

***EVIDENCE FOR MĀORI UNDER-
UTILISATION OF ACC FUNDED
INJURY TREATMENT AND
REHABILITATION SUPPORT
SERVICES: MĀORI
RESPONSIVENESS REPORT 1***

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AUGUST 2015

SUGGESTED CITATION

Wren, J. (2015). *Evidence for Māori under-utilisation of ACC injury treatment and rehabilitation support services: Maori Responsiveness Report 1*. ACC Research, Wellington New Zealand. August 2015

ISBN

ACKNOWLEDGEMENTS

I would like to particularly acknowledge and thank:

- Ronald Karaitiana and Jason Kurei, ACC Cultural Services, for their support and encouragement.

I thank the following individuals and organisations for their peer reviews, which significantly contributed to improving the two reports:

- Te Puni Kokiri, policy and research staff.
- Dr Peter Jansen, Director of Mauri Ora Associates and ACC Senior Medical Advisor.
- Dr Hilary Stace, Research Fellow, Health Services Research Centre, School of Government, and external member of ACC Research Ethics Committee.
- Lesley Gray, Senior Lecturer in the Department of Primary Health Care and General Practice, University of Otago, Wellington; a registered Public Health Specialist and Fellow of the Faculty of Public Health (UK).

I also thank Gaylia Powell, ACC Research, for her editing and proof reading.

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WHAKATAUKĪ

Whakataukī (proverbs) are used as a reference point in Māori speeches and also as guidelines spoken to others day by day. It is a poetic form of the Maori language often merging historical events, or holistic perspectives with underlying messages which are extremely influential in Maori society.¹

The following whakataukī represent the author's intent and reflections with the contents of this report and the companion one on the barriers to service utilisation and evidence for effective interventions. They are offered as a plea and hope for the future. The intent of the two reports is to help move things forward rightly.

Kua takoto te manuka

The leaves of the manuka tree have been laid down

The challenge is laid down. How do we want to respond?

I oreā te tuatara ka patu ki waho

A problem is solved by continuing to find solutions.

Tē tōia, tē haumatia.

Nothing can be achieved without a plan, workforce and way of doing things.

Naku te rourou nau te rourou ka ora ai te iwi

With your basket and my basket the people will live

By working together in co-operation and combining our collective resources we can get ahead.



¹ <http://www.maori.cl/Proverbs.htm>

EXECUTIVE SUMMARY

This report reviews the evidence over the last 10 years from a range of internal ACC and external research reports about Māori utilisation of ACC funded injury treatment and rehabilitation services. The papers reviewed consistently describe patterns of systematic differences between Māori and non-Māori in uptake of ACC services. This review argues that overall Māori are substantively under-represented in receipt of a range of services in the context of their proportion of the population. In some cases the information suggests Māori are over-represented in receipt of some services. This approach assumes Māori have the same injury experience as non-Māori. The assumption is invalid as other research has consistently shown that over many years the Māori experience of injury and associated burden of health loss is significantly higher compared to non-Māori. In this context, it is argued that the levels of service use are still too low given the size differences in the injury experience and associated health loss between the two population groups. Consequently, in the context of the Māori burden of injury and related health loss the conclusion is that there is a substantive case for under-utilisation of a range of ACC funded services by Māori, and in health terms, the underutilisation represents substantive inequality and inequity in ACC service uptake.

The evidence for under-utilisation is most notable in the referral and uptake of elective surgery services, home and community support services, and duration of weekly compensation claims. The differences in service utilisation between Māori and non-Māori vary between 5% and 50% depending upon the type of service, age group and gender.

The phenomena of under-utilisation by populations in most need of the care has been described as the 'inverse health care law' (Hart, 1971). This law says that the availability and use of good medical care tends to vary inversely with the need for it in the population. A variant of the law says that 'the concern of a population for its own health tends to vary inversely with the actual state of health of that population' (Dalrymple, 2012).

This report reviews the internal ACC evidence and the published academic literature for the operation of the inverse health care law in Māori utilisation of ACC funded services, and whether the level of utilisation represents an inequity and inequality in service use.

In terms of whether the under-utilisation represents a substantive inequity and inequality in service use, there are two perspectives on this. The first is a 'health lens' view, the other is the insurance / actuarial perspective. The differences between the two views are outlined in the following boxes.

From the 'health lens' view the available evidence is sufficient to indicate that there is significant inequality and inequity in Māori use of ACC funded injury treatment and rehabilitation services. However, from a business insurance and actuarial view there is little evidence for Māori underutilisation of ACC services because service utilisation is a matter of personal choice, and policies to promote equality (defined in the health perspective) run counter to established private sector business insurance principles.

HEALTH LENS VIEW: NEW ZEALAND MINISTRY OF HEALTH

In the health sector, the widely accepted health lens view acknowledges there

‘is considerable evidence, both internationally and in New Zealand, of significant inequalities in health between socioeconomic groups, ethnic groups, people living in different geographical regions and males and females (Acheson, 1988; Howden-Chapman & Tobias, 2000).

Research indicates that the poorer you are, the worse your health. In some countries with a colonial history, indigenous people have poorer health than others.

Reducing inequalities is a priority for government. The New Zealand Health Strategy acknowledges the need to address health inequalities as ‘a major priority requiring ongoing commitment across the sector’ (Minister of Health., 2000).

Inequalities in health are unfair and unjust. They are also not natural; they are the result of social and economic policy and practices. Therefore, inequalities in health are avoidable (Woodward & Kawachi, 2000).’

<http://www.health.govt.nz/publication/health-equity-assessment-tool-equity-lens-tackling-inequalities-health> (Accessed: 4 June 2015)

BUSINESS INSURANCE / ACTUARIAL VIEW

In contrast to the ‘health lens’ perspective, the business insurance / actuarial view of equitable service delivery is one where the ‘same or similar levels of service use’ are achieved between the population groups of interest irrespective of socio-economic background, health need and cultural differences on health and acceptable modes of service delivery. In addition, whether a service is used or not is seen as the economic choice of the client irrespective of socio-economic status and cultural views on health and modes of service delivery. Furthermore equity and fairness are interchangeable terms that reflect one objective of insurance pricing – in ACC terms, the level at which levies are set.

<http://www.investopedia.com/terms/a/actuarial-equity.asp>

(Source: Accessed, 19 March 2015)

In a 2013 editorial focussing on Māori health issues in the New Zealand Medical Journal it was noted that:

'Maori experience higher exposures to risk factors for poor health, more injury, more disability and poorer outcomes when they interact with health services....

Underlying the reported results...are entrenched systemic drivers of disparities and poor outcomes for Maori. These include social and environmental drivers, health system factors, health professional behaviours and institutional resistance to innovation....

(T)he determinants of Maori health outcomes...include low incomes, poor housing, inadequate education, erratic employment and racism.

The impacts are complex and intergenerational...We use them to address 'confounding' although in the real world they are 'compounding....' (Carr, 2013).

The question arises, if it is accepted that inequities exist in Māori utilisation of ACC funded services, what are the barriers to service utilisation and what is the evidence for effective interventions to deliver an ACC Māori response? These matters are examined in Report 2, which is a companion to this one.

PART 1: SCOPE OF REPORT

AIM

This report critically reviews the internal ACC evidence for Māori underutilisation of ACC funded injury treatment and rehabilitation services, and places the evidence in the context of the published health literature. A second companion report reviews the evidence about the barriers to Māori utilisation of ACC funded services and evidence for effective interventions to remove the barriers.

Both reports are intended to help ACC deliver on its responsiveness actions to Māori. Actions include the dissemination of information to the health sector about the evidence on Māori utilisation of ACC funded injury treatment and rehabilitation services, the barriers to service use, and the evidence for effective intervention. Consequently the reports are intended to enable informed discussion between interested parties, and to inform policy and operational decisions about what a future response to Māori of ACC funded injury treatment and rehabilitation services could include.

METHOD INFORMING THIS REPORT: CRITICAL LITERATURE REVIEW

BACKGROUND

In the period 2003-06 a suite of ACC client and business surveys showed there was widespread lack of knowledge amongst Māori and the general public about ACC and the range of services available to them (ACC., 2007; Research New Zealand., 2005). Nearly half of those surveyed did not know ACC could pay them Weekly Compensation if they are injured and were unable to work. More than half didn't know ACC could help pay doctors' treatment costs. Many respondents did not know they could get help at home or with childcare if they could not manage these while they recovered.² Māori indicated their use of services was inhibited by:

- lack of information in the community about the type and scope of services available for injury care
- lack of knowledge among treatment providers about ACC's services and entitlements
- physical isolation and lack of affordable transport
- attitudes/perceptions of injured people and their communities
- financial barriers in particular affordability of a range of primary and allied health care services (e.g. GP, Physiotherapy, Radiology) (Research New Zealand., 2005).

In response to the research, during 2005 and 2006 ACC undertook a suite of pilot projects in a number of regions and five Māori communities to address the barriers. In addition a major general public TV advertising campaign called "You're Covered" was launched in February

² Similar results are still prevalent in the current surveys where substantive numbers of clients and business respondents respectively don't know the range or services available to them.

2007 (ACC., 2007) and ran through to the end of 2009. The campaign aimed to raise general public awareness of the services available via ACC.

Following the campaign, in 2009 the ACC Board requested information regarding Māori uptake of entitlements once they accessed the Scheme, and whether there was any similarity between Māori and non-Māori utilisation of services and health outcomes. In response, over the next three years ACC Research prepared a set of unpublished briefing papers about Māori utilisation of ACC services (Fawcett & Kake, 2009; Kake & Allen, 2011; Kake & Dougherty, 2010; Kake & Hayward, 2011a, 2011b; Kake & Small, 2010), and commissioned two reports from CBG Health Research on General Practitioner referrals of ACC clients to elective services (CBG Health Research Ltd & ACC Research., 2014; CBG Health Research Ltd, 2010). In addition, more recent unpublished survey and data analysis work has been included in the discussion in Part 2. The body of work has been critically reviewed and used to inform this report. The findings are discussed in the next Part in the context of the published literature on Māori injury related health loss and health service utilisation.

In critically reviewing the material, attention focussed upon understanding the:

- context and purpose for which the material was written
- robustness of the methods used to inform the analysis
- consistency in the findings across time and topic area
- narrative associated with the material. For example the degree to which the material had been placed within a wider discussion about the injury and health experience of Māori compared to non-Māori and Māori utilisation of publically funded health services in general, and
- how important terms such as equity and equality have been defined or changed in use between reports.

METHODOLOGICAL CONCERNS IN MATERIAL REVIEWED

A number of issues have been identified in the material reviewed. There is some confusion about whether underutilisation exists, and does it represent substantive inequality and inequity. The lack of clarity in part reflects:

- inconsistency in the use of key terms in the discussion, in particular disparity, equity, equality and outcomes, and unawareness of how these terms could be interpreted differently between a 'health lens' view and a 'business insurance / actuarial' view.
- data limitations make it difficult to directly measure utilisation of ACC funded services, which means proxy measures such as pre-approvals or billing are used as indicators of service use, which may not have been the case. In the case of primary health care referral, it is not possible to directly measure whether a doctor referred a client to elective surgery
- due to the nature of the reports, the reporting of methods are incomplete, which prohibits the replication of the analysis for updating and checking the results with more recent data. In addition a range of statistical methods have been used to report results, which inhibits interpretation of results over time and between types of services

- as robust health outcome measures such as EQ 5D³ are not routinely it is not possible to assess the degree to which the health status of the population of interest is impacted by utilisation differences
- there is inconsistency across the material in the narrative about what the results mean, particularly in terms of:
 - whether there is underutilisation
 - where inequities exist in utilisation of ACC entitlements, and where the inequities occur in the service pathway
 - the size of the problem, and in the context of the Māori burden of injury related health loss and published literature on Māori underutilisation of health services
 - individual level experience of inequity in service use compared to experience of the population group as whole. In the published literature this has been described as the existence of distribution gaps, the outcome gap and the gradient gap within and between population groups.

In preparing this report, where possible the above issues have been addressed by clarifying the use of key terms, providing a consistent narrative that also recognises where important differences in perspective could exist, and recognising the limitations of the data available.

In reviewing the material it is clear that understanding whether Māori are underutilising ACC services is complex, and it is likely complex solutions will be required. However there are a few clear principles that can aid understanding and action, starting with clarifying key terms and acknowledging differences in perspective about the terms.

³ EQ 5D is a European and internationally validated self-report survey measure of a person's health related quality of life. It measures health quality on five measures (mobility, self-care, usual activities, pain discomfort, and anxiety – depression) that together represent a holistic view of health. It includes medical definitions as well as independent physical, emotional and social functioning (Gusi, Olivares, & Rajendram, 2010). EQ-5D is also one of the handful of measures recommended for use in cost-effectiveness analyses by the Washington Panel on Cost Effectiveness in Health and Medicine (Rabin & de Charro, 2001).

PART 2: EVIDENCE FOR MĀORI UNDERUTILISATION OF ACC INJURY TREATMENT AND REHABILITATION SERVICES

The argument for underutilisation of ACC services by Māori rests upon the evidence for Māori need of injury related health care, actual levels of utilisation of the services available, and whether the utilisation represents substantive inequality and inequity from either a 'health lens' or a 'business insurance / actuarial' perspective.

In understanding and deciding whether differences in service utilisation levels between populations groups are a significant cause for concern, terms such as equality, equity and outcome become important considerations. In preparing this report two distinctly different perspectives have been identified, which are important to understand when thinking about an ACC response to Māori. The first is a 'health lens' view, the other is the insurance / actuarial perspective.

DEFINING KEY TERMS AND USAGE: DISPARITY, EQUITY AND EQUALITY

In business insurance / actuarial terms, 'disparity' in utilisation is not commonly used, rather reference is made to whether a difference is statistically significant and compliant with accepted business insurance / actuarial pricing principles.

In the health literature a difference in service utilisation is called a 'disparity' and is defined as a real difference in a measurable health outcome, for example less loss of healthy life years lost between the populations of interest (Rumball-Smith, 2009). In terms of whether the under-utilisation represents a substantive inequity and inequality in service use it is important to note that in the health context the terms are not interchangeable.

The differences are illustrated in the following Figure 1 and Table 1 on the following pages.

In Figure 1 the 'equality' picture on the left shows a situation where the children are each given the same box to stand on to view the game, and consequently seem to have the same and therefore equal and fair opportunity as each other. However in reality due their size differences they are not able to realise (i.e. utilise) the opportunity equally.

In contrast, an equitable outcome is where the children on the right are enabled to fully experience the opportunity through the provision of boxes that allows all too fully participate equally irrespective of their size differences; size differences over which they have no individual control or choice.

