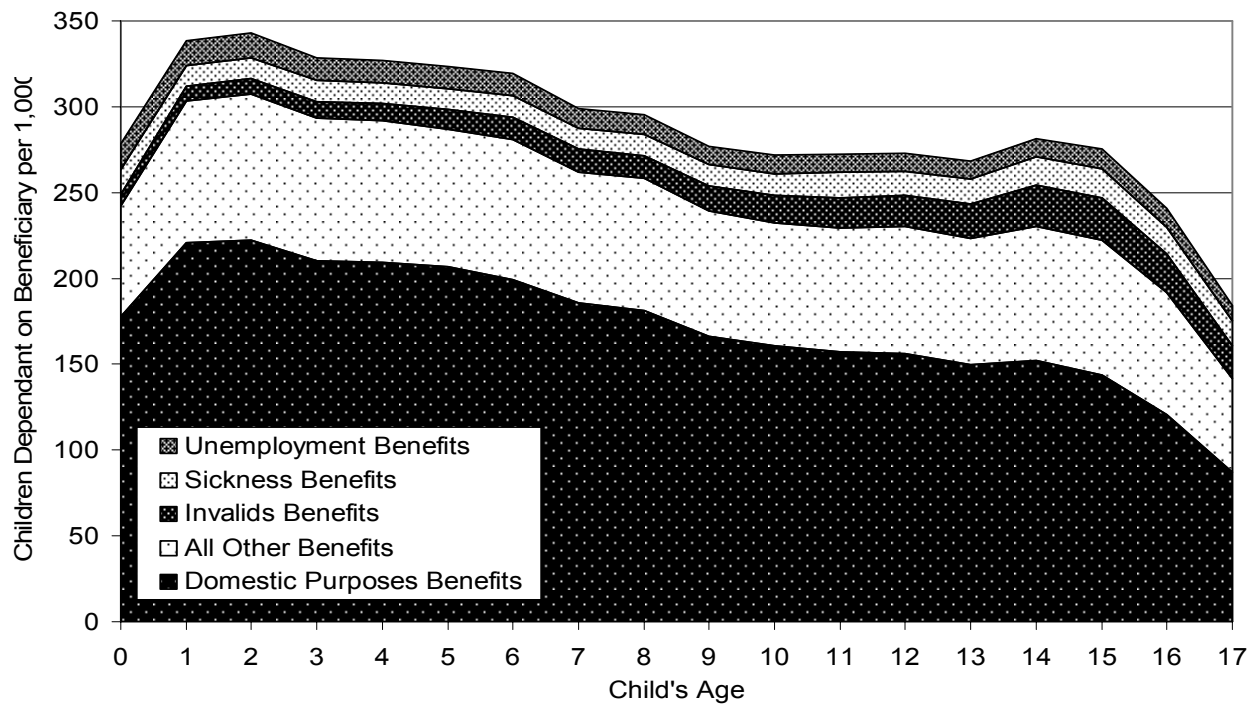
At the end of April 2006, there were 49,694 children <18 years who were reliant on beneficiaries and who received their benefits from Service Centres in or adjacent to the Counties Manukau catchment. Of these children, the majority (61.7%) were reliant on DPB recipients, with smaller proportions reliant on unemployment (5.6%), sickness (5.8%) and invalid's (3.5%) benefits and other benefit and non-benefit forms of income support (23.3%) (Table 1).

Figure 5. NZ Children <18 Years of Age who are Dependent on Benefit Recipients by Benefit Type, April 2000-2006



Note: Non Beneficiary includes those on low incomes who, while not being on a benefit, are nevertheless eligible for some forms of income support e.g. an accommodation supplement.

Figure 6. NZ Children <18 Years of Age who are Dependent on Benefit Recipients by Benefit Type & Age, April 2006



Note: All Other Benefits includes Non Beneficiaries (i.e. those on low incomes who, while not being on a benefit, are nevertheless eligible for some form of income support e.g. an accommodation supplement).

In Summary

Even once the effects of low income are taken into account, children who are dependent on beneficiaries are vulnerable to poorer outcomes, either as a result of their family's stricter economising behaviour, or the accumulation of other disadvantage. In NZ during 2000-06, the proportion of children <18 years dependent on beneficiaries fell, from 27.7% in 2000 → 22.6% in 2006. A large proportion of this decrease was due to a fall in the number relying on unemployment benefit recipients (4.9% in 2000 → 1.2% in 2006). While the proportion of children reliant on DPB recipients also fell slightly (18.8% in 2000 → 17.0% in 2006), more rapid declines in those reliant on unemployment benefits meant that in relative terms, the proportion of benefit dependent children relying on DPB recipients actually increased, from 67.6% in 2000 to 74.9% in 2006. During 2006, the proportion of children reliant on a beneficiary was highest for those <6 years, with numbers tapering off gradually through late childhood and early adolescence and then very rapidly >15 years of age.

In April 2006, there were 49,694 children <18 years reliant on beneficiaries who received their benefits from Service Centres in or adjacent to the Counties Manukau catchment. Of these, the majority (61.7%) were reliant on DPB recipients, with smaller proportions reliant on unemployment (5.6%), sickness (5.8%) and invalid's (3.5%) benefits and other benefit and non-benefit forms of income support (23.3%). While the numbers of benefit dependent children in Counties Manukau may not correlate precisely with the number living below the poverty line, they do reflect a particularly vulnerable group with higher personal health and support needs and tracking changes in their number over time (as labour market and other economic circumstances change) may be of value in predicting future health service demand.

Table 1. Children <18 Yrs Included in a Benefit in the Counties Manukau Region by Service Centre as at 28 April 2006

Service Centre	Benefit										
	Unemployment		DPB		Sickness		Invalids		Others*		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Clendon	288	6.9	3260	77.7	214	5.1	177	4.2	259	6.2	4198
Highland Park	95	2.5	1764	47.1	251	6.7	83	2.2	1550	41.4	3743
Hunters Corner	130	6.3	980	47.2	169	8.1	67	3.2	731	35.2	2077
Mangere	717	7.9	5504	60.7	587	6.5	387	4.3	1875	20.7	9070
Manukau	253	6.1	2585	62.2	227	5.5	169	4.1	923	22.2	4157
Manurewa	395	5.3	4285	57.9	388	5.2	216	2.9	2123	28.7	7407
Otahuhu	126	5.0	1510	60.1	214	8.5	103	4.1	559	22.3	2512
Otara	341	8.4	2659	65.3	261	6.4	150	3.7	659	16.2	4070
Papakura	255	4.3	3957	67.5	264	4.5	214	3.6	1176	20.0	5866
Papatoetoe	99	3.7	1579	59.4	156	5.9	73	2.7	751	28.3	2658
Pukekohe	72	2.4	1982	65.0	117	3.8	108	3.5	769	25.2	3048
Waiuku	28	3.2	584	65.8	43	4.8	17	1.9	216	24.3	888
Total	2799	5.6	30649	61.7	2891	5.8	1764	3.5	11591	23.3	49694

*Others Includes Non Beneficiary, NZ Superannuation, Veterans Pension, Transitional Retirement Benefit, Unemployment Benefit Student Hardship, Emergency Benefit, Emergency Unemployment Benefit Weekly & Unemployment Benefit (in Training) & Unemployment Benefit Hardship (in Training), Orphans Benefit, Unsupported Child Benefit and Widows Benefit.

FAMILY VIOLENCE

Te Rito: The NZ Family Violence Prevention Strategy [16] defines family violence as:

“a broad range of controlling behaviours commonly of a physical, sexual and / or psychological nature which typically involve fear, intimidation and emotional deprivation. It occurs within close interpersonal relationships”.

Research has shown that witnessing family violence can have significant and long term impacts on children [17]. The Dunedin Longitudinal Study, in following a cohort of 980 children to 26 years noted that 24% reported violence or threats of violence directed from one parent to another and of these, 6% reported threats, 9% reported 1-4 incidents of physical violence and 10% reported ≥ 5 incidents. Regardless of who carried out the violence, 64% of young people witnessing family violence described themselves as being upset “a lot” or “extremely” and a further 23% reported being “a bit” upset [18]. Similarly, the Christchurch Longitudinal Study followed a cohort of 1,265 children to 18 years and noted that ~38% reported exposure to interparental violence, with violence varying from verbal assaults (35%) to more infrequent physical attacks (slap, hit or punch partner 6%). After adjusting for known confounders, exposure to interparental violence was associated with an increased risk of anxiety, conduct disorder and property crime (father initiated violence) and alcohol abuse / dependence (mother initiated violence) [19].

In terms of the determinants of family violence, the Christchurch Longitudinal Study noted that violence was initiated with equal frequency by mothers and fathers [19]. In contrast, the Dunedin Longitudinal Study noted that 55% of violence was by fathers only, 28% was by both partners and 16% was by mothers only [18]. Other estimates suggest that between 15-35% of women are hit or forced to have sex by their partners at least once in their lifetime, while only 7% of men report a similar type of abuse [20]. Exposure to interparental violence has also been found to be higher amongst those living in difficult socioeconomic circumstances, both in NZ [21] and overseas [22], with the Christchurch Longitudinal Study reporting that family violence was 2.8 times higher if a child’s mother was <20 yrs at the child’s birth, was 2.4 times higher if a child’s mother was without formal qualifications and was 3.1 times higher if the family was in the lowest quartile for living standards [21]. Potential pathways for these associations include higher levels of stress and financial constraints that mitigate against leaving unsatisfactory relationships [22].

In developing regional responses, identifying children exposed to family violence needs to be given a high priority, not only because of the long term effects such exposures have on children’s psychological wellbeing, but also because of the potential overlaps between the occurrence of child abuse and partner abuse in families. While the actual figures are the subject of debate [23] [24], some estimates suggest that up to 30-60% of families who report one type of abuse, also experience the other type of abuse, with the likelihood of child abuse increasing with increasing partner abuse [20]. In this context, the recently released Family Violence Intervention Guidelines, which integrate child and partner abuse strategies into a single document, suggest some starting points at the service delivery level including screening all females ≥ 16 years, or those with signs and symptoms of abuse using a validated screening tool, supporting and empowering those identified as being the victims of abuse and following appropriate risk assessment, safety planning and referral pathways in clinical settings [20]. Similar guidelines for children are outlined in the CYFS Notifications section of this Report.

In an attempt to highlight the extent to which family violence is an issue for children and young people in Counties Manukau, the following section reviews Police POL400

attendances at family violence incidents in NZ and Counties Manukau during 1995-05. While it has been suggested that the Police are only involved in ~10% of the family violence incidents occurring in NZ each year [20] and that trend data may be sensitive to changes in the way in which the Police recognise and record family violence incidents (see Methods Section), it is nevertheless hoped that these figures will provide some insights into the context within which family violence is occurring, as well as to identify the “tip of the iceberg” in terms prevalence in the Counties Manukau region.

Data Sources and Statistical Methods

The Police POL400 Form

Police policy defines family violence as “*violence which is physical, emotional, psychological and sexual and includes intimidation or threats of violence*”. The term “family” includes parents, children, extended family members, whanau, or any other person involved in a relationship (e.g. partners, caregivers, boarders and flatmates), but does not include neighbours. The POL400 form is used whether or not an arrest is made, to report all Family Violence Offences, incidents and breaches of domestic protection orders. The nature of the incidents reported can vary from no offence being recorded, to the most serious forms of violence. Not all police attendances at this type of incident lead to charges being laid and situations can be resolved in a number of different ways.

The information contained in this section relates to all Police POL400 attendances, irrespective of whether a child was present. In addition, the information relates to the total number of POL400 attendances rather than the number of families involved i.e. each separate attendance at a family violence incident results in a new POL400 record, making it possible for a single household to generate multiple POL400 attendances during the same year. Rates were calculated using mid-year population estimates for each Police Area available from the Statistics NZ website and are for the number of Police attendances per 1,000 usually resident population. As rates are derived from total population denominators, it is difficult to determine how much of the regional variation in Police POL400 attendances could be due to differences in the underlying age structures of the Police Areas included in this report.

Note on Interpretation of Trend Data: As Police have given increasing focus to domestic violence over recent years, it is likely that more offences have been recognised and recorded as being domestic violence related than in earlier years. Additionally, the Police replaced their crime recording IT system in 2005 making it easier for staff to record an offence as being domestic violence related. The combined effect of these changes is that they are likely to produce increases in recorded domestic violence over time, with a particularly steep increase in mid-2005. As a result, Police statistics for recorded domestic violence cannot be used to make inferences about trends in the underlying incidence of domestic violence over time.

Police Family Violence Attendances in New Zealand

Presence of Children

Of the 56,477 family violence attendances in NZ during 2005 in which this information was recorded, children were present at 52.9% (**Table 2**).

Table 2. Number of POL400 Attendances Where Children Were Present, New Zealand 2005

	Number POL400 Attendances	% POL400 Attendances
Children Present	29857	52.9
Children Not Present	26620	47.1
Total	56477	100.0

Relationship Between Victim and Offender

Of the 34,743 family violence attendances in which the relationship between the victim and the offender was recorded during 2005, in 51% of cases the victim was the spouse / partner of the offender, with a further 22% having been in a previous relationship (separated / divorced / past relationship) and in 14% of cases, the conflict was between a parent and child (**Figure 7**).

Ethnicity of Victim

Of the 35,273 family violence attendances during 2005 where the ethnicity of the victim was recorded, 40% of victims were Māori, 39% were Caucasian, 9% were Pacific and 2% were Asian and Indian respectively (**Figure 8**).

Injuries Reported at Family Violence Attendances

Of the 56,481 family violence attendances during 2005 for which this information was recorded 82% reported no injuries. While the most common injuries were minor bruising (12.1%), cuts (2.9%) and serious bruising (1.5%), in 435 cases (0.8%) a hospital attendance was required and in 29 cases (0.1%) the incident resulted in a death (**Figure 9**).

Attendances Where an Offence was Disclosed

Police attendances at family violence incidents during 2005 resulted in a total of 23,414 offences being disclosed. While not all family violence attendances resulted in the disclosure of an offence and some attendances resulted in more than one offence, the nature of offences disclosed during this period gives some indication of the types of incidents occurring. Overall, 52% of the offences disclosed during 2005 related to assaults, with “assault by male on female” being the most common in this category (27% of all offences). In addition 14% of offences related to the Domestic Violence Act and a further 7% related to threats or intimidation (**Figure 10**).

Police Family Violence Attendances in Counties Manukau

Family Violence Attendances in Counties Manukau

The Police break the Counties Manukau region into 4 Police Areas (Counties Manukau Central, East, South and West), the boundaries of which can be seen in Appendix 1. **Table 3** summarises the number of Police attendances at family violence incidents in these Areas during 1995-05, while **Figure 11** compares rates per 1,000 during the same period. While it is difficult to use these figures to comment on trends in the prevalence of family violence during this period (due to changes in the way in which the Police have recognised and recorded family violence over time, particularly during 2005), what the figures do suggest is that a large number of family violence incidents are occurring in Counties Manukau each year and that (based on NZ level figures) children are likely to be present at a large proportion of these. In addition, for 3 out of the 4 Police Areas within Counties Manukau, Police attendances at family violence incidents appeared to be above the NZ average. As these rates are based on total population denominators however, it is difficult to determine how much differences in the age structure of the Counties Manukau population accounted for any of the differences seen.

Figure 7. Relationship between Victim and Offender for Police Attendances at Family Violence Incidents, NZ 2005

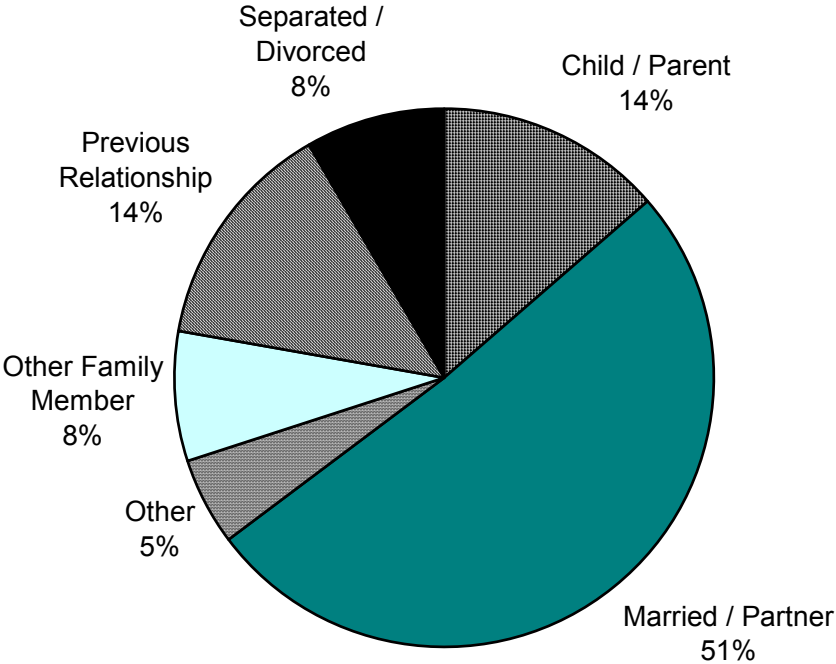


Figure 8. Ethnicity of Victim at POL400 Attendances, NZ 2005

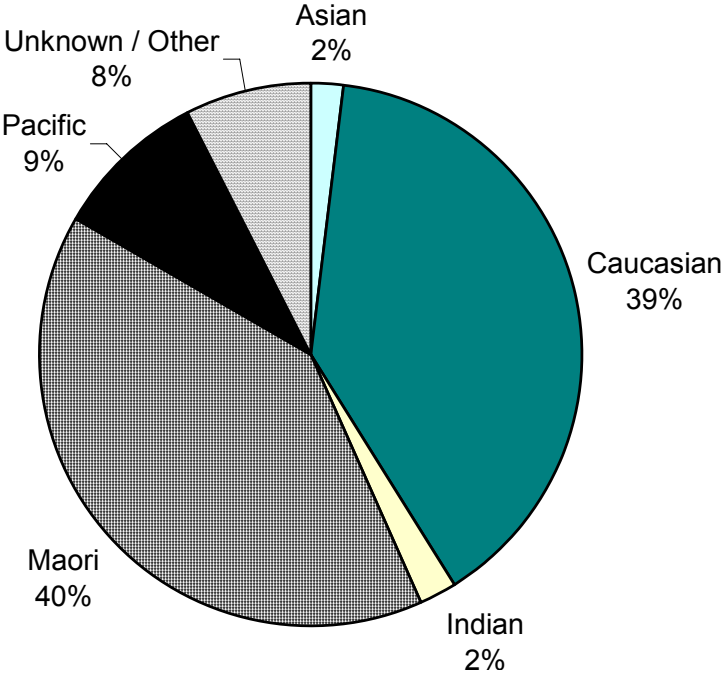


Figure 9. Number of POL400 Attendances Where Injuries Were Reported, Broken Down by Injury Type, NZ 2005

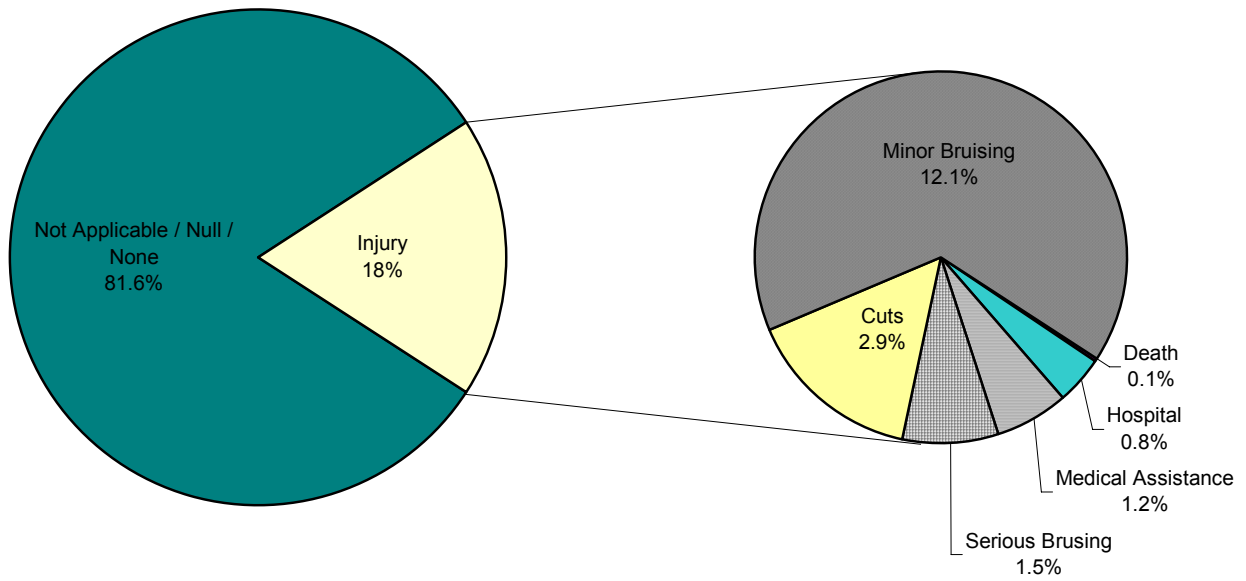


Figure 10. Number of POL400 Attendances Where an Offence Was Disclosed by Offence Type, NZ 2005

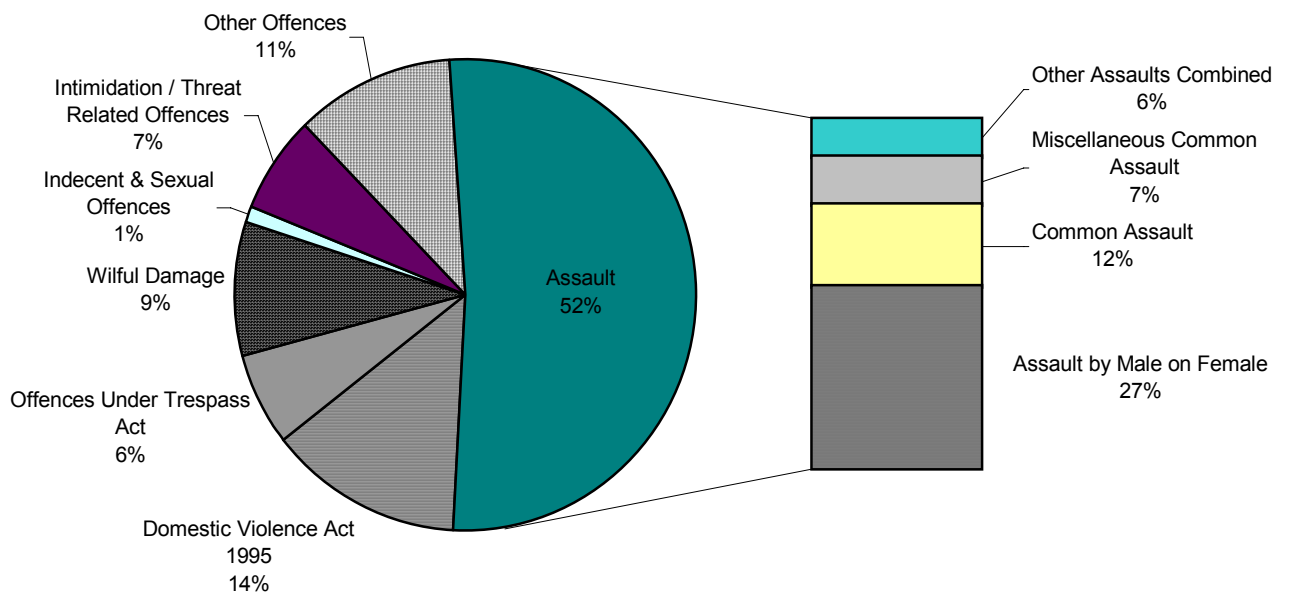
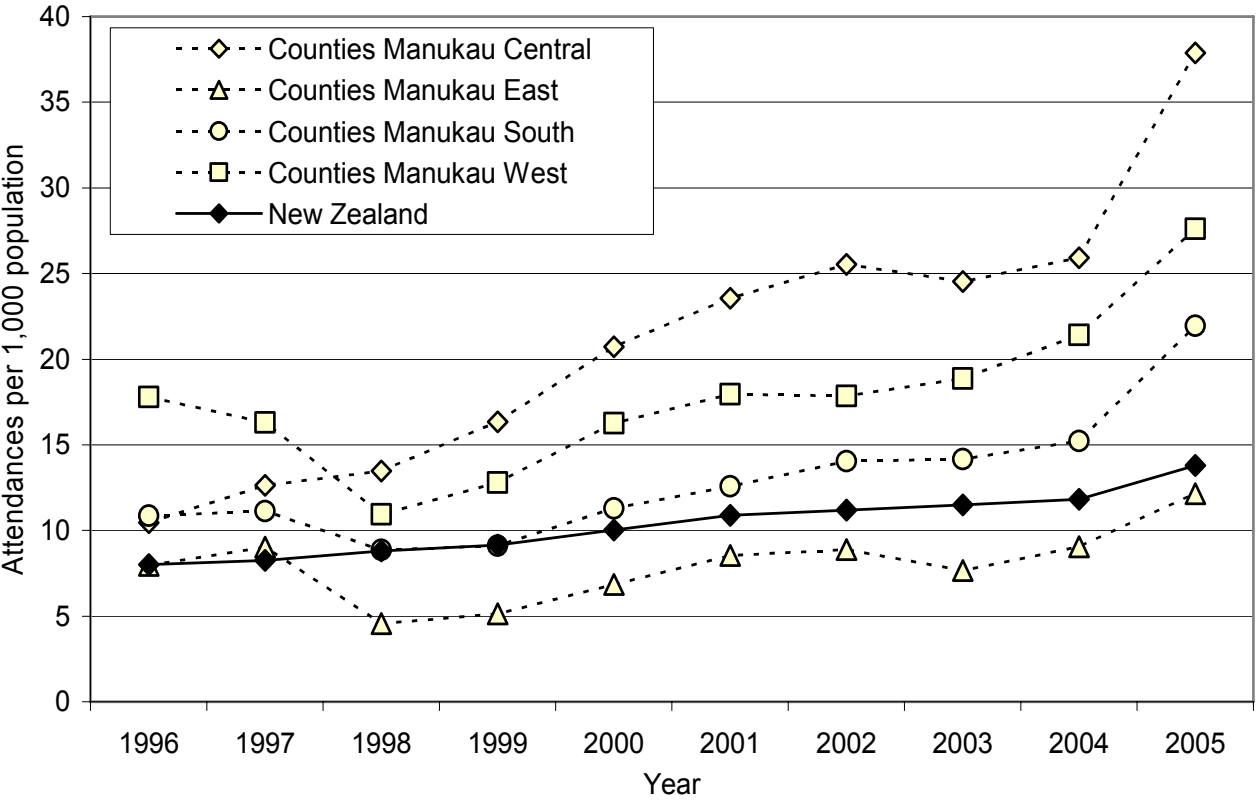


Table 3. Number of Attendances at Family Violence Incidents in the 4 Police Areas within the Counties Manukau Region during 1995-2005

Year	Police Area			
	Counties Manukau Central	Counties Manukau East	Counties Manukau South	Counties Manukau West
1995	503	911	946	1489
1996	634	932	1015	1831
1997	797	1094	1057	1706
1998	878	569	853	1162
1999	1090	656	884	1371
2000	1413	897	1108	1754
2001	1640	1143	1242	1959
2002	1836	1232	1407	1982
2003	1837	1103	1444	2139
2004	1980	1362	1574	2432
2005	2959	1865	2293	3187

Figure 11. Police Attendances at Family Violence Related Incidents for Police Areas in the Counties Manukau Region 1996-2005*



*See notes in Methods Section on Interpretation of Trend Data

In Summary

For children, exposure to family violence is of particular concern, not only because of the long term consequences such exposures have for their psychological wellbeing, but also because of the potential overlaps between the occurrence of child abuse and partner abuse in families. In NZ during 2005, children were present at 52.9% of the family violence incidents attended by Police. Of attendances where this information was available, in 51% of cases the victim was the spouse / partner of the offender, with a further 22% having been in a previous relationship and in 14% of cases the conflict was between a parent and child. Overall, 40% of the victims were Māori, 39% were Caucasian, 9% were Pacific and 2% were Asian and Indian respectively. While in 82% injuries were not reported, in a significant minority of cases minor bruising (12.1%), cuts (2.9%) and serious bruising (1.5%) were noted. In 435 cases (0.8%) a hospital attendance was required and in 29 cases (0.1%) the incident resulted in a death. Finally, Police attendances at family violence incidents during 2005 resulted in a total of 23,414 offences being disclosed, with 52% of these relating to assaults, 14% relating to the Domestic Violence Act and a further 7% relating to threats or intimidation.

While it is difficult to use Police data to comment on trends in the prevalence of family violence in Counties Manukau during 1995-05, (due to changes in the way in which the Police have recognised and recorded family violence over time), what Police data does suggest is that a large number of family violence incidents are occurring in Counties Manukau each year and that (based on NZ level figures) children are likely to be present at a large proportion of these. In addition, for 3 out of the 4 Police Areas within Counties Manukau, Police attendances at family violence were higher than the NZ average, potentially suggesting that exposure to family violence is an issue of particular concern for a significant minority of Counties Manukau children and young people.

CYFS NOTIFICATIONS

Longitudinal studies suggest that 4-10% of NZ children experience physical abuse and 11-20% experience sexual abuse and that the long term consequences for these children are significant [25]. In NZ, the agency with the statutory responsibility for protecting children from the recurrence of abuse is Child Youth and Family Services (CYFS), who receive notifications from a variety of sources including the police, the education and health sectors, families / whanau and the general public. The appropriate handling of these notifications is crucial, as failing to respond to a legitimate concern may lead, in the worst case scenario, to an avoidable death, while over-reacting to a non-substantiated concern can lead to significant trauma for a child's whanau [26].

In NZ since 2001, notifications to CYFS have doubled and while it is often assumed that this reflects an increase in the underlying rate of child abuse, recent research would suggest that changes in the behaviour of the child protection system itself may also have played a significant role [26]. In understanding these changes, knowledge of the current child protection referral process is crucial, as during 2004 it was estimated that of the 1 million phone calls and faxes to CYFS, only 140,000 (14%) were forwarded to intake social workers for further review. Of these, only ≈35,000 resulted in a formal notification being lodged (as many notifications were for >1 child, this resulted in a total of 63,000 client notifications for 2004). At each point in this pathway, the notifier, telephone operator and intake social worker had to make a decision about whether to escalate the concern further, with these decisions often being made in the context of insufficient or conflicting information, time pressures and an increasing intolerance within the wider community for the consequences of child abuse. That increases in CYFS notifications over the past 6 years have resulted, at least in part, from changes within the system itself is suggested by a number of observations including [26]:

- Correlations between high profile media events and spikes in notifications
- A 300% rise in fax concerns following the introduction of after hours fax lodgement
- An increase in the average number of siblings per notification
- Exponential growth in Police Family Violence (POL400) referrals as a result of new processes and behaviours
- A sudden surge in demand relating to the roll out of a Call Centre

While to a certain extent, this increase in notifications has been accompanied by a decline in the percentage requiring investigation (further investigation required in 86% in 2000 → 79% in 2005), recent evidence suggests that only 20% of avoidable child deaths in NZ are known to CYFS [26]. In addition, while the new Police referral system (which refers children as a result of family violence (POL400) attendances) appears to be uncovering softer concerns, the uptake of the system is variable across the country and in many cases the system has served to identify new concerns of a similar level of severity to previous notifications [26]. As a consequence, while a large proportion of the increase in CYFS notifications in recent years may have been due to changes within the system itself [26], it is likely that many of the victims of child abuse who present to health care settings in NZ each year remain undetected and that further effort is required to ensure that the health and safety needs of these children are met [20]. In this context, the recently released Family Violence Intervention Guidelines recommend taking a thorough history for child abuse from high risk groups, the provision of emotional support for victims and the following of risk assessment, safety planning and referral pathways in clinical practice [20].

In an attempt to highlight the magnitude of the issue for children and young people in Counties Manukau, the following section explores CYFS notifications in the region during 2001-2005. Because CYFS Regions and the Counties Manukau DHB catchment do not precisely overlap, information on the absolute number of referrals is provided for CYFS Offices within or immediately adjacent to the Counties Manukau DHB catchment. As the most appropriate denominator for this population was unknown, rate data is not available in this report.

Data Sources and Statistical Methods

CYFS Notification Data

The information in this section was obtained from CYFS for the period 2001-05. It includes the number of notifications received each year, the number requiring further investigation and the findings for those cases where further investigation was required.

Note 1: The number of notifications and further assessments required does not represent the number of distinct clients, as some clients had multiple notifications and assessments during the year. Similarly, the total number of assessment findings does not represent the number of client investigations, as some clients had multiple investigation records during the year. In addition, as some clients have more than one type of finding during an investigation, they may appear across several categories depending on the type of finding. Finally the number of assessments in a year does not directly relate to the number of notifications or further assessments, as there is a time lag between a further assessment being required and the investigation being completed. As a consequence, the figures presented in this section may overestimate the number of children referred to CYFS, or the total number found to have experienced abuse in any given year.

Note 2: Because CYFS Regions and DHB catchments do not share common boundaries, the information presented in this section is by CYFS Office, with those CYFS Offices most likely to serve the needs of families within the Counties Manukau region being included in the section that follows. Because of a lack of an appropriate denominator, rate data was not able to be calculated for this section.

CYFS Notifications in Counties Manukau

Notifications and Numbers Requiring Further Investigation

During 2005 there were a total of 9,194 notifications to CYFS Offices within the Counties Manukau region and of these 81.5% were thought to require further investigation. While these figures reflect a progressive increase in notifications since 2001, when 3,181 notifications were received, the proportion requiring further investigation declined during this period (92.6% required further investigation in 2001). Nevertheless, in absolute terms the number of notifications requiring further investigation increased, from 2,945 in 2001 to 7,490 in 2005 (**Table 4**). In interpreting these figures, it must be borne in mind that a single child may have been the subject of multiple notifications and that there were also significant changes to the notification system during this period.

Assessment Findings for Cases Requiring Further Investigation

Of those notifications which were investigated further during 2001-2005, a large proportion resulted in no abuse being found, with the numbers in this category increasing progressively as the period progressed. Where abuse was found however, neglect and behavioural / relationship difficulties were particularly prominent, followed by physical and emotional abuse (**Table 5**). Because of the nature of the reporting system however, and the fact that a single case may appear in a number of different categories, it is difficult to determine from these figures what proportion of cases related predominantly to a particular type of abuse (e.g. physical, emotional, sexual).

Table 4. No. of Children Notified to CYFS Offices in the Counties Manukau Region, 2001-05

Year	Notifications	No. Requiring Further Investigation	% Requiring Further Investigation	Year	Notifications	No. Requiring Further Investigation	% Requiring Further Investigation
Papakura				Manurewa			
2001	683	645	94.4	2001	940	869	92.4
2002	963	886	92.0	2002	1098	1025	93.4
2003	1091	1038	95.1	2003	1300	1193	91.8
2004	1472	1348	91.6	2004	1883	1712	90.9
2005	1788	1642	91.8	2005	3052	2497	81.8
Otago				Otago			
2001	604	550	91.1	2001	954	881	92.3
2002	743	686	92.3	2002	1094	1011	92.4
2003	812	762	93.8	2003	1408	1263	89.7
2004	907	798	88.0	2004	1753	1595	91.0
2005	1266	1068	84.4	2005	3088	2283	73.9
				NZ			
				2001	28012	24335	86.9
				2002	31784	27171	85.5
				2003	39008	32856	84.2
				2004	49585	40711	82.1
				2005	59313	46706	78.7

Table 5. Outcome of Assessment for Children Notified to CYFS, Counties Manukau 2001-05

Year	Emotional Abuse	Physical Abuse	Sexual Abuse	Neglect	Behavioural / Relationship Difficulties	Self Harm / Suicidal	Not Found
Papakura							
2001	38	51	35	67	100	6	491
2002	41	71	40	107	134	1	424
2003	66	57	48	81	135	5	416
2004	127	94	80	218	200	6	670
2005	217	88	44	247	159	2	761
Manurewa							
2001	29	68	30	130	82	2	569
2002	27	79	48	115	135	5	639
2003	40	53	41	83	144	3	507
2004	79	99	71	118	134	5	962
2005	227	125	64	178	162	5	1308
Otago							
2001	30	68	30	59	44	5	302
2002	41	72	48	65	85	4	474
2003	52	77	40	71	70	5	310
2004	45	112	44	80	103	6	505
2005	102	83	38	115	78	2	484
Otago							
2001	44	93	46	87	85	6	489
2002	81	122	51	106	81	4	334
2003	113	146	72	147	114	8	784
2004	155	157	71	153	105	9	806
2005	262	197	71	262	109	4	1016

In Summary

Research suggests that 4-10% of NZ children experience physical abuse and 11-20% experience sexual abuse during childhood. In NZ, the agency with the statutory responsibility for protecting children from recurrent abuse is Child Youth and Family Services (CYFS), who receive notifications from a variety of sources including the police, the education and health sectors, families / whanau and the general public. In NZ since 2001, notifications to CYFS have doubled and while it is often assumed that this reflects an increase in the underlying rate of child abuse, recent research would suggest that changes in the behaviour of the child protection system itself may also have played a significant role.

During 2005, there were a total of 9,194 notifications to CYFS Offices within the Counties Manukau region and of these 81.5% were thought to require further investigation. While these figures reflect a progressive increase in notifications since 2001, when 3,181 notifications were received, the proportion requiring further investigation declined during this period (92.6% required further investigation in 2001). Nevertheless, in absolute terms the number of cases requiring further investigation increased, from 2,945 in 2001 to 7,490 in 2005. In interpreting these figures, it must be born in mind that a single child may have been the subject of multiple notifications and that there were also significant changes to the notification system during this period.

Of those notifications which were investigated further during 2001-2005, a large proportion resulted in no abuse being found, with the numbers in this category increasing progressively as the period progressed. Where abuse was found, neglect and behavioural / relationship difficulties were particularly prominent, followed by physical and emotional abuse. Because of the nature of the reporting system however, and the fact that a single case may appear in a number of different categories, it is difficult to determine from these figures what proportion of cases related predominantly to a particular type of abuse.

ENVIRONMENTAL FACTORS



HOUSEHOLD CROWDING

The associations between substandard housing and poor health have been known for several centuries, with reports from as early as the 1830s attributing high rates of infectious disease to overcrowded, damp, and poorly ventilated housing [27]. In NZ, crowding is strongly correlated with childhood meningococcal disease, with the risk increasing progressively with the addition of each additional adult into a household [28]. While there is less local information for other infectious diseases, overseas research has also demonstrated correlations between crowding and rheumatic fever, TB, bronchiolitis, croup, childhood pneumonia, hepatitis B, head lice and conjunctivitis [29]. In addition, it has been suggested that crowding impacts negatively on mental health, leading to interpersonal aggression, withdrawal, socially deviant behaviour and psychological distress [30].

While the relationship between crowding and poorer health outcomes has been known for some time, uncertainty still remains about how much of the association is due to crowding itself and how much is due to other factors which often accompany crowding, such as poor quality housing (e.g. damp, mould, extremes of temperature), low income, unemployment, fewer material resources, living in run-down neighbourhoods and a lack of control over stress [29]. Supporters for a direct role for crowding have proposed a number of pathways including:

For Infectious Diseases [29, 30]:

- Increased frequency of contact between children and infectious disease carriers.
- Closer and more prolonged physical contact between children and carriers.
- Increased exposure to second hand tobacco smoke.
- Children sharing a bed or bedroom.
- Lack of ability to adequately care for sick household members.
- Difficulties in maintaining good hygiene practices.

For Poorer Mental Wellbeing [30]:

- An increased number of social contacts and unwanted interactions.
- A decrease in privacy and the ability to achieve simple goals e.g. eating or watching TV.
- Reduced ability of parents to monitor children's behaviour.
- The need to co-ordinate activities such as using the bathroom with others.

While there has been a gradual decline in household crowding in NZ during the past 40 years, marked disparities remain, with crowding being of particular concern for Māori and Pacific households, those on low incomes, benefits or with no qualifications, those living in rental housing, extended family groups, or with dependent children and those who are recent migrants [31]. That crowding potentially plays a major role in the health and wellbeing of these families was highlighted by participants in the Māori Women's Housing Research Project [32] who, when asked to comment on the role crowding played in their lives noted:

"...Crowding and homelessness do not help to provide a stable environment for Māori women and their families...it creates extremely stressful situations that become very volatile and often explode. The result of this can be seen clearly in the number of Māori women and children who become survivors of family violence, which in itself becomes repetitive".

The following section reviews crowding amongst households with children and young people in NZ and Counties Manukau using information available from the 2001 and 2006 Censuses. While household crowding is only one dimension of the relationship between poor housing and adverse health outcomes, information on crowding has been collected in Censuses over a number of years, making it a useful proxy for assessing exposure to sub-optimal housing conditions amongst NZ children and young people at a regional level.

Data Sources and Statistical Methods

The information contained in this section was derived from the 2001 and 2006 Censuses, as provided by Statistics NZ. It is for the usual residential population at the time of the Census, and utilises Level 1 prioritised ethnicity (of the child) when reporting differences by ethnic group. The NZDep 2001 Index was used throughout. Information relates to the household crowding status of individual children and thus the number of children reported on will be greater than the number of households on Census night (i.e. with the exception of the first graph, the unit of reference is the child and thus 2 children from the same household will be counted twice in these statistics).

Canadian Crowding Index

The Canadian National Occupancy Standard (CNOS) was developed in Canada in the 1980s to calculate appropriate person-bedroom ratios for households of differing sizes and compositions. It makes judgements on appropriate age limits for bedroom sharing e.g. using the CNOS, children <5 years of different sexes are able to share a room, while those aged 5-17 years may only share a room if they are of the same sex. The CNOS thus compares the number of bedrooms available to a household with its bedroom requirements, based on the age, gender, marital status and relationship of household members to one another. Households are then reported as having 2+, 1 or 0 bedrooms spare or as requiring an additional 1 or 2+ bedrooms, with those needing 1 or 2+ additional bedrooms being deemed a crowded household [31].

Household Crowding In NZ and Counties Manukau

NZ Trends

In NZ during the past 2 decades the proportion of crowded households (including those without children) declined, from 6.9% in 1986 to 4.8% in 2001 [31]. While crowding declined for all ethnic groups (with the exception of the “Other” category), in absolute terms declines were greatest for Māori and Pacific households. Despite these declines, crowding rates remained higher for Pacific > Māori & Asian / Indian > European households throughout this period (**Figure 12**).

Regional and Ethnic Differences

In Counties Manukau during 2001, 28.1% of children and young people (0-24 yrs) lived in crowded households, as compared to 15.4% nationally. There were also marked ethnic disparities in household crowding in Counties Manukau, with 54.4% of Pacific and 38.2% of Māori children and young people living in crowded households, as compared to 23.5% of Asian / Indian and 7.0% of European children and young people. While similar ethnic disparities were seen nationally, crowding rates for Counties Manukau Māori, Pacific and Asian / Indian children and young people were generally higher than their respective NZ ethnic specific averages (**Figure 13**).

Socioeconomic Differences

There were also marked socioeconomic disparities in the proportion of Counties Manukau children and young people living in crowded households during 2001, with rates rising progressively from 4.0% amongst those living in the most affluent (Decile 1) areas, to 51.7% amongst those living in the most deprived (Decile 10) areas. While similar disparities were seen for NZ as a whole (NZ Decile 1, 3.1% vs. Decile 10, 38.5%), at each level of socioeconomic deprivation, crowding in Counties Manukau was higher than the NZ average (**Figure 14**).

Relationship Between Socioeconomic Status and Ethnicity

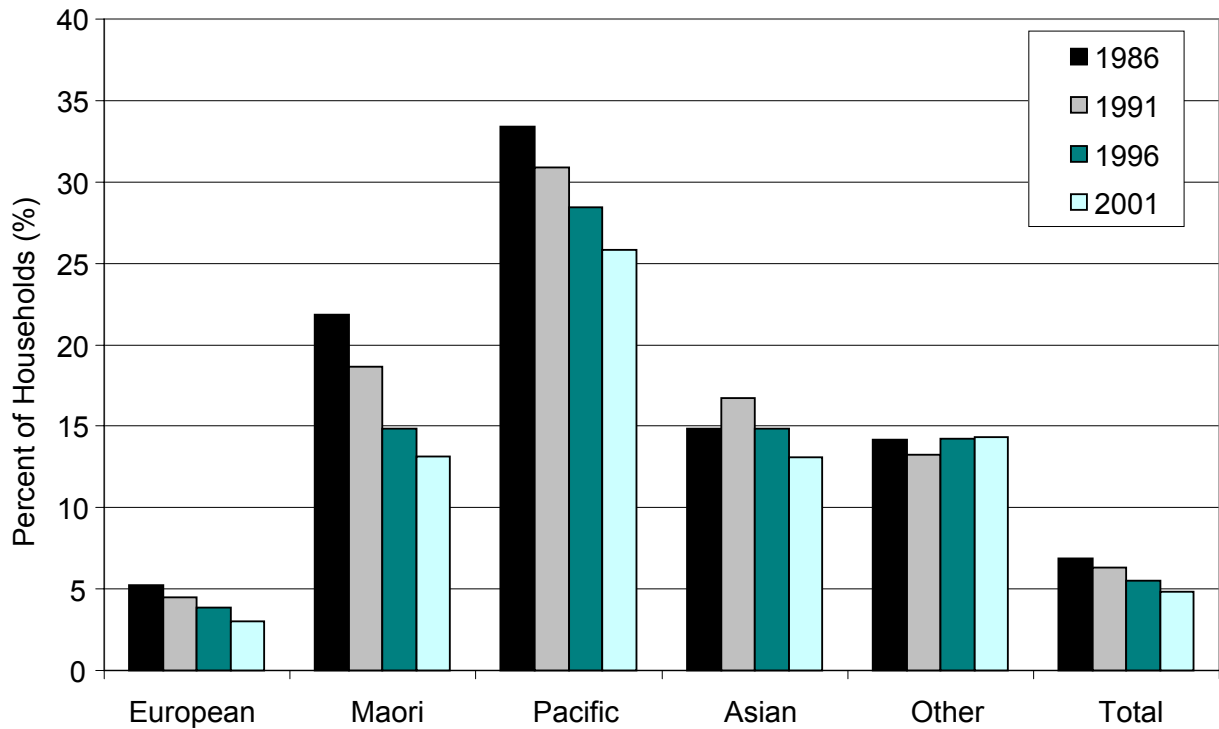
While there were insufficient numbers to undertake an analysis of the relationship between ethnicity and socioeconomic deprivation at a regional level, an analysis of NZ level data suggested that for each of NZ's largest ethnic groups, the proportion of children living in crowded households increased with increasing socioeconomic deprivation, but that at each level of socioeconomic deprivation, ethnic differences remained, with crowding rates being higher for Pacific > Māori and Asian / Indian > European children and young people (**Figure 15**).

In Summary

The associations between substandard housing and poor health have been known for several centuries, with reports from as early as the 1830s attributing high rates of infectious disease to overcrowded, damp, and poorly ventilated housing. In NZ, crowding is strongly correlated with meningococcal disease, while overseas reports also demonstrate correlations with a number of infectious diseases and mental health issues.

In Counties Manukau during 2001, 28.1% of children and young people (0-24 yrs) lived in crowded households, as compared to 15.4% nationally. There were also marked socioeconomic and ethnic disparities evident, with crowding rates being higher for Pacific > Māori > Asian / Indian / European children and young people and those living in the most deprived areas. While similar disparities were seen nationally, crowding rates for Counties Manukau Māori, Pacific and Asian / Indian children and young people were higher than their respective NZ ethnic specific averages and at each level of NZDep deprivation, crowding rates in Counties Manukau were higher than the NZ average. With the strong correlations between crowding, infectious disease and mental health issues, such figures potentially suggest that household crowding makes a significant contribution to health disparities in the Counties Manukau region.

Figure 12. Percentage of Crowded Households in NZ by Ethnicity at the 1986, 1991, 1996 and 2001 Censuses



Source: Statistics New Zealand [31]

Figure 13. Proportion of Children and Young People 0-24 Years Living in Crowded Households by Ethnicity, Counties Manukau vs. NZ at the 2001 Census

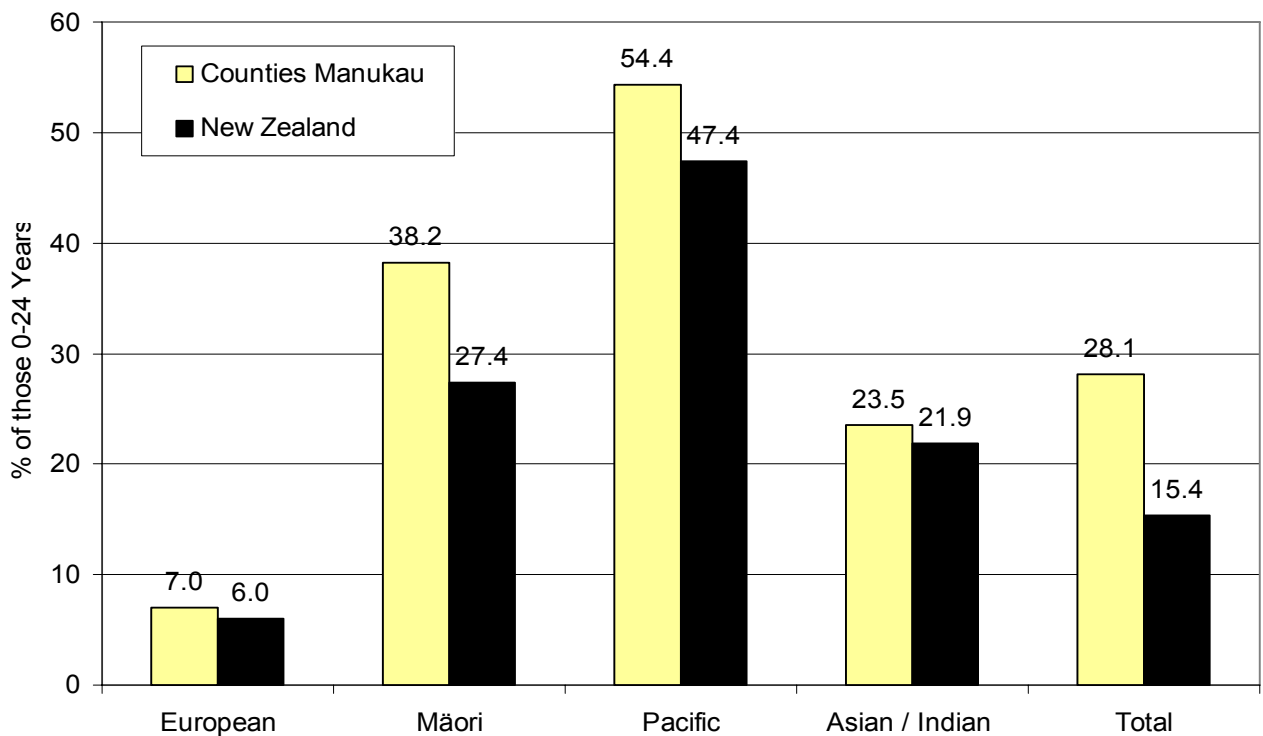


Figure 14. Proportion of Children and Young People 0-24 Years Living in Crowded Households by NZ Deprivation Index Decile, Counties Manukau vs. NZ at the 2001 Census

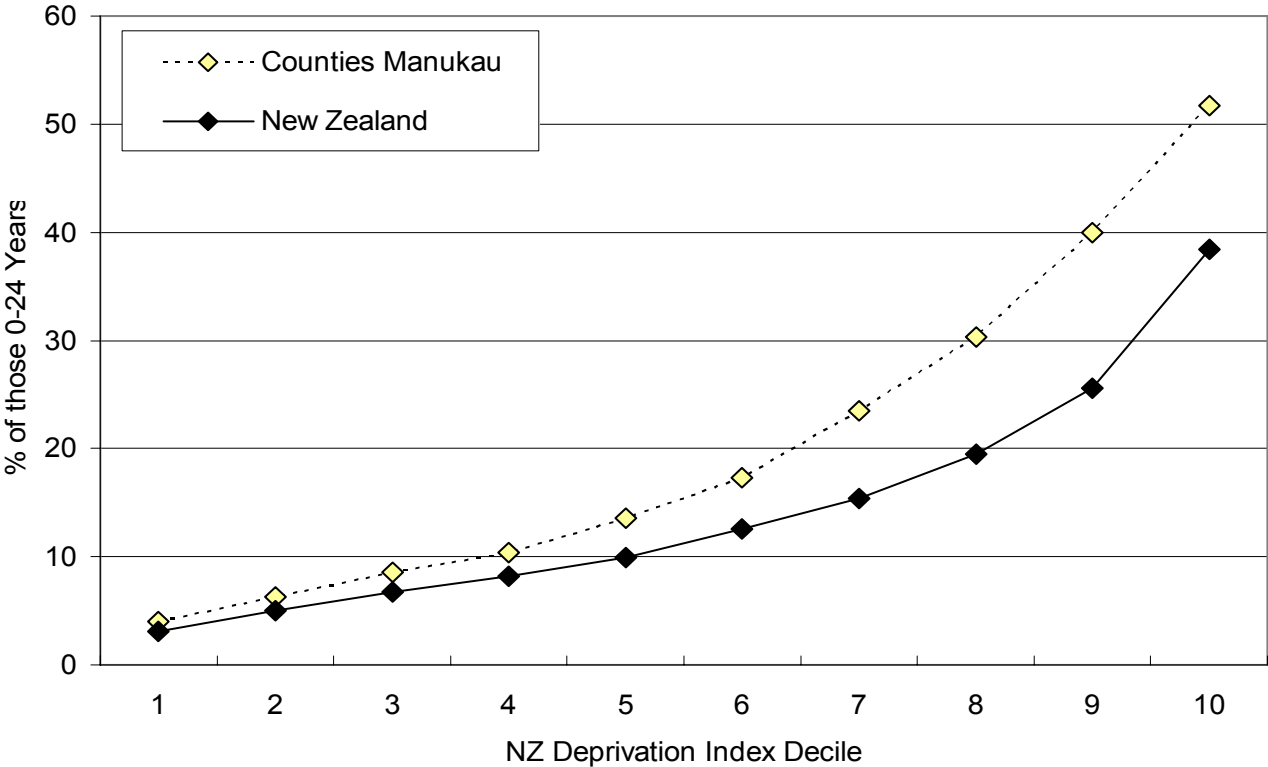
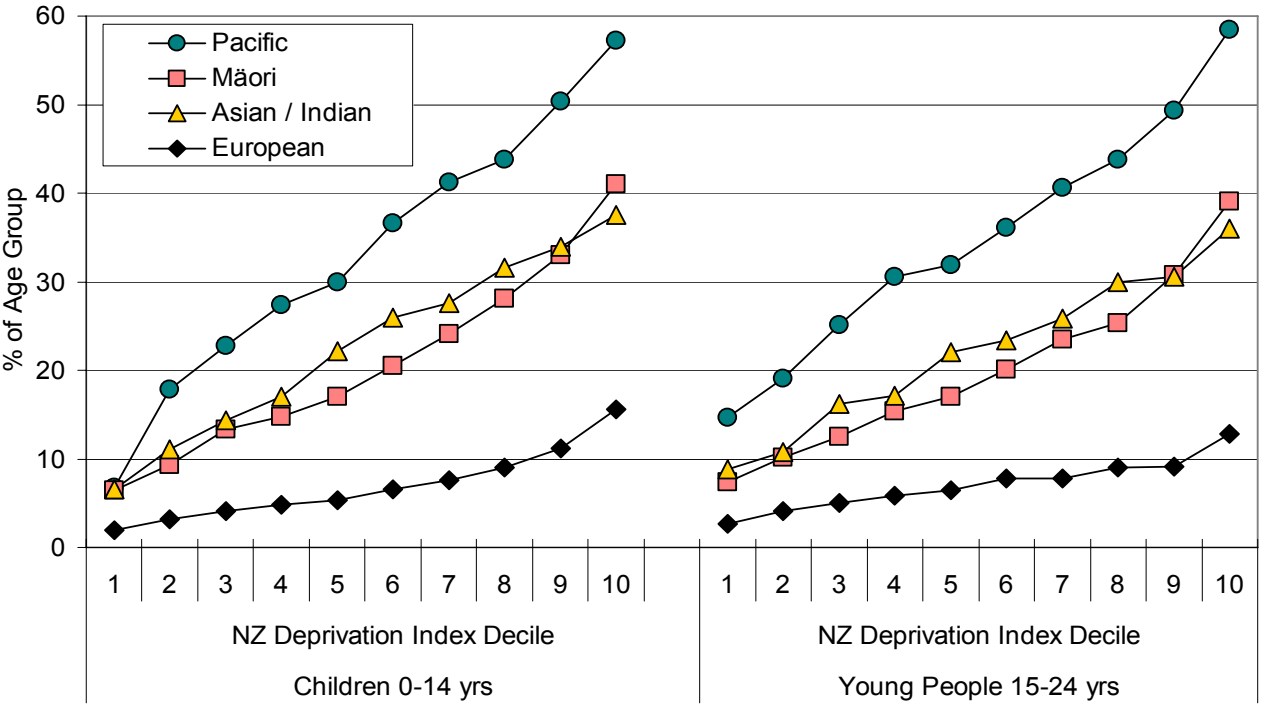


Figure 15. Proportion of NZ Children (0-14 yrs) and Young People (15-24 yrs) Living in Crowded Households by Ethnicity and NZ Deprivation Index Decile at the 2001 Census



EXPOSURE TO SECONDHAND CIGARETTE SMOKE

In NZ each year, it has been estimated that exposure to second hand cigarette smoke results in:

- 500 hospital admissions for chest infections in children <2 years
- 15,000 episodes of childhood asthma
- 27,000 GP consultations for asthma and respiratory problems
- 1,500 operations to treat glue ear
- 50 cases of meningococcal disease [33]

In addition, in utero exposure to cigarette smoke has been associated with a number of adverse outcomes including intrauterine growth restriction, sudden infant death syndrome, impaired cognitive development and childhood behavioural problems [34]. Furthermore, it has been suggested that the financial costs of smoking impact disproportionately on children in low income families, with up to 14% of non-housing related income in one study being spent on the purchase of tobacco related products [35]. Finally, parental smoking significantly increases the likelihood that children will smoke during their adolescent years [36], which if continued, increases their risk of outcomes such as ischaemic heart disease, lung cancer and chronic obstructive respiratory disease in later life.

