

**Health journeys of Pacific children aged 10-14 years
with
mental health conditions in New Zealand:
Evidence from the New Zealand Integrated Data Infrastructure**

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A thesis submitted for the degree of Master of Health Sciences

University of Otago, Dunedin, New Zealand

March, 2019

ABSTRACT

In New Zealand (NZ), young Pacific people are overrepresented among those experiencing mental health conditions (MHC) compared to young people of other ethnicities. Despite this, little is known about the possible determinants associated with these conditions among Pacific children and furthermore, their relationship with other health outcomes. The aims of this research were to describe MHC among Pacific children aged 10-14 years in NZ during 2008-2015; investigate the role of deprivation and migration as determinants for the onset of these MHC; look at short-term health outcomes, (measured by the occurrence of ambulatory sensitive hospitalisation (ASH) conditions) for Pacific children with MHC; and comment on using the Integrated Data Infrastructure (IDI) to identify children with MHC.

Using data extracted from several health data sets housed in Statistics New Zealand's Integrated Data Infrastructure (IDI), the focus of this quantitative study are young Pacific people, aged 10-14 years old between July 1st 2008 to June 30th 2015, with a range of MHC (attention deficit hyperactive disorder (ADHD), mood disorders, anxiety, conduct disorder or substance disorder). Data for these young people was accessed through use of the IDI datasets, which provides access to microdata across different organisations in NZ and allows the extraction of data from the Ministry of Health (MOH) and Statistics New Zealand sources.

Results of this study showed ADHD, mood and substance disorder are the most common MHC among Pacific children aged 10-14 years. Demographic patterns showed most Pacific children with MHC lived in areas of high socioeconomic deprivation and many were geographically located in the Counties Manukau region. Around two thirds were born in NZ and the remaining third overseas. Experience of ASH conditions among Pacific children with MHC appeared to be higher than among Pacific children without a MHC diagnosis, highlighting an important pattern of co-morbidity that is useful for services to be aware of and to respond to. It was therefore concluded that deprivation is associated with the onset of MHC, and that being diagnosed with a MHC is also associated with the onset of other health conditions.

The findings of this study are consistent with literature and statistics about Pacific mental health,

helping to gain a clearer insight in to what factors may be contributing to young Pacific people being more at risk of developing MHC and furthermore, how this onset can lead to other detrimental health outcomes. In addition, these findings also indicate where focus should be placed and what MHC are more common in this cohort. Ultimately, this research has the potential to help young Pacific people with MHC living in NZ.

ACKNOWLEDGEMENTS

*Tekaki kia Sihova 'a e ngaahi me'a 'oku ke fai; Pea 'e fakaai ho'o ngaahi fakakaukau.
Palovepi 16:3*

I would like to take this time to express my utmost appreciation to my three supervisors; Dr Jesse Kokaua, Dr Rick Audas & Dr Rose Richards Hessel, for readily offering your expertise and for your patience with me across the different components of this research. I also extend my gratitude to University of Otago research fellow Nick Bowden for your help in the datalab. Furthermore, I am greatly indebted to the University of Otago, Dunedin School of Medicine - Department of Women and Children's Health and the Centre for Pacific Health as part of Va'a o Tautai, for facilitating and overseeing this research project.

The completion of this thesis would not have been possible without Statistics New Zealand, entrusting me with access to the IDI and providing support while I maneuvered through the datalab. I thank each and every young person living in New Zealand who was eligible for this study, providing valuable insight through their own personal experiences with mental health.

A special thank you is extended to the COMPASS team at the University of Auckland, particularly Dr Barry Milne and Dr Jinfeng Zhao for allowing me access to the datalab facilities on campus, whilst in Auckland.

Finally, this thesis is dedicated to my parents 'Ikani Latu & 'Elenoa Ikatonga Prescott (nee. Koloamatangi) – growing up I watched you both work relentlessly, and it is this same work ethic that I have tried to emulate towards my studies. May you bask in the completion of this research knowing that you are by far, my greatest motivation. With love I remember my pone, my late grandfather Ve'a & my very first teacher; my late grandmother Mele Prescott (nee. Tāpealava). I pray the completion of this thesis will have you both dancing in the sky today. *Proverbs 22:6*. To my siblings George, Ve'a, Steve Siomita, Kolopeaua & Leiola; thank you for clearing my path time and time again, allowing me to focus solely on my studies. I am beyond grateful.

Manatu 'ofa ki Telekava mo Waikumete. 'Ofa atu ma'u pe.

Disclaimer

The results in this Thesis are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI), managed by Statistics New Zealand.

The opinions, findings, recommendations, and conclusions expressed in this Thesis are those of the author(s), not Statistics NZ. Access to the anonymised data used in this study was provided by Statistics NZ under the security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business, or organisation, and the results in this thesis have been confidentialised to protect these groups from identification and to keep their data safe.

Careful consideration has been given to the privacy, security, and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the Privacy impact assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.

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1.0 INTRODUCTION

The mind is a powerful and complex element of an individual, responsible for the way in which we think, perceive and react to our surroundings. It determines one's personality and is the very essence of the way in which we perceive the world. Unlike many other human systems, the mind is much more than just a tangible organ, surpassing the anatomical and physiological aspects of an individual to incorporate what can't be seen; namely one's psychological, spiritual and emotional well-being. Understanding when mental health is compromised is therefore vital because of the breadth of potential impacts to the individual and others connected to them. One aspect of this puzzle is exploring why mental health problems may exist in some populations at a higher prevalence than others, and how the onset of these conditions may, in turn, relate to other negative health outcomes.

Mental health has been defined as “a state of well-being, in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (World Health Organization, 2014). The current state of mental health among New Zealanders is concerning with 3.6% of the NZ population seeking specialist mental health or addiction services in 2016, having increased annually since 2011 (MOH, 2017a). When taking a closer look at disparities in mental health across different ethnic and age groups, it is evident that young Pacific people are particularly at risk of experiencing mental health problems, and these problems are manifesting into diagnosed conditions (Statistics New Zealand and Ministry of Pacific Island Affairs, 2011). Young Pacific people have been shown to have higher levels of depressive symptoms and disproportionately high rates of mood disorder, when compared to their non-Pacific counterparts (Fa'alili-Fidow et al., 2016; Oakley Browne, Wells, & Scott, 2006). Some aspects of mental health have biological underpinnings, making complete prevention unlikely. However, the environmental and lifestyle context surrounding individuals can also contribute to both the initial development and eventual experience of mental health problems (WHO Secretariat, 2012; Cecil, Viding, Fearon, Glaser, & McCrory, 2017; Pieterse, Todd, Neville, & Carter, 2012). This potential modifiability of environment and lifestyle contexts holds potential for prevention or minimisation of impact from illness. Furthermore, prevention through early intervention seems preferable to focusing on

treatment services after onset. Adolescence appears to be a key time for this early intervention, with research suggesting that interventions during this time can significantly reduce the severity of symptoms and improve outcomes into adulthood (Chanen et al., 2009).

Overall, despite Pacific people experiencing high rates of diagnosed mental health problems, research has also shown that those with severe disorders are less likely to utilise mental health services when compared to their non-Pacific counterparts (Oakley Browne et al., 2006). These two factors combine to create a substantial unmet need for mental health treatment among the Pacific population in NZ.

An area of additional concern in the context of a youthful Pacific population is a lack of research about mental health among young Pacific people, with very little known about prevalence of mental health conditions (MHC) specifically during late childhood/early adolescence, from the ages of 10-14 years. This is an important gap in knowledge to bridge in order to inform both prevention and treatment intervention opportunities among this age group.

To conduct this study, data has been sourced through the use of the Integrated Data Infrastructure (IDI), a database containing micro data from various NZ government ministries, maintained and regulated by Statistics New Zealand (Statistics New Zealand, 2017). This will be the first study of its kind to use the IDI for the purpose of looking at Pacific children with MHC, and particularly for the specified age group. Therefore, this research will be exploratory, providing insight into the capacity of the IDI and its ability to be used for mental health research about Pacific people.

Chapter one of this thesis provides an introduction, including a broad context, purpose and outline for the structure of the thesis. *Chapter two* summarises the research literature related to international patterns of children's mental health, mental health among Pacific children in NZ and factors associated with mental health. This chapter concludes with a summary and description of the study aims. *Chapter three* describes the methods used to conduct the present research including the measures used and handling of data access. This chapter also discusses Pacific research and describes methodologies important to conducting research on Pacific people. *Chapter four* presents the study results, divided into nine sections according to the types

and sources of data available. Finally in *Chapter five*, the results are discussed in the context of the broader literature, in addition study limitations and strengths are highlighted, and suggestions for future research are provided.

2.0 LITERATURE REVIEW

This chapter is divided into seven sections, the first of which describes definitions of mental health and children used within the study. The second and third describe literature related to children's mental health internationally and in the NZ context. The fourth section describes the context for mental health among Pacific children in NZ, including the holistic approach to health common to many Pacific peoples, perceptions related to mental health and prevalence of mental health conditions among Pacific children. The fifth and sixth sections look at potential factors associated with Pacific children's mental health, including migration, deprivation and relationships with other health outcomes. The final section summarises the literature presented and outlines the aims of the current study.

2.1 Defining children's mental health

As noted in the introduction, the World Health Organization (2014) describes mental health as a broad concept, including "a state of well-being, in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community". Alongside this broad definition there are a number of interchangeable terms that can be used when referring to MHC. Mental health refers to a characteristic that every individual has, such as physical health or spiritual health. This is not indicative of any dysfunction or problems, but simply refers to the mental wellbeing of an individual. For the purpose of the present study, the term "mental health condition" (MHC) will refer to any condition diagnosed or treated by a qualified health professional in a clinical setting, relating to a disorder that effects thinking, behaviour or mood. The terms "mental illness", "mental disorder", "mental health disorder", "psychiatric condition", "psychiatric disorder", "psychological condition" and "psychological disorder" are often synonymous terms that can be used in the same context and may appear throughout the literature review process in other studies, however the present study will not use these terms so that confusion can be avoided.

Another set of terms that can also often be used are those that describe symptoms of a MHC that may be experienced by an individual such as "mental health problems" or "psychological distress", however using these terms does not necessarily imply a diagnosed condition. Though

many terms are used interchangeably when referring to MHC, it is worthwhile to be aware of these subtle differences in order to avoid confusion.

The definition of “children” can also change across different settings. In the context of this study children will refer to individuals between the ages of 10-14 years, unless otherwise stated. Robust evidence has shown that a number of adult psychological conditions are likely to originate during childhood and adolescence (National Research Council & Institute of Medicine, 2009; Royal Australian and New Zealand Psychiatrists 2010; Kim-Cohen et al., 2003). Of the research that has been conducted on young people, the age range for participants has generally focused on youth aged between 15-24 years old, and research on younger adolescents is limited. This warrants the need to focus on children during their adolescent and early teenage years in order to gain a more thorough understanding of mental health among this age group.

2.2 The mental health status of young people – an international context

Child and adolescent mental health is a global problem and does not discriminate between developed or developing countries (Belfer, 2008; Gore et al., 2011; Kieling et al., 2011). The current status of children’s mental health internationally has been attributed to a number of common factors, some of which include resource allocation, underutilisation of treatment services and a lack of literature and research. The chapter sections will provide an overview of literature about children’s mental health on an international scale, providing the opportunity for comparisons to NZ.

2.2.1 Australia

Evidence suggests that 13.9% of 4-17 year old Australians have experienced a mental disorder (attention-deficit/hyperactivity disorder, any anxiety disorder, major depressive disorder, conduct disorder) over the past 12 months (Lawrence et al., 2016). Young Australian people aged between 16-24 years old have a higher risk of developing a MHC than any other age group, children and adolescents aged between 4-17 years also have a high risk (Sawyer et al., 2001; Australian Bureau of Statistics, 2008). Low rates of treatment utilisation were seen among the population, suggesting that young Australians were reluctant to seek help (Australian Bureau of Statistics 2008). This same survey showed 1 in 4 young Australians had experienced a clinical mental health problem, compared to 1 in 5 people in the general population (Slade et al., 2009).

With respect to minority populations, Rickwood, Telford, Parker, Tanti, & McGorry (2014) found that youth of Aboriginal and Torres Strait Island descent were over-represented in their nation-wide “Headspace” mental health centres. A comparative study between NZ and Australia showed NZ youth suicide rates were double that of Australia during the 2007-2013 period, with Māori and Aboriginal youth being the most at-risk (Snowdon, 2017). These findings show similarities between the neighbouring countries, particularly concerning the disparities that are experienced by indigenous and ethnic minority populations in terms of prevalence of MHC.

2.2.2 *North America*

Keyes (2006) showed mental health diagnosis was most prevalent among American youth aged between 12-14 years old, out of a sample of 1234 participants aged between 12-18 years old. At a population level, Soni (2009) found that emotional and behavioural disorders were the most prevalent chronic illnesses among children and youth in the United States of America (US), with an estimate of 20% of all children having a diagnosable mental, emotional or behavioural disorder (National Research Council & Institute of Medicine, 2009).

In the US, evidence suggests that ethnic groups differ in terms of the distribution, preference and use of mental health services (Redmond, Watkins, Broman, Abelson, & Neighbors, 2016). Both first and second generation immigrants were shown to be the most rapidly growing subgroup of the American population (Landale & Oropesa, 1995). As with many migrant communities this has been linked to experiences of poverty and discrimination. Studies conducted with the Hispanic population have shown this subgroup as having similar rates of depression to the general population (Kessler, Berglund, Demler, Jun, & Walters, 2005; Escobar, Nervi, & Gara, 2000), though post-traumatic stress disorder (PTSD) was prevalent among many Hispanic immigrants due to exposure to political violence in their respective countries of origin (Fortuna, Porche, & Alegría, 2008). Furthermore, Island-born Puerto Ricans residing in the United States had higher rates of mood or anxiety disorders than any other overseas-born subgroups (Canabal & Quiles 1995).

Similar to young Pacific people in NZ, studies have shown African American youth also under utilise mental health services (Assari & Caldwell, 2017; Breland-Noble, 2004), with factors such

as ethnicity, socioeconomic status, psychiatric disorders and self-reported health contributing to the high rates of African American youth with MHC (Assari & Caldwell, 2017). Another study involving African-American youth from low income backgrounds showed those who were regularly exposed to violence had significantly higher rates of PTSD (Fitzpatrick & Boldizar, 1993).

According to the Canadian Institute for Health Information (2015), hospitalisation and emergency room visits for the mental health of children in Canada also continue to rise. Indigenous populations of Canada, are disproportionately over-represented in the mental health rates of the Canadian population, as shown by high rates of suicide and emotional distress in this population (Kirmayer, Trait, & Simpson, 2009). An array of complexities exist when considering indigenous peoples of any country: colonialism and its systems being a major factor. An example of this is the residential school system that existed and corresponding governmental policies which have been shown to negatively impact the mental health of Canadian indigenous peoples (Elias et al., 2012; Mitchell & Macleod, 2014). The effects of migration on the mental health of Canadian children are also considered in the literature. Beiser, Hou, Hyman, & Tousignant (2002) conducted a study on the effects of poverty on overseas-born children, Canadian-born children with immigrant parents, and Canadian-born children with Canadian-born parents. This research was based on earlier literature from the 1980-1990's which had shown that mental health was likely to be jeopardised by family poverty (Schor & Menaghan, 1995; McLoyd, 1995; Elder, Nguyen, & Caspi, 1985). Findings of this study then concluded that overseas-born children were more than twice as likely as their Canadian-born counterparts to come from poor families, however had lower levels of emotional and behavioural problems. Furthermore, the effects of poverty were shown to be indirectly related to mental health problems, with poverty causing family dysfunction contributing to these problems occurring in children.

