



HEALTH QUALITY & SAFETY
COMMISSION NEW ZEALAND

Kupu Taurangi Hauora o Aotearoa

A Window on the Quality of New Zealand's Health Care

Acknowledgements

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Executive summary

Purpose of this report

New Zealanders expect and deserve safe health care of the highest quality. We have a complex health care system that helps prevent and treat illness every day, and provides care to those reaching the end of their life.

This report looks at currently available measures within a framework for understanding quality and considers 'How good is New Zealand's health care?' It seeks to create debate around the meaning and interpretation of the data presented, with a view to stimulating initiatives to improve our health and disability services.

Five specific questions are explored.

- When our patients most need to be **safe**, are they?
- Is the **experience of patients** being cared for in our system good?
- Is care **effective**, with the right care providing good outcomes?
- Do we provide an **equitable** system with good health care for all, regardless of sex, ethnicity, age or income?
- Does our system provide good **value for money** – does it avoid waste and deliver good outcomes for the resources used?

The report draws on data from:

- the Health Quality & Safety Commission's (the Commission's) quality and safety indicator set (see Appendix 3)
- the Commission's Atlas of Healthcare Variation (see Appendix 3)
- the Organisation for Economic Co-operation and Development's (OECD) health care quality indicator data set
- Ministry of Health data
- the Commonwealth Fund's international survey series.

Online references for this data are included in Appendix 1.

A window in time

The title of this report – *A Window on the Quality of New Zealand's Health Care* – has been carefully chosen. The report uses a framework similar to other system-wide framework approaches, such as the OECD's health care quality indicator data set, to provide a snapshot or 'window' into the quality of health care in New Zealand at a particular point in time.

This 'partial view' is built using previously published, reliable, validated data. However, while the best available, this data is not always complete or perfect. In the same way light through windowpanes changes and creates different patterns and shades, the view through the window will change over time as new data is added and interpretations change. Appendix 2 provides further information about why we chose the individual measures included in the report.

New Zealand health and disability support services have started to monitor quality of care more systematically in recent years. The quality accounts, published for the last two years by all district health boards (DHBs), are



an important step in this journey. To really make quality the centre of our health services we now need a consistent 'dashboard' of comparable measures covering all aspects of quality, used by providers across the whole system to track their progress.

The framework described in this report is a starting point for this. Many of the measures can easily be replicated locally. Monitoring, reporting and responding to these measures should drive improvement, transparency and accountability.

Findings

The evidence in this report indicates New Zealand's health and disability system is as good as, or better than, the health systems in most other similar developed countries for 7 out of the 10 measures where robust international comparison is possible. Most of the measures are improving or maintaining their position. A high proportion of patients report they were treated with dignity, respect, kindness and compassion in our hospitals. International comparisons show our health care system provides good value for money and helps people live longer, healthier lives.

Specifically:

- Disability adjusted life years lost¹ (DALYs) per 100,000 population in New Zealand is seventh lowest of those OECD nations measured by the World Health Organization (WHO) – similar to Australia and lower than most western European countries, the US and Canada. This shows our health system is effective in helping people live longer, healthier lives.
- Early results from a new national patient experience survey for inpatients show positive results compared with jurisdictions such as England, Sweden and Canada. Patients generally have a good experience in hospital, and feel they are treated with dignity, respect, kindness and compassion.
- The system has addressed inequity in some targeted areas – notably immunisation, in which large disparities between Māori and non-Māori child vaccination rates have been almost eliminated in five years.
- Our health system is relatively inexpensive compared with similar countries – New Zealand is the 18th highest of 34 OECD countries in per capita expenditure on health care. Less is spent than in nearly all comparable English-speaking and northern European countries. This, combined with results similar to or better than these countries for most quality measures, suggests a system which provides good value for money.
- Specific process measures² have improved over the past three years. For example:
 - the use of insertion bundles to prevent central line associated bacteraemia (CLAB) is now routine in intensive care units (ICUs), and generally in other settings as well. This is comparable with the State of Michigan and better than most other countries
 - New Zealand's compliance with best practice hand hygiene requirements has increased from 62 percent in 2012 to 77 percent in 2015. This is similar to recent data for Australia and Canada.
- Outcomes³ are more variable:
 - The rate of CLAB infection in ICUs has fallen from 3.3 per 1000 line days in 2011 to 0.37 in 2014 and is now very rare. New Zealand performs well internationally on this measure.

1. Years of life lost or disabled, based on expected years of healthy life.

2. Process measures show whether or not desired changes in practice have occurred at a local level (eg, giving older patients a falls risk assessment and developing a care plan for them).

3. Outcome measures focus on harm and cost that can be avoided.

- Rates of *Staphylococcus aureus* bacteraemia (a common bacterial infection in hospitals) have not changed. New Zealand's rates are slightly higher than Australia's and lower than Scotland's.
- There has been an increase in postoperative sepsis in recent years. The cause is unclear and further work is needed to understand and address this increase. New Zealand does not compare well with other countries in this measure.

There are three clear areas for improvement:

- Inequity in access. New Zealanders report economic barriers in access to health care second only to the US. This data precedes recent initiatives to provide free access to general practitioners (GPs) for children aged under 13. However, the Atlas of Healthcare Variation provides several other examples of variation between ethnic groups in use of the most appropriate care.
- Harm to patients - as illustrated by the Commission's annual report of serious adverse events.⁴
- Variation in patterns of care, even when taking into account the different needs of populations, or the wishes of individual patients.

4. Health Quality & Safety Commission. 2014. *Making health and disability services safer: Serious adverse events reported to the Health Quality & Safety Commission 1 July 2013 to 30 June 2014*. Wellington: Health Quality & Safety Commission. URL: <http://www.hqsc.govt.nz/publications-and-resources/publication/1832> (accessed July 2015).



1 Understanding the quality of our health care system

1.1 What does a high-quality health care system look like?

Our aim in producing this report is to enable evaluation of the quality and performance of our health care system and inform initiatives to improve the experiences and outcomes of patients across the country.

To do this, we need to understand what a good health care system looks like, and what measures might help us judge our system.

Quality in health care is not static. New Zealand already has a high-quality health care system from many perspectives, but as with all health care systems there is room for improvement. A major reason for measuring the performance of the system is to drive and track improvement over time. The New Zealand Triple Aim provides a focus for this improvement:

- improved quality, safety and experience of care for the individual
- improved health and equity for all populations
- best value for public health system resources.

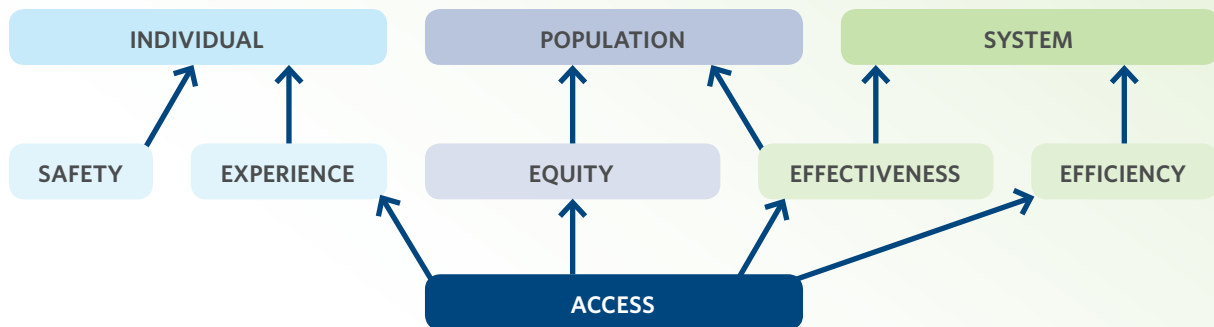


The Triple Aim balances the needs of **individuals** (for care responsive to their needs and preferences), the **population** (by recognising the needs of all) and the economy (by seeking an affordable and sustainable **system**).

The US Institute of Medicine has defined six dimensions of quality:

- **Safety** – When the patient most needed to be safe, were they?
- **Patient experience** – How did it feel to be cared for in our system?
- **Effectiveness** – The right care providing good outcomes.
- **Equity** – Good health care for all, regardless of gender, ethnicity, age or income.
- **Timeliness/Access** – Did the system provide care quickly once a need was recognised?
- **Efficiency** – Does the system avoid waste – and thus cost – in supplies, equipment, space, capital, ideas, time and opportunity?

These feed into the Triple Aim:



These headings group various measures of the quality of our system, at a high level and in more detail.