Estimates of the proportion of NZ children exposed to cigarette smoke in their homes vary, from as high as 26.5% amongst 14-15 year olds in a recent ASH Survey [37], to as low as 9.5% (daily exposure) in a recent research report [38]. The same report also suggests that while 19.6% of the general population smokes, only 47% of smokers smoke inside their homes. Reasons given for outdoor smoking policies included not wanting to expose others to second hand smoke and setting a good example for children [38]. The extent to which such outdoor smoking policies protect children from passive smoke exposure remains unclear however, with one recent NZ study suggesting that hair nicotine levels in children were significantly elevated in smoking households irrespective of whether family members smoked inside or outside their homes [39]. In contrast, another study (using different exposure measures) suggested that while environmental tobacco smoke and its contaminants (e.g. dust & surface contamination) were 5-7 times higher in households where smokers tried to protect their infants by smoking outside, such exposures were 3-8 times higher again amongst those who continued to smoke indoors i.e. outside smoking policies, while not being able to confer full protection, nevertheless did reduce the amount of exposure infants and young children had to tobacco smoke and its contaminants within the home [40].

The following section reviews the exposure of children in NZ and Counties Manukau to cigarette smoke within their homes using two different data sources: the percentage of children <15 years living in a household with a smoker at the 1996 and 2006 Censuses and the percentage of 14-15 year olds reporting exposure to cigarette smoke within their homes in ASH's annual Year 10 Smoking Surveys.

Data Sources and Statistical Methods

ASH Year 10 Surveys

Action on Smoking and Health (ASH) was established in 1982 with the aim of reducing smoking and smoking related premature deaths. While the Ministry of Health provides funding for the annual national Year 10 (4th form) Smoking Survey, ASH manages the data collection and oversees its analysis [37].

Since 1997, ASH has conducted annual surveys of smoking behaviour amongst Year 10 (14-15 year old) students and since 1999, these surveys have collected information from >30,000 students annually. In 2000 and 2001, >70% of schools in NZ participated, and of these 70% of enrolled students took part [36]. Questionnaires are self administered and cover demographic variables as well as smoking related issues. Survey forms with instructions are mailed to all secondary schools and teachers supervise the completion of the questionnaires by students. While it has been suggested that such a design means that it is not always clear how the sample has been selected and how consistently the survey has been administered, the large sample size and annual frequency makes the survey useful for monitoring smoking behaviour of 14-15 year old students in NZ and is a useful tool for understanding trends and risk factors for smoking initiation [41]. The information in the following section has been used with the permission of ASH.

1996 and 2006 Census Data

At both the 1996 and 2006 Censuses all respondents aged ≥ 15 years were asked “*Do you smoke cigarettes regularly (that is one or more per day)?*” The figures in this section refer to the number of children living in households where a resident ≥ 15 years answered yes to this question. Figures are for the usually resident population and are based on Statistics NZ’s prioritised Level 1 ethnicity of the child (see Appendix 6 of last year’s report) and the NZDep 2001 Index. Note: Census data categorises those >15 years into two groups: smokers and non smokers, with missing responses being assigned to the non smoking category. Thus Census data may underestimate the proportion of smokers, as the number with missing information is unspecified.

Exposure to Tobacco Smoke in the Home: ASH Survey Data

Since 2001, ASH’s annual surveys of the smoking behaviour of Year 10 students have included a question on parental smoking (“*Which of these people smoke? (tick one or more that apply), mother, father, older brother or sister, best friend, none of these*”), as well as a question on exposure to cigarette smoke within the home (“*Do people smoke inside your house?*”) [36]. The following section uses ASH Survey data to explore national and regional trends in parental smoking behaviour and exposure to cigarette smoke within the home for young people aged 14-15 years during 2001-2005.

Ethnic Differences in Parental and Household Smoking Behaviour

In NZ during 2001-05, the proportion of Year 10 students who reported that at least one of their parents smoked changed little (40.3% in 2001 \rightarrow 39.8% in 2005). Similarly, there were no significant changes in parental smoking rates amongst NZ’s largest ethnic groups, with rates remaining higher amongst Māori > Pacific > European / Other > Asian students during this period. While ethnic disparities were also evident for exposure to tobacco smoke in the home, exposure rates were lower than parental smoking rates might predict, potentially suggesting the presence of in-house non-smoking policies in families of all ethnic groups. While parental smoking rates did not decline during 2001-2005, household tobacco exposure did, with the proportion of 14-15 year olds exposed to smoking in their homes declining from 47.4% \rightarrow 41.8% for Māori, from 34.6% \rightarrow 28.6% for Pacific, from 27.1% \rightarrow 23.4% for European / Other and from 20.0% \rightarrow 19.0% for Asian students (**Figure 16**).

Socioeconomic Differences in Parental and Household Smoking Behaviour

Similarly, parental smoking rates by school socioeconomic (SES) decile did not change significantly in NZ during 2001-04, with the proportion of Year 10 students reporting at least one parent smoking remaining persistently elevated amongst those attending schools in the most deprived areas. Exposure to smoking within the home also exhibited a marked socioeconomic gradient (school decile 1-2 > 3-4 > 5-6 > 7-8 > 9-10), although exposures were much lower than parental smoking rates might predict, again suggesting the presence of in house non-smoking policies across all socioeconomic groups. While parental smoking rates by school SES decile did not decline significantly during 2001-2005, exposure to smoke within the home did, with rates decreasing from 42.1%→ 36.6% for those attending schools in the most deprived (decile 1-2) areas, from 34.7%→ 30.4% for those attending schools in average (decile 5-6) areas and from 20.6%→ 17.4% for those attending schools in the most affluent (decile 9-10) areas (Figure 17).

Parental and Household Smoking Behaviour: Counties Manukau vs. NZ

In Counties Manukau during 2001-05, the proportion of Year 10 students who reported at least one parent smoking remained relatively static (41.7% in 2001→ 41.1% in 2005), while the proportion who reported living in homes where people smoked inside declined (29.8% in 2001→ 26.0% in 2005). Both parental smoking rates and exposure to household tobacco smoke were similar to the NZ average during this period and trends were consistent with those occurring nationally (Figure 18).

Figure 16. Proportion of Year 10 Students with Parents Who Smoke and Who Live in a Home with Smoking Inside by Ethnicity, NZ ASH Surveys 2001-2005

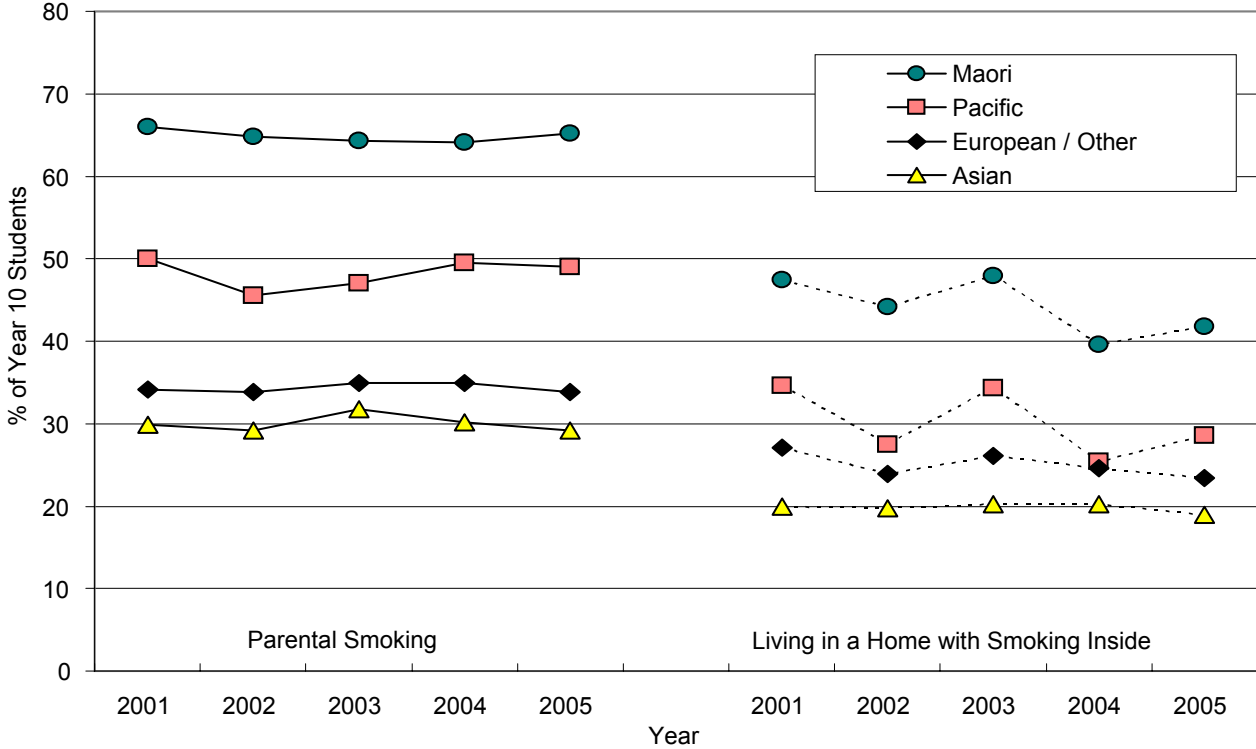


Figure 17. Proportion of Year 10 Students with Parents Who Smoke and Who Live in a Home with Smoking Inside by School Socioeconomic Decile, NZ ASH Surveys 2001-2005

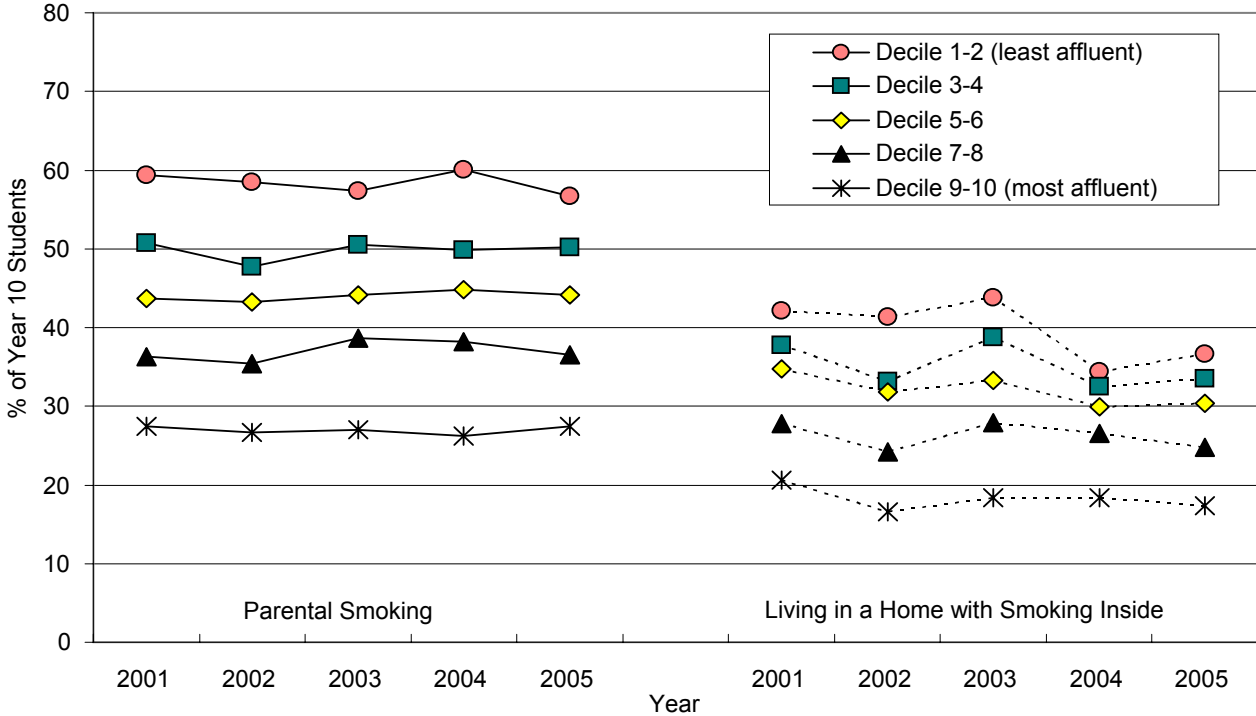
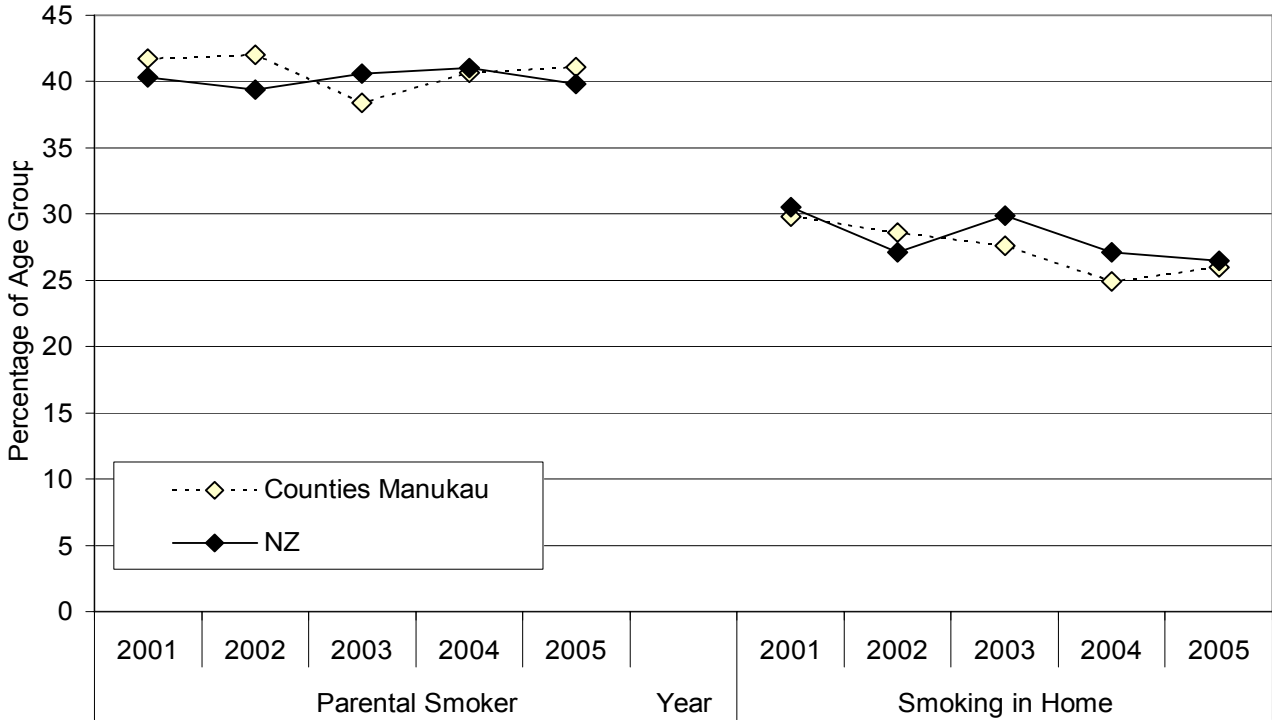


Figure 18. Proportion of Year 10 Students with Parents Who Smoke and Who Live in a Home with Smoking Inside, Counties Manukau vs. NZ ASH Surveys 2001-2005



Exposure to Tobacco Smoke in the Home: Census Data

Regional and Ethnic Differences

In Counties Manukau during 1996, 45.2% of children (0-14 yrs) lived in a household with a smoker, as compared to 40.2% nationally. Marked ethnic disparities were also evident in Counties Manukau, with 68.6% of Māori and 51.3% of Pacific children living in a household with a smoker, as compared to 33.2% of European and 23.0% of Asian / Indian children. While these disparities were similar to those occurring in NZ as a whole, the proportion of Māori children in Counties Manukau who lived in a household with a smoker was slightly higher than the NZ Māori average (**Figure 19**).

Socioeconomic Differences

There were also marked socioeconomic disparities in the proportion of Counties Manukau children living in households with a smoker during 1996, with rates rising progressively from 22.3% amongst those living in the most affluent (Decile 1) areas, to 59.2% amongst those living in the most deprived (Decile 10) areas. These disparities were similar to those occurring in NZ as a whole (NZ Decile 1, 20.8% vs. Decile 10, 59.7%) (**Figure 20**).

Relationship Between Socioeconomic Status and Ethnicity

While there were insufficient numbers to undertake an analysis of the relationship between ethnicity and socioeconomic deprivation at a regional level, an analysis of NZ level data suggested that for each of NZ’s largest ethnic groups, the proportion of children living in a household with a smoker during 1996 increased with increasing socioeconomic deprivation, but that at nearly every level of socioeconomic deprivation, household smoking rates remained higher for Māori >Pacific >European >Asian / Indian children (**Figure 21**).

Figure 19. Proportion of Children <15 Years Living in a Household with a Smoker by Ethnicity, Counties Manukau vs. NZ at the 1996 Census

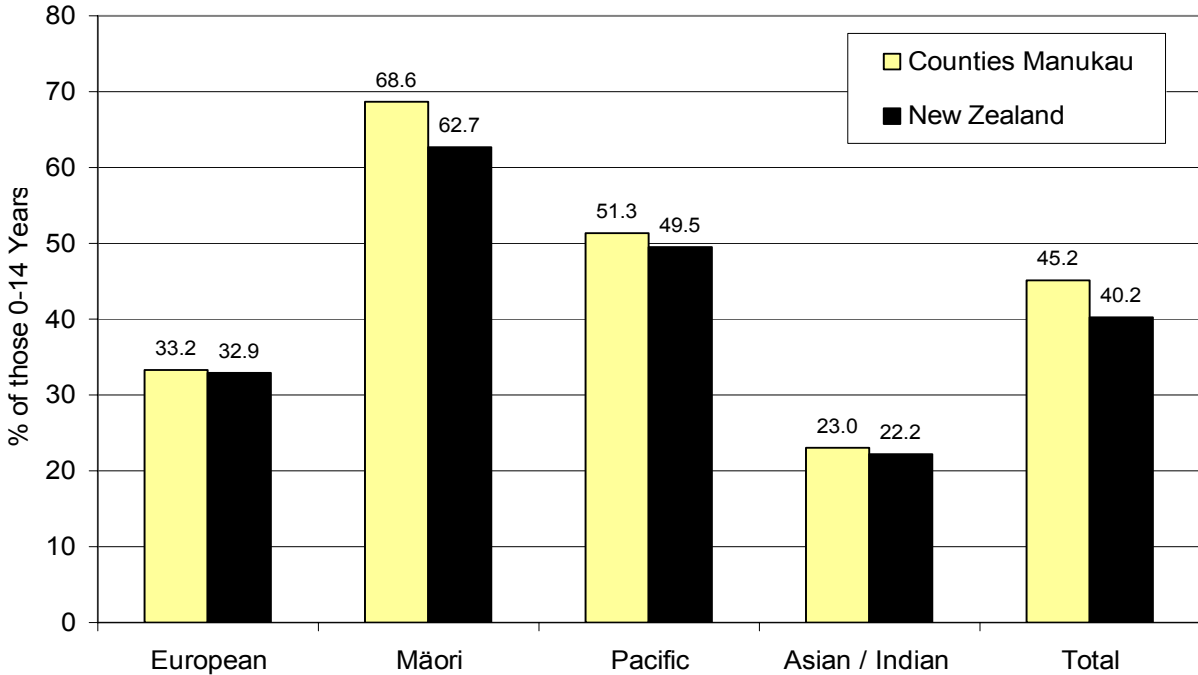


Figure 20. Proportion of Children <15 Years Living in a Household with a Smoker by NZ Deprivation Index Decile, Counties Manukau vs. NZ at the 1996 Census

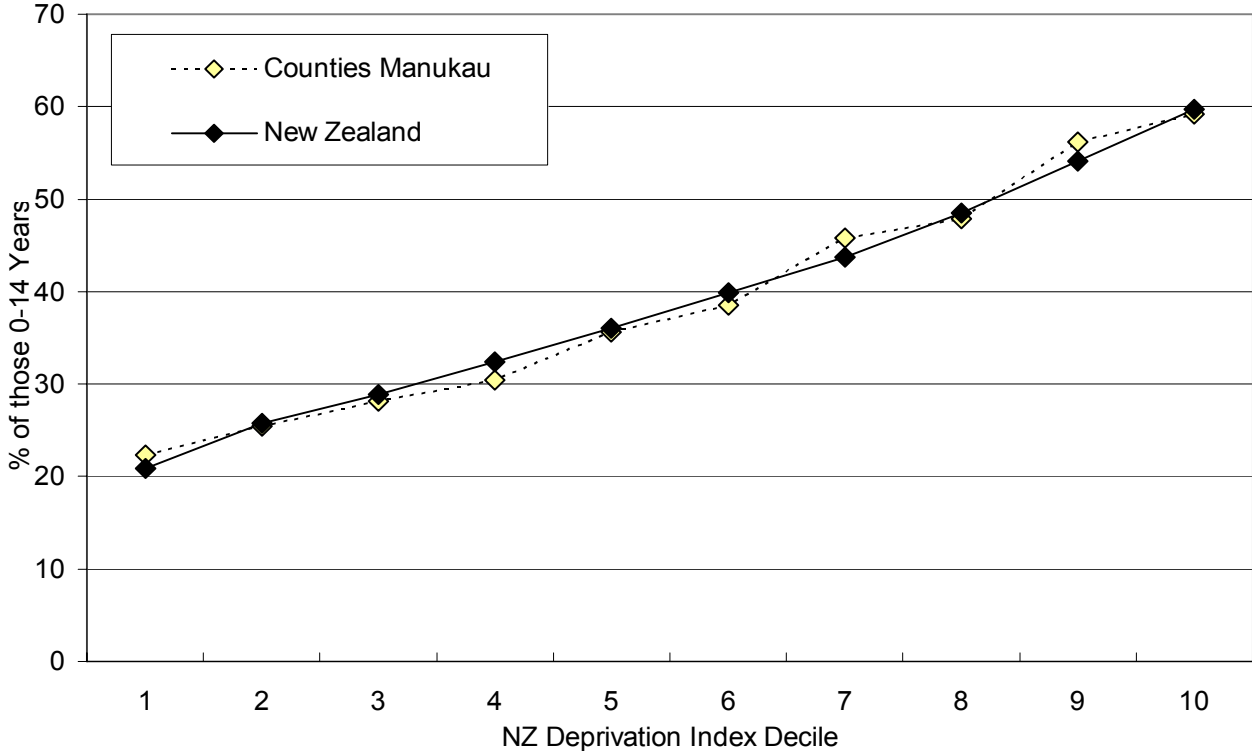
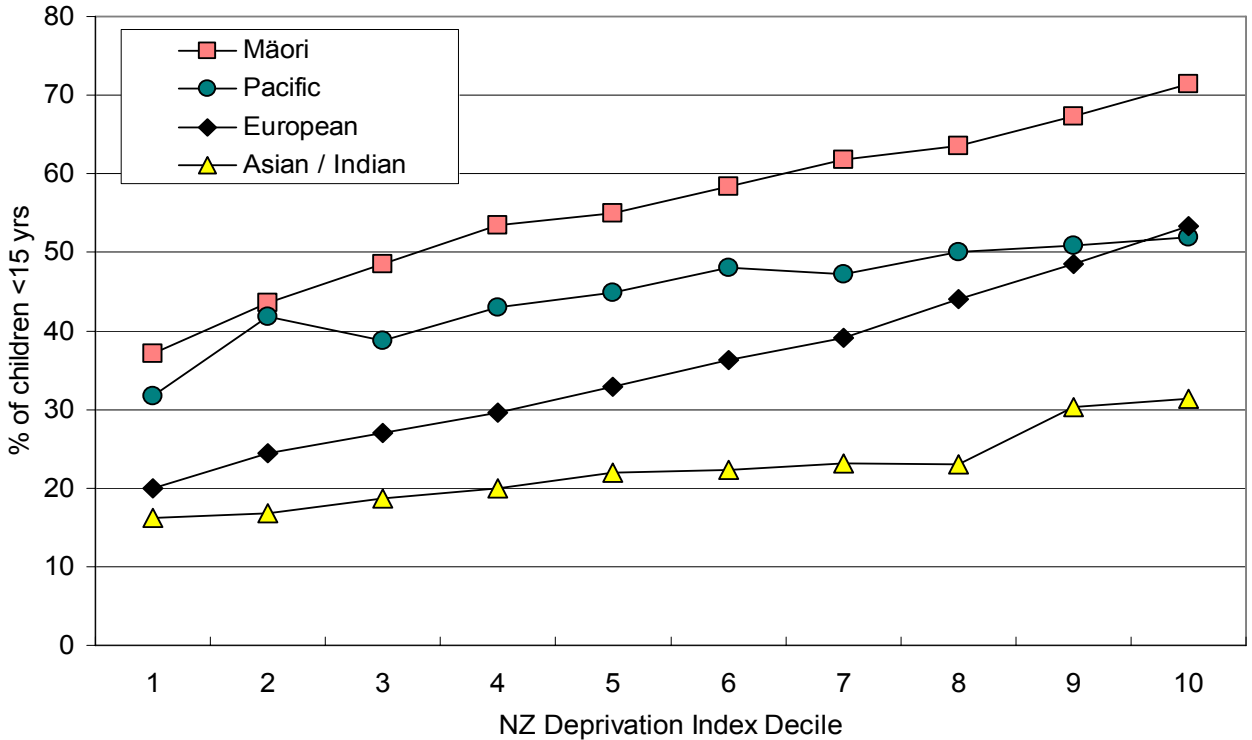


Figure 21. Percentage of Children < 15 Years Living in a Household with a Smoker by Ethnicity and NZDep Index Decile, NZ at the 1996 Census



In Summary

Exposure to second hand cigarette smoke is responsible for a large number of general practice visits and hospital admissions during childhood. In addition, exposure in utero has been associated with intrauterine growth restriction, sudden infant death syndrome, impaired cognitive development and childhood behavioural problems. Parental smoking is also thought to increase the likelihood that children will take up smoking during adolescence, which if continued, increases the risk of adverse health outcomes in later life.

In NZ during 2005, ASH Surveys suggested that 39.8% of Year 10 students had a parent that smoked and that parental smoking rates were higher amongst Māori > Pacific > European / Other > Asian students and those attending schools in the most deprived areas. While socioeconomic and ethnic disparities were also observed for exposure to smoke in the home, exposures were lower than parental smoking rates might predict, potentially suggesting the presence of in-house non-smoking policies among families of all socioeconomic and ethnic groups. In Counties Manukau during 2001-05, the proportion of Year 10 students reporting parental smoking remained relatively static (41.7% in 2001→ 41.1% in 2005), while the proportion reporting living in homes where people smoked inside declined (29.8% in 2001→ 26.0% in 2005). These figures were very similar to the NZ average during this period and trends were consistent with those occurring nationally.

Data from the 1996 Census painted a similar picture, with 40.2% of NZ children 0-14 years living in a household with a smoker and exposures being higher for Māori > Pacific > European > Asian / Indian children and those living in the most deprived areas. In Counties Manukau, 45.2% of children lived in a household with a smoker, with socioeconomic and ethnic differences being very similar to those seen nationally. Given the significant associations between passive smoking and outcomes such as SIDS, bronchiolitis, and pneumonia during childhood, it is likely that exposure to second hand cigarette smoke made a significant contribution to disparities in child health outcomes in Counties Manukau during this period.

OBESITY, NUTRITION & PHYSICAL ACTIVITY



INTRODUCTION

Recent estimates suggest that as many as 40% of the deaths in NZ each year may be attributable to the joint effects of sub-optimal diet and physical inactivity. This includes 85% of deaths due to ischaemic heart disease, 70% of deaths due to stroke and 80% of deaths due to diabetes [42]. It is thus no surprise that 5 of the 13 population health objectives in the NZ Health Strategy relate to:

1. improving nutrition
2. reducing obesity
3. increasing levels of physical activity
4. reducing the incidence and impact of cardiovascular disease
5. reducing the incidence and impact of diabetes

When viewed alongside reports suggesting that during the past 15 years, the number of overweight children in NZ may have doubled and the number of obese children more than trebled [43] and that Type II Diabetes, previously the domain of adults, is now emerging as a problem amongst our adolescent population [44], these associations are a cause for concern and potentially signal a large increase in premature mortality, as the current generation of NZ children and young people grow into maturity. Thus understanding the determinants of childhood obesity is crucial, if evidence based strategies are to be developed to prevent increases in premature mortality in future years.

The following 3 sections review the available NZ data on childhood obesity, nutrition and physical activity and highlight the findings which may be of value for planning interventions at a regional level. Because in NZ at present, there is no routine surveillance of childhood nutritional intake, weight or energy expenditure, the available evidence needs to be pieced together from one off surveys and research project reports. In reviewing the information contained in the sections that follow, it is suggested that the reader follows the order outlined below:

1. **Obesity:** This section provides an overview of the current distribution and determinants of childhood overweight and obesity in NZ, as well as some background information on how overweight and obesity are defined and measured in child and youth populations.
2. **Nutrition:** This section considers the role changes in nutrition may have played in the current obesity epidemic and highlights some of the findings of the 2002 National Children's Nutrition Survey which potentially have implications for planning obesity related interventions at a regional level.
3. **Physical Activity:** This section considers the role changes in physical activity may have played in the current obesity epidemic and explores the distribution of physical inactivity amongst NZ children and young people using SPARC survey data and the findings from the National Children's Nutrition Survey.

OVERWEIGHT AND OBESITY

In NZ during 1977-2003, the proportion of obese adults increased progressively, from 9% to 20% of males and from 11% to 22% of females. While modest increases in average BMI occurred during this period, the greatest increases were at the upper ends of the BMI distribution i.e. those who were overweight became even more overweight [45]. While no comparable time series data exists for children, during 1989-2000 the risk of being overweight amongst Hawke's Bay 11-12 year olds increased 2.2 fold, while the risk of being obese increased 3.8 fold [43].

Such increases are of concern, as obesity has been associated with a variety of adverse health outcomes including ischaemic heart disease, stroke, diabetes and cancer [42]. Ischaemic heart disease and diabetes are often preceded by a cluster of cardiovascular risk factors known as the "Metabolic Syndrome", characterised by abdominal adiposity, glucose intolerance, insulin resistance, hypertension and dyslipidaemia [46]. While these adverse risk factor profiles have traditionally been viewed as the domain of adults, recent evidence would suggest that the Metabolic Syndrome and Type II diabetes are increasing amongst adolescents. In Auckland, a recent audit of Adolescent Diabetes Clinic attendees indicated that the proportion of clients with Type II diabetes had risen from 1.8% in 1996, to 11% in 2002, with Type II diabetes accounting for 35.7% of new cases during 2000-01. Amongst those with Type II diabetes, risk factors for cardiovascular disease were common, with the average BMI being 34.6 kg/m², 85% having dyslipidaemia and 28% having hypertension [44].

When considering the pathways linking childhood obesity to adverse health outcomes, it remains difficult to determine conclusively whether being obese as a child independently increases the risk of later adverse outcomes, once the effects of adult obesity are taken into account [47]. Despite this uncertainty, there remains strong evidence to suggest that being obese as a child increases the risk of adult obesity, and that adult obesity in turn is linked to the adverse outcomes discussed above. While not all obese children become obese adults, the risk increases with increasing age, severity of obesity and whether the child's parents are also obese. In one recent study, 19% of obese 1-2 year olds were obese as young adults, as compared to 55% of obese 6-9 year olds and 75% of obese 10-14 year olds, with the risk of remaining obese being elevated nearly 3 fold if either parent was obese [48].

Factors predisposing children to obesity tend to be those which result in a positive energy balance over a relatively long period of time (e.g. a high fat diet, a low level of habitual physical activity and variations in body metabolism and insulin sensitivity). In addition, obesity has been shown to run in families, with genetic predisposition being seen as accounting for a significant proportion familial clustering, once the effects of shared environmental conditions are taken into account [49]. In population health terms, while it remains unclear which of these risk factors has made the greatest contribution to the current obesity epidemic, it is likely that interventions which address both sides of the energy equation (e.g. high fat diets, increased portion sizes vs. reductions in the amount of energy expended on transport, housework & leisure time activities) will be necessary, if the current obesity epidemic is to be addressed.

The following section reviews some of the issues associated with the measurement of overweight and obesity in children and young people, before providing an overview of the distribution of obesity in the NZ context. Because there is no routine surveillance of overweight and obesity in NZ children and young people at present, the information contained in this section is collated from one off surveys and research project reports. In the absence of

readily available regional data, readers are urged to extrapolate the findings of these surveys and research projects to their own populations, based on knowledge of their region's demographic profile.

Definitions and Issues Associated with Measuring Obesity in Children and Young People

While the methodology used by the different studies in this section varies, a number of issues are common to each. This section begins by providing a few definitions, as well as highlighting some of the issues associated with the measurement of obesity in children at different developmental stages and from different ethnic groups.

Obesity

Obesity is defined as an excess in adiposity or body fat mass. Measures of adiposity in current use include weight, weight for height (e.g. BMI), skin fold thickness (e.g. triceps / sub-scapular) and circumferences / diameters (e.g. waist-hip / waist-thigh ratios, mid-upper arm circumferences), each of which has its own reference standards and cut-points [47]. Of these, perhaps the most popular is the Body Mass Index (BMI), as defined below.

BMI

Obesity is often assessed using the Body Mass Index (BMI), calculated using the formula

$$\text{BMI} = \text{weight (kg)} / \text{height (m)}^2$$

Using height and weight to assess adiposity is generally viewed as being reliable, reproducible, non-intrusive and cheap, making BMI one of the most popular measures for obesity, both in NZ and overseas. In adults, cut-offs are based on mortality risk or other criteria, with those having a BMI of 25-29 kg/m² being traditionally classified as overweight and those with a BMI of 30 kg/m² or over being seen as obese. Using BMI to assess obesity in children however has a number of drawbacks, including the changes in body composition that occur as part of normal growth and with the onset of puberty and ethnic differences in body composition for a given BMI [46]. Each of these issues is discussed in more detail below.

Changes in Body Composition with Age: The Need for BMI Percentile Charts

Assessing obesity during childhood and adolescence is more complex than in adults, as both height and body composition change progressively with development. In particular, the proportion of fat mass / total body weight changes significantly during childhood, beginning at around 13-15% in term newborn infants and increasing progressively during the first year of life, to a maximum of 25-26% at 12 months of age. From 12 months to 4-6 years, the proportion of body fat then declines, to a nadir of around 12-16%, before increasing again between the ages of 6-10 years. By early adulthood, the proportion of fat mass is 20-25% for women and 15-20% for men [46]. As a result of these changes, when assessing the level of obesity in an individual child, BMI for age percentile charts are usually used, which extrapolate back the traditional adult cut points of 25-30 kg/m² and >30 kg/m² to the same points on the BMI distribution during the childhood years e.g. a male child with a BMI > 19.3 at the age of 5 years, is on the same point in the percentile charts as an 18 year old with a BMI of >30, and thus will be classified as obese [50]. As NZ to date has not developed its own BMI percentile charts for children, overseas standards must be used. Of these, the most popular is that developed by Cole [50] using pooled survey data from 6 different countries.

Ethnic Differences in BMI

With no BMI for age percentile charts specifically designed for NZ use, there remains a significant amount of debate about the appropriateness of the traditional BMI-for-age cut offs for NZ children of different ethnic groups. While a number of studies have suggested that, for a given BMI, Māori and Pacific children have a lower percentage of body fat [51] [52] [53], others have argued that while statistical differences may exist, there are no clinically significant ethnic differences in the relationship between BMI and body composition and that a common standard should be used for children of all ethnic groups [53]. Overseas research also suggests that ethnic differences in body composition may increase during puberty, with differences being much less marked amongst children <8 years of age [54]. Similarly, ethnic differences in the onset of puberty may also make utilisation of a common BMI cut off difficult, with puberty on average, occurring earlier amongst Māori and Pacific groups [55]. Such differences need to be kept in mind when interpreting ethnic specific obesity rates calculated using overseas percentile charts, as they may tend to overestimate obesity rates amongst Māori and Pacific children slightly.

Childhood Obesity in NZ: National and Regional Statistics Time Series Estimates

Hawke's Bay: As part of an asthma prevalence study, data on height, weight and ethnicity were collected from 870+ children aged 11-12 years, attending schools in either Hastings or Havelock North, in 1989 and 2000 [43]. The study found that:

- The % of overweight children increased 2.2 times, from 11.0% in 1989 to 20.9% in 2000.
- The % of obese children increased 3.8 times, from 2.4% in 1989 to 9.1% in 2000.
- The greatest proportional increases occurred amongst European children (overweight 3.0 times higher, obesity 8.3 times higher).

In absolute terms however, the highest obesity rates occurred amongst Māori and Pacific children, with the authors noting that during 2000:

- 35.0% of Pacific children were overweight, while 15.0% were obese.
- 24.7% of Māori children were overweight, while 15.3% were obese.
- 18.2% of European children were overweight, while 5.7% were obese.

The authors concluded that while higher proportions of Māori and Pacific children were overweight or obese, European children were rapidly catching up. They also noted that the statistically significant increases across all ethnic groups were consistent with overseas trends, making childhood obesity a major health problem in NZ.

Christchurch: Health and physical activity parameters for 5,579 10-14 year old intermediate school children were collected between 1991 and 2001[56]. During this period:

- Boy's weight increased by 2.9 kg and girls weight increased by 2.1 kg.
- The % of boys who were overweight or obese increased from 4.2% in 1991 to 7.8% in 2000, while the % of girls who were overweight or obese increased from 2.0% to 11.3%.
- The authors also noted that during this period the level of fitness of children deteriorated, with the time to complete a 550m run increasing by 23.6s for boys and 27.0s for girls.

These two studies provide the only available time series data on changes in childhood BMI in NZ during the past two decades. While in absolute terms, the proportions of overweight and obesity are not strictly comparable (the Hawke's Bay study used Coles [50] BMI percentile charts, while the Christchurch study used 25 kg/m² as a cut off for overweight and obesity), what these two studies do suggest is that over the past two decades the obesity epidemic has progressed relatively rapidly amongst NZ children.

The National Children's Nutrition Survey

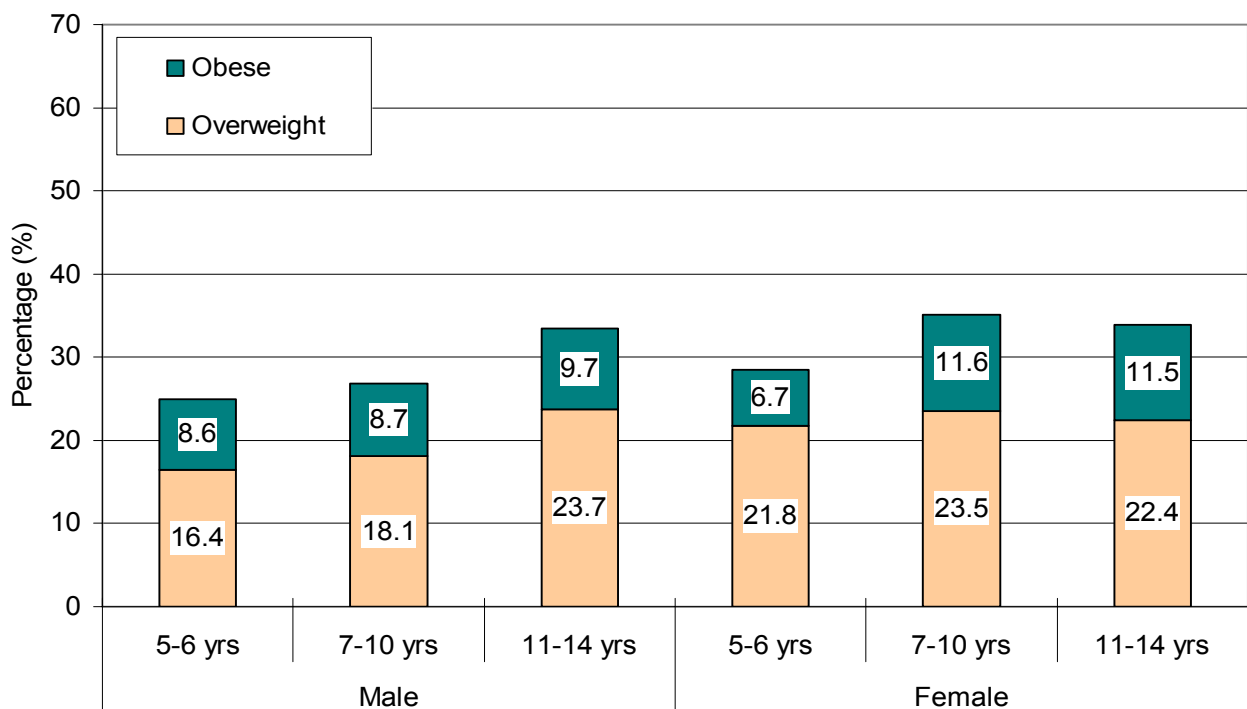
Notes on Methodology of National Children's Nutrition Survey

The 2002 National Children's Survey was a cross sectional survey of 3,275 NZ children aged 5-14 years. A nationally representative sample was achieved by randomly selecting schools (of 190 schools identified, 172 (90.5%) agreed to participate) and then within these schools, randomly selecting children (of the 4,728 children selected, 3,275 (69.3%) completed an initial 24-hour Diet Recall Questionnaire and 3,151 (66.6%) had their height and weight measured. Over sampling of Māori and Pacific children also occurred, so that ethnic specific analyses could be undertaken (1,160 Māori, 1,035 Pacific and 956 European / Other children had height and weight measurements taken). These measurements were carried out in the school setting, while the main interview was carried out at home in the presence of a parent or caregiver [55]. Cole's [50] BMI for age percentile charts were used to define overweight and obesity cut-points in the survey.

The 2002 National Children’s Survey was a cross sectional survey of 3,275 NZ children aged 5-14 years. As part of the survey height and weight measurements were taken and rates of overweight and obesity estimated for children of different ethnic and socioeconomic groups. The main findings were [55] :

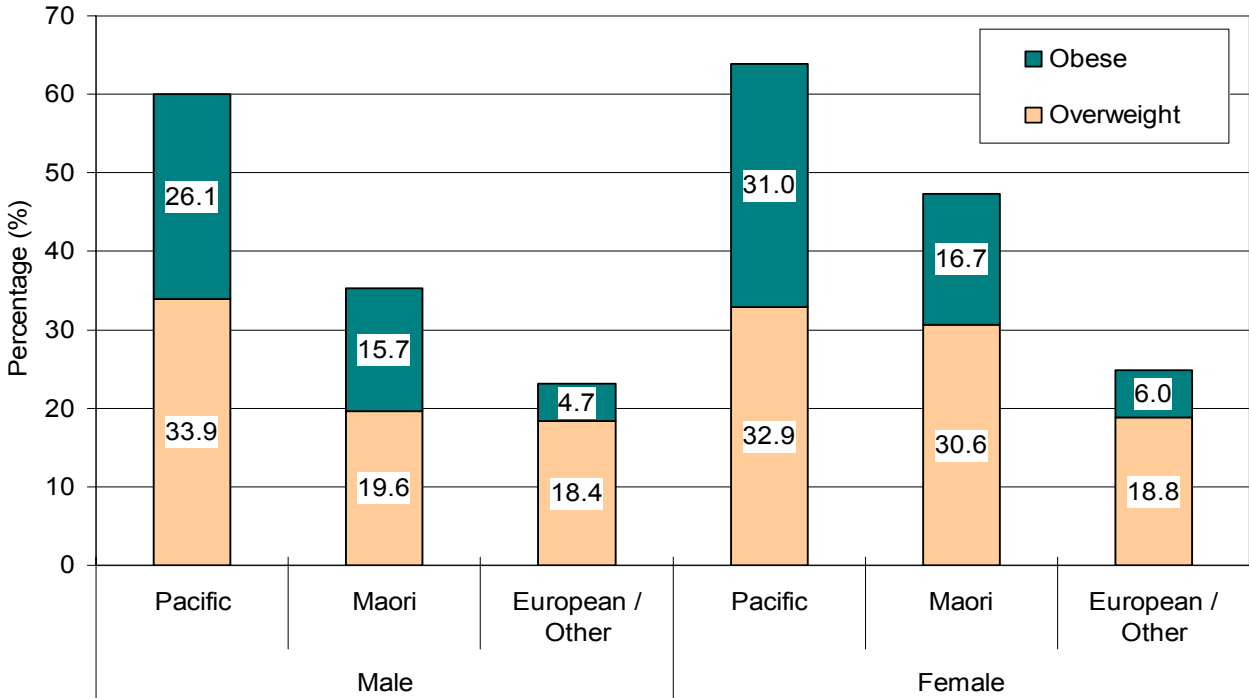
1. 21.3% of NZ children were overweight, while 9.8% were obese.
2. Rates of overweight and obesity were higher amongst Pacific > Māori > European / Other children, with the highest rates being for Pacific girls (**Figure 23**). The earlier onset of puberty in Māori and Pacific females, as well as the use of internationally derived cut-off values however, needs to be taken into consideration when interpreting these results.
3. Overweight and obesity exhibited a modest socioeconomic gradient, with rates being highest amongst those living in the most deprived NZDep small areas, for both males and females (although no confidence intervals were available for these figures) (**Figure 24**).
4. Differences in overweight and obesity between those living in rural and urban areas were not marked (**Figure 25**).

Figure 22. Proportion of Children Aged 5-14 Years Who Were Either Overweight or Obese by Gender and Age, NZ National Children’s Nutrition Survey 2002



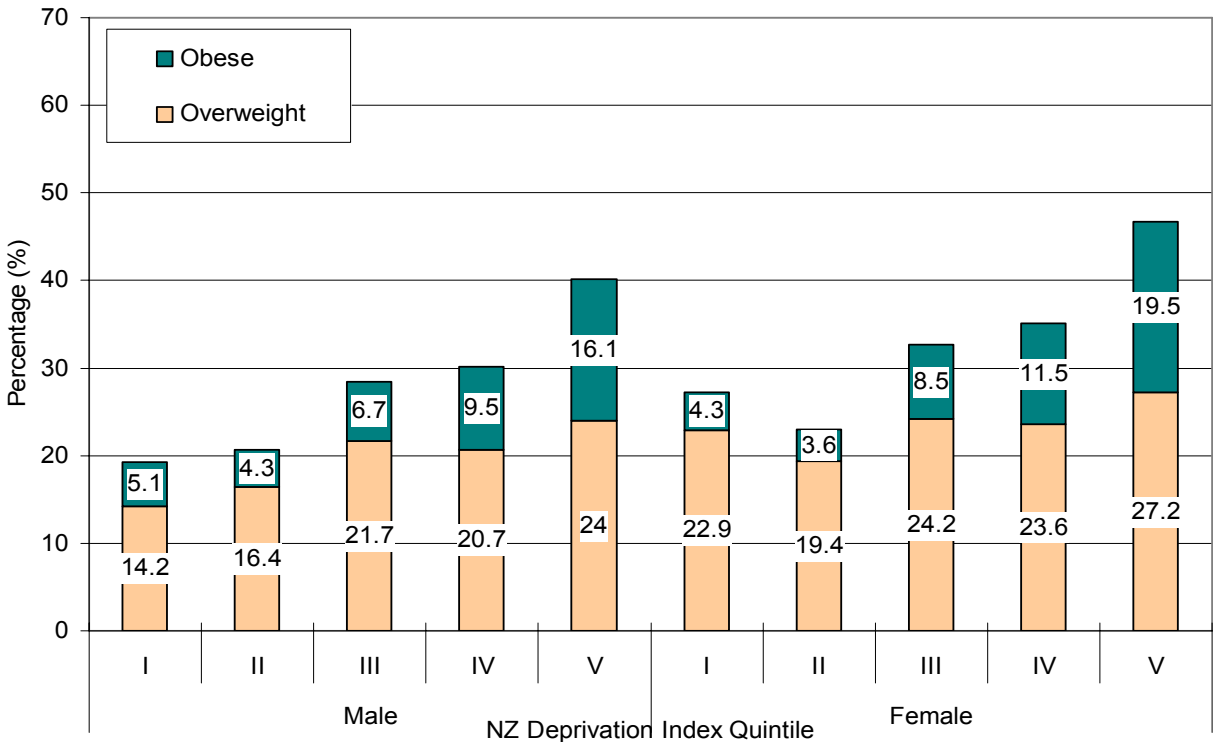
Source: NZ Food, NZ Children: Key Results of the 2002 National Children’s Nutrition Survey.

Figure 23. Proportion of Children Aged 5-14 Years Who Are Either Overweight or Obese, by Gender and Ethnicity, NZ National Children’s Nutrition Survey 2002



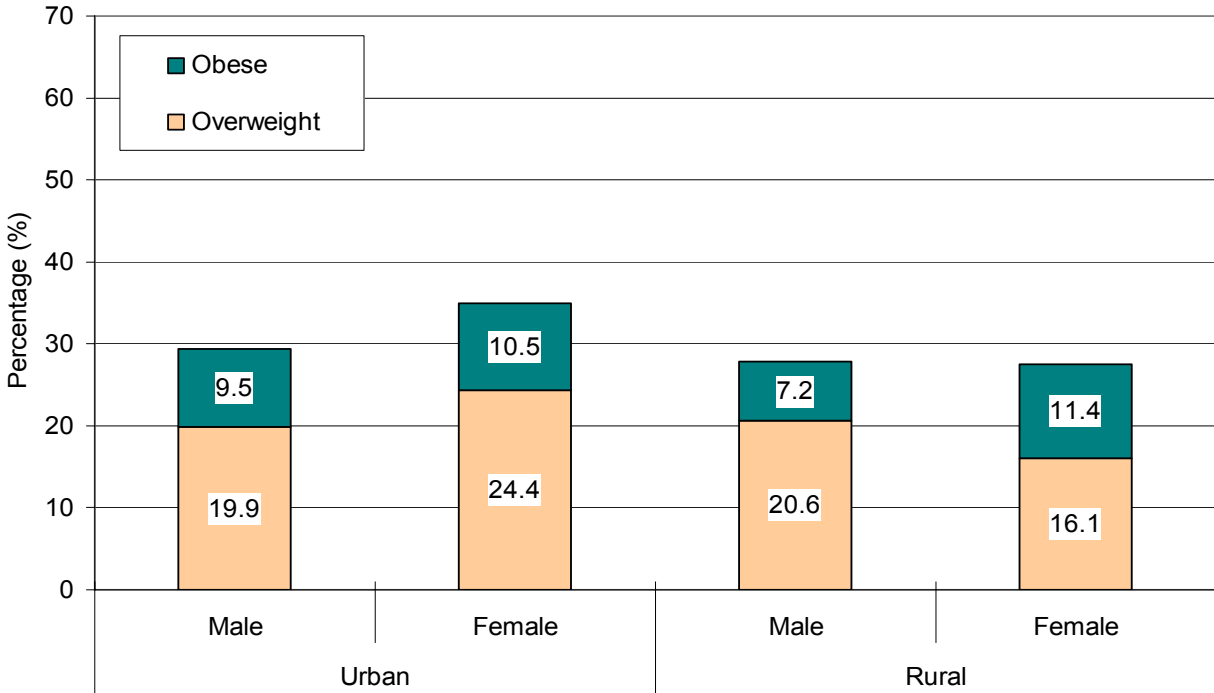
Source: NZ Food, NZ Children: Key Results of the 2002 National Children’s Nutrition Survey.

Figure 24. Proportion of Children Aged 5-14 Years Who Are Either Overweight or Obese by Gender and NZ Deprivation Index Quintile, NZ National Children’s Nutrition Survey 2002



Source: NZ Food, NZ Children: Key Results of the 2002 National Children’s Nutrition Survey.

Figure 25. Proportion of Children Aged 5-14 Years Who Are Either Overweight or Obese by Gender and School Type (Rural / Urban), NZ National Children’s Nutrition Survey 2002



Source: NZ Food, NZ Children: Key Results of the 2002 National Children’s Nutrition Survey.

Regional Data

Waikato

Project Energize, is a school based nutrition and activity programme aimed at improving rates of childhood obesity, cardiovascular risk factors and dental health amongst primary aged school children. While the Project is a randomised controlled trial, baseline data from this study nevertheless provides a valuable source of information on the prevalence and distribution of overweight and obesity amongst children aged 5 and 10 years in a diverse regional population.

Notes On Study’s Methodology

Project Energize, a school based nutrition and activity programme began in the Waikato during 2004, with the aim of improving rates of childhood obesity, cardiovascular risk factors and bone and dental health,. It is a randomised controlled trial involving 125 schools and a total of 1,507 five and 1,528 ten-year old children in the Waikato Region, with 62 schools receiving a mix of school nutrition and activity programmes which are individualised to meet the schools needs and 63 schools serving as controls (i.e. no specific intervention). Sampling was undertaken to ensure that a sufficient mix of rural / urban, small / large and high / low socioeconomic decile schools were included.

While only 50% of Project Energize schools received any active intervention, the programme nevertheless collected baseline height and weight data on all 3,035 participants, making it comparable in size to the National Children’s Nutrition Survey (NCNS). Consent rates at 48% however, were somewhat lower than the NCNS (69%) and thus the results presented below must be viewed with this in mind. As in the NCNS, Project Energize used Coles [50] BMI-for-age percentile charts to assign overweight and obesity cut points to study participants. All the figures in this section have been used with the kind permission of the Project Energize Team.

The main findings of the Project Energize baseline survey data were that:

1. Girls were more likely to be overweight than boys, with 26.4% of girls being either overweight or obese at 5 years as compared to 20.6% of boys. Similar patterns occurred at 10 years of age (**Figure 26**).
2. Overweight and obesity increased with age, with 23.5% of 5 year olds being either overweight or obese, as compared to 31.2% of 10 year olds.
3. The proportion of children who were overweight or obese at 5 years varied by ethnicity, with 31.2% of Māori boys being either overweight or obese, as compared to 16.1% of European boys. Similar differences were seen for girls. At 10 years, 47.1% of Māori girls were either overweight or obese, as compared to 28.8% of European girls. Similarly, 44.7% of Māori 10 year old boys were overweight or obese as compared to 20.5% of European 10 year old boys (**Figure 27**).
4. Rates of overweight and obesity increased as the level of affluence of the school decreased for both genders and at each age group, with 41.6% of 10 year old girls attending schools in the most deprived (Deciles 1-3) areas being overweight or obese, as compared to 25.9% of 10 year old girls attending schools in the most affluent (Deciles 8-10) areas (**Figure 28**).