2.2.3 Europe

Rajmil, Herman, Ravens-Sierberer, Erhard, & European KIDSCREEN group (2014) conducted a comprehensive study of socioeconomic inequalities and their impact on the mental health and quality of life for adolescents aged 8-18 years old across 11 European countries (Austria, Czech Republic, France, Germany, Greece, Hungary, Poland, Spain, Switzerland, the Netherlands and the United Kingdom). These socioeconomic inequalities were measured from data collected on

socioeconomic status (SES), physical and mental health status, and perceived health and well-being. Mental health was measured using the Strengths and Difficulties Questionnaire (SDQ) and a standardised health-related quality of life (HRQOL) questionnaire, developed by the KIDSCREEN European project. Findings concluded that inequalities of mental health existed consistently among these European countries according to parental levels of education, however the response rate for some countries in the study was low.

Young people in Slovenia who were from low socioeconomic status were found to have poorer mental health when compared to those of higher socioeconomic backgrounds, with girls being 2.5 times more likely than boys to have experienced feelings of depression (Klanšček, Žiberna, Korošec, Zorc, & Albreht, 2014). Similarly, in Sweden, adolescent girls were more likely to report having poorer mental health status than boys (Hutton et al., 2014). An interesting finding of this study claimed that there was a protective association for younger girls with parents who were born abroad. A longitudinal study in the Netherlands found that adolescents with mental health problems at age 11 were predicted to have lower educational attainment at the follow up age of 19 (Veldman et al., 2014).

2.2.4 Africa & Asia

There are significant gaps in research regarding youth mental health in Africa (Kieling et al., 2011), however Cortina, Sodha, Fazel, & Ramchandani (2012) estimated 1 in 7 sub-Saharan African children had significant mental health difficulties, while 1 in 10 sub-Saharan African children up to 16 years old had psychiatric disorders. There are a number of obstacles to deal with in addressing mental health in African societies such as adaptation to low-income settings as well as differences in definition and diagnosis of mental health. Poverty and socioeconomic status (SES) are evidently an important factor to consider in Africa, perhaps even more so than any other continents due to extreme malnutrition being an important concern. Though not focused on youth, Myer, Stein, Grimsrud, Seedat, & Williams (2008) conducted a study on a possible association between socioeconomic status and mental health in South Africa and found psychological distress being most common among participants with lower socioeconomic status and social capital, or the influence of communities and neighbourhoods.

Reliable literature on Asia showing trends and patterns across the continent as a whole is also scarce, which could be attributed at least partially to the large diversity of Asia and its countries.

The research that is available has shown crisis among Asia's mental health systems with contributing factors including negative attitudes towards mental illness, limitations in the availability and accessibility of treatment services and limited budgets (Chanpattana, 2010).

2.3 The mental health of young people in Aotearoa New Zealand

2.3.1 Prevalence of MHC and symptoms

According to the MOH (2016), young NZ people aged 15-24 years old have the highest proportion of psychological distress when compared to all other age groups. Oakley Browne et al. (2006) found that young people had a higher prevalence of mood and conduct disorder and had higher rates of suicide ideation, planning and attempts than adults aged 25 years and over. In addition, 2012 saw youth aged 15-24 years having the highest rate of suicide among NZ age groups (Ministry of Social Development, 2016).

The 2015/16 New Zealand health survey (MOH, 2016) found ADHD was the second most common type of emotional and behavioural disorder among 2-14 year olds, with an estimated 1 in every 20 NZ children having ADHD (Kids Health, 2016). Anxiety was shown to be the leading MHC among Pacific people aged 16 years and older in a study undertaken during 2004 and 2005 (Oakley Browne et al., 2006), and presented as the most common type of emotional/behaviour disorders among 2-14 year olds as shown in the 2015/16 New Zealand Health Survey (MOH, 2016). Rates of anxiety disorders was shown to be significantly higher among adolescents and youth than other age groups (Oakley Browne et al., 2006).

The Youth2000 survey series was the first research of its kind to be conducted in NZ in 2000, inviting NZ secondary school students to complete a questionnaire with a large range of questions about health, wellbeing, home and spirituality (Adolescent Health Research Group, 2003). This survey series also included subsequent surveys conducted in 2001, 2007 and 2012 (Clark et al., 2013). The 'emotional well-being' section of this survey is equivalent to mental health and included suicide ideation, life satisfaction, depressive symptoms and substance use. This survey series was therefore focused more on the symptoms of MHC as opposed to conditions that had been clinically diagnosed. However, the results of Youth2000 surveys could be used as early predictors for diagnosed conditions to come. Comparisons between the surveys found that there has been little to no improvement in self-reported depressive symptoms over

time (Clark et al., 2013), supporting evidence about one of the main underlying factors of this research - that the current mental health system is not as effective as it should be for young New Zealanders. Furthermore, four out of five secondary school students who had experienced serious mental health problems did not seek professional help (Mariu, Merry, Robinson, & Watson, 2011).

The New Zealand Health Survey (NZHS) includes the SDQ (MOH, 2018), a tool used internationally as a screening measure for young people. It is not a diagnostic tool but rather identifies any potential issues from an early stage for the purpose of highlighting deviating behaviours before they develop into disorders (Goodman, 1997). Fletcher, Tannock, & Bishop (2001) showed the SDQ had the ability to identify children who had problems that may have otherwise been missed. The most recent sample includes children aged 3-14 years, and estimated 57,000 NZ children who were considered high risk of experiencing social, emotional and behavioural problems (MOH, 2018). The age of inclusion overlaps with the 10-14 year age range for inclusion in this study and therefore provides valuable insight. Key findings showed children living in high deprivation were more likely to have an elevated SDQ score (suggesting greater difficulties) compared to those living in lower deprivation.

An observation that has emerged in these larger scale studies such as Youth2000 and NZHS, is the tendency to focus on the symptoms and problems as opposed to diagnosed conditions for young people with MHC. This could possibly be attributed to the age of the participants and the assumption that more serious conditions may be more warranted for adults. This may also be due to survey tools for diagnosable disorders being a burden to young individuals. Prevalence rates between clinical diagnosis and self-reported rates of MHC can differ due to different approaches to measurement.

2.3.2 Pathways for mental health diagnosis and services for young people in NZ

Diagnosis of MHC in NZ typically depends on the condition and the person, as symptoms and the severity of the condition varies between individuals. The first point of contact should be the family doctor/general practice (GP) services (MOH, 2017). Referrals will then be made to the appropriate mental health service and treatment commenced. If no further referral is needed, a GP may prescribe an individual with the appropriate medication or advise them of therapeutic

options. Slight variations may exist between district health boards (DHB) depending on the region an individual resides in, however the process of seeking treatment is relatively consistent throughout NZ.

Treatment services for MHC in NZ can be categorised as clinical, behaviourally therapeutic, or both. All DHBs fund primary mental health services for New Zealanders aged 12-19 years old and as mentioned, referrals can be made to mental health services by a family doctor, a school pastoral team or a school nurse or counsellor (MOH, 2017). Public and private hospital treatment is available for MHC should it be required, and prescribed medication is available for alleviation of symptoms when necessary. In addition, services are also available for individuals with disabilities who also suffer from a MHC. In addition, crisis services are readily available for emergencies (MOH, 2018a).

Services are also available for non-emergency situations. This includes different online treatment services available for young people experiencing difficulties with mental health, all of which offer informative advice on how to work through mental health problems. Some of these online services recommended by the MOH (2017) include the SPARX (Le Va, 2018) and Aunty Dee computer programs (Le Va, 2016). In addition, there are various telephone helplines currently available for anyone who would like someone to talk so, some of which are specifically targeted at young people under the age of 18. They include organisations such as Youthline, Kidsline and ‘What’s up’ (MOH, 2017). Research has shown that some of the most common reasons for the use of the What’s up telephone service include peer relationships, bullying, relationships with partners and relationships with family (Craig, McDonald, Wicken, Reddington, & Taufu, 2010).

2.4 The mental health of Pacific young people in Aotearoa New Zealand

2.4.1 Defining Pacific peoples

While references will be made to Pacific people as a collective for the most part of the present study, it is important to emphasise that Pacific people are a heterogeneous population of different Pacific nations each with their own cultures, customs and traditions. The term ‘Pacific’ for the context of the present study is defined as Oceanic nations within the Pacific Ocean region. It is not subject to those of full Pacific descent, but describes any individual who identifies themselves, however much so, with one of the ethnic groups that is outlined. There are numerous

definitions associated with the term ‘Pacific’, however for the purpose of this research, ‘Pacific people’ will refer to persons who affiliate themselves with one or more of the following ethnic groups, as classified by Statistics New Zealand (Statistics New Zealand, 2015a); Samoan, Cook Islands Māori, Tongan, Niuean, Tokelauan, Fijian, Australian Aboriginal, Hawaiian, Kiribati, Nauruan, Papua New Guinean, Pitcairn Islander, Rotuman, Tahitian, Solomon Islander, Tuvaluan, Ni Vanuatu.

The Pacific ethnic group has the most youthful population in NZ, with 35.8% being 15 years or under and the median age of Pacific people in 2013 being 22.1 years old (MOH, 2014). This is relevant for the study of MHC given that Te Rau Hinengaro: The New Zealand Mental Health Survey found that the high burden of mental health problems among Pacific people could primarily be attributed to the youthfulness of the Pacific population (Oakley Browne et al., 2006).

2.4.2 Pacific perspectives and models of health

Pacific health models have been developed with the intention of integrating service delivery among Pacific people and incorporating principles that are valued across Pacific societies in order to appropriately address health related issues. The use of these health models outline principles for effective service delivery, and may be used in many different contexts by clinicians and researchers. The development of these Pacific health models ensures Pacific people are represented appropriately and adhere to cultural values held by Pacific people. While these ethnic-specific health models present concepts that are familiar to Pacific people and incorporate principles that can be overlooked by mainstream health systems, there has been research with younger Pacific participants that have felt that these models are based more on island-born adult perspectives and lack contemporary NZ born youth views and perspectives (Agnew et al., 2004). This leaves room for the development of more health models that are inclusive of worldviews that younger Pacific may have, which evidently are different from the older generations. In response to this issue, Pacific health models have been developed in more recent years such as Fonofale (Pulotu-Endermann, 2009), Popao (Fotu & Tafa, 2009), Te Vaka Atafaga (Kupa, 2009) and Tivaevae (Kuchler & Eimke, 2010; Te Ava, Airini, & Ribie-Davies, 2011). What this indicates, is the degree of variation that can exist between different age groups. Perceptions that may be valid in one are not necessarily the same among all, even among

populations of the same ethnic group. Researchers and service providers must therefore be aware of differences in opinions and perceptions on issues that can occur between age groups. More detail of the Fonofale and Popao models can be found in Appendix A.

2.4.3 Prevalence of MHC among young Pacific people

While it has grown in recent years, there is still a gap in reliable literature on Pacific mental health, more so on the mental health of young Pacific people. Through the Pacific Progress series and the *Health and Pacific Peoples in New Zealand* report, Statistics New Zealand and the Ministry of Pacific Island Affairs (2011) reported that young Pacific people are twice as likely to suffer from depression and anxiety when compared to their non-Pacific counterparts. Pacific children are also more likely to experience a mental disorder when compared to older Pacific people (Oakley Browne et al., 2006). Furthermore, young Pacific people have the most prevalent suicide rates among the different Pacific age groups (Tiatia-Seath, Lay-Yee, & Von Randow, 2017; Fa'alili-Fidow et al., 2016). While suicide is outside the scope of this research, these statistics are a clear indication of the magnitude of mental health issues among young Pacific people, often leading to these detrimental and irreversible outcomes when left untreated or when treatment services are ineffective. According to the Youth 2007 survey, young Pacific people were twice as likely to have experienced depression, anxiety or attempt suicide as their non-Pacific peers (Craig, Jackson, Han, & NZCYES Steering Committee, 2007). Young Pacific women were particularly of concern with depression symptoms, deliberate self-harm and suicidal ideation rates approximately double that of young Pacific men (Helu, Robinson, Grant, Herd, & Denny, 2009; Adolescent Health Research Group, 2008). Te Rau Hinengaro also showed younger Pacific people were more likely to experience mental health problems than their older Pacific counterparts, and these mental health problems were more likely to be classed as 'serious' (Foliaki, Kokaua, Schaaf, & Tukuitonga, 2006).

Statistics New Zealand and Ministry of Pacific Island Affairs (2011) showed Pacific Island youth as being twice as likely as their non-Pacific counterparts to suffer from depression or anxiety, and to attempt suicide. Fa'alili-Fidow et al. (2016) conducted a report on the health of Pacific youth as part of the findings of the Youth'12 national health survey, the third and most recent youth2000 survey conducted in 2012. This report compared results from previous surveys conducted in 2001 and 2007 and found that the percentage of Pacific students who reported

depressive symptoms had increased from 2007 to 2012, although it had decreased since 2001. This Youth'12 report also discussed the survey results which indicated the higher likelihood of Pacific secondary students to be living in deprivation and violence among others. While these are challenging contexts, for young people in NZ there is the opportunity to access mental health resources and services that would otherwise not have been available in their respective Pacific countries. This includes the standard of health care that is available in NZ when compared to Pacific nations, which confirms the importance of utilising the available services.

It is evident that there is a need for more research in the area of children's mental health among Pacific people in order to gain a better understanding, before progression to the development of further interventions. More targeted research on young Pacific people with MHC is fundamental in order to progress in bridging the inequalities that exist, particularly factoring in the younger age groups that have not been covered as most research available has focused on the older teenage years and early adulthood. These gaps in literature therefore present the opportunity for the present study.

2.4.4 Pan Pacific perspectives of mental health

Traditionally, Pacific views on mental health have believed that disturbing behaviour is the result of external spiritual forces taking hold of an individual, because of a sacred custom or covenant that they have broken or offended (Agnew et al., 2004). Another description of Pacific perceptions on mental health mention the relationship between an individual and a spiritual entity being offended, this entity usually believed to be a God (Suaalii-Sauni et al., 2009). These traditional views were addressed by the use of traditional healers in many Pacific nations. Mental health is undoubtedly believed to be intrinsic to the overall health of an individual, as shown by Pacific models of health such as the Fonofale and Popao models, based on Samoan and Tongan values respectively (Pulotu-Endermann, 2009; Fotu & Tafa, 2009). As shown earlier in the chapter, these models perceive mental health as a metaphorical pillar and a primary component in the wellbeing of an individual.

The influence of Pacific culture on its people is important, affecting perceptions of health, illness, causes of disease and death (Tukuītonga, 2018). Research has shown that older Pacific people in particular tend to hold these traditional values and practices, with a strong spiritual

connection to healing, sickness, dying and death (Tukuitonga 2013). Dysfunctions in mental health are attributed to God's will and have often resulted in the use of traditional healers and treatment outside of the mainstream health systems. Younger Pacific people stand in a compromised position being exposed to their cultural principles in their respective cultural backgrounds while also living in NZ's westernised society, with biomedical approaches to physical and mental illness. This is not unique to Pacific migrants, but the rigid traditional views shared by older Pacific people in recent times can negatively impact younger generations who are not so firm in their traditional cultural beliefs. The challenges in finding a balance between cultural backgrounds and older generations with the influences of their environment may result in a sense of confusion in identity. There is a need to ensure that young Pacific people who suffer from mental health conditions are not disadvantaged because of their position in NZ society, and the bicultural or multicultural complexity that can be associated with being or descending from migrants.

The taboo and stigma surrounding the topic of mental health is not exclusive to Pacific people but has evidently served as a restraint to seeking treatment over the years. This is likely to mean that mental health statistics on Pacific people at present and in the past have not been a true representation of the population. It is the hope of the researcher that by shedding light on the state of mental health among young Pacific people through the use of the IDI, meaningful conversations on mental health will be encouraged, from the home between family members to more health service and policy settings at a governing level.

Although there is a need for more evidence examining Pacific people and mental health in NZ, there are several good studies that have been conducted. Suaalii-Sauni et al., (2009) conducted discussions through in depth focus groups, and the concept of family and a sense of belonging was recognised as one of the most fundamental core values for Pacific people. Participants from different Pacific backgrounds acknowledged the importance of having family as part of the healing process for mental health sufferers, more so the 'extended family' which was thought to be an important aspect to Pacific participants. Tamasese, Peteru, Waldegrave, & Bush (2005), in a study of Samoan mental health, also had a common theme of family as the centre of treatment and mental health approaches. While generalising these results to all Pacific people as a collective may be limited, what these findings indicated was that Pacific people are very much part of a

wider collective, whether it be the Pacific community that they belong to or their families, both immediate and extended. This is evident as Tamasese et al., (2005) refers to family as a vital part of healing, yet also stating family pressures as being a possible cause of mental illness. Family often being the centre of everyday life for Pacific people means that rather than thinking individually, there is always a need for considerations to be made about family and obligations to a wider collective.