Our various measures of harm, such as infections or injury from falls, provide information about the safety of our health care in relation to **individuals**, while measures of mortality amenable to health care and many of our measures of equity provide information about the health of the **population**. Our measure of potentially avoidable expenditure on hospitalisation of older people with multiple admissions provides an insight into the value provided by the **system**.

1.2 Why do we measure?

Measuring the right things well and publicising the results stimulates improvement in quality.^{5,6,7} Measurement is very important in improving health care. Our health care workers want to do the best they can, but to direct their efforts and monitor progress they need to know how well they are doing now, what to improve and whether or not their efforts are working. Fairness and transparency are also important – the public pays for health care and has a right to know how good it is.

1.3 The challenges of measurement

Health quality measures tend to be either very general and high level – such as mortality rates – or very focused on the individual – such as the rate of falls in hospital causing injury. It can be hard to attribute reasons for performance for high-level measures (for example, a high mortality rate may reflect the underlying health of a population, access to health care, the quality of the health care once accessed or other reasons). Lower-level measures may be unrepresentative of the wider situation – a hospital may do well on one indicator (rate of falls, for example) and poorly on another (the rate of *S aureus* infections, for example). For this reason we have chosen a selection of measurements at both levels (sometimes referred to as system level measures and contributory measures, or more colloquially ‘big and little dots’⁸) to populate our framework.

This report uses only measures which are currently publicly available, have been through testing and development somewhere in the world, and have been shown to be useful.

Table 1 shows the measures we have selected inside a framework based on the level of the measures and the elements of quality.

5. Marshall MN, Shekelle PG, Leatherman S, et al. 2000. The public release of performance data: what do we expect to gain? A review of the evidence. *JAMA* 283(14): 1866–74.
6. Hibbard JH, Stockard J, Tusler M. 2005. Hospital performance reports: impact on quality, market share, and reputation. *Health Aff (Millwood)* 24(4): 1150–60.
7. Marshall MN, Shekelle PG, Davies HT, et al. 2003. Public reporting on quality in the United States and the United Kingdom. *Health Aff (Millwood)* 22(3): 134–48.
8. Doolan-Noble F, Lynton M, Hau S, et al. 2015. How well does your health care system perform? Tracking progress toward the triple aim using system level measures. *NZMJ* 128(1415).



The window on quality

Table 1: Measures selected inside a framework, based on the level of the measures and the elements of quality

		Safety	Experience	
System measures	Overall harm estimates	Adverse events in hospital (academic) 2002	Scores out of 10 for the four domains of patient experience (QSI) 2014 	
		DALYs lost to adverse health events (MoH) 2013		
Contributory measures	Common individual harms and their avoidance	In-hospital falls with fractured neck of femur (QSM) 2014 	Highest and lowest scoring questions in the patient experience survey (QSI) 2014 	
		Central line insertions using bundle (QSM) 2014 		
		CLAB (QSM) 2014 		
		Compliance with WHO Five Moments of Hand Hygiene (QSM) 2014 		
		<i>Staphylococcus aureus</i> bacteraemia rates (QSM) 2014 		
		Postoperative sepsis (QSM) 2014 		
		Postoperative DVT/PE (QSM) 2014 		
		Protecting prescribing risks	Polypharmacy among older people (Atlas) 2011 	
			Older people prescribed with an antipsychotic and a benzodiazepine (Atlas) 2011 	

Symbols

INTERNATIONAL COMPARISON

Green globe - best (3-5 countries), best or 2nd best (6-7 countries), top quartile (more than 7 countries); **Red globe** - worst (3-5 countries), worst or 2nd worst (6-7 countries), bottom quartile (more than 7 countries); **Yellow globe** - performance between green and red; **Grey globe** - fewer than 3 countries had data.

DIRECTION OF TRAVEL

Green arrow - statistically significant improvement; **Yellow arrow** - no statistically significant change; **Red arrow** - statistically significant deterioration; **Grey arrow** - insufficient data.

VARIATION

Green dots - variation smaller than 1.5-fold between top and bottom; **Yellow dots** - variation 1.5-2-fold; **Red dots** - variation greater than 2-fold; **Grey dots** - no data.

Effectiveness		Equity	Efficiency	
Ultimate outcome measures	Age standardised amenable mortality rates (academic) 2006 	We have taken the approach of looking at a range of measures by different groups rather than one overarching equity measure	Overall cost per capita	DALYs per 100,000 population against per capita expenditure on health care (OECD) 2010
	DALYs per 100,000 population (WHO) 2012 			
Coordination of care	Occupied bed-days associated with people aged 75 and over who admitted to hospital as an emergency two or more times (QSI) 2014 	Ethnicity	Costs of harm	Estimated cost of CLAB (QSM) 2014
	Community follow-up of mental health patients (QSI) 2013 			Childhood immunisation by ethnicity (QSI) 2013
Patients receiving recommended medication	People with gout who received allopurinol regularly (Atlas) 2011 	Economic status	Costs of uncoordinated care and unwarranted variation	Estimated potentially avoidable expenditure on hospitalisation of older people with multiple admissions (QSM) 2014
	People with diabetes who received insulin or metformin regularly (Atlas) 2013 			People with diabetes who received insulin or metformin regularly (Atlas) 2013
		Access to health care by income group (Commonwealth Fund) 2013 		Potentially unwarranted variation in care: hospital admissions for diabetes 2013; hospital admissions for gout 2011 (Atlas)
				Cancelled operations (QSI) 2013



Abbreviations

CLAB = central line associated bacteraemia

DALYs = disability adjusted life years

DVT/PE = deep vein thrombosis/pulmonary embolism

HbA1c = glycated haemoglobin

WHO = World Health Organization

Sources

Academic - Academic study published in peer-reviewed journal

Atlas - Health Quality & Safety Commission Atlas of Healthcare Variation

Commonwealth Fund - Commonwealth Fund comparative study of international health systems

MoH - Ministry of Health published report

OECD - Organisation for Economic Co-operation and Development health statistics

QSI - Health Quality & Safety Commission quality and safety indicator set

QSM - Health Quality & Safety Commission quality and safety markers

WHO - World Health Organization global burden of disease study

Full sources are available in Appendix 1.

1.4 Our complex health system

Every day across our 20 DHBs, 3000 patients enter New Zealand's hospitals. Thousands more see a GP or primary health care nurse, use diagnostic and screening services, or consult with pharmacists, physiotherapists and other health care professionals. At such a scale (health care made up 10 percent of New Zealand's economy in 2011),⁹ experiences and outcomes vary widely.

Box 1: The scale of New Zealand's health sector, 2013-14

Cost: \$14.7 billion

Employees: 250,000 (10 percent of the national workforce)

Hospital admissions (inpatient cost-weighted discharges): 800,000

Outpatient discharges: 250,000

Prescriptions dispensed each year: over 50 million

1.5 How can we judge quality?

This report evaluates quality in three ways.

- We compare New Zealand's health system with health systems in similar countries.
- We see whether New Zealand's health system is getting better or worse over time.
- We look at variation in practices or outcomes between different parts of the country and between different groups of patients.

International comparisons

We have used international comparisons where we can, but these need cautious interpretation. Different countries often measure the same things in slightly different ways. Differences in the way health care is organised may make a measure useful in one country and irrelevant in another. International comparisons are not always possible or valuable.

This report uses a comparison set for Australia, Canada, Sweden, the UK and the US. As well as having more published comparable measures than most other countries, all except Sweden are English-speaking with many cultural similarities to New Zealand. Not all measures can be reported for all countries. Where data is taken from OECD or WHO international comparative data, all countries included are reported. Where confidence intervals (CIs) (explained in Box 2) are available these are reported and the statistical inference highlighted. In many cases these are not available, as data is not reported in a scientific format.

Change over time

Measuring change over time can show whether processes or outcomes are getting better or worse. However, we need to distinguish genuine change from random variation, or 'noise' (see Box 2). There are some techniques for this, which we refer to later.

9. OECD Data. Health resources: Health spending. 2013. URL: <https://data.oecd.org/healthres/health-spending.htm> (accessed July 2015).



Change also needs to be considered in context. The fact something has improved does not necessarily mean it is now good. The biggest improvements may be in areas where performance was worst and improvement is easiest to make. The reverse is also true: if a result is already very good, further improvement may be very difficult.

Box 2: When does a change count? Statistical process control, special and common cause variation

Rates go up or down a little every time they are measured. Commentators may portray these apparent changes as evidence of improvement or deterioration when in fact they may just be a reflection of random variation. There are well-established statistical methods that identify which changes are meaningful. In this document we use one of these – statistical process control – to differentiate sustained, meaningful changes (or special cause variation) from this random ‘noise’, also known as common cause variation.