Figure 26. Proportion of Children Who Were Overweight and Obese by Age and Gender, Project Energize Waikato 2004

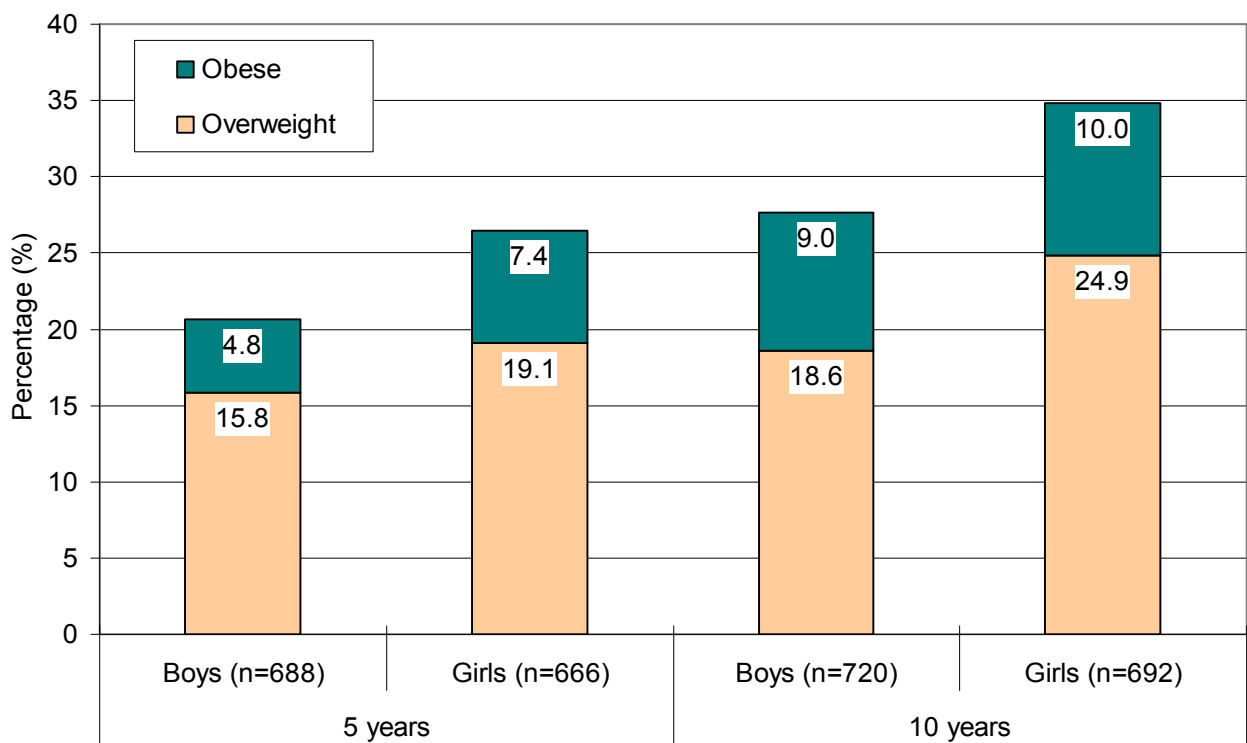


Figure 27. Proportion of Children Who Were Overweight and Obese by Age, Gender & Ethnicity, Project Energize Waikato 2004

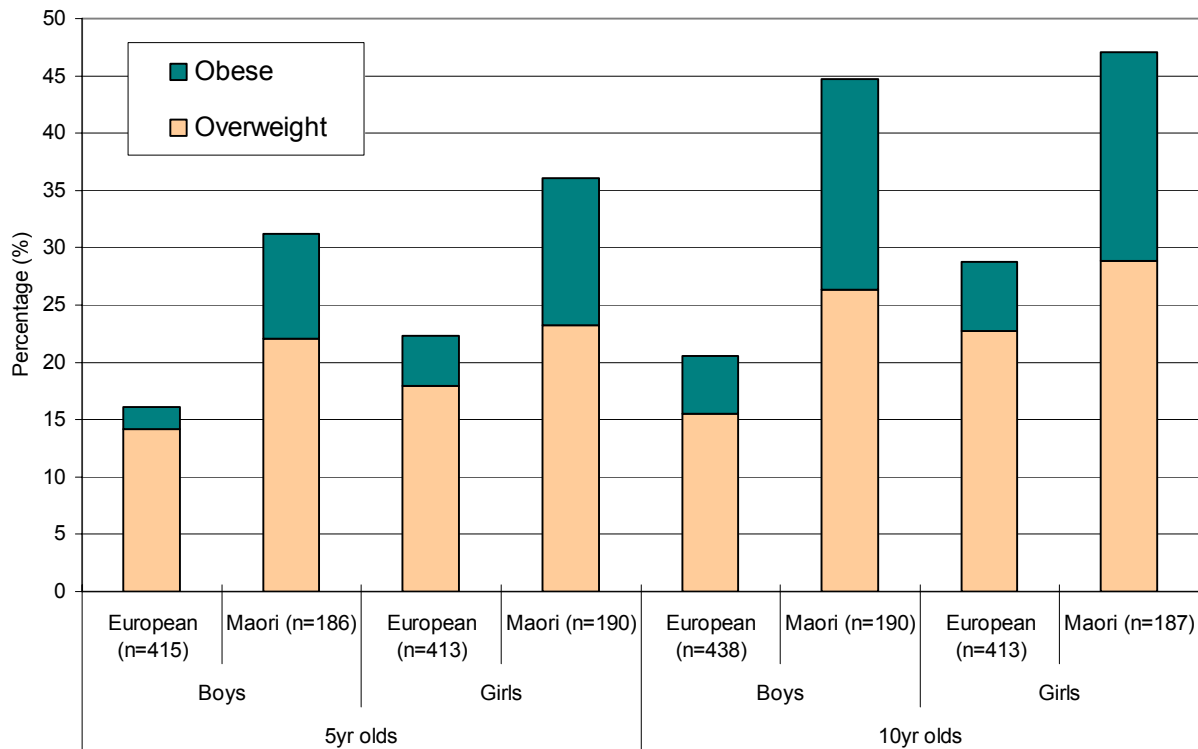
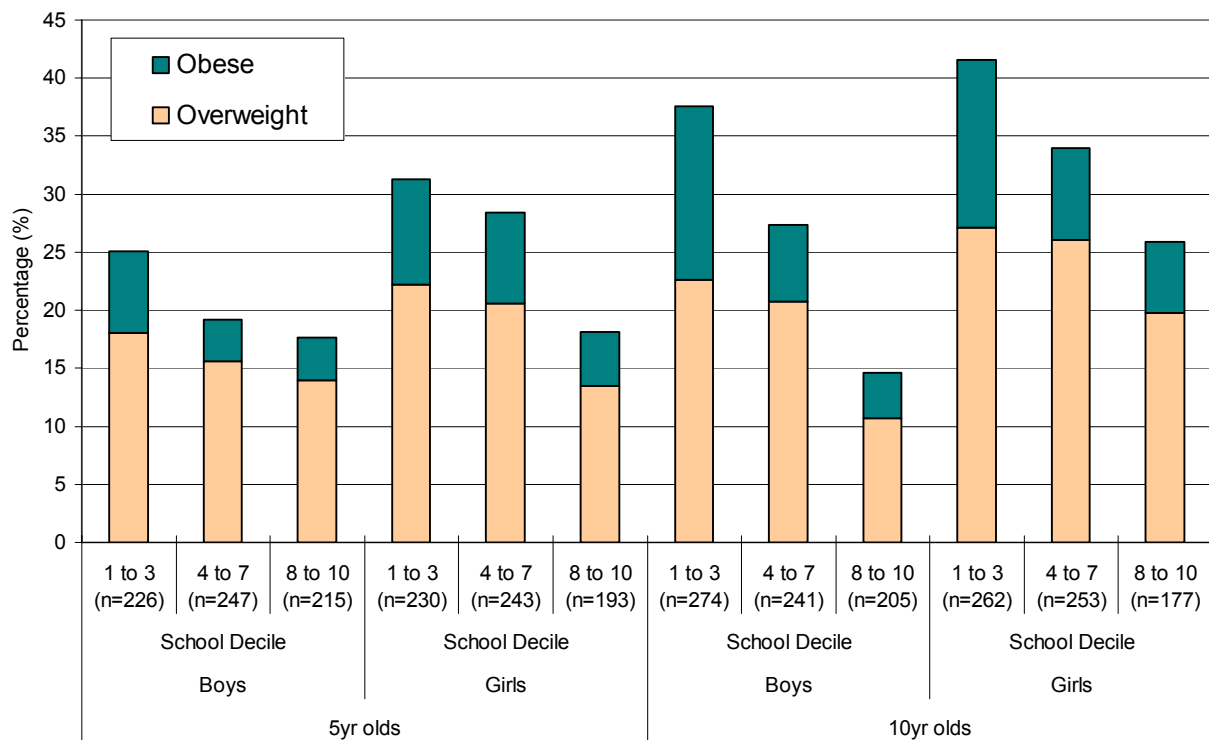


Figure 28. Proportion of Children Who Were Overweight or Obese by Age, Gender and School Socioeconomic Decile (1-3 Most Deprived; 8-10 Most Affluent), Project Energize Waikato 2004



Summary and Policy Implications

The above review of the available NZ data sources suggests that:

1. **Prevalence:** While estimates vary from study to study, NZ data collected since 2000 suggests that $\approx 20\%$ of NZ children are overweight and $\approx 10\%$ are obese.
2. **Trends over Time:** Of the 2 studies which have tracked the pace of the obesity epidemic amongst NZ children and young people, both suggest that it is progressing relatively rapidly, with the proportion of children who are overweight or obese increasing 2-3 fold over the past decade.
3. **Ethnic Disparities:** All of the NZ studies reviewed demonstrated higher rates of overweight and obesity amongst Pacific > Māori > European children and adolescents. These findings must be viewed within the context of an earlier average age of puberty amongst Pacific and Māori girls, as well as ethnic differences in the ability of BMI to approximate total body fat composition. As these factors potentially alter the ability of internationally derived percentile charts to accurately identify overweight and obesity in Māori and Pacific groups, these findings must be viewed with caution.
4. **Socioeconomic Disparities:** Of the 2 studies which explored the impact of socioeconomic deprivation on overweight and obesity, both demonstrated socioeconomic gradients, with rates being highest amongst those in the most deprived areas, irrespective of the measure used.
5. **Age and Gender:** While gender differences were inconsistent from study to study, in general, rates of overweight and obesity increased with increasing age (although the statistical significance of these findings varied with the methodology used).

These findings suggest that the current levels of overweight and obesity amongst NZ children and adolescents are a significant public health concern and that unless sound policies and strategies are put in place to address this issue, the socioeconomic and ethnic disparities in overweight and obesity which currently exist amongst NZ children and young people, will serve to exacerbate disparities in chronic disease burden as the current generation of NZ children and young people grows to maturity.

Before considering strategies to address this issue however, the reader is strongly urged to read the two sections which follow, which explore nutrition and physical activity amongst NZ children and young people. While to date, surveillance in these areas has also been limited, the strong interrelationships between sub-optimal nutrition reduced physical activity and obesity suggests that an exploration of these factors may well identify potential intervention points, where population health strategies can be developed in future years.

NUTRITION

As rates of childhood obesity have increased, attention has turned towards the environments in which children live and the role dietary and lifestyle changes have played in subtly altering the balance between caloric intake and the amount of energy expended on incidental physical activity. While no time series information is available for NZ, serial surveys of nutritional intake in the USA between the mid-70s and 90s have demonstrated a number of strong and consistent trends including a 3-fold increase in the consumption of chips / crackers / pretzels, a 2-fold increase in the consumption of soft drink and a shift towards larger portion sizes. While the proportion of energy derived from fat fell during this period, the proportion derived from carbohydrate increased, with the majority of the increase in per capita calorie intake seen since the mid-80s being derived exclusively from carbohydrate. In addition, the proportion of food dollars Americans spent on eating out increased, from 33% in 1970 → 47% in 2001, with researchers noting that food consumed away from home was more energy dense and contained more fats and sugars than food prepared at home. Relative price changes also saw increases in the price of fruit and vegetables, while prices for sugar, sweets, soft drinks and fats fell in relative terms [57].

While no comparable time series data is available in the NZ context, information from a number of cross sectional surveys suggests that aspects of the current nutritional environment are not conducive to healthy food choices for NZ children. In one recent survey of 200 primary / intermediate schools, 79% of school canteens offered pies, 57% offered juice and 55% offered sausage rolls. In contrast, filled rolls (the most expensive item) were offered by only 47%, while 30% offered sandwiches and 17% offered fruit [58]. The potential implications this has for disparities in childhood nutritional intake were recently highlighted by the National Children's Nutrition Survey, which suggested that Māori and Pacific children were significantly more likely to buy some or most of the food they consumed at school from the school tuckshop and were also more likely to consume pies, hamburgers, and fizzy drinks than European / Other children [59].

The following section reviews the distribution and determinants of nutritional intake amongst NZ children using information derived from the 2002 National Children's Nutrition Survey. While the lack of regional data precludes a corresponding analysis at a DHB level, it is nevertheless hoped that information in this section will serve a useful starting point for considering strategies to address the obesity epidemic at a regional level.

Data Sources and Statistical Methods

2002 National Children's Nutrition Survey [55]

The 2002 National Children's Survey is a cross sectional survey of 3,275 NZ children aged 5-14 years. A nationally representative sample was achieved by randomly selecting schools (of 190 schools identified, 172 (90.5%) agreed to participate) and within these schools, randomly selecting children (of 4,728 children selected, 3,275 (69.3%) completed the initial 24-hour Diet Recall Questionnaire). Over sampling of Māori and Pacific children also occurred, so that ethnic specific analyses could be undertaken (1,224 Māori, 1,058 Pacific and 993 European / Other children completed the 24-hour Diet Recall Questionnaire). Measurements of weight and height were carried out in the school setting, while the main interview was carried out at home in the presence of a parent or caregiver.

Dietary intake was assessed using a 24-hour diet recall, with children being asked to report their dietary intakes during the 24-hours immediately prior to data collection. The interview was structured in 3 stages to maximise the child's recall, with the child initially being asked to supply a "quick list" of all foods, beverages and dietary supplements eaten during the previous 24 hours. The next stage involved a more detailed description of each food item (time eaten, amount eaten, accompanying foods e.g. bread with butter, cooking method, brand and product names, recipes for home prepared foods). Finally the list was reviewed and the order and types of foods verified to ensure nothing had been omitted. Food and beverages from the 24 hour recall were then electronically matched to food composition data to calculate nutrient intake.

Eight questions on food security (initially developed for 1997 National Nutrition Survey) were also asked, if adult caregivers were present at the time of interview. Data was not collected from households where the child was interviewed without an adult present. Questions focused on dietary restrictions associated with limited financial resources (e.g. amount, variety, running out of food, reliance on food banks, stress associated with inability to provide food) , with respondents being asked to comment on whether the posed situation always, sometimes or never occurred in their household (a 4th category of don't know was also available). In addition, a further section on eating patterns asked children about the source of the food they usually ate at school e.g. whether food was brought from home, a shop / diary / takeaway outlet or the school canteen or tuckshop, with children being asked whether most, some or none (or don't know) of the food they ate at school was sourced from these particular places.

Limitations of the National Children's Nutrition Survey include its "one-off" cross-sectional nature, resulting in an inability to track trends over time, its small sample size prohibiting a statistically meaningful regional analysis and the usual issues associated with a 24-hour dietary recall of a limited sample being used to estimate the usual dietary intakes of the total population. Its strengths however are it's ethnically based sampling frame, meaning that valid ethnic specific analyses can be undertaken, as well as the fact that the 24-hour recall was repeated on a sub-sample of 505 children, meaning adjustments could be made to better reflect the "usual" intakes of the total sample.

The 2002 National Children's Nutrition Survey

Average Energy Intake

The 2002 National Children's Nutrition Survey (CNS02) suggested that at all ages, males tended to have higher energy intakes than females and that energy intake increased with increasing age. In addition, Māori children had higher median daily caloric intakes than European or Pacific children did, although socioeconomic gradients in caloric intake were not prominent (**Figure 29**).

Percentage of Energy Intake from Fat

The NZ Nutrition Taskforce (1991) guideline recommends that fat provides $\leq 33.0\%$ of a person's total energy intake [60]. Overall the mean percentage of daily energy intake from fat was similar for males (33.2%) and females (32.9%). When broken down by NZ Deprivation Index Decile, females in the most affluent (Decile 1-2) areas had a significantly lower proportion of their total energy intake derived from fat, than females in the most deprived (Decile 9-10) areas. In addition, the total energy intake from fat was significantly lower for European / Other children than for Māori or Pacific children (**Figure 30**).

Food Security

While 78% of households with children 5-14 years reported that they could always afford to eat properly, 20.1% said they could only do so only sometimes. Larger households (with 7+ members or 5+ children) were significantly more likely to report that they could only afford to eat properly sometimes. In addition, households in the most deprived (NZDep Decile 9-10) areas were significantly less likely to always eat properly, when compared to those in more affluent (NZDep Deciles 1-7) areas. Finally, Māori and Pacific households were significantly

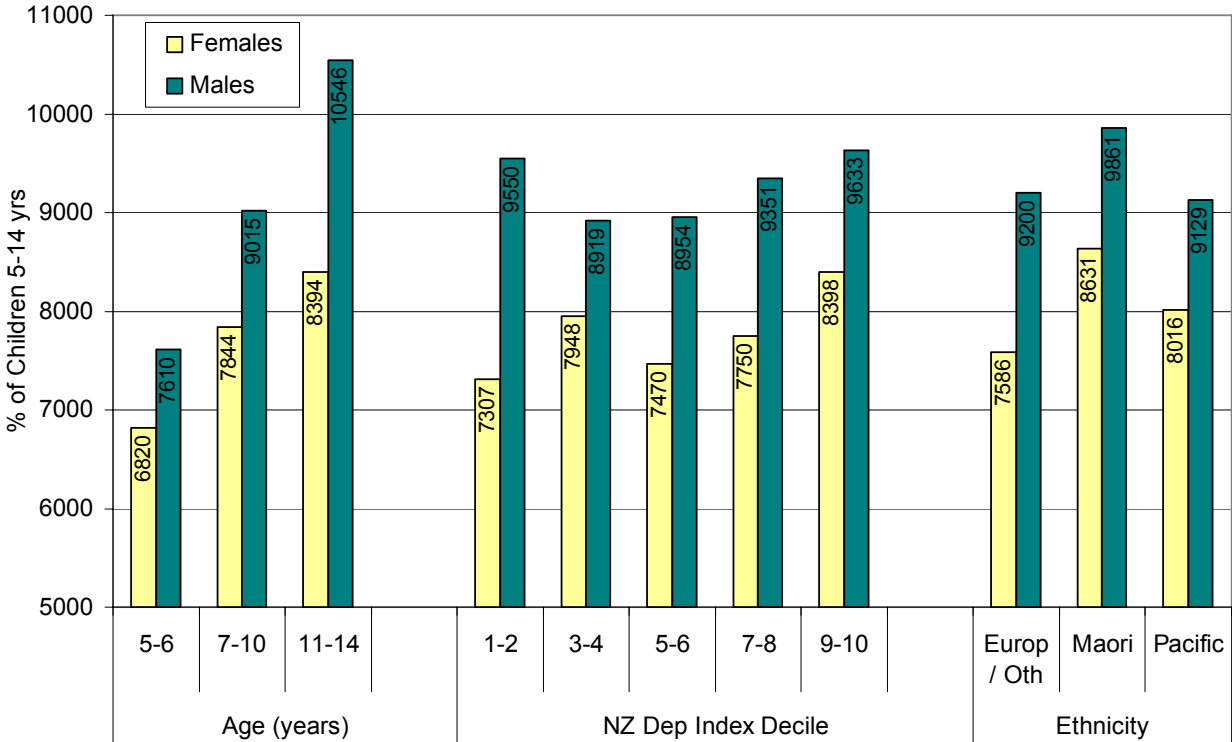
less likely to be able to always eat properly, when compared to European / Other households (Figure 31).

A number of other elements relating to food security were also explored in the CNS02 including whether a household ever ran out of food, had to eat less or had to restrict the variety of the food they ate because of a lack of money. In addition, questions were asked about whether the household experienced stress because they had insufficient money for food. While around 22% of households reported that food sometimes or often ran out because of a lack of money, this figure was as high as 40% amongst larger households (with 7+ family members, or 5+ children). In addition, households in the most deprived (NZDep Deciles 9-10) areas were significantly more likely to run out of food than those living in more affluent (NZDep 1-7) areas. Finally Pacific households were significantly more likely to run out of food than Māori or European / Other households (Figure 32).

Source of Food Consumed at School

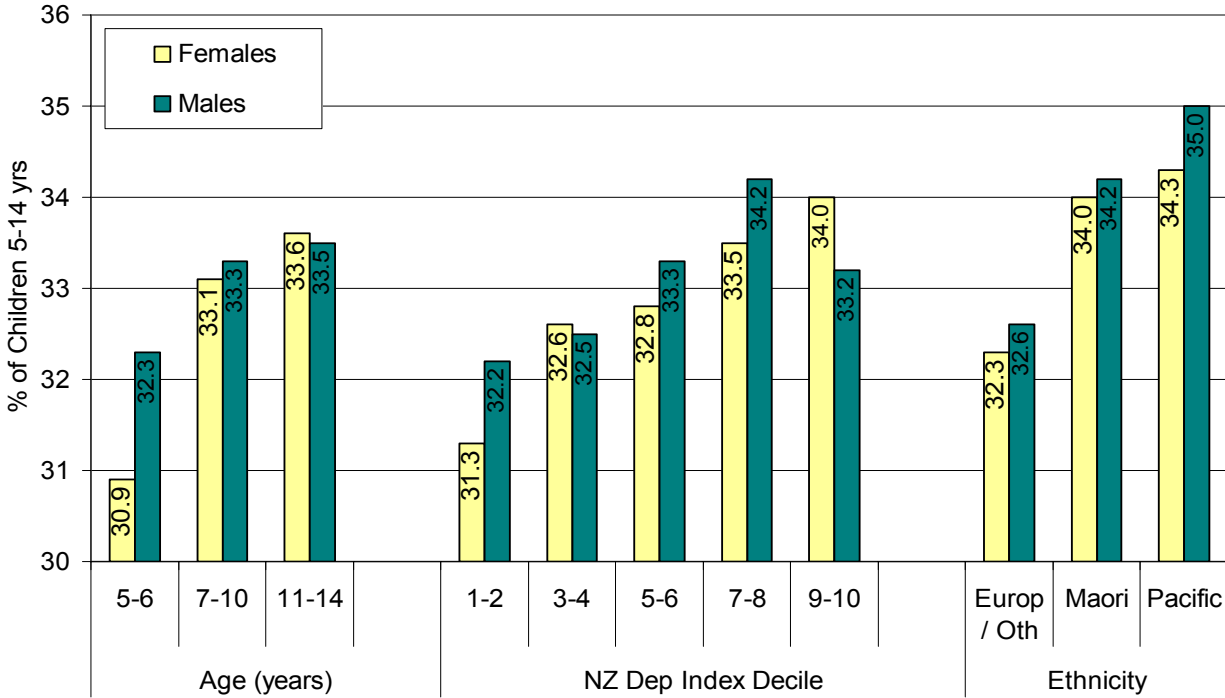
The majority of NZ children (84.4%) brought most of the food they consumed at school from home, with $\approx \frac{3}{4}$ not buying any of their food from a shop or takeaway in the past week. The proportion who brought most of their food from home declined significantly with age however, as well as with socioeconomic deprivation, with fewer children in the most deprived (Decile 9-10) areas bringing their food from home. Finally, fewer Māori and Pacific children brought most of their food from home, with more saying that they brought some of their food from a shop / takeaway or canteen / tuckshop (Figure 33, Figure 34).

Figure 29. Mean Energy Intake (kJ) for Children 5-14 Years by Gender, Age, NZDep Index Decile and Ethnicity, NZ National Children's Nutrition Survey 2002



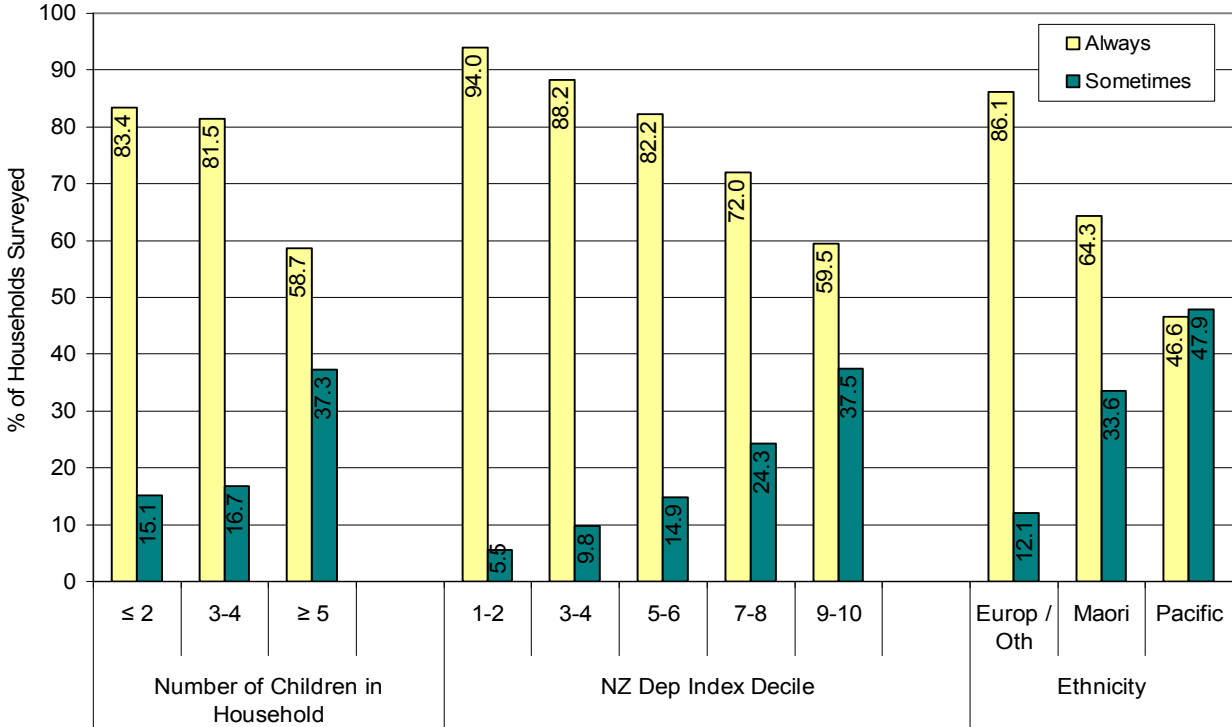
Source: NZ National Children's Nutrition Survey 2002.

Figure 30. Percentage of Energy Intake from Total Fat Amongst Children 5-14 Years by Gender, Age, NZDep Index Decile and Ethnicity, NZ National Children's Nutrition Survey 2002



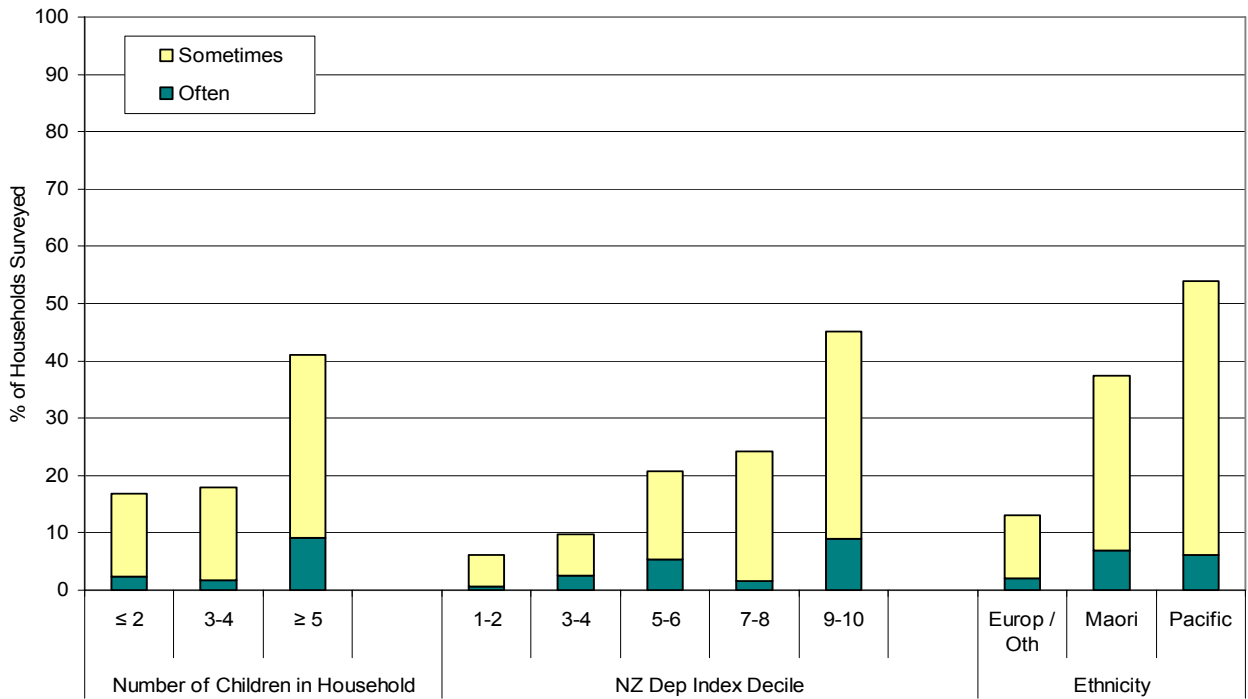
Source: NZ National Children's Nutrition Survey 2002.

Figure 31. Proportion of Households with Children 5-14 Years who Reported they Could Afford to Eat Properly Always or Only Sometimes, NZ National Children's Nutrition Survey 2002



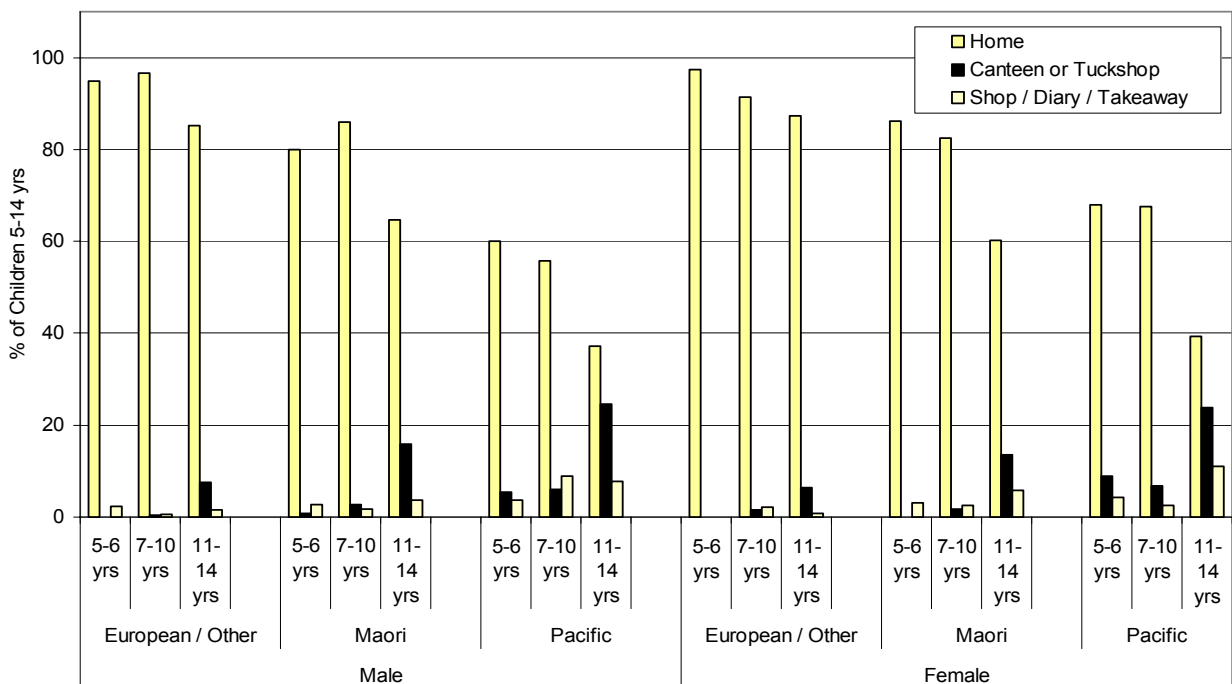
Source: NZ National Children's Nutrition Survey 2002.

Figure 32. Proportion of Households with Children 5-14 Years who Reported that Food Runs Out Often or Sometimes Due to a Lack of Money, NZ National Children's Nutrition Survey 2002



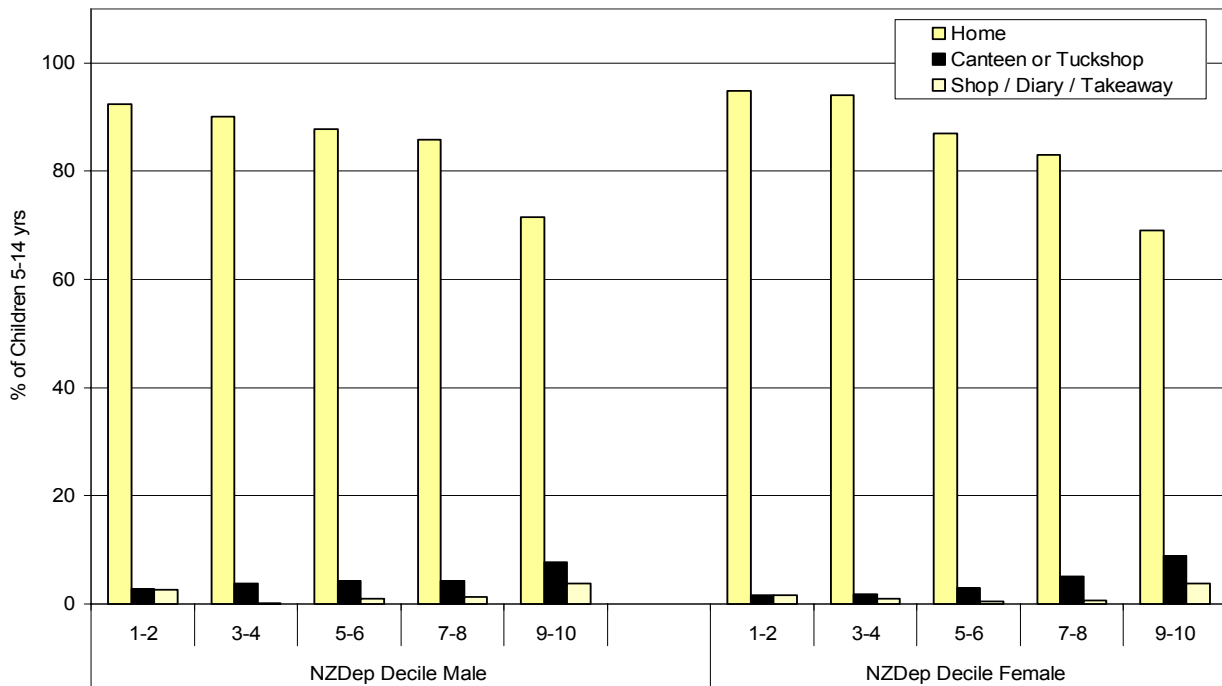
Source: NZ National Children's Nutrition Survey 2002.

Figure 33. Source of Food Eaten at School by Gender, Age and Ethnicity, NZ National Children's Nutrition Survey 2002



Source: NZ National Children's Nutrition Survey 2002

Figure 34. Source of Food Eaten at School by NZ Deprivation Index Decile, NZ National Children's Nutrition Survey 2002



Source: NZ National Children's Nutrition Survey 2002

Summary and Policy Implications

The CNS02 provided a number of insights into the nutritional intake of NZ children which may be of value in addressing the current obesity epidemic. These include:

1. On average, males have higher energy intakes than females and energy intakes increase with increasing age. Both findings are consistent with a larger body size and the need to consume more energy to maintain body mass and meet daily exercise requirements.
2. Total energy intake, when broken down by ethnicity and socioeconomic status did not precisely mirror current ethnic disparities in obesity rates, with Māori children having higher total caloric intakes than European and Pacific children, yet Pacific children having the highest obesity rates. In addition, while socioeconomic gradients in obesity were prominent, socioeconomic gradients in total caloric intake were not. In contrast, the proportion of the daily intake derived from fat did correspond more closely with ethnic and socioeconomic gradients in obesity, with the % of daily intake from fat being higher amongst Pacific > Māori > European / Other children and (particularly amongst females) those living in the most deprived areas.
3. Even in the context of the current obesity epidemic, food security remained an issue for larger families, those living in the most deprived areas and for Pacific > Māori > European families, with many saying that they could not always afford to eat properly, and that they often or sometimes ran out of food. That those with the greatest food security issues (Pacific > Māori > European / Other, Least Affluent > Most Affluent) were the same as those experiencing the highest rates of childhood overweight and

obesity, suggests that further research is needed to assess the impact affordability of healthy food options has on the current obesity epidemic.

4. While the majority of children brought the food they consumed at school from home, this declined as children grew older. In addition, the proportion relying on school canteens or local food outlets was higher for Pacific > Māori > European / Other children and those living in the most deprived areas. As indicated above, recent survey data has suggested that many items currently offered in school canteens may not support healthy food choices, thus potentially exposing a larger proportion of Pacific > Māori > European / Other children and those living in more deprived areas, to a range of unhealthy food choices (e.g. pies, sausage rolls), thereby exacerbating disparities in body mass index.

Thus, at a regional level, a multifaceted approach to the obesity epidemic may be needed, which takes into account the environments in which children and young people make their food choices (e.g. school canteens, local food outlets), as well as the social and economic constraints (e.g. relative pricing of healthy vs. non healthy food options) which preclude the uptake of healthy food choices for some socioeconomic and ethnic groups. In addition, the role physical activity plays must be considered and this is discussed in the section which follows.

PHYSICAL ACTIVITY AND EXERCISE

While declines in the amount of time children and young people spend engaged in physical activity are thought to have contributed significantly to the obesity epidemic, a paucity of longitudinal data makes it difficult to quantify the precise role this has played in the NZ context. Overseas, evidence for declining activity levels comes from a variety of sources, including a Swedish study which noted significant decreases in energy expenditure (particularly occupational and transport) over the 20th century, which were accompanied by corresponding increases in sedentary leisure activity (e.g. watching TV, reading) [61]. In the UK, USA and NZ, declines in the number of children walking or cycling to school since the early 1970s have been attributed to parents' perceptions regarding safety and a reluctance to let children cycle on the roads [62] [63, 64]. A recent study on the level of fitness of NZ children, also suggested that children's underlying fitness levels may be deteriorating, with the time taken for intermediate school children to run 550 metres increasing by 23.6s for boys and 27.0s for girls between 1991 and 2000 [56]. In addition, participation in organised sport has decreased substantially in a number of countries, while the proportion of leisure time children spend on "electronic entertainment" (e.g. computers, TV) has increased [61]. Not all overseas studies have come to the same conclusion however, with a number of studies exploring leisure time physical activity amongst young people during the 1980s-90s noting either increases in participation in vigorous activity, or no overall change [61]. In understanding the reasons for these differences however, methodological issues need to be taken into consideration, including the emphasis that different studies place on leisure time physical activity (e.g. sport) vs. total energy expenditure (e.g. housework, walking to school), as well as the potential for questions relating to vigorous activities (e.g. that make you "huff and puff") to become less meaningful as the overall fitness of a population declines.

In NZ, the only trend information on children's physical activity comes from SPARC Surveys, which during 1997-01 noted a small decline in the number of children (5-17 yrs) who were active (68.9% in 1997 → 66.5% in 2001) and a corresponding increase in the number who were sedentary (no activity in past week 7.9% in 1997 → 12.8% in 2001) [65]. The following section explores the available information on physical activity in NZ and Counties Manukau using information from the 1997-2001 SPARC Sport and Physical Activity Surveys [65], as well as the limited amount of cross-sectional information provided by the National Child Nutrition Survey [55]. While neither source is able to determine whether increases in total energy intake or decreases in physical activity have played the greatest role in the current obesity epidemic, increasing physical activity remains one of the mainstays of the NZ's Current Healthy Eating, Healthy Action Strategy and thus an understanding of its determinants is of value in identifying potential intervention points for future strategy development.

Data Sources and Statistical Methods

2002 National Children's Nutrition Survey

The 2002 National Children's Survey was a cross sectional survey of 3,275 NZ children aged 5-14 years. A nationally representative sample was achieved by randomly selecting schools (of 190 schools identified, 172 (90.5%) agreed to participate) and then within these schools, randomly selecting children (of 4,728 children selected, 3,269 (69.1%) completed the Physical Activity Questionnaire). Over sampling of Māori and Pacific children also occurred, so that ethnic specific analyses could be undertaken (1,223 Māori, 1,056 Pacific and 990 European / Other children completed the Physical Activity Questionnaire). Measurements of weight and height were carried out in the school setting, while the main interview was carried out at home in the presence of a parent or caregiver [55].

The measurement of physical activity was based on the Physical Activity Questionnaire for Children, developed by Crocker et al [66] and adapted for NZ use after piloting in the NZ context. The scale has demonstrated acceptable internal consistency and validity in a number of overseas studies and is thought to have moderate external validity [55]. The questionnaire asks about activity patterns during the most recent school week, with mean activity ratings being calculated across a range of questions covering participation in sporting activities, transport to and from school and activities during school lunchtimes and breaks, as well as after school. While the majority of interviews were carried out at the child's home in the presence of a parent / caregiver, some interviews for those aged > 9 years were undertaken at school. Perceived limitations of the questionnaire include its inability to estimate total energy expenditure or the intensity or duration of the activities children reported taking part in. In addition, the focus of the questionnaire is only on activities taking place during the school year [55].

SPARC's NZ Sport and Physical Activity Surveys

The information in this section comes from the combined results of the Hillary Commission's (now Sport and Recreation NZ (SPARC)) 1997/98, 1998/99 and 2000/01 Sport and Physical Activity Surveys [67]. Unless otherwise specified, the results quoted are based on the combined results of all 3 surveys and are compiled from publications available on SPARC's website www.sparc.org.nz. In total, these 3 surveys interviewed 4,000 young people aged 5-17 years about their participation in physical activity and sport. People were chosen for the survey at random from 12 Regions covered by 17 Regional Sports Trusts. Interviews took place in each region during each month of the survey years, so as to ensure that seasonal variations could be taken into account. Interviews took place in the young person's home, with questions being answered by an adult household member, although the young person could also help answer the questions if they were present during the interview. Information was collected about all of the sport and active leisure that the young person had taken part in during the past 2 weeks. The time the young person spent on their chosen sports and activities was then added to find how active they had been over the past 2 weeks and categorised as per **Table 6** below.

While these surveys are the only source of longitudinal and regional information on the physical activity levels of NZ young people, they are seen as having a number of limitations, including the fact that for those aged 5-17 years, activity levels are based on parental report (which in a number of studies has been shown to correlate poorly with direct measures of physical activity). In addition, the SPARC survey tool has not been validated for the population under study and the focus has tended to be on sport and exercise rather than physical activity per se. Finally, the levels of activity required to define a youth as physically active are lower than overseas, possibly over inflating NZ's levels of physical activity and making overseas comparisons difficult [68]. Nevertheless, these surveys provide a useful tool for assessing young people's participation in sport and exercise over time, as well as at a regional level.

The 2002 National Children's Nutrition Survey

Total Physical Activity Scores

The 2002 National Children's Nutrition Survey (CNS02) measured children's physical activity in a variety of areas (e.g. sporting participation, travel to and from school, amount of time spent in various activities during / after school or at weekends). Each activity was scored on a 5 point scale (1 = least active → 5 = most active), with the overall activity rating being averaged across all 8 physical activity questions. Overall ratings were then ranked and children were assigned to one of four quartiles, with those in the lowest quartile being the

least active and those in the highest quartile being the most active [55]. The main findings of this analysis were (Figure 35):

1. At all ages and across all ethnic groups, females were more likely to be in the least active quartile, while males were more likely to be in the most active quartile.
2. The proportion in the least active quartile increased with age, while the proportion in the most active quartile decreased with age, for both genders.
3. European/ Other children were more likely to be in the least active group and less likely to be in the most active group. Pacific children had the lowest proportion in the least active group, while Māori children had the highest proportion in the most active group.

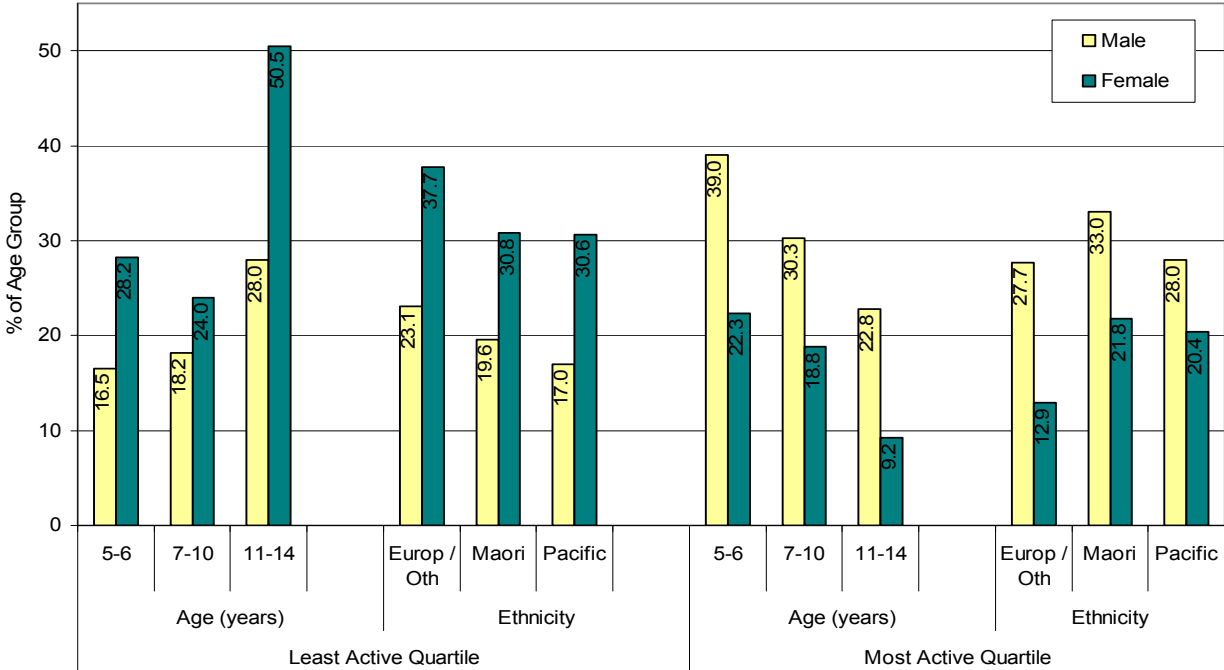
Travel to and From School

Included in the physical activity questions was one which asked “How many times during the past week did you walk, bike, skate or scooter to or from school?” Analysis of those who did not travel to school by active means (e.g. were driven to school by car) suggested that (Figure 36):

1. The % of children transported to school decreased with age, for both genders.
2. The % of children transported to school decreased with increasing NZDep deprivation.
3. Pacific, followed by Māori children were less likely to be transported to school than European / Other children.

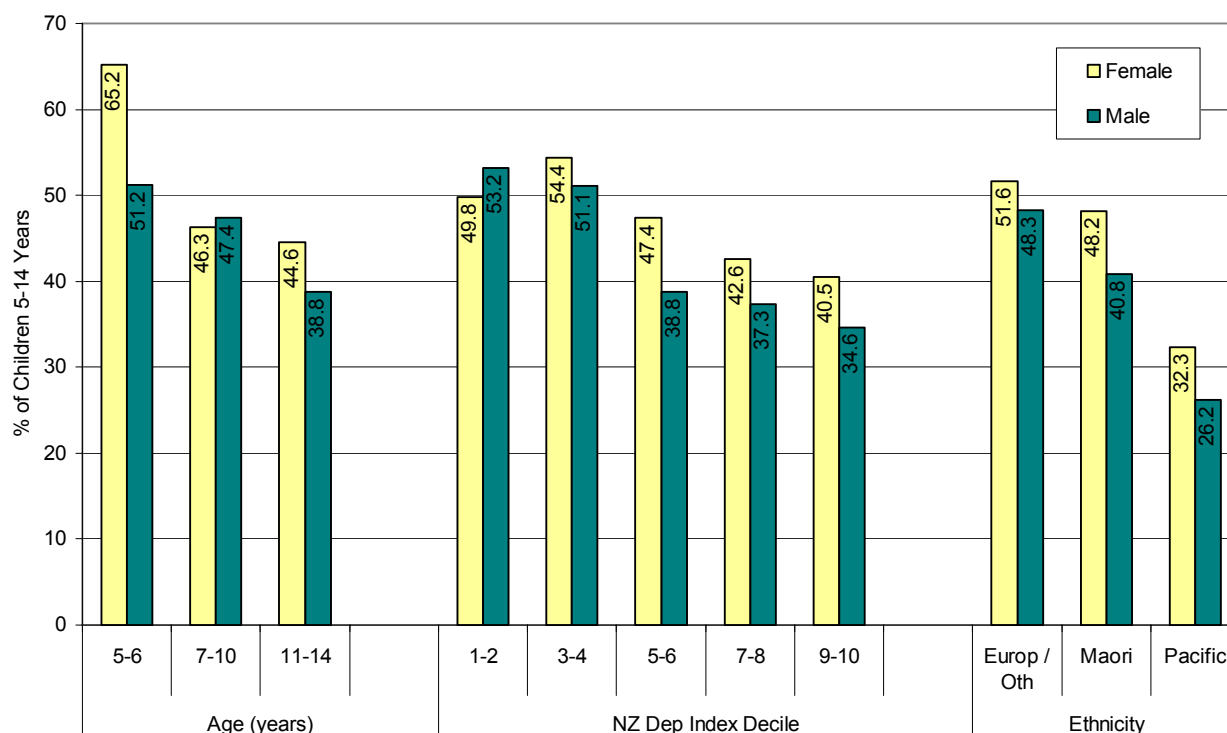
Note: While travel to and from school is only one element of physical activity undertaken by children in their everyday lives, the ability of the CNS02 Survey to capture elements of day-to-day physical activity, over and above those associated with sport or active leisure, may be one of the reasons why the findings of the CNS02 differ in some respects from those of the SPARC Surveys presented in the section that follows.

Figure 35. Proportion of Children 5-14 Years in the Least and Most Active Physical Activity Quartiles by Gender, Age and Ethnicity, NZ National Children's Nutrition Survey 2002



Source: NZ National Children’s Nutrition Survey 2002.

Figure 36. % of Children 5-14 Years Who Did Not Travel to School by Active Means, by Gender, Age, NZDep Index Decile and Ethnicity, NZ National Children's Nutrition Survey 2002



Source: NZ National Children's Nutrition Survey 2002.

Sport and Recreation NZ (SPARC) Surveys

During the course of 3 separate surveys (1997/98, 1998/99 and 2000/01) the Hillary Commission (now SPARC) interviewed the caregivers of 4,000 children and young people aged 5-17 years. Questions focused on the amount of time spent on either sport or active leisure during the past 2 weeks, with children being assigned to 1 of 4 groups (sedentary, relatively inactive, relatively active, highly active) based on their parent's responses and the criteria outlined below.

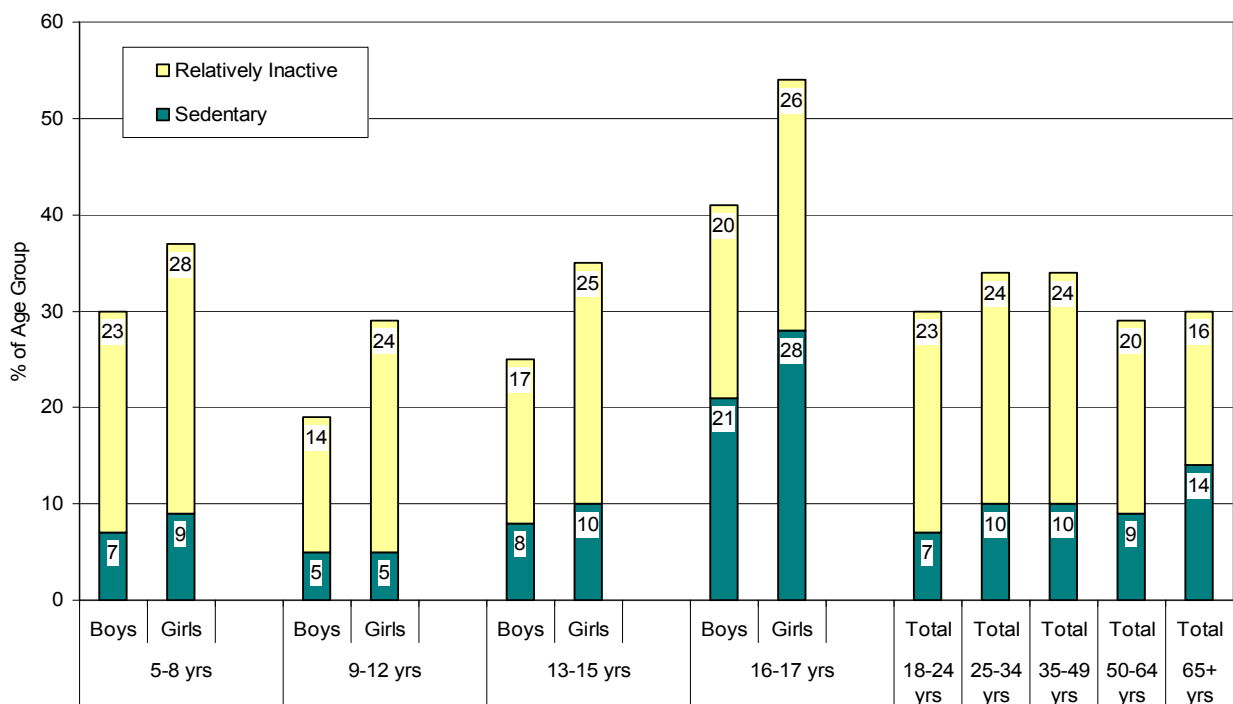
Table 6. Definition of Physical Activity used in SPARC's 1997-2001 Surveys

Activity Level	Category	Description
Physically Inactive	Sedentary	No sport / leisure-time physical activities in the 2 weeks before the interview (4 weeks for those >17 years).
	Relatively Inactive	Took part in some leisure time physical activity in the 2 weeks before the interview (but not necessarily in the past 7 days) and all those who took part in <2.5 hours in the 7 days before the interview.
Physically Active	Relatively Active	Took part in at least 2.5 hours, but less than 5 hours of sport / leisure time physical activity in the 7 days before the interview.
	Highly Active	Took part in 5 hours or more of sport / leisure time physical activity in the 7 days before the interview.

A combined analysis of these 3 surveys suggested that:

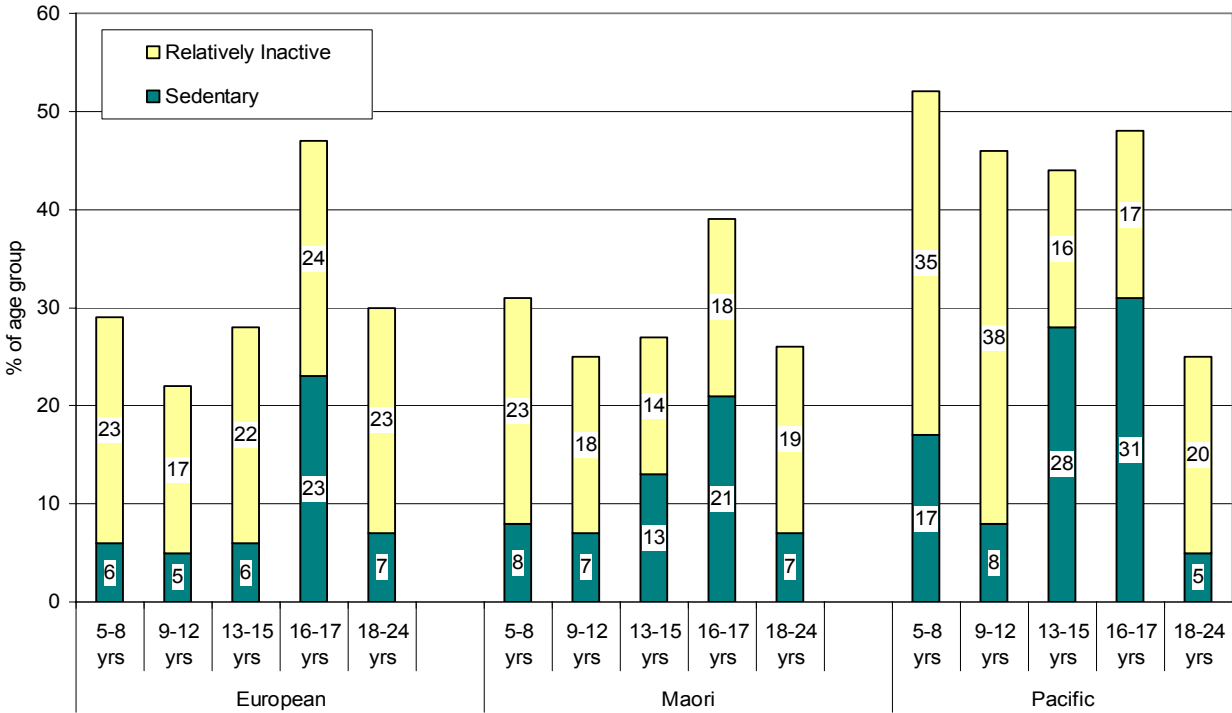
1. On average, 32% of children and young people 5-17 years were inactive (< 2.5 hours sport or active leisure in past 7 days).
2. At every age, females were more likely to be inactive than males (**Figure 37**).
3. The proportion of children who were inactive increased progressively from late childhood to adolescence. While the proportion who were inactive dropped away markedly after 17 years, differences in the way in which the sedentary group was categorised (<18 yrs: no activity in past 2 weeks vs. 18+ yrs: no activity in past 4 weeks) make differences between young people and adults difficult to interpret (**Figure 37**).
4. Levels of inactivity were higher for Pacific children and young people than for Māori or European children and young people (**Figure 38**)
5. Young people's activity levels were influenced by their parent's activity levels, with only 25% of young people being inactive if their parents were highly active, as opposed to 43% being inactive if their parents were sedentary (**Figure 39**).

Figure 37. Proportion of Children and Young People 5-17 Years Who Were Either Sedentary or Relatively Inactive by Gender, Compared to Older Age Groups*, NZ SPARC Surveys 1997-2001



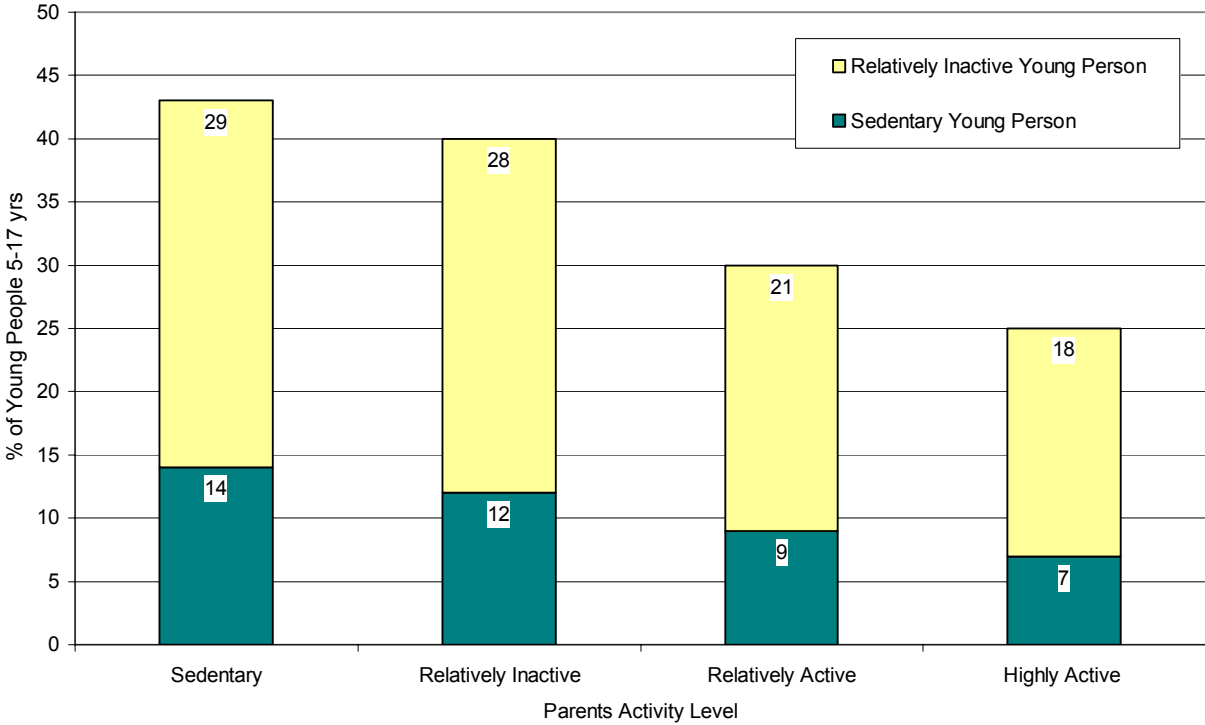
Source: Sport and Recreation NZ. *Note slightly different definition for sedentary >17 yrs (Table 6).

Figure 38. Proportion of Children and Young People 5-24 Years Who Were Either Sedentary or Relatively Inactive by Age and Ethnicity, NZ SPARC Surveys 1997-2001



Source: Sport and Recreation NZ.

Figure 39. Proportion of Children and Young People 5-17 Years Who Were Either Sedentary or Relatively Inactive vs. Their Parent's Activity Level, NZ SPARC Surveys 1997-2001



Source: Sport and Recreation NZ.

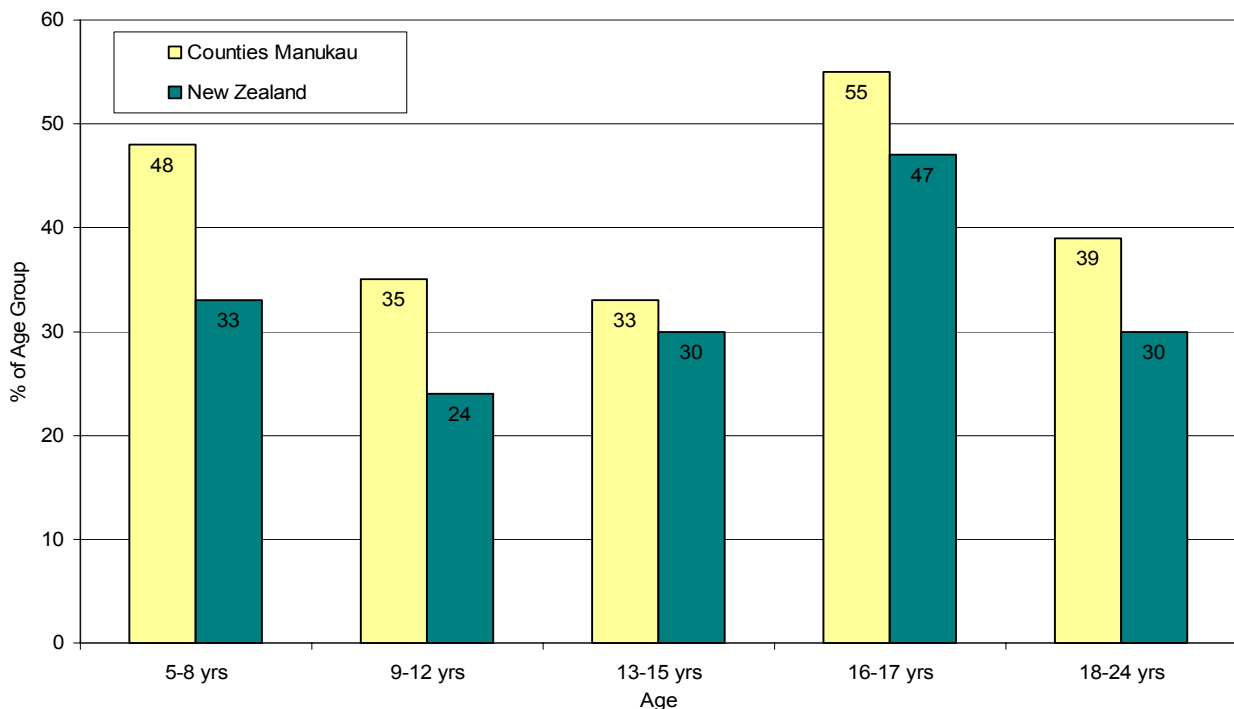
Physical Activity in Counties Manukau

While it was not possible to provide a breakdown of the National Children's Nutrition Survey by region, the combined results of the NZ Sport and Physical Activity 1997/98, 1998/99 and 2000/01 Surveys were able to be disaggregated by Regional Sports Trust (the boundaries of which are outlined in Appendix 2) and thus information was available for a total of 438 children and young people 5-17 years living in the Counties Manukau SPARC Region.