2.4.5 Samoan, Cook Island Māori and Tongan perspectives of mental health

Samoans are by far the largest Pacific ethnic group in NZ, accounting for half of the total Pacific population (Statistics New Zealand, n.d.). Second to this are those of Cook Island Māori (CI) descent followed by the Tongan population. Like Pacific mental health and furthermore the mental health of young Pacific people, there are few studies exclusively comparing the mental health between Pacific ethnic groups. Several published studies have reported comparisons made between one or more of these Pacific ethnicities (Tautolo, Schluter, & Sundborn, 2009; Suaalii-Sauni et al., 2009). It should be noted, that the following studies refer to the general adult population as opposed to a specific age group, therefore these conclusions may not necessarily be the same for younger people as age can very much be a determining factor for many health conditions.

i) Samoa

As discussed previously in the chapter, Tamasese et al. (2005) conducted a qualitative study on Samoan perspectives on Mental Health and identified a significant gap in the literature. A key finding from that study suggested that an important method for breaking barriers which is the use of the Samoan language in mental health services. Other important discussion points included the concept of “tapu” and sacredness in relationships, as well as participants reporting the lack of culturally competent services in NZ.

Bush, Collings, Tamasese, & Waldegrave (2005) compared the perspective of psychiatrists and the concept of a Samoan view of self and its place in general public practice psychiatry, concluding the need for Samoan or Pacific Island Mental health services to be developed. This qualitative study explored the views of the participating psychiatrists such as the role of spirituality and cultural practices, and their place in mental health services. The authors’

suggestions for improving the quality of service delivery included appropriate greeting rituals, constant family involvement and considering culturally specific roles and relationships in the lives of the patients.

ii) Cook Islands Māori

Similar to that of the Samoan population, reliable literature about mental health in CI Māori (CI) populations is also limited. What is known about CI mental health in the past decade has mainly been derived from Te Rau Hinengaro. Foliaki et al. (2006) found Cook Islanders had a 12 month prevalence rate of mental disorders that was 50% higher than the general NZ population. In addition, Kokaua and Wells (2009) conducted a study on prevalence of mental disorders among Cook Islanders using mental health services in NZ. Findings of this study showed evidence of high levels of mental disorder and low levels of specialist mental health service utilisation, reflective of the Pacific population and an inverse relationship between MHC rates and use of treatment services. Inpatient and forensic services were an exception with an over-representation of CI using these services.

Research on views about mental health among young CI people was recently conducted using a qualitative approach (Puna & Tiatia-Seath, 2017). Where the previous studies concerning the CI population have focused on the MHC themselves, Puna and Tiatia-Seath (2017) focuses more on how service delivery can be improved to better suit young CI people. The emerging themes that arose from this study were the importance of maintaining social support and retaining cultural connections.

iii) Tonga

Foliaki (1997) touches on the traditional views shared by Tongans in previous decades about the concealing of mental illness in Tongan families. The reasons for this are likely to be due to the taboo and feelings of embarrassment that often come hand in hand with the topic. Suicide in Tongan communities has also presented as a difficult matter to discuss, bringing shame to families who believe that they had failed to adequately support the victim. Mental health issues such as gambling addiction have also been studied in the general Tongan population in NZ (Finau, Foliaki, Vaka, Ofanoa, & Kokaua, 2014). From this study it was concluded that young Tongan males have high levels of problem gambling and consequently, high levels of

psychological distress. However, this study concluded that overall, Tongans had less psychological morbidity when compared to other migrant populations from the Australasia region.

Many Tongans still associate mental health with spiritual disturbances and breaches in superstitious circumstances. The findings of Poltorak (2011) reiterate this by exploring mental illness in the Vava'u island group of Tonga. Valuable insight is given into traditional views of mental illness in Tongan society, less influenced by the impact of Western society like that of Tongans residing in NZ. Key dialogues in this paper include discussing the concept of 'tevolo', described as being possessed by a spiritual force as a Tongan perspective of mental illness. To grasp a better idea of this concept, 'tevolo' is translated into English as 'devil' or 'spirited', which undoubtedly implies negative connotations associated with the symptoms of mental illness.

The three largest Pacific ethnic groups

Based on these findings across the three largest Pacific ethnic groups living in NZ, it is clear that there are similar disparities among all. Some common themes that can be derived from the mentioned studies include the need for cultural competency in health service delivery and the complexity of openly talking about mental health topics in Pacific settings. In addition, many Pacific peoples still hold traditional views on mental health causes which serve as barriers for accessing treatment and getting the help that is needed. The inequalities that exist therefore cannot be attributed solely to the shortcomings of mental health treatment services, but also their inability to adequately engage Pacific people to fully utilise the treatments available. While services must be adjusted significantly, an attitudinal shift must also occur among Pacific peoples to encourage their use of these treatment services. It is evident that more research is needed about mental health and Pacific peoples in NZ.

2.5 Potential external influences on the experience of MHC by young People people

The WHO Secretariat (2012) identified a number of social and environmental circumstances that can influence the onset of MHC, some of which include exposure to violence/abuse, poverty as well as racism. These attributes have been proven internationally to increase the likelihood of MHC diagnosis (Cecil et al., 2017; Pieterse et al., 2012), and has been found to contribute to

individuals becoming more prone to negative outcomes such as substance abuse and suicide later in life (Fisher et al., 2011; MOH, 2016a). When considering determinants that are significant to Pacific populations, two potential factors are apparent; the migration history of the Pacific community and the impact of high deprivation, where Pacific peoples are over represented.

2.5.1 The effects of migration

Migration is described by Statistics New Zealand as the movement of people into and out of NZ as well as movement within the country (Statistics New Zealand, 2018). For the purpose of this study migration will refer to the movement of Pacific people from the islands of Oceania to NZ. Migration is one of the defining characteristics of the Pacific population in NZ, and migration from their respective Pacific countries to NZ is a life changing move for Pacific people, leaving behind all familiarity in search of greater opportunities in a foreign land. More than half (57.9%) of the Pacific sample that took part in Te Rau Hinengaro were born overseas (Foliaki et al., 2006). Whether a young Pacific person is part of this migration or is a descendant of migrants, the effects are perceptible when considering direct and indirect factors that may contribute to mental health. The effects that migration has on mental health have been demonstrated to be both positive and negative, results varying among different ethnic groups internationally (Rundberg et al., 2006; Islam, Khanlou, & Tamim, 2014; Miclutia, Junjan, Popescu, & Tigan, 2007).

For Pacific people, a study conducted in 1985 showed Pacific migrants in NZ adapting better to the urban lifestyle of living in Auckland in comparison to their non-Pacific counterparts (Graves & Graves, 1985). This study profiled Pacific people at the time as possessing characteristics that equipped them for migration and adjusting to new environments, including an easy going approach to life, light-heartedness and generosity. Initiators of stress identified were monetary matters and familial relationships. In contrast in a later study, Foliaki (1997) demonstrated an association between migration and negative outcomes which included poor mental health, as well as barriers to accessing medical services, high unemployment, low income and poor housing.

More recently, Kokaua, Schaaf, Wells, & Foliaki (2009) concluded that according to the findings of Te Rau Hinengaro, Pacific child migrants and NZ born migrant descendants had a higher

prevalence of mental health disorders, as opposed to older migrants who shifted to NZ as adults. As discussed previously, one potential mechanism for this observation is younger migrants and NZ born Pacific people experiencing feelings of conflict between Western society living in NZ and customs and traditions of their respective Pacific nations within the family and community dynamic. Mila-Schaaf (2011) discussed the challenges faced by young Pacific people who may often understand their identity, but have difficulties navigating cultural practices, customs and speaking the language. This is an added pressure to the challenges of increasing dependence and identity development that are present during adolescence, serving as possible contributors to the increased risk of mental health in young Pacific people. This is further reiterated by Tukuitonga (2018) who contrasts the position of young Pacific people and describes it as being “between old and new cultures”, as opposed to their parents and older generations who are part of the “old” culture.

The effects of migration can be felt by Pacific children to who feel the expectations of their families and wider communities to succeed in NZ, which may have been one of the primary drivers for migrating away from their home Pacific nations. Pressure to excel can understandably place a heavy burden on the shoulders of young Pacific Islanders, who are likely to feel obligated to live up to these expectations and thrive for the purpose of making their families proud. Strained relationships between parents and children can arise from these underlying pressures and expectations, often even subconsciously (Cowley-Malcolm, Faibairn-Dunlop, Paterson, Gao, & Williams, 2009; Anae, 2001; Fairbairn-Dunlop, 2002; Duituturaga, 1988).

In addition, Tiatia-Seath et al. (2017) showed that prevalence of suicide between 1996 and 2013 was higher among NZ born Pacific people as opposed to those born overseas, with some variation among different Pacific ethnic groups. Tongans for example, had higher rates of suicide for those born overseas, as did the Other Pacific subgroup. Participants of Samoan descent were shown to have the highest rates of suicide, with 19.3% of these individuals suffering from some kind of mental and/or behavioural disorder as a result of drugs and/or alcohol prior to their death. These variations suggest that there are determinants that could possibly effect particular Pacific ethnic groups more than others.

These distinct life events, such as the process of migration that many Pacific people have experienced in the last 50 years, place them apart from other ethnic groups such as Māori and most NZ European. This means that interventions targeting young Pacific people need to take the impact of migration into consideration, or inequalities will persist. It is important that any further relationships between migration status and mental health are documented to inform service delivery and healthcare treatment.

2.5.2 Deprivation and hardship among Pacific people

The second potential determinant that is explored in this study, is deprivation. Deprivation is defined as “a state of observable and demonstrable disadvantage relative to the local community or the wider society or nation to which an individual, family or group belongs” (Townsend, 1987). Deprivation is therefore used in this study to describe poverty and hardship among those who experience it. Research has shown an over representation of Pacific people living in deprivation and experiencing hardships from an early age (Fa’alili-Fidow et al., 2016).

International studies have shown adolescents from low income families are more prone to develop behavioural problems (Dashiff, DiMicco, Myers, & Sheppard, 2009). National statistics have shown NZ has moderate to high levels of child poverty (The Ministry of Social Development, 2016), and the 2013 census showed 56% of Pacific people in NZ lived in the most deprived areas (Statistics New Zealand, n.d.). Fa’alili-Fidow et al., (2016) reported young Pacific people being shown to be significantly more likely to experience the hardships of deprivation in comparison to their European counterparts. Deprivation and migration are determinants that are linked to each other, as migration to NZ has often resulted in Pacific people experiencing economic hardships.

2.6 Potential outcomes of experiences of MHC among young Pacific people

MHC and symptoms in young people have been directly associated with adverse outcomes such as poor educational status, impaired social functioning, difficulty gaining employment and early parenthood (Fergusson & Woodward, 2002; Kim-Cohen et al., 2003). These relationships however, are not well understood and require more study in order to better grasp the magnitude

of MHC and their outcomes. This section will therefore review literature on mental health, academic performance and other health outcomes following the onset of an MHC.

2.6.1 Mental health

Fergusson and Woodward (2002) conducted a longitudinal study of young people aged 14-16 years old with an anxiety disorder and increased risks of educational and social outcomes later in life. Participants were studied from birth to the age of 21 and data was collected through mixed methods, with parental interviews, teacher questionnaires, participant interviews, hospital records and police record data. After gathering data over a 21-year period, it was concluded that there was in fact an increased risk of adverse psychological outcomes and mental illness in adulthood, as well as an indirect correlation to educational underachievement and unemployment for these young people. This study found that diagnosis of anxiety disorder during youth was correlated to the development of other mental health issues such as depression and substance disorder. Similarly, Patton et al., (2014) conducted a longitudinal study over a 16 year period about the persistence of mental health from adolescence through to adulthood on a cohort of 1943 Australian adolescents. The design of the study involved exploring the duration of adolescent mental health symptoms, and results found that the likelihood of adolescent mental health problems preceding adulthood mental health disorders was dependent on this time period. That is, those participants with brief episodes of a mental health disorder (defined as being less than 6 months) during their adolescent years were less likely to experience mental health disorders in adulthood, compared to those who experienced mental health episodes for longer periods of time when they were younger.

Costello, Mustillo, Erkanli, Keeler, & Angold (2003) provides valuable insight into the 10-14 year age range with participants of this study ranging from ages 9 to 16. They concluded that participants who had been diagnosed with a psychiatric disorder when they were younger were more likely to go on to have a psychiatric diagnosis as they got older, as opposed to those who hadn't been previously diagnosed. Substance disorder was included in the MHC that had the highest levels of continuity among the cohort. In NZ, Fergusson and Horwood (2001) also explored adolescent and youth mental health and the likelihood for the continuity of mental health problems from childhood into adolescence and through to adulthood. Key findings showed an increased likelihood of children with conduct problems and attention problems

respectively, to go on to delinquency and substance use at an older age. These problems co-occurring further increased the risk of delinquency and substance use.

2.6.2 Academic performance

International evidence has shown a linear relationship between mental health and academic performance, as seen by a study conducted on Iranian university students (Bostani, Nadri, & Nasab, 2014). Particular MHC that were significantly associated with educational performance included anxiety and depression. Depression has also been shown in international studies to increase the likelihood of repeating a year, dropping out and /or being placed in special education programs (Quiroga, Janosz, Lyons, & Morin, 2012; Robles-Piña, Defrance, & Cox, 2008). A Canadian quantitative study conducted through the use of a “leaving school” questionnaire, explored the possible causal relationship between primary anxiety disorder and leaving school prematurely (Van Ameringen, Mancini, & Farvolden, 2003). Findings included 49% of participants reporting that they had left school early, and 24% reporting that anxiety was the primary reason for this early exit.

In addition to substance use outcomes mentioned previously, A NZ study conducted in Christchurch showed children who experienced attention and conduct problems also had an increased risk of school failure (Fergusson & Horwood, 2001). These findings strongly suggested a parallel causal pathway exists between early conduct problems and attentional problems co-occurring, resulting in educational difficulties later in life.

2.6.3 Other health outcomes

An earlier study examining the impact of childhood emotional abuse on health risk behaviour later in life found a relationship between high levels of exposure and increased risk for a number of leading causes of death in adulthood (Felitti et al., 1998). Using quantitative methods, the authors found prevalence and risks of smoking, obesity, physical inactivity, depression, and suicide attempts were increased for adults who had been exposed to emotional abuse during childhood. Though this research was not focused solely on the diagnosis of a particular MHC, “emotional abuse” and “mental health abuse” can be considered symptomatic of a MHC and therefore relates to the research at hand. Scott et al., (2011) found associations between early

onset mental health disorders and psychological adversity, with a number of physical health conditions across adults aged 18 and above in North America and Europe. This study focused on heart disease, asthma, diabetes mellitus, arthritis, chronic spinal pain and chronic headaches as the physical conditions of interest, covering a total of 10 countries through a cross-sectional survey. This research covered a large number of participants across numerous countries and in turn provides the opportunity to generalise these results. The range of conditions covered further supports this. What these findings indicate is that mental health may directly or indirectly lead to other adverse health outcomes, which furthermore suggests the potential importance of why these conditions should be addressed. While suffering from a MHC is a burden in itself, the potential of being more at risk of other health conditions increases the burden further and disadvantages those who are already struggling with other aspects of their health.

Exploring the literature about these long term outcomes provides insight about what is to be expected for the participants of the present study in later life, should the current mental health system remain unchanged. There are no published studies which focuses on the relationship between the onset of MHC and short-term outcomes immediately following onset among young people in NZ. This provides a gap in the literature for this study to explore a possible relationship between the two variables, while also exploring the effects of migration and deprivation prior to the onset of an MHC. Although improved understanding of long-term outcomes will be valuable, the next step forward would essentially be looking at the short-term outcomes that are observed in close proximity to the onset of MHC. Short-term health outcomes that can occur following the onset of a MHC puts further strain on sufferers and their caregivers. If preventing or reducing the impact of MHC can potentially minimise the risk of other such health outcomes, then that places an even greater value on the impact of improving the mental health of young people in NZ.