Figure 1: Illustrating Equality and Equity



Source: schoolsofequality.com (Accessed 2 July 2015)

Tikanaga Perspective on the illustration

In tikanga Māori, the picture paints the potentially different life experiences of Teina (younger sibling) and Tuakana (older sibling). Instead of learned helplessness shown in the left picture, in the right hand picture the older sibling helps the younger to have a better life experience, and thereby achieve a more equitable life experience for the whanāu (Karaitiana, 2015).

The relationship between Teina and Tuakana can be summed up as:

‘Ma te tuakana ka totika te teina, ma te teina ka totika te tuakana’ - From the older sibling the younger one learns the right way to do things, and from the younger sibling the older one learns to be tolerant.’

(http://www.turuki.org.nz/tuakana_teina/index.htm (Hawkes Bay District Health Board: Accessed 20 July 2015))

In terms of ACC whether the differences in utilisation are seen as representing a substantive inequity and inequality tends to reflect whether a 'health lens' or a 'business insurance / actuarial' perspective is adopted. The differences between the two views are outlined in the following table.

Table 1: Definition of key terms: Disparity, inequity, fairness, inequality and outcome – a Health Lens approach compared to Insurance / Actuarial approach

<u>Health Lens approach</u>	<u>Business Insurance approach</u>
Disparity / Difference	
• Disparity and difference 'tend to be' interchangeable. • However, the term disparity tends to be reserved to describe a real (and substantive) difference in health outcomes (as measured in terms of real health loss, for example average length of years lived, or more injuries when standardised by age) between two or more population groups of interest (Rumball-Smith, 2009).	• Disparity and difference 'are' interchangeable, and means there is a difference between the value of the products or services being compared. • The differences may be large or minor in size and importance. Any differences can be seen as representing 'fair value, or 'equity' in insurance terms.
<u>Inequity, Fairness and Equality</u>	
• Inequity occurs when health services are not utilised at the levels expected given the health need of the specific population group of interest. Where the differences are substantive a disparity exists. • Equity and Fairness are not necessarily the same things. This is because health needs are different between populations groups for a variety of well-established reasons, and thus differences in service utilisation are expected. The presence of difference does not necessarily mean that it is unfair (Starfield, 2001).	• Inequity occurs when an insurance premium is charged that does not match the risk of a loss associated with the group of claims of interest. Consequently, cross subsidisation is an inequity. • Equity and Fairness are interchangeable terms and is an objective of insurance pricing. • Equity and Fairness is based upon the principle that all insureds with the same characteristics should have the same expectation of loss and should be listed under the same underwriting classification and have the same premium rating (in this case ACC Levy). Whether a service is used or not, is the economic choice of the client irrespective of socio-economic status and cultural views on health and modes of service delivery. (Source: Accessed, 19 March 2015) http://www.investopedia.com/terms/a/actuarial-equity.asp

• Whether an Equality and Inequality exists depends upon the degree to which one population group uses more or less services compared to another population group in the context of their respective health needs. • Inequality can occur through either over or under utilisation. In situations where services are used at levels higher than the need, then the utilisation can be described as representing 'over utilisation', 'service capture', or service delivery based upon 'want' rather than need. • <u>The appearance of 'inequity' in service use need not mean that an 'inequality' exists.</u> This is because inequalities are not always inequities as they may not be avoidable or unfair (Whitehead, 1992). For example, some conditions or diseases can only occur in males or females, or some conditions are more prevalent in some ethnic groups because of their genetic makeup. • Health inequities do not occur naturally and are not random, but are the result of social and economic policy and practices (Ministry of Health, 2004). Typically, when talking about 'health inequities' in the public health context, the narrative includes notions of the differences as being unnecessary and avoidable, as well as 'unfair and unjust' (The Royal New Zealand College of General Practitioners., 2015).	• Equality is equated with 'Egalitarianism' and associated philosophical and political views. • In general international insurance companies resist legislative restrictions based on egalitarian principles as they are seen as counter to the promotion of equity and fairness in insurance pricing. • <u>The closest term to equality is 'Fair Value'.</u> • Fair value can mean either: (i) the value an individual investor assigns to a company's marketable securities based on his or her analysis of a company's financial information (ii) the price of a product or service in the market in comparison to the utility (benefit) realised by the purchaser (iii) the value of assets and liabilities as defined by accounting rules. (Source: Accessed, 19 March 2015) http://www.investopedia.com/terms/e/egalitarianism.asp http://www.investopedia.com/terms/f/fairvalue.asp http://www.investopedia.com/terms/u/unisex-legislation.asp
Outcome	
• Outcome is typically used in reference to a <u>change in health status</u> at the individual or population group level. The change in status can be directly observed or measured in some form. For example from poor health to full health as assessed by GP, or measured through a test, or through epidemiological analysis.	• Health / Wellness Outcome is defined in two senses: ○ health sense ○ cost impact • Health sense includes consideration of ○ Complications / morbidities ○ Presentism ○ Absence ○ Litigation / Accident ○ Costs / Disability

	○ Injury rates • Cost impact involves ○ cost of health care ○ productivity ○ absence ○ property / casualty ○ workers compensation ○ disability (Sibson Consulting for Society of Actuaries, 2015)
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UTILISATION OF ACC SERVICES

INTRODUCTION TO THE ACC EVIDENCE: A CRITICAL RESEARCH PERSPECTIVE

In the period 2009 – 2011 a suite of ACC internal briefing papers were prepared looking at the Māori population utilisation of a range of ACC services (Fawcett & Kake, 2009; Kake & Allen, 2011; Kake & Dougherty, 2010; Kake & Hayward, 2011a, 2011b; Kake & Small, 2010; Kake, 2011). The papers were in response to ACC Board requests for updates on Māori service utilisation following completion of the ‘Your Covered’ media campaign in 2009.

Service areas examined focussed upon Elective Surgery referrals and uptake, receipt and duration of Weekly Compensation, and use of Home and Community Support Services. To varying degrees the papers included time series analysis of ACC claims data, production of age-adjusted rates, and use of standard statistical tests for differences by age group, sex, geographic region, socio-economic status, and between Māori and non-Māori in a few cases. Two reports examined in detail the referral rates of Māori to elective surgery, which included adjusting for the presence of comorbidities and injury type (CBG Health Research Ltd & ACC Research., 2012, 2014; CBG Health Research Ltd, 2010).

In most cases the discussion of the results was quite limited in terms of placing the results in the context of the health burden of injury, identifying differences between a ‘health lens’ view and an ‘business insurance / actuarial’ view of what inequality and inequity meant in terms of interpreting the results, and the published literature on health service utilisation and use of other government agency services.

The methodological ambiguities of the briefing papers are such, except for the two CBG reports, that it is difficult to easily replicate and check the results, and to compare the results across the papers in some instances. Some of the latter papers (particularly those in 2011) provide updated numbers of the 2009 analyses, but offer little extra insight into interpretation and discussion.

A set of telephone survey reports have also been identified that report on ACC client experiences of receipt of elective surgery services, and their return to work journey including receipt of Weekly Compensation and exit from Weekly Compensation to return to work (ACC Research., 2011, 2014; Research New Zealand., 2012). These reports are far more consistent in their methodology and reporting, however the discussion is strictly limited to descriptive presentation of the results without any other context being provided or illustration of how the results might be used to inform other questions of interest to the organisation.

One conclusion from reviewing the papers is a need for a more rigorous epidemiology methodology to be adopted, and for the collection and reporting of robust health outcome data in a format that is readily accessible for statistical analysis.

OVERALL USE OF ACC SERVICES

While from a critical review perspective a number of issues can be identified with the material reviewed, the various authors of the papers have consistently described patterns of systematic differences between Māori and non-Māori in uptake of a range of ACC funded injury treatment, rehabilitation and support services over the years. The analyses indicate that overall Māori are substantively under-represented in receipt of a range of services in the context of their proportion of the population. This approach assumes Māori have the same injury experience as non-Māori. The assumption is invalid as research has consistently shown that over many years the Māori experience of injury and associated burden of health loss is significantly higher compared to non-Māori (Ministry of Health and Accident Compensation Corporation., 2013). The differences are most notable in the areas of road, work, assault, sport, and suicide / intentional self-harm. There is one exception, falls related injuries, which tend to be lower in Māori compared to non-Māori. The differences largely reflects the much younger age structure of the Māori population, socio economic status, cultural differences, to some degree geographic location, and higher levels of participation in high risk occupations and sport activities (Ministry of Health and Accident Compensation Corporation., 2013; Carr, 2013). Where Māori are over-represented in the following analyses it can be argued that the levels of service use are still too low given the size differences in the injury experience of the two population groups. In the following sections analyses of key types of ACC services are reported for the following three types of ACC entitlements: home and community support, elective surgery, and weekly compensation respectively.

HOME AND COMMUNITY SUPPORT SERVICES

The provision of appropriate levels of Home and Community Support Services (HCSS) is an important part in supporting people to return to work or community independence. HCSS includes support around personal care and attendant care for cognitive tasks of daily living, childcare and household duties (home help). Typically, access to HCSS starts with an accepted claim being referred to an ACC Branch or Contact Centre for a needs assessment. A less common pathway involves clients requesting HCSS through an Inquiry Centre. The HCSS needs assessment includes questions about the availability of others such as whānau / family members to help around the home.

The differences reported below are clear, systematic and statistically significant. However from the research it is not clear whether the differences represent under-utilisation by Māori or over-utilisation by non-Māori, although the former is more likely.

HCSS NON-SERIOUS INJURY CLIENTS

As a percentage of all accepted claims, HCSS entitlement claims range from 0.4% to 1.2%. These percentages represent claims volumes ranging from approximately 400 to 1000 per annum for Māori and up to 12,000 for non-Māori in the 2005 – 2013 financial year period. The numbers and percentages are even smaller for HCSS services associated with ACC defined serious injuries (Serious injuries are defined as typically involving the spine and traumatic brain injuries respectively).

Analysis shows the main differences are between Māori women and non-Māori women (there is no statistical difference between males), and the type of home care support utilised: higher levels of formal care by non-Māori compared to in-formal care by Māori.

Figure 2 shows that for ACC defined non-serious injuries Māori clients have consistently received lower rates of HCSS services than non-Māori for many years. The differences are statistically significant for Māori females (Figure 3).

Figure 2: % All Accepted Claims with HCSS Entitlements, Age-adjusted, non-serious injuries, by Ethnicity, All Claims and Female

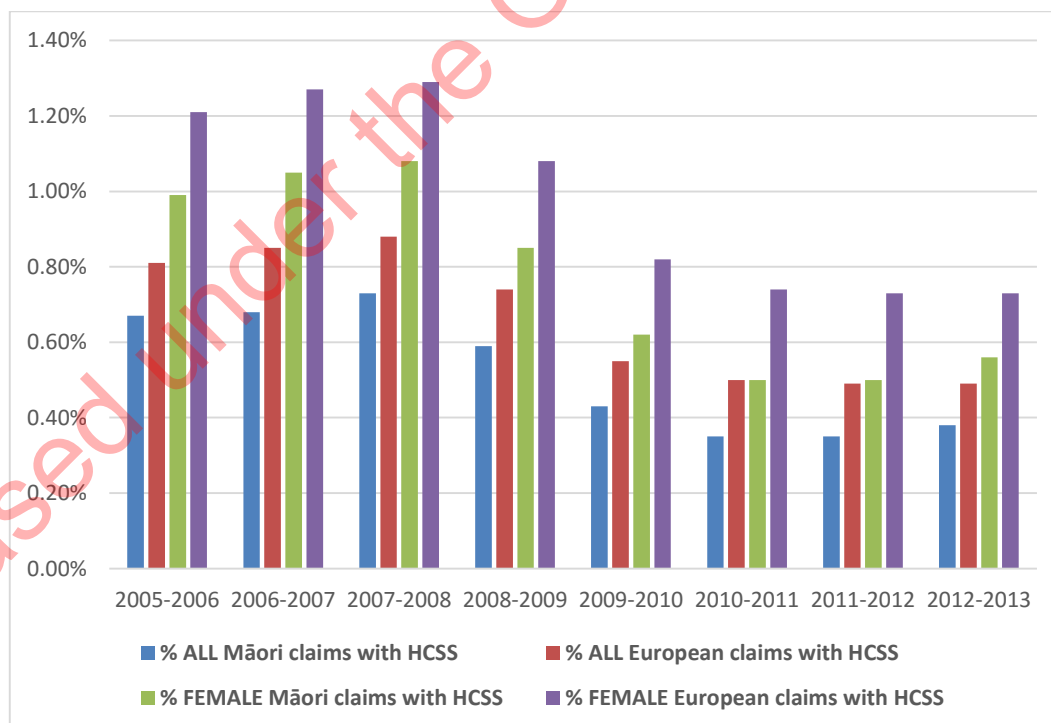
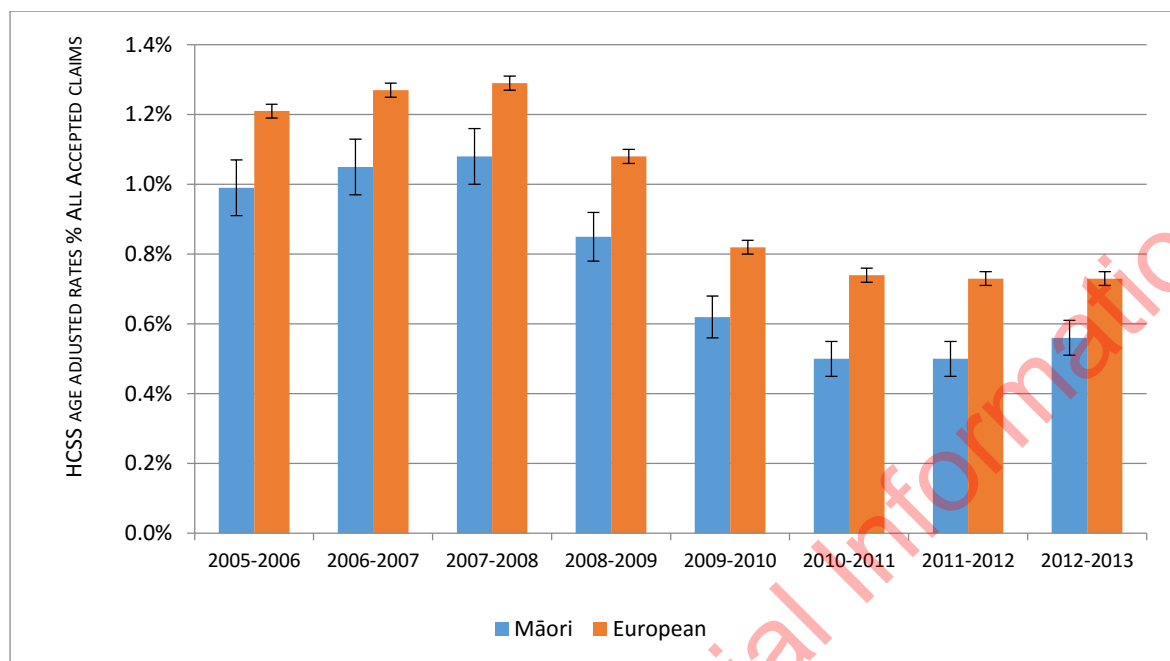


Figure 3: Age-adjusted HCSS rates for FEMALE Māori and non-Māori non-serious injury clients, 95% confidence interval bars



The figures also show that in recent years the overall volume of these types of services has decreased significantly since the 2009 recession and the gap between Māori and non-Māori has marginally decreased.