An analysis of the responses supplied by caregivers for children and young people in Counties Manukau suggested that:

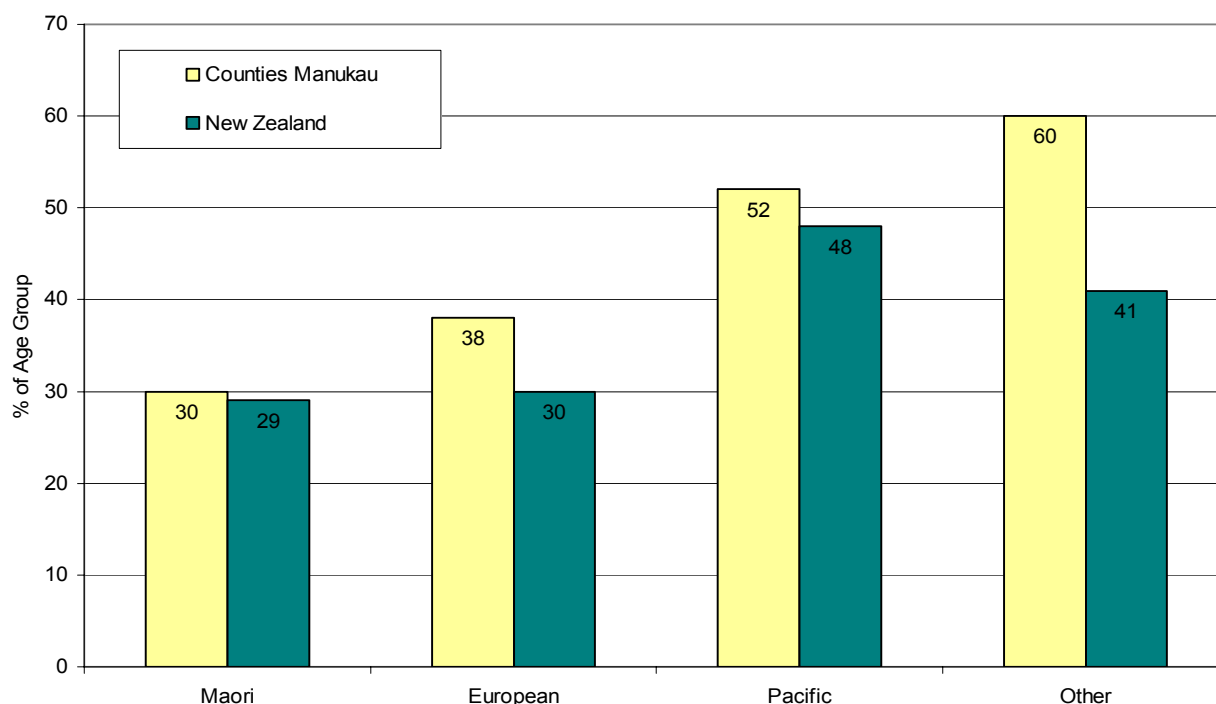
1. While the proportion of children and young people in Counties Manukau who were inactive exhibited a similar J shaped age distribution to the NZ average (i.e. highest amongst those aged 16-17 years, with a small peak in the youngest age group), at all ages from 5-24 years, the proportion of children and young people who were inactive in Counties Manukau was higher than the NZ average (Figure 40).
2. Within Counties Manukau, the least active were the Other Ethnic Group (predominantly Asian), then Pacific, Māori and European. Each ethnic group in Counties Manukau was more inactive than their counterparts nationally (**Figure 41**).

Figure 40. Proportion of Children and Young People Who Were Either Sedentary or Relatively Inactive by Age, Counties Manukau vs. NZ, SPARC Surveys 1997-2001



Source: Sport and Recreation NZ.

Figure 41. Proportion of Children & Young People 5-17 Yrs Who Were Either Sedentary or Relatively Inactive by Ethnicity, Counties Manukau vs. NZ, SPARC Surveys 1997-2001



Source: Sport and Recreation NZ.

Summary and Policy Implications

While data limitations make it difficult to determine whether increases in total energy intake or decreases in physical activity have played the greatest role in the current obesity epidemic, increasing physical activity remains one of the mainstays of the NZ's Current Healthy Eating, Healthy Action Strategy and thus an understanding of its determinants is of value in identifying potential intervention points for future strategy development. In NZ the Children's Nutrition Survey provides a limited amount of information on physical activity in children, while SPARC surveys have monitored children's participation in active sport and leisure since 1997. On comparing the findings of these two surveys, a number of common themes emerge, as well as a number of contradictions. In general, the available evidence would suggest that:

1. Approximately 32% of NZ children 5-17 years were inactive.
2. Girls were more likely to be inactive than boys.
3. The % of children and young people who were inactive increased with age, reaching a peak during late adolescence and thereafter declining. Changes in SPARC's definition of sedentary before and after 17 years however, make differences between adults and young people difficult to interpret.
4. The physical activity levels of children and young people in NZ are influenced by the activity levels of their parents.

Where differences between the two surveys emerge is in their conclusions relating to ethnic differences in physical inactivity. While the CNS02 suggested that European / Other children were the most inactive group, SPARC surveys suggested that Pacific children were at greatest

risk. In interpreting these findings however, it must be remembered that the two surveys utilised two totally different methodologies, with children in the CNS02 being interviewed about their daily activity levels and questions covering all aspects of physical activity, including travel to and from school. In contrast, SPARC's Surveys were based on parental report and focused on participation in sports and active leisure. As a consequence, it is possible that the CNS02 more successfully captured elements of children's day to day activity, while SPARC Surveys emphasised those elements relating to organised sport. In addition, the CNS02 combined European and Asian children into a single ethnic group, whereas SPARC's Surveys suggested that in terms of active leisure, these two groups were quite different. Despite these limitations, what these findings do suggest is that at least a third of NZ children and young people are either sedentary or relatively inactive and thus there is significant potential to achieve gains in physical activity within the context of the current obesity epidemic.

DISABILITY



INTRODUCTION AND COMMON ISSUES

Introduction

In 1995, a report on the Health Status of Infants and Children in the Midland Region noted that:

“There is a dearth of information on people who have disabilities living in Midland, as well as NZ” and that “the dearth of useful information on disabilities and people with disabilities, is a serious impediment to rational and effective service planning and delivery” [69].

Since the time of this report, little has changed and it remains very difficult to access useful regional information on the nature and prevalence of disabilities amongst NZ children and young people. Nevertheless, the provision of health and disability support services remains a key role of those working at a regional level and it is undesirable that a lack of local level data should preclude the coverage of disability issues in this report. The following sections thus bring together some of the available data on disabilities amongst NZ children and young people. Where local data is readily available (e.g. congenital anomalies evident at birth, deafness notification data, children receiving services for visual impairment) this is included in the sections which follow. Where local data is not available, but an issue is nevertheless perceived to be important, estimates of its prevalence are made based on extrapolations from overseas figures. In this way, it is hoped that some of the key issues for children and young people with disabilities can be highlighted, even in the absence of local level data.

In presenting this information, this section begins with a review of some of the issues which are common to many children and young people with disabilities, irrespective of the nature of their disability. Later sections explore particular types of disability affecting NZ children and young people and are arranged in the following order:

1. Conditions Evident at Birth: Down Syndrome and Neural Tube Defects (Spina Bifida).
2. Estimates for Other Conditions: Intellectual Disability, Autism, Cerebral Palsy.
3. Permanent Hearing Loss: Notifications to the NZ Deafness Database.
4. Visual Impairment: Children Referred to BLENNZ Services.

In addition, for a review of the numbers of young people (16-24 yrs) on Sickness and Invalid's Benefits and the reasons for their uptake, the reader is referred to the section on Young People on Benefits, in the later Youth Section of this report.

Common Issues for Children & Young People with Disabilities

In 2001, the Household Disability Survey estimated that 11% of NZ children (0-14 yrs) had a disability. While little information was available on the precise nature of these disabilities, in general terms they included chronic health problems, sensory impairments, psychiatric or psychological problems, intellectual disabilities, speech, learning and developmental problems and the need for special education or technical equipment. Of those with a disability, 41% had existed from birth, 33% were caused by a disease / illness and 3% resulted from an injury [70].

In order to assist families in caring for children and young people with disabilities, the Ministry of Health funds a number of disability support services. Access to almost all of these

services is via Needs Assessment and Service Co-ordination (NASC) Agencies, who accept children with significant intellectual, physical or sensory disabilities, or with autism spectrum disorders. NASC Agencies work on the basis of assessed need and the equitable sharing of available resources, with needs assessments being designed to identify the disability support needs of children and young people and their caregivers. The need for support services is usually reviewed annually (or more often at parental request) and if there is a significant change in needs (e.g. school entry) a new needs assessment is carried out. Some of the services available via NASC include in-home support, respite care in specialist facilities, special equipment and housing alterations. Unfortunately not all types of support service are available in all regions and entitlements may vary with the age of the child [71]. Additionally, not all children with a disability will qualify for a NASC assessment.

Access to appropriate support services is crucial however, if those caring for children and young people with disabilities are to be able to cope with the demands placed on them in their care giving roles. In NZ as in many other developed countries, there has been a move away from institutional care during the past 2-3 decades, with the majority of disabled children now living in households and care becoming increasingly the domain of family members [72]. Such shifts have significant resource implications however, if the transition to home based care is to be sustainable for families caring for disabled children and young people. In this context it is perhaps concerning that a recent Australian review of the area noted that [72]:

1. **Family Structure:** Higher proportions of disabled children and young people live in single parent families. While the reasons for this remain unclear, some have attributed this to the stresses associated with the raising of a disabled child, although others have suggested that once socioeconomic factors are taken into account, rates of divorce are not significantly different between couples with and without disabled children.
2. **Family Socioeconomic Position:** Higher proportions of disabled children live in low income families. While some suggest that families living in financial hardship have a higher number of risk factors for childhood disability, other research indicates that families with disabled children have significant out-of-pocket costs which are directly related to their children's special needs, as well as the more indirect time costs associated with caring for their children. Such costs are particularly significant for families with medium to low incomes and for single parents, whose care commitments may prevent them from taking up or staying in employment.
3. **Effects on Parents:** For many parents, caring for a child with a disability can be stressful, with a number of studies noting that mothers caring for children with conditions such as autism, physical and learning disabilities and Asperger's syndrome, had higher rates of stress and depression. Sole parents may be particularly vulnerable to stress, as a result of their dual role as primary caregiver and primary bread-winner.
4. **Role of Social and Material Support:** In explaining why some parents experience less stress than others when caring for children and young people with disabilities, it has been suggested that the availability of socioeconomic resources plays a crucial role. In addition, the presence of social and material support (e.g. emotional support, access to services, early interventions, respite care, equipment services and family support programmes) are thought to be crucial in ensuring parental wellbeing.
5. **Effects on Siblings:** Evidence of the effects that childhood disability has on siblings is mixed. At the positive end of the spectrum, some siblings report enhanced self-esteem, empathy, maturity and a sense of responsibility, while others view having to take on higher levels of caregiver and household responsibility (particularly if

financial resources or family size are limited), less attention from parents and the restrictions a disabled family member places on their social life, in more negative terms.

6. **Positive Effects:** In contrast, there has been much less research into the more positive effects caring for a disabled child has on families e.g. strengthening family relationships and the positive emotional bonds parents develop with their children.

While the majority of these findings were based on research in Australia or other developed countries, a recent NZ report on the reasons why families with children with high disability support needs sought permanent ‘out of family’ care [73] suggests that many of the issues highlighted by the Australian review, are also of relevance in the NZ context. As a consequence, a range of disability support services, including access to in-home support, out of home respite care and multidisciplinary early intervention services are required by the families of children and young people with disabilities, irrespective of the precise origins of their disability and at a regional level, ensuring families have adequate access to such services is likely to significantly enhance their health and wellbeing.

CONGENITAL ANOMALIES EVIDENT AT BIRTH

The 2001 Household Disability Survey estimated that of the 11% of children (0-14 yrs) with a disability, 41% had existed from the time of birth [70]. Of these, a significant proportion are likely to be congenital anomalies, with overseas estimates suggesting that ~2-3% of births are associated with a major congenital anomaly [74]. While in NZ minor congenital anomalies of the musculoskeletal, genitourinary and cardiovascular systems are frequently mentioned in hospital discharge data, it is likely that many of these are either of little functional significance, or readily corrected during the first years of life (e.g. cleft palate, undescended testis). In contrast, a number of less common but more serious anomalies can lead to a significant degree of disability and a variable requirement for disability support services (although some may not become evident until children fail to reach developmental milestones in later childhood). Two conditions which are usually readily identifiable at the time of birth and which can lead to a significant degree of disability however are Down Syndrome and Neural Tube Defects, which will be reviewed in the section that follows.

Down Syndrome

Down Syndrome is the most common (non sex-linked) chromosomal anomaly in live born babies and diagnosis is usually made in-utero or at the time of birth. Children with Down Syndrome have a range of clinical features including reduced growth (height ~ 3rd percentile), slow cognitive development, low muscle tone and joint laxity and an increased risk of a number of medical conditions (e.g. congenital heart disease, thyroid dysfunction, otitis media, cataracts, hearing problems), which may affect their quality of life [71]. Approximately 95% of children with Down Syndrome have an extra chromosome 21 (trisomy 21), with the remaining 5% having either translocations (3%) or mosaicism (2%). In mosaicism, some cells have 46 chromosomes and some have 47, leading to a milder clinical presentation and intelligence often approaching the normal range [75].

On average, 50 babies in NZ each year are born with Down Syndrome and at a regional level it is necessary to ensure that the health, developmental, educational and psychosocial needs of these children and their families are identified and met. The MOH Guidelines on the clinical assessment and management of children and young people with Down Syndrome [71] outline a range of clinical and support services children and young people require at different stages of their development. These include:

1. Parental counselling at the time of birth and ongoing support thereafter.
2. Lactation consultant / speech-language therapist support with the establishment of breastfeeding, as well as the ongoing monitoring of feeding, nutrition and growth.
3. Identification and management of other congenital anomalies and related medical conditions (e.g. CVS defects, cataracts, hearing problems, obesity), with ongoing coordination of care and anticipatory monitoring (e.g. thyroid function, ongoing hearing and vision screening).
4. Access to early intervention and disability support services (e.g. physiotherapists, speech-language, occupational and neurodevelopmental therapists, Child Disability Allowance) and Specialist Education Services.

Neural Tube Defects (Anencephaly, Encephalocele, Spina Bifida)

Neural Tube Defects (NTDs) are congenital malformations which result from abnormal closure of the neural tube between the 3rd and 4th week of gestation. They can result in

structural defects anywhere along the neuroaxis, from the developing brain to the sacrum. NTDs are generally divided into two groups:

1. Those affecting cranial structures i.e. anencephaly and encephalocele.
2. Those affecting spinal structures i.e. spina bifida.

Cranial malformations are generally the most clinically obvious and are often incompatible with life. In contrast, spina bifida can range from a severe open defect leading to muscle weakness, loss of skin sensation and problems with bowel and bladder control, to defects that are less easily detected [76]. Associated central nervous system anomalies and hydrocephalus, as well as later scoliosis or kyphosis may further complicate the clinical presentation. While advances in neurosurgical, urologic and medical care have allowed many children with spina bifida to survive with virtually intact cognitive skills, specialised medical and surgical care is necessary to ensure that children achieve independent mobility. For younger children, the ability to walk is usually influenced by the degree of paralysis arising from the spinal cord lesion, although as children get older, the amount of energy required for walking and the slow speeds achieved may lead to an increasing reliance on a wheelchair for day to day mobility [77].

The aetiology of NTDs is complex and generally thought to be a combination of genetic and environmental factors. While a number of chromosomal / genetic disorders have been associated with NTDs, many result in in-utero death, making their overall contribution to defects evident at the time of birth less than might otherwise be expected. In contrast to Down Syndrome, the effect of maternal age on NTDs is thought to be small, although a number of studies have suggested that folic acid supplementation prior to / at conception may reduce the risk of NTDs and their associated costs at a regional level. As a consequence a number of groups have recently advocated for the mandatory supplementation of NZ's food supply with folic acid [78].

Data Sources and Statistical Methods

The data used in this analysis was from the National Minimum Dataset (Hospital Admissions) for the period 1996-2005. All admissions identified as a birth event (Admission Type BT) were included in this analysis. Numerators included all babies with mention of either Down Syndrome (ICD-10 Q90) or Neural Tube Defects (Anencephaly ICD-10 Q00, Encephalocele ICD-10 Q01, Spina Bifida ICD-10 Q05) in the first 15 diagnostic codes, while denominators included all births identified in the same dataset. Total congenital anomaly counts were calculated by summing the number of congenital anomalies (ICD-10 Q00-Q99) mentioned in the first 15 diagnostic codes of the births dataset, while the number with cardiovascular anomalies was assessed by summing the number of births with a cardiovascular anomaly (Q20-28) mentioned in the first 15 diagnostic codes.

The Prevalence of Down Syndrome and NTDs at the Time of Birth

Notes on Interpreting Birth Prevalence Information

In NZ the prevalence of Down Syndrome at the time of birth has been static in recent years, with earlier estimates of 0.82 per 1,000 in 1980-82 and 0.94 per 1,000 in 1989-91 [79] being very similar to the estimates of 0.92 per 1,000 in 2004-05 derived from the birth admission dataset. Static rates may well mask large underlying shifts in the true incidence however, as one of the key risk factors for Down Syndrome is higher maternal age (particularly >35 years), with the number of women giving birth in this age group increasing significantly in NZ in recent years. It is likely that such changes have been offset however, by increases in prenatal diagnosis and the selective termination of pregnancy, which overseas have resulted in

significant reductions in the number of babies being born with congenital anomalies [80]. In contrast, NTDs are generally thought to be unrelated to maternal age, meaning that any increases in obstetric surveillance may not have been offset by opposing changes in maternal age. As a consequence, the time series information presented in **Figure 42**, which suggests a dramatic decline in the rates of NTDs but static rates for Down Syndrome likely reflects the complex interplay between opposing factors including access to prenatal diagnosis, the personal choices of parents and population level shifts in known (e.g. maternal age) and unknown risk factors [79].

Spina Bifida in NZ and Counties Manukau

In NZ during the past 10 years, approximately 12 babies each year were identified as having spina bifida and 4 as having either anencephaly or an encephalocele at the time of birth, although the general downward trend meant that the numbers in the latter part of this period may have been slightly lower (**Figure 43**). In Counties Manukau during this period, a total of 18 babies were born with spina bifida, with the numbers being fairly evenly spread across the 10 year period (average 1.8 births per year).

Down Syndrome in NZ and Counties Manukau

In NZ during the past 10 years, approximately 52 babies per year were identified as having Down Syndrome at the time of birth, with approximately 8-9 of these births occurring in Counties Manukau each year. Throughout this period, the number of babies being born with Down Syndrome in Counties Manukau remained relatively static; with rates being either similar to or higher than the NZ average (**Figure 44**).

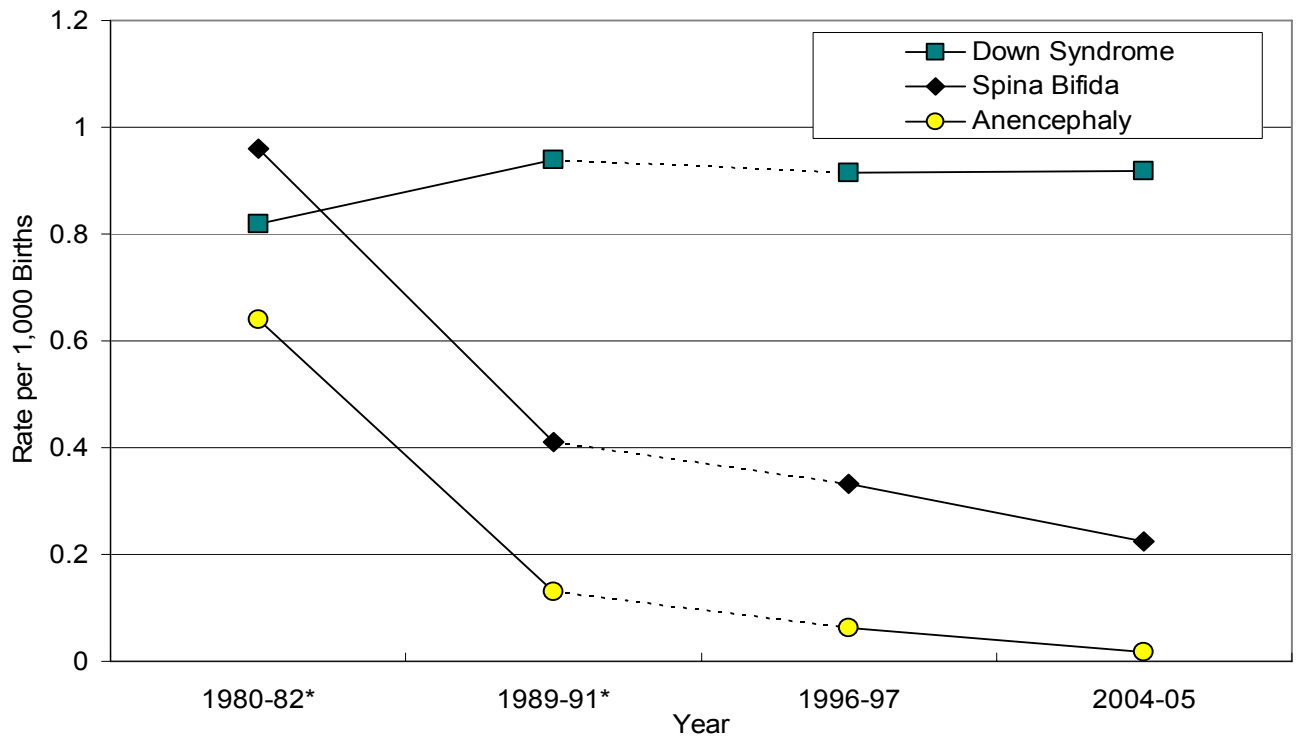
In NZ during 2001-05, 51.8% of babies born with Down Syndrome had one or more additional congenital anomalies listed at the time of birth, with 41.2% of babies having at least one anomaly of the cardiovascular system (**Table 7**).

In Summary

It has been estimated that of the 11% of NZ children <15 years with a disability, 41% were present from the time of birth. Of these, a significant proportion is likely to be congenital anomalies, with overseas estimates suggesting that ~2-3% of births are associated with a major congenital anomaly. In NZ, while a large number of the minor congenital anomalies documented at the time of birth are likely to be either of little functional consequence, or readily repaired during the early years of life, a significant minority may lead to long term disability and a variable need for disability support services.

In NZ the number of children born with Down Syndrome has remained relatively static during the past 25 years, while the number with Neural Tube Defects has declined dramatically. In reality, both trends reflect the complex interplay between opposing factors including access to prenatal diagnosis and the selective termination of pregnancy, the personal choices of parents and population level shifts in known (e.g. maternal age) and unknown risk factors. While it is likely that prenatal diagnosis has also reduced the number of children being born with other major congenital anomalies, at a regional level a small number of children are still born each year with major congenital anomalies and these children require an integrated approach to their health and disability support needs, if they are to reach their full potential.

Figure 42. Prevalence at Birth of Down Syndrome & Neural Tube Defects*, NZ 1980-05



Note: Estimates for 1980-82 and 1989-91 are from the NZ Birth Defects Monitoring Programme [79] while estimates for 1996-97 and 2004-05 are from the National Minimum Dataset.

Figure 43. Prevalence of Neural Tube Defects at Birth, NZ 1996-2005

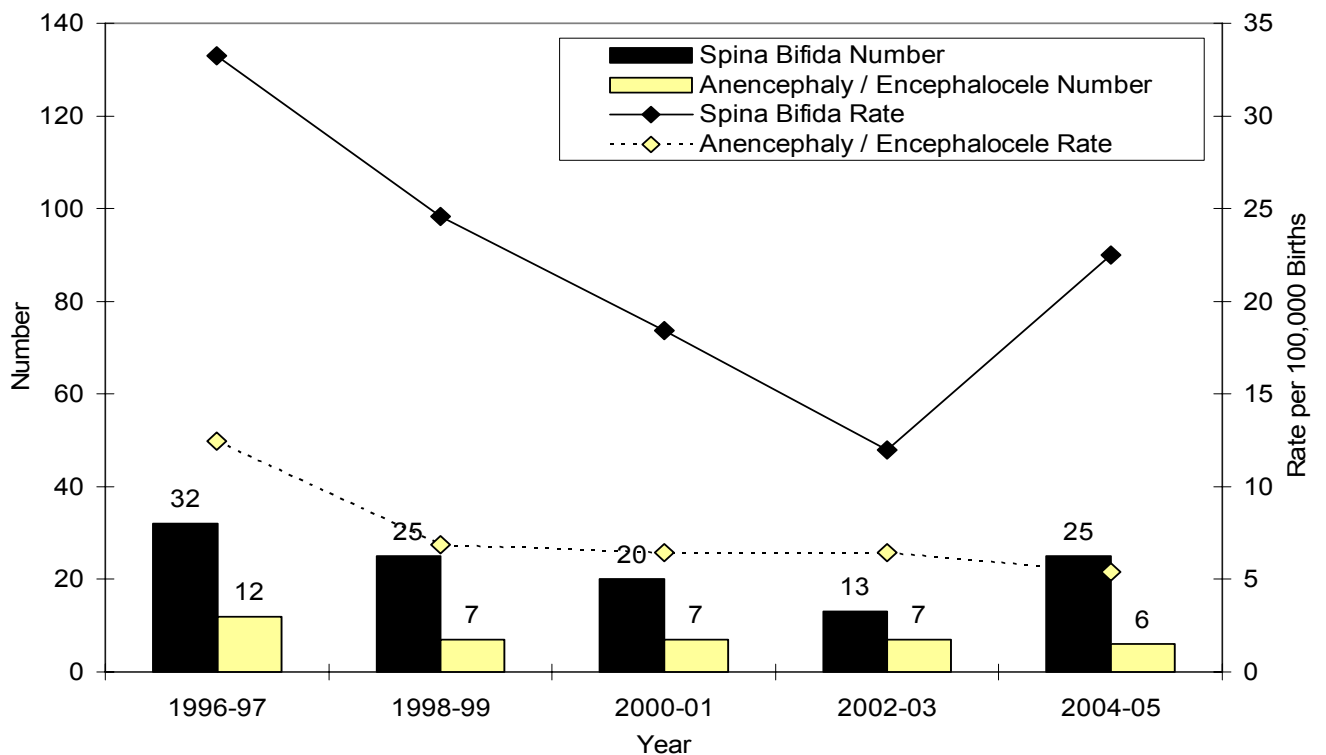
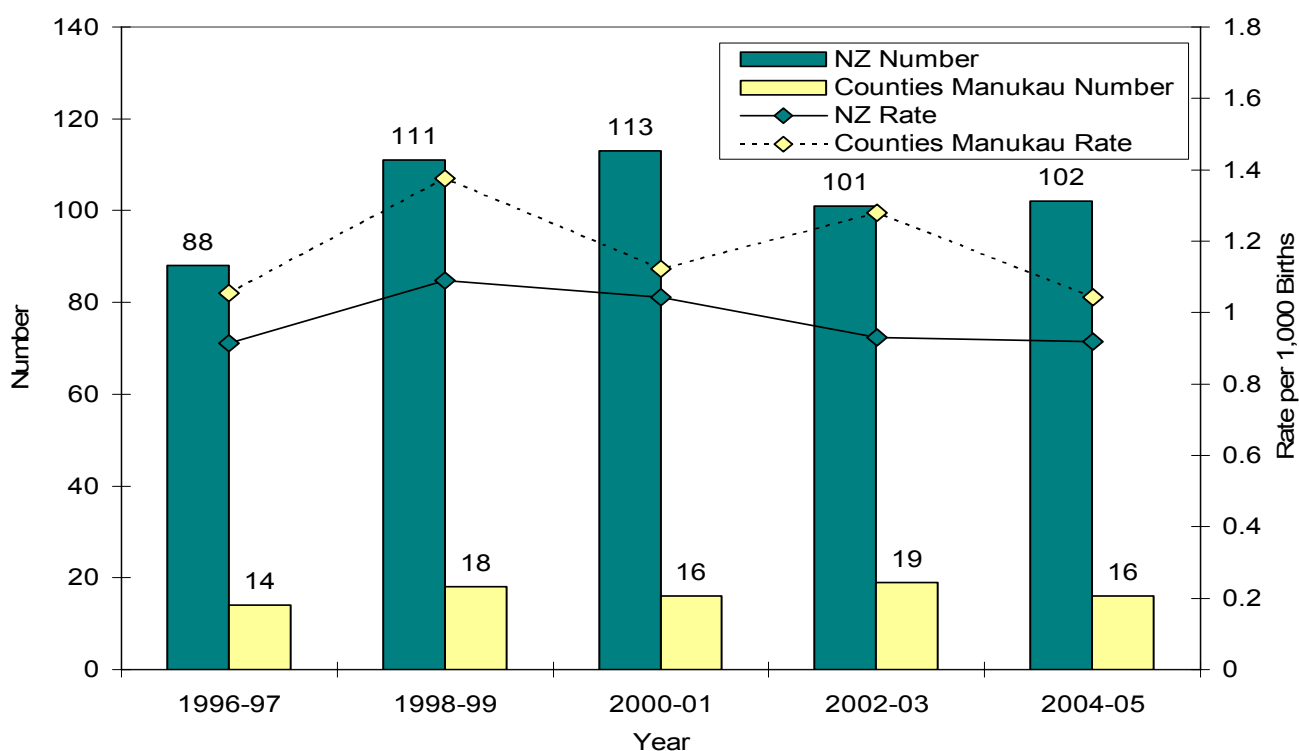


Table 7. Number of Other Congenital Anomalies Listed at the Time of Birth for Babies with Down Syndrome, NZ 2001-2005

Number of Other Anomalies Evident at Birth	Number of Babies with Down Syndrome in 5 Year Period	% of Babies with Down Syndrome
All Congenital Anomalies		
Nil	123	48.2
1	55	21.6
2	47	18.4
3	16	6.3
4-6	14	5.5
Total	255	100.0
Cardiovascular Anomalies		
No CVS Anomaly Present	150	58.8
CVS Anomaly Present	105	41.2
Total	255	100.0

Figure 44. Prevalence of Down Syndrome at Birth, Counties Manukau vs. NZ 1996-2005*



Note: Numbers are per 2 year period, rates are per 1,000 births.

OTHER DISABILITIES: PREVALENCE ESTIMATES

While many conditions leading to disability are evident at the time of birth a number of others, while still having their origins in utero or the first weeks of life, may not become evident until children fail to reach developmental milestones in later life. In many cases, children with these disabilities are managed predominantly in the primary care / outpatient setting, with little information on them being captured in NZ's national datasets. As a consequence, while children with autism, intellectual disabilities, developmental delay, cerebral palsy and behavioural problems make up a large part of the workload of developmental paediatricians, little data are available with which to estimate the prevalence of these conditions, or their trends over time. The lack of available data should not preclude consideration of the needs of these children in regional strategy development and thus the following section briefly reviews 3 conditions commonly seen in children's outpatient clinics. These are:

1. Autism and Autism Spectrum Disorders
2. Cerebral Palsy
3. Intellectual Disabilities

For each condition, a brief overview is presented, followed by a summary of the types of health and disability support services likely to be required at the regional level. The number of children likely to be affected at a national / regional level is then estimated, using extrapolations from overseas research.

Autism and Autism Spectrum Disorders

Pervasive Developmental Disorders comprise a group of developmental disorders characterised by poor or absent communication, social isolation and unusual behaviours. They include Autism, Asperger Syndrome, Pervasive Developmental Disorder NOS, Rett Syndrome and Childhood Disintegrative Disorder. Of these, autism is most studied and is characterised by severe difficulties with social interaction and communication and with behaviours and interests that are restricted or stereotyped. Onset is usually <3 years, with delayed language development being a common reason for presentation. Many children with autism never speak, or if they do so their language often has unusual intonation, echolalia (a repetition of what is said) or pronoun reversal. Other features include impaired eye gaze, a lack of social reciprocity, limited or absent peer relationships and difficulties in developing imaginative play. Children are often pre-occupied with non-functional features of objects, such as taste or smell and stereotyped movements are often present (e.g. hand flapping or finger flicking) [81].

Early intervention improves outcomes for children with autism. Management is primarily educational. While programmes vary in nature, the overall aims of treatment are usually to foster growth in areas of communication, cognition and self help skills, as well as to reduce problem behaviours which interfere with learning. Programmes often draw on procedures from special education and behavioural psychology. Occasionally pharmacological treatments are used to manage problem behaviours and to enhance children's participation in educational programmes. Over time a large number of alternative treatments have also been put forward, although evidence for the efficacy of many is often limited or non-existent [81].

At present the cause of autism remains unknown, although higher rates of seizures, persistent primitive reflexes and cognitive disability suggest central nervous system involvement. A genetic basis is also likely, as recurrence rates in families are high, but the mode of

transmission remains unknown [81]. While there have been reports of large increases in Autism Spectrum Disorders over the past 40 years (estimates in the 1960s of ~4 per 10,000 contrast with more recent estimates of 30-60 per 10,000), some of these differences are likely due to increased ascertainment and a broadening of the diagnostic concept to include a greater number of children with normal IQs [82].

At present there is no routine information on the prevalence of Autism or Asperger Syndrome in NZ, although a recent estimate from the Statistics NZ Household Disability survey suggested that 2,100 NZ children may have Autism or Asperger Syndrome (personal communication Phillipa Clark 2006) giving a prevalence of 24.8 per 10,000. Similarly, a recent estimate from the Nelson Marlborough Region suggested a prevalence of 46 per 10,000, with 56% having Autism, 30% having Asperger Syndrome and 14% having a non specified Pervasive Developmental Disorder [83]. Using these estimates, as well as those from overseas research **Table 8** extrapolates these prevalences to the NZ and Counties Manukau populations at the time of the 2001 Census.

Table 8. Estimated Number of Children and Young People 2-24 Years with Autism, Counties Manukau vs. NZ at the 2001 Census

	Overseas Estimates	NZ Estimate (No. Aged 2-24 yrs)	Counties Manukau Estimate (No. Aged 2-24 yrs)
Autism	7.2 per 10,000 [84] 7.1 per 10,000 [85]	Range 883-895	Range 100-101
Autism Spectrum Disorders	24.8 per 10,000* 46 per 10,000 [83] 30-60 per 10,000 [82]	Range 3,084-7,462	Range 348-841

*Personal communication Phillipa Clark based on Statistics NZ Household Disability Survey

Cerebral Palsy

Cerebral palsy refers to a group of disorders of movement or posture arising from a non-progressive insult to the central nervous system during early development. The insult may occur prior to, during or shortly after birth and while being non-progressive, its physical consequences can evolve over time [86]. The clinical presentation may also vary, with one recent Australian study [86] noting that of children with cerebral palsy in one cohort, ~ 84% had predominantly spastic cerebral palsy (characterised by weakness, increased muscle tone, overactive reflexes and a tendency to contractures), 8.3% had predominantly dyskinetic cerebral palsy (characterised by involuntary movements which disappear during sleep) and 6.6% had predominantly ataxic cerebral palsy (characterised by problems with coordination, gait and rapid movements of the distal extremities) [77]. In addition, while cerebral palsy refers solely to the motor impairment, features such as seizures, intellectual impairment and learning disabilities are also common [77].

Depending on their degree of motor impairment, children and young people with cerebral palsy require a variety of personal health care and disability support services, with the overall aim being to ensure the highest possible functioning within the family and community contexts. Physical and occupational therapy are beneficial in the management of motor impairments, with proper positioning and handling being necessary to minimise the difficulties associated with posture, trunk control and feeding. Passive and active exercises to stretch tight tendons may also be necessary to maintain normal alignment of bone, joint and

soft tissue and to prevent contractures. Medical and surgical procedures may be necessary to correct contractures that do not respond to physiotherapy and to re-establish motor balance between opposing muscle groups, with innovations in this area evolving rapidly. In addition, a variety of equipment (e.g. walkers and standing frames, motorised wheel chairs, feeding tubes, computers to augment communication) and additional supports (e.g. speech therapy, medications, ophthalmology referrals, tailored educational programmes, respite care) may be required to meet the needs of children and their caregivers.

While maturity at birth is the strongest single predictor of cerebral palsy, advances in neonatal care and the enhanced survival of very premature infants have not led to a large increase in prevalence, with research suggesting that after initial increases following the introduction of neonatal intensive care, rates fell away again as experience in neonatal care grew [86]. In addition, with ½ of all cerebral palsy cases occurring in infants of normal birth weight and with asphyxiation at birth accounting for only a small percentage of cases, research has now turned to other exposures during pregnancy and immediately after birth (e.g. intrauterine infection / inflammation and perinatal coagulation disorders) as possible causes [87]. While there is no routinely collected data on the prevalence on cerebral palsy in NZ, numerous overseas studies have estimated the prevalence to be 2-3 per 1,000 live births, with very little change since the mid-50s, despite marked improvements in obstetric and perinatal care. **Table 9** extrapolates prevalence estimates from 2 overseas studies to the NZ and Counties Manukau populations at the time of the 2001 Census.

Table 9. Estimated Number of Children and Young People 2-24 Years with Cerebral Palsy, Counties Manukau vs. NZ at the time of the 2001 Census

Overseas Estimates	NZ Estimate (No. Aged 2-24 yrs)	Counties Manukau Estimate (No. Aged 2-24 yrs)
1-3 per 1,000 live births [86] 2 per 1,000 live births [77]	Range 1244-3731	Range 140-421

Intellectual Disabilities

Intellectual disabilities in children have a variety of causes including genetic conditions (e.g. inborn errors of metabolism), chromosomal anomalies (e.g. Down Syndrome) congenital anomalies (e.g. neural tube defects), conditions arising before, during or shortly after birth (e.g. intrauterine infections, hypoxia, extreme prematurity) or during childhood and adolescence (e.g. meningitis, head injury). Over time a number of different classification systems have been used to gauge the severity of intellectual disability. While earlier systems used cognitive ability, as measured by IQ (**Table 10**) as the only diagnostic criteria, more recent classification systems have also included an assessment of children’s adaptive behaviour, as well as the level of support they require to function on their everyday environment. The American Association of Mental Retardation (AAMR) revised its official classification system in 1992 to reflect this transition, with their definition of mental retardation now including those with:

“significant subaverage intellectual functioning (defined as an IQ score of below 70 to 75) existing concurrently with related limitations in two or more of the following applicable adaptive skill areas: communication, self care, home living, social skills, community use, self direction, health and safety, functional academics, leisure and work” [88].

At a regional level, children and young people with intellectual disabilities require a variety of personal health and disability support services. Personal health needs include routine well child care (e.g. immunisation, monitoring of growth and development), as well as the management of conditions more common in children with intellectual disabilities (e.g. seizure disorders, orthopaedic problems and vision and hearing problems). Early intervention programmes for infants and toddlers assist in nurturing children's development, while tailored educational programmes during the preschool and school years may facilitate learning, positive self-esteem, social competence and adaptive living skills [77]. During adolescence, issues related to sexuality, vocational training and community living become more prominent [3].

Table 10. Classification of Mental Retardation Based on Severity and IQ Score

Level of Severity	IQ Levels		Level of Functional Impairment [3]	Prevalence Estimate (Overseas Studies)	Est. No. in Counties Manukau Aged 2-24 yrs
	ICD-9 CM	DSM-IV			
Any	IQ <70		See Below	3 per 100 [89]	4,206
Mild	50-70	50-55 to 70	Includes ~90% of children with mental retardation. Most need at least some special class placement and some can achieve primary school reading levels. Those with well developed adaptive skills may be able to function independently as adults.		
Moderate	35-49	35-40 to 50-55	Educational goals focus on gaining maximal self care +/- some academic skills. Those with good adaptive skills may function semi-independently in supervised living and sheltered workshop settings.	3.8 per 1,000 [90]	533
Severe	20-34	20-25 to 35-40	Children can learn minimal self-care and simple conversational skills. Much supervision is needed throughout their lives.		
Profound	<20	<20 or 25	Children require total supervision. Very minimal self care skills possible and few are toilet trained. Language development generally minimal		

Source: Murphy et al. [89]

While there is no data routinely collected on the prevalence on intellectual disability in NZ, a range of overseas estimates are available. While estimates vary widely depending on the

definition used and the population surveyed, it is usually assumed that ~ 3% of the population have an IQ of <68, with 80-90% of these being classified as having mild mental retardation and 5% being severely or profoundly impaired [3]. Other estimates suggest that 3-4 per 1,000 have an IQ in the <50 range [90]. Based on these figures **Table 10** estimates the number of children and young people (2-24 years) in Counties Manukau with intellectual disabilities, as well as the number with an IQ of <50 and thus functioning in the moderate → profound range.

PERMANENT HEARING LOSS

Sensorineural hearing loss is a permanent condition which occurs when the functioning of the inner ear, the auditory nerve and / or its connections to the brain are impaired. Between 135-170 babies (2-3 /1000) in NZ each year are identified as having a permanent congenital hearing loss [91] and until recently, NZ has relied on a “risk factor” approach to identification, with children with any of the factors listed below being referred to an Audiologist for further assessment:

1. A Family History of Hearing Loss
2. Jaundice Requiring Exchange Transfusion
3. Craniofacial Abnormalities
4. Ototoxic Drugs
5. Mechanical Ventilation Lasting 5+ Days
6. Low APGAR Scores (0-4 at 1 Minute, 0-6 at 5 Minutes)
7. Birth Weight <1500g
8. Bacterial Meningitis
9. Infections (e.g. Rubella, Herpes, Toxoplasmosis) Associated with Hearing Loss.

Unfortunately, such “high risk” approaches have not led to an earlier age of diagnosis, with the average age of confirmation for moderate / higher degrees of hearing loss being ~ 45 months in 2004 [92]. Such delays are of concern, as hearing impairment during the early years of life may prevent / delay speech and language development and in the longer term, impact negatively on cognitive development, academic performance, social wellbeing and subsequent career choice [93]. In mediating these impacts, 4 key variables are thought to play a role:

1. **Age of Onset:** Children born with permanent hearing loss often have limited exposure to sound during a critical period of brain development, leading to poorer development of the central auditory system and a reduced ability to acquire language. As a result, the greatest benefits from auditory interventions are achieved within the first 3 years of life.
2. **Severity of the Loss:** There are varying degrees of hearing loss and associated functional impairment (**Table 11**). Lower degrees of hearing loss can still have negative impacts, as they are often detected later, allowing time for deficits in speech and language to develop.
3. **Intervention Delay:** The internationally recommended age for identification of hearing loss is 3 months, with intervention commencing by 6 months of age [94]. These recommendations are based on evidence suggesting that infants whose hearing loss is detected early and who receive appropriate assistance, have significantly better spoken language and subsequent educational outcomes than later detected peers [93]. Available interventions include hearing aids, speech language therapy, the teaching of sign language and other educational supports and cochlear implants.
4. **Presence of Other Disabilities:** Analysis of NZ Deafness Notification Data suggests that approximately $\frac{1}{4}$ of hearing impaired children have other disabilities, including Downs Syndrome, brain injury, developmental delay and metabolic disorders, which may themselves impact on children’s learning and cognitive development [92].

In response to concerns regarding the late age of detection of congenital hearing loss, the Government in its May 2006 Budget, announced a funding package of \$16 million over the next 4 years to establish a Universal Newborn Hearing Screening Programme for NZ. Since

this announcement, work has focused on programme design and models for a national information system. In addition, the Universal Newborn Hearing Screening Advisory Group has highlighted a number of areas where further work is necessary if the programme is to be implemented effectively (e.g. national workforce development; creation of a national lead agency, funding agreements and data systems; quality improvement, monitoring and evaluation) [91]. It is likely that significant further policy work will be required before the final roll out of the national programme, and in the meantime the majority of DHBs will still need to rely on the “at risk” identification system.

While awaiting the roll out of a universal screening programme, the NZ Deafness Database (managed by the National Audiology Centre) is a valuable source of information on the number of children diagnosed with permanent hearing loss in NZ each year. The following section reviews information from the NZ Deafness Database’s Annual Reports during 1998-2005, as well as data from the National Minimum Dataset on admissions to hospital for cochlear implant surgery in those aged 0-24 years during 1990-2005.

Data Sources and Statistical Methods

NZ Deafness Notifications

Information on the number of children with a hearing loss was obtained from the NZ Deafness Notification Data Annual Reports, produced by the National Audiology Centre for the years 1998-2004 [92]. These reports are derived from the NZ Deafness Notification database, which collects information on children meeting the following criteria:

“Children <18 years of age with congenital hearing losses or any hearing loss not remediable by medical or surgical means which requires hearing aids and / or surgical intervention. They must have an average bilateral hearing loss (over 4 audiometric frequencies 500-4000 Hz) of >26 dBHL in the better ear”.

Children are excluded if their hearing loss is <26 dBHL, is unilateral, acquired or they were born overseas.

The data is presented by year of notification, rather than year at first identification, with the degree of hearing loss assessed using the dBHL ranges outlined in Table 11. As notification is not mandatory, these statistics may undercount the number of children with permanent hearing loss. A recent data matching exercise with the Children’s Hearing Aid Fund, which has mandatory form completion, revealed 157 children over an 11 year period who had not been reported to the Deafness Database, but who had been fitted with hearing aids. Similar processes have been carried out at intervals in the past (44 retrospective cases were added during 2001). In addition, because of the generally late age at first diagnosis, it is not possible to be certain of the aetiology or time of onset of the reported hearing loss. Thus although most cases are likely to be congenital, it is still not possible to rule out the possibility that the hearing loss was acquired, or that the degree of loss had changed between birth and identification.

Cochlear Implants

Information on cochlear implants was obtained from the National Minimum Dataset (Hospital Admission Dataset) and included all admissions with an ICD-9 procedural code in the range 20.96-20.98 (Implantation or Replacement of Cochlear Prosthetic Device) listed as a primary or secondary procedure. Because ICD-9 coding does not differentiate between the implantation and replacement of a cochlear implant, it is possible that some of the cases listed in this section represent the replacement of a cochlear implant in a previously implanted individual.

Notifications to the NZ Deafness Database 1998-2004

Degree of Hearing Loss

The NZ Deafness Database classifies the degree of hearing loss in the better hearing ear using the dBHL ranges outlined in **Table 11**. During 2004, children were assessed as follows (n=155):

Table 11. Degrees of Hearing Loss & Associated Functional Impairment, NZ Notifications 2004

Degree of Loss	Associated Functional Impairment Likely at this Level of Loss [93]	% of 2004 notifications
Mild (26-40 dBHL)	Some difficulties in hearing soft speech and conversations (persons sound as if they are mumbling) but can often manage in quiet situations with clear voices. Speech and language usually develop normally if child is fitted early with hearing aids.	59%
Moderate (41-65 dBHL)	Difficulty understanding conversational speech, particularly in the presence of background noise. Volume of TV & Radio needs to be turned up to be heard. Speech & language generally affected if hearing aid is not provided early. A hearing aid will assist most hearing difficulties if speech discrimination is good and listening environment is not too noisy.	29%
Severe (66-95 dBHL)	Normal conversational speech is inaudible and only raised voices at close distance can be understood. Speech and language will not develop spontaneously in children with severe hearing loss. Hearing aids will amplify many speech sounds and will greatly assist children in developing speech, although speech quality is likely to be affected. Some children may benefit from a cochlear implant.	7%
Profound (96+ dBHL)	Learning to speak without significant support is very difficult, although there is individual variation. Greater inconsistency in the benefit derived from hearing aids: some can understand clear speech in quiet conditions when wearing a hearing aid, while others derive little benefit. This group should be considered for cochlear implants, with benefits being evident, especially if implanted at a young age.	5%

Other Disabilities

During 2004, a number of children who met the criteria for inclusion in the NZ Deafness Database also had other disabilities. These included (n=155):

No Other Disability...77.4%	Multiple Disabilities... 8.4%	Other Syndromes...3.9%
IHC.....1.9%	Asthma.....1.9%	Down Syndrome.....0.6%
Other Disabilities.....4.5%	Unknown..... 1.3%	

Cause of Hearing Loss

During 2004, in half of cases the cause of the hearing loss was unknown. While a family history is quoted in 32% of cases, this is higher than for Australian figures and very few children undergo genetic testing for hearing loss. Listed causes during 2004 included (n=155):

Unknown.....50%	Family History..... 32%	Multiple Causes..... 6%
Asphyxia..... 3%	Low Birth Weight.....2%	Facial Malformation...1%
Other Causes..... 6%		

Age of Identification of Hearing Loss

The average age of confirmation of hearing loss is calculated for children with at least a moderate loss (>40 dBHL), as the age of detection for mild losses is often much later and until recently the effects on educational performance were thought to be less marked. In recent years, the average age of identification of at least a moderate loss has varied by year of notification (**Table 12**) and by region (**Table 13**). In addition, significant delays between the time of first suspicion and final confirmation (range 6.5-13.5 months) may have potentially further delayed the age at which effective interventions began.

Table 12. Age at Suspicion & Confirmation of Moderate or Greater Hearing Loss, NZ 2001-04

Year	Mean Age Suspected (months)	Mean Age Confirmed (months)	Mean Time Taken (months)
2004	31.8	45.3	13.5
2003	35.3	46.1	10.8
2002	24.4	35.1	10.7
2001	28.1	33.7	6.5

Table 13. Age of Identification of Moderate or Greater Hearing Loss by Region, NZ 1998-2004

Region	Average Age of Identification (months)	% of Notifications	No. of Notifications
Northland	48.5	9.6	70
Auckland Region	48.2	33.8	246
Waikato	42.7	5.5	40
Lakeland	49.6	2.6	19
Bay of Plenty	52.1	7.0	51
Tairāwhiti	32.6	1.9	14
Taranaki	25.1	2.1	15
Hawke's Bay	24.5	5.0	36
Manawatu	45.3	7.2	52
Wellington	49.6	7.3	53
Nelson Marlborough	26.2	2.1	15
Canterbury	39.1	9.1	66
South Canterbury	27.6	0.7	5
Otago	51.6	2.8	20
Southland	33.8	3.4	25
NZ Total			727

During 1998-2004, the average age of identification of a moderate or greater hearing loss in the Auckland Region was 48.2 months (**Table 13**). It is hoped that with the roll out of a Universal Newborn Hearing Programme in NZ over the next few years, this age will decline significantly.

Notifications by Region

In the Auckland Region during 1998-2004, ~40 children per year met the inclusion criteria for the Deafness Notification Database. The large number of notifications in 2001 and 2004 reflect a number of retrospective notifications which were overlooked in previous years (**Table 14**). Unfortunately, notifications were not broken down by DHB and thus an estimation of the number of children with permanent hearing loss in Counties Manukau is difficult.

Table 14. Number of Notifications Meeting Criteria for Inclusion in Deafness Notification Database by Region of Residence, NZ 1998-2004

Region	Notification Year						
	1998	1999	2000	2001*	2002	2003	2004*
Northland	10	8	11	10	5	7	10
Auckland Region	21	35	40	74	36	52	37
Waikato	7	13	9	19	10	9	15
Lakeland	3	2	0	3	3	3	6
Bay of Plenty	10	6	4	21	6	12	9
Tairāwhiti	3	0	1	3	2	1	5
Taranaki	2	2	1	1	3	3	8
Hawke's Bay	1	2	2	31	5	4	5
Manawatu	3	3	0	12	7	12	24
Wellington	3	10	5	8	12	17	5
Nelson Marlborough	2	3	2	1	3	4	4
West Coast	0	0	0	0	1	1	1
Canterbury	0	3	7	10	12	9	10
South Canterbury	0	1	1	4	1	3	3
Otago	0	1	8	5	5	3	7
Southland	1	3	2	0	3	4	6
NZ Total	65	90	92	202	113	144	155

*2001 figures include 44 retrospective notifications. During 2004, an additional 157 retrospective cases which had not been notified over an 11-year period were also added to the database, but are not included in this total.

Cochlear Implants

Cochlear implants are devices which provide hearing sensations for severely and profoundly deaf individuals. They consist of two parts, an electrode array which is implanted into the cochlear and a speech processor which is worn externally (either behind the ear or on the body). Once it has been established that no significant benefit is being obtained from a hearing aid, a cochlear implant should be considered as soon as possible, although congenitally deaf children who are 3+ years of age need to have been fitted with hearing aids and started to develop speech and language, in order to benefit from an implant. Following successful implantation, the degree of benefit varies depending on the age of onset of the deafness, the child's previous experience with hearing and the duration of the loss [95].

In NZ a Cochlear Implant Programme was established in 1986 with funding provided by the Deafness Research Foundation. The programme was based in Auckland with a satellite clinic in Christchurch (as of 1988). In 2003, a North Island and Southern Cochlear Implant Programme became established to assist in meeting the needs of cochlear implant recipients [95]. The following section reviews the number of children and young people (0-24 yrs) admitted to hospital for cochlear implantation surgery in NZ and Counties Manukau during 1990-2005, using information available from the National Minimum Dataset.

Cochlear Implants in NZ and Counties Manukau

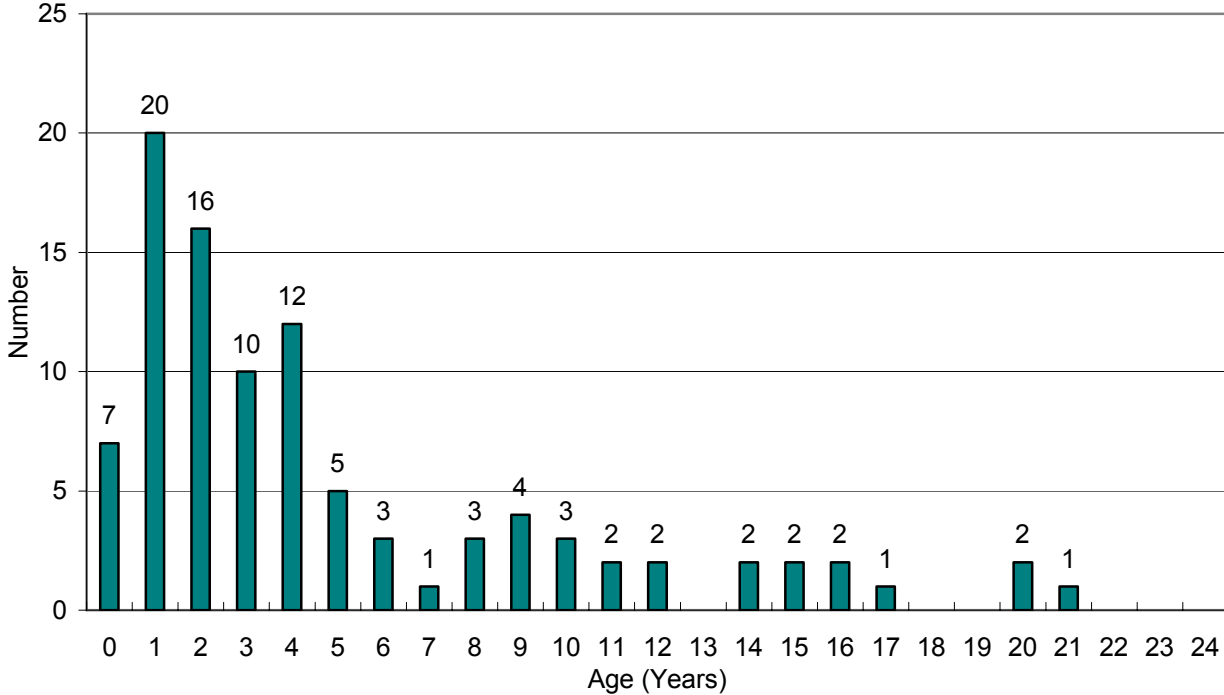
In NZ during 1988-05, the NMDS recorded a total of 238 hospital admissions for cochlear implant surgery, involving a total of 222 children. Thus, while it is likely that the majority of admission were for the implantation of a cochlear prosthetic device, a small number may have

been admitted for repair / replacement surgery (differentiation between the two is difficult using current ICD coding).

Cochlear Implants by Age

In NZ during the past 5 years, 43.9% of cochlear implant surgery in the 0-24 age group occurred before the age of 3 years and 66.3% occurred before the 5 years of age. A small number of implants occurred after the age of 5 years, although the possibility of repair / replacement surgery could not be ruled out in these cases (**Figure 45**).

Figure 45. Age at Admission for Cochlear Implant Surgery, NZ 2001-2005



Cochlear Implants in Counties Manukau

In Counties Manukau during 1990-05, the number of children receiving cochlear implant surgery gradually increased, from no cases per year during the first 4 years, to 2-3 cases per year during the last 5 years for which data was available (**Table 15**).

Table 15. Number* of Admissions for Cochlear Implant Surgery by DHB, NZ 1990-2005

DHB	1990-91	1992-93	1994-95	1996-97	1998-99	2000-01	2002-03	2004-05
Northland	0	1	1	1	2	0	0	0
Waitemata	0	2	3	2	3	7	5	7
Auckland	0	4	5	6	12	3	4	4
Counties Manukau	0	0	2	2	3	4	4	5
Waikato	1	2	0	2	5	2	4	4
Lakes	0	0	1	0	2	3	1	3
Bay of Plenty	0	0	0	0	1	1	3	1
Tairāwhiti	0	0	0	0	0	2	0	0
Taranaki	0	0	0	4	0	2	1	1
Hawke's Bay	0	0	0	0	0	0	2	1
MidCentral	0	0	0	1	0	3	3	3
Whanganui	0	0	0	0	0	0	1	0
Wairarapa	0	1	0	1	1	0	0	0
Capital and Coast	0	1	1	0	1	2	3	3
Hutt	0	0	0	0	0	0	1	0
Nelson Marlborough	0	0	1	2	1	3	1	1
West Coast	0	0	1	0	0	1	1	0
Canterbury	2	2	2	4	7	8	9	2
South Canterbury	0	0	0	1	2	0	0	0
Otago	0	0	1	2	0	4	2	0
Southland	0	0	0	0	0	3	1	2
NZ Total	3	13	18	28	40	48	46	37

*Numbers are per 2 year period and may include those undergoing repair / replacement of a cochlear implant.