One indicator of short-term health outcomes in NZ is ambulatory sensitive hospitalisation (ASH) conditions among young people. ASH conditions include a range of health conditions resulting result in hospitalisation that could potentially have been prevented if health care had been accessed earlier. These conditions account for approximately 30% of hospital discharges for children aged 0-14 years (Health Quality and Safety Commission, 2015).

Research that is available on ASH conditions has often treated these as a collective (as opposed to individual conditions), and has generally focused on developing more effective diagnostic tools to enable interventions at primary care level in order to avoid hospitalisation where possible (Craig, Anderson, Jackson, & Jackson, 2012; Anderson, Craig, Jackson, & Jackson, 2012). Around a third of all pediatric hospital admissions in NZ between 2005-2009 were categorised as being an ASH condition (Craig et al., 2012). Pacific children have a higher prevalence of many of the ASH conditions compared to their non-Pacific counterparts (Craig et al., 2008; Health Partners Consulting Group, 2012; Matheson, Reidy, Tan, & Carr, 2015). Dekker, Kokaua, Oben, Simpson, & Richards (2018) reported on the prevalence of ASH conditions among Pacific children aged 0-4 years old, and found that the highest conditions among this cohort were asthma and wheeze, gastroenteritis, dental, skin infections and pneumonia. The study did not look further into precursors or co-variables related to these conditions, which is an important gap in understanding how these might be prevented or more appropriately managed.

Furthermore, we are unaware of literature having explored the relationship between MHC and the onset of an ASH condition, although there have been common determinants between the two conditions for Pacific people such as that of deprivation, which has also been found to be related to the onset of ASH conditions (Matheson et al., 2015). Therefore, there is an opportunity to explore in this study if participants with MHC have a higher risk of developing an ASH condition.

2.7 Study aims

Findings of this literature review show the mental health of young people is an issue internationally, particularly among indigenous peoples and ethnic minorities. NZ is no exception, with patterns of inequity highlighted in various publications. Young Pacific people in particular show higher rates of mental health problems compared to their non-Pacific counterparts. Pacific people are a youthful population, and when looking at patterns and seeking effective solutions it is important to understand Pacific contexts and perspectives on mental health. These may include holistic and traditional views intertwined with Western influences, having been exposed to different cultures growing up in NZ. Evidence shows that there are stigmas around the topic of mental health in Pacific communities that must be overcome which should contribute to reducing the inequalities that exist between Pacific and non-Pacific people in terms of accessing mental

health services. This primarily involves changing attitudes towards mental health and utilising treatment services. It is also important to acknowledge that the Pacific population is heterogeneous, with differences that exist between Pacific ethnic groups and their beliefs with respect to mental health.

When considering factors associated with MHC it is useful to look at context, which, for young Pacific people includes the influence of migration and low socioeconomic resources as potential determinants. It is also useful to look at outcomes from the experience of a MHC in order to know how to support individuals moving forward. Among Pacific populations this includes the potential for increased risk of other negative health outcomes. A potential example of this is ASH conditions, with the onset of these being a useful first step in exploring health outcomes related to different MHC.

The aims of this study are to:

1. Describe MHC among Pacific children aged 10-14 years in NZ, by Pacific ethnicity where appropriate.
2. Explore patterns in descriptive statistics regarding place of birth, place of residence and local area deprivation for those with MHC
3. Examine the patterns of ASH conditions in those who experience MHC
4. A parallel aim is also to assess the IDI as a platform for investigating Pacific mental health and its potential for looking at health outcomes for those with MHC.

3.0 METHODS

The present research was a retrospective longitudinal study from fiscal years 2008 to 2015. Time was measured by fiscal year, with one fiscal year being defined as 1 July to 30 June of the following year. The cohort of interest for this epidemiological research were adolescent children aged 10-14 years living in NZ diagnosed with one of the MHC of interest. A focus was placed upon those of Pacific descent but also drew comparisons to children of other ethnic groups.

This study was carried out as part of the Better Start National Science Challenge. A Better Start is one of 12 National Science Challenges funded by the Ministry of Business, Innovation & Employment (MBIE), with the aim of improving the quality of life for NZ children so they may lead long, healthy, productive lives (National Science Challenge, n.d.). Launched in February 2016, this particular Challenge focuses on reducing obesity, as well as improving the learning skills and mental health of young New Zealanders. It is hosted by the University of Auckland and collaborates with other tertiary providers including the University of Otago. A Better Start uses the IDI which is referred to in the challenge as ‘the Big Data Theme’. The Big Data Theme utilises the richness of data that can be extracted from the IDI across a number of agencies, for the purpose of better understanding young lives and ensuring NZ children have the best possible start to life.

3.1 Participants

3.1.1 Inclusion and exclusion criteria

Individuals were identified by age, between the ages of 10-14 years old during the 2008-2015 fiscal years, living in any region of NZ during the 8-year time period. Participants of principle interest were those identified with MHC. These were identified using: The Programme for the Integration of Mental Health Data (PRIMHD); publicly funded hospital admissions data in the national minimum dataset (NMDS); prescription of a medicinal drug used (PHARMS); or subsidies for disability support care (SOCRATES). These are described in greater detail in 3.2.2. Individuals who were deemed eligible for inclusion were further identified as experiencing the

onset of an ASH condition under the NMDS database if they had been admitted into hospital for a select group of primary diagnoses.

3.1.2 Defining and identifying participants of Pacific descent

Categorisation of ethnic groups is a standard classification from the IDI, calculated internally by Statistics New Zealand. These draw from multiple sources of data where ethnicity is gathered. Each data source is prioritised and ethnicity is taken from the dataset that has the highest priority rating. The data source with the highest priority is the NZ Census, followed by Births Deaths and Marriages, the MOH, the Ministry of Education and so on. Thus improving the accuracy of ethnic group identification as well as decreasing the number of non-identification. The five primary ethnic groups of interest were NZ European, Pacific, Māori, Asian and Other. The “Other” ethnic group comprised of Middle Eastern, Latin American or African (MELAA) participants and any other ethnic groups that were not already stated. Individual Pacific Island ethnicities were identified using the same method of prioritised data sources.

Individuals were classified as Pacific if they identified themselves as descending from, or associated with, at least one of the following ethnic groups, as defined by Statistics New Zealand (2015a); Pacific (not further defined), Samoan, CI, Rarotongan, Tongan, Niuean, Tokelauan, Fijian, Australian Aboriginal, Hawaiian, Kiribati, Nauruan, Papua New Guinean, Pitcairn Islander, Rotuman, Tahitian, Solomon Islander, Tuvaluan, Ni Vanuatu.

Only the three largest Pacific ethnic groups, Samoan, CI and Tongan, had sufficient numbers to allow Pacific specific analyses. Those from less frequent Pacific ethnicities were categorised as “Other Pacific”.

3.2 Data collation and analysis

3.2.1 Integrated Data Infrastructure (IDI)

The data collation process was conducted through the secondary data use of the Integrated Data Infrastructure (IDI), a cross-sectional longitudinal database under Statistics New Zealand containing micro data from various government ministries and source agencies in NZ (Statistics New Zealand, 2017). Data from these government ministries and agencies is provided to

Statistics New Zealand who then create unique identifiers that can subsequently be used to link individuals across different datasets. These agencies provide data from the health, education and social services among others. The use of the IDI enables researchers to produce statistical outputs about the social and economic status of NZ people, analysing pathways, transitions and outcomes for populations of interest (Statistics New Zealand, 2017). Because of the extensiveness of the micro data within the IDI, strict confidentiality measures were in place for the purpose of protecting the privacy and confidentiality of New Zealanders. Access to the IDI was highly restricted and was available only once an application to Statistics New Zealand was accepted. More information on the IDI may be found in Appendix B.

Rules surrounding the use of the IDI are enforced by legislation surrounding the privacy and confidentiality of all New Zealanders. IDI microdata was accessible through computer laboratories referred to as datalabs which were located throughout the country, where only approved researchers are granted permission from Statistics New Zealand to enter and use. Unauthorised persons are strictly forbidden. The datalabs used for the study in particular were at the University of Auckland (Tamaki Campus), Auckland as well as the University of Otago (Dunedin campus), Dunedin.

For researchers, the purpose of using the IDI is to gain insight into NZ individuals and households, extracting quality data in order to inform decision and policy makers regarding complex issues such as poverty, crime, poor health and education outcomes, to name a few. The ability to access and link data across different ministries and agencies means the researcher will be able to analyse numerous different outcomes and predictors, including finding evidence for a possible association between the diagnosis of MHC to the incidence of ASH conditions at some point in the future.

3.2.2 Specific data sources utilised from within the IDI

The following datasets were chosen for inclusion in the study in order to reflect the major services used by mental health patients nation-wide. Essentially, the data in these datasets has been obtained from communities, hospitals, pharmacies and secondary mental health services, as well as a disability dataset to include individuals with a disability who may have received

funding from the government as a result of a MHC. All these datasets are collected by the MOH, and are described below.

i) The Programme for the Integration of Mental Health Data (PRIMHD)

The Programme for the Integration of Mental Health Data (PRIMHD) database is a relational dataset made up of multiple sub-tables, capturing all referrals to the mental health system regardless of whether they have an eventual mental health diagnosis or not. PRIMHD is the primary national mental health and addiction information collection service, consisting of service activity and outcome data (MOH, 2018b). Specifically, the data contains information about referral, services provided and demographics. PRIMHD is sourced from the MOH and was preceded by the Mental Health Information National Collection (MHINC), which was disestablished after the introduction of PRIMHD. In the IDI, PRIMHD is divided into PRIMHD ACT (Activity) and PRIMHD DIAG (diagnosis). PRIMHD ACT provides information about service dates (start and end), as well as organisations and teams providing in these services for individuals seen by a publicly funded mental health service. PRIMHD DIAG on the other hand, is uploaded separately and records the diagnosis for each individual, allowing for the identification of the diagnoses that each person is assigned. Inclusion of both PRIMHD ACT and PRIMHD DIAG are included in the datasets constructed for this study.

ii) Hospital events (NMDS)

The National Minimum Dataset for hospital events (NMDS) database captures all discharge information about patients admitted to both private and public hospitals in NZ. This dataset captures the date of admission, discharge information, primary diagnosis and secondary diagnoses as well as a resource utilisation weight.

iii) Pharmaceutical data (PHARMS)

The Pharmaceutical data (PHARMS) database consists of data from the Pharmaceutical claims collection. It contains information about subsidised dispensing that have been processed by the General Transaction Processing System (GTPS), and is inclusive of demographic data about individuals who used health care services and the geographical location of where particular prescriptions were dispensed. For this study, the data extracted was about prescribed medications

specific to MHC such as that of anti-depressants, anti-anxiety or anti-psychotic medications. Prescribed medication serves as an indicator of MHC as the medications are generally specific to the conditions for which they are prescribed.

iv) SOCRATES

The National Need Assessment and Service Coordination Information (SOCRATES) database consists of data about individuals who are eligible for disability support services. It is used by Ministry-funded Needs Assessment and Service Coordination (NAS) agencies as a record of information.

3.2.3 Ethical approval and accessing the IDI

The process of gaining access to the IDI for this research began with an application to the University of Otago Human Ethics committee, where it was advised that approval was not required due to the inclusion of this research in a bigger scheme i.e. the Better Start National Science Challenge, which already gained full ethics approval. The application for access to the datalabs was then submitted to Statistics New Zealand where approval was given to the researcher promptly for access to the IDI datalabs.

Following access approval and before entry to the lab, confidentiality training was conducted with a member of Statistics New Zealand which took place through a one hour Skype video session. This training outlined the measures that must be carried out in order to ensure anonymity of individuals in the IDI, as well as potential issues that could arise concerning confidentiality and how to approach these situations appropriately. Following the completion of confidentiality training, a Statistics New Zealand representative provided login details specific to the researcher that would allow entry in to the IDI lab, and access to the data required for the present study.

3.2.4 Extracting and linking data from the datasets of interest

The initial steps of data collection in the datalab following approval and confidentiality training consisted of selecting which datasets would be used for the topic at hand. After thorough consideration and correspondence with the supervisory team over what the most suitable datasets

to use for the study would be, the following were chosen; MOH, Statistics New Zealand Census and the New Zealand Deprivation (NZDep13) scale (Atkinson, Salmond, & Crampton, 2014).

The data of the participants included in the study were linked through their SNZ_UID identification number, a global code identifier unique to every individual in NZ assigned by Statistics New Zealand (Statistics New Zealand, 2015). The inclusion of this SNZ_UID number in the coding process meant that individuals could be linked to other datasets and over time.

3.2.5 Data Analysis

This is a largely descriptive study comprised mainly of statistical processing to produce crude rates. Data was analysed using STATA 14.0 (Stata, n.d.) inside the datalab environment and final output tables were processed in Microsoft Excel.

3.2.6 Data suppression & application for data release

It is a standard part of any analysis in the IDI that, prior to inclusion of the data in any publication, the data that was to be released needed to be cleared by Statistics NZ. Also a standard part of this process entailed rounding numbers to base three and the suppression of all counts under the value of 6 as per IDI guidelines in order to ensure anonymity. Thus, any tabled cells with a count lower than 6 that were not stated exclusively and instead denoted as “n<6” for confidentiality purposes.

The resulting analyses was submitted to Statistics New Zealand for confidentiality checking, and subsequently released to the researcher upon approval.

3.3 Measures

3.3.1 Socioeconomic status

The New Zealand small-area index of relative socio-economic deprivation (NZDep) is widely used to measure socioeconomic deprivation (Atkinson et al., 2014), with the first index released in 1997 known as NZDep91. It is the accumulation of data from the 2013 national census, defining the index on a geographical scale for any given area across NZ. The NZDep scale is

used for a number of different purposes, including its use at a government level for the allocation of resources, policy development, research and advocacy. It is important to understand that NZDep is an indicator of the deprivation of the neighbourhood, not necessarily the individual/family. It is based on the premise that more affluent individuals tend to cluster together residentially, and less affluent individuals cluster with other less affluent individuals. It is the most accurate measure of deprivation without singling out any particular individual. The NZDep scale will therefore be used to measure the deprivation of participants in this study.

3.3.2 MHC

In addition to the overall count of children with any MHC, the five most common MHC have been identified for specific inclusion in the study, based primarily on their high frequencies during the initial stages of the analysis. The MHC in the present study should be differentiated from all mental health disorders, as the five MHC outlined below were identified through interactions with mental health specialist services and interventions, which will be discussed as this thesis progresses.

Attention deficit hyperactivity disorder

Attention deficit hyperactivity disorder (ADHD) is a clinically diagnosed condition associated with impairments in attention, impulsiveness and hyperactivity (Biederman et al., 2006; Murphy & Barkley, 1996). Diagnosis of ADHD cannot be done through a single test, but is rather a result of a collection of information from health professionals based on numerous tests on the attention, behaviour and communication characteristics of an individual and accordingly with the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) (American Psychiatric Association, 2000).

Anxiety disorder

Anxiety disorder refers to extreme bouts of anxiety and feeling anxious, diagnosed as either generalised anxiety disorder or as a kind of phobia (MOH, 2019). Anxiety disorder refers more specifically to panic disorder, agoraphobia without panic, specific phobia, social phobia, generalized anxiety disorder, post-traumatic stress disorder and obsessive-compulsive disorder, as described by Oakley Browne et al. (2006).

Mood Disorders

Mood disorder refers to a group of MHC characterised by the elevation and lowering of one's mood, classified as bipolar disorder or depression (American Psychiatric Association, 2000). These elevated moods are referred to as “mania”, while the lowering moods are often known as “depression”. Issues have been raised about the diagnosis of bipolar disorder in young people, where diagnosis has still been conducted according to the DSM-IV that is also used to diagnose adults although symptoms may vary with age (Silva, Matzner, Diaz, Singh, & Dummit, 1999).