The differences between males and females reflect that the female rates of receipt of HCSS are double those of male rates. The gender – ethnic interaction is present in the whole time series.

In terms of HCSS volumes, Māori consistently receive HCSS services at rates ranging from approximately 55% to 60% lower than the non-Māori rates (Table 2). When adjusted for age, the differences reduce and range from approximately 17% to 30% over the time period (

Table 3). If Māori were to receive the same level of HCSS service as non-Māori, then we would expect to see approximately another 1000 claims per year (Table 2).

When looking at the rates of HCSS service receipt for Māori females and adjusting for age differences between the populations, the Māori female rates are consistently approximately 20%-33% lower than non-Māori females over time (Table 5). Table 4 shows that if Māori females were to utilise HCSS services at the same level as non-Māori females we would expect to see approximately an additional 650 claims per year.

Table 2: Claim volumes and HCSS Services received for non-serious injury claims ALL Māori and European clients, 2005-2013

Claim volumes and HCSS Services for non-serious injury claims ALL Māori and European clients								
Lodgement year	All Accepted claims		HCSS claims volumes		% HCSS claims			
	Māori	European	Māori	European	% ALL Māori claims with HCSS	% ALL European claims with HCSS	Ratio (ALL Māori vs ALL European rate)	Expected Māori HCSS claims if European rate applied
2005-2006	200,786	1,134,949	988	12,207	0.49	1.08	45.37	2,168
2006-2007	211,276	1,185,315	1,089	13,349	0.52	1.13	46.02	2,387
2007-2008	217,230	1,214,934	1,211	14,230	0.56	1.17	47.86	2,542
2008-2009	208,699	1,206,340	970	12,338	0.46	1.02	45.10	2,129
2009-2010	202,905	1,155,053	655	9,070	0.32	0.79	40.51	1,603
2010-2011	206,296	1,147,630	557	8,389	0.27	0.73	36.99	1,506
2011-2012	208,068	1,154,934	558	8,402	0.27	0.73	36.99	1,519
2012-2013	210,635	1,174,179	620	8,641	0.29	0.74	39.19	1,559

Table 3: Age adjusted HCSS rates for non-serious injury claims count for ALL Māori and European clients

Age adjusted HCSS rates for Non-serious injury claims count for ALL Māori and European clients				
Lodgement year	% ALL Māori claims with HCSS	% ALL European claims with HCSS	Ratio (ALL Māori vs ALL European rate)	Extra ALL Māori claims if same level as European rate
2005-2006	0.67	0.81	82.72	638
2006-2007	0.68	0.85	80.00	707
2007-2008	0.73	0.88	82.95	701
2008-2009	0.59	0.74	79.73	574
2009-2010	0.43	0.55	78.18	461
2010-2011	0.35	0.50	70.00	474
2011-2012	0.35	0.49	71.43	462
2012-2013	0.38	0.49	77.55	412

Table 4: Claim volumes and HCSS rates for FEMALE Maori and non-Maori non-serious injury clients

Claim volumes and HCSS rates for FEMALE Maori and non-Maori non-serious injury clients								
Lodgement year	Accepted claims		HCSS claims					
	Māori	European	Māori	European	% Māori claims with HCSS	% European claims with HCSS	Ratio (FEMALE Māori vs European rate)	Expected Female Māori HCSS claims if European rate applied
2005-2006	79,904	520,153	641	9,365	0.80	1.80	44.44	1,438
2006-2007	84,782	545,558	730	10,226	0.86	1.87	45.99	1,585
2007-2008	87,401	562,545	787	10,754	0.90	1.91	47.12	1,669
2008-2009	85,095	565,560	617	9,358	0.73	1.65	44.24	1,404
2009-2010	82,829	537,878	424	6,987	0.51	1.30	39.23	1,077
2010-2011	85,208	542,514	361	6,580	0.42	1.21	34.71	1,031
2011-2012	86,627	548,279	366	6,523	0.42	1.19	35.29	1,031
2012-2013	88,393	561,936	420	6,726	0.48	1.20	40.00	1,061

Table 5: Age adjusted HCSS rates for FEMALE Māori and European clients for non-serious injury claims

Age adjusted HCSS rates for FEMALE Māori and European clients for non-serious injury claims			
% FEMALE Māori claims with HCSS	% FEMALE European claims with HCSS	Ratio (FEMALE Māori vs FEMALE European rate)	Extra FEMALE Māori claims if same level as European
0.99	1.21	81.82	326
1.05	1.27	82.68	347
1.08	1.29	83.72	340
0.85	1.08	78.70	302
0.62	0.82	75.61	255
0.50	0.74	67.57	270
0.50	0.73	68.49	266
0.56	0.73	76.71	225

ODDS RATIOS FOR MĀORI RECEIPT OF HCSS SERVICES FOR NON-SERIOUS INJURY CLAIMS

Several factors may affect a client's access to HCSS, including but not only:

- institutional factors e.g. referral behaviour overall, service availability at urban and rural level, and regional variations in policy application or claims management process
- decline behaviour (including staff discretionary decisions), timeliness, information/understanding
- demographic factors (e.g. client age, gender, ethnicity)
- socio-economic and cultural / beliefs / perceptions, family circumstances including social deprivation, income, family makeup, community, transport affordability
- health and injury (injury severity and injury type, comorbidity)
- psychosocial (e.g. cross-cultural communication, health literacy).

The factors that are immediately available in the ACC claim administrative data (age, gender, ethnicity, location, deprivation index, injury site and type) have been analysed to estimate the odds ratios between Māori and European non-serious injury clients receipt of HCSS services.

The odds ratio estimates in Table 6 support the findings in the age-adjusted rates analysis shown above, while also presenting the effect size and relationship of some factors to HCSS rates. Overall, unadjusted ratios indicate a very large gap in HCSS rates between Māori and non-Maori clients. Controlling for age alone reduces the estimated gap in rates and improves the confidence interval of the model. The key points are:

- The unadjusted HCSS rate for Europeans is more than double that of Māori, with the odds for European clients receiving HCSS being 2.4 times more than for Māori clients, meaning the Māori rate is only at 42% of European rate.
- After controlling for differences in age and gender, the difference decreased to 1.18, meaning that the Māori rate is at 84% of the European rate.
- Adjusting for age, gender, deprivation, injury site, urban/rural classification of claims results in the Māori rate being about 77% of the European rate. There is 95% confidence that the European rate is between 1.26 to 1.32 times the Māori rate.
- All the variations in odds ratios between Māori and Europeans are statistically significant, meaning the observed differences do not exist by chance alone.

Table 6: Odds ratios for Non-serious Injury clients: European vs Māori

Control variables	European vs Māori			Māori vs European		
	Point Estimate	95% Confidence Limits		Point Estimate	95% Confidence Limits	
Unadjusted	2.351	2.296	2.408	0.425	0.415	0.435
Deprivation quintile	2.554	2.492	2.617	0.392	0.382	0.401
Injury site	2.424	2.367	2.482	0.413	0.403	0.422
Injury type	2.443	2.385	2.502	0.409	0.400	0.419
Urban/rural	2.380	2.325	2.438	0.420	0.410	0.430
Gender	2.190	2.139	2.243	0.457	0.446	0.468
Age	1.221	1.192	1.251	0.819	0.799	0.839
Age and Gender	1.184	1.156	1.213	0.845	0.824	0.865
Age, Gender and Injury site	1.219	1.190	1.249	0.820	0.801	0.841
Age, Gender and Deprivation quintile	1.258	1.227	1.290	0.795	0.775	0.815
Age, Gender and Urban/rural	1.193	1.164	1.222	0.838	0.818	0.859
Age, Gender, Injury Site, Urban/Rural and Deprivation quintile	1.291	1.259	1.324	0.774	0.755	0.794

HCSS SERIOUS INJURY CLIENTS

Table 7 shows that the volumes of claims in this category are very small (less than 100 per annum for Māori and less than 200 for non-Māori).

Figure 4 shows that in contrast to non-serious injuries, for ACC defined seriously injured clients there is no statistically significant difference between Māori and non-Māori, and this holds true even after adjusting for age differences in the population, gender, injury site, region and type of HCSS service. One explanation for this is that historically there has been a strong focus in the Serious Injury Service on evidence-based assessments, and there is less opportunity for discretionary decision-making by claims managers and clients about the services received. The data also shows that in the earlier years, pre 2009 recession, Māori rates were higher than non-Māori, however this is no longer so.

Figure 4: HCSS age-adjusted rates for Māori and European serious injury clients, and confidence intervals, 2005-2013

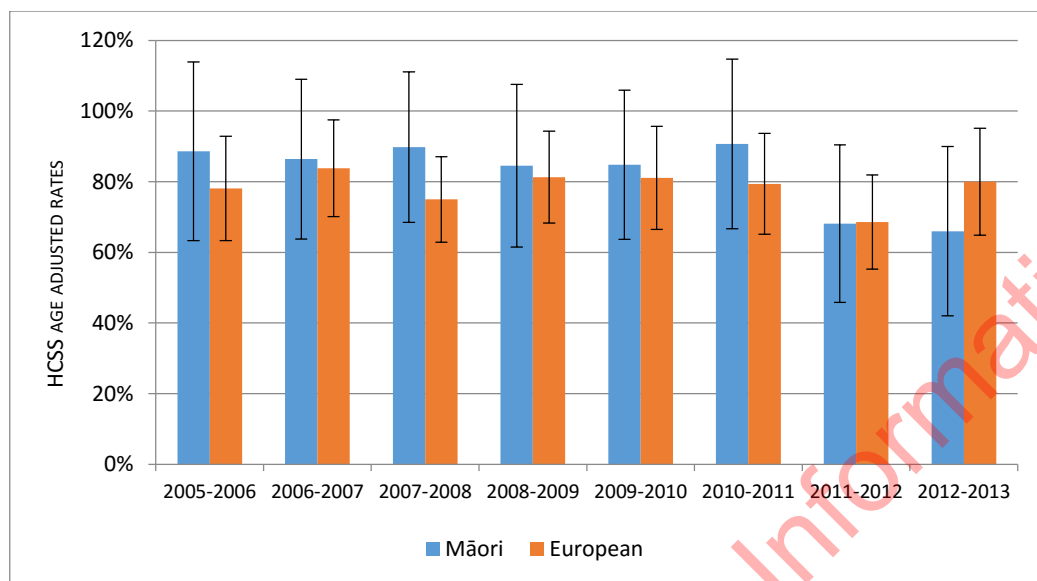


Table 7: Serious injury claims count and HCSS rates for ALL Māori and European clients

Lodgement year	Accepted claims		HCSS claims		% Māori claims with HCSS	% European claims with HCSS	Ratio (Māori vs European rate)	Māori HCSS claims with European rate applied
	Māori	European	Māori	European				
2005-2006	53	139	47	107	88.70	77.00	115.19	41
2006-2007	64	172	56	144	87.50	83.70	104.54	54
2007-2008	76	191	68	147	89.50	77.00	116.23	59
2008-2009	61	187	52	151	85.20	80.70	105.58	49
2009-2010	72	148	62	118	86.10	79.70	108.03	57
2010-2011	61	143	55	119	90.20	83.20	108.41	51
2011-2012	50	144	36	102	72.00	70.80	101.69	35
2012-2013	43	134	29	108	67.40	80.60	83.62	35

Table 8: Age-adjusted serious injury claims and HCSS rates for ALL Māori and European clients

Age adjusted				
Māori	European	Ratio (Māori vs European rate)	Māori HCSS claims with European rate applied	Extra ALL Māori claims if same level as European
88.60%	78.10%	113.44%	41	-6
86.40%	83.80%	103.10%	54	-2
89.80%	75.00%	119.73%	57	-11
84.50%	81.30%	103.94%	50	-2
84.80%	81.10%	104.56%	58	-4
90.70%	79.40%	114.23%	48	-7
68.10%	68.60%	99.27%	34	-2
66.00%	80.00%	82.50%	34	5

POTENTIAL EXPLANATIONS FOR DIFFERENCES IN HCSS RATES

Potential explanations for the differences in the levels of service observed include:

- Māori clients may be less informed about the kinds of HCSS services are available (Nikora, Karapu, Hickey, & Te Awekotuku, 2004)
- Māori clients may not be as assertive in communicating with staff in seeking the type of help they need and which could be made available to them
- there is unintended systematic bias in ACC's decision-making around HCSS claims that could be occurring at the policy and or operational level
- Māori women may prefer to rely on 'informal care' to provide home support (i.e. family / whānau / friends) rather than agency supplied staff. This may also reflect negative experiences with agencies or concerns that cultural considerations will not be respected (Collins & Wilson, 2008; National Health Committee, 2010; UMR, 2008).

ELECTIVE SERVICES

INTRODUCTION

Elective services are injury treatment and rehabilitation services involving mainly receipt of radiology, physiotherapy and orthopaedic surgical intervention. The provision of services and the extent of cover (type of service and cost⁴) provided is governed by a range of factors including government regulation, contract, and policy settings. The big three categories by volume and cost for receipt of elective surgery are knees, shoulders and the spine.

Treatment may be provided through a range of public and private providers under contract to ACC.

Figure 5 on the next page illustrates a typical elective surgery pathway for ACC clients. The pathway starts with the client seeking treatment from a health provider, who then makes a referral to a specialist provider. At any point up to step 5 in the pathway use of the service may cease for a variety of reasons at the discretion of any of the stakeholders including the client.

Prior to receipt or uptake of the service by the client, clients usually have to go through a range of assessments and may be required to undertake some rehabilitation type treatment or make some life style changes (such as weight loss) before the treatment can be provided. If a health comorbidity is present (for example diabetes, heart disease, arthritis etc.), this is likely to complicate the treatment journey as the comorbidity may have to be treated or require extra rehabilitation prior to and following receipt of the surgery.

In the period 2009-2012 a range of internal ACC studies have looked at the levels of use of elective surgery services, and other services by Maori and non-Maori (Fawcett & Kake, 2009; Kake & Allen, 2011; Kake & Dougherty, 2010; Kake & Hayward, 2011a, 2011b; Kake & Small, 2010). In addition, two reports from CBG Health Research on General Practitioner referrals of ACC clients to elective services were commissioned. These two reports combined primary health care data with ACC data to examine the rates of clients travelling through the elective surgery pathway. The analyses included examining differences by ethnicity, age, sex, type of injury, and presence of comorbidity (CBG Health Research Ltd & ACC Research., 2014; CBG Health Research Ltd, 2010).