The simplest form of this analysis is known as a run chart. By plotting data for each time period (normally in this case a month) against the median value for the whole period we can identify trends in data. In particular we note ‘shifts’ in data when there are six or more consecutive points above or below the median line. This identifies a statistically significant sustained change in performance. Once a shift is observed the median line can be moved to reflect the post-shift median. Figure 1, which looks at the rate of in-hospital falls over time, shows a run chart where no statistically significant sustained change in performance is shown.

A control chart is a more sophisticated version of a run chart. It sets the average (mean) level and shows control limits (set 3 sigma away from the mean) to show when a process is literally ‘out of control’. Points outside of the control limits are described as outliers – that is, they have a difference from the average so great that this cannot be ascribed to chance alone. There are also rules concerning shifts; in this case eight points one side or other of the mean demonstrates a sustained shift up or down.

We use 95 percent CIs to denote significant differences between population groups or countries, wherever these are available or calculable. These show the range where we believe a true value to lie. If two values (eg, the infection rate in two countries) are different and their CIs do not overlap, we can be confident the values are likely to be different and that this is not a result of chance. The word ‘significant’ is only used when this denotes a statistically significant difference.

A full statistical appendix for this report is available at www.hqsc.govt.nz.

Variation in New Zealand

Understanding where and why variation in health care exists is important. Variation based on differences between patients is appropriate. Variation based on differences in practice between providers or institutions is usually inappropriate, but unfortunately this type of variation is common in health care. Variation may point to geographical areas or groups of people receiving poorer care than others.

Variation may reflect a lack of evidence or consensus about what best care is for certain conditions. Typically, variation shows underuse, overuse or both. Underuse is obviously undesirable, but overuse is also a concern when resources are limited. Overuse places patients at unnecessary risk of harm from treatments that are not really warranted. It also uses money that could be spent on providing services to those in greater need. Reducing inappropriate variation in health care tends to improve quality overall. Very wide variation is usually a sign that improvements can be made and should stimulate discussion over best practice and how to ensure everyone is receiving appropriate care.

2 Is our health care safe?

The Health Quality & Safety Commission promotes simple interventions to improve patient safety and the quality of care, including in these four areas: falls, healthcare associated infections, surgical harm and medication safety.

In this section we consider progress in reducing harm in these areas and ask: Why does this matter? What do we know? Has there been any change? How do our results compare internationally?

For the most part, New Zealand delivers safe patient care. However, all health care carries some risks, and patients are still being harmed in New Zealand, sometimes with serious and long-term consequences. The total extent of this is unclear. In 2002, Davis and colleagues¹⁰ found that 12.9 percent of hospital admissions were associated with an adverse event, although nearly a fifth of these occurred outside a public hospital and most adverse events had only minor patient impact.

This is in line with reports on health care systems worldwide.^{11,12,13} This figure has been the basis of further work as part of the burden of disease project and the Ministry of Health has estimated that, in 2006, 30,000 DALYs were lost as a result of adverse health care events (see Box 3).¹⁴

Box 3: Disability adjusted life years

The Ministry of Health report *Health Loss in New Zealand*¹⁵ sets out DALYs as a measure.

DALYs measure the gap between the population's current state of health and that of an ideal population in which everyone experiences long lives free from illness or disability. This definition comprises years of life lost – based on expected years of life at each age compared with the lowest observed death rates for each age across all countries – and years lived with disability – time spent in less than full health.

This figure of 30,000 DALYs lost gives some indication of the need to improve the safety of our health care system, but it is an estimate based on an extrapolation made from a study which had certain limitations (as all such studies do) nearly 15 years ago. The study has not been repeated, so a more recent and relevant figure is not available. However, the annual reports of serious adverse events show there is still room for improvement in the safety of our hospital services, at least. We know less about the safety of primary health care or disability services in New Zealand.

10. Davis P, Lay-Yee R, Briant R, et al. 2002. Adverse events in New Zealand public hospitals I: occurrence and impact. *NZMJ* 115(1167): U271.

11. Kohn T, Corrigan J, Donaldson M (eds). 2000. *To Err Is Human: Building a Safer Health System*. Washington: National Academy of Sciences. URL: <http://www.nap.edu/catalog/9728/to-err-is-human-building-a-safer-health-system> (accessed July 2015).

12. Wilson RM, Runciman WB, Gibberd RW, et al. 1995. The Quality in Australian Health Care Study. *Med J Aust* 163(9): 458-71.

13. Department of Health. 2000. *An organisation with a memory*. London: Department of Health.

14. Ministry of Health. 2013. *Health loss in New Zealand: a report from the New Zealand Burden of Disease, Injuries and Risk Factors Study 2006-16*. Wellington: Ministry of Health. URL: <http://www.health.govt.nz/system/files/documents/publications/health-loss-in-new-zealand-final.pdf> (accessed July 2015).

15. Ministry of Health. 2013. *Health Loss in New Zealand: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study, 2006-2016*. Wellington: Ministry of Health. URL: <http://www.health.govt.nz/publication/health-loss-new-zealand-report-new-zealand-burden-diseases-injuries-and-risk-factors-study-2006-2016> (accessed July 2015).



2.1 Broken hip (fractured neck of femur) after a fall in hospital

Why does this matter?

We know around half of all serious adverse events reported in New Zealand's hospitals involve patients falling. Just under half of the serious falls reported result in a patient breaking his or her hip (ie, in a fractured neck of femur). Many patients fall and injure themselves in the community, but each week, two patients break their hips in New Zealand's hospitals, where events of this type should be rare. These injuries can lead to long-term loss of mobility, loss of confidence and social function, and greater risk of dying within a year of the fall.¹⁶ In addition, each patient who falls stays an average of a month longer at hospital, at a minimum cost of around \$30,000.

What do we know?

Around 100 falls with a fractured neck of femur have been recorded in New Zealand hospitals each year since 2008-09. Expressed as a rate, this represents around 11 patients for every 100,000 hospital admissions for patients aged 15 and over since July 2011.

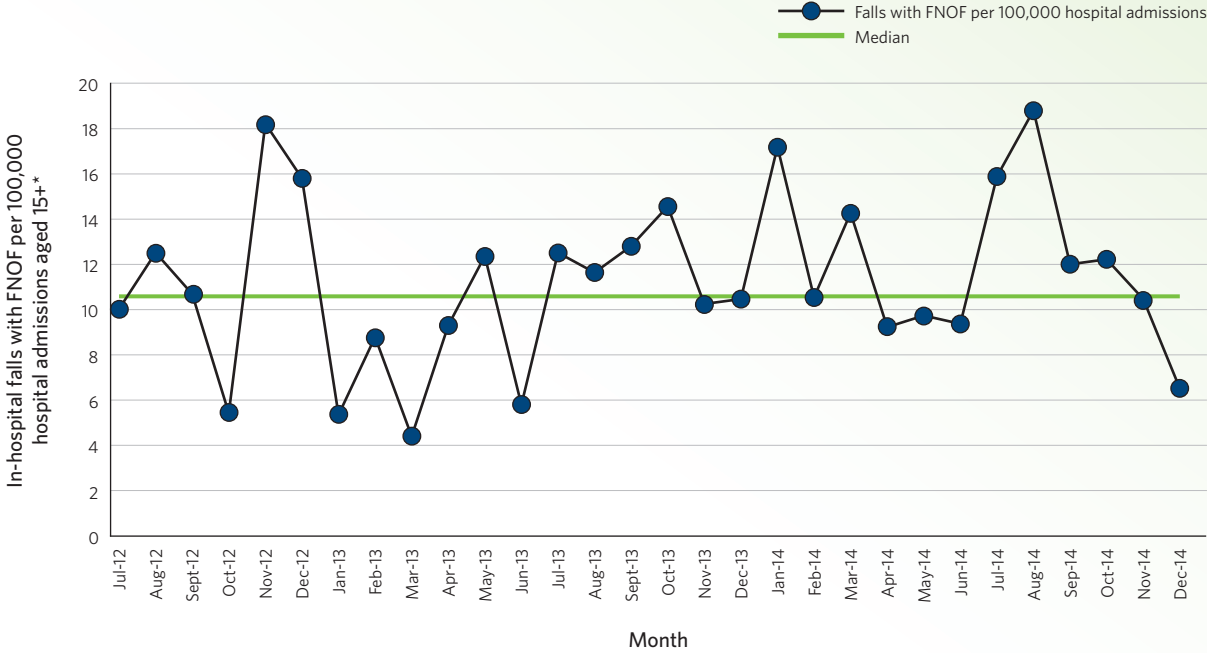
To put this in context, more than 3000 patients in total are treated for broken hips each year – obviously, most occur out of hospital.