Conduct disorder

A child is diagnosed with conduct disorder when they display serious misbehaviour towards other people, either aggressively or non-aggressively (American Psychiatric Association, 2000). These behaviours are not directed only towards other people but may also include belligerent, destructive or threatening behaviours towards animals or property.

Substance disorder

Substance disorder refers to the frequent use of alcohol and drug substances where individuals are at increased risk of harm or clinically significant problems (Adolescent Health Research Group 2008). Any degree of substance use can be harmful, however overuse and addiction increases the risk of health, social and economic harm.

3.3.3 Ambulatory sensitive (avoidable) hospital conditions

The second segment of data collection for this research will explore a potential association between the onset of MHC and the development of short-term health outcomes, measured through the inclusion of ambulatory sensitive (avoidable) hospital (ASH) conditions and their prevalence among the participants. ASH conditions are generally acute hospital admissions that can be reduced or avoided through disease prevention or therapeutic interventions (Jackson & Tobias, 2001). Advisors note the careful use of the term ‘sensitive’, in that not all conditions can be prevented. Efforts are therefore made to reduce rates where possible, as opposed to completely eliminating them. Research has shown admission rates for ASH conditions among Māori and Pacific children are higher for dental, asthma and cellulitis/skin infections (Craig et al., 2008; Health Partners Consulting Group, 2012; Matheson et al., 2015, Dekker et al., 2018).

ASH conditions also serve as an indicator for the effectiveness of primary and secondary healthcare. Based on these disparities, ASH conditions will be included in the study as an appropriate indicator for short-term health outcomes following the onset of a MHC.

3.4. Reflecting Pacific research values and principles

Integrating relevant Pacific principles into the present research was of vital importance in order to maximise the benefits of this research for Pacific people. The sensitivity that can often be associated with the subject of mental health means that careful handling of the data is particularly important. Access to this type of data is a privilege given to the researcher, with the primary intention of this research being that the study will be for the greater good of all of those involved and also for future generations.

The quantitative approach provided a means of studying young Pacific people with mental health conditions with sufficient numbers to enhance the validity and ability to generalise results. However, it does not require direct relationships between researcher and participant, an important part of gaining trust and building foundations for interaction in Pacific settings. This quantitative approach excludes any interaction with participants, and specifically demands that participants are not identified in any way. On the one hand protecting the participant but at the same time isolating the connection with those communities. This lack of interaction between researcher and participant placed responsibility onto the research team to ensure that principles important to Pacific communities were still adhered to and upheld in this research. In order to move forward with research for Pacific people, methods that are not as frequently used must be utilised in order to expand the body of literature. It does, however, mean that the use of Pacific methodologies that have been developed in recent years were not applicable, at least as the primary methodology. The research team therefore, worked to uphold and respect the values of the communities from which the data was extracted from. In this case, the Pacific communities in NZ.

There is also an issue of consent, and whether individual consent by the children who will be part of the study should have been necessary. Unlike primary data collection where potential participants can choose to be included or excluded, the IDI captures all individuals who used a

particular service. The use of this data for a research project such as that of this thesis may extend past the scope of the IDI's administrative use, which is something to be mindful of.

Seumanutafa (2018) discusses the importance of the collective in many Pacific cultures, where discussions tend to move away from singular and more towards the group dynamic. This collective is often a characterising feature of Pacific people, with large families and large communities being embraced in society and being measures of good fortune. One of the most advantageous attributes of the IDI is the ability to look at different sub-populations and communities without breaching confidentiality, all the while adhering with the IDI's purpose to create population and sub-population level information.

Another important component of this study is ensuring that research for Pacific people is designed and lead by Pacific people. Vaioleti (2006) discusses violations that have been felt when non-Pacific researchers conduct research on Pacific people, where subjectivity of Pacific participants has been overlooked and failure to acknowledge roles that may exist and effect the interpretation of results, such as different age, gender, relationship and cultural rank. More recent research has argued about the influences of colonialism in major methodologies and the need to indigenise research paradigms (Seumanutafa, 2018). These findings reinforce the need for Pacific researchers in their respective fields to conduct Pacific focused research, where the researcher is part of or familiar with the cohort that they study and approach their research in a culturally appropriate manner.

To acknowledge the Pacific communities from which the data was being extracted from, the University of Otago Pacific Research Protocols was used as a theoretical framework for the basis of this study. The following principles were offered as a guide for upholding principles important to Pacific people that may have otherwise been overlooked. These were applied to the context of the research at hand, the researcher holding herself accountable in ensuring that the purpose of the study was first and foremost beneficial to the participants, and causing no harm to any individuals involved. The use of this theoretical framework allowed for the quantitative approach of the study to integrate core Pacific values, and provided a methodology due to Pacific research methodologies generally being tailored only to qualitative research.

Maximising benefits to humans; Children are the future of any generation, regardless of ethnicity. This is one of the most fundamental beliefs of any Pacific society. Focusing on Pacific children aged 10-14 years old - during such a crucial and transitional time in their lives such as that of adolescence will hopefully benefit the population as a whole, helping young people with MHC lead productive and successful lives.

Relationships; Maintaining relationships between the researcher and supervisors is crucial for an effective study to be carried out. In addition, the relationship between the researcher and Statistics New Zealand on behalf of the IDI is equally as important, for the IDI has a crucial role throughout the study.

Respect; Protecting the confidentiality of the participants is essentially the most fundamental way of showing respect to the individuals whose data has been used to better the lives of young Pacific people. Honouring these confidentiality guidelines furthermore shows respect to Statistics New Zealand as the providers and regulators of the IDI database, and the agreements made between the different contributors involved in the present research.

Cultural competency; The present study is focused on young Pacific people and continuously acknowledges the importance of culture in different Pacific societies, as well as in NZ. While the data collection process does not involve direct interaction with the participants, cultural competency can still be practiced through awareness of cultural knowledge. From a more personal aspect, being culturally competent also means the researcher is aware of her own beliefs, values and practices so as to conduct this research in an appropriate and culturally respectful manner.

Meaningful engagement; Because direct interaction is not possible for the practice of meaningful engagement, the researcher builds and maintains trust by upholding the confidentiality regulations of the IDI. This is associated strongly with the previous principle of respect. Meaningful engagement is also vital between the researcher and the supervisory team as effective correspondence over the research is crucial.

Reciprocity; Reciprocity ensures that the research that is to be conducted will benefit young Pacific people, their families and the communities around them. In addition, ensuring that the research will not cause any harm or bring negative outcomes. In return, the researcher will produce valuable research that will further progress the researcher's knowledge on the topic.

Utility; The present study is in response to the current state of Pacific children's mental health. Using the IDI utilises the data collected by various agencies for the purpose of improving lives, enabling policy makers to make more informed decisions with evidence-based research.

Rights; Reiterating what has been previously explained, adhering to the confidentiality agreement ensures that the rights of the participants are not being overlooked. The privilege to access the IDI is not taken lightly and the researcher fully understands the sensitivity in using data that is so personal to an individual. Ethical approval was also ensured during the planning stages to ensure the study was within the rights of all those involved.

Balance; Balance between the researcher and the supervisors of the present study is important, where all parties understand the roles they must fulfill in order to complete the research to the best of their ability.

Protection; The most important component of the study is to protect the individuals with MHC. The easiest way of protecting the participants is by honouring the IDI regulations in protecting their confidentiality.

Capacity building; The present study and this thesis will serve as a contribution to the body of knowledge concerning Pacific people. It has been established in the literature review process that there is quantitative research present on the mental health of young people, of Pacific people, but not specifically on the mental health of young Pacific people. Using the IDI brings an innovative means of secondary data use from what has been done in the past, and will further develop the way in which research can be conducted concerning Pacific people.

Participation; The presence of Pacific people throughout the study is abundant. This includes Pacific researchers in the supervisory team, as well as the researcher herself being of Pacific

heritage and the Pacific cohort as the primary participants of the study. Research that is designed and conducted by Pacific, for Pacific is one of the most important characteristics of the study.

4.0 RESULTS

Between 285,177 and 293,058 residents living in NZ aged from 10 to 14 years old qualified for inclusion into the present study during the fiscal years 2008-2015. One fiscal year is defined as 1 July through to 30 June of the following year. In those years there was a minimum of 36,286 children in 2008 and a maximum of 38,040 in 2015 who identified themselves as Pacific.

4.1 Total Ethnic Populations of children during study period

Table 1: Child (10-14 years) population totals in NZ from 2008-2015, by ethnicity

Year	Pacific population					Total NZ population				
	Samoaan	CI	Tongan	Other Pacific	Total Pacific	European	Māori	Asian	Other	Total all ethnicities
2008	13638	6546	5715	13641	36285	207669	75813	27015	11979	292356
2009	15039	6993	6468	11949	36819	205938	75177	28347	10764	292326
2010	16227	7536	7281	10659	37650	204921	75225	29370	9888	293058
2011	17133	7839	7962	9291	37890	203139	74742	29574	8868	291405
2012	17832	8112	8442	8127	37914	1999884	73548	29661	8022	287637
2013	17748	8118	8460	8010	37686	198261	73011	30087	8124	285435
2014	17589	8211	8613	8388	37959	197646	73095	31170	8586	285177
2015	17415	8259	8598	8826	38040	197517	73389	32271	8973	285444

Table 1 shows an overall decrease in the numbers of children aged 10-14 years old in NZ from 292,356 in 2008 to 285,444 in 2015. NZ European (European) made up the greatest proportion of children among the ethnic groups, followed by Māori, Pacific, Asian, and then the Other category. Approximately 7 out of 10 (70%) of children were European, 1 in 4 (26%) were Māori and 1 in 8 (12%) were Pacific. The number of participants in the Pacific cohort increased

annually, from 36,235 participants in 2008 to 38,040 participants in 2015. The population of the Māori ethnic group on the other hand, stayed relatively static throughout the study period. In contrast, the numbers of European children and those of Other ethnic groups decreased annually.

4.2 Data sources for the case identification of MHC

Table 2 shows the sources of data that were used in this study to identify common mental diagnoses, ADHD, anxiety, mood disorders, conduct disorder or substance disorder, for 10-14 year-old Pacific and non-Pacific children between the 1st of July 2008 to the 30th of June 2015. These sources provide an indication of how each diagnosis was identified, reflecting also the type of service or treatment used by people with different mental health conditions. To reiterate, PRIMHD DIAG (diagnosis data) contains information about diagnosis of individuals going through mental health services, whereas PRIMHD ACT (activity data) contains information about the dates that mental health related services were used and what these services were. In addition, the PHARMS dataset consists of information concerning pharmaceutical prescriptions. NMDS contained information about hospital admissions and the SOCRATES database was related to disability support services. The results showed the highest proportion of participants with MHC were identified in the PRIMHD DIAG and PHARMS datasets. This is consistent across all ethnic groups. Among the different MHC, ADHD was the most common disorder identified followed by substance disorder. Pacific children had the third highest prevalence among ethnic groups, after NZ European (European), the highest, followed by Māori.

PHARMS data was the most common source of identification for MHC among the Pacific cohort, and 1404 Pacific children were identified with ADHD through PHARMS or their use of prescription medications associated with or used for the treatment. Nine out of ten ADHD cases for Pacific children were identified through the PHARMS database. A further 192 Pacific children used medications for mood disorders. PRIMHD DIAG identified 70-80% of the cases, while individuals with substance disorder were almost all identified through PRIMHD ACT, or through their use of a specialist addiction service.

Table 2: Sources of data for MHC, by ethnicity

Ethnicity	Source	Mental health condition				
		ADHD	Anxiety	Mood	Conduct disorder	Substance disorder
European	NMDS	54 (0.2%)	825 (15.4%)	156 (2.7%)	81 (7.9%)	348 (11.2%)
	PRIMHD ACT	<6	<6	<6	<6	2685 (83.6%)
	PRIMHD DIAG	1959 (7.3%)	4461 (83.1%)	1083 (18.8%)	924 (90.6%)	84 (2.7%)
	PHARMS	24405 (91.2%)	24 (0.4%)	4506 (78.4%)	<6	<6
	SOCRATES	351 (1.3%)	60 (1.1%)	<6	18 (1.8%)	<6
	<i>Total</i>	26766 (100%)	5370 (100%)	5748 (100%)	1020 (100%)	3120 (100%)
Māori	NMDS	33 (0.4%)	303 (20%)	75 (5.9%)	36 (6.8%)	312 (6.7%)
	PRIMHD ACT	<6	<6	<6	<6	4224 (90.5%)
	PRIMHD DIAG	675 (8.8%)	1197 (78.9%)	330 (25.9%)	477 (89.8%)	135 (2.9%)
	PHARMS	6807 (88.9%)	<6	867 (68.2%)	<6	<6
	SOCRATES	144 (1.9%)	12 (0.8%)	<6	18 (3.4%)	<6
	<i>Total</i>	7656 (100%)	1518 (100%)	1272 (100%)	531 (100%)	4668 (100%)
Pacific	NMDS	<6	90 (22.1%)	33 (10.9%)	9 (5.8%)	96 (10.6%)
	PRIMHD ACT	<6	<6	<6	<6	780 (86.4%)
	PRIMHD DIAG	117 (7.5%)	318 (77.9%)	81 (26.7%)	135 (86.5%)	27 (3%)
	PHARMS	1404 (90.5%)	<6	192 (63.4%)	<6	<6
	SOCRATES	30 (1.9%)	<6	<6	9 (5.8%)	<6
	<i>Total</i>	1551 (100%)	408 (100%)	303 (100%)	156 (100%)	903 (100%)
Asian	NMDS	<6	60 (23.3%)	15 (5.6%)	<6	24 (22.2%)
	PRIMHD ACT	<6	<6	<6	<6	81 (75%)
	PRIMHD DIAG	21 (3.4%)	192 (74.4%)	57 (21.3%)	33 (84.6%)	<6
	PHARMS	579 (93.2%)	<6	192 (71.9%)	<6	<6
	SOCRATES	15 (2.4%)	<6	<6	<6	<6
	<i>Total</i>	621 (100%)	258 (100%)	267 (100%)	39 (100%)	108 (100%)
Other	NMDS	<6	39 (17.3%)	<6	<6	24 (13.6%)
	PRIMHD ACT	<6	<6	<6	<6	132 (74.6%)
	PRIMHD DIAG	72 (7.2%)	180 (80%)	54 (26.9%)	48 (88.9%)	18 (10.2%)
	PHARMS	900 (90.4%)	<6	141 (70.1%)	<6	<6
	SOCRATES	21 (2.1%)	<6	<6	<6	<6
	<i>Total</i>	996 (100%)	225 (100%)	201 (100%)	54 (100%)	177 (100%)

4.3 Data sources for the identification of MHC specific to Pacific children

Table 3: Sources for the identification of Pacific children in NZ with MHC over 2008-2015

Ethnicity	Source	Mental health condition				
		ADHD	Anxiety	Mood	Conduct disorder	Substance disorder
Samoan	NMDS	<6	15	<6	<6	9
	PRIMHD ACT	<6	<6	<6	<6	78
	PRIMHD DIAG	36	75	12	12	<6
	PHARMS	360	<6	84	<6	<6
	SOCRATES	6	<6	<6	<6	<6
	<i>Total</i>	402	90	99	12	90
CI	NMDS	<6	<6	<6	<6	<6
	PRIMHD ACT	<6	<6	<6	<6	27
	PRIMHD DIAG	15	36	9	<6	<6
	PHARMS	207	<6	27	<6	<6
	SOCRATES	<6	<6	<6	<6	<6
	<i>Total</i>	228	36	36	<6	27
Tongan	NMDS	<6	6	<6	<6	<6
	PRIMHD ACT	<6	<6	<6	<6	36
	PRIMHD DIAG	27	36	12	12	<6
	PHARMS	183	<6	51	<6	<6
	SOCRATES	<6	<6	<6	<6	<6
	<i>Total</i>	213	42	63	12	39
Other Pacific	NMDS	<6	93	27	9	102
	PRIMHD ACT	<6	<6	<6	<6	807
	PRIMHD DIAG	126	330	93	141	30
	PHARMS	1488	<6	216	<6	<6
	SOCRATES	36	<6	<6	9	<6
	<i>Total</i>	1650	426	336	162	933

Table 3 presents the case identification of MHC, as reported in Table 2, for specific Pacific ethnic groups. Consistent with the findings of Table 2, PHARMS was the most common source of Pacific MHC across all Pacific ethnic groups. MHC for Tongan participants were more commonly identified by PRIMHD ACT whereas CI in PRIMHD DIAG. With respect to NMDS, too few cases were identified to report by diagnosis and specific ethnicity. Approximately 15 Samoan participants who had been hospitalised had an associated anxiety diagnosis, while 9 had an associated substance disorder diagnosis. Very few, just over 1% of people with a mental

health problem, were identified through SOCRATES. The Other Pacific ethnic group also showed prevalences among all MHC excluding ADHD which had less than 6.