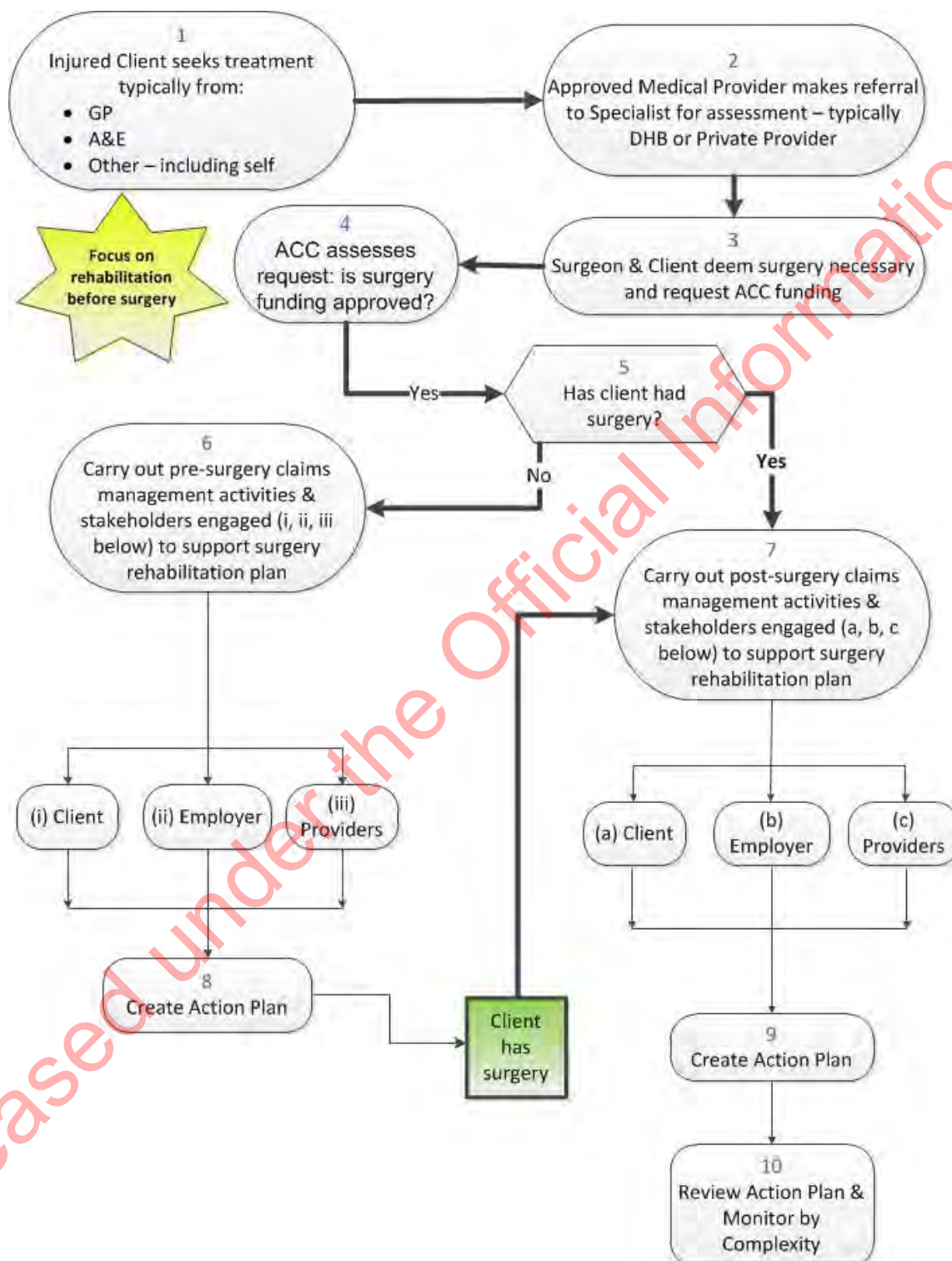
KEY FINDINGS

Internal ACC research studies have all reported systematic differences in the utilisation of elective surgery services between Maori and non-Maori at each stage of the referral process, and by injury severity and geographic region (Fawcett & Kake, 2009; Kake & Dougherty, 2010; Kake & Small, 2010). Overall, Maori were more likely to receive less referrals at each stage and the differences increased throughout the process. Geographically, rates of referral were lowest in the Far North, but there was a steady

⁴ Some elective surgery services may incur a co-payment charge depending upon the service provider and other details about the claim.

gradient increase in referral rates moving southwards. The greatest gaps in the receipt of surgery were in the areas of knee, shoulder and lower back / spine. The differences persisted after adjusting in the age structures of the population (Kake & Dougherty, 2010).

Figure 5: Electives Services Uptake Pathway



The 2009 paper (Fawcett & Kake, 2009) concluded that if Maori were to receive the same level of service (i.e. parity or equality) as non-Maori there would be approximately an

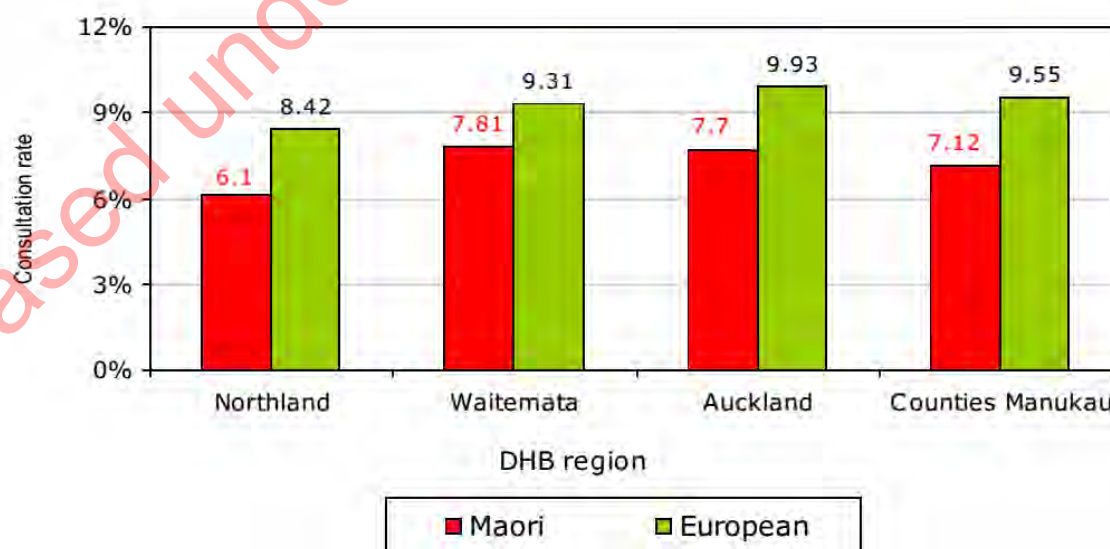
additional 700 elective surgery claims per annum. However, the authors also noted that parity of service uptake does not mean equity in service utilisation given that the Māori population has consistently been:

- described as a 'population at high risk of injury' (Feyer & Langley, 2000)
- reported as having higher rates of rates of injury hospitalisation of 30% to 50% (Ministry of Health, 2006; Robson & Harris, 2007)
- 33% higher head / traumatic brain injury (Barker-Collo & Feigin, 2009)
- 200-300% more spinal cord injuries (Dixon, Danesh, & Caradoc-Davies, 1993).

These levels of difference in health need suggest that Maori receipt of elective surgery services should be much higher than they are.

When specialist consultation rates by District Health Board (DHB) region were examined, the authors (Kake & Dougherty, 2010) found that in 2009 there were statistically significant differences in consultation rates for elective surgery between Māori and non-Māori ACC clients. The consultation rates for DHBs with the significant Maori / non-Māori differences are shown in **Error! Reference source not found.** Figure 6. In the figure the Northland DHB consultation rate is 6.1% for Maori compared to 8.4% for European clients, which equates to the Maori consultation being only 72% (6.1/8.42) of the European consultation rate. The greatest differences are in the Auckland, Counties-Manukau, Northland, and Waikato DHB regions (Kake & Dougherty, 2010). In contrast to these DHBs, no statistically significant difference was found in Tairāwhiti DHB. The authors suggested the design and methods used for primary care service delivery and secondary referral in Tairāwhiti, which involve significant input from Māori health providers, could explain the difference. The authors also concluded that the main determinant of the difference in elective surgery rates was differences in GP referral rates to specialists.

Figure 6: Proportion of claims leading to surgical / medical consultation for Maori and European clients in selected DHBs, July 2008 to June 2009



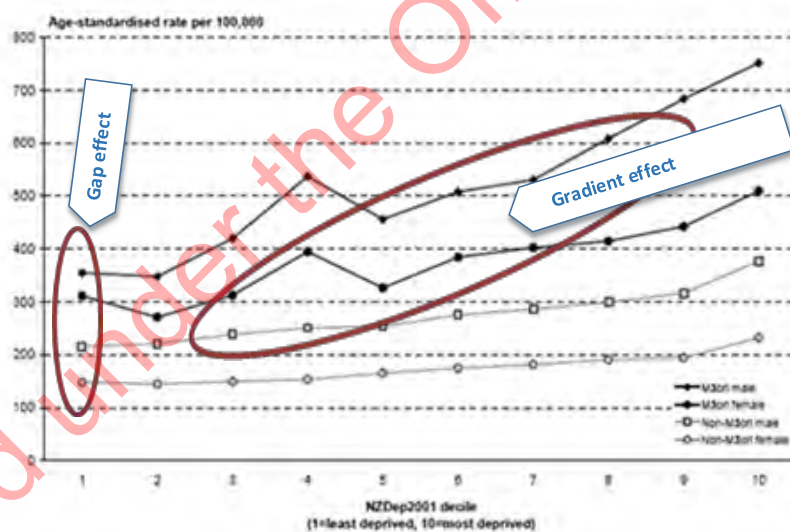
Source: (Kake & Dougherty, 2010)

ADDITIONAL REGIONAL ANALYSES

In latter related paper, further regional analysis was undertaken of differences in rates of receipt elective surgery, home support services and receipt of weekly compensation (Kake & Small, 2010). The authors reported that rates for all types of services were lowest in the Northern ACC regions, and improve progressively southwards, with the highest rates of service receipt in the South Island, and generally in the southern most region. In socio-economic terms, lower socio-economic groups were reported as having the lowest rates of surgical consultation and elective surgery, irrespective of ethnicity (however no numbers are given in the paper). The authors noted the results were consistent with the injury profile of these population groups, and the possible existence of income related gap and gradient effects in service use.

Gradient effects occur when there are systematic differences in health service utilisation according to socio-economic status. The term 'gap effects' refers to the size difference in utilisation between different socio-economic groups. An income gap is where the differences are observed by ethnicity within the same socio-economic group. A gradient effect occurs where the size of the gap changes with the level of income – the income gap becomes larger with each increase in level of socio-economic deprivation. The effects are shown in Figure 7.

Figure 7: Illustrating Socio-economic Gradient and Gap Effects in Health



GENERAL PRACTITIONER (GP) ELECTIVE SERVICES REFERRAL RATES

To examine further the role of GP referrals in use of elective surgery services CBG Health Research was commissioned in 2010 and 2012 to undertake further analyses using both primary health care and ACC data (CBG Health Research Ltd & ACC Research., 2014; CBG Health Research Ltd, 2010).

The 2010 pilot study found that for the period of January 2007 to August 2010, of the 35,861 referrals by the GPs in the Counties Manukau DHB covering nine GP practices, the referral rate for Māori was significantly lower at 68.1% of European clients. Further analyses indicated that the presence of co-morbidities (asthma, diabetes, and heart disease/failure) did not explain the lower GP referral rate for Māori clients.

In 2012 the pilot study sample was expanded to include a random sample of 56 GP Practices and an analysis of 47,377 referrals written in the 2013 year (CBG Health Research Ltd and ACC Research. 2014). Table 9 shows that in this sample of GPs, Māori had the lowest rates of referral for all of the main types of elective services: radiology, physiotherapy and orthopaedics.⁵

Table 9: Percent (%) GP referral rates of ACC clients to elective services by ethnicity, 2013 (CBG Health Research, 2014)

N		Prioritised Ethnicity %			All
		Māori	Other	Pacific	
		9007	34896	3474	47377
Radiology	Mean	6.78	9.09	8.12	8.58
Physiotherapy	Mean	11.3	12.3	10.7	12.0
Orthopaedics	Mean	1.40	1.53	1.05	1.47
Any referral	Mean	20.0	23.0	19.2	22.2

The next two tables present the same analysis by age group. It is interesting to note that the orthopaedic referral rate for Māori in the 18-24 year age group is approximately 60% higher (1.8% versus 1.1%), which would be expected given the level of Māori injury in this younger age group. These analyses show the importance of adjusting for age in any analysis of referral rates.

Table 10: Percent (%) GP referral rates of ACC clients to Radiology and Physiotherapy services by ethnicity and age-group, 2013 (CBG Health Research, 2014)

Age	N (Age group)	Radiology				Physiotherapy			
		%				%			
		Prioritised Ethnicity			All	Prioritised Ethnicity			All
		Māori	Other	Pacific		Māori	Other	Pacific	
0-5	3209	3.1	4.0	3.9	3.7	0.1	0.1	0.2	0.1
6-17	7617	6.8	10.9	8.9	9.5	4.7	6.5	4.9	5.8
18-24	4067	7.4	8.6	8.7	8.3	10.3	11.8	13.2	11.5
25-44	11229	6.8	8.6	8.2	8.2	16.3	16.4	17.0	16.4
45-64	13032	8.1	9.9	10.0	9.6	17.2	16.4	15.9	16.5

⁵ Orthopaedics data was obtained by additional scanning of all names in letters to include all referrals to known orthopaedic surgeons or services. Radiology and Physiotherapy referrals were identified by service codes, an approach which may not capture all referrals.