Has there been any change?

Since July 2012 the rate of in-hospital falls resulting in a fractured neck of femur has averaged just over 10 per 100,000 admissions for people aged 15 and over, or just under two per week. Random variation can be seen, but no evidence of a systemic change.

16. Osteoporosis New Zealand. 2012. *Bone Care 2020*. Wellington: Osteoporosis New Zealand.

Figure 1: In-hospital falls leading to a fractured neck of femur (FNOF) in people aged 15 and over, by month, 2012-14



*The rate is directly standardised for the age, gender and admission method of patients, using 2011-12 as a reference year for these variables

International comparison

International comparisons are not straightforward as relatively few countries collect and publish this measure systematically. The UK National Health Service (NHS) hip fracture database is the closest equivalent to a national collection, but even this requires combination with routine administrative data. From this we can make no conclusion about how New Zealand compares with other countries.



Table 2: In-hospital falls with fractured neck of femur per 100,000 admissions aged 15 and over, New Zealand and international comparators, 2013

Country	Falls per 100,000 admissions (2013)
New Zealand	11.0
Australia	N/A
England*	17.7 ^{17,18,19}
Scotland	N/A
United States	N/A
Canada	N/A
Sweden	N/A

*England and Wales

2.2 Healthcare associated infections

Why does this matter?

Infections associated with health care are common worldwide. The Commission's patient safety programmes have included improving hand hygiene, preventing surgical site infections (SSIs) and preventing CLAB (a bacterial infection of the blood) in ICUs.

S aureus bacteraemia is the most common healthcare associated infection in New Zealand hospitals, and is linked to having to spend more time in hospital, disability and even death. Good hand hygiene is one way of reducing the risk of this infection.

CLAB in very sick patients in ICUs has long been a problem in healthcare. It can produce severe illness, prolong hospital stay and may sometimes be fatal. A certain rate of CLAB has previously been considered inevitable. Recent evidence, however, shows that the introduction of a small and low-cost bundle of interventions can virtually eliminate these infections. New Zealand established a collaborative²⁰ - *Target CLAB Zero* - bringing together all DHBs in the country to do this.

17. Royal College of Physicians. 2014. *National Hip Fracture Database Annual Report 2014*. p61 - numerator. London: Royal College of Physicians. URL: [http://www.nhfd.co.uk/20/hipfractureR.nsf/vwcontent/2014reportPDFs/\\$file/NHFD2014ExtendedReport.pdf?OpenElement](http://www.nhfd.co.uk/20/hipfractureR.nsf/vwcontent/2014reportPDFs/$file/NHFD2014ExtendedReport.pdf?OpenElement) (accessed July 2015).

18. Health and Social Care Information Centre (HSCIC). 2014. Provisional Monthly Hospital Episode Statistics for Admitted Patient Care, Outpatients and Accident and Emergency Data - April 2013 to December 2013. Denominator England. URL: <http://www.hscic.gov.uk/searchcatalogue?productid=14416&q=HES+online&topics=1%2fHospital+care%2fAdmissions+and+attendances&kwd=H&sort=Relevance&size=10&page=1#top> (accessed July 2015).

19. NHS Wales Informatics Service Information Services. nd. Patient Episode Database for Wales (PEDW) Statistics - data for the period 1st April 2012 to 31st March 2013. NHS Hospital in-patients - All Welsh Providers - Denominator Wales. URL: <http://www.infoandstats.wales.nhs.uk/documents/869/WA%20Providers.pdf> (accessed July 2015).

20. In a collaborative, teams of health care providers work independently to test out changes in how they deliver care that seeks to implement best practices and accepted standards for the collaborative's topic area. Teams use a common set of indicators to measure the quality of the care processes the collaborative is trying to improve and, where possible, the desired health outcomes. The collaborative organises regular sharing of results among teams through learning sessions in which teams learn from each other about which changes have been successful and which have not. This results in a dynamic improvement strategy in which many teams working on related problem areas can learn from each other in a way that facilitates rapid dissemination of successful practices. In its emphasis on spread and scale-up of improvements, the improvement collaborative model offers a powerful new tool in the arsenal of proven quality improvement methods. See: <http://www.hqsc.govt.nz/our-programmes/infection-prevention-and-control/projects/prevention-of-central-line-associated-bacteraemia/>.

SSIs can cause serious illness, longer hospital stays, long-term disabilities, emotional and financial stress, and loss of life. A significant number of SSIs are preventable through the right interventions:

- timely and appropriate antibiotic prophylaxis
- skin preparation
- clipping, not shaving, of surgical sites.

What do we know?

Central line associated bacteraemia

The introduction of the *Target CLAB Zero* collaborative to prevent CLAB has been a major success. The use of the insertion bundle is now routine (used in more than 95 percent of cases in the last six months, see Figure 2) with the result that CLAB infection in ICUs is now a very rare event.

Since April 2012, the national CLAB rate has been 0.37 cases of CLAB per 1000 line days (see Figure 3), compared with 3.32 in 2011. The baseline figure was collected as part of the collaborative over three months, but is shown as just one point on the run chart.

Figure 2: Central line insertions in ICUs compliant with the insertion bundle, by month, 2012-14

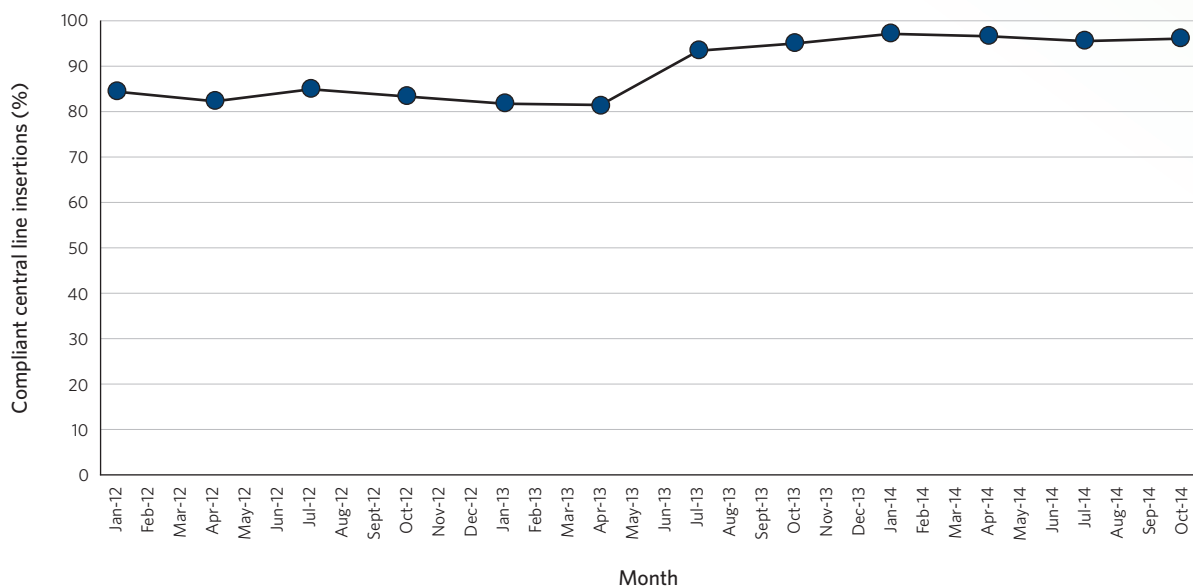
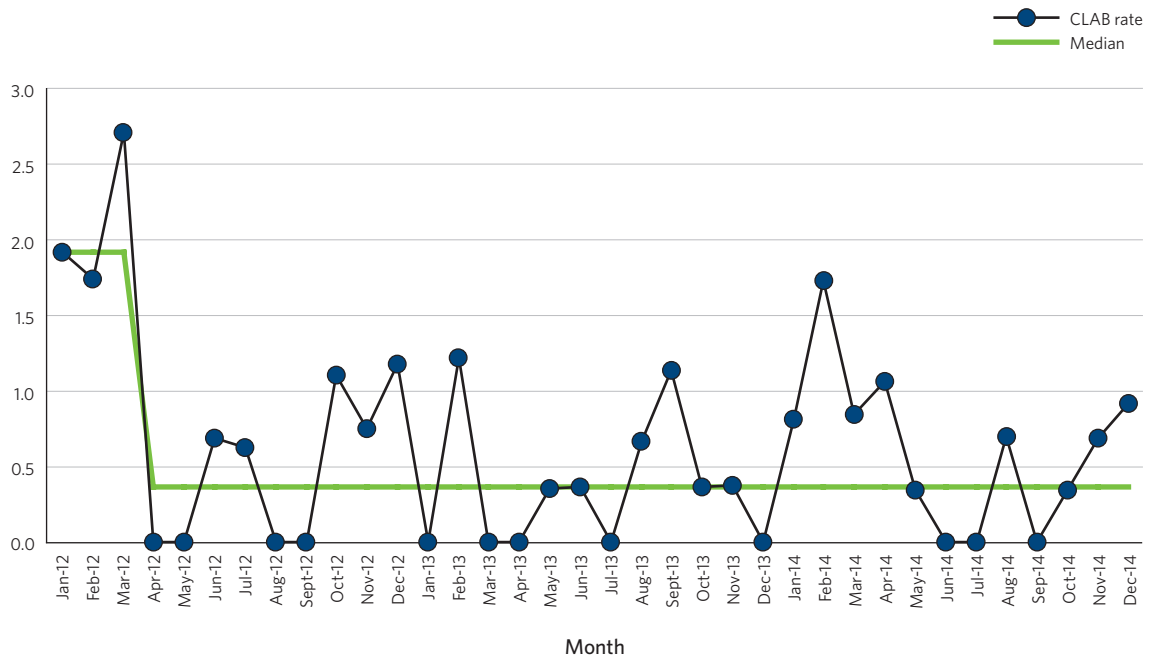