4.4 Demographic background of young people with MHC

Table 4: Demographic patterns among children aged 10-14 years old with MHC in NZ from 2008-2015, by ethnicity

	Year	Total Pacific	Samoan	CI	Tongan	Other Pacific	Māori	European	Asian	Other	All ethnicities
Total Number	2008-2015	4497 (100%)	1443 (100%)	651 (100%)	1032 (100%)	1371 (100%)	15441 (100%)	39258 (100%)	2208 (100%)	1785 (100%)	50835 (100%)
	Average Annual	818	306	133	212	251	3013	8200	391	335	10,355
Gender	Female	2118 (47.1%)	708 (49.2%)	321 (49.3%)	468 (45.3%)	615 (44.9%)	6621 (42.9%)	17415 (44.4%)	1035 (46.9%)	750 (42.0%)	22353 (44.0%)
	Male	2379 (52.9%)	735 (50.8%)	330 (50.7%)	564 (54.7%)	756 (55.1%)	8820 (57.1%)	21843 (55.6%)	1173 (53.1%)	1035 (58.0%)	28488 (56.0%)
NZDep (2008-2015)	Q1	228 (5.6%)	93 (6.4%)	33 (5.1%)	53 (5.1%)	69 (5.0%)	1104 (7.1%)	8314 (21.2%)	404 (18.3%)	264 (14.8%)	9068 (17.8%)
	Q2	321 (7.9%)	135 (9.4%)	30 (4.6%)	68 (6.6%)	111 (8.1%)	1524 (9.9%)	7564 (19.3%)	468 (21.2%)	324 (18.2%)	8629 (17%)
	Q3	465 (11.4%)	186 (12.9%)	66 (10.1%)	99 (9.6%)	171 (12.5%)	2271 (14.7%)	7801 (19.9%)	437 (19.8%)	348 (19.5%)	9244 (18.2%)
	Q4	771 (18.9%)	282 (19.5%)	111 (17.1%)	198 (19.2%)	258 (18.8%)	3396 (22.0%)	7995 (20.4%)	443 (20.1%)	381 (21.3%)	10327 (20.3%)
	Q5	2292 (56.2%)	747 (51.8%)	411 (63.1%)	614 (59.5%)	762 (55.6%)	7146 (46.3%)	7584 (19.3%)	456 (20.7%)	468 (26.2%)	13573 (26.7%)
DHB region* (2008-2015)	Auckland	690 (17.9%)	234 (17.3%)	171 (27.0%)	138 (14.2%)	237 (18.1%)	789 (5.7%)	2640 (6.7%)	462 (20.9%)	156 (10%)	3834 (8.8%)
	Counties Manukau	1362 (35.3%)	477 (35.3%)	246 (38.9%)	354 (36.4%)	441 (33.7%)	1926 (14.1%)	3159 (8%)	516 (23.4%)	189 (12.1%)	5610 (12.9%)
	Waitemata	603 (15.6%)	249 (18.4%)	78 (12.3%)	129 (13.3%)	216 (16.5%)	1416 (10.4%)	5628 (14.3%)	474 (21.5%)	276 (17.7%)	6837 (15.7%)
	Rest of NZ	1200 (31.1%)	393 (29.0%)	138 (21.8%)	351 (36.1%)	414 (31.7%)	9537 (69.8%)	21585 (55%)	579 (26.2%)	939 (56.2%)	27315 (62.7%)
Place of Birth (2008-2015)	NZ born	2697 (60.0%)	1071 (74.2%)	453 (69.6%)	795 (77.0%)	492 (35.8%)	10716 (69.4%)	29529 (75.2%)	1080 (48.9%)	702 (39.3%)	36594 (72.0%)
	Overseas born	1800 (40.0%)	372 (25.8%)	198 (30.4%)	237 (23.0%)	879 (64.2%)	4725 (30.6%)	9729 (24.8%)	1128 (51.1%)	1083 (60.6%)	14241 (28.0%)

*A number of individuals eligible for the study were not residing within a specified DHB regions

4.4.1 Numbers of children over time

Table 4 provides a demographic breakdown of children with MHC. Over time, the numbers of 10-14 year-old children in NZ with at least one MHC increased over the duration of the study (not shown). It is important to be mindful that the populations included in the study were dynamic, changing continuously with the ages of the children. The majority of those with MHC were of European descent, followed by Māori and then Pacific. In 2014, 12,120 children were identified as having a mental health problem, the highest year among the duration of the study. Alternatively, 2009 was the lowest with 9099.

The annual numbers of Pacific children with an MHC generally increased per year, peaking in 2014. On average over 800 children were identified each year at least one mental health problem, over 4000 children seen over the entire eight-year period. The Samoan ethnic group had the highest number each year for children with an MHC among the three specified Pacific ethnic groups, followed by Tongan and then CI.

4.4.2 Socioeconomic status

More than half (56%) of the Pacific cohort with MHC resided in “Quintile 5 areas, the areas defined by the New Zealand Deprivation Index as having the highest estimated levels of deprivation in NZ. Nationally, with 20% of NZ’s population residing in these areas with these levels of deprivation.

4.4.3 Geographic distribution

The years 2011 to 2014 saw an annual increase in MHC across the Pacific cohort. The highest percentage of Pacific children with MHC resided in Auckland, particularly in the Counties Manukau region. Pacific children were 3 times as likely as European children to reside in Counties Manukau. In comparison, children of other ethnicities were more likely to live outside of Auckland.

4.4.4 Place of birth/migration

Approximately 61% of the Pacific cohort with MHC were born in NZ, while 69.4% of Māori were NZ born. European and Other ethnic groups also had majority of their populations born in NZ. The Asian ethnic group however deviated from these trends with 60.6% of their population born overseas.

4.5 Annual rates of children aged 10-14 years with MHC per 10,000 children

Table 5: The annual rates of children with MHC per 1,000 children by ethnic group, 2008-2014

Ethnicity	Year						
	2008	2009	2010	2011	2012	2013	2014
Pacific	21.8	18.6	18.6	19.8	20.7	25.6	27.7
Māori	32.3	33.4	38.1	40.1	43.2	47.2	49.7
European	35.6	35.9	37.9	39.6	41.9	45.3	47.8
Asian	12.7	12.5	12.3	12.0	13.1	14.2	16.4
Other	34.1	36.5	36.1	34.8	35.2	36.9	34.6
All ethnicities	31.5	31.1	33.2	34.9	37.0	40.3	42.5

4.5.1 Prevalence over time

European children aged 10-14 years had the highest rates, between 31 and 43 per 1,000 children with an MHC, increasing throughout the duration of the study. This annual increase from 2008 to 2014 was constant across all ethnic groups, aside from the Other ethnic group which varied from year to year. Data also showed 2-3% of Pacific children in NZ had an MHC, increasing from 21.8 per 1,000 children in 2008 to 27.7 per 1,000 children in 2014. 2015 was excluded from the table to avoid inaccuracy as coding only allowed the IDI to present the first half of the 2015 fiscal year.

4.6 Prevalence of MHC

Table 6 shows the annual prevalence of identified MHC in children seen by specialist mental health services over the 2008-2015 time period, recorded in the PRIMHD DIAG data. Pacific had the lowest rates per 1,000 children aged 10-14 years, with the exception of the Asian ethnic group. For every 1000 Pacific children, five had ADHD the most common MHC among the ethnic groups and three were affected by a substance disorder, the second most common condition for Pacific.

Table 6: The 12-month prevalence rates of children with MHC per 1,000 children by diagnosis, annual average from 2008-2015

MHC	Ethnicity					
	Pacific	Māori	European	Asian	Other	All ethnicities
ADHD	4.7	11.8	15.1	2.5	11.6	12.2
Anxiety	1.3	2.5	3.2	1.1	2.9	2.7
Mood	1.2	2.5	4.3	1.3	3.0	3.4
Conduct disorder	0.5	0.9	0.6	0.3	1.0	0.6
Substance disorder	3.0	7.8	1.9	0.5	2.6	2.9
Any Diagnosis	10.7	25.5	25.2	5.4	20.2	28.6

4.7 The use of specialist mental health services

Table 7 presents the number of children who were seen by mental health services over the 2008-2015 time period, recorded in the PRIMHD activity data. In addition, the percentages of those who were seen in each of the specialist mental health services. Among Pacific children, the highest percentage were being seen by other non-specified services, where 73% of Pacific and 79.6% of non-Pacific children came under. Of the specified specialist MH services, substance use services had the highest prevalence with more than a quarter of Pacific children (27.6%) seen by these services. Non-Pacific children with MHC had nearly 50% less use of substance use services than Pacific. Pacific children were also nearly three times as likely to be seen in Forensic services with 3%, compared to 1.1% of non-Pacific children.

Table 7: The percentage of children seen by specialist MH services

Specialist MH service	Pacific (n = 5180)	Non-Pacific (n = 40,076)
Acute services	1.6%	1.6%
Child and Youth	9.3%	10.7%
Crisis interventions	9.7%	11.3%
Eating	0.7%	1.4%
Forensic	3.0%	1.1%
Other services	72.5%	79.6%
Early psychotic interventions	0.4%	0.4%
Substance use	27.6%	18.8%

Table 8: The rates of ASH conditions per 1,000 Pacific children with MHC, 2008-2015

ASH condition	N	Average annual rate per 1,000 children
Denominator (N)	6102	1000.0
Skin infections	438	71.8
Gastroenteritis	366	60.0
Injuries assault	315	51.6
Upper respiratory	315	51.6
Otitis Media	276	45.2
Asthma	243	39.8
Dental	234	38.3
Self-harm	219	35.9
Pneumonia	213	34.9
Alcohol related	177	29.0
Constipation	156	25.6
Dermatitis	153	25.1
Nutrition	120	19.7
Vaccine preventable	60	9.8
Gastro Oesophageal	39	6.4
Rheumatic fever	30	4.9
CRHD	18	2.9
Bronchiectasis	12	2.0

4.8 ASH rates among children with MHC

Table 8 to 10 describes the comorbidity of the MHC of interest with ASH conditions that have been benchmarked for the Pacific child population by Dekker et al. (2018). Table 8 shows the rates per 1,000 Pacific children with MHC who had been admitted to a public hospital for an ASH related diagnosis, or an avoidable condition, during the duration of the study. Arranged in

order from the highest to least prevalent, hospital admissions with skin infections was most common with an average annual rate of 72 per 1,000 Pacific MHC children. Following on, gastroenteritis, injuries as a result of assault and upper respiratory were the next most common preventable disorders. Bronchiectasis was the least prevalent, with an average of 13 Pacific children hospitalised each year.

4.9 Children aged 10-14 years old with MHC who are diagnosed with an ASH condition from 2008-2015

Table 9: The most common ASH conditions in Pacific children 10-14 years with MHC: demographic background; 2008-2015

		ASH condition								
		Any condition	Skin infections	Gastroenteritis	Injuries assault	Upper respiratory	Otitis Media	Asthma	Dental	Self-harm
Gender	Female	4560	804	1047	492	687	234	444	336	828
	Male	5217	1227	741	1371	597	459	489	555	525
NZDep	Q1	477	75	84	57	42	33	36	39	78
	Q2	840	132	174	132	120	60	87	60	138
	Q3	1218	228	234	198	144	75	102	105	189
	Q4	1971	378	405	366	285	159	210	195	279
	Q5	5262	1209	888	1110	687	366	495	492	663
DHB Region	Auckland	1719	402	300	405	222	123	165	147	252
	Counties Manukau	3216	702	573	678	429	210	303	276	360
	North Island	2592	486	462	384	324	186	231	285	405
	South Island	804	120	159	132	84	57	69	78	138
	Waitemata	1425	318	291	267	216	117	171	108	192
Place of Birth	Overseas born	4335	966	771	1086	549	216	360	324	636
	NZ born	5442	1065	1017	780	732	477	573	567	717

4.9.1 Socioeconomic status

The highest number of participants suffering from the ASH conditions of interest were all residing in Q5 areas with 5262 Pacific children while only 477 resided in Q1 areas. Based on the patterns shown, the higher the deprivation scale the more Pacific children suffering from an ASH condition. Areas with lower NZDep scores had as little as six or fewer participants suffering from an ASH condition - shown by rheumatic fever, CRHD and bronchiectasis findings in Q1 and Q2 areas.

4.9.2 DHB regions

Counties Manukau also had the highest number of Pacific participants with 3216, compared to 1719 in Auckland, 1425 in the Waitemata, 2592 in the North Island and 804 in the South Island DHB regions.

4.9.3 Birth place

Table 6 showed 5442 Pacific children were NZ born, while 4335 were born overseas. NZ born Pacific children had a higher prevalence among all ASH conditions with the exception of injuries from assault, which was higher for those born overseas.

Table 10: ASH conditions rates per 1,000 Pacific children with MHC in NZ: 7 most common ASH conditions, by demographic groups; from 2008-2015

		ASH condition								
		Pacific Population	Skin infections	Gastroenteritis	Injuries assault	Upper respiratory	Otitis Media	Asthma	Dental	Self-harm
		N	Rate per 1000 people	Rate per 1000 people	Rate per 1000 people	Rate per 1000 people	Rate per 1000 people	Rate per 1000 people	Rate per 1000 people	Rate per 1000 people
Gender	Female	4560	176.3	229.6	107.9	150.7	51.3	97.4	73.7	181.6
	Male	5217	235.2	142.0	262.8	114.4	88.0	93.7	106.4	100.6
NZDep	Q1	477	157.2	176.1	119.5	88.1	69.2	75.5	81.8	163.5
	Q2	840	157.1	207.1	157.1	142.9	71.4	103.6	71.4	164.3
	Q3	1218	187.2	192.1	162.6	118.2	61.6	83.7	86.2	155.2
	Q4	1971	191.8	205.5	185.7	144.5	80.7	106.5	98.9	141.6
	Q5	5262	229.8	168.8	210.9	130.6	69.6	94.1	93.5	126.0
DHB Region	Auckland	1719	233.9	174.5	235.6	129.1	71.6	96.0	85.5	146.6
	Counties Manukau	3216	218.3	178.2	210.8	133.4	65.3	94.2	85.5	111.9
	North Island	2592	187.5	178.2	148.1	125.0	71.8	89.1	110.0	134.7
	South Island	804	204.2	197.8	164.2	104.5	70.9	85.8	97.0	156.3
	Waitemata	1425	223.2	204.2	187.4	151.6	82.1	120.0	75.8	171.6
Place of Birth	Overseas born	4335	222.8	177.9	250.5	126.6	49.8	83.0	74.7	131.8
	NZ born	5442	195.7	186.9	143.3	134.5	87.7	105.3	104.2	146.7

Table 10 presents the rates per 1,000 Pacific children with MHC described by demographic background, who are hospitalised with one of the most common ASH conditions. Pacific boys were more likely to be admitted for skin infections, injuries, otitis media and dental, while Pacific girls were more likely to be admitted for gastroenteritis, upper respiratory, asthma and self-harm. Skin infections and injuries from assault as a result of abuse increased as deprivation increased. In addition, self-harm in Q1 and Q2 areas were 25% higher than in Q5 areas.