In Summary

Hearing loss during the early years of life is of significant concern, as delays in intervention may lead to impaired language development and long term, may impact negatively on cognitive development, academic performance and subsequent career choice. Evidence would suggest that NZ's current high risk approach to detection is resulting in significant delays, with the average age of detection of moderate or greater loss in NZ being 45.3 months in 2004.

In the Auckland Region each year, approximately 40 children meet the inclusion criteria for the Deafness Notification Database and while there are no figures available for Counties Manukau, approximately 2-3 Counties Manukau children each year are admitted to hospital for cochlear implant surgery. It is hoped that the roll out of a Universal Newborn Hearing Programme in NZ over the next few years will lead to a decline in the age at first detection of hearing loss and significantly earlier intervention for these children.

BLINDNESS AND LOW VISION

It is difficult to precisely estimate the number of children and young people who have visual impairments in NZ, although a recent review of the available evidence for adults noted that that the figure varied significantly depending on the data source used, with figures ranging from as low as 11,293 if estimates were based on membership of the Royal NZ Foundation of the Blind, to as high as 98,400 if the NZ Disability Survey is used [96]. Similarly for children, extrapolations from the 2001 Disability Survey suggest that in 2004 there were 460 blind and 1,380 visually impaired children (0-15 yrs) in NZ. In contrast the Vision Education Agency, which records information on blind and low vision children receiving educational supports, noted that of the 1,323 children who were enrolled with the Blind and Low Vision Education Network NZ (BLENNZ) during 2006, 147 were blind, 27 were identified as deafblind (dual sensory loss), 870 were low vision, 54 were identified as having cortical visual impairments, and 225 had an unspecified level of visual impairment.

While in NZ there is no routinely available information on the reasons for blindness and low vision amongst children and young people, information from overseas registers would suggest that in developed countries the most common causes are retinal disorders, optic atrophy and lesions of the higher visual pathways. Retinal causes frequently include hereditary retinal dystrophies and retinopathy of prematurity, while lesions of the higher visual pathways are often associated with other disabilities, arising from problems in the central nervous system. In about a third of cases, the underlying cause of the eye malformation or anomaly is unknown [97]. Irrespective of the underlying cause however, children who are blind and low vision require a range of education, health and disability support services, in order to ensure that they reach their full developmental potential.

In NZ the Blind and Low Vision Education Network (BLENNZ) offers a range of services to blind and low vision children. These include:

- Homai Campus School, Immersion and Residential Services
- Assessment and Teaching Services including:
 - National Assessment Team, Homai Campus
 - Regional Services:
 - Auckland Visual Resource Centre, Homai Campus, South Auckland
 - Marlborough Resource Unit, North Shore, Auckland
 - Northland Resource Centre, Whangarei
 - Hamilton, Tauranga, Gisborne, Napier Visual Resource Centres
 - Welbourn Visual Resource Centre, New Plymouth
 - Palmerston North Sensory Resource Centre
 - Kelburn Visual Resource Centre, Wellington
 - Nelson Visual Resource Centre
 - Elmwood Visual Resource Centre, Christchurch
 - South Canterbury Resource Centre, Timaru
 - Otago Visual Resource Centre, Dunedin
 - Southland Visual Resource Centre, Invercargill

Children are eligible for BLENNZ services if they have a visual impairment and meet a number of criteria. A visual impairment is defined as a disorder of the structure or function of the eye, the visual pathways or the cortex, that even with the best correction and treatment, interferes with learning. Eligibility criteria include:

Medical: There is a written report from an ophthalmologist, optometrist or other relevant medical specialist identifying vision impairment as manifest by at least one of the following:

- A visual acuity of 6/18 or less in the better eye after correction.
- A visual field so restricted that it affects functional ability in an educational setting.
- A progressive loss of vision which may affect functional ability in an educational setting.
- For children 0-5 years, bilateral lack of central vision with an estimated visual acuity of 6/18 or less after correction, or a documented eye condition as above.
- A cerebral vision impairment which affects functional ability in an educational setting.

Educational: A functional vision assessment conducted by an educational professional with expertise in blindness education identifies impaired processing of information via visual pathways and this impairment reduces the child's ability to use regular print resources, black / white boards / other educational resources and necessitates the use of ≥ 1 of the following:

- Adaptation of the environment or of teaching and learning approaches.
- Access to assistive technology or materials in other formats e.g. collage, Braille.
- Access to the Expanded Core Curriculum or adaptation of the regular curriculum.

For eligible children, BLENNZ offers a range of teaching and assessment services based at Homai Campus and regionally located Visual Resource Centres. Key services include assessment and evaluation, early childhood services (centre or home based programmes to assist young children acquire essential skills), teaching and learning programmes in the Expanded Core Curriculum, professional development for teachers, teacher aids and education support workers and the provision of accessible format materials, resources and equipment.

The following section uses information on the number of children enrolled with BLENNZ to estimate the number of children with significant visual impairments in NZ during 2006. While enrolment data is provided for all children, more detailed information on the nature of children's visual impairments and the communication modalities used is provided for the 87% of children on the Visual Education Agency's Database as at June 2006.

Data Sources and Statistical Methods

Visual Education Agency National Database for Blind and Vision Impaired Learners

The information contained in this section was obtained from the Visual Education Agency Database and was supplied by BLENNZ. The Vision Education Agency collects information about the educational needs of blind and vision impaired students. It collects basic enrolment data on all students who receive services from BLENNZ and more detailed information on demographic, communication and resourcing for each student. An opt off system however means that while basic enrolment information is available on all students (i.e. the number enrolled with the various Visual Resource Centres around the country), more detailed information was only available for the 87% of learners during 2006 who did not opt out of having their information recorded in the National Database for Learners.

Enrolments at BLENNZ Visual Resource Centres in NZ

Enrolments with Visual Resource Centres

During June 2006, a total of 1,323 children and young people were enrolled with BLENNZ, with enrolments being spread across the educational spectrum from early childhood to the secondary school level. In the Auckland Region a total of 459 children and young people were enrolled at the Auckland Visual Resource Centre, the Homai Campus School and at Manurewa High Visual Resource Room, with 88 being involved in early childhood education, 235 being at primary school and 136 attending schools at the secondary level (**Table 16**).

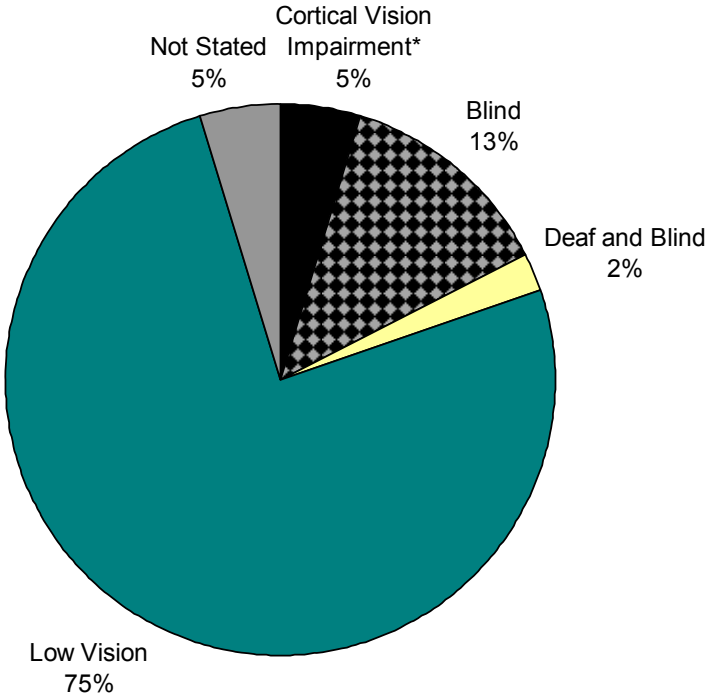
Visual Status and Other Disabilities

During June 2006, of the 1,153 (87%) children and young people who had their information recorded on the national database, 75% had low vision, 13% were blind, 2% were deafblind and 5% were noted as having cortical visual impairment (although the latter category was inconsistently reported by different VRCs across the country) (**Figure 46**). In addition, 60.4% of children and young people on the national database were listed as having other disabilities, the consequences of which ranged from minor→ major impacts on their functioning.

Communication Modalities

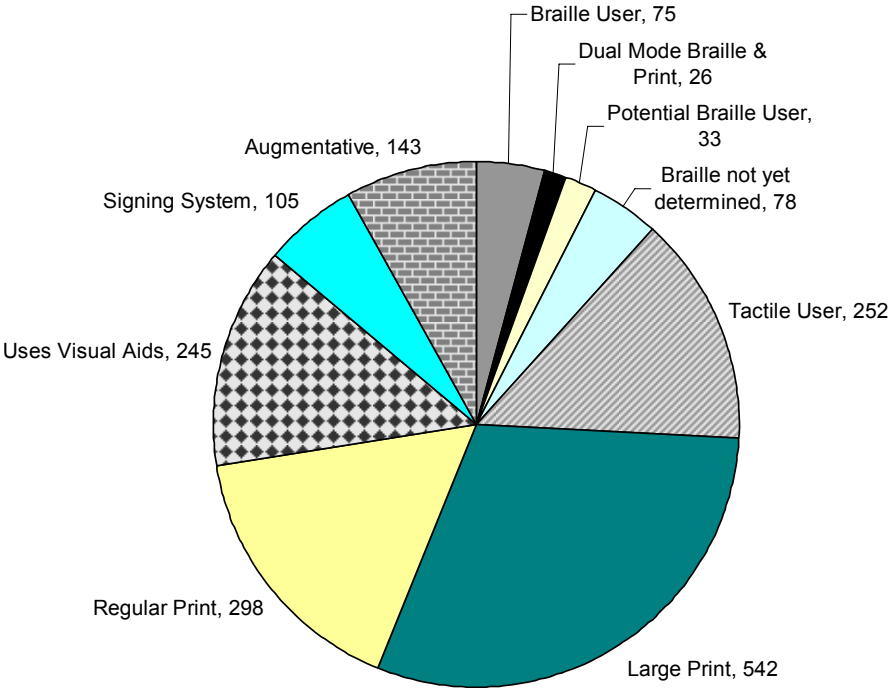
During June 2006, of the 1,153 (87%) children who had their information recorded on the national database 101 were Braille users with a further 33 identified as potential Braille users. Of the print users identified, 542 used large print and 298 used regular print, although a large proportion of these children also used visual aids, making numbers in **Figure 47** sum to >100%. In addition, children enrolled at the Visual Resource Centres across NZ also used a range of other communication modalities including augmentative communication and signing systems.

Figure 46. Visual Status of Blind and Low Vision Learners Receiving Education Services and Enrolled on National Database*, New Zealand June 2006



Note: Reporting of Cortical Vision Impairment may be inconsistent across the country.

Figure 47. Communication Modes of Blind and Low Vision Learners Receiving Education Services and Enrolled on National Database*, New Zealand June 2006



Note: 112 of learners identified as using regular print also used visual aids and 255 of learners identified as using large print also used visual aids so totals add up to >100% of sample size.

In Summary

While it is difficult to precisely estimate the number of NZ children and young people who are blind or have low vision, estimates from the Vision Education Agency suggest that around 1,332 children and young people in NZ each year require educational support as a result of a visual impairment. In the Auckland Region during 2006, 459 children and young people received educational support by means of enrolment at the Auckland Visual Resource Centre, Manurewa High Resource Room or Homai Campus School.

Children and young people enrolled at Visual Resource Centres across the country had a variety of visual impairments during 2006, ranging from low vision→ blindness→ deafblindness→ cortical visual impairments and used a variety of communication modalities including large print, visual aids, Braille and signing systems. In addition, 60.4% had other disabilities which had minor→ major impacts on their functional ability. Irrespective of the underlying cause of their visual impairment however, at a regional level children and young people with visual impairments require a range of education, health and disability support services, the coordination of which is vital to ensuring they reach their full developmental potential.

Table 16. Number of Blind and Low Vision Learners Receiving Education Services by Region, New Zealand June 2006

Region	Visual Resource Centre Enrolments	Educational Level	Roll No.	2006 Referrals
Auckland / Northland	Auckland VRC 403 Manurewa High 17	Early Childhood	88	41
		Primary	217	
		Secondary	98	
		Manurewa High	17	
Homai Campus School	Homai CS 39	Primary	18	N/A
		Secondary	21	
Waikato / Thames / Coromandel / King Country	Hamilton VRC 108	Early Childhood	24	20
		Primary	61	
		Secondary	23	
Bay of Plenty	Tauranga VRC 40	Early Childhood	7	3
		Primary	23	
		Secondary	10	
Gisborne / East Cape	Gisborne VRC 40	Early Childhood	6	23
		Primary	23	
		Secondary	11	
Hawkes Bay	Napier VRC 48	Early Childhood	5	4
		Primary	26	
		Secondary	17	
Taranaki	Welbourn VRC 45	Early Childhood	7	1
		Primary	29	
		Secondary	9	
Horewhenua Manawatu	Palmerston North SRC 76	Early Childhood	20	11
		Primary	40	
		Secondary	16	
Wellington	Kelburn VRC 142	Early Childhood	26	27
		Primary	69	
		Secondary	47	
Nelson / Buller / Marlborough	Nelson VRC 47	Early Childhood	11	2
		Primary	21	
		Secondary	15	
Canterbury / West Coast	Elmwood VRC 240	Early Childhood	20	21
		Primary	146	
		Secondary	74	
Otago	Otago VRC 43	Early Childhood	4	5
		Primary	21	
		Secondary	18	
Southland	Southland VRC 35	Early Childhood	8	7
		Primary	18	
		Secondary	9	
Total	1323	Total	1323	165

BUFFERS & PROTECTIVE FACTORS



EARLY CHILDHOOD EDUCATION

Research would suggest that participation in high quality early childhood education (ECE) has significant long term benefits for children's academic performance. While the benefits appear greatest for children from low income families, those who attend ECE regularly and those who have started ECE at a younger age (e.g. 2-3 years), a number of longitudinal studies have suggested that the relationship between ECE and subsequent outcomes may be quite complex and related to the age at which the child starts ECE, the number of hours in ECE each week, the quality of the ECE service and the socioeconomic background from which the child comes [98].

In one US study, children who started ECE between 2-3 years had higher pre-reading and mathematics scores at school entry than those who started earlier or later, but starting ECE at <2 years was associated with lower social development scores. In addition, children experienced greater academic gains if they attended ECE for >15 hours per week, but this was offset by lower social scores, particularly for those who attended for >30 hours per week. Outcomes also varied by socioeconomic status, with children from low income families only experiencing significant academic gains if they attended ECE for >30 hours per week, but for these children attending >30 hours per week had no negative behavioural consequences. In contrast, children from affluent homes experienced no additional academic gains from attending ECE for >30 hours per week, but displayed increasingly negative behaviour the longer they attended ECE [99]

In NZ the Competent Children, Competent Learners Study, which followed a cohort of NZ children from preschool to age 14, suggested that differences in the ECE environment continued to influence performance at age 14, with differences between those with the highest or most of a particular aspect of ECE and others being on average 9%. Family factors (income and maternal qualifications) made more of a difference than a child's ECE experience however, although ECE experience continued to make a contribution once these factors had been taken into account. In general ECE experience made the greatest impact at the time a child started school, but the contribution was still evident at 14 years, even after taking age-5-performance, family income and maternal qualifications into account [98].

In NZ, ECE is provided by a variety of different services and in a variety of different settings ranging from the more traditional Kindergartens and Te Kohanga Reo, to services that cater for the needs of working parents (e.g. Education and Care Services, Home Based Services). During 1990-05, NZ's enrolments in ECE increased for all age groups, with the largest increases occurring amongst those <3 years, for whom enrolments doubled. This increase in enrolments was absorbed almost entirely by the Education and Care Services, who offer flexible hours and require little parental involvement and thus are particularly attractive to working parents. While there was also a 6-fold increase in Home Based Services during this period, in absolute terms the numbers of children receiving this type of care were less [100].

The following section reviews Ministry of Education data on the participation of NZ children in ECE during the past 16 years, as well as the prior participation of new entrants in ECE in Counties Manukau and NZ during 2000-05.

Data Sources and Statistical Methods

Enrolments in Early Childhood Education

Information on enrolments in Early Childhood Education (ECE) by Service Type during 1990-2005 was provided by the Ministry of Education. The figures tend to overestimate the number of children enrolled, as they double or triple count those children who attend more than one early ECE service. They are however, a useful indicator of patterns of enrolment across the different types of ECE during this period.

Prior Participation in Early Childhood Education

The number of new school entrants (Year 1) reporting regular participation in ECE immediately prior to attending school is a useful measure of ECE participation rates, as it overcomes some of the over counting problems associated with reporting ECE enrolment rates. It however provides no information on the duration of, number of hours in, or the type of ECE attended prior to attending school.

NZ Trends in ECE Enrolment by Service Type and Hours Spent in ECE

In NZ during 1990-2005, the number of enrolments in Early Childhood Education (ECE) increased by 56.7% (**Figure 48**). Changes varied markedly by service type however, with enrolments in Kindergartens (+2.6%) and Te Kohanga Reo (-0.4%) remaining relatively static. In contrast, enrolments in Education and Care Services increased by 170.3%, enrolments in Home Based Services by 506.5% and enrolments in License Exempt Playgroups by 224.2%. Playcentre enrolments however, declined by 33.6% during this period. Thus while in 1990 Kindergarten had been the most common source of ECE, by 1995 Education and Care Services were the most common, with 45% of ECE enrolments during 2005 being for this type of Service.

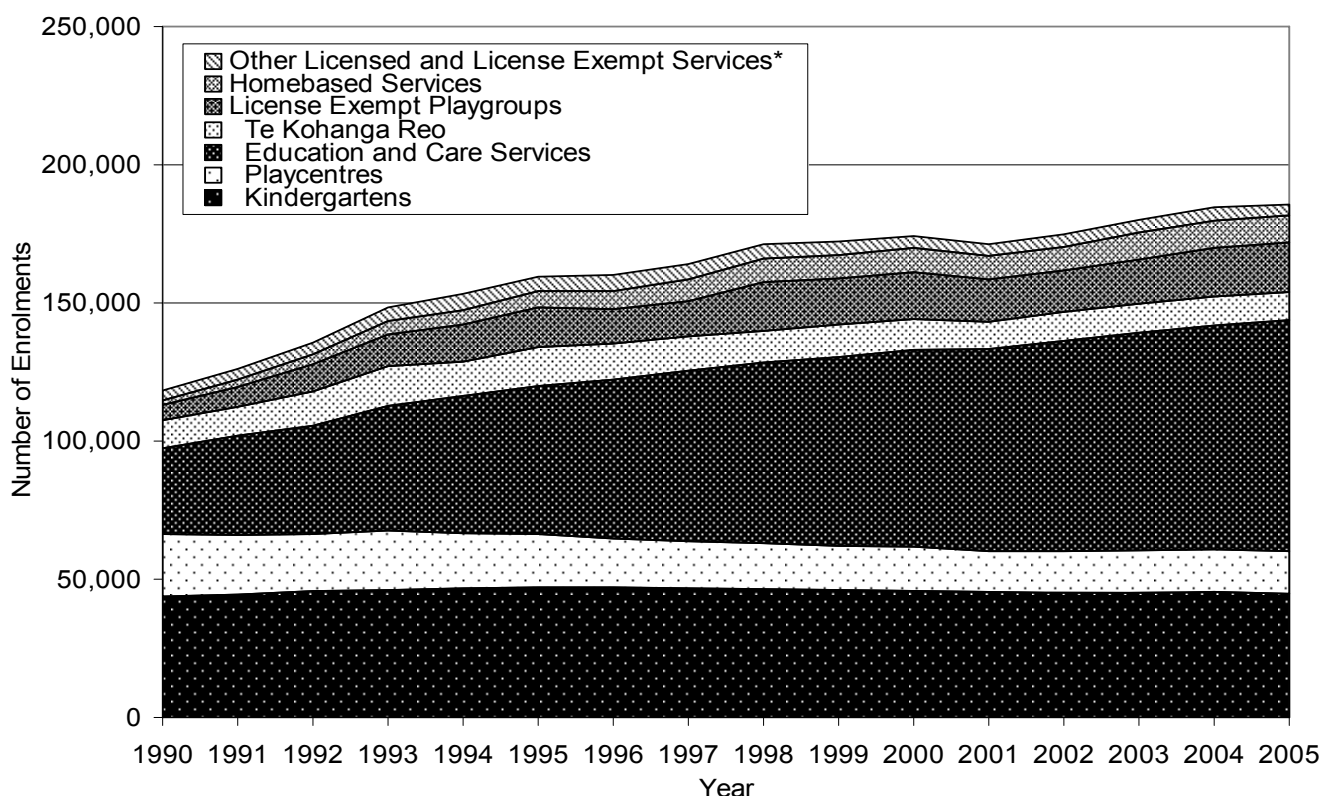
In addition to an increase in ECE enrolments, the number of hours spent in ECE increased progressively during 1996-05 for all Service types, with the exception of Playcentres and Te Kohanga Reo (**Table 17**). Children enrolled in Te Kohanga Reo, at 27-30 hours per week, spent the longest amount of time in ECE, followed by those enrolled in Home Based Networks who had the second longest average hours, as well as the largest increases in average hours in ECE during this period [101].

Table 17. Average Number of Hours of Attendance in Early Childhood Education Services by Service Type, NZ 1996-2005

Type of Service	Year									
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Kindergarten	10.4	10.4	10.7	10.8	11.2	11.5	11.8	12.0	12.5	12.6
Playcentre	4.3	4.4	4.4	4.3	4.4	4.2	4.3	4.3	4.4	4.3
Education and Care	15.0	15.8	15.9	16.4	16.6	17.7	18.3	18.6	19.5	20.3
Homebased Networks	15.5	15.2	15.7	16.1	16.9	18.6	18.1	19.7	21.3	22.4
Licensed Te Kohanga Reo*	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5

Source: Ministry of Health. *Estimated: Most Children are enrolled between 27-30 hours per week.

Figure 48. Licensed and License Exempt Early Childhood Education Enrolments by Service Type, NZ 1990-2005



Source: Ministry of Education.* Other License and License Exempt Services include Correspondence School, Nga Puna Kohungahunga, License Exempt Playcentres & Kohanga Reo and Pacific Islands EC Groups.

Table 18. Enrolments in Māori Medium Early Childhood Education, NZ 1992-2005

Year	Te Kohanga Reo	Nga Puna Kohungahunga	License-Exempt Kohanga Reo	Total
1992	12,617	12,617
1993	14,514	14,514
1994	12,508	...	1,035	13,543
1995	14,015	...	248	14,263
1996	13,279	...	1,023	14,302
1997	12,611	...	401	13,012
1998	11,689	...	361	12,050
1999	11,859	...	524	12,383
2000	11,110	...	381	11,491
2001	9,594	209	214	10,017
2002	10,389	351	138	10,878
2003	10,319	408	130	10,857
2004	10,418	560	191	11,169
2005	10,070	519	146	10,735

Source: Ministry of Education

Prior Participation in ECE: NZ & Counties Manukau

Ethnic Differences

In NZ the percentage of new entrants (Year 1) reporting regular participation in ECE prior to attending school increased during the past 6 years, from 91.0% in 2000 to 94.3% in 2005. While prior participation in ECE remained highest amongst European > Asian / Indian > Māori > Pacific children during this period, in absolute terms participation rates for Māori and Pacific children increased more rapidly (Pacific 76.1% in 2000 → 84.5% in 2005; Māori 84.8% in 2000 → 89.9% in 2005) than for European children (95.4% in 2000 → 97.7% in 2005) (**Figure 49**).

Socioeconomic Differences

In NZ during 2005, the percentage of new entrants (Year 1) reporting regular participation in ECE also exhibited a modest socioeconomic gradient, with those attending the least affluent schools being less likely to report prior attendance at ECE. Thus during 2005, 16.7% of children attending the least affluent (Decile 1) schools had not attended ECE immediately prior to school entry, as compared to only 1.4% of children attending the most affluent (Decile 10) of schools (**Figure 50**). Nevertheless these figures suggest that on average, 83.3% of children in the least affluent schools had attended some form of ECE immediately prior to school entry.

Prior Participation in Counties Manukau

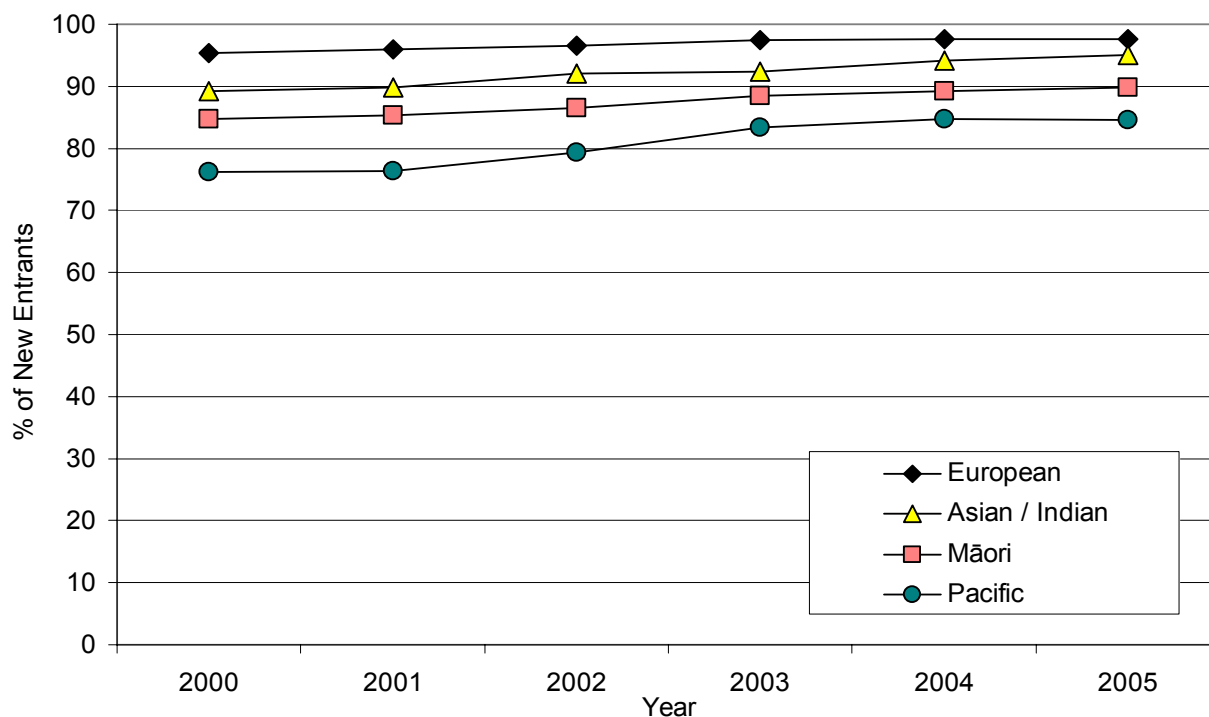
In Counties Manukau during 2000-05 there was a gradual increase in prior participation in ECE amongst school entrants which was consistent with NZ wide trends. Throughout this period however, prior participation rates in Counties Manukau were lower than the NZ average (**Figure 51**). While prior participation rates for Counties Manukau European and Asian / Indian children were similar to, or slightly lower than their NZ ethnic specific averages, rates for Counties Manukau Māori and Pacific children were consistently lower than their NZ ethnic specific averages (**Figure 52**).

In Summary

Research suggests that participation in high quality early childhood education (ECE) has significant long term benefits. In NZ, ECE is provided in a variety of contexts ranging from the more traditional Kindergartens and Te Kohanga Reo, to services that cater for the needs of working parents. In NZ during 1990-05 the number of children enrolled in ECE increased by 56.7%, with the largest increases being in Education and Care Services, Home Based Services and License Exempt Playgroups. In addition, during 1996-05 the number of hours children spent in ECE increased for all Service types, with the exception of Playcentres and Te Kohanga Reo.

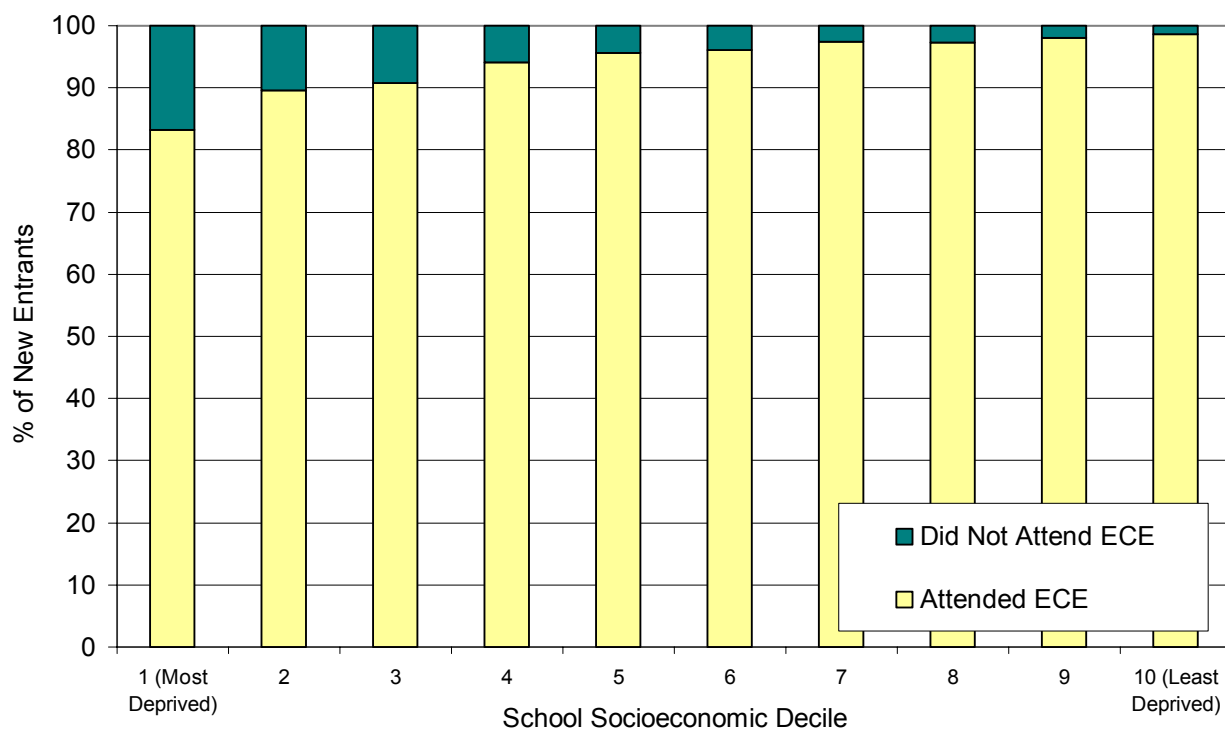
In NZ during 2000-05, the percentage of new entrants (Year 1) reporting prior participation in ECE increased from 91.0% in 2000 to 94.3% in 2005 and while rates remained highest amongst European > Asian / Indian > Māori > Pacific children and those attending the most affluent schools, in absolute terms rates increased most rapidly for Māori and Pacific children. In Counties Manukau during 2000-05, while there was a gradual increase in prior participation rates in line with NZ wide trends, prior participation rates in Counties Manukau remained lower than the NZ average. While prior participation rates for European and Asian / Indian children were similar to or slightly lower than the NZ European and Asian / Indian averages, rates for Māori and Pacific children were consistently lower than their respective NZ ethnic specific averages.

Figure 49. Proportion of New Entrants Who Had Previously Attended Early Childhood Education by Ethnicity, NZ 2000-2005



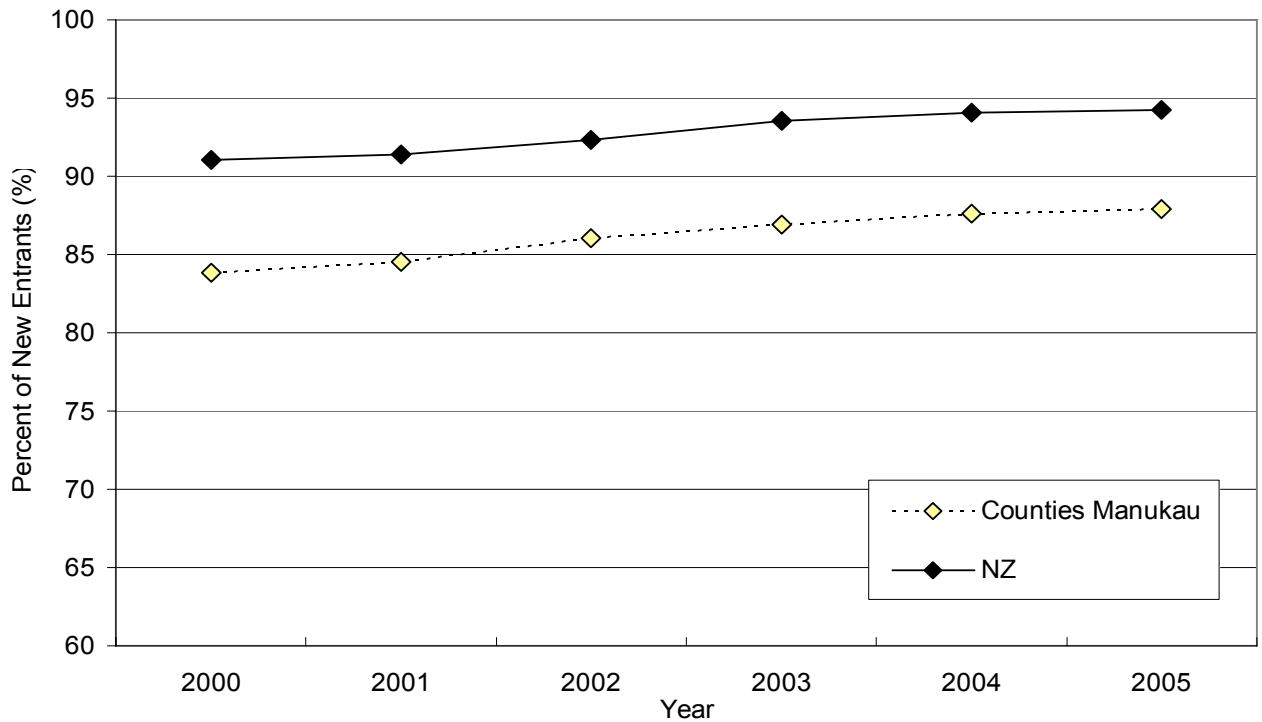
Source: Ministry of Education.

Figure 50. Proportion of New Entrants Who Had Previously Attended Early Childhood Education by School Socioeconomic Decile, NZ 2005



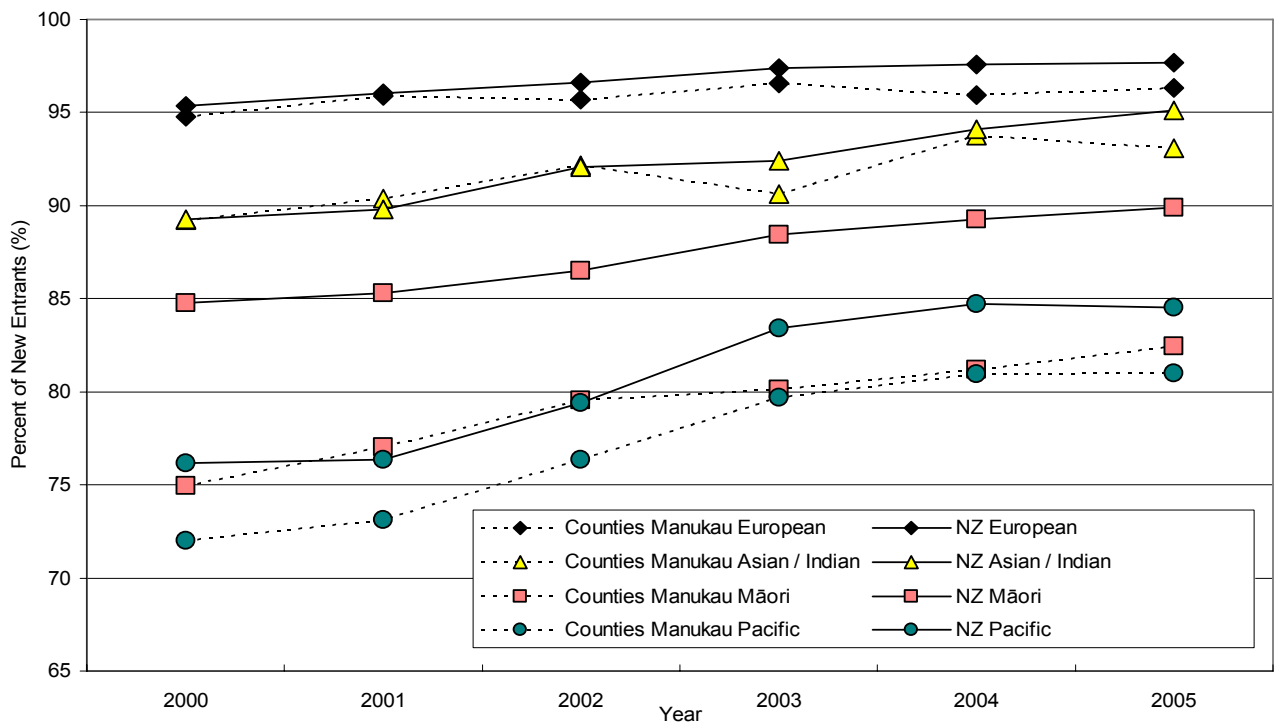
Source: Ministry of Education.

Figure 51. Proportion of New Entrants (Year 1) Who Had Previously Attended Early Childhood Education Services, Counties Manukau vs. NZ 2000-2005



Source: Ministry of Education.

Figure 52. Proportion of New Entrants (Year 1) Who Had Previously Attended Early Childhood Education Services by Ethnicity, Counties Manukau vs. NZ 2000-2005



Source: Ministry of Education.

KURA KAUPAPA MĀORI & KURA TEINA

Cultural identity is a critical component of positive Māori development. It has been suggested that if someone identifies as Māori but is unable to access Māori language, custom, land, marae, whanau or community networks, then it is unlikely that their cultural identity will be secure. A secure identity in turn is positively linked to health status, educational achievement and emotional and social adjustment [102]. In developing a set of indicators to assess outcomes for Māori, knowledge of whakapapa, use of marae and the practise of Māori values were seen as important cultural elements, but te reo Māori was regarded as fundamental and of sufficient importance to warrant consideration as a separate outcome in its own right. While not all agreed that it was critical for wellbeing, most identified te reo Māori as the single most defining characteristic of being Māori [102].

In NZ, Kura Kaupapa Māori schools are total immersion schools designed by Māori for Māori which follow a curriculum that validates Māori knowledge, structures, processes, learning styles and learning practices. They offer a school environment that is immersed holistically in the Māori language and culture. Kura Kaupapa Māori are regarded as a key part of the strategy to assist in revitalising the Māori language and improving the participation and achievement levels of Māori in schooling [103]. Their origins can be traced back to the 1970s, when aspects of Māori language and culture began to be included in mainstream (English-medium) programmes, although they were usually delivered within the context of a westernised curriculum and in the English language. During the 1980s, schools and bilingual units (classes within schools) became established, with the expectation that they would deliver the curriculum in Māori and English. During this period, Kohanga reo (Māori language and culture preschools) also began to emerge, in response to the perceived need to provide for the regeneration of the Māori language and culture, as well as the autonomy to deliver a curriculum along cultural lines. As the number of Kohanga Reo graduates grew, parental demand resulted in the growth of bilingual and Māori immersion units within the primary and secondary school sector [104]. While early Kohanga Reo and Kura Kaupapa Māori were privately funded, Kura Kaupapa Māori were officially recognised as legitimate schools in 1989 when they were incorporated into the state education system and hence eligible for state funding [104]. Today Māori medium education takes place across the educational spectrum from pre-school to tertiary including:

1. Kohanga reo and other bilingual and immersion programmes in the early childhood sector
2. Kura Kaupapa Māori (Years 1-8) and wharekura (Years 1-13)
3. Immersion and other bilingual programmes in mainstream schools
4. Wananga in the tertiary sector.

The following section uses Ministry of Education data to explore the number of children and young people enrolled in Māori medium education during 1992-06. While it is unlikely that monitoring enrolments in Māori medium education captures the full diversity of Māori language proficiency, it is nevertheless hoped that the figures contained in the section which follows will serve as a crude proxy for measuring progress towards improving Māori language proficiency amongst NZ children and young people.

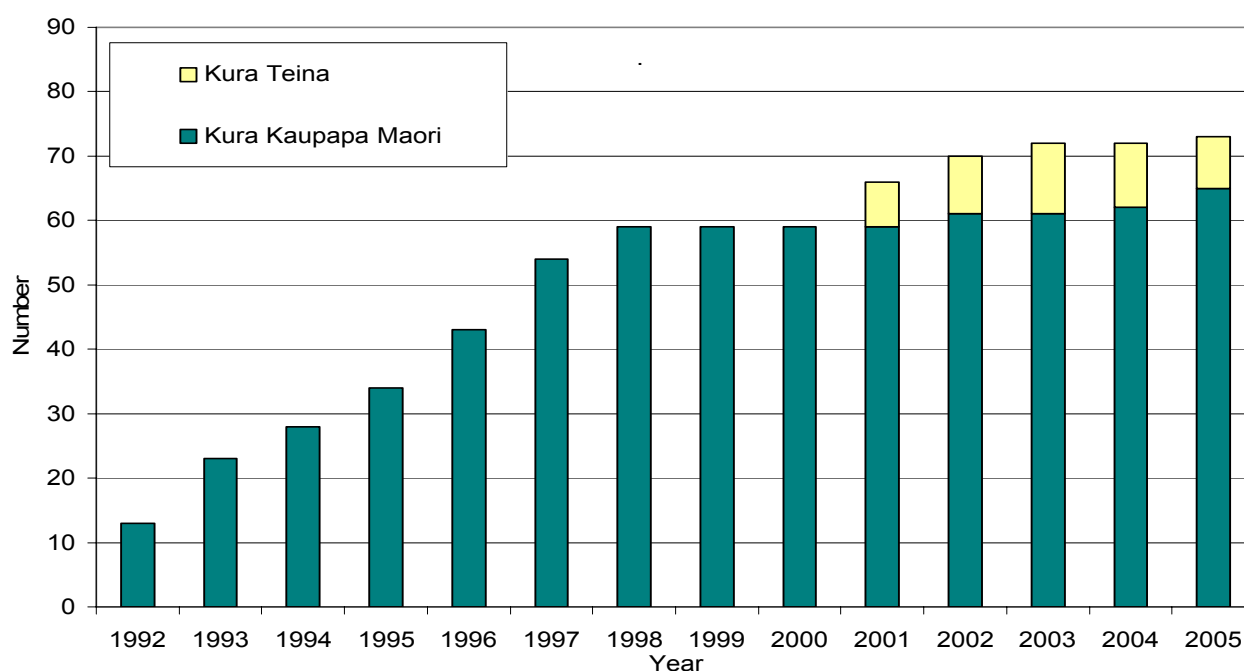
Māori Medium Education Enrolments in NZ & Counties Manukau

Kura Kaupapa Māori and Kura Teina in NZ and Counties Manukau

Kura kaupapa Māori are schools where the teaching is in the Māori language and the school's aims, purposes and objectives reflect the Te Aho Matua philosophy. Kura teina is an initiative by a community which wants to become a kura kaupapa Māori and has prepared a business case and been formally accepted by the Ministry of Education into the establishment process. During this establishment phase, kura teina are attached to and mentored by an established high performing kura kaupapa Māori. Prior to 2001, kura teina were not counted as separate schools [105].

In NZ since 1992 there has been a 5.6-fold increase in the number of kura kaupapa Māori and kura teina, from 13 in 1992 to 73 in 2005. The most dramatic increases occurred during the 1990s and since then the rate of growth has slowed, with a 24% increase in the number of schools since 2000 (**Figure 53**). Over the same period, the number of children enrolled in kura kaupapa Māori and kura teina has increased by 25%, from 4,964 in 2000 to 6,181 in 2005 [105]. In Counties Manukau during 2005, there were 4 kura kaupapa Māori and 2 kura teina, which between them enrolled a total of 542 students (**Table 19**).

Figure 53. Number of Funded Kura Kaupapa Māori and Kura Teina*, NZ 1992-2005



Source: Ministry of Education. * Note: Prior to 2001 Kura Teina were not counted as separate schools.

Māori Medium Education in NZ and the Auckland Region

While kura kaupapa Māori and kura teina offer a Māori language immersion environment, a number of other NZ schools offer some of their curriculum in the Māori language, with the degree of Māori medium learning often being divided into 4 levels:

1. Level 1: 81-100%
2. Level 2: 51-80%
3. Level 3 31-50%
4. Level 4(a) up to 30%

Thus a number of NZ students also have access to some of their educational curriculum in the Māori language, as a result of attending a bilingual school or an immersion / bilingual class in a primary or secondary school setting (**Table 20**). In the Auckland Region during March 2006, 5,306 full time equivalent students were involved in Māori medium education, with 1,931 (36.4%) of these being involved at Level 1 (80-100%) (**Table 21**).

Table 19. Number of MOE Funded Kura Kaupapa Māori and Kura Teina by DHB Region, 2005

Region	Number of Schools		Number of Students	
	Kura Kaupapa Māori	Kura Teina	Kura Kaupapa Māori	Kura Teina
Northland	8	0	807	0
Waitemata	4	0	379	0
Auckland	2	0	120	0
Counties Manukau	4	2	482	60
Waikato	8	2	921	81
Lakes	4	1	421	28
Bay of Plenty	8	1	634	11
Tairāwhiti	6	1	271	51
Taranaki	3	0	151	0
Hawke's Bay	5	0	434	0
MidCentral	3	1	289	20
Whanganui	3	0	243	0
Capital and Coast	1	0	120	0
Hutt	1	0	185	0
Wairarapa	1	0	110	0
Nelson				
Marlborough	0	0	0	0
West Coast	0	0	0	0
Canterbury	2	0	225	0
South Canterbury	0	0	0	0
Otago	1	0	27	0
Southland	1	0	111	0
NZ Total	65	8	5,930	251

In Summary

Cultural identity is a critical component of positive Māori development and has been positively linked to health status, educational achievement and emotional and social adjustment. In NZ, kura kaupapa Māori are total immersion schools which follow a curriculum that validates Māori knowledge, processes, learning styles and practices and are regarded as a key part of the strategy to revitalise the Māori language and to improve the participation and achievement levels of Māori in education. Since 1992, there has been a 5.6-fold increase in the number of kura kaupapa Māori and kura teina, with the number of children enrolled increasing from 4,964 in 2000 to 6,181 in 2005. In Counties Manukau during 2005, there were 4 kura kaupapa Māori and 2 kura teina, catering for a total of 542 students. It is hoped that the ongoing growth of kura kaupapa Māori and other schools incorporating Māori language in their teaching will continue to foster the use of Māori language amongst NZ children and young people and as a consequence, further enhance positive cultural identity.

Table 20. Number of Full-time Equivalent students involved in Māori Medium Education by School Sector and Form of Education as at 1 March (2002-06)

FORM OF EDUCATION		2002		2003		2004		2005		2006	
		Total	Māori	Total	Māori	Total	Māori	Total	Māori	Total	Māori
Primary	Immersion School	3,381	3,372	3,385	3,381	3,391	3,388	3,260	3,256	2,907	2,901
	Bilingual School	7,265	6,096	7,529	6,132	7,382	5,942	6,544	5,308	5,231	4,535
	Immersion Class	2,946	2,900	3,055	3,024	2,940	2,895	3,133	3,062	3,246	3,166
	Bilingual Class	7,127	6,362	6,805	6,065	6,617	6,051	7,224	6,070	8,045	6,572
	TOTAL	20,719	18,730	20,774	18,602	20,330	18,276	20,161	17,696	19,429	17,174
Secondary	Immersion School					94	93	113	113	121	121
	Bilingual School	338	337	542	539	584	582	737	735	982	977
	Immersion Class	307	300	469	467	151	146	275	242	284	276
	Bilingual Class	2,124	1,966	2,178	2,039	2,322	2,170	2,342	2,128	2,400	1,792
	TOTAL	2,769	2,603	3,189	3,045	3,151	2,991	3,467	3,218	3,787	3,166
Composite	Immersion School	2,324	2,323	2,779	2,772	3,038	3,027	3,058	3,050	3,025	3,022
	Bilingual School	547	534	728	723	1,031	1,026	1,273	1,270	1,352	1,334
	Immersion Class	528	519	620	606	519	507	575	564	562	556
	Bilingual Class	684	623	589	553	679	633	701	658	521	470
	TOTAL	4,083	3,999	4,716	4,654	5,267	5,193	5,607	5,542	5,460	5,382
Special	Bilingual Class	46	45	39	39	49	44	51	46	46	39
	TOTAL	46	45	39	39	49	44	51	46	46	39
TOTAL		27,617	25,377	28,718	26,340	28,797	26,504	29,286	26,502	28,722	25,761

Table 21. Number of Full-Time Equivalent Students in Māori Medium Education by Level of Learning & Region, March 2006

REGION	LEVEL OF MĀORI MEDIUM LEARNING								TOTAL	
	Level 1: 81-100%		Level 2: 51-80%		Level 3: 31-50%		Level 4(a): up to 30%			
	Total	Māori	Total	Māori	Total	Māori	Total	Māori	Total	Māori
Northland	1,224	1,221	819	798	723	634	494	413	3,260	3,066
Auckland	1,931	1,898	953	906	1,448	1,312	974	386	5,306	4,502
Waikato	2,089	2,070	529	525	329	307	699	493	3,646	3,395
Bay of Plenty	2,575	2,553	858	848	881	708	2,073	1,354	6,387	5,463
Gisborne Region	699	694	248	243	485	476	215	195	1,647	1,608
Hawkes Bay	674	672	586	580	638	610	472	406	2,370	2,268
Taranaki	186	185	58	57	68	50	140	68	452	360
Manawatu-Whanganui	866	864	520	509	382	339	500	361	2,268	2,073
Wellington Region	1,202	1,198	207	196	80	67	397	291	1,886	1,752
Canterbury	402	378	229	206	298	202	95	34	1,024	820
Otago	28	27	16	16			5	5	49	48
Southland	139	138	42	37					181	175
Tasman	43	42			5	5	2	2	50	49
Nelson Region	24	24	106	98	25	21			155	143
Marlborough			41	39					41	39
TOTAL	12,082	11,964	5,212	5,058	5,362	4,731	6,066	4,008	28,722	25,761

YOUNG PEOPLE 15-24 YEARS



LIFESTYLE AND BEHAVIOURAL FACTORS



SMOKING IN YOUNG PEOPLE

ASH Surveys suggest that in NZ during 2005, 16.8% of young people aged 14-15 years smoked at least monthly, with 9% smoking on a daily basis [37]. Factors associated with higher smoking rates included gender (female > male), ethnicity (Māori > Pacific > European > Asian), relative socioeconomic deprivation (school decile: least affluent > more affluent), parental smoking (both parents > one parent > neither parent) [37], pocket money (larger amounts > smaller amounts) [106] and peer smoking behaviour [107].

The disparities highlighted by this survey are a cause of concern, as the Christchurch Longitudinal Study has shown that amongst adolescents, the transition from non-smoking to smoking is a one way process that accelerates with age and that once teenagers graduate to a given smoking status, return to earlier stages is uncommon [108]. These findings are also supported by overseas research, which suggests that 33-50% of young people who try smoking (even a few cigarettes), become regular smokers, with the transition taking on average 2-3 years. Once smoking regularly, the well documented signs of nicotine dependence and withdrawal become as evident amongst adolescents, as they do in the adult population [109]. As a consequence, adolescent smoking is one of the key predictors of adult smoking behaviour, with ¾ of adult smokers trying their first cigarettes and becoming daily smokers before the age of 18 years. Early onset smoking in turn, has been associated with an increased risk of heavy smoking and smoking related diseases [109], including coronary heart disease, stroke, lung cancer and chronic obstructive lung disease and in the context of passive smoking, childhood respiratory disease, fetal growth restriction and SIDS [33]. Thus any initiatives which reduce the uptake of smoking amongst adolescents will have far reaching effects, not only for the current generation of NZ young people as they grow into maturity, but also for the next generation of NZ children who, as a result of their parent's smoking behaviour, are likely to be exposed to cigarette smoke in utero and during their early years.

The following section reviews information on youth smoking behaviour in NZ and Counties Manukau using data from two different sources. The first is the annual ASH Year 10 Surveys, which collect information on the smoking behaviour of >30,000 14-15 year old secondary school students in NZ each year, while the second is the NZ Census (1996 & 2006), which collects information on the number of young people aged >15 years who smoke on a regular basis.

Data Sources and Statistical Methods

ASH Year 10 Surveys

Action on Smoking and Health (ASH) was established in 1982 with the aim of reducing smoking and smoking related premature deaths. While the Ministry of Health provides finding for the annual national Year 10 (4th form) Smoking Survey, ASH manages data collection and oversees analysis of the data [37]. Since 1997, ASH has conducted annual surveys of smoking behaviour amongst Year 10 (14-15 year old) students and since 1999, these surveys have collected information from >30,000 students annually. In 2000 and 2001, >70% of schools in NZ participated, and of these >70% of enrolled students took part [36]. Questionnaires are self administered and cover demographic variables as well as smoking related issues. Survey forms with instructions are mailed to all secondary schools and teachers supervise the completion of the questionnaires by students. While it has been suggested that such a design means that it is not always clear how the sample has been selected and how consistently the survey has been administered, the large sample size and annual frequency makes the survey useful for monitoring smoking behaviour of 14-15 year old students in NZ and is a useful tool for understanding trends and risk factors for smoking initiation [41]. The information in the following section has been used with the permission of ASH.

1996 and 2006 Census Data

At both the 1996 and 2006 Censuses all respondents aged ≥ 15 years were asked “*Do you smoke cigarettes regularly (that is one or more per day)?*” The figures used in this section refer to the number of young people aged 15-24 years who answered yes to this question. Figures are for the usually resident population and are based on Statistics NZ’s prioritised Level 1 ethnicity and the NZDep 2001 Index. Note: Census data categorises those >15 years into two groups: smokers and non smokers, with missing responses being assigned to the non smoking category. Thus Census data may underestimate the proportion of smokers, as the numbers with missing information is unspecified.

ASH Smoking Survey Data

Since 1999, ASH has conducted surveys of $>30,000$ Year 10 students annually, with $>70\%$ of schools in NZ participating, and $>70\%$ of students taking part [36]. The results reflect the smoking behaviour of 14-15 year old secondary school students in NZ and are useful in understanding trends and risk factors for smoking initiation in this country.

Gender and Ethnicity

During 1999-05, with the exception of Asian students, daily smoking rates in Year 10 were highest amongst females. There were also marked variations in daily smoking rates by ethnicity, with rates being highest for Māori $>$ Pacific $>$ European / Other $>$ Asian young people. During this period however, daily smoking rates declined for all ethnic groups (Māori female -26%; Māori Male -40%; Pacific female -37%; Pacific male -37%; Asian female -50%; Asian male -31%; European / Other female -43%; European / Other male -56%) (**Figure 54**).

Socioeconomic Status

During 1999-05, there were also marked socioeconomic (SES) gradients in daily smoking rates amongst Year 10 students, with rates being highest amongst those attending schools in the least affluent areas. While gender differences were again evident, these diminished as the level of affluence increased, with the marked female predominance evident in schools in the least affluent areas virtually disappearing in the most affluent schools. Again, daily smoking rates declined for all school SES deciles, although in relative terms, once adjusted for ethnicity, these declines were greatest for those attending the most affluent schools (Decile 1-2 (least affluent) females -19%, males -39%; Decile 5-6 (average) females -31%, males -48%; Decile 9-10 (most affluent) females -53%, males -62%) (**Figure 55**).

Parental Smoking

During 2001-05, daily smoking rates were highest amongst students for whom both parents smoked $>$ one parent smoked $>$ neither parent smoked. While daily smoking rates declined for all 3 groups during this period, once relative changes had been adjusted for age, sex and ethnicity, smoking rates declined more slowly amongst those with two smoking parents (both parents smoking -21%; one parent smoking -38%; neither parent smoking -40%) (**Figure 56**).

Daily Smoking Rates in Counties Manukau

In Counties Manukau during 1999-05, the proportion of Year 10 students who were daily smokers declined, from 17.2% in 1999 \rightarrow 8.8% in 2005, while the proportion who had never smoked increased, from 37.7% in 1999 \rightarrow 53.0% in 2005. Throughout this period, daily smoking rates in Counties Manukau were generally similar to the NZ average, while the proportion who had never smoked was higher (**Figure 57**).