Figure 3: CLAB rate per 1000 line days, by month, 2012-14



International comparisons

Programmes to reduce cases of CLAB have not happened everywhere. CIs are inconsistently published on this data, limiting our ability to tell if differences are significant. New Zealand's raw reported CLAB rate is nonetheless lower than those reported by most other countries, and this figure for New Zealand as a whole performs as well as the best sites in the US.²¹

21. Institute for Healthcare Improvement (IHI). nd. Memberships: Central Line Bundle. URL: <http://www.ihl.org/Engage/Memberships/MentorHospitalRegistry/Pages/CentralLineBundle.aspx> (accessed July 2015).

Table 3: CLAB rate per 1000 line days, New Zealand and international comparators

Country	CLAB per 1000 line days
New Zealand	0.37 (0–0.71)
Australia*	0.35 ²²
England	1.48 (2010) ²³
Scotland	<1 (2010–11) ²⁴
United States	1.65 (2009) ²⁵
Canada**	0.48 (2012) ²⁶
Sweden	N/A

*New South Wales

**Ontario

95% CIs in parenthesis for New Zealand figure

Box 4: Quality and safety markers combining process and outcome measures

The Commission measures progress against safety priorities through a combination of process (ie, good safety practice like hand hygiene or use of the central line insertion bundle) and outcome (ie, the related harms that we are trying to prevent). These are known as quality and safety markers and are published on a quarterly basis.

The balance of these two measures allows us to track uptake of good practice but relate to real results for patients, avoiding the trap of 'hitting the target but missing the point'.

What do we know?

Hand hygiene

Improved hand hygiene practices, such as compliance with the WHO Five Moments for Hand Hygiene (Table 4), are a key way to prevent healthcare associated infections, including antibiotic-resistant infections within hospitals.

22. Clinical Excellence Commission (CEC) New South Wales. nd. Central Line Associated Bloodstream Infection. URL: <http://www.cec.health.nsw.gov.au/echartbook/cec-indicators-intro-chartbook/cec-indicators-clab-icu>.

23. Bion J, Richardson A, Hibbert P, et al. 2013. 'Matching Michigan': a 2-year stepped interventional programme to minimise central venous catheter blood stream infections in intensive care units in England. *BMJ Qual Saf* 22(2): 110–23.

24. NHS Scotland. 2011. *NHS Scotland Chief Executive's Annual Report 2010/11*. Edinburgh: NHS Scotland. URL: <http://www.gov.scot/Publications/2011/11/10140644/0> (accessed July 2015).

25. Centers for Disease Control and Prevention (CDC). 2011. Vital signs: central line-associated blood stream infections—United States, 2001, 2008, and 2009. *MMWR Morb Mortal Wkly Rep* 60(8): 243–8. URL: <http://www.cdc.gov/mmwr/pdf/wk/mm60e0301.pdf> (accessed July 2015).

26. Health Quality Ontario. 2012. *Quality Monitor 2012: Report on Ontario's Health System*. Toronto: Health Quality Ontario. URL: <http://www.hqontario.ca/portals/0/Documents/pr/qmonitor-full-report-2012-en.pdf> (accessed July 2015).



Table 4: Hand Hygiene New Zealand programme WHO Five Moments for Hand Hygiene

<p>When:</p> <ul style="list-style-type: none"> • Moment 1: before patient contact • Moment 2: before a procedure <p>Why:</p> <p>To protect the patient against harmful germs, including the patient's own, from entering his/her body</p> <p>When:</p> <ul style="list-style-type: none"> • Moment 3: after a procedure or body fluid exposure risk • Moment 4: after patient contact • Moment 5: after contact with patient surroundings <p>Why:</p> <p>To protect yourself and the health care environment from harmful patient germs</p>

There has been a gradual increase in the New Zealand average of audited 'moments' compliant with hand hygiene good practice over the last year. The programme currently has a target of 75 percent of observed moments to be compliant. This has been achieved in New Zealand since October 2014, with 77 percent of moments currently compliant, and 15 out of 20 DHBs meeting this threshold (Figure 4).

Figure 4: New Zealand overall hand hygiene compliance rate and qualifying DHBs reaching threshold level, by month, 2012-15

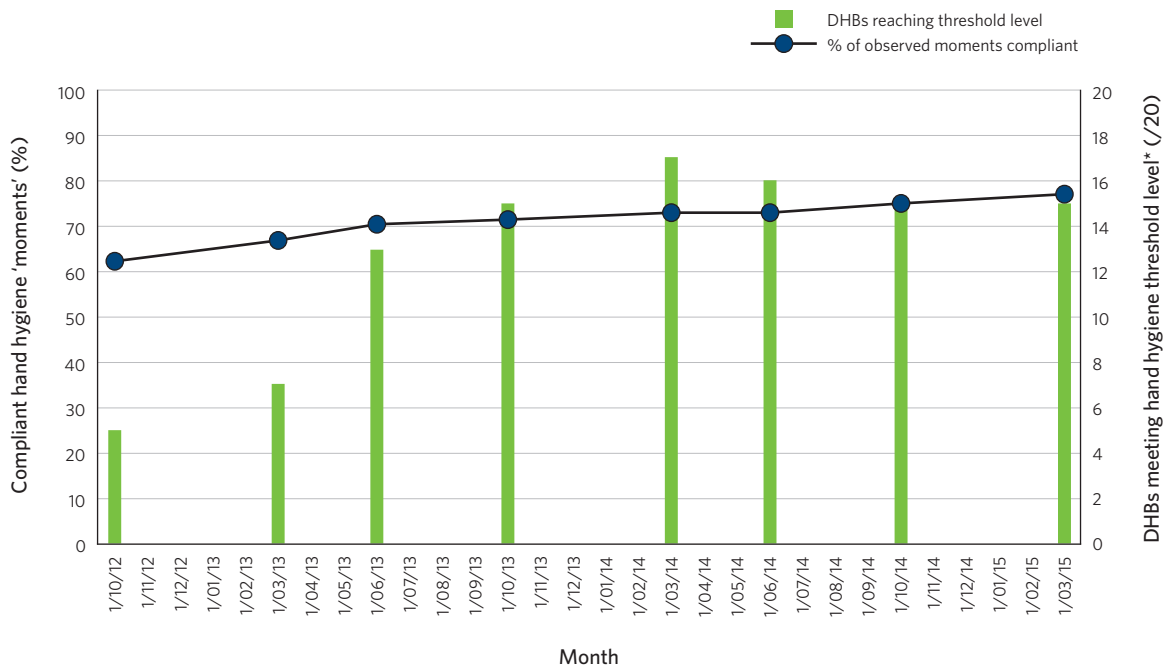


Table 5 shows that New Zealand's performance on this measure remains 5 percent lower than Australia's – a statistically significant difference. Scotland's recorded compliance is exceptionally high.