4.9.4 DHB region

Pacific children with MHC living in Counties Manukau had the highest number of individuals (n = 3216) being hospitalised for an ASH condition. The South Island region had the lowest with 804. The Waitemata region had the highest rates for gastroenteritis, upper respiratory, otitis media, asthma and self-harm. Skin infections and Injuries from assault had the highest rates in the Auckland region with 233.9 per 1000 people and 235.6 per 1000 people, respectively.

4.9.5 Place of birth

Rates for asthma, otitis media and dental were shown to be substantially higher for NZ born Pacific children as opposed to those born overseas. Injuries from assault were higher for children born overseas with a rate of 250.5 per 1000 people, compared to 143.3 per 1000 people for those born in NZ.

4.10 Chapter summary

Within the IDI, there are a variety of ways that children with MHC could potentially be identified, the results showed that PRIMHD DIAG and PHARMS were the databases where most of the cohort who had MHC was identified in the present study.

Within this cohort, Pacific children were the third largest ethnic group (after European and Māori), with 1 in 8 (12%) children included in the study being Pacific.

Looking at the demographic profile of the 4497 Pacific cohort with MHC, participants appeared to be more likely to reside in areas of high deprivation, while three in five Pacific children with MHC were born in NZ.

When rates of MHC were explored, ADHD, substance disorder and anxiety were the most common conditions among Pacific. The mental health specialist services where Pacific children were most likely to be seen were Other, substance use and crisis intervention services, which was consistent with the patterns observed among non-Pacific children.

The latter part of the chapter explores experiences of ASH conditions among Pacific children with MHC, with results suggesting that this cohort experiences high rates of ASH, in particular skin infections, gastroenteritis and injuries from assault. Pacific children with MHC who experienced ASH conditions were more likely to reside in areas of high deprivation, with a high proportion of these children residing in the Counties Manukau region.

5.0 DISCUSSION

The present study had three aims: to describe the burden of MHC among Pacific children aged 10-14 years old; to examine the associations between deprivation, migration and place of residence with MHC; and describe the associations between MHC and short-term health outcomes. A fourth study aim was to explore the use of the IDI and describe and discuss the potential for further research into MHC among Pacific children and Pacific communities in general. In topics like mental health among young people where there is currently little known about experiences and engagement with treatment services, the IDI provided valuable clues for what is happening in terms of access and outcomes. Through the use of multiple sources of data, we were able to identify children living in NZ with particular MHC, as well as gather data about their demographic backgrounds and health outcomes. The findings and implications for each of these aims will then be discussed in turn, followed by a reflection on the strengths and limitations of this study and overall conclusions.

5.1 MHC among Pacific children aged 10-14 years old

This study showed 2-3% of Pacific children in the specified age group from 2008-2014 had a MHC, with an average annual of 818 Pacific children aged 10-14 years old having a MHC per year. Pacific children had the third highest MHC rates, after European and Māori children. Males had a higher prevalence of MHC than females irrespective of their ethnic group. This is in contrast with patterns seen in other research that have shown young Pacific females having double the rates compared to males for symptoms of depression, intentional self-harm and suicidal ideation (Helu et al., 2009; Adolescent Health Research Group, 2008). This may be due to the difference in the definition of an MHC, where Helu et al. (2009) focused on hospitalisations due to self-harm as opposed to the MHC that were included in the present study, in particular the inclusion of ADHD, which is much more prevalent among males.

ADHD was the most common MHC among the five conditions of interest. This is consistent with earlier findings by Craig et al. (2010), who found that hyperkinetic disorders were the highest diagnosed conditions among Pacific children accessing MH services from 2005-2007. In

addition, a rise in the diagnosis of kinetic disorders was observed as childhood progresses to adolescence and peaking at the age of 13. Overall, numbers of MHC increased steadily up to 2014.

The Pacific cohort showed average rates for the MHC of interest in comparison to other ethnic groups. Consistent with the general findings of the study, ADHD was the most common MHC for Pacific children aged 10-14 years. According to Te Rau Hinengaro, Pacific adults had comparatively higher prevalence of Anxiety and Conduct disorder compared with others and comparable levels of mood disorders (Oakley Browne et al., 2006). The findings of the present study deviate from Te Rau Hinengaro, which may be attributed to the age differences of those included in the different studies.

Based on previous studies discussed in chapter two about the lower rates of health seeking behaviours among Pacific people in NZ (Oakley Browne et al., 2006; Kokaua & Wells, 2009), it is possible that results of the present study are an under representation of the true rates of MHC among Pacific children. Further research is required to address the likelihood of this.

5.2 Deprivation, migration and place of residence as factors in MHC among Pacific children

The second aim of this study was to explore the likelihood of deprivation, migration and place of residence as determinants, and their possible role in the alleviation or increased risk of mental health symptoms prior to the onset of ADHD, mood, anxiety, conduct disorder and substance disorder among the cohort. Prioritising these factors as potential determinants was based on previous studies discussed in chapter two, about the influence of migration and deprivation on the development of mental health problems (Kokaua et al., 2009; Dashiff et al., 2009),

5.2.1 Deprivation

More than half of Pacific children with MHC were shown to reside in the most deprived areas of NZ, the highest among the different ethnic groups. This is consistent with the findings of previous studies that found deprivation and hardship had negative effects on health outcomes (Aber, Bennet, Conley, & Li, 1997; Bradley & Corwyn, 2002) and mental health specifically

(Cecil et al., 2017; Pieterse et al., 2012; Riva, Gauvin, & Barnett, 2007). In the NZ context, it is consistent with findings of work by Craig et al. (2010) who showed that between 2005 and 2007, the number of children seeking treatment services for ADHD or other hyperkinetic disorders was significantly lower in NZDep 1 and 2 areas as compared to areas of higher deprivation.

As well as showing that deprivation is a common background factor for Pacific children with MHC, these results also provide highlight geographic locations where treatment services could be concentrated to respond to higher numbers within that area. Specifically, approximately one third of Pacific children with MHC lived in the Counties Manukau region, and almost two thirds of the total Pacific subgroup living in the wider Auckland region alone.

5.2.2 The effects of migration

Previous findings in Te Rau Hinengaro (Kokaua et al., 2009) noted higher rates of MHC among Pacific child migrants and Pacific children born in NZ, in contrast to those born and raised in a Pacific nation who migrate to NZ in adulthood. In the current study, three in five Pacific children with MHC were NZ born. Further research would be beneficial in order to better understand the relationship between migration and its impact on the onset of MHC among young Pacific people.

5.3 Pacific children with MHC and short term health outcomes

Studies have suggested that MHC during childhood may be linked to physical health conditions during adulthood (Felitti et al., 1998; Scott et al., 2011). These studies focused on long-term outcomes (Scott et al., 2011), while the present study extends this by looking at a subset of preventable short-term health outcomes (ASH) which occur in a more immediate time frame following the onset of a MHC. The ASH conditions included in the present study have been found to be more prevalent among Pacific children in NZ, compared to non-Pacific (Edwards, Asher, & Byrnes, 2003; Jaine, Baker, & Venugopal, 2008; Grant et al., 2011).

Previous research carried out by Craig et al. (2012) and Dekker et al. (2018) provided Pacific population benchmarks for the ASH conditions included in the present study, though some variations did exist between age groups in each study. Comparisons between the rates found in the present study and Craig et al. (2012) suggest children with MHC are experiencing higher

rates for many of the ASH conditions than those without MHC diagnosis. Skin infections, for example were found to have a rate of 3.24 per 1000 NZ children aged 29 days-14 years in Craig et al. (2012), while skin infections among Pacific children aged 10-14 with MHC in the current study had an annual average rate of 71.8 per 1000 people. This observation was constant among all the ASH conditions common to both studies. By finding a likely association between the onset of a MHC and the onset of an ASH condition shortly after, it is likely that mental health problems can lead to these other health conditions developing among young people. This suggests that children with MHC are also managing other preventable health conditions which may be exacerbating either condition and should be considered in treatment services for both MHC and ASH conditions. In addition, these findings also suggest that poor mental health outcomes and poor physiological health tend to cluster in the same individuals.

Among the cohort of Pacific children with MHC, there was an over representation of those who lived in areas of greater socioeconomic deprivation for those who experienced ASH conditions. This is consistent with previous work (Health Partners Consulting Group, 2012) that has noted poorer health outcomes in areas where there are high levels of deprivation such as the Counties Manukau region. Craig et al. (2010) showed hospital admissions among children was significantly higher for those living in decile 9 and 10 areas over the 2000-2008 year period. This is further reiterated by the findings of Craig et al. (2012) which showed children living in decile 10 areas had significantly higher hospitalisation admissions compared to those living in decile 1. Craig, Taufa, & Jackson (2008) showed paediatric hospitalisation rates as having large socioeconomic gradients, and this is confirmed by the preceding findings about increased hospitalisations in young Pacific people, and in high decile areas.

It has been shown that Pacific people in NZ are more prone to experiencing deprivation, with poor housing conditions and lower incomes in comparison to non-Pacific people (MOH, 2014; Statistics New Zealand, and Ministry of Pacific Island Affairs, 2011). The temporal order of MHC and ASH conditions, with these lifestyle factors can be complex. This raises the question of whether intervention and prevention should be focused on the health conditions, or whether it would be more effective to address the lifestyle factors that can lead to these conditions developing.

A key finding of the present study showed that self-harm was inversely associated with NZDep, with self-harm rates being highest in Q1 areas and decreasing as the NZDep increased. This is consistent with international research conducted about the increased risk of self-harm based on deprivation (Ayton, Rasool, & Cottrell, 2003; Carroll, Knipe, Moran, & Gunnell, 2017). A number of other conditions such as gastroenteritis and upper respiratory however, did not indicate any association with NZDep and the onset of ASH conditions.

Among this cohort of Pacific children with MHC, Skin infections were the most common ASH condition, followed by Gastroenteritis and injuries. Another Pacific focused, study (Dekker et al., 2018) which looked at ASH conditions among a cohort of 0-4 year old Pacific children reported that asthma and wheeze, gastroenteritis, dental, skin infections and pneumonia were most prevalent among that age-group, and it may be expected that there are age related differences in the patterns of ASH conditions.

5.4 The use of the IDI for identifying and describing MHC

The present study was, to our knowledge, the first of its kind to use the IDI as a means of researching Pacific children with MHC in NZ. The process of extracting data from the IDI is a continuously regulated task, highly monitored by Statistics New Zealand in order to uphold its confidentiality rules. The use of the IDI for mental health research is innovative and unprecedented, and because of this there was no relevant literature with similar research methods available. The present study therefore offers valuable insight into the capabilities of this database, and the extent to which quantitative research can be conducted examining the health experiences and trajectories of Pacific people.

The use of administrative data for health related research has a number of advantages such as the access to large sample sizes, low expenditure and the reflection of real-world practice (Nguyen & Barshes, 2010; Mazzali & Duca, 2015). Since the data collection process of the present study, Bowden (2019) has developed algorithms for improving the case identification of mental health data in NZ. This is based on previous studies which have shown the difficulty in handling mental health related research in the past (Frayne et al., 2010; Kake, Arnold, & Ellis, 2008). The use of these algorithms for further research in order to extend on the present study would be beneficial for clarifying and refining data about mental health problems in the future.

When considering young Pacific people who must often cope with cultural restraints and perspectives when the topic of mental health is addressed, the use of the IDI seems like a valuable platform for data analysis. This does however remove the personal aspects of interacting with the individuals included in the study, and perhaps gaining a different insight into their circumstances. The intention of using the IDI was done with the hope that by drawing common conclusions to past research about the topic at hand and researching to obtain new results, the body of evidence would become more robust and will further encourage the necessary changes to be made within the mental health sector.

5.5. Data sources used for identifying MHC

There is currently very little reported about diagnoses of MHC among Pacific children in NZ, and the treatment received for these diagnoses. The findings from this study suggest that diagnosis of MHC is not only identified through specialist mental health services, but can also be identified through other treatment services. Diagnosis of anxiety and conduct disorder for Pacific children aged 10-14 years old was most commonly identified through specialist mental health services, while those with ADHD and mood disorder were more likely to be identified based on their use of prescribed pharmaceuticals. In addition, while a number of Pacific children with substance disorders were being seen by specialist mental health services, few were actually diagnosed by these specialised services. This was also found among children in other ethnic groups. Many children were also shown to be using adult mental health treatment services such as forensic, as opposed to child and youth services.

Children with MHC were identified through four different health databases within the IDI, each containing different types of information about the use of mental health treatments for specified conditions. A key observation shows that the majority of services being used by Pacific children with MHC were for specialist mental health services indicated by PRIMHD DIAG (diagnosis), and prescribed medications indicated by PHARMS. This observation was also found among the other ethnic groups. These findings could be interpreted as children with MHC and their families seeking treatment and medications prior to the condition requiring hospitalisation, which may have been indicated if a higher proportion of data about the Pacific cohort was being sourced from NMDS (hospital events). Many of the services that report to different data sets have the

potential to and are most likely to have been used simultaneously, for example an individual who seeks treatment from a specialist MH service (PRIMHD), and then goes on to be prescribed medication which is purchased from a pharmacy (PHARMS).

The inclusion of NMDS captured children during 2008-2015 who had been discharged from a private or public hospital with a primary mental health related treatment or with a mental health condition entered as a contributing diagnosis. Overall, for NZ children anxiety was the most common MH condition sourced from the NMDS database, followed by substance disorder. The Pacific cohort contrasted somewhat with the highest NMDS numbers being for substance disorder, followed by anxiety. When comparing the overall trends between the ethnic groups for NMDS, the Pacific cohort had lower hospital admissions for the MHC observed. Comparisons between Pacific ethnic groups showed the children identifying as Samoan or 'other' had the highest number of hospital admissions, mainly for anxiety and substance disorder. Both CI and Tongan ethnic groups had too few eligible children admitted to hospital for the specified MHC to be described here.

PHARMS was used to identify children with MHC based on their prescribed medications. Of the participants identified through PHARMS, the highest proportion of prescribed medication was for ADHD. Nine out of ten Pacific children were identified with ADHD through medication use. This may indicate that many children with ADHD were not taking medication, which could be related to the severity of their condition or other reasons not stated. PHARMS also showed medications were commonly being prescribed for mood disorder, while the remaining disorders of interest showed negligible results. It is useful to note that some ambiguous medications may identify a MHC without the ability to determine an exact diagnosis. That is the prescription demonstrates a mental health condition, but there are multiple conditions for which that drug could have been prescribed.

PRIMHD is the main database for specialist MH services in NZ. This study suggests that use of specialist MH services by Pacific children increased over the years, peaking in 2014. Children identified through PRIMHD DIAG data had been diagnosed with a MHC from a specialist MH service, while PRIMHD ACT (activity) identified high numbers among the ethnic groups for substance disorder alone, indicating the use of specific mental health or addiction services. The

most common MHC sourced from PRIMHD DIAG was anxiety disorder. This means that children suffering from anxiety were seeking health care from a specialist MH service more frequently than any of the other MHC.

Pacific children with MHC were less likely to be treated by a specialist MH service when compared to their non-Pacific counterparts. This is consistent with the findings of Te Rau Hinengaro (Oakley Browne et al., 2006), which showed lower rates of mental health visits among the Pacific population in comparison to other ethnic groups. When considering the age of the participants in the present study, it is likely that a child's access to mental health services is strongly influenced by parents or caregivers and potential barriers such as concerns about stigma and shame held by adults may play a part in this unmet need.

As stated, child and youth services was the most common of the specialist mental health services to be used by children with MHC during the 2008-2015 period. This was expected because of the age range for inclusion in the study, however results also showed that a number of children with MHC were being seen in other specialist services that were not exclusively for children, such as forensic, acute and psychotic. This is an area for future work as it is important that age appropriate assessment and treatment is available for Pacific children, particularly given the youthful age demographic of the Pacific community in NZ as a whole.

Pacific children were also three times as likely as non-Pacific to be seen in forensic services. In 2013 young Pacific people aged 10-13 years were found to have the second highest rates of offending per 1,000 children, following Māori (Ministry of Social Development, 2016a). The higher rates for Pacific children being seen in forensic services may therefore be influenced by the substantially high rates of offending among Pacific children.