Figure 54. Daily Smoking Rates amongst Year 10 Students by Gender and Ethnicity, NZ ASH Surveys 1999-2005

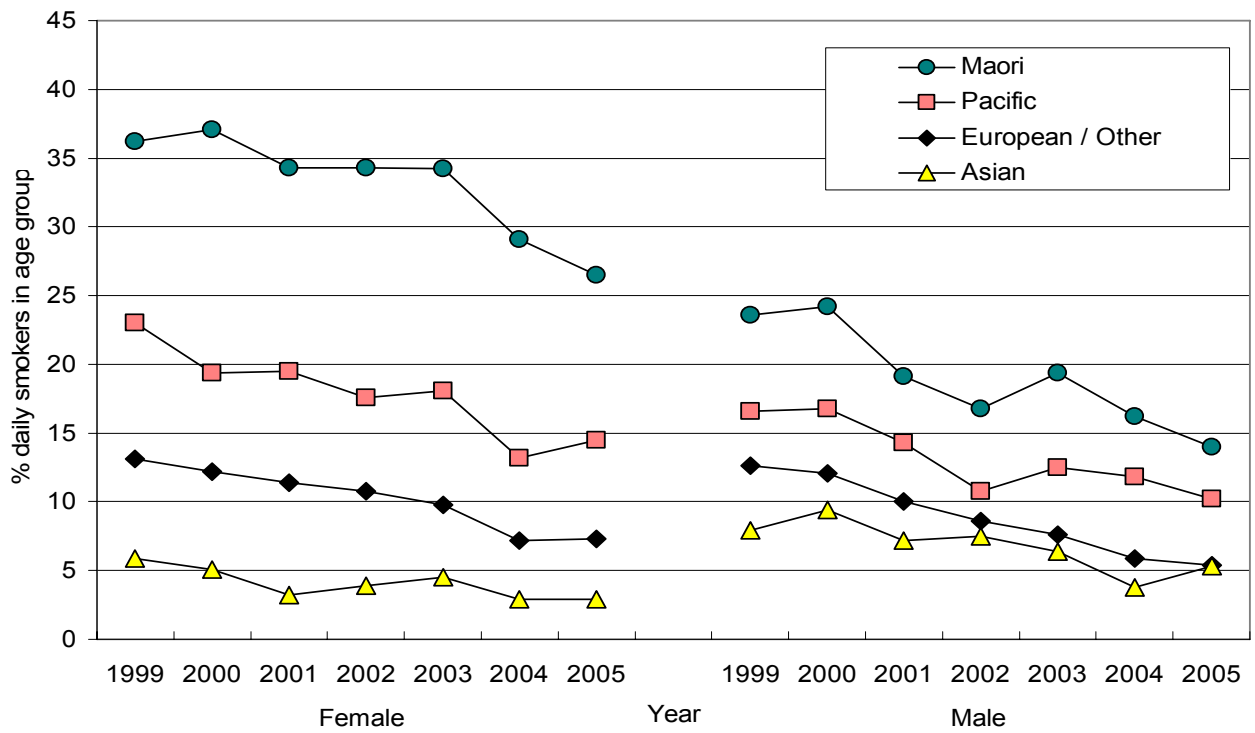


Figure 55. Daily Smoking Rates in Year 10 Students by Gender and School Decile, NZ ASH Surveys 1999-2005

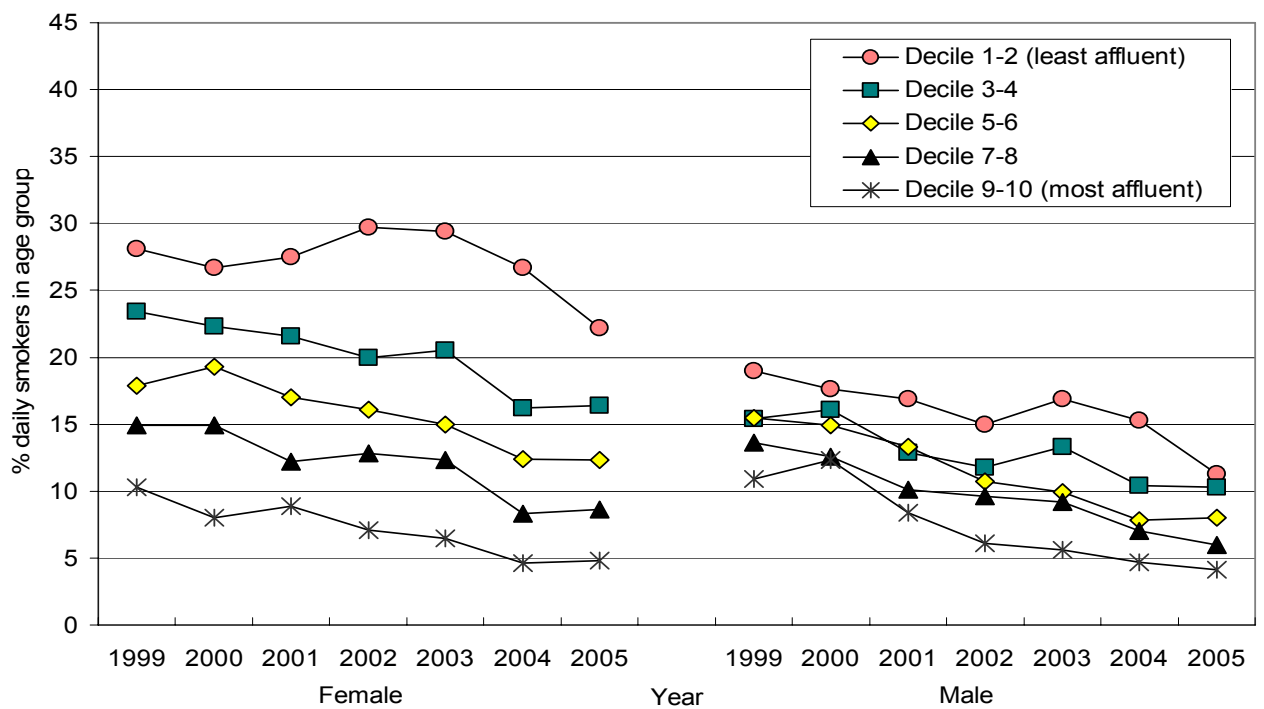


Figure 56. Daily Smoking Rates in Year 10 Students by Parents Smoking Status, NZ ASH Surveys 2001-2005

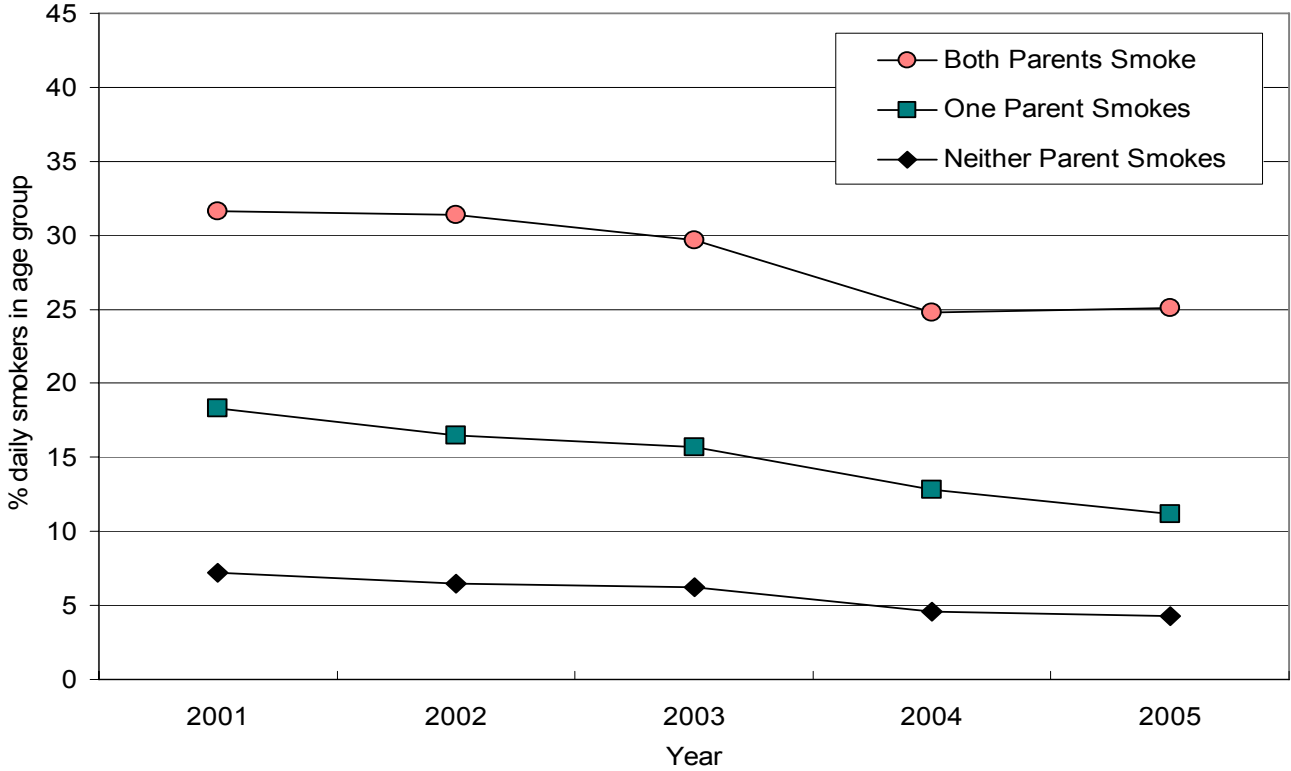
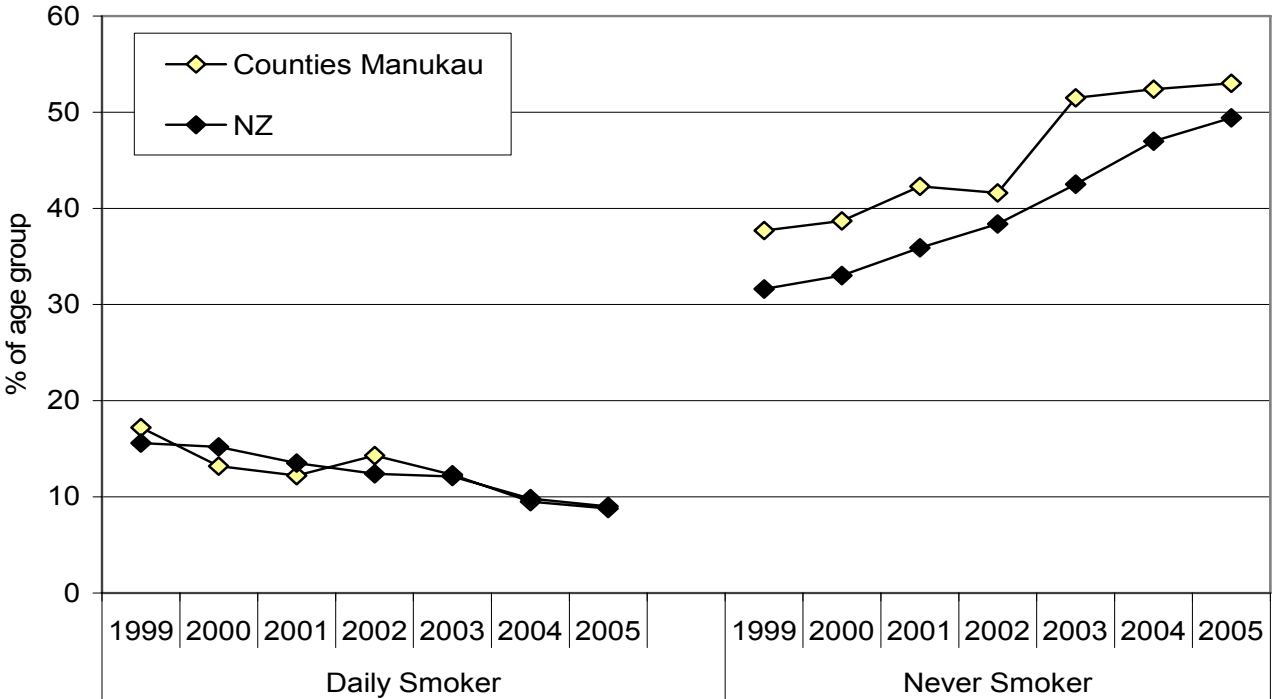


Figure 57. Daily vs. Never Smoking Rates in Year 10 Students, Counties Manukau vs. NZ ASH Surveys 1999-2005



Smoking in Young People 15-24 Years at the 1996 & 2006 Censuses

At the 1996 and 2006 Censuses all respondents aged ≥ 15 years were asked “Do you smoke cigarettes regularly (that is one or more per day)?” The figures in this section refer to the number of young people 15-24 years who answered yes to this question.

Regional and Ethnic Differences

In Counties Manukau during 1996, 23.7% of young people (15-24 yrs) reported smoking cigarettes regularly, as compared to 24.5% nationally. During the same period marked ethnic disparities were also evident, with 42.1% of Māori and 23.0% of Pacific young people being regular smokers, as compared to 21.6% of European and 5.9% of Asian / Indian young people. These disparities were very similar to those occurring nationally (**Figure 58**).

Socioeconomic Differences

There were also marked socioeconomic disparities in the proportion of Counties Manukau young people who were regular smokers during 1996, with rates rising progressively from 14.1% amongst those living in the most affluent (Decile 1) areas, to 31.5% amongst those living in the most deprived (Decile 10) areas. While socioeconomic gradients were similar to those occurring in NZ as a whole (NZ Decile 1 14.9% vs. Decile 10 33.8%), at each level of NZDep deprivation, smoking rates in Counties Manukau were slightly lower than the NZ average (**Figure 59**).

Relationship Between Socioeconomic Status and Ethnicity

While there were insufficient numbers to undertake an analysis of the relationship between ethnicity and socioeconomic deprivation at a regional level, an analysis of NZ level data suggested that for each of NZ’s largest ethnic groups, the proportion of young people who were regular smokers during 1996 increased with increasing socioeconomic deprivation, but that at nearly every level of deprivation, smoking rates remained higher for Māori > Pacific & European > Asian / Indian young people (**Figure 60**).

Figure 58. Proportion of Young People 15-24 Years who Smoked by Ethnicity, Counties Manukau vs. NZ at the 1996 Census

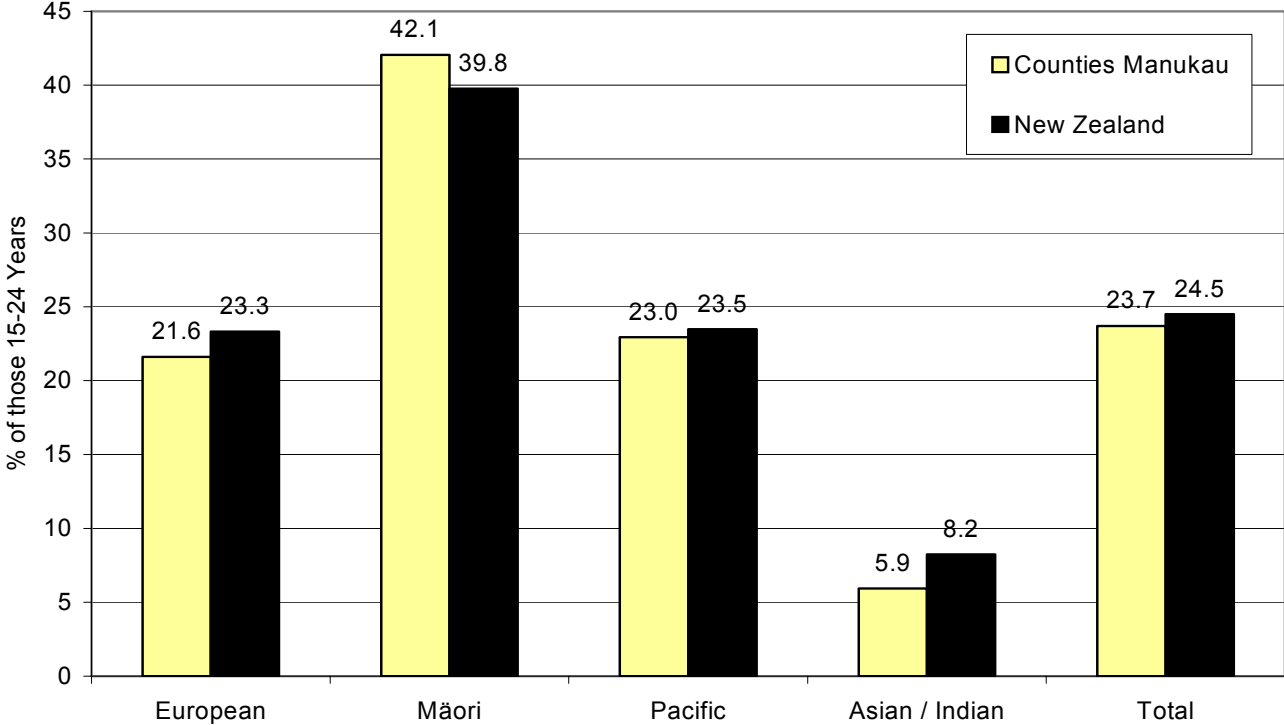


Figure 59. Proportion of Young People 15-24 Years who Smoked by NZ Deprivation Index Decile, Counties Manukau vs. NZ at the 1996 Census

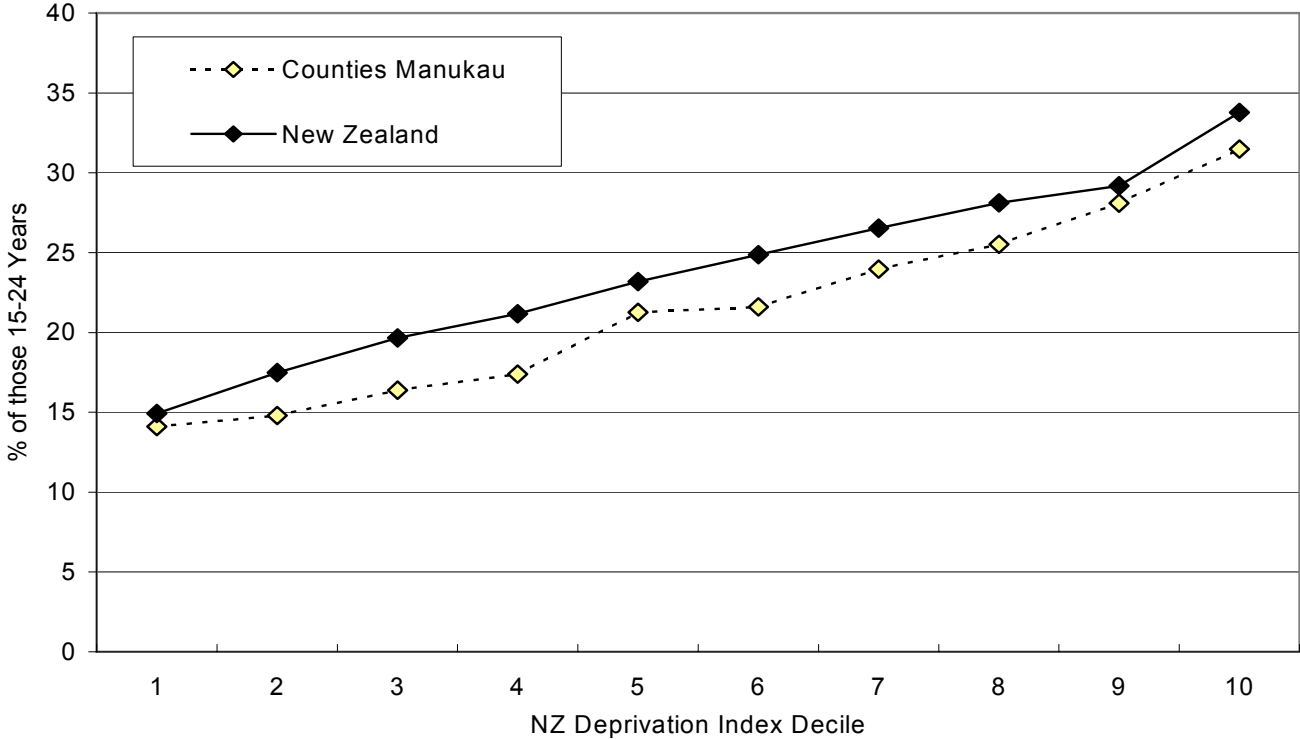
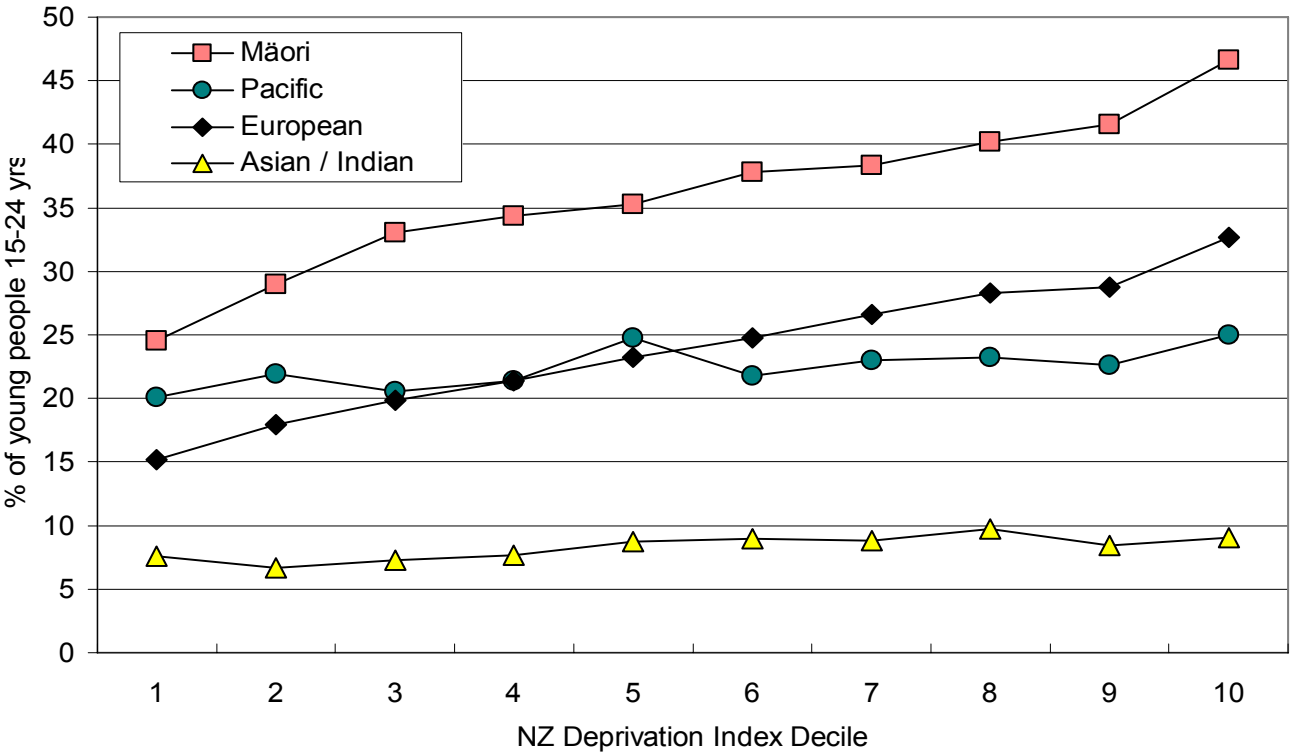


Figure 60. Proportion of Young People 15-24 yrs who Smoked by Ethnicity and NZ Deprivation Index Decile, NZ at the 1996 Census



In Summary

High youth smoking rates are a cause for concern, as research suggests that 33-50% of young people who try smoking become regular smokers, with the transition taking on average 2-3 years. Once smoking regularly, the well documented signs of nicotine dependence and withdrawal become evident, as they do in the adult population. In NZ, the Census (1996 & 2006) and ASH collect information on youth smoking. ASH Surveys suggest that in NZ during 1999-05, daily smoking rates among Year 10 students were highest amongst females, Māori > Pacific > European / Other > Asian young people, those in the most deprived areas and those for whom one or both parents smoked. During 1999-05, daily smoking rates declined for all ethnic and socioeconomic groups, although declines were less rapid for students attending schools in the more deprived areas and for those for whom both parents smoked. In Counties Manukau, the proportion of Year 10 students who were daily smokers declined from 17.2% in 1999→ 8.8% in 2005, with smoking rates during this period being similar to the NZ average.

Data from the 1006 Census demonstrated a similar picture, with 23.7% of Counties Manukau young people (15-24 yrs) being regular smokers, as compared to 24.5% nationally. Rates were higher for Māori > Pacific > European > Asian / Indian young people and those living in the most deprived areas. Such disparities are of concern, as if left unaddressed they potentially signal ongoing disparities in later adult health outcomes (e.g. respiratory and ischaemic heart disease), as well as in-utero and early childhood exposures as the current generation of Counties Manukau young people begin their own families in future years.

ALCOHOL USE

The Alcohol Advisory Council (ALAC)'s annual survey estimated that in NZ during 2005, 80% of young people aged 12-17 years had tried alcohol, 53% were current drinkers and that 22% drank at least once a week. In addition, 44% of males and 30% of females reported binge drinking (≥ 5 drinks) on their last drinking occasion [110]. Using this information, ALAC grouped young people into 4 main categories:

1. **Non-Drinkers:** 48% of young people, usually < 13 years of age and / or attending church.
2. **Supervised Drinkers:** 21% of young people, usually 14+ years of age, at school and drinking fortnightly, monthly or less, typically at home with their parents / whanau. Supervised drinkers tended to consume ≤ 2 drinks per occasion and to be concerned about the short term (e.g. behaviour, hangovers) and long term (e.g. health, weight) effects of alcohol.
3. **Social Binge Drinkers:** 16% of young people. This group tended to drink regularly (\geq every two weeks) and to binge (52% drank ≥ 5 drinks on the last occasion), mainly with their friends on weekends or holidays. Social binge drinkers tended to be 16+ years of age, at school and to drink for the social benefits (e.g. comradeship, sense of belonging, confidence) and because everyone else was drinking.
4. **Uncontrolled Binge Drinkers:** 16% of young people. This group were typically male, drank \geq once a week and binge drank (54% drank ≥ 5 drinks on the last occasion). Uncontrolled binge drinkers were generally ≥ 16 years of age, less likely to be at school ($\sim 1/3$ were in employment) and frequently drank to enjoy the physical "buzz", or with the intention of getting drunk [110].

While these figures suggest that many NZ young people are either non-drinkers or drink infrequently under the supervision of their parents / whanau, the high number of binge drinkers has potential public health consequences, with the Youth 2000 Survey (a representative survey of 9,699 secondary school students [111]), noting that of those who had ever drunk alcohol:

1. 28% had got into trouble
2. 26% done something they would not normally do (e.g. breaking rules / law)
3. 14% had got into a fight
4. 13% had had an injury or accident
5. 12% had had sex while drunk and later regretted it
6. In the last month, 27% had ridden in a car driven by someone who was potentially drunk
7. In the last month, 8% had driven a car while potentially drunk

Such adverse outcomes are of particular relevance in the context of the current debate on the minimum age for purchasing alcohol in NZ, which in 1999 was lowered from 20 to 18 years. Since that time a number of studies have suggested possible negative health consequences in the areas of emergency department attendances and hospital admissions for injuries, traffic crashes and intoxication [112] [113] [114]. But while initiatives aimed at reducing the availability of alcohol to under-age young people are seen as one way of reducing the burden of alcohol related harm [111], the 2001 National Alcohol Strategy suggests that such supply based strategies are most effective when adopted in conjunction with demand reduction strategies (e.g. education, labelling, moderation advertising) and problem limitation initiatives (e.g. host responsibility in licensed premises and private venues) [115].

The following section explores the potential impact of alcohol on (non-emergency department) hospital admissions in young people 15-24 years. Because alcohol is often seen as only a contributory cause (e.g. in an alcohol related traffic crash, alcohol will only be listed after the primary diagnosis (e.g. fractured femur) and external causes (e.g. vehicle occupant in transport accident) have been recorded), the following section includes all (non-emergency department) admissions in which alcohol was listed in the first 15 diagnoses, or the first 10 external causes (injury admissions) of the National Minimum Dataset. While it is likely that such an approach will be subject to significant undercounting, as it relies on the thoroughness of hospital staff in documenting all relevant contributory causes (see Methods Section for estimate of undercount), it is nevertheless hoped that such an approach will serve to identify “the tip of the iceberg” in terms of the contribution alcohol use makes to hospital admissions in this age group.

Data Sources and Statistical Methods

Alcohol related hospital admissions in this analysis included those with any mention of an alcohol related condition in the first 15 diagnostic codes or the first 10 external cause codes of the National Minimum Dataset. Alcohol related conditions included ICD-10 Diagnostic Codes F10 Mental & Behavioural Disorders Due to Alcohol, T51 Toxic Effects of Alcohol and ICD-10 E codes X45 Accidental Poisoning by and Exposure to Alcohol, X65 Intentional Self Poisoning by and Exposure to Alcohol, Y15 Poisoning by and Exposure to Alcohol of Undetermined Intent, Y90-91 Evidence of Alcohol Involvement Determined by Blood Alcohol Level or Level of Intoxication. All cross sectional analyses for the 2001-2005 period were undertaken using ICD-10 codes. For time series analysis, alcohol related conditions were coded in ICD-9 to ensure continuity, with ICD-10 codes being back mapped to ICD-9 by the NZHIS for the years prior to 2001. Relevant ICD-9 Diagnostic Codes included ICD-9 291 Alcohol Induced Mental Disorders, 305.0 Alcohol Abuse, 303 Alcohol Dependence Syndrome and 989 Toxic Effects of Alcohol, while ICD-9 E codes included E860 Accidental Poisoning by Alcohol. In addition, because of inconsistent uploading of emergency department cases to the National Minimum Dataset (see Appendix 2 of 2005 Report) all hospital admissions with an Emergency Department Specialty Code on discharge were also excluded from this analysis. Cause of injury was assigned using the E code relating to each injury admission. Denominators were derived from the usual resident NZ and DHB populations as estimated at the 1986, 1991, 1996 and 2001 censuses, with linear extrapolation being used to estimate population numbers between censuses. Age-specific hospital admission (2001-05) rates were calculated by dividing the (5 year) total number of Alcohol Related Admissions in each 1-year age bracket, by the total extrapolated census populations for the same 5 year period. Similar procedures were used to estimate ethnic and NZDep specific hospital admission rates during 2001-2005. Relative risks were calculated by dividing admission rates in each category of interest by those of the reference category, while confidence intervals were calculated using the Epi Info statistical software program.

Extent of Undercounting: A 2000 study of the role alcohol played in injury attendances at an Auckland emergency department noted 35% of injured patients had consumed alcohol prior to their injury, a figure considerably higher than the usual 10-18% reported overseas [116]. An analysis of NZ emergency department cases for the period 2000-05 using the methodology described above (age 15-24 yrs in the NMDS), found that 10.3% of injury cases had a mention of alcohol, while only 4.5% of injury cases admitted beyond the emergency department setting (the group reviewed in this section) had alcohol as a listed cause. As a result, the figures contained in this section are likely to underestimate the burden of alcohol related morbidity amongst the youth population and when interpreting the data contained in this section, this must be borne in mind.

Alcohol Related Hospital Admissions in NZ and Counties Manukau

Age

In NZ during 2001-05, alcohol related hospital admissions were relatively infrequent in children, but rose rapidly in the early teens, reaching a plateau in the late teens / early 20s (**Figure 61**).

Ethnicity and NZ Deprivation Index Decile

In NZ during 2001-05, there were marked socioeconomic disparities in alcohol related hospital admissions, with rates being 2.68 times higher for those living in the most deprived (Decile 10) areas, when compared to those living in the most affluent (Decile 1) areas. Ethnic disparities were also evident, with admission rates being 2.10 times higher for Māori young people than for European young people. Admission rates for Pacific (RR 0.81) and Asian / Indian (RR 0.13) young people were significantly lower (**Table 22**).

Nature of Alcohol Related Admissions

Alcohol was listed as a contributory cause in a large number of hospital admissions for young people during 2001-05. Analysis of the primary diagnosis for each of these admissions suggested that only 12.3% had acute intoxication or poisoning by alcohol listed as the primary diagnosis. In 36.2% of cases an injury was the primary diagnosis, with head injuries and injuries of the upper limbs playing a particularly prominent role. In addition, a further 28.5% of admissions had a mental health condition listed as the primary diagnosis, with schizophrenia making up the single largest diagnostic category in this group. Finally 10.8% of admissions had poisoning by other drugs or substances listed as their primary reason for admission (**Table 23**). In interpreting these figures however, it must be remembered that as a result of inconsistent uploading of emergency department cases to the National Minimum Dataset (Appendix 2 of 2005 Report), emergency department cases have been removed (see methods section). Thus these figures potentially reflect the more severe end of spectrum, as it is likely that many cases of intoxication or minor alcohol related injuries are dealt with and discharged in the emergency department setting. In addition, it is likely that these figures represent an undercount, as they rely on hospital staff at the time of discharge listing alcohol use as a contributory cause, something which may be reported inconsistently over time and across the country.

Injury Admissions with Alcohol as a Contributory Cause

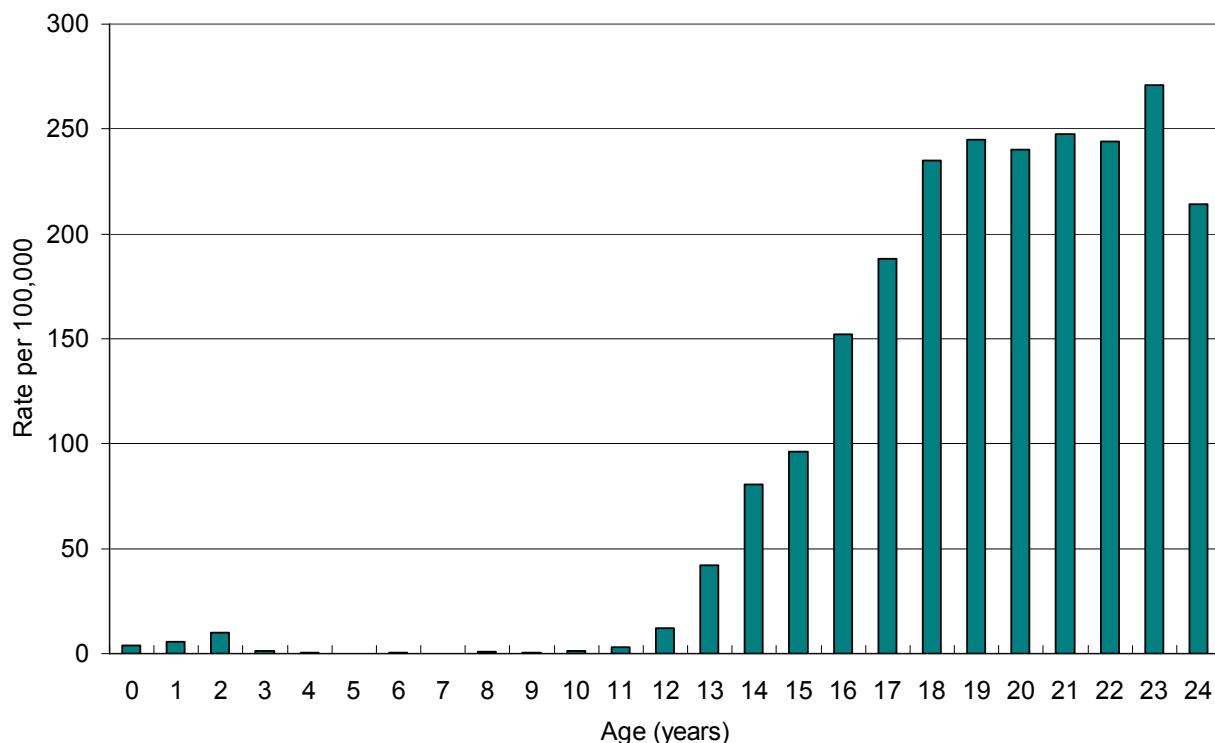
An analysis of those who were admitted with a primary diagnosis of injury and alcohol use listed as a contributory cause, suggested that 26.4% of these injuries were sustained as a result of an assault, with a further 20.1% being sustained while the young person was the occupant of a vehicle. Of note, a large proportion of vehicle accidents were not with other vehicles, but arose as a result of the car crashing into a stationary object, or in a non-collision situation (e.g. vehicle overturning). Finally 18.7% of injuries resulted from a fall and a further 15.5% from contact with sharp glass (**Table 24**).

Alcohol Related Admissions in Counties Manukau

In Counties Manukau during 1990-05, while the number of alcohol related hospital admissions increased dramatically, admission rates remained lower than for the rest of NZ. In interpreting these figures it must be remembered that such differences may reflect differences in the way emergency departments handle alcohol related conditions across the country, differences in the way in which hospital coders record contributory causes, as well as differences in the underlying burden of alcohol related injury and harm. Nevertheless such

figures suggest that a potentially large number of admissions in the Counties Manukau region each year may have had alcohol as a contributory cause.

Figure 61. Alcohol Related Hospital Admissions* by Age, NZ Children and Young People 0-24 Years 2001-2005



* Admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department discharges removed.

Table 22. Ethnicity, NZDep Index Decile and Risk of Alcohol Related Hospital Admission*, NZ Young People 15-24 Years, 2001-2005

Variable	Rate*	RR	95% CI	Variable	Rate*	RR	95% CI
NZDep Index Decile				NZDep Index Quintile			
1	114.7	1.00		1-2	114.4	1.00	
2	114.1	0.99	0.83-1.19	3-4	160.2	1.40	1.25-1.57
3	153.8	1.34	1.13-1.59	5-6	194.7	1.70	1.52-1.90
4	165.9	1.45	1.23-1.71	7-8	254.7	2.23	2.01-2.47
5	183.9	1.60	1.36-1.89	9-10	274.6	2.40	2.17-2.66
6	204.0	1.78	1.52-2.08	Ethnicity			
7	253.0	2.21	1.89-2.57	Māori	400.6	2.10	1.98-2.23
8	256.2	2.23	1.92-2.59	Pacific	154.7	0.81	0.72-0.92
9	247.8	2.16	1.87-2.50	European	191.0	1.00	
10	307.7	2.68	2.32-3.11	Asian / Indian	25.0	0.13	0.10-0.17

*Rate per 100,000 per year, relative risks are unadjusted. Admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department discharges removed.

Table 23. Alcohol Related Hospital Admissions* by Primary Diagnosis, NZ Young People 15-24 Yrs, 2001-2005

ICD-10	Condition	Number	Rate*	%
Mental and Behavioural Disorder Codes				
F100	Alcohol Intoxication	503	20.5	9.7
F102	Alcohol Dependence	122	5.0	2.4
F101, F103-F109	Other Mental and Behavioural Disorder due to Alcohol	92	3.7	1.8
F20	Schizophrenia	461	18.8	8.9
F21-F29	Other Schizotypal and Delusional Disorders	206	8.4	4.0
F31	Bipolar Affective Disorder	121	4.9	2.3
F32-F33	Depression / Recurrent Depressive Disorder	181	7.4	3.5
F43	Reaction to Stress / Adjustment Disorders	122	5.0	2.4
F00-F99	Other Mental and Behavioural Disorders	294	12.0	5.7
Digestive System Codes				
K 226, K292, K920	Upper Gastrointestinal Bleeding / Gastritis	83	3.4	1.6
Injury and Poisoning Codes				
T51	Toxic Effect of Alcohol	133	5.4	2.6
T36-50	Poisoning by Drugs, Medicines & Biological Substances	560	22.8	10.8
S00-S09	Head Injuries	834	33.9	16.1
S42, S52, S62	Upper Limb Fractures	104	4.2	2.0
S50-51, S53-59	Other Elbow and Forearm Injuries	166	6.8	3.2
S60-61, S63-69	Other Wrist and Hand Injuries	233	9.5	4.5
S72, S82, S92	Lower Limb Fractures	143	5.8	2.8
S10-T79	Other Injuries	393	16.0	7.60
All Other Diagnostic Codes				
Remaining ICD Codes	Other Conditions	426	17.3	8.2
Total		5177	210.6	100.0

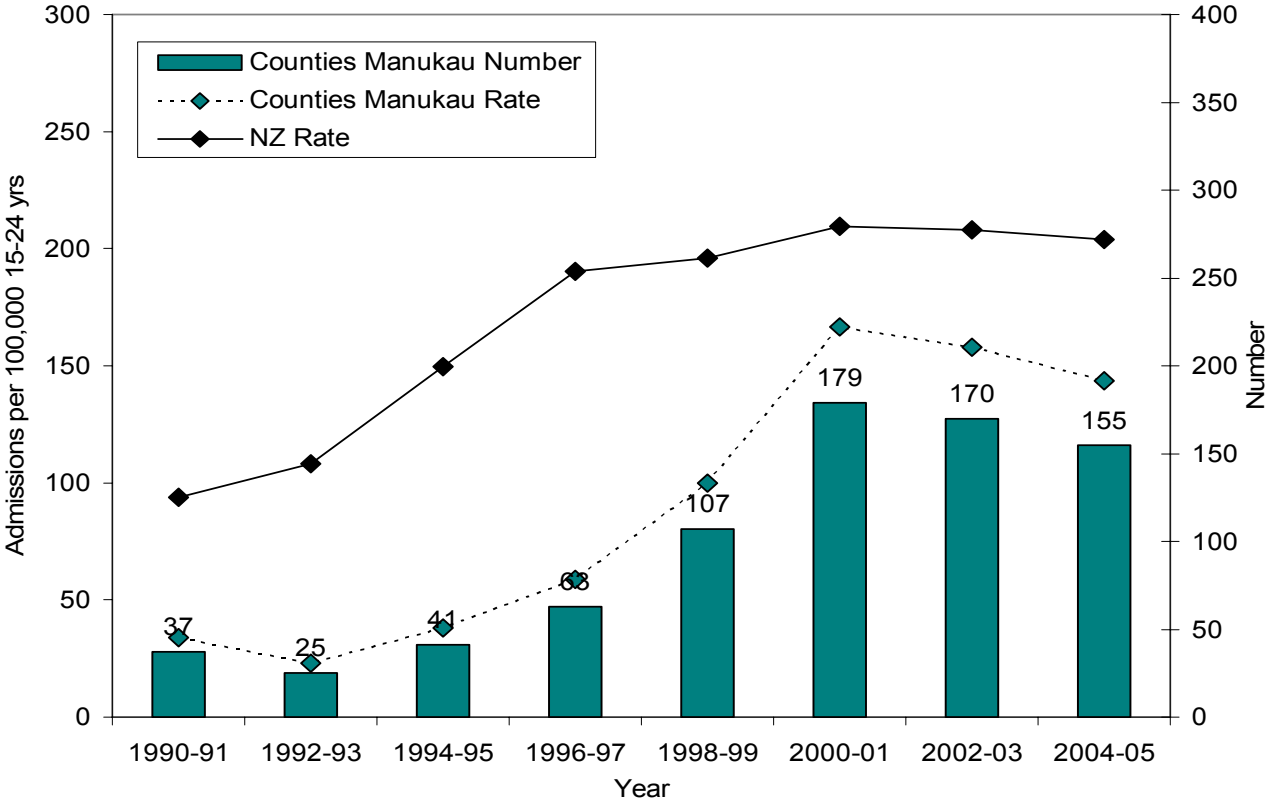
*Rate per 100,000 per year. Admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department discharges removed.

Table 24. Primary Cause of Alcohol Related Admissions* Resulting in Injury, NZ Young People 15-24 Years, 2001-2005

ICD-10 Code	Cause of Injury	Number	Rate*	%
V01-V19	Pedestrian or Cyclist in Transport Accident	89	3.6	4.8
V47	Car occupant in collision with stationary object	161	6.5	8.6
V48	Car occupant in non collision e.g. overturning	125	5.1	6.7
V40-79	Vehicle occupant in transport accident	90	3.7	4.8
V20-39, V80-89, V98-99	Other Land Transport Accident	45	1.8	2.4
W00-W19	Falls	350	14.2	18.7
W25	Contact with Sharp Glass	291	11.8	15.5
X60-84	Intentional Self Harm	58	2.4	3.1
Y04	Assault by Bodily Force	284	11.6	15.2
X85-Y09	Other Assault	210	8.5	11.2
Remaining ICD Codes	Other Causes	170	6.9	9.1
Total		1873	76.2	100.0

*Rate per 100,000 per year. Admissions with any mention of alcohol in the 2nd - 15th diagnostic codes or 2nd-10th external cause codes and with an injury as a primary diagnosis; Emergency Department discharges removed.

Figure 62. Alcohol Related Hospital Admissions* Amongst Young People 15-24 Years, Counties Manukau vs. NZ 1990-2005



In Summary

The Alcohol Advisory Council (ALAC)’s 2005 survey suggested that 80% of young people 12-17 years had tried alcohol, 53% were current drinkers and that 44% of males and 30% of females binge drank (≥5 drinks) on their last drinking occasion. The high proportion of binge drinkers has significant public health consequences, with the Youth 2000 Survey suggesting that of secondary school students who had ever drunk alcohol, a significant minority had got into trouble or fights, had an injury or accident, driven while potentially drunk or had sex while drunk and later regretted it.

During 2001-05, alcohol related hospital admissions were highest for those in their late teens / early 20s, for Māori young people and for those living in the most deprived areas. Reasons for admission included acute intoxication, mental health issues and injuries, with the latter commonly arising from an assault or a motor vehicle crash. Significant methodological constraints however must be taken into consideration when interpreting these findings, as with the removal of emergency department cases, these figures reflect the more severe end of spectrum. In addition, it is likely that these figures represent an undercount, as they rely on hospital staff at the time of discharge listing alcohol use as a contributory cause, something which may be reported inconsistently over time and across the country. Nevertheless it is hoped that the figures presented in this section can act as a starting point when considering the range and extent of alcohol related harm amongst young people in Counties Manukau in recent years.

EDUCATION



INTRODUCTION

While education has traditionally been regarded as an issue outside the control of the health sector, an understanding of the role education plays in the genesis of health inequalities is crucial if DHBs are to develop long term strategies to improve health status in their regions. As an important determinant of health, education and is thought to act via 4 main pathways [117]:

1. **Enhancing Socioeconomic Position:** By enhancing earnings and occupational status and reducing the risk of unemployment, educational attainment increases the level of resources available to individuals and reduces their exposure to job insecurity, stress and the negative effects these have on mental and physical wellbeing.
2. **Better Access to Health Services:** In situations where diagnoses and treatments are not straight forward, education benefits health through enabling individuals to work the health system more effectively, particularly if it is complicated or unfamiliar.
3. **Uptake of Health Related Practices:** Educational attainment has been associated with the uptake of a range of health related practices including exercise, a healthy diet, dental hygiene, the absence of smoking, moderate alcohol and drug consumption, the use of seatbelts and condoms and adherence to medical advice. While the correlations are reasonably consistent the pathways remain unclear, although recent research has focused on the role education plays in increasing feelings of personal control, which in turn increase the likelihood people will initiate preventive behaviours e.g. quitting smoking.
4. **Coping with Stress:** It is thought that educational attainment enhances social integration, civic engagement and social networks and that these factors in turn allow social resources to be drawn on in times of stress, thereby enhancing an individual's resilience to stressful events and reducing their reliance on strategies such as smoking, alcohol and stress related eating.

In addition, education is thought to play a crucial role in the intergenerational transmission of socioeconomic disadvantage. While this is a complex area, with many factors (e.g. parental expectations, patterns of socialisation, inheritance of resources, genetic factors) potentially playing a role, educational attainment is often seen as a crucial (dis)continuity point, reflecting simultaneously the socioeconomic environment in which a young person grows up, as well as their likely occupation and earning potential in future years. As a consequence, education is often seen as THE major determinant of long range social mobility for those <30 years of age [118], making it a crucial intervention point in any strategy to reduce disparities in health outcome.

The following sections, using data from the Ministry of Education, explore indicators of educational performance and participation amongst young people in NZ and Counties Manukau during the past decade. The indicators reviewed in these sections include:

1. Educational Attainment at School Leaving
 - School Leavers with No Qualifications
 - School Leavers with a University Entrance Standard
2. Retention of Students in Senior Secondary Schools
3. Stand-Downs, Suspensions, Exclusions and Expulsions

EDUCATIONAL ATTAINMENT AT SCHOOL LEAVING

In an increasingly knowledge based society, formal school qualifications are crucial in ensuring that young people gain access to tertiary education and entry level jobs [119]. Yet despite this, during 2005 12.9% of school leavers left school with little or no formal attainment. While some of these students may have continued their education through other tertiary providers, it is likely that a significant number would have also attempted to join the workforce, a process made more difficult by their lack of formal qualifications [120].

In attempting to understand why some students leave school with little or no formal attainment, the Ministry of Education (MOE) recently commissioned a literature review on the determinants of children's educational attainment [121]. This review suggested that:

1. There are marked ethnic disparities in children's educational achievement, with European and Asian children consistently achieving at higher levels than Māori and Pacific children do, although some of these differences may be due to socioeconomic factors.
2. There are marked socioeconomic disparities in childhood educational achievement, with performance across a variety of subjects (e.g. reading, maths, science) increasing with increasing parental occupational class and school socioeconomic decile. Family income during early childhood (0-5 yrs) also affects educational achievement during primary school, even if income subsequently improves during this time.
3. Children living in families with higher levels of parental (especially maternal) education and which provide study facilities, computers and other resources, have higher achievement levels than those without such resources.
4. Frequent mobility adversely impacts on educational attainment, with those attending 4+ schools by the age of 10 yrs achieving less well on some social and academic measures.
5. Factors positively impacting on educational attainment include parental expectations, social networks (e.g. Pacific church & Māori cultural connections), peer influences (which exert positive and negative effects), access to community institutions (e.g. libraries, medical services), social agencies (e.g. to receive income entitlements) and integrated programmes which enhance the involvement of families in children's education.

While the relationships between each of these factors are necessarily complex, the review highlights the significant role family socioeconomic position and access to educational resources play in the academic achievements of NZ children and young people. Such achievements in turn, are likely to influence the socioeconomic position in which the current generation of NZ young people bring up their own families in future years.

The following section, using information available from the Ministry of Education, reviews two key indicators of educational performance:

1. the proportion of school leavers with little or no formal attainment
2. the proportion of school leavers with a University Entrance Standard

These indicators need to be considered within the context of two other MOE (participation) indicators, which are explored in the subsequent sections of this report.

Definitions, Data Sources and Statistical Methods

Information in this section was obtained from the Ministry of Education and is based on two of their Education and Learning Outcomes Indicators:

1) **School Leavers with a University Entrance Standard:** The number of school leavers attaining a qualification enabling them to go directly on to tertiary study at degree level / the number of school leavers in a given school year. Relevant qualifications include 42-59 credits at Level 3 or above for NCEA or other National Certificates at Level 3 with University Entrance requirements, Accelerated Christian Education or overseas award at Year 13, University Entrance, National Certificate Level 3, University Bursary (A or B), NZ Scholarship or National Certificate Level 4.

2) **School Leavers with Little or No Formal Attainment:** The total number of school leavers who left school with little or no formal educational attainment / the number of school leavers in a given school year. For a student to be considered as having little or no formal attainment they had to meet the following criteria: <2001, leaving school without any credits towards a qualification in the National Qualifications Framework or leaving school with 1-11 credits in a National Certificate; 2002-2004, leaving school without any credits towards a qualification in the National Qualifications Framework or leaving school with 1-13 credits at NCEA Level 1 and other NQF qualifications; 2005, leaving school without any credits towards a qualification in the National Qualifications Framework or leaving school with 1-13 credits at any NCEA Level and other NQF qualifications.

School Socioeconomic Decile: All schools are assigned a decile ranking based on the socioeconomic status of the areas they serve. These rankings are based on Census data from families with school age children in the areas from which the school draws its students, along with school ethnicity data. Census variables used in the ranking procedure include equivalent household income, parent's occupation and educational qualifications, household crowding and income support payments. Using these variables, schools are assigned a decile (10%) ranking, with Decile 1 schools being the 10% of schools with the highest proportion of students from low socioeconomic communities and Decile 10 schools being the 10% of schools with the lowest proportion of these students. Decile ratings are used by the Ministry of Education to allocate targeted funding, as well as for analytical purposes.

Notes on Interpretation of Time Series Data: NCEA is part of the National Qualifications Framework and has replaced School Certificate, 6th Form Certificate and University Entrance / Bursaries. In 2002 all schools implemented NCEA Level 1, replacing School Certificate. In 2003, NCEA Level 2 was rolled out, although schools were still able to offer a transitional 6th Form Certificate Programme. From 2004, NCEA Level 3 replaced Higher School Certificate, University Entrance / Bursaries and a new Level 4 qualification, the NZ Scholarship was offered. The changes in qualification structure mean that time series information prior to and after 2002 may not be strictly comparable and in addition, the staggered roll out of the new qualification structure may mean that changes over the 2002-2005 period merely reflect this transition.

Highest Educational Attainment in NZ and Counties Manukau

NZ Trends

In NZ, the proportion of secondary school students who left school with a University Entrance Qualification rose during the mid-late 1990s, reached a peak of 29.3% in 1997-1998 and thereafter began to decline. Following the introduction of the NCEA in 2002, the proportion of students with a University Entrance Qualification began to rise again, reaching a peak of 32.9% in 2005. Similarly, the proportion of secondary school students with little or no formal educational attainment rose during the early 1990s, reached a peak of 19.1% in 1996 and thereafter began to decline. This decline became more rapid after the introduction of the NCEA in 2002 (**Figure 63**). Care must be taken when interpreting educational attainment trends before and after the introduction of the NCEA in 2002 however, as the qualification structure may not be strictly comparable. In addition the roll out of NCEA occurred over a 3-year period, possibly masking any abrupt transitions within the data.

NZ Ethnic Specific Trends

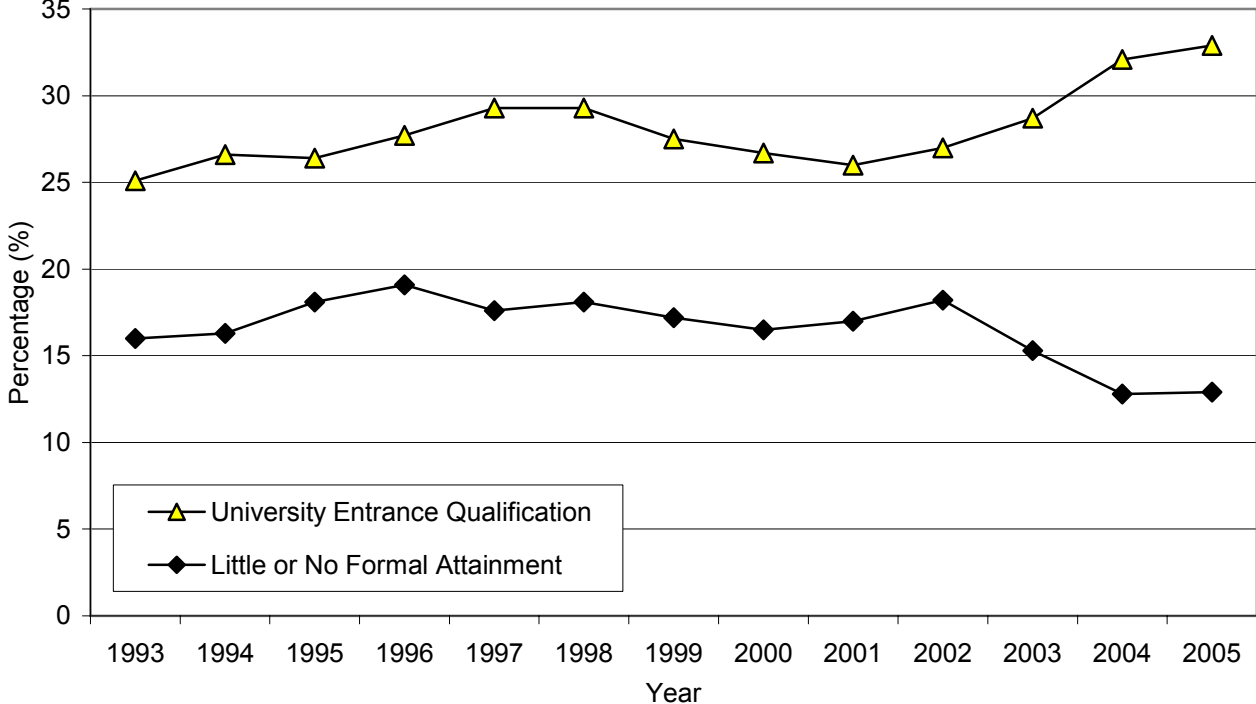
In NZ during 1993-05, higher proportions of Māori > Pacific > European > Asian / Indian students left school with little or no formal attainment. For Māori, the proportion of students with little or no formal attainment reached a peak of 39% in 1996 and thereafter began to decline, with the most rapid declines occurring following the introduction of the NCEA in 2002. For Pacific students, rates reached a peak of 27.4% in 1998 and thereafter declined only very marginally, until the introduction of the NCEA in 2002.

In contrast, during the same period higher proportions of Asian / Indian > European > Pacific > Māori students left school with a University Entrance Qualification. While there were some increases in rates for Asian / Indian and European students during the early-mid 1990s, rates for Māori and Pacific students remained fairly static until the introduction of the NCEA in 2002 (**Figure 64**). (As mentioned above, care must be taken in interpreting these figures, as the staged introduction of the NCEA which began in 2002, means that the qualification structures before and after this date may not be strictly comparable).

School Socioeconomic Decile

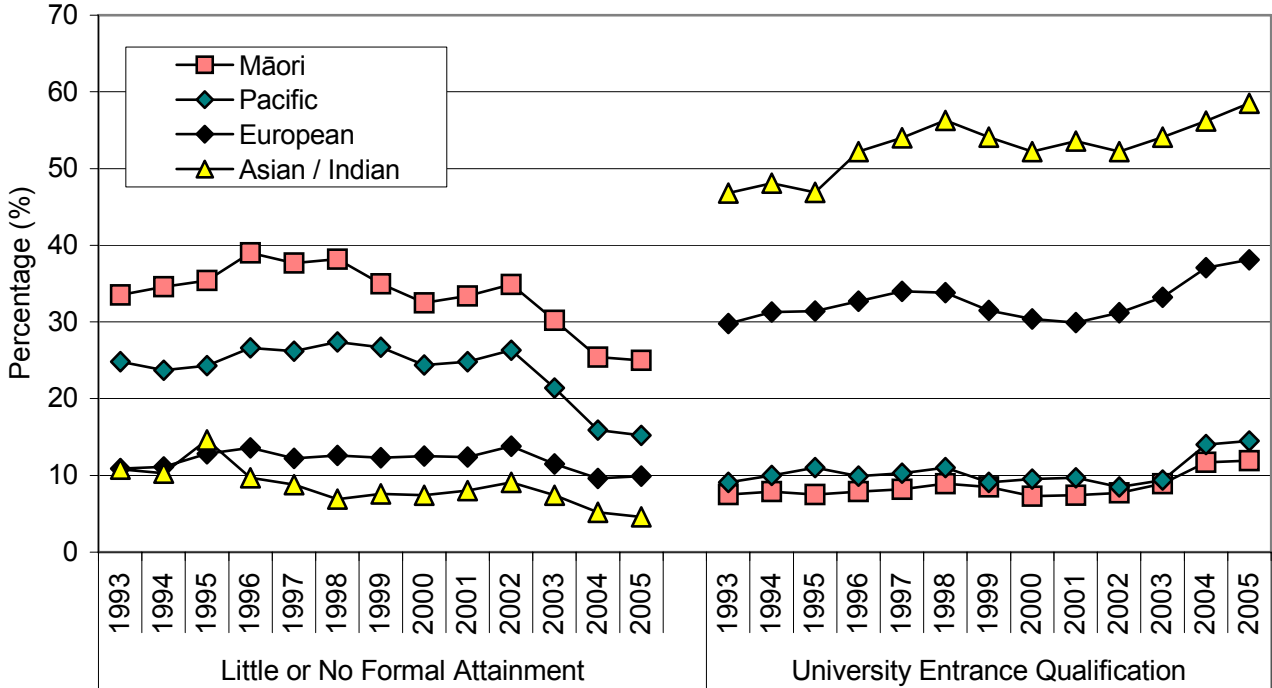
During 2005 there were marked socioeconomic disparities in educational achievement across all of NZ’s largest ethnic groups, with the proportion of students leaving school with little or no formal attainment increasing progressively as the socioeconomic deprivation of the school’s catchment increased. Similarly, the proportion of students who left school with a University Entrance Qualification declined progressively with increasing socioeconomic deprivation (**Figure 65**).