65+	8559	7.4	8.8	6.7	8.7	15.2	9.1	8.6	9.5
All	47713	6.8	9.1	8.2	8.6	11.3	12.3	10.7	12.0

Table 11: Percent (%)GP referral rates of ACC clients to Orthopaedic and Any Referral for Elective Services by ethnicity and age group, 2013 (CBG Health Research, 2014)

Age	N (Age group)	Orthopaedics				Any referral			
		%				%			
		Prioritised Ethnicity			All	Prioritised Ethnicity			All
		Māori	Other	Pacific		Māori	Other	Pacific	
0–5	3209	0.2	0.1	0.0	0.1	5.4	6.4	4.5	5.8
6–17	7617	0.6	1.0	0.3	0.8	13.0	18.9	14.5	16.7
18–24	4067	1.8	1.1	2.0	1.4	19.8	21.7	22.4	21.2
25–44	11229	1.8	1.9	1.5	1.9	25.9	26.7	25.6	26.4
45–64	13032	2.2	2.1	1.7	2.1	26.2	27.9	25.7	27.5
65+	8559	0.9	1.1	0.6	1.1	24.9	19.4	15.3	19.7
All	47713	1.4	1.5	1.1	1.5	20.0	23.0	19.2	22.1

ODDS RATIOS OF GP REFERRAL FOR ORTHOPAEDIC SURGERY

Table 12 focuses upon the probability of being referred to an orthopaedic surgeon if a patient is Māori, and after controlling for a range of predictors of interest that are often related to referral (age, gender, deprivation, chronic illness and injury type). The result is reported in the form of a 'Point Estimate Odds Ratio', which is the probability of a referral being made for a person of the stated ethnic group relative to people of the 'Other' ethnic group. Where the estimate is less than 1, the result indicates a lower probability of referral and where the result is greater than 1 a higher probability of referral. The probability of referral is deemed to be statistically significant at the 95% confidence limit if the confidence intervals around the point estimate do not include '1' (i.e. equal odds).

The key finding Table 12 is the row in grey highlight that shows after controlling for the range of predictors of interest, the odds ratio point estimate for Māori referral to orthopaedic surgery is 84% of the rate for people of 'Other' ethnicities. This means that the observed Māori referral rates for orthopaedic injury treatment surgery are 16% less than non-Māori. However, statistically the actual referral rate could be as low as 60.3% or as high as 117% of the 'Other' ethnicity rate for this service (this is shown by the confidence limits). Given these confidence limits, statistically there is no difference between Māori and non-Māori referral rates for orthopaedic surgery in this study.

In the same table the odds ratios for different injury types confirm how strongly injury type predicts referral, as expected, and further shows the importance of including injury type in an analysis of referral rates if different population groups experience different rates of types of injury.

The question arises, does this study indicate significant inequity in referral of ACC funded elective services? The results clearly show sizable differences in GP referral of Māori for ACC funded injury treatment elective services, particularly for orthopaedic services, but also for Radiology and Physiotherapy. However the size of the difference and whether it is substantive depends on the focus of the analysis and the lens used to assess equity and

inequality in terms of an insurance / actuarial or a health approach, and whether the decision focuses solely upon the statistical test of significance.

Table 12: Odds of referral for orthopaedic surgery controlling for age, gender, deprivation, chronic illness and injury type (CBG Health Research, 2014)

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
25-<45 vs 75+	2.878	1.659	4.991
45-<65 vs 75+	3.191	1.902	5.355
65-<75 vs 75+	2.215	1.256	3.905
Female vs Male	0.735	0.595	0.909
Quintile 1 vs 5	1.143	0.801	1.632
Quintile 2 vs 5	1.150	0.817	1.620
Quintile 3 vs 5	1.022	0.728	1.435
Quintile 4 vs 5	0.935	0.666	1.312
Māori vs Other	0.842	0.603	1.174
Pacific vs Other	0.932	0.563	1.543
Heart Failure	0.881	0.353	2.201
Ischaemic Heart Disease	1.073	0.746	1.544
Diabetes	0.875	0.597	1.284
Mental Health diagnosis	1.016	0.789	1.309
Asthma	1.131	0.848	1.509
ACC Diagnosis Groups			
42 vs 99 Soft tissue vs Other	7.182	4.596	11.223
43 vs 99 Fracture / dislocation	13.456	7.980	22.691
46 vs 99 Amputation	34.217	4.120	284.186
90 vs 99 Gradual onset	16.007	9.094	28.175

On one level of interpretation, once age, gender, deprivation and common chronic illnesses and injury type is controlled for, the Maori referral rate is 84% of the 'Other' rate – a 16% lower difference. However, this does not take into account the approximately 60% higher rates of referral of young Māori in the 18 to 24 age group compared to non-Māori in the same age group. This can be interpreted (particularly from an insurance / actuary definition) as a sizable inequality in favour of Māori of this age group. Furthermore, the 95% confidence interval (0.603 – 1.174) suggests that the Māori rate is not statistically significantly different from the 'Other' (non-Māori) rate, and consequently there is no difference between Māori and Non-Māori referral rates for injury treatment elective surgery.

However, from a health lens perspective, the results of this table can be interpreted as presenting sufficient evidence⁶ of inequities and inequalities in Māori referrals and uptake of ACC funded services, particularly in the context of the substantive literature on Māori injury rates presented in the next part of this report. Furthermore, in epidemiological terms, while the statistical test indicates no difference, in the context of the wider evidence on the Māori injury related health loss in comparison to non-Māori where Māori have rates of healthy life loss twice that of non-Māori (Ministry of Health and Accident Compensation Corporation and Corporation. 2013) the level of treatment need is such that it could be reasonably expected that the referral rates for the broad range of elective services – including surgery - should be much higher for Māori than those reported in the two CBG studies, and the internal ACC studies cited.

RECEIPT AND DURATION OF WEEKLY COMPENSATION SERVICES

Weekly compensation services involve making a claim for receipt of 80% wage compensation where there is more than five days off work due to an injury that occurred at work. The numbers of claims can be counted⁷, and population rates of claiming calculated and adjusted for differences in the age structure of the populations of interest.

Apart from the number and rates of claims for this entitlement, another important metric is the duration of cover. This metric is measured as the number of days from when receipt of wage compensation (weekly compensation) begun and when it ceases due to return to work. The metric is known as the 'return to work' (RTW) duration time. The measure is an internationally accepted performance benchmark between workers compensation schemes, and the metric is routinely reported between Australasian injury compensation schemes.

A number of analyses of receipt of weekly compensation claims and RTW duration have been undertaken at various time points (Fawcett & Kake, 2009; Kake & Allen, 2011; Kake & Small, 2010). The analyses show systematic differences over time by ethnicity, age, socio-economic status, and geographic region in the use of these services.

In 2009 Fawcett & Kake highlighted systematic age differences between Māori and non-Māori rates of receipt of weekly compensation over a number of years. The authors showed that Māori aged over 45 years of age received weekly compensation at levels twice that of non-Māori in the same age group. Māori under this age-group also received weekly compensation at levels higher than their non-Māori counterparts, however the difference was considerably closer at 22% (Fawcett & Kake, 2009).

⁶In the legal sense of "sufficient to establish a fact or raise a presumption unless disproved or rebutted" by conclusive evidence.

Source: www.law.cornell.edu/wex/prima_facie and <http://definitions.uslegal.com/s/sufficient-evidence/>

⁷ Weekly Compensation Claim counts are typically reported in terms of "conversion". This the number of "Accepted Claims" that transition (convert) into becoming a "Weekly Compensation" claim where the claim is accepted as being work related and involving more than five days off work.

A more detailed analysis of the period 2006-2009 was undertaken in 2010 by Kake & Small (2010). They showed that male clients have almost twice the weekly compensation conversion rate of female clients (4.9% for males vs. 2.5%). It was noted this was consistent with the higher injury profile of males in general and with the greater representation of males in industries with the highest injury rates (i.e. agriculture, fishing and forestry; manufacturing, and construction). In addition, there were ethnic differences in weekly compensation conversion rates. Māori had the highest rates (5.2%) in the period they examined, followed by Pacific (4.0%), European (3.8%), and Asian clients (2.5%) (Kake & Small, 2010). These results are consistent with the injury profile of the populations given industry and occupation participation rates, with Māori more prevalent in high risk sectors. The question arises though, are the reported Weekly Compensation rates as high as they should be given the significantly higher rates of Māori participation in high risk sectors compared to non-Māori?

Kake & Small (2010) also observed a significant increase in the conversion rates for weekly compensation as socio- economic level decreased. For example, the conversion rate for the lowest socio-economic group was 33% higher than the rate for the highest socio-economic group. This relationship is consistent with the higher injury profile of lower socio-economic groups. There were also regional differences in weekly compensation conversion rates. In general rates were higher in southern regions. The Southern South Island had the highest rate (4.76%), the Midlands/East Coast (4.3%) and the West North Island/Wellington (3.9%). The Northern Region (Auckland, Northland) had the lowest rate (3.2%), and this is partially explained by the concentration of Asian clients in this area with low conversion rates. The main urban areas (e.g. Auckland, Wellington) had the lowest conversion rate (3.6%). Rural and independent urban areas (e.g. Taupo) have similar conversion rates (4.8% and 5.1%).

In terms of RTW duration rates, Kake & Small (2010) found there was no significant ethnic, gender, regional, rural/urban, and socio-economic differences in 3- and 9-month rates. The evidence also indicated that it was possible that some population groups were exiting weekly compensation at an earlier point in their recovery from injury than others. The findings are surprising because, based on injury profile, it is expected that some groups (e.g. males, Māori, and lower socio-economic groups) would have lower exit rates than others. This would be even more so if the population groups were also seeking treatment latter compared to other population groups. In which case, the delay in seeking treatment would lead to longer recovery time due to the complications (including increased severity of the injury) caused by the initial delay. A subsequent report by Kake & Allan (2011) found that beginning with the recession in 2009, Māori and European rates of Weekly Compensation came closer together, however the differences remained statistically different, and the duration of claims did not change.

The following figure and table updates the work cited above, and extends the analysis further by showing the odds ratios for receipt of weekly compensation by a range of variables including type of injury. The left hand axis in Figure 8 shows (see lines) that Māori have higher rates of weekly compensation compared to European, the gap closed with the recession and may be widening again as the economy recovers and Māori employment increases. The figure also shows on the right hand axis (see bars) the number of weekly compensation claims in thousands. In contrast to these volumes, the ACC defined weekly compensation serious injury claims is approximately 30 per annum for Māori and 100 for European (see Table 13).

Figure 8: Age-adjusted Weekly Compensation Claim Rates and Counts for ACC defined non-Serious Injuries, Maori – European, 2005-2013 financial years

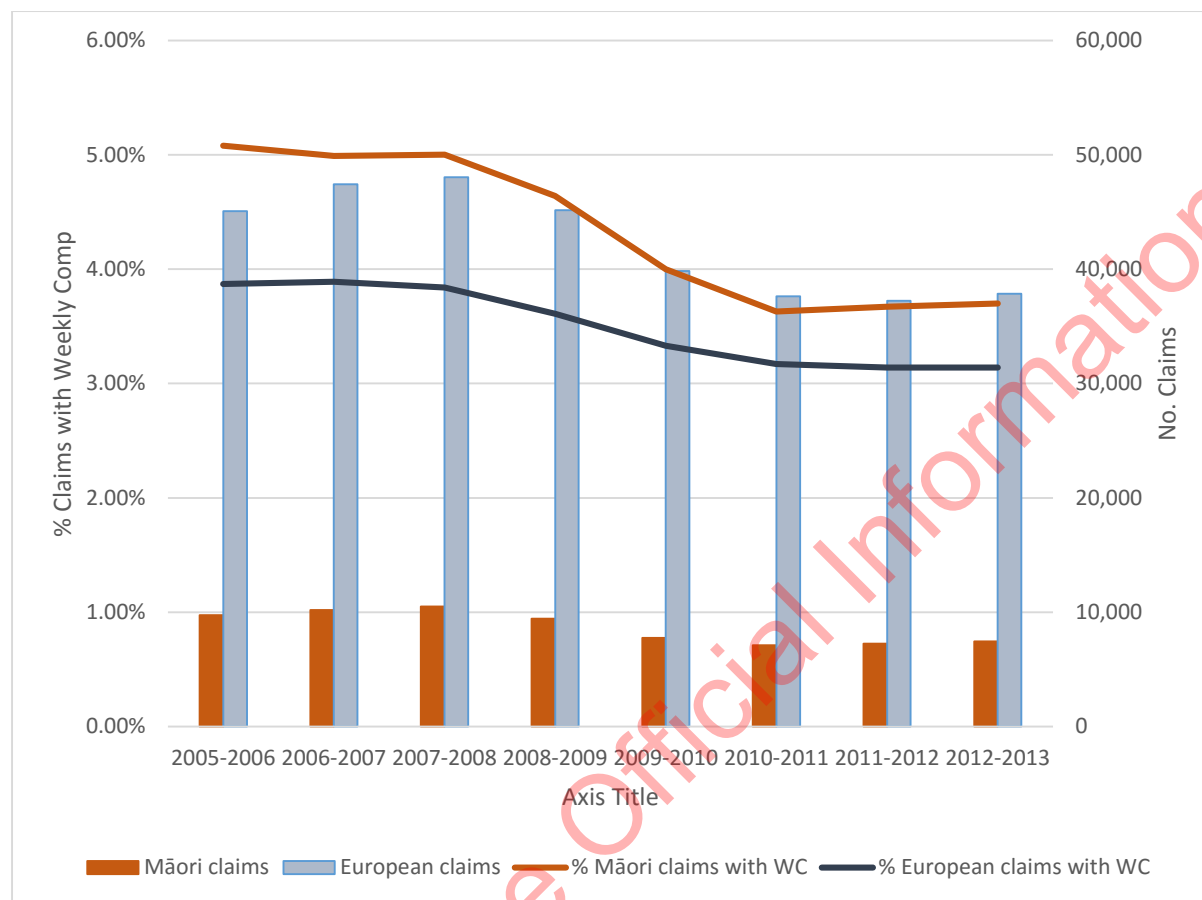


Table 13: Number of ACC defined Serious Injury Weekly Compensation Claims by Ethnicity, 2005-2013 financial year

Year of Claim	Number of Serious Injury Weekly Compensation Claims	
	Māori	European
2005-2006	22	73
2006-2007	28	102
2007-2008	45	110
2008-2009	20	105
2009-2010	28	101
2010-2011	28	84
2011-2012	17	79
2012-2013	18	75

Table 14 presents the odds ratios for receipt of weekly compensation between Māori and European, and adjusting for a range of differences between the population groups such as age, type of injury, socio-economic status (deprivation quintile), gender, and urban / rural location. The table highlights the importance of differences in the age structure of the population (Māori are a much younger population compared to European) for explaining the overall observed differences. Given that Māori unemployment is approximately double that of non-Māori and much higher than that for the younger age groups (Ministry of Business Innovation and Employment, 2013), we would expect the Māori rates of weekly compensation to increase as Māori participation in the economy increases, and consequently the differences in receipt of weekly compensation to widen again.