Table 5: Compliance with the WHO Five Moments for Hand Hygiene, New Zealand and international comparators

Country	Compliance with the WHO Five Moments for Hand Hygiene
New Zealand (March 2015)	77.4% (77.0–77.8%) ²⁷
Australia (March 2015)	82.2% (82.1–82.3%) ²⁸
England	N/A
Scotland (August 2013)	96% (95–97%) ²⁹
United States	N/A
Canada* (2011)	72% before patient contact, 83% after patient contact ³⁰
Sweden	N/A

*Ontario

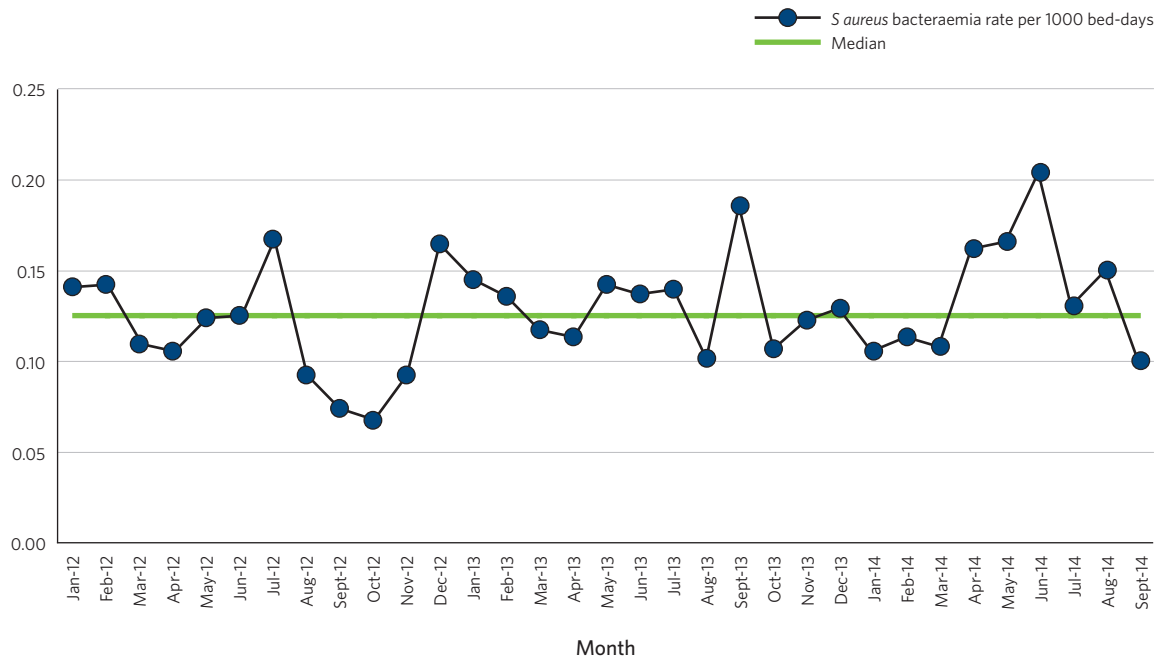
95% CIs in parenthesis

We measure the *S aureus* bacteraemia rate per 1000 bed-days to track progress against infection. This rate has remained consistent, at just over 0.12 cases of *S aureus* bacteraemia per 1000 bed-days, for two and a half years, with little sign as yet of a sustained reduction (see Figure 5).

27. Health Quality and Safety Commission. 2015. *Hand Hygiene New Zealand. National Hand Hygiene Performance Report 1 November 2014 to 31 March 2015*. Wellington: Health Quality & Safety Commission. URL: <http://www.handhygiene.org.nz/images/stories/HHNZDOWNLOADS/National%20Hand%20Hygiene%20Report%201%20November%202014%20to%2031%20March%202015%20Final.pdf> (accessed July 2015).
28. Hand Hygiene Australia. 2015. National Data Period One, 2015. Heidelberg: Hand Hygiene Australia. URL: <http://www.hha.org.au/LatestNationalData.aspx> (accessed July 2015).
29. National Hand Hygiene NHS Campaign. 2013. *Compliance with Hand Hygiene - Audit Report. 27th Bi-monthly Report (September 2013)*. Glasgow: Health Protection Scotland. URL: <http://www.documents.hps.scot.nhs.uk/hai/infection-control/national-hand-hygiene-campaign/audit-report-2013-09-25.pdf> (accessed July 2015).
30. Health Quality Ontario. 2012. *Quality Monitor 2012: Report on Ontario's Health System*. Toronto: Health Quality Ontario. URL: <http://www.hqontario.ca/portals/0/Documents/pr/qmonitor-full-report-2012-en.pdf> (accessed July 2015). (NB: uses a slightly different measure of before and after patient contact rather than the full five moments.)



Figure 5: *S aureus* bacteraemia rate per 1000 bed-days, by month, 2012-14



International comparisons

Only a few countries consistently report rates of *S aureus* bacteraemia. New Zealand's *S aureus* bacteraemia rate is significantly higher than Australia's and lower than Scotland's. To give a sense of the effect of this, if New Zealand was to achieve Australia's reported level of *S aureus* bacteraemia, there would have been 71 fewer infections in the country in 2013-14, although had the rate been the same as Scotland's, New Zealand would have had 412 more infections.

Table 6: *S aureus* bacteraemia rate per 1000 bed-days, New Zealand and international comparators, 2013-14

Country	<i>S aureus</i> bacteraemia rate per 1000 bed-days
New Zealand	0.13 (0.12-0.15)
Australia	0.1 (0.09-0.11) ³¹
England	N/A
Scotland	0.31 (0.29-0.33) ³²
United States	N/A
Canada	N/A
Sweden	N/A

95% CIs calculated by the Commission using published data

31. National Health Performance Authority. 2015. Hospital performance: Healthcare-associated *Staphylococcus aureus* bloodstream infections in 2013-14. Sydney: National Health Performance Authority. URL: http://www.myhospitals.gov.au/docs/default-source/our-report-pdfs/hp-if_sab_2013_14_rpt.pdf (accessed July 2015). (Calculated from benchmarked results).

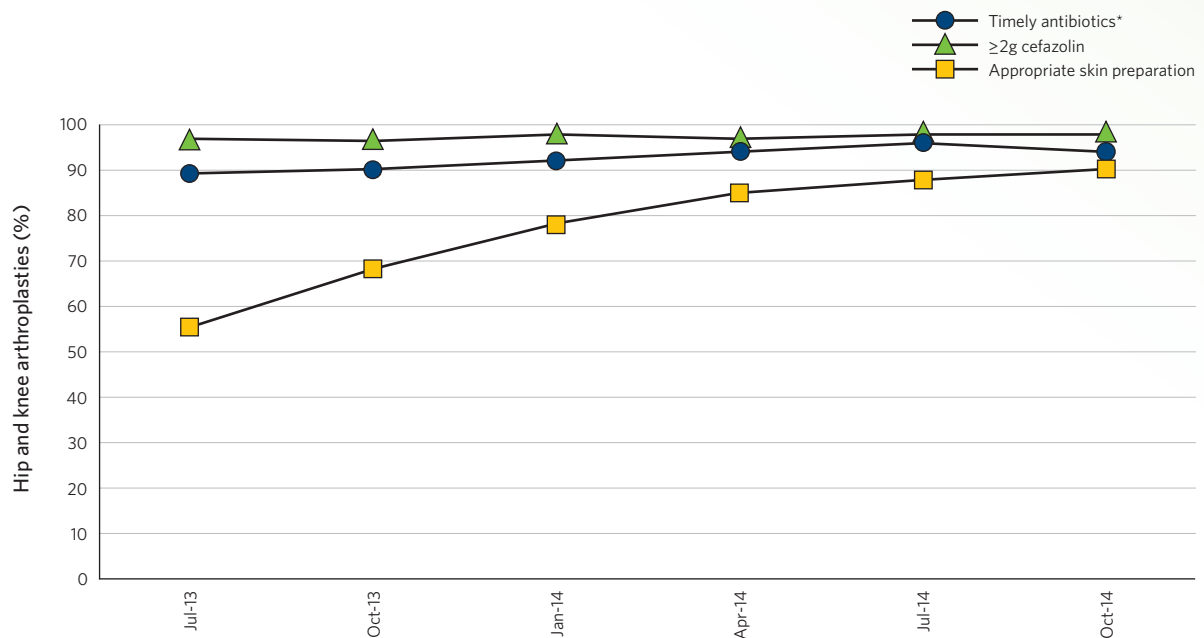
32. Health Protection Scotland. 2015. *HPS Weekly Report* 49(2015/02). URL: <http://www.hps.scot.nhs.uk/documents/ewr/pdf2015/1502.pdf> (accessed July 2015).

What do we know?