Figure 63. Highest Educational Attainment of School Leavers, NZ 1993-2005



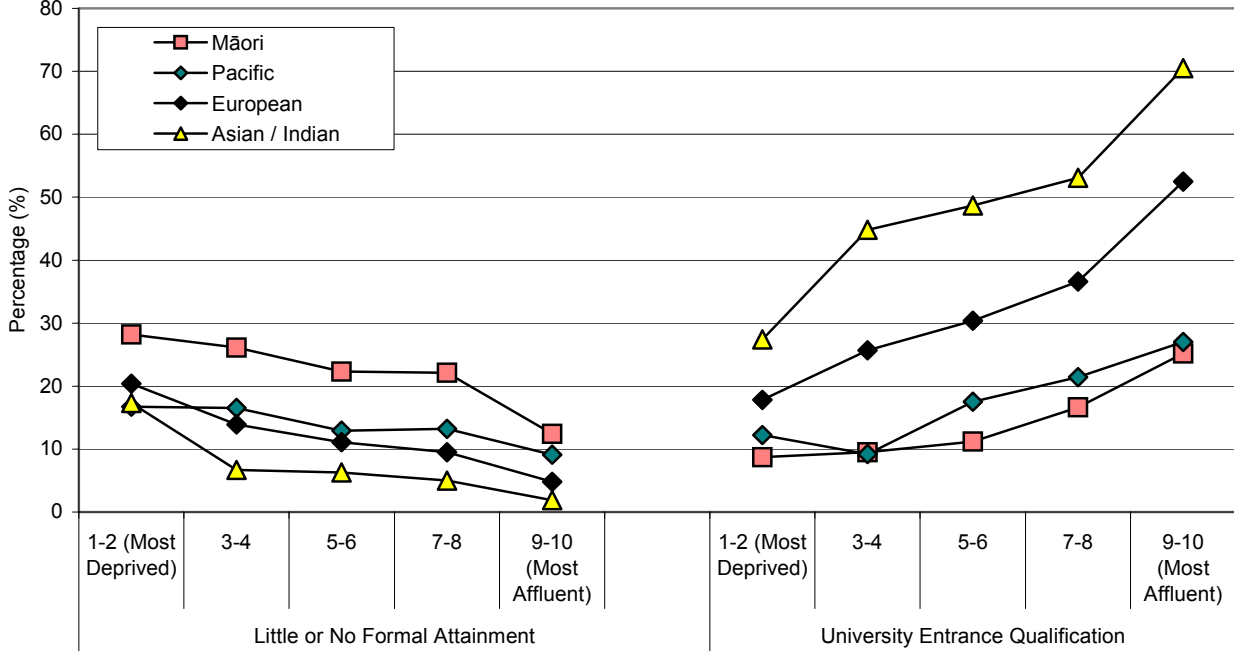
Source: Ministry of Education.

Figure 64. Highest Educational Attainment of School Leavers by Ethnic Group, NZ 1993-2005



Source: Ministry of Education.

Figure 65. Highest Educational Attainment of School Leavers by Ethnic Group and School Socioeconomic Decile, NZ 2005



Source: Ministry of Education.

Highest Educational Attainment in Counties Manukau

Figure 66. Highest Attainment of School Leavers, Counties Manukau vs. NZ 1995-2005

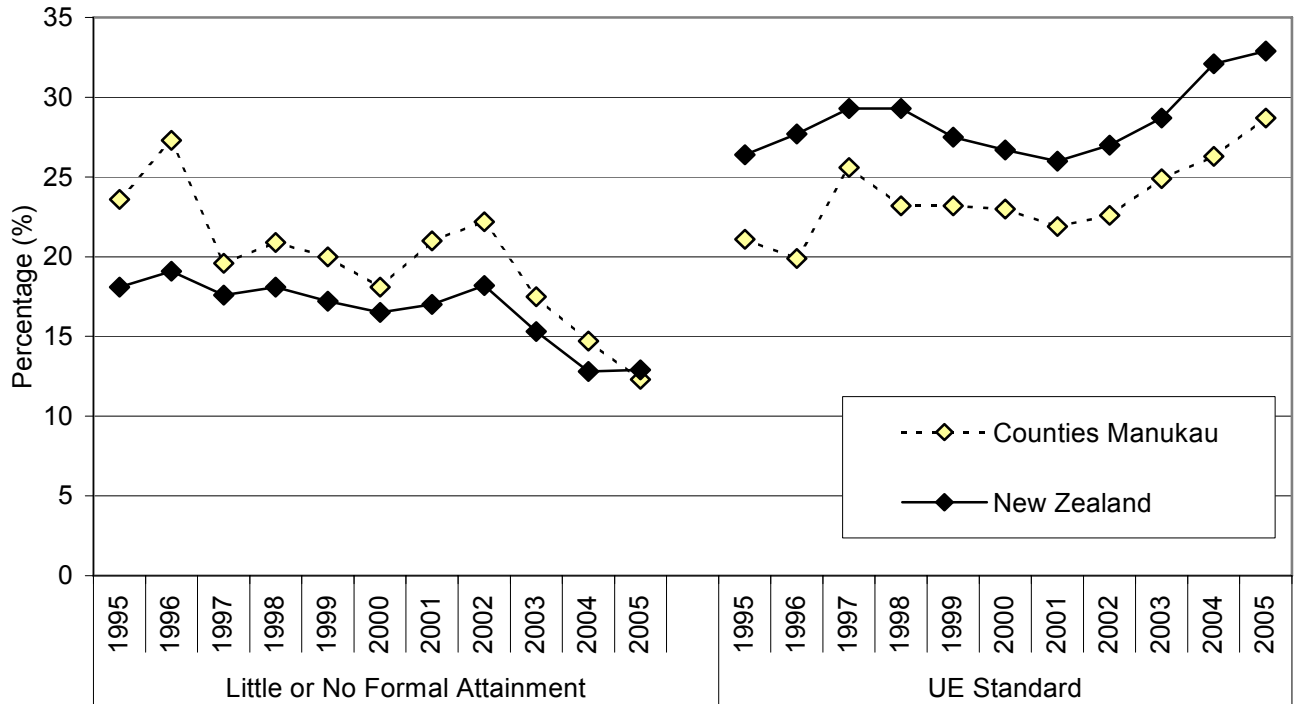
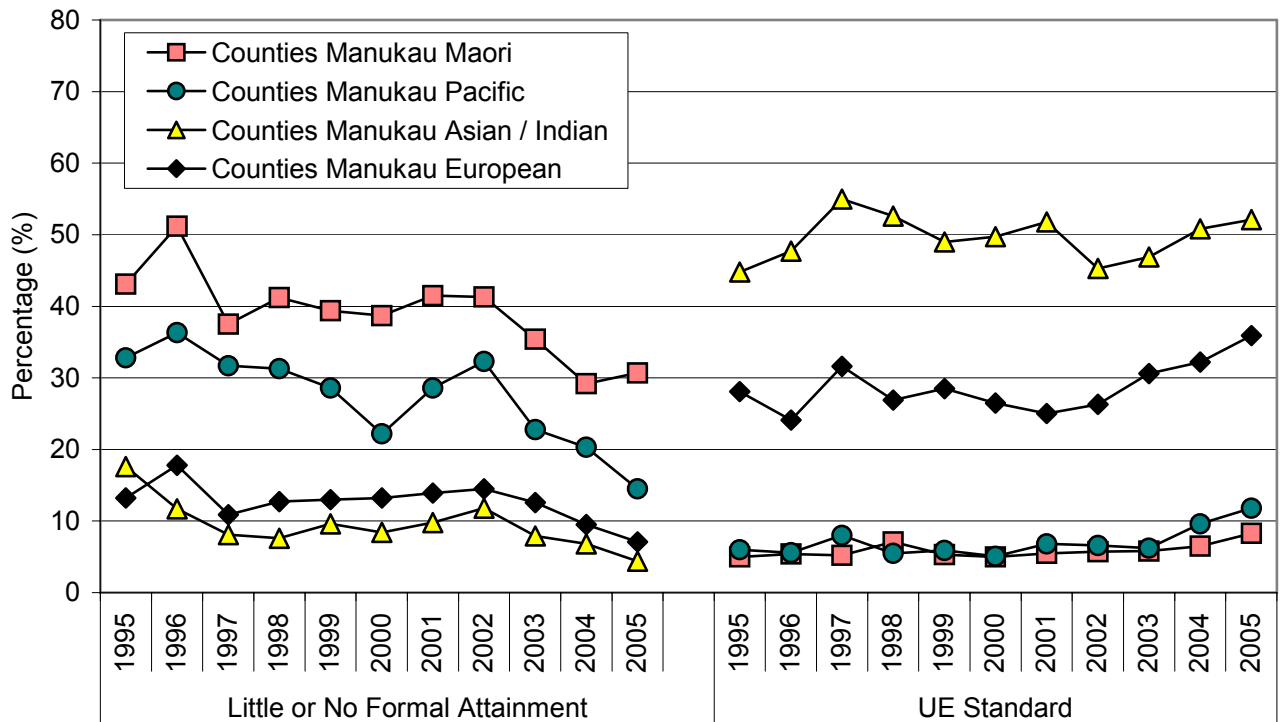


Figure 67. Highest Attainment of School Leavers by Ethnic Group, Counties Manukau 1995-05



Highest Educational Attainment in Counties Manukau

In Counties Manukau during 1995-05, the proportion of young people leaving school with little or no formal attainment was generally higher than the NZ average, while the proportion leaving school with a University Entrance Standard was lower. While there was a decline in the number of Counties Manukau young people leaving school with little or no formal attainment and a corresponding rise in the number leaving with a University Entrance Standard, care must be taken in interpreting these figures, as the staged introduction of the NCEA which began in 2002, means that the qualification structures before and after this date may not be strictly comparable (**Figure 66**).

Ethnic Specific Trends in Counties Manukau

In Counties Manukau during 1995-05, there were marked ethnic disparities in educational attainment at school leaving, with the proportion of young people leaving with little or no formal attainment being higher for Māori > Pacific > European > Asian / Indian young people. In contrast, rates for acquiring a University Entrance Standard were higher for Asian / Indian > European > Māori and Pacific young people. Again interpretation of time series data must take into account the staged introduction of the NCEA, which began during 2002 (**Figure 67**).

In Conclusion

In NZ during the past decade, the proportion of students attaining a University Entrance Standard, or leaving school with little or no formal attainment have fluctuated, possibly in part as a result of changes in prevailing labour force conditions and the availability of alternative forms of tertiary education. While there have been marked improvements in the proportion of students achieving a University Entrance Standard, or leaving school with little or no formal attainment since the introduction of the NCEA in 2002, care must be taken when interpreting these figures, as the old and new qualification structures may not be strictly comparable.

In Counties Manukau during 1995-05, the proportion of young people leaving school with little or no formal attainment was generally higher than the NZ average, while the proportion leaving school with a University Entrance Standard was lower. There were also marked ethnic disparities in educational attainment, with the proportion of Counties Manukau young people leaving with little or no formal attainment being highest for Māori > Pacific > European > Asian / Indian young people. In contrast, rates for acquiring a University Entrance Standard were highest for Counties Manukau Asian / Indian > European > Māori and Pacific young people. For Counties Manukau the implications of these findings may be significant, as at a regional level, unless such disparities in educational attainment can be addressed, it is unlikely that interventions aimed at addressing the issue of health inequalities amongst the next generation of NZ children and young people, will achieve long term success.

SENIOR SECONDARY SCHOOL RETENTION

A key factor in ensuring academic achievement at secondary school level is participation. In order to achieve, students must stay at school, experience a sense of belonging and stay interested and engaged in learning. Research suggests that there are strong correlations between early school leaving, unemployment and lower incomes and that these in turn influence later socioeconomic position [122]. One indicator of continuing participation is school retention i.e. the % of students who attend school beyond the age they are legally required to do so [122]. In NZ, the minimum school leaving age rose from 15 to 16 years in early 1993 [123], although parents of students aged 15 years are able to apply to the Ministry of Education for an exemption on the basis of educational problems, conduct or the unlikelihood that a student will obtain benefit from attending school. In such cases, parents are required to give details about training programmes or employment that the student will move on to, if the exemption is granted [122].

In understanding trends and disparities in NZ's school retention rates over the past two decades, a number of factors must be taken into account:

1. During the past two decades school retention rates have fluctuated, partly in response to prevailing labour market conditions, with the rising retention rates observed during the late 1990s coinciding with increases in unemployment [124].
2. Not all students who leave school <18 years, or without formal qualifications transition directly into the workforce, with many taking part in other forms of tertiary education (e.g. in 2004 of those <18 yrs, 14% of Māori, 10% of European, 8% of Pacific and 4% of Asian / Indian young people were involved in tertiary education, with >80% studying at Certificate 1-3 Level).
3. During 1998-04, there were large increases in the number of students attending tertiary education, with the largest gains being amongst Māori students in Level 1-3 Certificate courses. During 1994-04, there were also steady increases in the number of Māori students undertaking bachelor's degrees. While those <18 yrs made up only a small proportion of this increase (the largest gains were in those 25+ yrs), these figures suggest that for many students, participation in education does not end at school leaving and that this must be taken into account when assessing the impact early school leaving has on long term employment and earning potential.
4. Not all forms of tertiary education have the same impact on future earning potential, with an analysis of graduate incomes during 2002 suggesting that those completing a Level 1-3 Certificate had a median income of only \$25,920, as compared to \$40,000 for those completing a bachelors degree [125]. Thus, while a number of school leavers may actively participate in Certificate Level Courses, further training may be required if they are to achieve the same income premiums as those completing a degree.

The following sections explore secondary school retention rates in NZ and Counties Manukau during 1992-05, using information available from the Ministry of Education. In addition, information on tertiary participation rates at a national level is provided, in order to give some context to the ethnic differences in secondary participation during this period.

Definitions, Data Sources and Statistical Methods

Information in this section was obtained from the Ministry of Education and is based on two of their Student Participation Indicators:

1) **Retention of Students in Senior Secondary Schools to Age 16:** The total number of 16-year old students on the roll as at 1 July each year / the total number of 14-year old students on the roll as at 1 July, 2 years previously.

2) **Retention of Students in Senior Secondary Schools to Age 17:** The total number of 17-year old students on the roll as at 1 July each year / the total number of 14-year old students on the roll as at 1 July, 3 years previously.

School Socioeconomic Decile: All schools are assigned a decile ranking based on the socioeconomic status of the areas they serve. These rankings are based on Census data from families with school age children in the areas from which the school draws its students, along with school ethnicity data. Census variables used in the ranking procedure include equivalent household income, parent's occupation and educational qualifications, household crowding and income support payments. Using these variables, schools are assigned a decile (10%) ranking, with Decile 1 schools being the 10% of schools with the highest proportion of students from low socioeconomic communities and Decile 10 schools being the 10% of schools with the lowest proportion of these students. Decile ratings are used by the Ministry of Education to allocate targeted funding, as well as for analytical purposes.

Notes on Interpretation of Data: Because the retention of individual students cannot be tracked over time, these figures are estimates derived from comparing enrolments by ethnic group in each year, with the numbers in each ethnic group enrolled 2 and 3 years previously. As a result of high migratory inflows, enrolments for some ethnic groups may actually increase, inflating the observed retention rates and in the case of Asian students, resulting in apparent retention rates of >100%. These issues need to be taken into account when interpreting school retention data, particularly for Asian and Pacific students. School retention rates exclude foreign NZAID and foreign fee paying students.

Senior Secondary School Retention Rates: NZ Data

Retention Rates by Age and Ethnicity

Limited time series information on school retention rates by ethnic group was available for 1992-2005, while more detailed information was available for 2002-05. During 1992-05 (**Figure 68**):

1. School retention rates declined progressively as students moved from 16 → 18 yrs of age.
2. School retention rates at 16, 17 and 18 years were consistently lower for Māori students than for Pacific students or the total population, although the absolute differences became smaller as students reached 18 years of age.
3. Retention rates at 16 and 17 years declined throughout the early 1990s increased again to reach a peak in 1998-99 and thereafter declined again. The rise in retention rates at 16-17 years in the late 1990s coincided with a peak in unemployment, particularly for those with no qualifications. Similarly, declines in retention in 16-17 year olds must be seen within the context of a 5% increase in the number of 15-17 year olds participating in tertiary alternatives during this period [124].
4. While retention rates were higher for Pacific students throughout this period and it is likely that this reflects real ethnic differences, these figures also must also be interpreted in the light of Pacific migration and the potential effect this may have on inflating retention rates, as discussed in the methods section above.

During 2002-05 when more detailed information was available, apparent school retention rates at both 16 and 17 years were higher amongst Asian / Indian > Pacific and European > Māori students, with retention rates in excess of 100% for Asian / Indian students potentially being the result of ongoing immigration, as discussed in the methods section above (Figure 69).

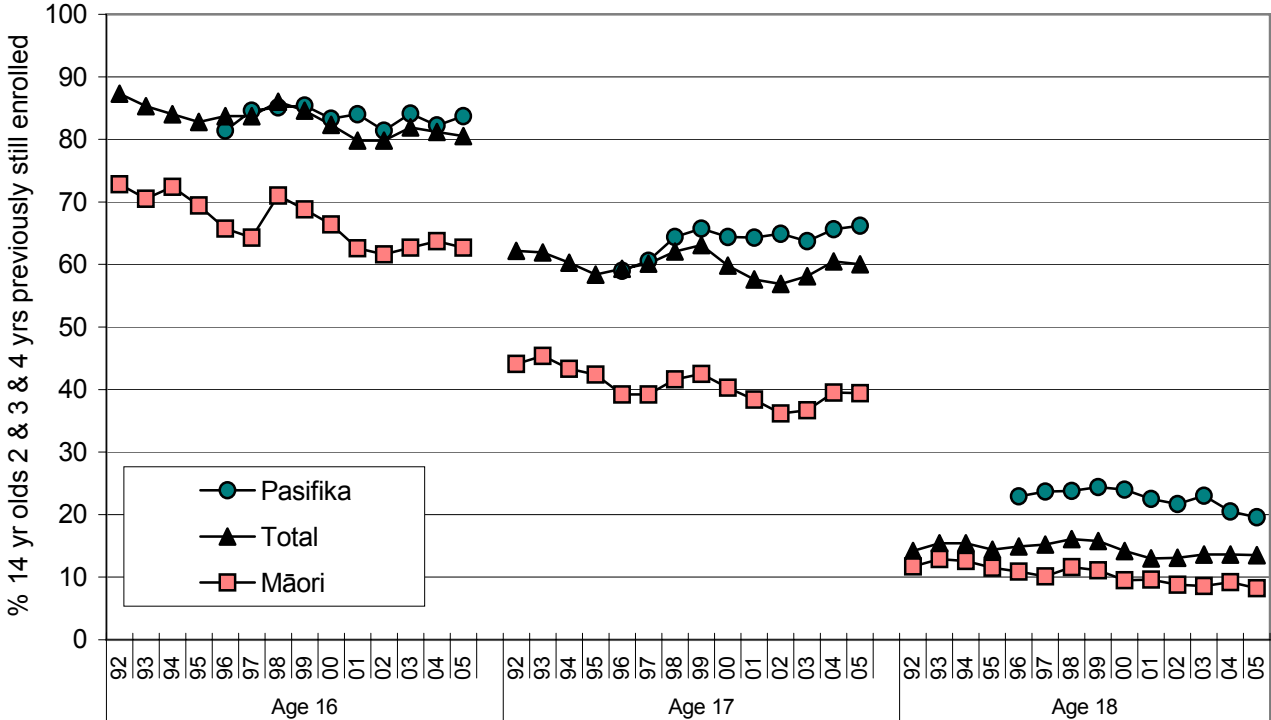
Retention Rates by School Socioeconomic Decile

During 2005, modest socioeconomic gradients in school retention rates were apparent at both 16 and 17 years, with the proportion of students remaining at school increasing progressively as the affluence of the school catchment area increased (Figure 70).

Comparison with Tertiary Participation Rates

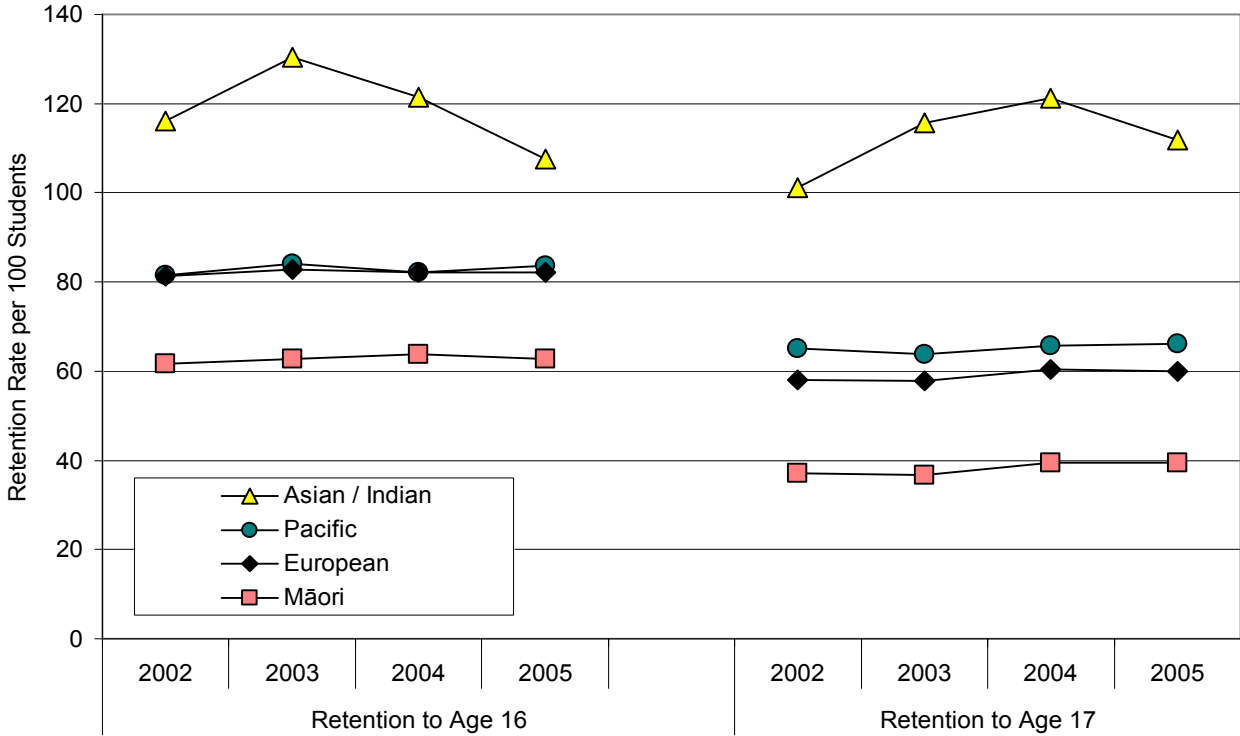
Ethnic differences in school retention rates <18 years of age need to be viewed within the context of the alternative educational opportunities available to students. As discussed previously, there were large increases in tertiary participation during 1998-04, particularly amongst Māori students taking Certificate Level 1-3 courses. There were also steady longer term increases in the proportion of Māori students participating in bachelor level study during 1994-04 (Figure 71). While the majority of these increases were in the 25+ age group, such figures suggest that for many, participation in formal education does not cease at school leaving, although the income premiums achieved for completing various types of study need to be taken into consideration when assessing the longer term impacts educational participation has on socioeconomic security.

Figure 68. School Retention Rates at 16, 17 & 18 yrs by Ethnic Group, NZ 1992-2005



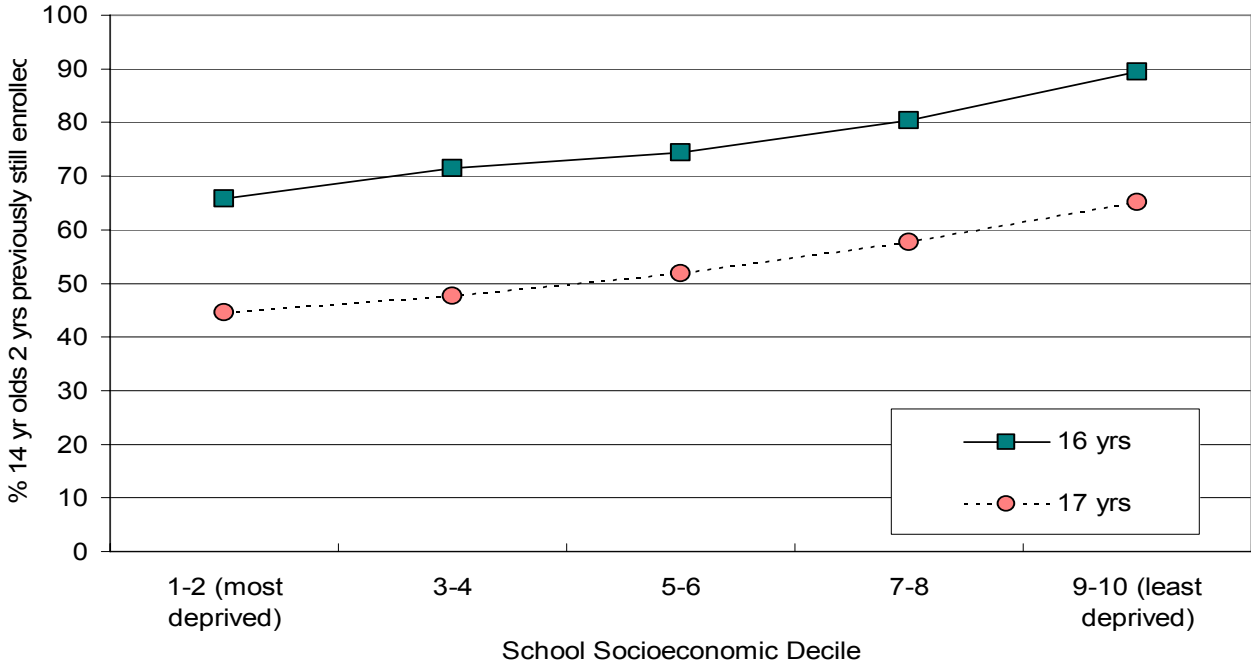
Source: Ministry of Education.

Figure 69. School Retention Rates at 16 & 17 yrs by Ethnic Group, NZ 2002-2005



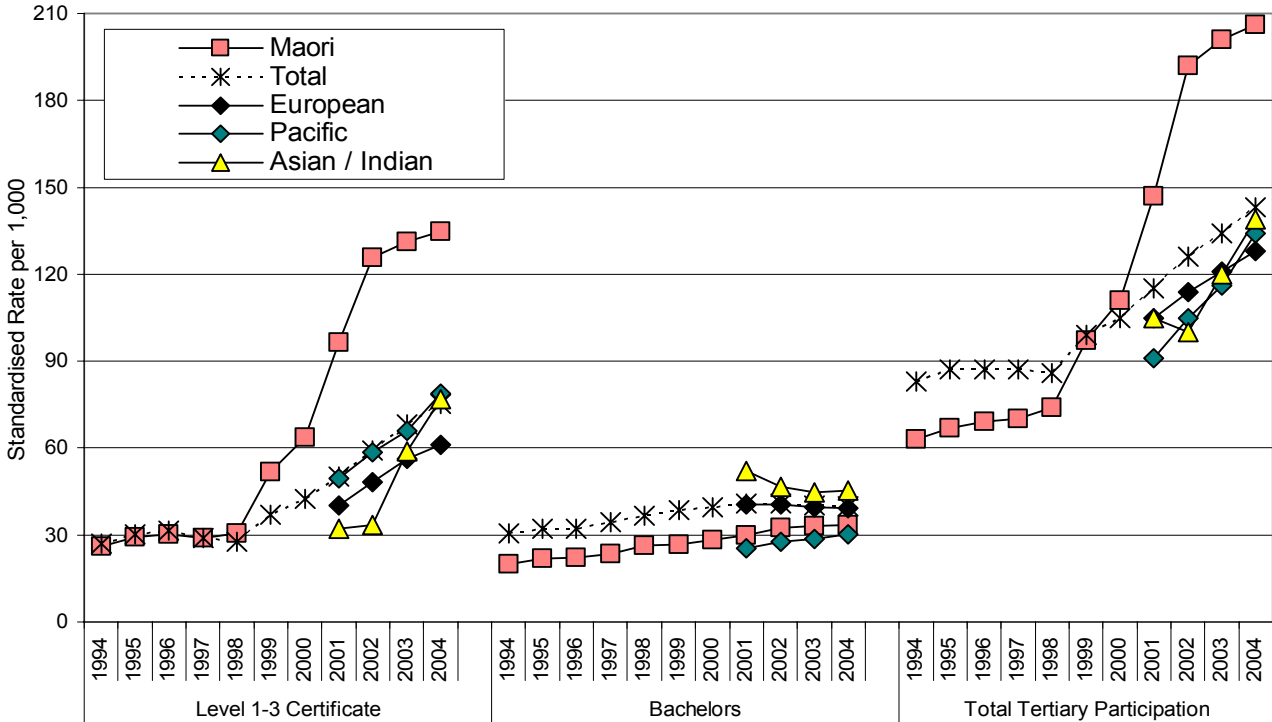
Note: Due to the high positive net migration, retention rates for Asian students may be over inflated.

Figure 70. School Retention Rates at 16 & 17 yrs by School Socioeconomic Decile, NZ 2005



Note: Due to the high positive net migration of Asian students, retention rates in schools with high Asian student populations are erroneously inflated. Given the disproportionately large concentration of Asian students in higher decile schools, the graph above excludes Asian students.

Figure 71. Age Standardized Tertiary Education Participation Rates by Ethnicity and Type of Qualification, NZ 1994-2004 (all age groups)



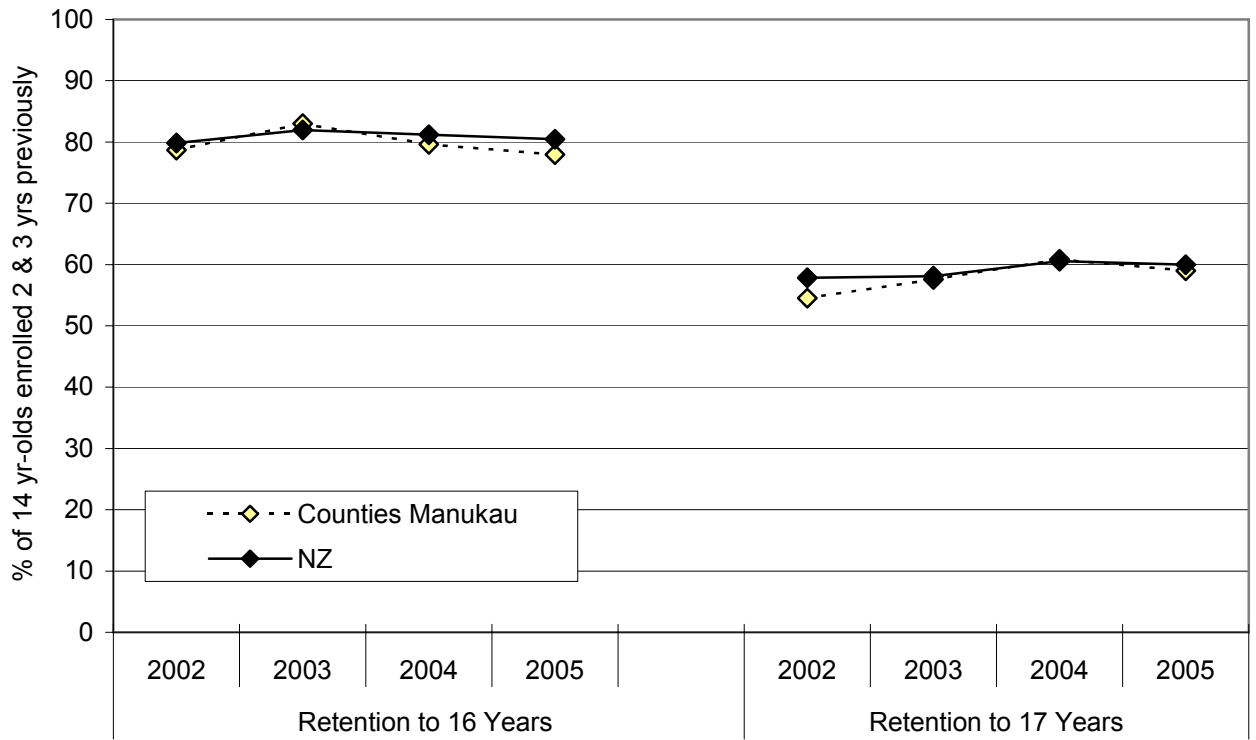
Source: Ministry of Education.

School Retention Rates in Counties Manukau

In Counties Manukau during 2002-05, school retention rates at 16 and 17 years were very similar to the NZ average (Figure 72). Once retention rates were broken down by ethnicity however, marked ethnic disparities were evident, with retention rates at both 16 and 17 years being lower for Māori > Pacific and European > Asian / Indian students. While school retention rates for Māori students tended to be below the NZ Māori average at both 16 and 17 years, retention rates for Asian / Indian students were either similar to or higher than the NZ Asian / Indian average. Retention rates for European and Pacific students were similar to their NZ averages at 16 years, but were generally lower than the NZ average at 17 years of age (Figure 73). Care must be taken when interpreting both ethnic specific and total population school retention rates, as these figures may become artificially inflated in areas with large migration inflows.

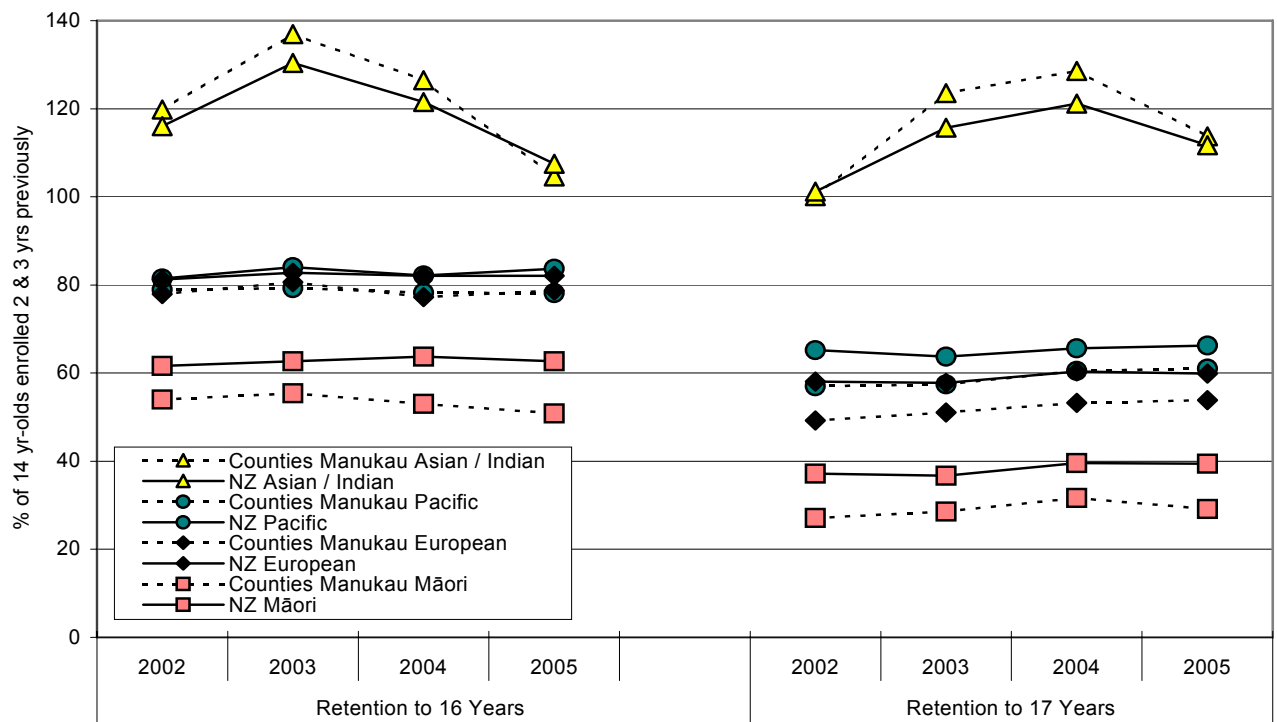
Note: Information on regional tertiary participation rates are not provided in this section, due to the large shifts in the NZ youth population which occur after 17 years of age, when young people move from regional areas to large urban centres to take advantage of tertiary study opportunities. In this context, regional participation rates may reflect the number and type of tertiary providers in an area, rather than regional participation rates for young people who have grown up in Counties Manukau, or who return there during their study breaks or vacations.

Figure 72. School Retention Rates at Age 16 & 17 yrs, Counties Manukau vs. NZ 2002-2005



Source: Ministry of Education.

Figure 73. School Retention Rates at 16 & 17 yrs by Ethnic Group, Counties Manukau vs. NZ 2002-2005



Source: Ministry of Education

In Summary

While school retention rates for NZ young people <18 years have fluctuated over the past decade, marked socioeconomic and ethnic disparities have remained, with retention rates being lower for Māori students and those attending schools in the most deprived areas. In Counties Manukau during 2002-05, school retention rates at 16 and 17 years were very similar to the NZ average, although once broken down by ethnic group, marked disparities were evident, with lower retention rates being seen for Māori > Pacific and European > Asian / Indian students and in the case of Māori students, these retention rates were lower than the NZ Māori average.

The ethnic differences in school retention rates cited above however, need to be viewed within the context of the alternative educational opportunities available to students. In NZ during 1998-04, there were large increases in tertiary participation rates, particularly amongst Māori students taking Certificate Level 1-3 courses. There were also steady longer term increases in the proportion of Māori students participating in bachelor level study during 1994-04. While the majority of these increases were in the 25+ age group, such figures suggest that for many, participation in formal education does not cease at school leaving, although the income premiums achieved for completing various types of study need to be taken into consideration when assessing the longer term impacts educational participation have on future socioeconomic security.

SUSPENSIONS, EXCLUSIONS & EXPULSIONS

Participation in secondary school is vital for academic achievement and factors which cut short or interrupt participation potentially impact on educational outcomes. In NZ schools, stand-downs, suspensions, exclusions and expulsions are ways in which the educational system deals with student behaviour that disrupts the learning and wellbeing of other students or staff. These approaches are not used lightly by schools, but are seen as a way of helping students return to productive learning and relationships within the school community [126].

In recent years, the most common reasons for suspensions and exclusions were for issues related to student conduct, including continual disobedience, physical or verbal assaults on staff or other students and for other harmful or dangerous behaviours. In addition, a significant number were suspended or excluded as a result of alcohol, drug use, or cigarette smoking [127]. While for the majority of students a stand-down or suspension was a one off event, with the time spent away from school being fairly limited (e.g. a few days–weeks), both NZ and overseas research has suggested that adolescent conduct problems are significantly associated with poorer long term outcomes including educational underachievement (e.g. leaving school early and without qualifications), unemployment and occupational instability during young adulthood [128].

In exploring the determinants of childhood / adolescent conduct problems and how they impact on educational achievement, the Christchurch Longitudinal study noted that [128]:

1. **Determinants of Conduct Problems in Childhood:** Conduct problems in middle childhood were significantly associated with a range of socioeconomic, family and individual factors including young maternal age, lack of maternal qualifications, low parental occupational status, below average living standards, living in a sole parent household or a household with significant conflict, lower IQ and attention problems.
2. **Conduct Problem's Impact on Secondary School Achievement:** In turn, conduct problems during childhood were significantly associated with poorer school achievement in the teenage years (% leaving school <18 yrs with no qualifications). Some, but not all of this association could be explained by the fact that children with conduct problems came from more disadvantaged backgrounds, which in turn was associated with poorer educational performance. Adjusting for these background factors reduced the associations between conduct problems on poorer school achievement from a 4.8 times excess risk to a 1.8 times excess risk (i.e. a significant, albeit reduced risk remained which could not be attributed to these factors).
3. **Conduct Problems and Adolescent Behaviour:** Those with conduct problems in childhood tended to also develop patterns of behaviour during adolescence (e.g. cannabis use, suspension from school and affiliation with peers who used cannabis, tobacco or alcohol, truanted or broke the law) which predisposed to poorer educational outcomes, and once these behavioural patterns were taken also into account, any residual associations between conduct problems and educational achievement disappeared.

The authors thus concluded that while socioeconomic, family and individual factors contributed significantly to the onset of conduct problems during childhood and as a consequence, accounted for a large part of the association between conduct problems and poorer educational achievement in adolescence, a significant amount of the association was also due to the tendency for children with conduct disorders to develop affiliations with

delinquent peers and patterns of substance use during adolescence, which reduced their commitment to continuing with their education [128].

The following section, using information from the Ministry of Education, reviews the proportion of students in NZ and Counties Manukau who were stood-down, suspended, excluded or expelled from school during 2000-05. Unfortunately changes in the Ministry of Education's suspension rules in 1999 meant that data from before this period was not strictly comparable.

Definitions, Data Sources and Statistical Methods

Information in this section was obtained from the Ministry of Education [126] and is based on the Ministry's Stand-down and Suspension database, which was developed in July 1999, after the introduction of the Education (Suspension) Rules 1999. Since these regulations introduced stand-downs for the first time, statistics prior to mid-1999 are not comparable. Information in this section is based on two of the MOE's Student Participation Indicators: Stand-downs & Suspensions and Exclusions & Expulsions, which are defined as follows:

- 1) **Stand-Down:** The formal removal of a student from school for a specified period. Stand-downs may not exceed 5 school days in any term or 10 days in any year. Following stand-downs students automatically return to school.
- 2) **Suspension:** The formal removal of a student from school by the principal until the Board of Trustees decides the outcome at a suspension meeting. Following a suspension, the Board may decide to lift the suspension, with or without conditions, extend the suspension or, in the most serious cases exclude or expel the student.
- 3) **Exclusion:** The formal removal of a student <16 yrs from school with the requirement that they enrol elsewhere.
- 4) **Expulsion:** The formal removal of a student 16+ yrs from school. They may enrol at another school.

Note: Rates were calculated by dividing the number of stand-downs, suspensions, exclusions or expulsions per individual year of age during the school year / the number of students on the school roll at July 1st per individual year of age. All figures were then age standardised (by the MOE), so that all subgroups in all years had the same age structure (this was necessary as stand-downs and suspensions are highest amongst those 13-15 years and thus differences in age structure by ethnic group or over time (e.g. due to differing school retention rates) may have led to artificial differences in rates. As such the standardised rate is an artificial measure, but does provide an estimate of how groups over time might compare if they had the same age distribution [129]. As a number of students were suspended on more than one occasion, the number of individual students suspended may well be less than the number of cases reported in these figures.

Stand-Downs, Suspensions, Exclusions and Expulsions: NZ Data

Stand-Downs and Suspensions

In NZ during 2005, there were 21,862 stand-downs and 5,154 suspensions, with these events being most likely to occur amongst those aged 13-15 years, males and Māori students. The most common reasons for suspension were the misuse of drugs (29%), continual disobedience (25%) and a physical assault on other students (16%), which together accounted for 69% of all suspension cases. For most students a stand-down or suspension was a once only event [130].

Exclusions and Expulsions

Since 2000, around 30% suspensions each year have resulted in an exclusion and <3% in an expulsion [130]. During 2005, this resulted in 1,622 exclusions and 141 expulsions, with the main reasons for exclusion being continual disobedience (35.6%), physical assaults on other students or staff (23.0%) and drugs (18.9%). During 2005, exclusions were higher amongst students 13-15 years, males, Māori > Pacific > European > Asian students and those in average → more deprived geographic areas (**Table 25**).

Table 25. Number of Exclusions in NZ State Schools during 2005 by Type of Behaviour

	Type of Behaviour												Total	Rate per 1,000 Students
	Alcohol	Arson	Continual Disobedience	Drugs (Including Substance Abuse)	Physical Assault on Students or Staff	Sexual Harassment or Misconduct	Smoking	Theft	Vandalism	Verbal Assault on Students or Staff	Weapons	Other Harmful or Dangerous Behaviour		
School Type														
Primary/Special	0	1	96	30	129	12	2	4	1	27	17	20	339	0.8
Secondary/Composite	19	9	478	275	242	15	3	61	22	69	25	55	1,273	6.6
Total	19	10	574	305	371	27	5	65	23	96	42	75	1,612	2.6
Gender														
Male	10	10	407	226	293	25	3	52	18	73	37	57	1,211	3.8
Female	9	0	167	79	78	2	2	13	5	23	5	18	401	1.3
Total	19	10	574	305	371	27	5	65	23	96	42	75	1,612	2.6
Ethnicity														
Māori	7	4	239	172	196	10	3	25	12	45	18	40	771	5.3
Pacific	4	1	73	23	61	2	0	13	8	10	11	6	212	3.7
Asian	2	0	5	3	3	0	0	2	0	0	0	1	16	0.3
Other	1	1	16	5	19	1	0	7	0	4	0	4	58	5.1
European	5	4	241	102	92	14	2	18	3	37	13	24	555	1.5
Total	14	6	333	203	279	13	3	47	20	59	29	51	1,057	2.6
School Socioeconomic Decile														
1-3 (Most Deprived)	5	5	180	96	112	10	2	18	12	34	21	20	515	3.2
4-7	9	3	316	154	216	14	3	30	9	52	18	45	869	3.4
8-10 (Most Affluent)	5	2	77	55	43	3	0	17	2	10	3	10	227	1.1
Total**	19	10	574	305	371	27	5	65	23	96	42	75	1,612	2.6

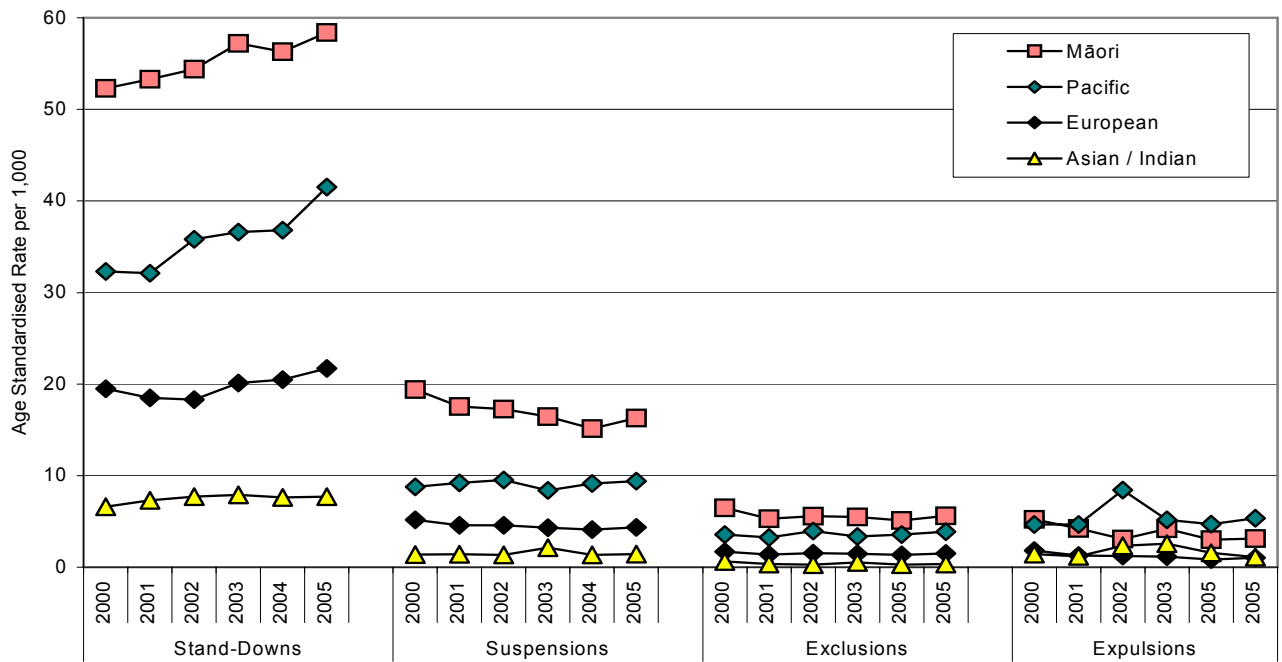
* Exclusion rates for students in "Other" ethnic group was anomalously high in 2005 as some schools classify students receiving exclusions as 'Other' when on the school roll they appear in another ethnic groups.** Total includes schools that were not classified into a decile band *** exclusions are not age standardized.

Trends during 2000-2005

During 2000-05, the number of suspensions, exclusions and expulsions declined by 10.0%, 6.7% and 28% respectively, while the number of stand-downs increased by 16.8%. Throughout this period stand-downs, suspensions and exclusions were higher amongst Māori > Pacific > European > Asian/Indian students, while expulsion rates were higher for Pacific > Māori > European and Asian / Indian students (**Figure 74**).

The progressive decline in suspension rates for Māori students during this period should be seen in the context of a Suspension Reduction Initiative (SRI) which started in 2001. This SRI initially involved working with 86 secondary schools with historically high suspension rates for Māori students, although an additional 24 schools have become involved with the SRI since 2001 and a number of the original schools have left the initiative. It is thought that this SRI may have helped in reducing the overall suspension rate for Māori students by 16% since 2000 [129].

Figure 74. Age Standardised School Stand-Down, Suspension, Exclusion and Expulsion Rates by Ethnicity, NZ 2000-2005

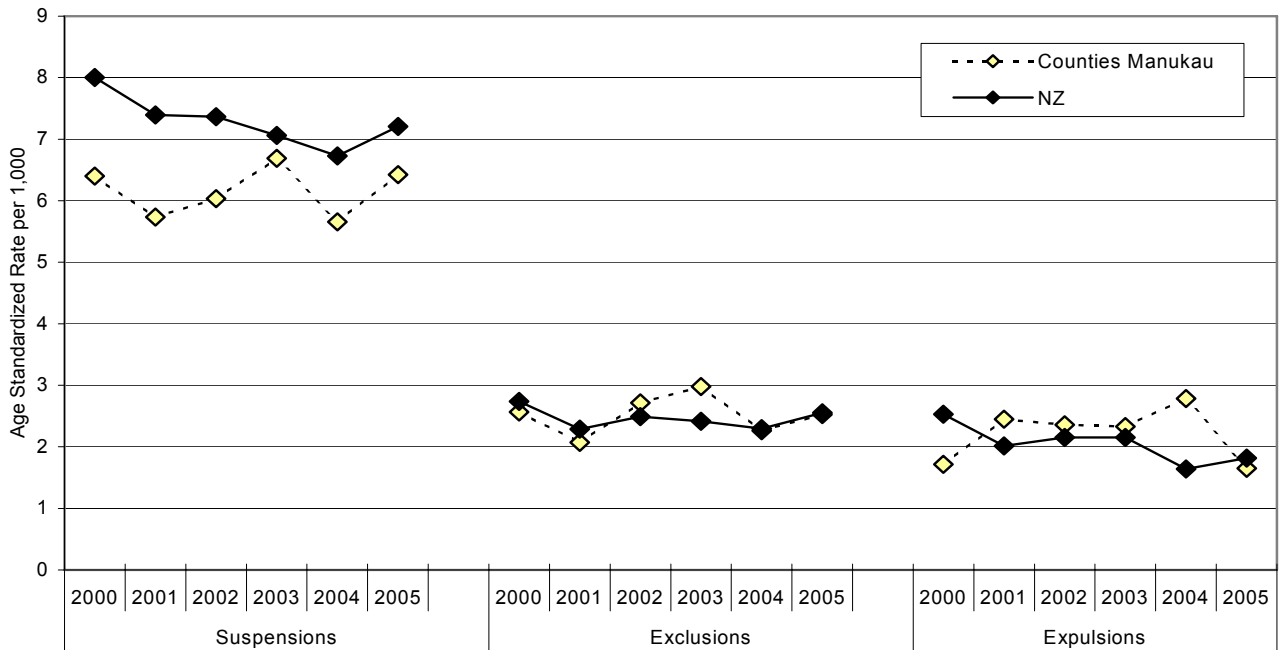


Source: Ministry of Education.

Suspensions, Exclusions & Expulsions in Counties Manukau

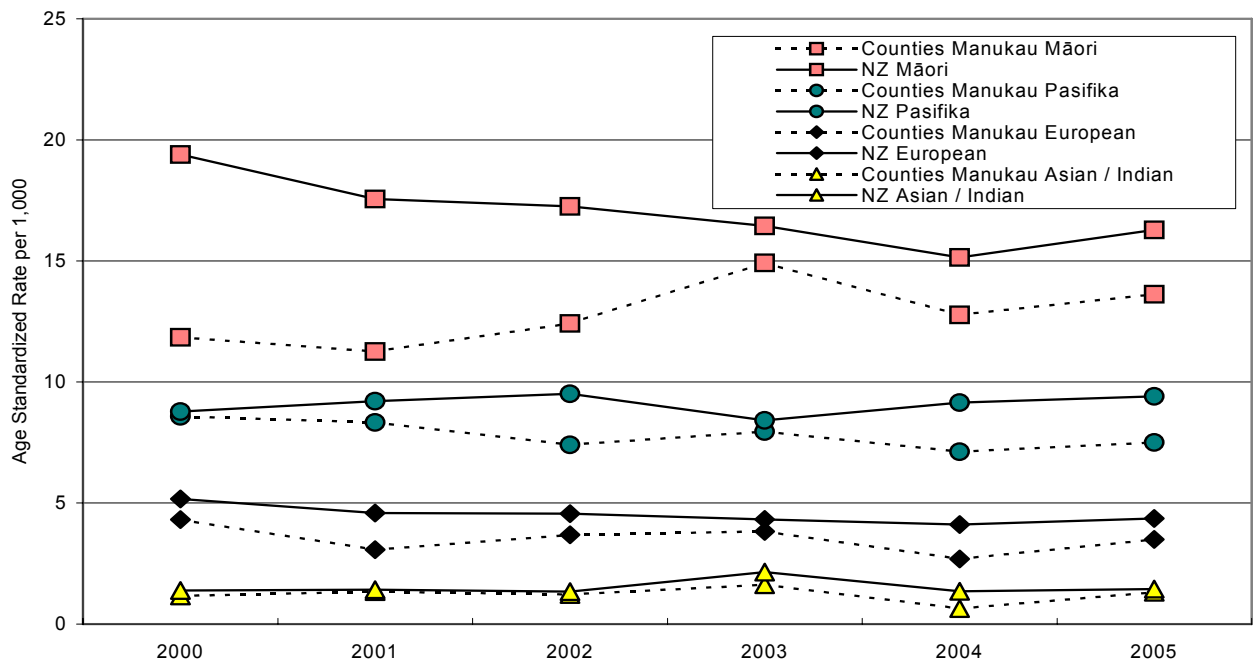
In Counties Manukau during 2000-05, suspension rates were generally lower than the NZ average, while exclusion and expulsion rates were similar (**Figure 75**). Once broken down by ethnic group suspension rates for Counties Manukau Māori, Pacific and European students tended to be lower than their respective ethnic specific averages, while rates for Counties Manukau Asian / Indian students were similar (**Figure 76**).

Figure 75. Age Standardized School Suspension, Exclusion and Expulsion Rates, Counties Manukau vs. NZ 2000-2005



Source: Ministry of Education

Figure 76. Age Standardized School Suspension Rates by Ethnicity, Counties Manukau vs. NZ 2000-2005



Source: Ministry of Education

In Summary

In NZ during 2000-05 the number of suspensions, exclusions and expulsions of students has declined, while the number of stand-downs has increased. In general, the main reasons for suspensions and exclusions were continual disobedience, physical assaults on other students or staff and drug use, with higher rates being reported amongst secondary school students, those aged 13-15 years, males and Māori students. In part, some of the decline in suspension rates during this period may be due to the Suspension Reduction Initiative, which has operated in a number of secondary schools with historically high suspension rates since 2001.

In Counties Manukau during 2000-05, suspension rates were generally lower than the NZ average, while exclusion and expulsion rates were similar. In addition, suspension rates amongst Counties Manukau Māori, Pacific and European students were generally lower than their respective NZ ethnic specific averages, while suspension rates for Counties Manukau Asian / Indian students were similar to the NZ average. Despite this, such figures potentially suggest that for a significant minority of students, conduct problems may alter their participation in secondary education and as a consequence, their future academic achievement and career aspirations.

YOUNG PEOPLE ON BENEFITS



YOUNG PEOPLE ON BENEFITS

While adolescence is for many young people, a time for investing in learning and acquiring new skills, it is also a time of vulnerability. While the majority of young people successfully complete their years of secondary education and continue on to further training and employment, a significant minority are unable to support themselves financially for a variety of reasons. For those who meet certain eligibility criteria, the NZ Government offers a range of benefits, with those most commonly being utilised by those 16-24 years being listed below:

1. **Domestic Purposes Benefits:** This group of benefits is mainly utilised by sole parents with dependant child(ren) <18 years who are not living with the child's other parent or another partner. To be eligible, a young person must be aged 18+ years, or be 16-17 years and legally married and must meet residency and income qualifications. An Emergency Maintenance Allowance is available to those who do not meet these criteria (e.g. who are <18 years of age) but who are alone and caring for children and unable to support themselves financially. This group also includes a small number (~1%) aged 16+ years who are caring full time for someone, other than a partner, that would otherwise be receiving hospital care and who meet residency and income qualifications.
2. **Unemployment Benefits:** Unemployment benefits are available to young people who are available for and actively seeking full time work. Clients must be aged 18+ years or 16-17 years and living with a spouse or partner and dependent children. Those receiving unemployment benefits are subject to a full time work test, as are their spouses or partners if they have no dependent children, or their youngest dependent child is aged 14+ years. An Unemployment Benefit-Hardship is available to those who do not meet these criteria but who are not successfully able to support themselves through paid employment or by other means.
3. **Sickness Benefit:** To be eligible for a Sickness Benefit young people need to be 18 years of age, or 16-17 years of age and either 27+ weeks pregnant or living with a partner and children they support. They must have had to stop working or reduce their hours because of sickness, injury, pregnancy or disability OR if unemployed or working part time, find it hard to look for or do full time work for the same reasons. To qualify, a young person (and their partner's) income must be below a certain level and they must have a medical certificate, the first of which can last for only up to 4 weeks. For pregnant women, payments may continue for up to 13 weeks after the birth of their child.
4. **Invalid's Benefit:** To be eligible for an Invalid's Benefit, young people need to be 16+ years of age and unable to work 15+ hours a week because of a sickness, injury or disability which is expected to last at least 2 years OR their life expectancy is <2 years and they are unable to regularly work 15+ hours a week OR they are blind with a specified level of visual impairment. A doctor's certificate is required and young people need to be NZ citizens or permanent residents.

While the diversity of the above criteria suggests that young people reliant on benefits form a particularly heterogeneous group, comprising those temporarily out of work, those caring for young children and those unable to participate in the workforce for a variety of medical or other reasons, they may nevertheless share a number of experiences in common with other groups highlighted in earlier sections of this report (e.g. children reliant on beneficiaries, those leaving school early and without qualifications, those with long term disabilities) and as a consequence, may warrant further consideration in future planning and strategy development. The following section uses data from the Ministry of Social Development's

SWIFTT database to explore the number of young people (16-24 years) in NZ and Counties Manukau who were reliant on Benefits during 2000-06.