Table 14: Odds ratios for receipt of Weekly Compensation Non-serious Injury claims: European vs Māori

Control variables	Māori vs European			European vs Māori		
	Point Estimate	95% Confidence Limits		Point Estimate	95% Confidence Limits	
Unadjusted	1.151	1.142	1.160	0.869	0.862	0.876
Deprivation quintile	1.095	1.086	1.104	0.913	0.906	0.921
Injury site	1.152	1.143	1.162	0.868	0.861	0.875
Injury type	1.186	1.177	1.196	0.843	0.836	0.85
Urban/rural	1.142	1.133	1.151	0.876	0.869	0.882
Gender	1.108	1.099	1.117	0.903	0.895	0.91
Age	1.226	1.216	1.236	0.816	0.809	0.822
Age and Gender	1.205	1.195	1.214	0.83	0.824	0.837
Age, Gender and Injury site	1.188	1.179	1.198	0.842	0.835	0.848
Age, Gender and Deprivation quintile	1.148	1.139	1.158	0.871	0.863	0.878
Age, Gender and Urban/rural	1.193	1.183	1.202	0.838	0.832	0.845
Age, Gender, Injury Site, Urban/Rural and Deprivation quintile	1.121	1.111	1.13	0.892	0.885	0.9

Source: Agnes Guevara, Auren Xu and John Wren, ACC Research, July 2015.

These results clearly demonstrate statistically significant differences between Māori and Europeans in rates of receipt of weekly compensation, with Māori rates being at least 12% higher after adjusting for a range of population differences. As these results have not been able to adjust for industry and occupation – which are major predictors of work related injury, it is not clear whether the differences represent equity in service utilisation. However, given that in 2013 Māori represent approximately 51% of Labourers, 25% of machinery operators and drivers, and 24% of technicians and trades workers (Ministry of Business Innovation and Employment, 2013) that are all higher risk occupations, it could be expected that the differences in rates of receipt of weekly compensation should be substantively higher than 12%. One key explanation for the rate not being higher could be that given Māori are also

over represented in the vulnerable⁸ working population (Ministry of Business Innovation and Employment, 2010), and consequently may not want to claim Weekly Compensation in case it has negative consequences for their on-going employment.

2014 SURVEY OF INITIAL TREATMENT SEEKING AND RETURN TO WORK EXPERIENCES

Over a number of years ACC Research has commissioned a number of Return to Work surveys reporting on clients RTW experience, and participated in an Australasian RTW survey monitor series that provides a benchmark RTW rate measure across jurisdictions. The survey results have been re-examined to look at differences between ethnic groups, and show consistent statistically significant differences over time between Māori and non-Māori experiences of ACC services and their RTW work experience.(ACC Research, 2011, 2014).

The 2014 survey was larger than previous years and included questions about ACC clients' experience of return to work and their initial route taken for receipt of injury treatment and referral for elective services. The final sample size was 705 respondents, and weights were applied to the Māori responses to improve confidence about the observed differences between Māori and non-Māori.

Analysis of the results indicates clear differences in some key areas of service utilisation and expectations about recovery and RTW:

- both Māori and non-Māori sought their initial injury treatment at similar levels from the same providers
 - 45% of Māori went to an Accident & Emergency, compared to 48% for non-Māori, and 52% for Other ethnicities
 - 36% of Māori went to a GP compared to 35% of European and 38% for Other ethnicities
- approximately half of claimants were subsequently referred for additional treatment from either a specialist (48 percent), or a physiotherapist (47 percent)
 - however Māori were statistically significantly less likely to be referred to a specialist or physiotherapist compared to non-Māori
 - 34% of Māori were referred to Specialist services compared to 48% of New Zealand European and 59% of Other Ethnicities
 - 30% of Māori were referred to Physiotherapy services compared to 46% of New Zealand European and 60% of Other Ethnicities
- 95 percent of those referred for additional treatment reported that they experienced no difficulties in accessing this treatment
- a significantly smaller proportion of Māori rated their own health as 'excellent' prior to the injury compared to non-Māori (21% vs. 38%). There were no significant differences following their injury.

⁸ 'Vulnerable' workers are typically defined in the workplace health and safety and employment literature in terms of a range of employment characteristics that results in 'precarious' employment (Fashoyin, Tiraboschi, Sargeant, & Ori, 2013).

- there were significant differences between expectations about recovery, with Māori expecting to recover sooner at levels much higher than European and Other (48% compared to 32% and 11% respectively)
- a greater proportion of Māori reported returning to similar levels of hours of work compared to European and Other (56% compared to 46% and 43% respectively),
 - and only 7% Māori reported taking extra time off work after first returning to work compared to 11% of European and 18% of Other ethnicities
- there was no difference between Māori (5%) and European (4%) about whether they felt 'physically' not ready to return to work, in contrast to 12% of Other who reported feeling not ready. Similarly there was little difference between Māori and European over how they felt 'emotionally' about returning to work, compared to 51% of Other
- Māori reported higher levels of motivation for return to work as coming from 'themselves' and 'whānau / friends' (and less so 'GP') compared to European and Other (see Table 15). It is also interesting to note in the table the influence of 'the boss' and 'ACC representative' for Other ethnicities in return to work decisions is significantly higher compared to Māori and European:

Table 15: Key influencers in client return to work decisions, 2010 RTW Monitor Survey

Influencer	Māori (%)	European (%)	Other (%)
Other health professional	35	40	30
Themselves	20	14	13
Whānau and / or friends	21	11	14
GP	12	7	7
The 'boss'	5	6	11
ACC representative	9	5	13

- There was little difference between the ethnicities in terms of belief about the benefits or returning to work for their recovery.
 - However, twice as many Māori (35%) reported returning to work because 'it provides structure' compared to non-Māori (17%).

PART 3: INVERSE HEALTH CARE LAW AND INJURY TREATMENT IN NEW ZEALAND: EVIDENCE FOR INEQUITY IN SERVICE UTILISATION

UNDERSTANDING THE MĀORI BURDEN OF INJURY RELATED HEALTH LOSS

Given the evidence in Part 2, the questions arises does the reported differences represent evidence for substantive inequity in ACC service utilisation?

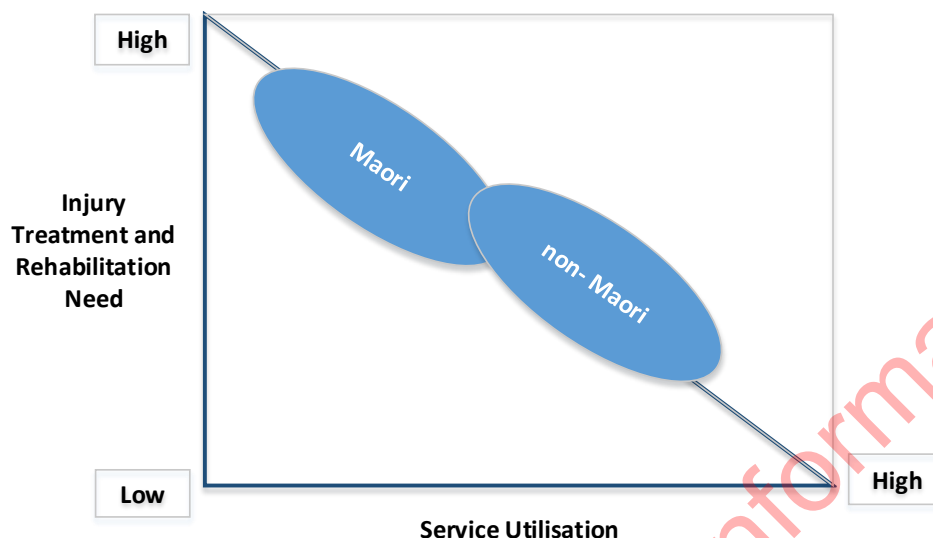
It has been argued since the 1970s that the availability and use of good medical care tends to vary inversely with the need for it in the population. This relationship has been called the 'inverse health care law' (Hart, 1971). A variant of the law says that 'the concern of a population for its own health tends to vary inversely with the actual state of health of that population' (Dalrymple, 2012).

Internationally and in New Zealand, it has been argued that where the law is in operation in socially and economically deprived areas health needs are higher and involve more complex care. However GP consultations can be difficult to access, involve limited GP contact time, result in less patient enablement and higher morbidity, and result in greater GP practitioner stress (Mercer & Watt, 2007; Pedersen & Vedsted, 2014). It has also been argued that the inverse care law is a 'dominant feature' of New Zealand's primary health care system (Malcolm, 2002).

For ACC, this law can be rephrased to say that the population's views on their injury treatment need varies inversely to their actual need. The figure below illustrates the application of the law to ACC services. The relative position of the two bubbles to each other and the axis's indicates that Māori as a population group have a higher need for injury treatment services compared to non-Māori. However Māori are not receiving and utilising the services at the levels expected given the population level of injury treatment and rehabilitation need.

The following figure illustrates the hypothetical application of the inverse care law to injury treatment utilisation in New Zealand and ACC services. The vertical access on the left indicates the relative burden of injury and health loss, and the horizontal access indicates the relative utilisation of injury treatment and rehabilitation services of the two population groups of interest – Māori and non-Māori. The position of the bubbles indicates the operation of the inverse care law at two levels. The higher position of the Māori bubble on the left side reflects the significantly higher burden of injury borne by Māori and thus injury treatment need, however Māori use less services in comparison to their health need. The lower position of the bubble in relation to the line compared to the non-Māori bubble reflects the relative differences in social deprivation between the two population groups and consequent utilisation of services compared to non-Māori.

Figure 9: Illustration of hypothetical application of Inverse Care Law to injury treatment in New Zealand by Māori and non-Māori populations



INEQUITIES IN MĀORI UTILISATION OF PUBLIC HEALTH SERVICES

The New Zealand academic literature is substantive, clear and consistent about the existence of significant differences in Māori health outcomes and inequities in access to health services compared to non-Māori. The public health literature, particularly since the late 1990s, has consistently shown that:

- Māori bear a significantly higher burden of health and injury related loss respectively compared to non-Māori (Ministry of Health and Accident Compensation Corporation., 2013; Ministry of Health, 2001b, 2006; Reid, 2000; Robson & Harris, 2007)
- there has historically been significant under-utilisation by Māori of publicly funded health services in a range of health areas compared to their health need, and while progress has been made there is much more to be achieved (Barker-Collo & Feigin, 2009; Blakely, Simmers, & Sharpe, 2011; Blakely, 2011; Brabyn & Barnett, 2004; Bryant & Campbell, 1996; Carr, 2013; Chong & Dai, 2013; Cormack, Robson, Purdie, & et al, 2005; Crengle, 2000; Curtis, 2013; Dixon et al., 1993; Lindsay, G; Jackson, G; Robinson, 2007; Maclennan, Wyeth, Hokowhitu, Wilson, & Derrett, 2013; Malcolm, 2002; Maniapoto & Gribben, 2003; Mauri Ora & Associates., 2009; Ministry of Health, 2001a; Ratima, Ratima, Durie, & Potaka, 1993; Reid, 2000; Robson & Harris, 2007; Rumball-Smith, 2009; Russell, Smiler, & Stace, 2013; Sharpe, 2011; Singleton, Buddicom, Vane, & Poutawera, 2013; Tobias & Yeh, 2007; Wang et al., 2013)
- there is considerable research based evidence about the barriers for Māori in the uptake of health services (including ACC specific information), and what can be done about it (Barwick, 2000; Baxter, 2002; Brabyn & Barnett, 2004; Carr, 2013; Cherrington & Masters, 2005; Crengle, 2000; Health Promotion Forum., 2010; Health Waikato, 2001; Human Rights Commission., 2012; Jansen & Smith, 2006;

Maniapoto & Gribben, 2003; Masters & Cherrington, 2005; Mauri Ora & Associates., 2009, 2010; McLeod et al., 2004; Ministry of Health, 2002a, 2002b, 2004; New Zealand Medical Association., 2011; Parks & Kreuter, 2010; Ratima et al., 1993; Reid, 2000; Rumball-Smith, 2009; Russell et al., 2013)

- there is a substantive rationale for a specific Māori focussed response to Māori to address the under-utilisation of health / injury treatment services, particularly for Crown agencies (Kingi, 2007; Ministry of Health, 2002a, 2002b; Public Health Association, 2002; Russell et al., 2013; Woodward & Kawachi, 2000)
- improving equity of service use in health terms starts with recognising that equity does not mean the equal or the same use of services across all population groups, or that a mainstream is always appropriate for Māori and other population groups with diverse backgrounds, health needs and injury experiences (EEO Trust, 2010; Health Promotion Forum., 2010; Human Rights Commission., 2012; Mauri Ora & Associates., 2009; Ministry of Health, 2002a; Parks & Kreuter, 2010; Public Health Association, 2002; Reid, 2000; The Royal New Zealand College of General Practitioners., 2015; Woodward & Kawachi, 2000)
- there is evidence that while improvements have been made in Māori access to health services in the health sector, more remains to be done to promote equality in use of health services and in health outcomes (Blakely et al., 2011; Carr, 2013)
- the presence of health comorbidities at the time of injury considerably complicates the injury treatment and rehabilitation process, and costs to ACC (CBG Health Research Ltd & ACC Research., 2012)
- Otago University researchers have shown that significant numbers of Māori have measurably poor health outcomes three months post injury on a wide range of measures. They argue their evidence suggests that more effort needs to be put into 'improved strategies...for appropriate rehabilitation for injured Māori, irrespective of injury severity' (MacLennan et al., 2013).

In the face of the accumulated evidence, in 2000 the 'He Korowai Oranga (New Zealand Māori Health Strategy)' was released by the government and remains current policy today (Ministry of Health, 2002a).

In addition, the New Zealand the Royal New Zealand College of GPs has acknowledged in their position statement on achieving health equity that in "New Zealand, ethnic inequalities between Māori and non-Māori are the most consistent and compelling inequities in health" (The Royal New Zealand College of General Practitioners., 2015). Similar statements have been published by the New Zealand Medical Association, Health Promotion Forum, and the New Zealand Public Health Association and others (Blakely, 2011; Health Promotion Forum., 2010; New Zealand Medical Association., 2011; Public Health Association, 2002).

WHAT DO CLINICIANS SAY ABOUT EQUITABLE ACCESS TO ELECTIVE SURGERY

Evidence in Part 2 about utilisation of ACC funded elective services has highlighted the important role of GPs in the referral process of ACC clients to elective services as one important reason why Māori utilisation of these services are not as high as could be expected.

McLeod et al (2004) have examined the influence of New Zealand clinicians in influencing access to elective surgery through the use of in-depth interviews and a review of the literature. A range of factors were identified, including:

- health system factors including the perceptions of clinicians of patients' ability to benefit
- patients' ability to make informed decisions about surgery
- patients' social and cultural perceptions of the health system
- low socio-economic status of many patients in need which restricts their ability to utilise public services or private services (McLeod et al., 2004).