5.6 Pacific research

Adhering to the principles of the Pacific research protocols outlined in chapter three, it was important that the present study was done so from a Pacific lens. Because Pacific methodologies have had a tendency to be tailored to qualitative research, as well as the restricted protocols of using the IDI, the opportunities to do so were limited. The researcher therefore tailored the research specific to Pacific people where possible. One way the researcher did this was by

choosing possible determinants of MHC that have been known to have a profound impact on Pacific communities in NZ, hence the inclusion of deprivation and migration. Using the IDI also allowed the researcher to separate major Pacific subgroups, acknowledging that although Pacific people are often categorised into a homogenous group, there are distinct differences that exist between each Pacific ethnicity. This was also done so for DHB regions where Auckland, Counties Manukau and the Waitemata DHB regions were categorised into their own groups, based on the large population of Pacific people residing in the Metro Auckland region.

5.7 Strengths and limitations of this study

Using the IDI was advantageous for the purpose of having access to several datasets containing a wide range of information about all individuals in the NZ population, for any given year. The use of the IDI allowed for health and non-health related data to be obtained, in order to gain a clearer understanding of what factors contribute to the onset of MHC, and the outcomes that may follow. Another strength was the transactional nature of the data - captured when an event such as a hospital admission or the diagnosis of one of the MHC actually occurred. In addition, the retrospective design of the study meant that there was clarity in temporal sequencing, allowing for time series and life course analyses, albeit limited to data availability.

Using the IDI also provided whole population coverage, allowing researchers to specify and make comparisons between different subgroups (i.e. Samoan, Tongan, CI), as opposed to categorising all Pacific people into a homogenous group.

While efforts were made to obtain accurate data, limitations arose throughout the study concerning the datasets used. Unavailability of extensive primary health organisation (PHO) data in the IDI meant that GP outpatient services for the treatment of a mental health disorder is not accounted for. While the focus of the table was on treatment services that were specifically for MHC, there is a likelihood that GP services may have offered treatment or prescribed medication without further referral. Since the data collection process was conducted in this study, there have been further refinements to the datasets with more robust identifications of MHC now being possible (Bowden et al., 2019). This would most likely improve and refine how the MHC included in the study were identified.

It is worth noting that the ‘other Pacific’ group is larger than would be expected, which raises the possibility of mis-identification of ethnicity within this context. This should therefore be addressed in further research.

The time taken for data clearance also served as a limitation towards the end of the study, where Statistics NZ requested a count of the number of mental health service entities to verify each individual cell count. This was not required previously, and some delay ensued while internal protocols were refined resulting in an unintended delay to this study.

5.8 Future directions

Future directions for this study should be focused on grasping a more extensive understanding of the IDI through its ability to obtain data in high quantities, as well as its capability to be used for other health-related research. Furthermore, conducting more comprehensive statistical analyses on mental health finding would be desirable as well as an extension to a wider set of health outcomes.

Other suggestions for future research also include incorporating the IDI into qualitative studies about mental health, and gaining a further understanding of what poverty and hardships mean to a young Pacific person with an MHC. In addition, specifically analysing the relationship between MHC and the onset of other health conditions that were not already included in the study. Furthermore, using the IDI to look at other MHC that were not included in the study, as well as stratifying the data by individual ages and by gender as it was evident that these factors had an impact on the data. Lastly, the influence of other possible determinants that could affect mental health such as poor housing and overcrowding. All of which are possible in the IDI with time.

5.9 Conclusions

The key findings of this study showed Pacific children aged 10-14 years old had the third highest number of MHC among the ethnic groups, following European and Māori. In addition, males children were more likely to experience MHC compared to females. ADHD was the most common MHC among the cohort irrespective of ethnicity, and over half of Pacific children with MHC were found to be living in the most deprived areas of NZ.

By comparing with previous studies, Pacific children with MHC were found to have higher rates of ASH condition than Pacific children without a MHC diagnosis. It may therefore be likely that MHC among Pacific children could be associated to the onset of other short term health outcomes. Lastly, using the IDI was shown to be effective in providing useful statistical data about MHC among Pacific children as well as other health statistics, with the capability to extract data across different sectors to gain a better understanding.

These findings demonstrate the effectiveness of using administrative data for Pacific mental health research. The findings of this study provide quantitative data about the current state of mental health among young Pacific people, and presents an innovative approach for research addressing these health inequalities that currently exist in Pacific communities.

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7.0 APPENDICES

Appendix A

Fonofale

The fonofale model of health (Pulotu-Endermann, 2009) was created in the mid 1980's and is one of the earliest Pacific conceptualisations, predated only by Te Whare Tapa Wha.

Incorporating values and beliefs held by Pacific cultures tied together with the common themes of family, spirituality, and culture. Fonofale is arguably the best known Pacific health model, and has been used in a number of Pacific and mainstream services (Agnew et al., 2004). The fonofale model is illustrated by the structure of a Samoan fale (house), with pillars that uphold the roof and a floor that the house is built on. Each of these components metaphorically symbolises the way in which different factors must synergise to function effectively.

The fale represents the health of an individual or a collective, and the different components of the fale symbolise the influences that contribute to the overall wellbeing of any one person. The floor of the fale represents family, the foundation of all Pacific cultures. The concept of the family dynamic in Pacific cultures is not subject to immediate family, but can often also include extended family and other relatives. Pacific people strongly believe that an individual is always part of a greater collective, which is usually family. The collectiveness of a family in a community sense is highly regarded in Pacific societies, and the family dynamic is one of the most important components in influences how individuals progress in life. Furthermore, family's, metaphoric foundation in the fale, symbolises the crucial role they play in providing a strong basis for a person's wellbeing, for the fale cannot stand or endure without a strong foundation. In the context of the present study, family is crucial based on research that has suggested interventions that integrate family into treatment may have more effective outcomes (Tamasese et al., 2005; Suaalii-Sauni et al., 2009).

The roof of the fale symbolises culture, a fundamental component that shelters the family and the fale itself. The concept of culture can have different definitions for different individuals, and

Pulotu-Endermann (2009) describes culture as being a continuum for Pacific people living in New Zealand, rather than a single preference of one or the other. With the influence of westernised culture having different impacts, some Pacific people may identify with their Pacific cultures to a different extent than others. Therefore, the influence of ones' Pacific culture in their life varies from person to person but is still present.



Figure 1 shows The Fonofale health model based on the structure of a Samoan fale (house). (<http://www.hauora.co.nz/resources/Fonofalemodelexplanation.pdf>)

Popao

The Popao model is another Pacific based health model that was developed for the purpose of recovery and strength (Fotu & Tafa, 2009). Unlike Fonofale, Popao is specific to Pacific mental health. It focuses primarily on consumer use and support structures surrounding mental health services, and uses the metaphorical model of an outrigger canoe as shown in figure 2. This model provides an approach to mental health conditions by focusing on improving relationships between consumers and service delivery, identifying where improvements need to be made,

providing motivational means for those with mental health conditions and their families and measuring changes and improvements over time.

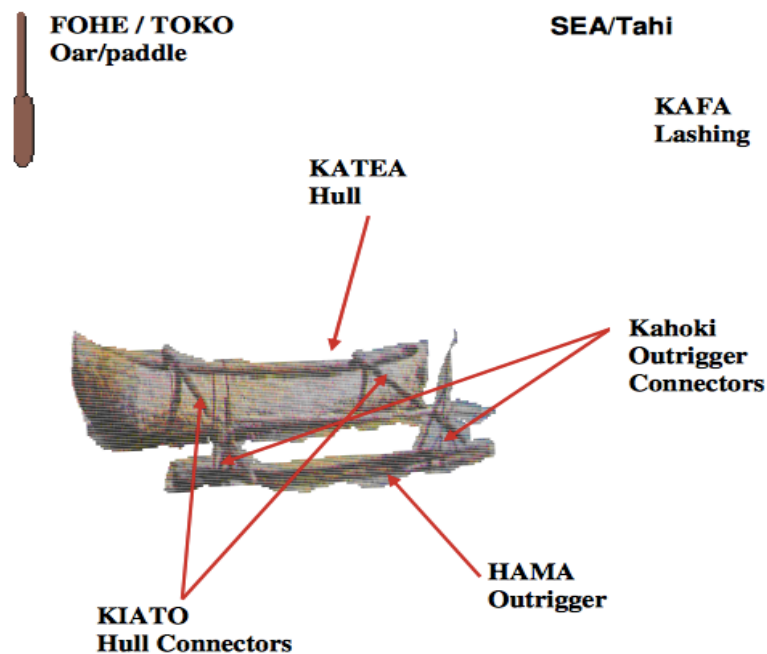


Figure 2 shows the Popao Model conceptualized by Tongan values using the structure of an outrigger canoe. (<https://www.tepou.co.nz/uploads/files/resource-assets/the-papao-model-a-pacific-recovery-and-strength-concept-in-mental-health.pdf>)

The Popao model focuses on empowering individuals to lead strong and meaningful lives, and equipping them with the life skills needed to navigate through difficult situations that can occur. The Popao model integrates Tongan cultural concepts, yet it is not exclusive to one ethnic group and can be used across Pacific ethnicities. The development of the Popao Cultural and Collaborative Assessment (PCCA) tool incorporates a questionnaire that was developed for consumers to assess their wellbeing.

Using the Popao model is thought to be most effective in measuring individual progress and a reflective tool, as shown by the contents of the PCCA tool and the questions focused oneself. Providing the PCCA tool in the Tongan language also means it is not restricted to English readers only, but can also be used by Tongan readers.

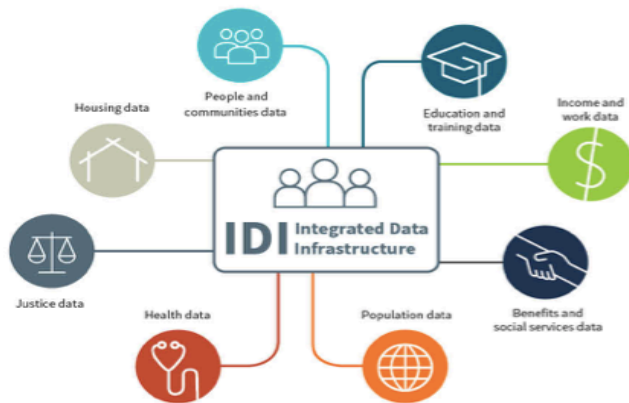
The ability to use these Pacific models to engage with people of the same culture and furthermore create a sense of relatedness, is perhaps one of the reasons that culturally appropriate services are so necessary. The introduction of more models all specified to their different purposes indicates the progress being made towards culturally appropriate treatments, whether it be for those who are suffering from health conditions or for those providing their respective services.

Appendix B

Data in the IDI September 2018

Stats NZ
Tatauranga Aotearoa

Stats NZ's Integrated Data Infrastructure (IDI) is a large research database containing de-identified microdata about people and households.



The IDI contains person-centred microdata from a range of government agencies, Stats NZ surveys including the 2013 Census, and non-government organisations. For more information about data in the IDI, see

www.stats.govt.nz/integrated-data/integrated-data-infrastructure

The Longitudinal Business Database (LBD) complements the IDI with microdata about businesses. For more information about data in the LBD, see

www.stats.govt.nz/integrated-data/longitudinal-business-database

Health data

- B4 School Checks – from 2011
- Cancer registrations – from 1995
- Chronic conditions – from 2007
- General medical services claims – from 2002
- Health tracker – 2006-13
- Laboratory claims – from 2003
- Mortality – from 1988
- Immunisation – from 2006
- National non-admitted patient collection – from 2007
- Pharmaceuticals – from 2005
- PHO enrolments – from 2003
- Population cohort demographics and addresses – from 2004
- Mental health and addiction – from 2008
- Publicly funded hospital discharges – from 1988
- National Needs Assessment and Service Coordination Information System (SOCRATES)
- Maternity – from 2003

Education and training data

- Early childhood education participation – from 2008
- Primary education – from 2007
- Secondary education – from 2004
- Tertiary education – from 1994
- Industry training – from 2001
- Targeted training – from 2001
- Adult competency assessments – from 2014

Benefits and social services data

- Benefits – from 1990
- Youth services – from 2004
- Children's Action Plan – from 1996
- Working for Families – from 2003
- Child, Youth, and Family – from 1991
- Student loans and allowances – from 1992
- ACC injury claims – from 1994
- Family Start – from 2008

Justice data

- Recorded crime: offenders – from 2009
- Recorded crime: victims – from 2014
- Court charges – from 1992
- Sentencing and remand – from 1998

People and communities data

- Auckland City Mission – from 1996
- Migrant Survey – from 2012
- Driver licence and motor vehicle registers
- Longitudinal Immigration Survey of NZ – 2005-09
- General Social Survey – 2008-2016
- Disability Survey – 2013
- Te Kupenga – 2013

Population data

- Border movements – from 1997
- Visa applications – from 1997
- Departure and arrival cards – from 1997
- 2013 Census
- Births, deaths, marriages, and civil unions – from 1840

Income and work data

- Tax and income – from 1999
- NZ Income Survey – from 2006
- Household Labour Force Survey – from 2006
- Survey of Family, Income, and Employment – 2002-10
- Household Economic Survey – from 2006

Housing data

- Tenancy – from 2000
- Social housing – from 1980



Stats NZ operates a five-safes environment, balancing privacy and confidentiality with data insights.

For information about applying to use the IDI or to learn about how we keep the data safe, see www.stats.govt.nz/integrated-data

Figure 3 summarises the data available in the IDI, outlining the sectors that contribute to the datasets available. (http://archive.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/idi-data/idi-data-overview.aspx)

De-identified data – supporting analytical insights while maintaining privacy and confidentiality

This document summarises the benefits and risks of de-identified data and how it can be used for analysis.

What is de-identified data?

- *Identified data* contains personal identifiers such as names, exact dates of birth, and specific addresses.
- *De-identified data* has had personal identifiers removed or encrypted so that data records are not associated with named individuals.

What are the benefits of de-identified data?

- De-identified data is a powerful tool for analysis. Most analyses that can be performed using identified data can also be performed using de-identified data.
- It reduces the risk of disclosure of information about specific people.
- Research indicates the public is more accepting of the government sharing data that does not contain personal identifiers.¹

¹ Opus International Consultants (2015). Public attitudes to data integration. Available from www.stats.govt.nz.

How do we manage risks with de-identified data?

- Specific people could still be identified through prior knowledge of their characteristics. Stats NZ has a framework to minimise these risks:

Safe people	Users of the IDI are vetted and trained in the safe use of data.
Safe projects	Research projects must be in the public interest. Research is restricted to the analysis of groups not individuals.
Safe settings	Data can only be accessed in secure settings.
Safe data	Personal identifiers are removed or encrypted by Stats NZ. Researchers get access <i>only</i> to the data relating to their research.
Safe output	Researchers must confidentialise output before data can be taken out of the Data Lab to ensure individuals cannot be identified.

- Stats NZ has a strong reputation as a data expert and trusted custodian of public information, and is bound by the Statistics Act 1975 and the Privacy Act 1993 to protect the identities of people in the data it holds.

What's possible with de-identified data?

Link data from multiple sources to gain system-wide insights	✓
View longitudinal, life-course information	✓
Identify risk factors and protective factors	✓
Perform predictive risk modelling	✓
Evaluate effectiveness of particular interventions	✓
Identify characteristics of groups with positive and negative outcomes	✓
Tailor interventions to people based on characteristics they share with groups studied	✓
Follow individuals who are using services, i.e. case management	✗
Identify specific individuals who are at risk or would benefit from a specific intervention	✗
Identify specific individuals who are abusing systems and take enforcement action	✗

Stats NZ's **Integrated Data Infrastructure (IDI)** is a large database of de-identified data about New Zealanders. It contains education, income, benefits, migration, justice, and health data. The data is sourced from a range of government agencies, Stats NZ surveys, and NGOs. It is being used for analyses like:

- investigating complex multi-dimensional issues that affect New Zealanders.
- generating evidence-based insights into the effectiveness of government initiatives and social services (social investment approach).

See www.stats.govt.nz/idi for more information about the IDI.

Figure 4 summarises information about the de-identified data within the IDI (http://archive.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/idi-data/de-identified-data.aspx)