Surgical site infection

In 2012 the Commission launched the Surgical Site Infection Improvement Programme to reduce SSIs. Hip and knee arthroplasty surgery was the first procedure focus – these operations are performed in high numbers and the consequences of an SSI in an arthroplasty are serious. All 20 DHBs are collecting and reporting local data and driving improvement against the recommended practice interventions within their DHB. Over the last 18 months there has been a significant increase in recommended antibiotic prophylaxis and skin preparation for hip and knee patients across the country as a whole (see Figure 6). In particular there has been a widespread increase in the dosage of the preferred antibiotic given (from 1g to 2g or greater of cefazolin). A year ago only 85 percent of operations which used cefazolin used 2g or more; now 96 percent do.

Figure 6: Hip and knee operations where good practice in antibiotic prophylaxis and skin preparation was followed, 2013-14



* Timely antibiotics = antibiotic given 0-60 minutes before first incision

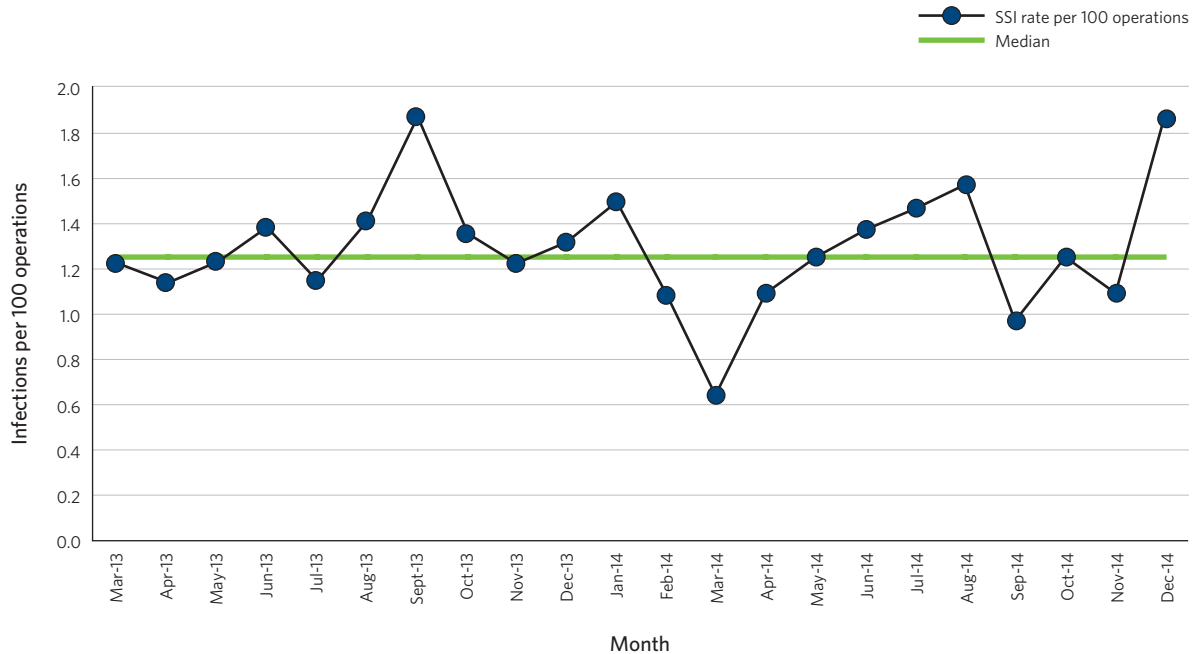
≥2g cefazolin = two or more grams of cefazolin used as the antibiotic

Appropriate skin preparation = chlorhexidine plus alcohol or povidone iodine plus alcohol used for skin preparation



So far, as Figure 7 shows, there has been no significant change in the rate of SSIs.

Figure 7: Surgical site infection for hip and knee operations, by month, 2013-14



2.3 Complications associated with surgery

Why does this matter?

The 2002 Davis study on adverse events in hospital found almost 60 percent of those adverse events were associated with surgery. Such events can be traumatic for the patient and costly for the service provider.

The Commission's perioperative harm prevention programme focuses on preventing the adverse events which can harm patients undergoing surgery.³³ Effective teamwork and communication are key to safe surgical care, and the programme has a focus on improving communication between health professionals, and between health professionals and patients.

A 2008 study³⁴ and a substantial literature show surgical harm (mortality and morbidity) could be reduced through consistent and reliable implementation of the WHO Surgical Safety Checklist. Here we report on two of these harms: postoperative sepsis and deep vein thrombosis/pulmonary embolism (DVT/PE).

What do we know?

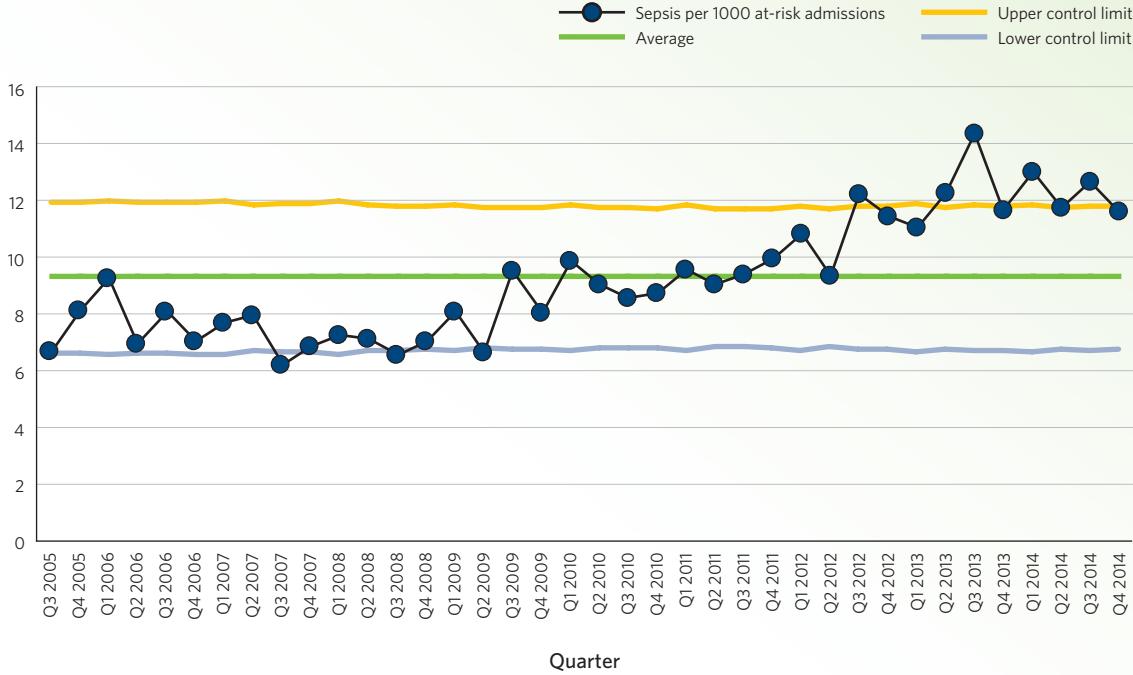
Postoperative sepsis

There has been a clear statistically significant increase in postoperative sepsis in New Zealand in recent years, as shown in Figure 8. The rate has risen from around 7 per 1000 at-risk admissions between 2005 and 2009 to around 11 per 1000 in 2013, and continues to rise.

33. Davis P, Lay-Yee R, Briant R, et al. 2003. Adverse events in New Zealand public hospitals II: preventability and clinical context. *NZMJ* 116(1183): U624.

34. Haynes AB, Weiser TG, Berry WR, et al. 2009. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med* 360(5): 491-9.

Figure 8: Postoperative sepsis per 1000 at-risk admissions, by quarter, 2005-14



The cause of this is not immediately clear, although it may reflect an increase in the proportion of patients with more and greater risk factors undergoing surgery, in particular an increase in patients with diabetes (who are more at risk of sepsis). Further work is required to understand and address this increase.

International comparisons

The OECD comparisons show New Zealand in the worst quartile of OECD member states. In Figure 9 our comparator group is shown in green, New Zealand in red and the OECD average in yellow.