It was also noted that GPs and Specialists identified a range of socio-economic factors that acted as barriers, and made patients more 'vulnerable' to systemic barriers' to utilisation of additional services. As a consequence, both

'GPs and secondary care clinicians described situations where they would personally advocate for individual patients to improve their access. Advocacy was related to clinicians' perceptions of the value that patients would receive from the surgery and patients' needs for public sector funding' (McLeod et al., 2004).

However, the authors also pointed out that

'when resources are constrained, subjective decision-making by clinicians has the potential to further advantage or disadvantage patients through the weighting surgeons implicitly place on socio-demographic factors when making rationing decisions' (McLeod et al., 2004).

This is of particular concern to ACC because of its potential to impact negatively on promoting equitable access by vulnerable populations to ACC funded services.

DIFFERENCES IN MĀORI BURDEN OF INJURY AND HEALTH LOSS COMPARED TO NON-MĀORI: A BRIEF INTRODUCTION

The Māori burden of health and injury is well described elsewhere (Ministry of Health and Accident Compensation Corporation., 2013; Ministry of Health, 2001b, 2013; Statistics New Zealand., 2014). Consequently the following provides a very brief overview with the aim of indicating the size of the differences between the Māori and non-Māori burden of injury and associated health loss.

The purpose of doing this is to provide context for thinking about whether ACC funded injury treatment and rehabilitation services are being accessed at the levels that could be expected given the burden of injury and health loss described.

2013 NEW ZEALAND BURDEN OF INJURY REPORT (MINISTRY OF HEALTH AND ACC)

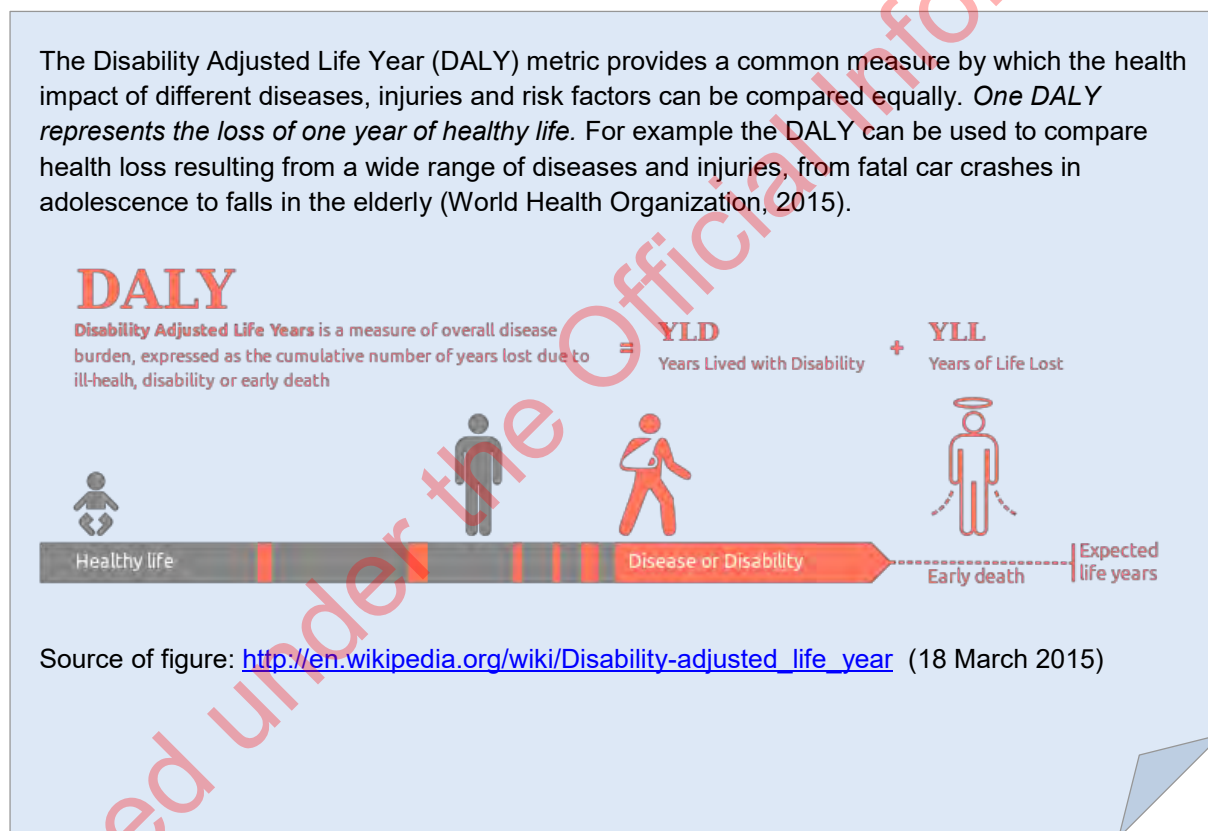
The 2013 New Zealand Burden of Disease and Injury reports (Ministry of Health and Accident Compensation Corporation., 2013; Ministry of Health, 2013) are the most recent

authoritative analysis of the differences between Māori and non-Māori burden of health loss due to disease and injury. These reports present analyses of health loss by age, sex and ethnicity, and include important insights into the contribution of different risk factors for injury, such as osteoporosis, alcohol misuse and mental illness.

The reports are part of a World Health Organization initiative to quantify internationally the level of health loss, or 'burden', attributable to a comprehensive set of diseases, injuries and their risk factors, using an internationally accepted standardised approach. The impact of disease and injury is quantified in terms of both its fatal burden (impact on premature mortality) and its non-fatal burden (impact on disability), combined in a summary measure, the disability-adjusted life year (DALY). Related measures include the number of healthy years of life lost (YLL), and Quality Adjusted Life Years (QALYS) due to the event.

The box below illustrates what a DALY is.

Figure 10: Illustrating what a DALY is



Welfare economists sometimes monetise the DALY measures by placing a cost on each of the years of life lost, to derive a socio-economic cost estimate. This approach, though, is controversial to many in the health sector. O'Dea and Wren (2010 and 2012) used a monetised DALY in their social and economic cost estimates of injury in New Zealand, and included a comparison of Māori with Non-Māori (O'Dea and Wren, 2010; O'Dea and Wren, 2012). In their analysis they reported the social and economic cost per Māori injury fatality (\$6.72 million in 2008) as being significantly higher than that of the total population (\$5.74 million). They commented this was likely to be an effect of the relatively younger Māori

population (i.e., Māori are disproportionately represented in the younger, riskier age bands), which means more years of productive life are lost by their deaths. While the monetisation of DALYS is controversial, it is useful when making investment decisions involving social and economic trade-offs against other types of investment (Wren & Barrell, 2010).

KEY RESULTS NEW ZEALAND BURDEN OF INJURY STUDY 2013

The authors of the 2013 report found that in terms of health years of life lost due to premature death or disability, both Māori males and Māori females experience twice the rate of injury-related health loss compared to non-Māori.

Table 16 on the next page shows that in total in 2006 approximately 20,000 years (13,788 + 5,757 = 19,545) years of healthy life (DALY) were lost in the Māori population due to injury. This loss represents 12% of total health loss from all causes for Māori, compared to 8% for the total population (including Māori)).⁹

Māori males experienced the majority of this health loss, with 13,788 DALYs lost compared to 5,757 DALYs lost in females. Compared to non-Māori these losses were twice the rates of non-Māori. This difference is shown by the 'standardised rate ratio' highlighted by the blue circle in Table 16.

Explaining what SRRs and SRDs are in the following tables

'Standardised Rate Ratio' (SRR)

The standardised rate ratio (SRR) is a measure of difference after adjusting for differences in the age structure of the populations. For example:

- Where the SRR = 1, the rates of injury-related health loss are equal in both populations
- Where the SRR = 1.5, the rate of injury-related health loss is 50% greater in Māori
- Where the SRR = 0.5, the rate of injury-related health loss is 50% lower in Māori.

The SRR is calculated by dividing the rate of health loss reported for Māori by the rate for non-Māori, in the unit used (for example, injury related Years of Life Lost (YLL), Years Lived with Disability (YLD) or Disability Adjusted Life Years (DALYs)). In the table below the Māori male rate is 2.0 times higher than Non-Māori males ($46.7/23.8 \approx 1.96$ (or 2 after rounding)).

Standardised Rate Difference (SRD)

The SRD is the age-standardised DALY rate in Māori minus the age-standardised DALY rate in non-Māori.

⁹ Table 2, page 6, 2013 Burden of Disease and Injury Report. MOH and ACC.

In terms of absolute health lost, the standardised rate difference (SRD) column in Table 16 shows that Māori males lost an extra 22.9 years of life per 1000 population compared to non-Māori males, and Māori females lost an extra 9.8 years compared to Non-Māori females. Overall these losses mean Māori experienced an additional 16 DALYs lost per 1000 population over and above the rate of health loss in non-Māori.

Table 16: Relative and absolute difference in injury-related health loss per 1000 population, by sex and ethnicity, 2006

	DALYs	Age-standardised DALY rate per 1000	Standardised rate ratio	Standardised rate difference per 1000
Māori male	13,788	46.7	2.0	22.9
Non-Māori male	41,265	23.8		
Māori female	5,757	17.8	2.2	9.8
Non-Māori female	15,459	8.0		

Source: Table 23, page 24. Ministry of Health and Accident Compensation Corporation. 2013. *Injury-related Health Loss: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study 2006–2016*. Wellington: Ministry of Health

Table 17 shows that in 2006 the observed rates of types (nature) of injury for Māori were typically 1.5 to 2 times those of Non-Māori (Ministry of Health and Accident Compensation Corporation., 2013). The differences in type of injury are most evident for soft tissue injury and open wounds where the SRR for Māori females was 6.4 and 2.8 for Māori males compared to Non-Māori. Māori also experienced higher rates of internal and crush injuries and injuries to the central nervous system. This suggests that we could expect Māori to receive significantly higher rates of ACC funded injury treatment and rehabilitation services compared to non-Māori, given these levels of reported health need.

Figure 11 shows the relative level of inequality for each external cause of injury experienced by Māori males and females compared to non-Māori. Differences in the burden of injury are most evident for interpersonal violence (assault injuries) and transport injuries. Māori males are also at greater risk of health loss through drowning compared to non-Māori males (SRR = 2.1), with Māori females at increased risk of poisoning-related health loss (SRR = 2.3).

Figure 12 highlights the absolute contribution of external causes of injury to the difference between injury DALY rates in Māori and non-Māori (the SRD). Transport injuries were the leading cause of the observed inequality, responsible for over 40% of the excess injury-related health loss experienced by Māori. Self-inflicted injury was responsible for approximately 25% of the observed inequality, with interpersonal violence accounting for around 15% of the difference.

Table 17: Māori and non-Māori age-standardised rates of injury, per 1000 population, by nature of injury, sex and ethnicity, 2006*

Nature of injury	Māori male ASR	Non-Māori male ASR	SRR: males	Māori female ASR	Non-Māori female ASR	SRR: females
Central nervous system injury (CNS)	15.8	7.6	2.1	6.0	2.6	2.4
Internal and crush injury	8.4	3.7	2.3	2.9	1.1	2.6
Toxic effects	4.0	3.2	1.2	2.1	1.4	1.5
Drowning and immersion	2.8	1.5	1.9	0.9	0.5	1.7
Fracture and dislocation	1.0	0.9	1.1	0.6	0.5	1.2
Soft tissue injury and open wound	1.2	0.4	2.8	0.7	0.1	6.4
Burn	1.0	0.5	1.9	0.3	0.2	1.6
Amputation	0.2	0.2	0.9	0.1	0.1	1.3
Other injury	12.4	5.7	2.2	4.4	1.6	2.8

* Caution should be taken when interpreting these figures due to small numbers.

Source: Table 29, page 27. Ministry of Health and Accident Compensation Corporation. 2013. *Injury-related Health Loss: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study 2006–2016*. Wellington: Ministry of Health

Figure 11: Relative (SRR) inequalities in injury-related health loss in Māori, by external cause of injury, 2006, compared to non-Māori