Data Sources and Statistical Methods

Ministry of Social Development's Work and Income Data [15]

The information in this section was provided by the Ministry of Social Development and is derived from their SWIFTT database, which records information on the recipients of financial assistance through Work and Income for the period 2000-06. All figures, unless stated otherwise, refer to the number of young people aged 16-24 years in receipt of a core benefit at the end of April and thus provide no information on those receiving assistance from Work and Income at other times of the year.

Notes on Geographic Location: As information on benefit recipients was not linked to domicile code, it was not possible to provide information on the numbers of young people resident within Counties Manukau who were reliant on benefits. Information was available however, on the number of young people receiving benefits from the various Service Centres within or adjacent to Counties Manukau's catchment area. A lack of a clearly delineated denominator however, precluded the calculation of rates.

Young People Reliant on Benefits in NZ

All Benefits

In NZ during 2000-06, there was a large decline in the number of young people reliant on unemployment benefits, with rates falling from 89.1 per 1,000 in 2000 to 25.3 per 1,000 in 2006. In contrast, the number of young people reliant on domestic purposes benefits remained relatively static (43.8 per 1,000 in 2000 → 43.7 per 1,000 in 2006). While the number reliant on invalids and sickness benefits increased, the overall proportion of young people on benefits declined during this period, from 173.3 per 1000 in 2000 to 124.4 per 1,000 in 2006 (**Table 26**).

Table 26. Proportion of NZ Young People 16-24 Yrs Reliant on Benefits, April 2000-2006

Benefit Type	Year (Rate per 1,000)						
	2000	2001	2002	2003	2004	2005	2006
Unemployment Benefit	89.1	79.4	70.4	61.7	41.9	31.1	25.3
DPB Related	43.8	44.0	44.3	44.0	44.2	43.5	43.7
Invalids Benefit	10.6	11.5	12.4	13.1	14.0	14.7	15.3
Sickness Benefit	8.5	9.0	9.9	11.3	12.4	13.1	14.8
Independent Youth Benefit	7.6	8.2	6.6	5.8	5.1	4.5	3.8
Unemployment: Training Related	6.1	5.6	5.0	5.6	5.5	5.2	6.0
Emergency Benefit	1.4	1.5	1.1	1.3	1.1	1.0	1.1
Other Benefits	6.2	6.7	6.2	6.2	7.0	11.1	14.3
Total	173.3	165.9	155.9	149.2	131.1	124.2	124.4

*Non-benefits include those on low incomes eligible for other income support e.g. accommodation supplement.

Unemployment Benefit

In NZ during 2000-06, the number of young people reliant on unemployment benefits fell, from 40,732 in April 2000 to 10,650 in April 2006. While unemployment benefit uptake declined for all ethnic groups, marked disparities remained, with uptake rates being higher for Māori > Pacific > European young people throughout this period. While the number of young people on training related unemployment benefits declined much less markedly (2,773 in April 2000 → 2,542 in April 2006), comparisons between these two benefit categories are

problematic, as while training related benefits are aimed at assisting young people with training that will aid their transition into the workforce, unemployment benefits are more responsive to labour market changes (e.g. market led job growth). Ethnic disparities were also evident in training related unemployment benefits, with higher rates of uptake for Māori > Pacific > European young people (**Figure 77**).

Domestic Purposes Benefit

In NZ during 2000-06 the number of young people on the domestic purposes benefit or emergency maintenance allowance fell slightly, from 19,991 in April 2000 to 18,347 in April 2006. As a result of population changes however, rates changed little, being 43.8 per 1,000 in 2000 and 43.7 per 1,000 in 2006. Throughout this period, marked ethnic disparities in DPB uptake were evident, with rates being consistently higher for Māori > Pacific > European young people (**Figure 78**).

Sickness and Invalid Benefits

In NZ during 2000-2006, there was a gradual increase in the number of young people reliant on sickness and invalid's benefits, with the total number on a sickness benefit increasing from 3,892 in April 2000 to 6,234 in April 2006 and the total number on an invalid's benefit increasing from 4,866 to 6,424 during the same period. There were also marked ethnic disparities in the number of young people reliant on sickness and invalids benefits, with rates being higher for Māori young people throughout this period. While invalid's benefit uptake was consistently lower for Pacific young people, sickness benefit uptake was only lower for Pacific young people during the last 4 years for which data was available (**Figure 79**).

During April 2006, 46% of young people receiving a sickness benefit required financial support for psychological / psychiatric reasons and 18% required support as the result of a pregnancy. Accidents (7%), musculoskeletal problems (6%) and substance use (6%) also made a significant contribution (**Figure 80**). In contrast for invalid's benefits, while 51% also required financial support for psychological / psychiatric reasons, 21% required support as the result of congenital anomalies and 10% as the result of nervous system problems (**Figure 81**).

Young People Reliant on Benefits in Counties Manukau

As information on benefit recipients was not linked to domicile code, it was not possible to provide information on the number of young people resident in Counties Manukau DHB who were reliant on benefits. Information was available however, on the number of young people receiving benefits from Service Centres in or adjacent to the DHB's boundaries, although lack of a clearly delineated denominator precluded the calculation of rates.

In Counties Manukau during 2000-06, there was a gradual decline in the number of young people receiving unemployment benefits, although the numbers receiving domestic purposes benefits remained relatively static and the numbers receiving sickness and invalid's benefits increased. Thus while in 2000, unemployment benefits were the most frequent form of income support received by Counties Manukau young people, by 2006 domestic purposes benefits were the predominant benefit type in the region (**Table 28**). These trends were very similar to those occurring nationally (**Table 27**) and may in part be due to changes in the labour market and the greater employment opportunities available for young people in recent years.

Figure 77. Unemployment Benefit and Training Related Unemployment Benefit Recipients by Ethnicity, NZ Young People 16-24 Years, April 2000-2006

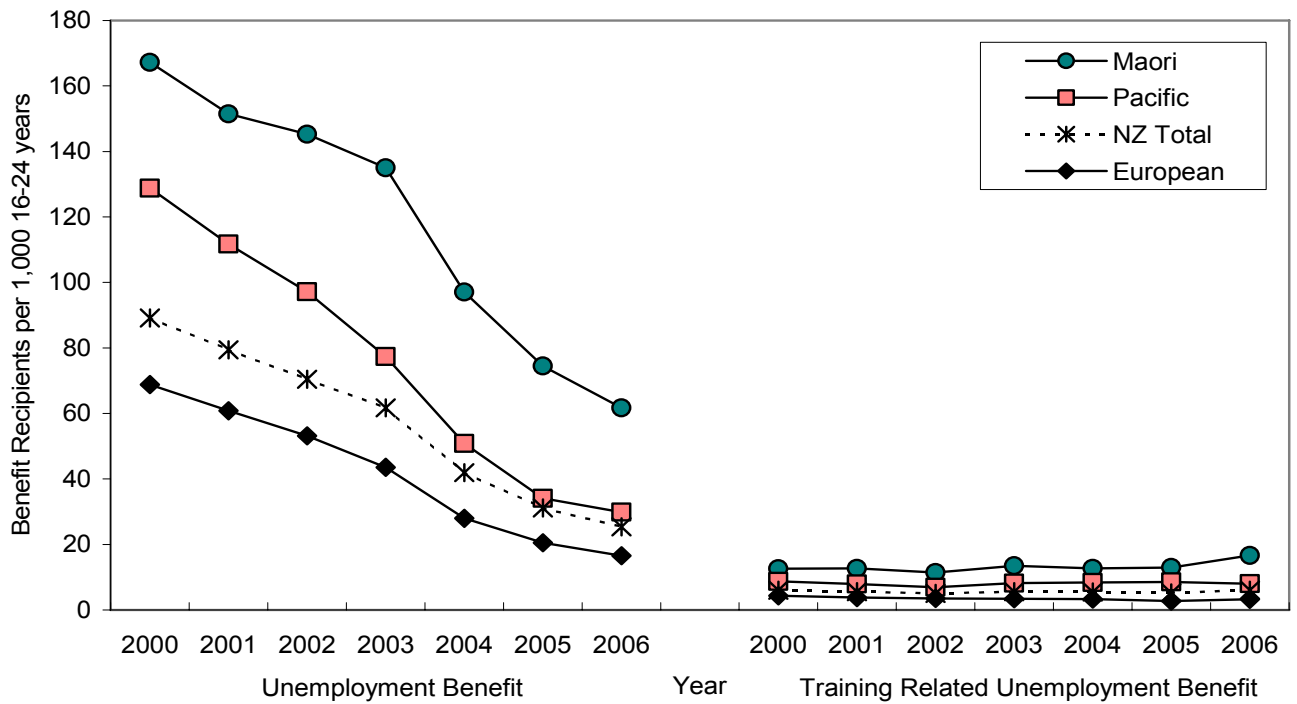


Figure 78. DPB and Emergency Maintenance Allowance Recipients by Ethnicity, NZ Young People 16-24 Years, April 2000-2006

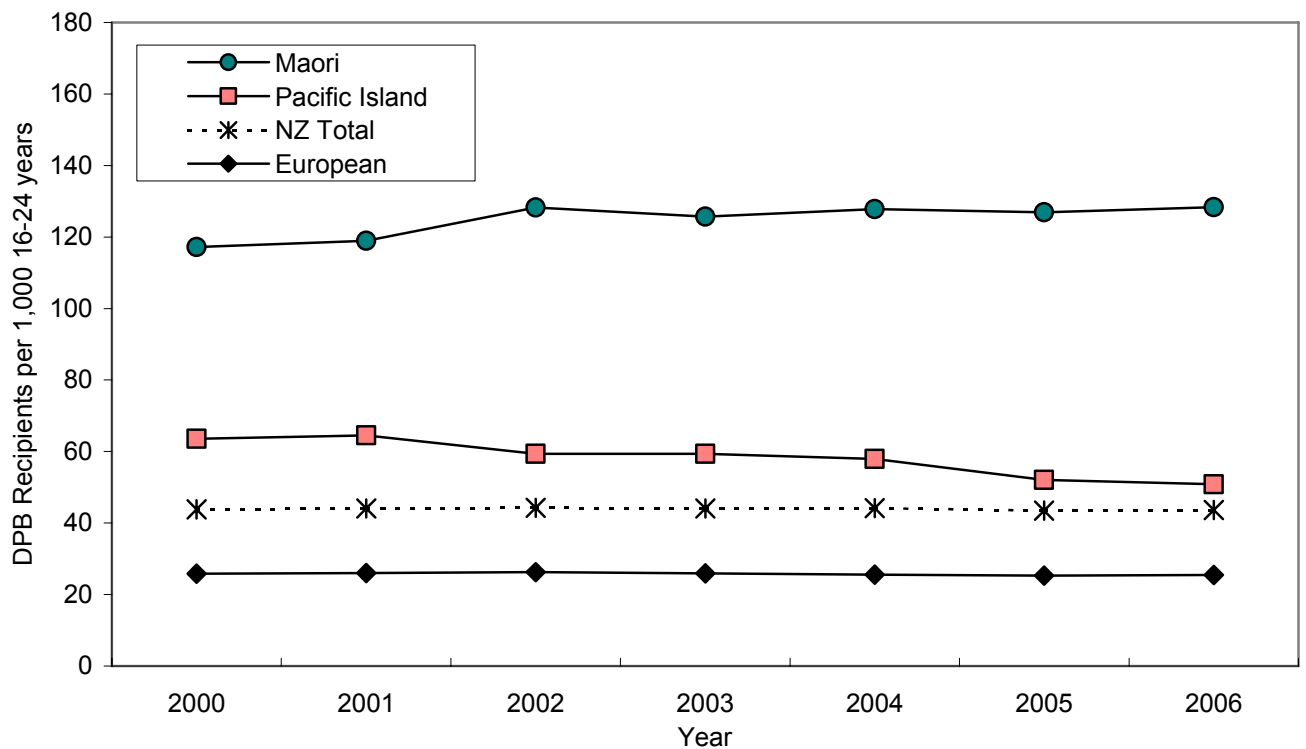


Figure 79. Sickness and Invalid Benefit Recipients by Ethnicity, NZ Young People 16-24 Years, April 2000-2006

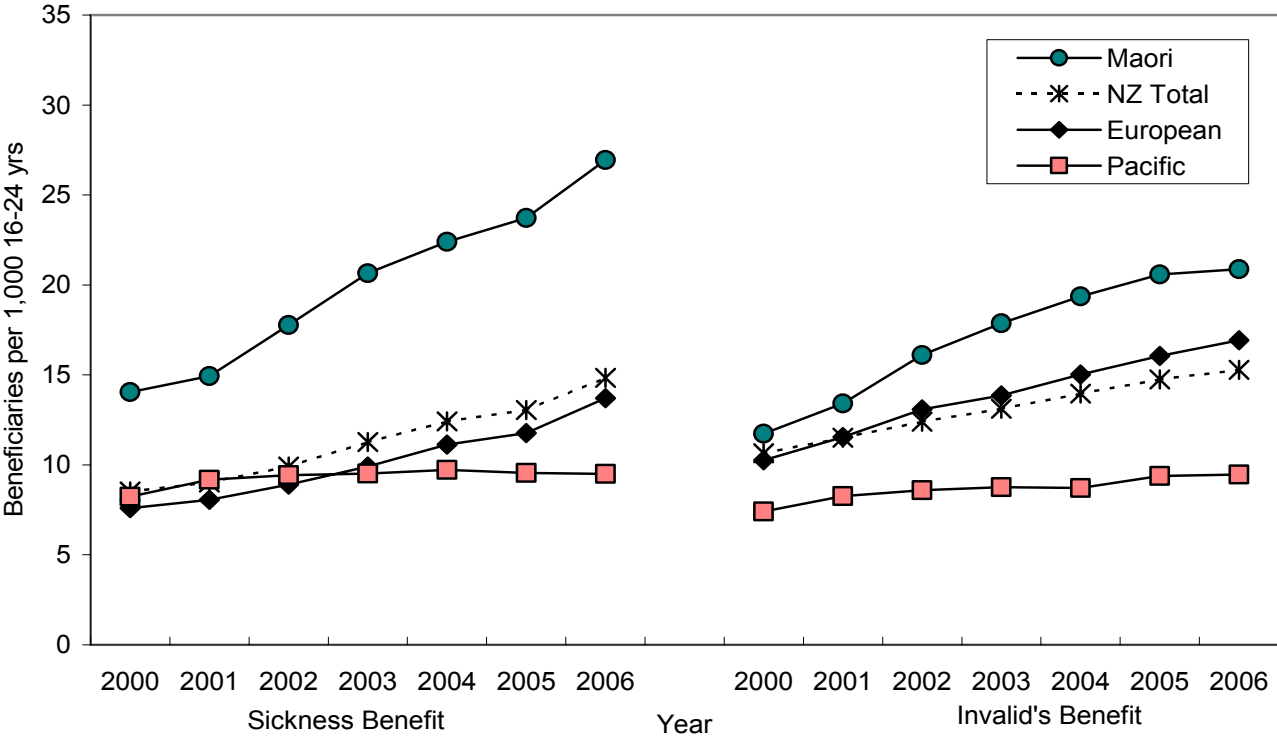


Figure 80. Sickness Benefit Recipients Aged 16-24 Yrs by Cause of Incapacity, NZ April 2006

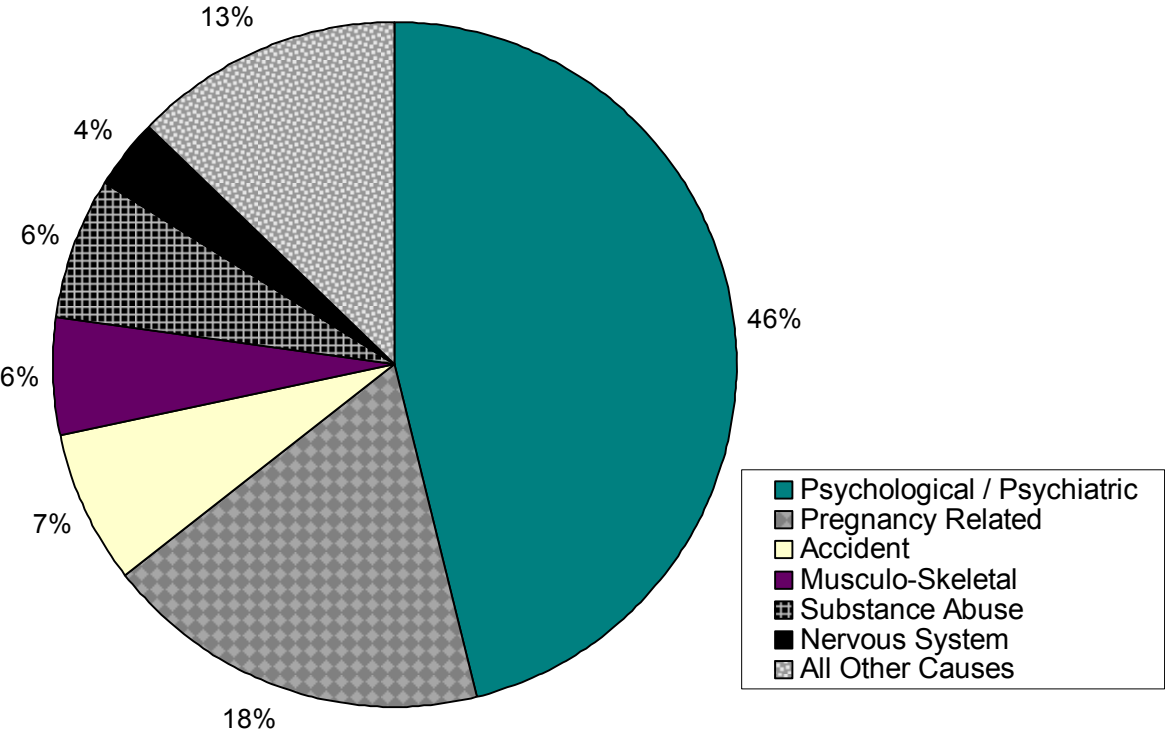
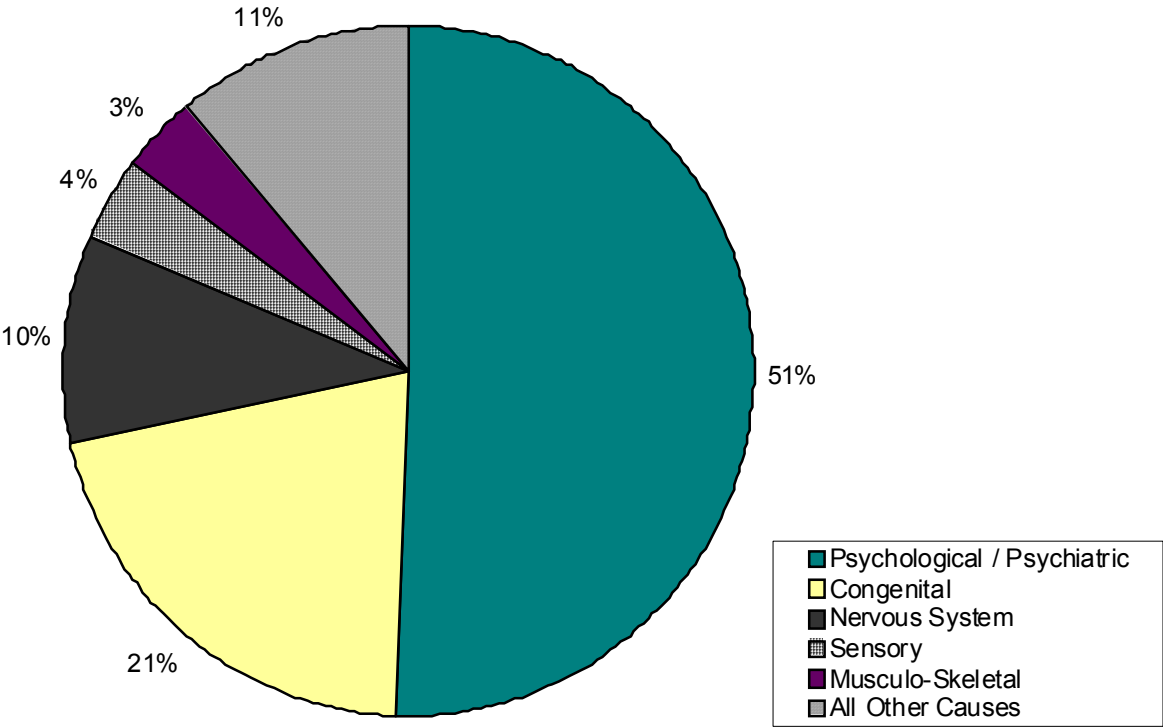


Figure 81. Invalid Benefit Recipients Aged 16-24 Years by Cause of Incapacity, NZ April 2006



In Summary

While adolescence is for many young people, a time for investing in learning and acquiring new skills, it is also a time of vulnerability. While the majority of young people successfully complete their years of secondary education and continue on to further training and employment, a significant minority are unable to support themselves financially for a variety of reasons. For those who meet eligibility criteria, the NZ Government offers a range of benefits and while the young people taking up these benefits comprise a heterogeneous group, including those temporarily out of work, those caring for young children and those unable to participate in the workforce for a variety of medical or other reasons, they may nevertheless share a number of experiences in common with other groups highlighted in earlier sections of this report.

In NZ during 2000-06, the number of young people (16-24 yrs) reliant on unemployment benefits fell, from 40,732 in 2000 to 10,650 in 2006. While unemployment benefit uptake declined for all ethnic groups, marked disparities remained, with rates being higher for Māori > Pacific > European young people. Rates for those reliant on the DHB changed little, being 43.8 per 1,000 in 2000 and 43.7 per 1,000 in 2006. There were also marked ethnic disparities in DPB uptake, with rates being higher for Māori > Pacific > European young people. There was a gradual increase in the number of young people on sickness and invalid's benefits, with uptake rates being higher for Māori and lower for Pacific young people during most of this period.

In Counties Manukau during 2000-06, there was a gradual decline in the number of young people receiving unemployment benefits, although the numbers receiving domestic purposes benefits remained relatively static and the numbers receiving sickness and invalid's benefits increased. Thus while in 2000, unemployment benefits were the most frequent form of income support received by Counties Manukau young people, by 2006 domestic purposes benefits were the predominant benefit type in the region. These trends were very similar to those occurring nationally and may in part be due to changes in the labour market and the greater employment opportunities available for young people in recent years.

Table 27. Number of Young People 16-24 Yrs in New Zealand on Benefits by Type, April 2000-06

Benefit Type*	2000		2001		2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Unemployment Related	44211	55.8	39488	52.8	34245	49.4	29631	45.3	20325	35.9	15193	28.7	12267	23.5
Domestic Purposes	19991	25.2	19847	26.5	19684	28.4	19306	29.5	19110	33.7	18527	35.0	18347	35.1
Sickness Benefits	3892	4.9	4066	5.4	4406	6.4	4940	7.6	5369	9.5	5566	10.5	6234	11.9
Invalid's Benefits	4866	6.1	5185	6.9	5511	8.0	5755	8.8	6035	10.6	6288	11.9	6424	12.3
Other Benefits	6230	7.9	6187	8.3	5464	7.9	5792	8.9	5850	10.3	7396	14.0	8995	17.2
All Benefits	79190	100.0	74773	100.0	69310	100.0	65424	100.0	56689	100.0	52970	100.0	52267	100.0

*Note: Unemployment includes Unemployment Benefit, Unemployment Benefit-Hardship and Independent Youth Benefit; Domestic Purposes includes Domestic Purposes Related Benefit and Emergency Maintenance Allowance; Sickness Benefit includes Sickness Benefit and Sickness Benefit-Hardship.

Table 28. Number of Young People 16-24 Yrs in Counties Manukau Region* on Benefits, April 2000-06

Benefit Type*	2000		2001		2002		2003		2004		2005		2006	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Unemployment Related	5118	51.4	4963	49.9	4413	46.5	3911	43.6	2882	36.1	2179	29.4	2111	28.2
Domestic Purposes	3130	31.4	3240	32.6	3284	34.6	3206	35.7	3244	40.6	3144	42.5	3179	42.5
Sickness Benefits	425	4.3	463	4.7	532	5.6	566	6.3	553	6.9	597	8.1	611	8.2
Invalid's Benefit	507	5.1	563	5.7	609	6.4	632	7.0	664	8.3	675	9.1	651	8.7
Other Benefits	786	7.9	722	7.3	651	6.9	660	7.4	639	8.0	808	10.9	936	12.5
All Benefits	9966	100.0	9951	100.0	9489	100.0	8975	100.0	7982	100.0	7403	100.0	7488	100.0

*Note: Unemployment includes Unemployment Benefit, Unemployment Benefit-Hardship and Independent Youth Benefit; Domestic Purposes includes Domestic Purposes Related Benefit and Emergency Maintenance Allowance; Sickness Benefit includes Sickness Benefit and Sickness Benefit-Hardship.

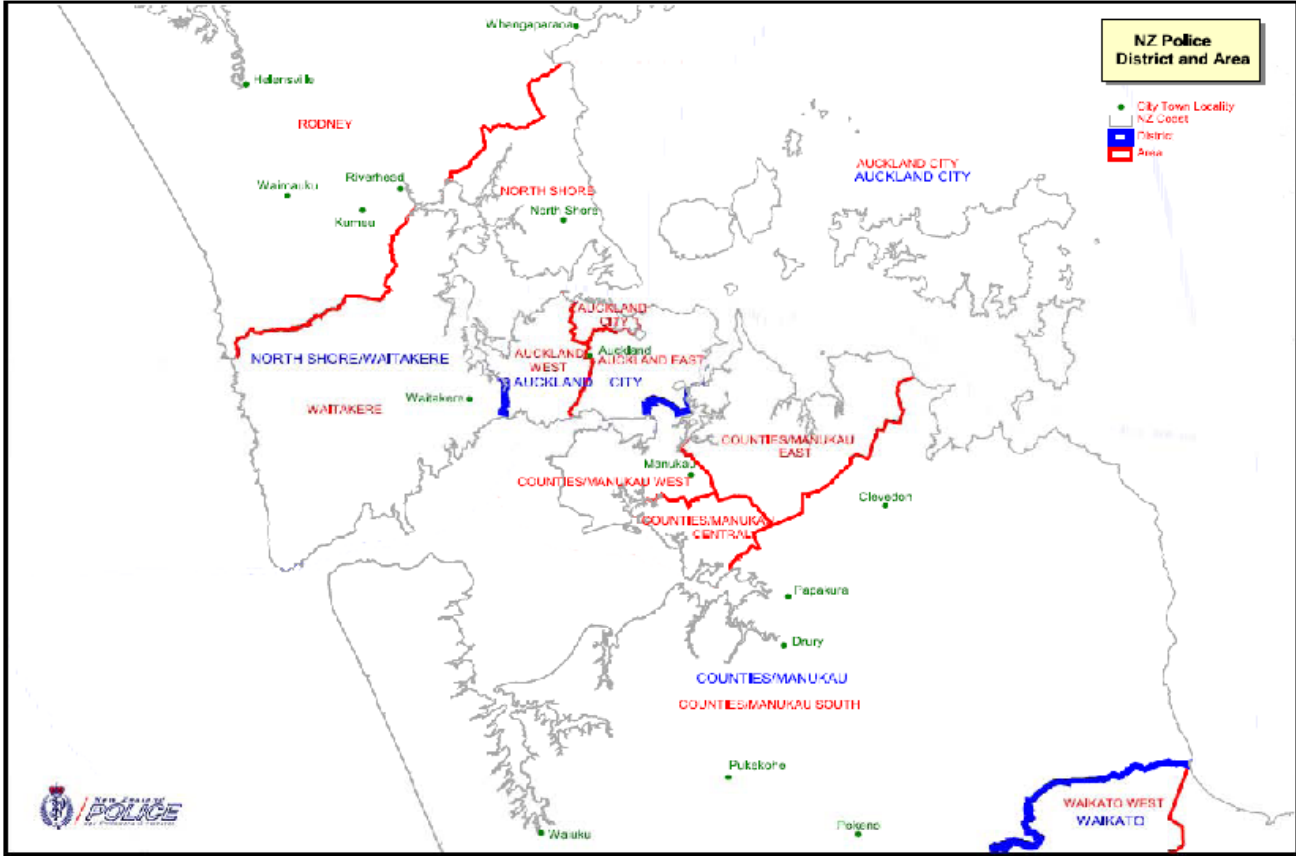
*Note: Data from Service Centres in or Adjacent to the Counties Manukau DHB Catchment: Clendon, Highland Park, Hunters Corner, Mangere, Manukau, Manurewa, Otahuhu, Otara, Papakura, Papatoetoe, Pukekohe, Waiuku.

APPENDICES AND REFERENCES



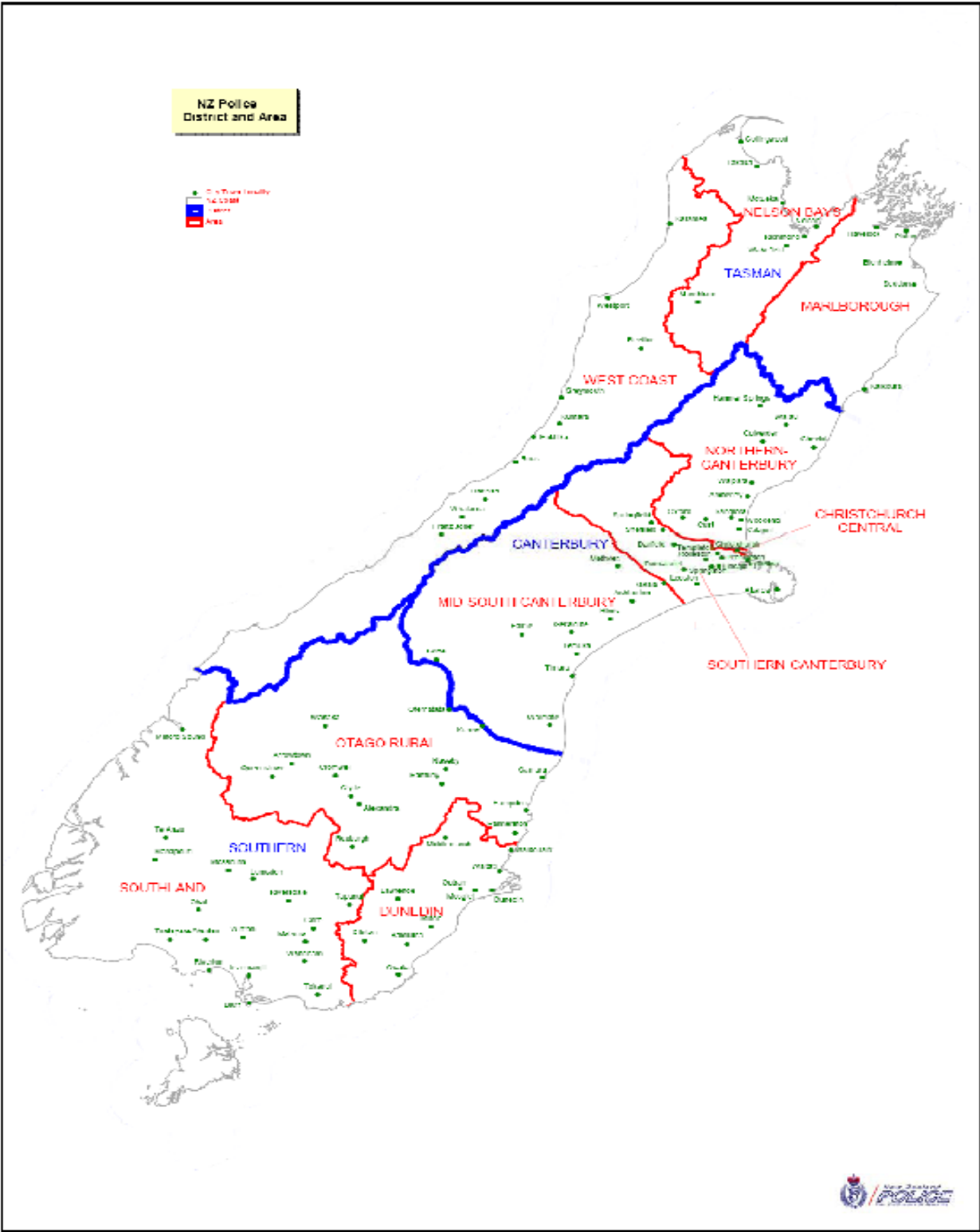
APPENDIX 1. POLICE AREA BOUNDARIES

Figure 82. Police Area Boundaries in the Auckland Region



Source: <http://www.stats.govt.nz/products-and-services/table-builder/crime-tables/maps.htm>

Figure 84. Police Area Boundaries in the South Island



Source: <http://www.stats.govt.nz/products-and-services/table-builder/crime-tables/maps.htm>

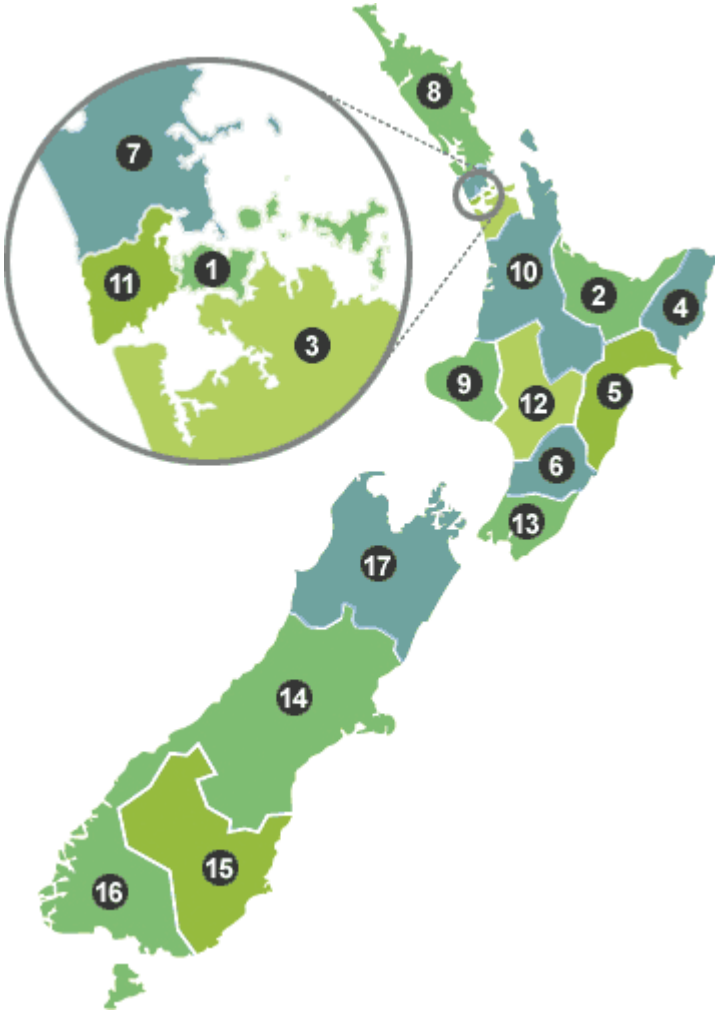
APPENDIX 2: SPARC REGIONAL SPORTS TRUSTS

SPARC is a crown entity that provides support through investment to a wide range of organisations who make sport happen. This includes 17 regional sports trusts who promote sport and physical activity to people of all ages in the community. The trusts are independent organisations, which receive money from SPARC according to their size and the population they serve. The location of these sports trusts is shown below.

Figure 85. SPARC Regional Sports Trusts

- North Island
 - 1. Auckland
 - 2. Bay of Plenty
 - 3. Counties Manukau
 - 4. Gisborne
 - 5. Hawkes Bay
 - 6. Manawatu
 - 7. North Harbour
 - 8. Northland
 - 9. Taranaki
 - 10. Waikato
 - 11. Waitakere
 - 12. Whanganui
 - 13. Wellington Region

- South Island
 - 14. Canterbury/Westland
 - 15. Otago
 - 16. Southland
 - 17. Tasman



Source: <http://www.sparc.org.nz>

REFERENCES

1. Ministry of Health, *Child Health Strategy*. 1998, Ministry of Health: Wellington. p. 1-60.
2. Adolescent Health Research Group, *New Zealand Youth: A Profile of their Health and Wellbeing*. 2003, University of Auckland: Auckland. p. 1-54.
3. Nelson, W., et al., *Nelson Textbook of Pediatrics*. 14th ed, ed. W. Nelson, V. Vaughan, and R. Kliegman. 1992, Philadelphia: WB Saunders Company.
4. Behrman, R., et al., *Nelson Textbook of Pediatrics*. 14th ed. 1992, Philadelphia: W.B. Saunders Company.
5. Ministry of Social Development, *Indicators of Social Wellbeing in New Zealand*. 2006, Ministry of Social Development: Wellington. p. 17.
6. Stevens, K., et al., *Focus on Families: Reinforcing the Importance of Family*. 2005, Families Commission: Wellington. p. 1-61.
7. Statistics New Zealand, *New Zealand Now: Families and Households*. 1998, Statistics New Zealand: Wellington. p. 41-51.
8. Jensen, J., et al., *New Zealand Living Standards 2004*. 2006, Ministry of Social Development: Wellington. p. 99-122.
9. Ram, B. and F. Hou, *Changes in Family Structure and Child Outcomes: Roles of Economic and Familial Resources*. *The Policy Studies Journal*, 2003. **31**(3): p. 309-330.
10. Mackay, R., *The Impact of Family Structure and Family Change on Child Outcomes: A Personal Reading of the Research Literature*. *Social Policy Journal of New Zealand*, 2005. **24**: p. 111-133.
11. Aber, j., et al., *The Effects of Poverty on Child Health and Development*. *Annual Reviews of Public Health*, 1997. **18**: p. 463-83.
12. Bradley, R. and R. Corwyn, *Socioeconomic Status and Child Development*. *Annual Reviews of Psychology*, 2002. **53**: p. 371-99.
13. Krishnan, V., et al., *Children in Poor Families: Does the Source of Family Income Change the Picture?* *Social Policy Journal of New Zealand*, 2002. **18**(June 2002): p. 118-147.
14. St John, S. and D. Craig, *Cut Price Kids: Does the 2004 "Working for Families" Budget Work for Children?* 2004, Child Poverty Action Group: Auckland. p. 15.
15. Ministry of Social Development, *The Statistical Report for the Year Ending June 2004*. 2005, Ministry of Social Development: Wellington. p. 1-177.
16. Ministry of Social Development, *Te Rito: New Zealand Family Violence Prevention Strategy*. 2002, Ministry of Social Development: Wellington.
17. Hassall, I. and J. Fanslow, *Family Violence in New Zealand: Can We Do Better?* *The New Zealand Medical Journal*, 2006. **119**(1228): p. 1-4.
18. Martin, J., J. Langley, and J. Mullichamp, *Domestic Violence as Witnessed by New Zealand Children*. *The New Zealand Medical Journal*, 2006. **119**(1228): p. 1-14.

19. Fergusson, D. and J. Horwood, *Exposure to Interparental Violence in Childhood and Psychosocial Adjustment in Young Adulthood*. Child Abuse and Neglect, 1998. **22**(5): p. 339-357.
20. Fanslow, J., *Family Violence Intervention Guidelines*. 2002, Ministry of Health: Wellington. p. 1-88.
21. Goodwin, R., D. Fergusson, and J. Horwood, *Childhood Abuse and Familial Violence and the Risk of Panic Attacks and Panic Disorder in Young Adulthood*. Psychological Medicine, 2004. **35**: p. 881-890.
22. Tolan, P., D. Gorman-Smith, and D. Henry, *Family Violence*. Annual Reviews of Psychology, 2006. **57**: p. 557-83.
23. Goodyear-Smith, F., *Recognising and Responding to Partner Abuse: Challenging the Key Facts*. The New Zealand Medical Journal, 2004. **117**(1202): p. 1-5.
24. Fanslow, J., *Responding to Partner Abuse: Understanding its Consequences and Recognising the Global and Historical Context*. The New Zealand Medical Journal, 2004. **117**(1202): p. 1-4.
25. Ministry of Health, *Our Children's Health. Key Findings on the Health of New Zealand Children*. 1998, Ministry of Health: Wellington. p. 1-197.
26. Mansell, J., *The Underlying Instability in Statutory Child Protection: Understanding the System Dynamics Driving Risk Assurance Levels*. Social Policy Journal of New Zealand, 2006. **28**: p. 97-132.
27. Shaw, M., *Housing and Public Health*. Annual Reviews of Public Health, 2004. **25**: p. 397-418.
28. Baker, M., *Household Crowding a Major Risk Factor for Epidemic Meningococcal Disease in Auckland Children*. Paediatric Infectious Disease Journal, 2000. **19**: p. 983-90.
29. Baker, M. and P. Howden-Chapman, *Chapter 5: Household Crowding and Health*, in *What is the Extent of Crowding in New Zealand*, Statistics New Zealand, Editor. 2003, Statistics New Zealand: Wellington. p. 58-83.
30. Gray, A., *Definitions of Crowding and the Effects of Crowding on Health: A Literature Review*. 2001, Ministry of Social Policy: Wellington. p. 2-40.
31. Statistics New Zealand, *What is the Extent of Overcrowding in New Zealand*. 2003, Statistics New Zealand: Wellington. p. 1-36.
32. Maori Women's Housing Research Project Report, *"...for the sake of decent shelter..."* 1991, Maori Women's Housing Research Project Report. p. 21.
33. Woodward, A. and M. Laugesen, *Morbidity Attributable to Second Hand Cigarette Smoke in New Zealand*. 2001, Ministry of Health: Wellington. p. 1-21.
34. DiFranza, J., C. Aligne, and M. Weitzman, *Prenatal and Postnatal Environmental Tobacco Smoke Exposure and Children's Health*. Pediatrics, 2004. **113**(4): p. 1007-1015.
35. Thomson, G., et al., *Tobacco Spending and Children in Low Income Households*. Tobacco Control, 2002. **11**: p. 372-375.

36. Scragg, R., M. Laugesen, and E. Robinson, *Parental Smoking and Related Behaviours Influence Adolescent Tobacco Smoking: Results from the 2001 New Zealand National Survey of 4th Form Students*. The New Zealand Medical Journal, 2003. **116**(1187).
37. Scragg, R., *Report of 1999-2005 National Year 10 Smoking Surveys*. 2006, Action on Smoking and Health (ASH): Auckland. p. 1-54.
38. Gillespie, J., K. Milne, and N. Wilson, *Secondhand Smoke in New Zealand Homes and Cars: Exposure, Attitudes and Behaviours in 2004*. The New Zealand Medical Journal, 2005. **118**(1227).
39. Al-Delaimy, W., J. Crane, and A. Woodward, *Passive Smoking in Children: Effect of Avoidance Strategies at Home as Measured by Hair Nicotine Levels*. Archives of Environmental Health, 2001. **56**(2): p. 117-122.
40. Matt, G., et al., *Households Contaminated by Environmental Tobacco Smoke: Sources of Infant's Exposures*. Tobacco Control, 2004. **13**: p. 29-37.
41. Ministry of Health, *Seeing Through the Smoke: Tobacco Monitoring in New Zealand*. 2005, Ministry of Health: Wellington. p. 1-55.
42. Ministry of Health and the University of Auckland, *Nutrition and the Burden of Disease: New Zealand 1997-2011*. 2003, Ministry of Health: Wellington. p. xv-xvi.
43. Turnbull, A., et al., *Changes in Body Mass Index in 11-12 year Old Children in Hawkes Bay, New Zealand (1989-2000)*. Journal of Paediatrics and Child Health, 2004. **40**: p. 33-37.
44. Hotu, S., et al., *Increasing Prevalence of Type 2 Diabetes in Adolescents*. Journal of Paediatrics and Child Health, 2004. **40**: p. 201-204.
45. Ministry of Health, *Tracking the Obesity Epidemic: New Zealand 1977-2003*. 2004, Ministry of Health: Wellington. p. ix-xii.
46. Ministry of Health, *An Analysis of the Usefulness and Feasibility of a Population Indicator of Childhood Obesity*. 2006, Ministry of Health: Wellington. p. 1-74.
47. Power, C., J. Lake, and T. Cole, *Measurement and Long Term Health Risks of Child and Adolescent Fatness*. International Journal of Obesity, 1997. **21**: p. 507-526.
48. Whitaker, R., et al., *Predicting Obesity in Young Adulthood from Childhood and Parental Obesity*. The New England Journal of Medicine, 1997. **337**(13): p. 869-873.
49. Bouchard, C., *Obesity in Adulthood -- The Importance of Childhood and Parental Obesity*. New England Journal of Medicine, 1997. **337**(13): p. 926-927.
50. Cole, T., et al., *Establishing a Standard Definition for Child Overweight and Obesity Worldwide: International Survey*. British Medical Journal, 2000. **320**(7244): p. 1240-6.
51. Rush, E., et al., *Body Composition and Physical Activity in New Zealand Maori, Pacific and European Children aged 5-14 Years*. British Journal of Nutrition, 2003. **90**: p. 1133-1139.
52. Rush, E., et al., *Estimation of Body Fatness from Body Mass Index and Bioelectrical Impedance: Comparison of New Zealand European, Maori and Pacific Island Children*. European Journal of Clinical Nutrition, 2003. **57**: p. 1394-1401.

53. Tyrrell, V., et al., *Obesity in Auckland School Children: A Comparison of the Body Mass Index and Percentage of Body Fat as Diagnostic Criterion*. International Journal of Obesity, 2001. **25**: p. 164-169.
54. Ellis, K., S. Abrams, and W. Wong, *Body Composition Reference Data for a Young Multiethnic Female Population*. Applied Radiation Isotopes, 1998. **49**: p. 587-8.
55. Ministry of Health, *NZ Food NZ Children: Key Results of the 2002 National Children's Nutrition Survey*. 2003, Ministry of Health: Wellington. p. 1-267.
56. Dawson, K., M. Hamlin, and J. Ross, *Trends in the Health Related Physical Fitness of 10-14 Year Old New Zealand Children*. Journal of Physical Education New Zealand, 2001. **34**(1): p. 26-39.
57. Sturm, R., *Childhood Obesity. What We Can Learn from Existing Data on Societal Trends: Part 2*. Public Health Research, Practice and Policy, 2005. **2**(2): p. 1-9.
58. Carter, M. and B. Swinburn, *Measuring the 'Obesogenic' Food Environment in New Zealand Primary Schools*. Health Promotion International, 2004. **19**(1): p. 15-20.
59. Utter, J., et al., *Nutrition and Physical Activity Behaviours Among Maori, Pacific and New Zealand European Children: Identifying Opportunities for Population-Based Interventions*. Australian and New Zealand Journal of Public Health, 2006. **30**(1): p. 50-55.
60. Department of Health, *Food for Health. The Report of the Nutrition Taskforce to the Department of Health*. 1991, Department of Health: Wellington.
61. Dollman, J., K. Norton, and L. Norton, *Evidence for Secular Trends in Children's Physical Activity Behaviour*. British Journal of Sports Medicine, 2005. **39**: p. 892-897.
62. Land Transport Safety Authority, *The New Zealand Travel Survey 1997/98*. 2000, Land Transport Safety Authority of New Zealand: New Zealand.
www.ltsa.govt.nz/research/index.html.
63. Roberts, I., *Safely to School*. The Lancet, 1996. **347**(June 15): p. 1642.
64. Tudor-Locke, C., B. Ainsworth, and B. Popkin, *Active Commuting to School*. Sports Medicine, 2001. **31**(5): p. 309-313.
65. Sport and Recreation New Zealand, *SPARC Trends. Trends in Participation in Sport and Active Leisure 1997-2001*. 2003, Sports and Recreation New Zealand: Wellington. p. 1-53.
66. Crocker, P., et al., *Measuring General Levels of Physical Activity: Preliminary Evidence for the Physical Activity Questionnaire for Older Children*. Medicine and Science in Sport, 1997. **29**: p. 1344-1349.
67. van Aalst, I., D. Kazakov, and G. McLean, *SPARC Facts*. 2003, Sports and Recreation New Zealand: Wellington. www.sparc.org.nz.
68. Hohepa, M., G. Schofield, and G. Kolt, *Adolescent Obesity and Physical Inactivity*. New Zealand Medical Journal, 2004. **117**(1207): p. 1-13.
69. Midland Health, *Part 1: Infants and Children*, in *The People of the Midland Health Region. Volume 2: Health Status*. 1995, Midland Health: Hamilton. p. 1-59.
70. Statistics New Zealand, *Disability Counts 2001*. 2002, Statistics New Zealand: Wellington. p. 1-133.

71. Ministry of Health, *The Clinical Assessment and Management of Children, Young People and Adults with Down Syndrome: Recommended Clinical Practice*. 2001, Ministry of Health: Wellington. p. 1-31.
72. Australian Institute of Health and Welfare, *Children with Disabilities in Australia*, in *AIHW cat no DIS 38*. 2004, AIHW: Canberra. p. 1-108.
73. Carpinter, A., C. Irwin, and G. Rogers, *Just Surviving*. 2000, Ministry of Health: Wellington. p. 1-22.
74. Dastgiri, S., et al., *Prevalence and Secular Trend of Congenital Anomalies in Glasgow, UK*. *Archives of Disease in Childhood*, 2002. **86**: p. 257-263.
75. Sindoor, S. and N. Fayetteville, *Down Syndrome: A Review of the Literature*. *Oral Surgery Oral Medicine Oral Pathology Oral Radiology*, 1997. **84**: p. 279-85.
76. Frey, L. and W. Hauser, *Epidemiology of Neural Tube Defects*. *Epilepsia*, 2003. **44**(Supplement 3): p. 4-13.
77. Rudolph, A., *Rudolph's Pediatrics*. 20th Edition ed, ed. A. Rudolph, H. Hoffman, and C. Rudolph. 1996, London: Prentice Hall International.
78. Paediatric Society of New Zealand, *Submission from the Paediatric Society of New Zealand on the Mandatory Folic Acid Fortification Standard*. 1996, Paediatric Society of New Zealand: Wellington. p. 1-4.
79. Ministry of Health, *Congenital and Inherited Conditions*. 1996, Ministry of Health: Wellington. p. 1-30.
80. Stoll, C., et al., *Impact of Prenatal Diagnosis on Livebirth Prevalence of Children with Congenital Anomalies*. *Annales de Genetique*, 2002. **45**: p. 115-121.
81. Volkmar, F. and D. Pauls, *Autism*. *The Lancet*, 2003. **362**: p. 1133-1141.
82. Rutter, M., *Incidence of Autism Spectrum Disorders: Changes Over Time and Their Meaning*. *Acta Paediatrica*, 2005. **94**: p. 2-15.
83. Taylor, P. *Childhood Pervasive Developmental Disorder in a Geographical Population in New Zealand*. in *The Paediatric Society of New Zealand 58th Annual Scientific Meeting*. 2006. Nelson.
84. Fombonne, E., *The Epidemiology of Autism: A Review*. *Psychological Medicine*, 1999. **29**: p. 769-786.
85. Williams, J., J. Higgins, and C. Brayne, *Systematic Review of Prevalence Studies of Autism Spectrum Disorders*. *Archives of Disease in Childhood*, 2006. **91**: p. 8-15.
86. Blair, E. and F. Stanley, *Issues in the Classification and Epidemiology of Cerebral Palsy*. *Mental Retardation and Developmental Disabilities Research Reviews*, 1997. **3**: p. 184-193.
87. Nelson, K., *The Epidemiology of Cerebral Palsy in Term Infants*. *Mental Retardation and Developmental Disabilities Research Reviews*, 2002. **8**: p. 146-150.
88. Luckasson, R., et al., *Mental Retardation: Definition, Classification and Systems of Supports*. 1992, American Association on Mental Retardation: Washington DC.
89. Murphy, C., et al., *Epidemiology of Mental Retardation in Children*. *Mental Retardation and Developmental Disabilities Research Reviews*, 1998. **4**: p. 6-13.

90. Leonard, H. and X. Wen, *The Epidemiology of Mental Retardation: Challenges and Opportunities in the New Millennium*. Mental Retardation and Developmental Disabilities Research Reviews, 2002. **8**: p. 117-134.
91. Universal Newborn Hearing Screening Advisory Group, *Universal Newborn Hearing Screening for New Zealand 2005. A Report of the Universal Newborn Hearing Screening Advisory Group to the National Screening Unit*. 2005, Ministry of Health: Wellington. p. 1-38.
92. National Audiology Centre, *New Zealand Deafness Notification Data 2004*. 2004, National Audiology Centre: Auckland. p. 1-26.
93. Project HIEDI, *Improving Outcomes for Children with Permanent Congenital Hearing Improvement*. 2004, Project HIEDI: Auckland. p. 1-103.
94. Joint Committee on Infant Hearing, *Year 2000 Position Statement: Principles and Guidelines for Early Detection and Intervention Programs*. 2000.
95. New Zealand Audiological Society, *The NZ Cochlear Implant Program*. 2006. www.audiology.org.nz.
96. Gravitas Research and Strategy Ltd, *The Cost of Blindness in New Zealand*. 2006, Royal New Zealand Foundation of the Blind and Association of Blind Citizens (NZ). p. 1-142.
97. Kocur, I. and S. Resnikoff, *Visual Impairment and Blindness in Europe and their Prevention*. British Journal of Ophthalmology, 2002. **86**: p. 716-722.
98. Wylie, C., et al., *Contributing to Early Childhood Education to Age-14 Performance*. 2006, New Zealand Council for Educational Research. p. 1-39.
99. Loeb, S., et al., *How Much is Too Much? The Influence of Preschool Centres on Children's Social and Cognitive Development*, in *Working Paper 11812*. 2005, National Bureau of Economic Research: Cambridge. www.nber.org/papers/w11812.
100. Ministry of Education, *Participation in Early Childhood Education*. 2006, Ministry of Education: Wellington. p. 1-3.
101. Ministry of Education, *Hours of Participation in Early Childhood Education*. 2006, Ministry of Education: Wellington. p. 1-3.
102. Durie, M., et al., *Maori Specific Outcomes and Indicators*. 2002, Te Puni Kokiri The Ministry of Maori Development: Palmerston North. p. 1-61.
103. Te Puni Kokiri, *Fact Sheet 15: Te Maori i nga Kura Kopaki. Maori in Composite Schools*. 2001, Te Puni Kokiri: Wellington. p. 1-2.
104. Rau, C., *Literacy Acquisition, Assessment and Achievement of Year Two Students in Total Immersion Maori Programs*. The International Journal of Bilingual Education and Bilingualism, 2005. **8**(5): p. 404-432.
105. Ministry of Education, *Kura Kaupapa Maori and Kura Teina Schools*. 2006, Ministry of Education: Wellington. p. 1-2.
106. Scragg, R., M. Laugesen, and E. Robinson, *Cigarette Smoking, Pocket Money and Socioeconomic Status: Results from a National Survey of 4th Form Students in 2000*. The New Zealand Medical Journal, 2002. **115**(1158).
107. Stanton, W., *Substance Use: Progression in the Use of Tobacco, Alcohol and Other Drugs*, in *From Child to Adult: The Dunedin Multidisciplinary Health and*

- Development Study*, P. Silva and W. Stanton, Editors. 1996, Oxford University Press New Zealand: Auckland. p. 186-205.
108. Fergusson, D. and L. Horwood, *Transitions to Cigarette Smoking During Adolescence*. Addictive Behaviours, 1995. **20**(5): p. 627-642.
 109. Elders, M., et al., *The Report of the Surgeon General: Preventing Tobacco Use Among Young People*. American Journal of Public Health, 1994. **84**(4): p. 543-547.
 110. Alcohol Advisory Council, *The Way We Drink 2005*. 2005, Alcohol Advisory Council. p. 1-22.
 111. Adolescent Health Research Group, *Alcohol and New Zealand Youth: A Snapshot of Young People's Experiences with Alcohol*. 2004, The University of Auckland: Auckland. p. 1-27.
 112. Langley, J. and K. Kypri, *Regarding New Zealand Medical Association's Position on the Minimum Purchase Age for Alcohol*. New Zealand Medical Journal, 2006. **119**(1234).
 113. Kypri, K., et al., *Minimum Purchasing Age for Alcohol and Traffic Crash Injuries Among 15 to 19 Year Olds in New Zealand*. American Journal of Public Health, 2006. **96**(1): p. 126-131.
 114. Everitt, R. and P. Jones, *Changing the Minimum Legal Drinking Age- Its Effects on a Central City Emergency Department*. New Zealand Medical Journal, 2002. **115**(1146): p. 9-11.
 115. Alcohol Advisory Council of New Zealand, *National Alcohol Strategy 2000-2003*. 2001, Ministry of Health: Wellington. p. 1-76.
 116. Humphrey, G., S. Casswell, and D. Han, *Alcohol and Injury Among Attendees at a New Zealand Emergency Department*. The New Zealand Medical Journal, 2003. **116**(1168): p. 1-10.
 117. Hammond, C., *How Education Makes Us Healthy*. London Review of Education, 2002. **1**(1): p. 61-78.
 118. Erikson, R. and J. Goldthorpe, *Intergenerational Inequality: A Sociological Perspective*. Journal of Economic Perspectives, 2002. **16**(3): p. 31-44.
 119. Ministry of Education, *School Leavers with a University Entrance Standard*. 2006, Ministry of Education: Wellington. p. 1-3.
 120. Ministry of Education, *School Leavers with No Qualifications*. 2006, Ministry of Education: Wellington. p. 1-3.
 121. Biddulph, F., J. Biddulph, and C. Biddulph, *The Complexity of Community and Family Influences on Children's Achievement in New Zealand. Best Evidence Synthesis*. 2003, Ministry of Education: Wellington. p. 1-202.
 122. Ministry of Education, *Early Leaving Exemptions*. 2006, Ministry of Education: Wellington. p. 1-2.
 123. Statistics New Zealand, *Chapter 4: Education*, in *Young New Zealanders*, S.N. Zealand, Editor. 1998, Statistics New Zealand: Wellington. p. 37-54.
 124. Ministry of Education, *Retention of Students in Senior Secondary Schools*. 2006, Ministry of Education: Wellington. www.educationcounts.edcentre.govt.nz.

125. Ministry of Education, *Graduate Income Premium*. 2006, Ministry of Education: Wellington. p. 1-4.
126. Ministry of Education, *A Report on Stand-Downs, Suspensions, Exclusions and Expulsions*. 2001, Ministry of Education: Wellington. p. 1-8.
127. Ministry of Education, *Report on Stand-Downs, Suspensions, Exclusions and Expulsions*. 2005, Ministry of Education: Wellington. p. 1-14.
128. Fergusson, D. and L. Horwood, *Early Conduct Problems and Later Life Opportunities*. *Journal of Psychology and Psychiatry*, 1998. **39**(8): p. 1097-1108.
129. Ministry of Education, *Stand-downs and Suspensions from School*. 2006, Ministry of Education: Wellington. <http://educationcounts.edcentre.govt.nz>.
130. Ministry of Education, *A Report on New Zealand Student Engagement*. 2006, Ministry of Education: Wellington. p. 1-11.