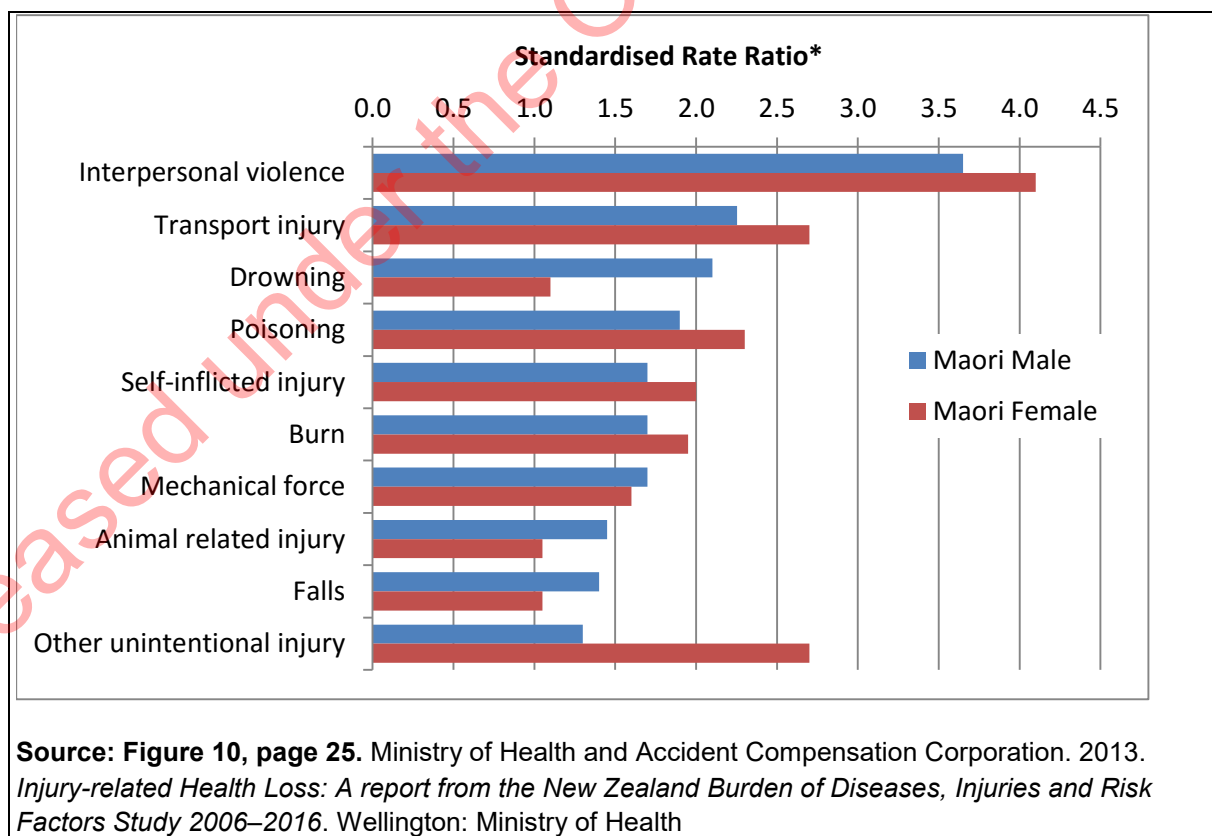
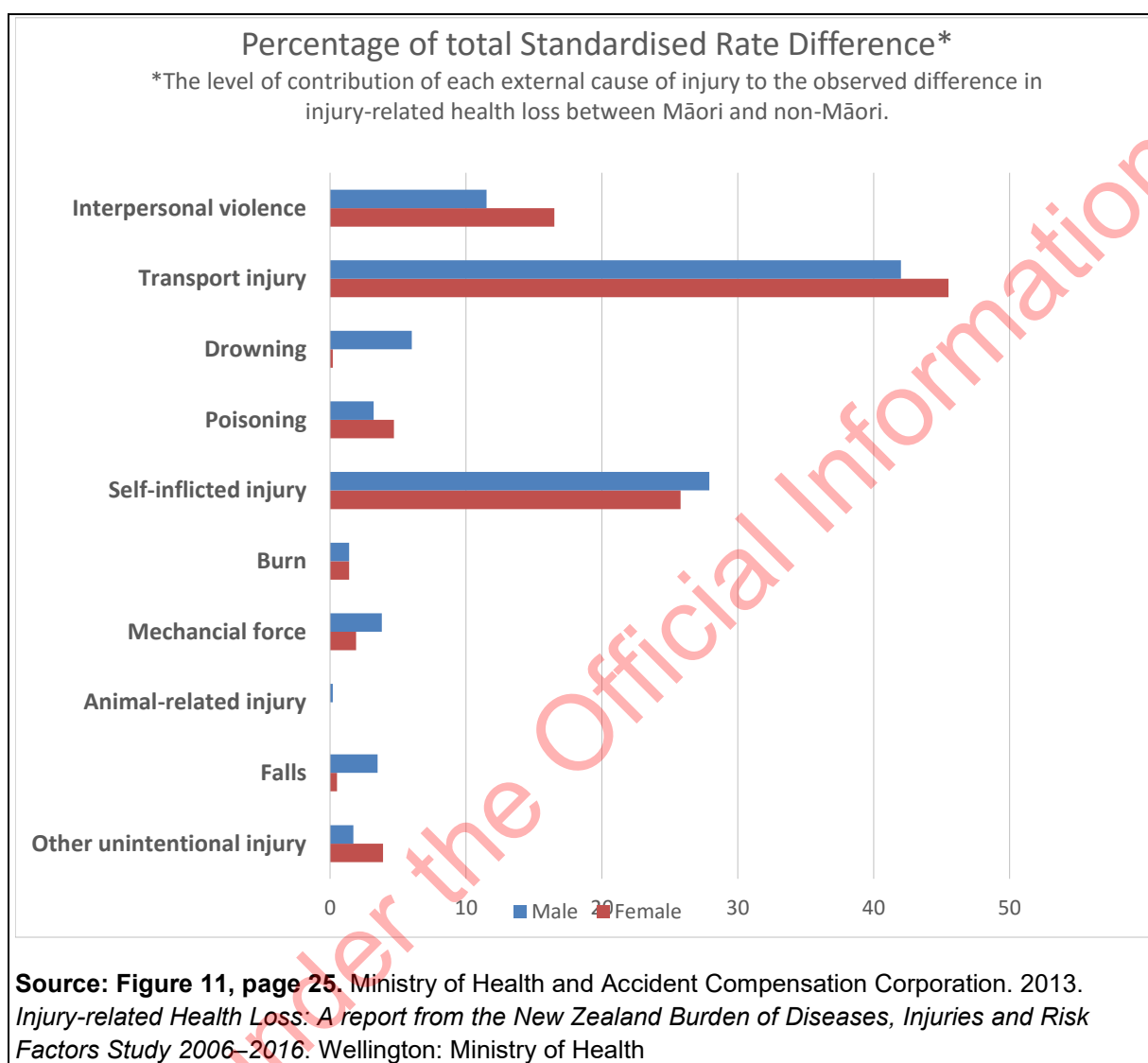


Figure 12: Absolute (% of total SRD) inequalities in injury-related health loss in Māori, by external cause of injury, 2006, compared to non-Māori



MĀORI WORKPLACE RELATED INJURY STATISTICS

There are currently no routinely reported comparative and robust Māori – non-Māori workplace injury statistics. In 2004, the New Zealand National Occupational Health and Safety Advisory Committee (NOHSAC) noted that there “is a particular lack of information on work-related morbidity and mortality in women, Māori and Pacific people” (Driscoll et al., 2004). In a related report, the Committee advised the Minister of Labour that New Zealand had “a long way to go in even identifying the size and nature of the problems, let alone developing effective interventions.... particularly for occupational injury and illness in women and in Māori” (Pearce et al., 2004). Very little has changed in the intervening period. A substantive part of the problem is the lack of robust workforce ethnicity data.

NOHSAC authors noted that the available research from the 1990s showed that after adjusting for age differences, Māori rates of workplace fatalities were 56% higher compared to non-Māori. However, after adjusting for industry and occupation the difference reduced to 19% and 10% respectively indicating that the Māori rates relative to non-Māori were highly related to rates of Māori employment in high risk occupations in the primary industry sector, construction and manufacturing, relative to other ethnicities in the workforce (Driscoll et al., 2004; Pearce et al., 2004).

2012 NZIPS OUTCOMES MONITORING REPORT (NZIPS)

In the 2012 the New Zealand Injury Prevention Secretariat (NZIPS) published the last *NZIPS Outcomes Monitoring Report*, which was released by Minister for ACC Judith Collins (Proffitt & Beacham, 2012). It combined statistical indicators and information about the activities undertaken by lead agencies to monitor trends across the (then) New Zealand Injury Prevention Strategy priority and focus areas. The report was subject to extensive external peer review. Included in the report were observations about the disproportionate burden of injury borne by Māori, and made suggestions for action to address the burden. Based upon the Statistics NZ serious injury indicator data (Statistics New Zealand, 2014), the NZIPS authors commented that over time:

- Māori are generally over represented in fatality and serious injury statistics for most types of injury, and rates are generally increasing relative to the non-Māori population.
- The rates of fatal injury and non-fatal serious injury for Māori have remained relatively stable since 2000.
- Road crashes and suicide are the biggest causes of injury fatalities for Māori, and have higher rates of serious injury for assault and road crashes relative to the total population, but a lower rate for falls.
- The disproportionate rates fatality and serious injury are reflected in the higher socio-economic cost of injury for Māori relative to non-Māori that have been estimated (O'Dea, Wren, & ACC, 2010; O'Dea & Wren, 2012). In 2012 O'Dea and Wren estimated the socio-economic cost per Māori injury fatality at \$6.72 million in 2008, which was significantly higher than that of the total population at \$5.74 million (O'Dea & Wren, 2012). This is largely due to the younger age structure of the Māori population and consequently a larger proportion of the population at risk, which means more years of productive life are lost by their deaths to the Māori community and New Zealand overall.

Alcohol consumption is highly related to the disproportionate burden of injury:

- half of the Māori population is aged less than 24 years, an age group in which a high level of alcohol-related harms occurs. This means that the Māori population is more adversely affected by alcohol than the non-Māori population.
- the prevalence of severe alcohol-related problems (injury and non-injury) amongst Māori individuals and whānau is more than twice that among the non-Māori population. Māori are four times more likely than non-Māori to die of alcohol-attributable conditions.

- the higher rates of road crashes, suicide and assault injuries for Māori are very likely to be linked to the higher prevalence of alcohol-related problems amongst the Māori population, given the relationship between these types of injury and alcohol misuse (Proffitt & Beacham, 2012).

It has also been observed that the Māori burden of injury is similar to that reported for other indigenous peoples who have much higher rates of injury compared to non-indigenous people in the country and that fire, car, violence and alcohol related injuries are common features (Cherrington & Masters, 2005).

POORER MĀORI HEALTH OUTCOMES FOLLOWING RECEIPT OF INJURY TREATMENT AND REHABILITATION SERVICES

In terms of measurable health outcomes following injury treatment, the Otago University Prospective Outcomes of Injury Study (POIS)¹⁰ has recently published data about Māori health outcomes following injury treatment (MacLennan et al., 2013). The research, based upon a cohort of 566 participants who identified themselves as Māori, showed that significant numbers of Māori have measurably poorer health outcomes three months post injury on a wide range of measures:

- approximately 50% of Māori have difficulty walking, ongoing psychological distress, and some form of disability
- approximately 75% suffer ongoing pain or discomfort
- while the presence of adverse outcomes increased with injury severity, a high level of them were also present for minor injuries
- in spite of the adverse outcomes approximately 75% reported their health as being better than 'good'.

The authors argue their evidence suggests that more effort needs to be put into "improved strategies...for appropriate rehabilitation for injured Māori, irrespective of injury severity."

Unfortunately the authors have deliberately not provided comparisons with non-Māori (even though they have the data) on the basis that to do so would promote a 'deficit model' of health. The basis for this view is that while comparing Māori to non-Māori is common, and useful for illustrating differences in health between population groups, in reality it has been argued that such information is:

- not consistently used for evidence based decision-making, and is often only used for accountability purposes
- the comparison of Māori health status to non-Māori, is based upon a false assumption that the health of Māori and non-Māori are underpinned by the same value system

¹⁰ The study is a prospective longitudinal study comprising approximately 2500 participants recruited from ACC clients. The study aims to identify predictors of disability following injury (Derrett et al., 2009, 2011).

- while universal health indicators are important, they are limited in their capacity to capture the status of Māori health according to Māori concepts of health, and rarely involve Māori input in to their design (Russell et al., 2013).

However valid the argument might be, such a view does not help agencies who have to make use of scarce resources, which require them to identify and understand whether important differences exist between population groups in order to prioritise the resources to the populations most in need.

SUMMARY AND CONCLUSIONS

There are two perspectives that can be brought to bear on the question of whether ACC funded injury treatment and rehabilitation services are underutilised and whether the differences observed represent substantive inequality and inequity between the two main population groups of interest – Māori and non-Māori. The perspectives are the 'health lens' view, and the 'business insurance / actuarial' view.

The business insurance view suggests that any differences in service utilisation reflect individual decisions, and no intervention is required particularly if it is thought to compromise insurance principles.

In contrast, the 'health lens' approach argues that Māori have been shown to:

- be a population at high risk of injury (Feyer and Langley 2000)
- having levels of hospitalisation rates typically 30% to 50% higher than non-Māori (Ministry of Health and Accident Compensation Corporation., 2013; Ministry of Health, 2006; Robson & Harris, 2007)
- 33% higher head / traumatic brain injuries (Barker-Collo and Feigin 2009)
- 200% to 300% more spinal cord injuries (Dixon et al., 1993)

then a substantive argument can be made that ACC should be observing significantly higher Māori utilisation rates of ACC funded injury treatment and rehabilitation than those reported over time in internal ACC research reports.

The evidence for under-utilisation is most notable in the referral and uptake of a range of elective services and home and community support services. While the rates of Māori, weekly compensation claims are higher than non-Māori, there is reason to think the rates should be much higher and RTW duration longer, given the patterns of Māori participation in risky employment, injury profile and health loss due to injuries.

Furthermore, based upon the POIS study, robust evidence is beginning to emerge that Māori have poor injury treatment and rehabilitation outcomes using standard measures, even though many Māori perceive their health outcomes as satisfactory.

In summary the published evidence shows that

- Māori compared to non-Māori carry a disproportionate burden of injury across the whole domain of injury related health loss.
- Māori males and females experience twice the rate of injury-related health loss (as measured by DALYS) compared to non-Māori, with health loss from assault four times higher in Māori.

- The observed rates of types (nature) of injury for Māori were typically 1.5 to 2 times those of Non-Māori. The differences in type of injury are most evident for soft tissue injury and open wounds where the standardised rate ratio for Māori females was 6.4 and 2.8 for Māori males compared to Non-Māori. Māori also experienced higher rates of internal and crush injuries and injuries to the central nervous system.
- The greatest disparity in injury burden is experienced by Māori males – particularly by those under 35 years of age.
- Māori are over-represented in workplace statistics, probably largely due to the over-representation of Māori in the high-risk primary industry and other sectors such as construction.
- The social and economic cost per Māori injury fatality (\$6.72 million in 2008) is significantly higher than that of the total population (\$5.74 million); this is largely due to the loss of life amongst young Māori males.
- Internationally, the Māori experience of injury is similar to that of other indigenous peoples.
- There is emerging evidence that Māori receiving ACC funded injury treatment and rehabilitation services have poor health outcomes based on a suite of internationally accepted health outcomes measures, even though Māori report satisfaction with their outcomes.
- Māori as a population group, in general
 - do not seek injury treatment services soon enough
 - are not being referred for services to which they are entitled, by health care providers for a variety of reasons
 - experience more complex and problematic health outcomes from their injury treatment due to the presence of health comorbidities and delayed receipt of services
 - do not access services for a variety of reasons, which are outlined in more detail in the Report 2, which is a companion to this one.

The phenomena of under-utilisation by populations in most need of the care has been described as the 'inverse health care law' (Hart, 1971). This law says that the availability and use of good medical care tends to vary inversely with the need for it in the population. A variant of the law says that 'the concern of a population for its own health tends to vary inversely with the actual state of health of that population' (Dalrymple, 2012).

The New Zealand Medical Journal has observed that the reasons for these differences

'are entrenched systemic drivers of disparities and poor outcomes for Maori. These include social and environmental drivers, health system factors, health professional behaviours and institutional resistance to innovation....

the determinants of Maori health outcomes...include low incomes, poor housing, inadequate education, erratic employment and racism.

The impacts are complex and intergenerational...We use them to address 'confounding' although in the real world they are 'compounding' (Carr, 2013).

The challenge then is how to “generate new forces for change, and activate the next leap forward in Maori health (Carr, 2013)?

ACC Research has suggested that the ACC service delivery changes of 2009/10, while primarily aimed at cost control, may also have had a positive effect of improving services for Māori by introducing changes such as patient decision aids and an emphasis on using proven treatment pathways. This also suggests that the insurance / actuarial view need not be incompatible with a health lens view. This is because more sophisticated, refined and targeted service delivery pathways could be designed to meet the needs of specific population groups (and not only for Māori) according to their injury treatment and rehabilitation need and their socio-economic position and cultural preferences. ACC Research has provided guidance on this over the years. This is also the approach that has increasingly been trialled and adopted in the health sector for the last 15 years. Implicit in this is recognition that continuance of a ‘main stream one size / one size fits all approach’ is not sustainable in order to improve public trust and confidence, nor in the interests of financial prudence and achieving real health outcomes for the injured population (Wren, 2014).

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