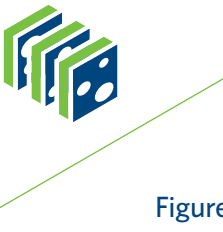
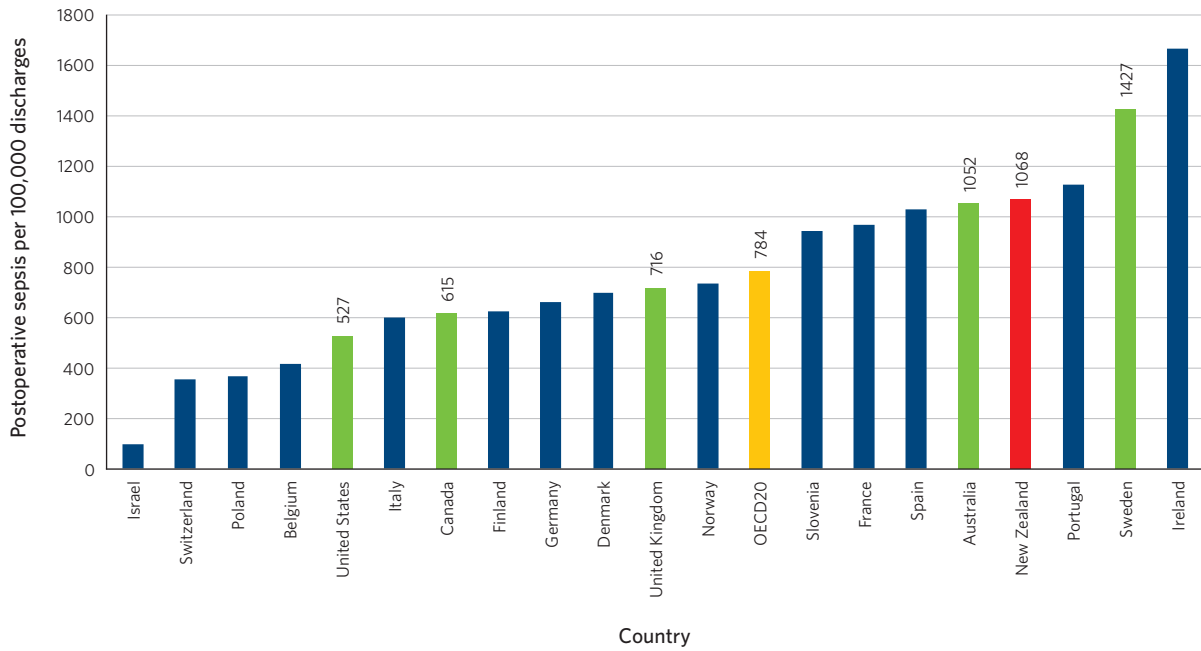


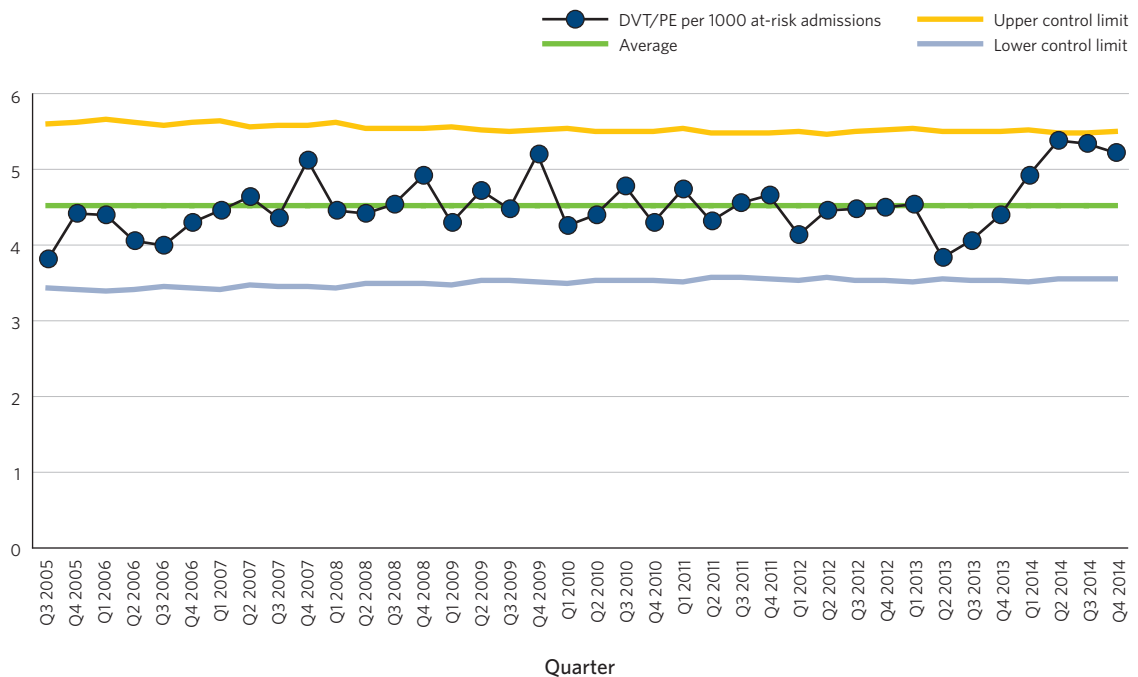
Figure 9: Postoperative sepsis per 100,000 discharges – OECD calculation, 2011



DVT/PE

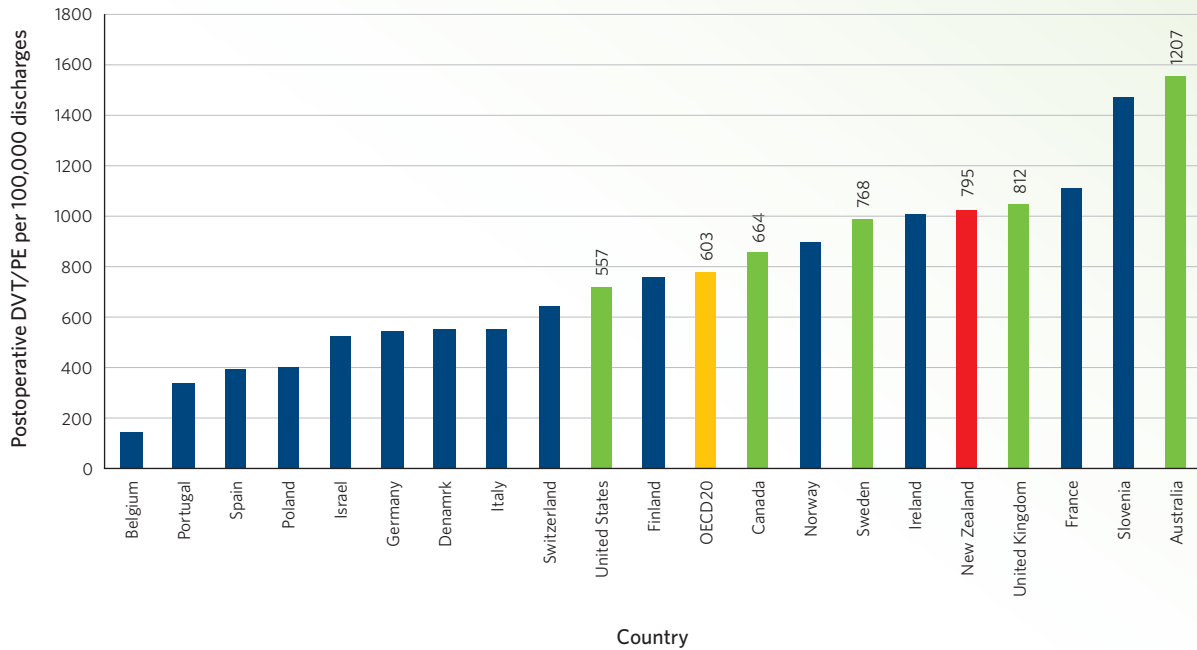
In contrast to postoperative sepsis, postoperative DVT/PE has remained relatively stable over the last 10 years, showing no special cause variation (see Figure 10).

Figure 10: Postoperative DVT/PE per 1000 at-risk admissions, by quarter, 2005-14



Just as with postoperative sepsis, New Zealand is in the quartile of OECD member states with the highest occurrence of postoperative DVT/PE (see Figure 11).

Figure 11: Postoperative DVT/PE per 100,000 discharges – OECD calculation, 2011



2.4 Polypharmacy and its avoidance

Polypharmacy means either the prescribing of many medicines to one person or prescribing them the wrong medicines relative to the other medicines they are on. As more medicines are prescribed there is an increased risk of adverse drug interactions, falls, admissions to hospital and even death. Increasing the number of medicines prescribed to a person also increases the risk they won't take their medicines properly, and the additional medicines may not improve their health. The use of a number of medicines is also costly to the health system. The frequency of adverse drug events increases with the number of medicines taken: from 13 percent of patients with two medicines and 58 percent of patients with five medicines, to 82 percent of patients when seven or more medicines are taken.³⁵

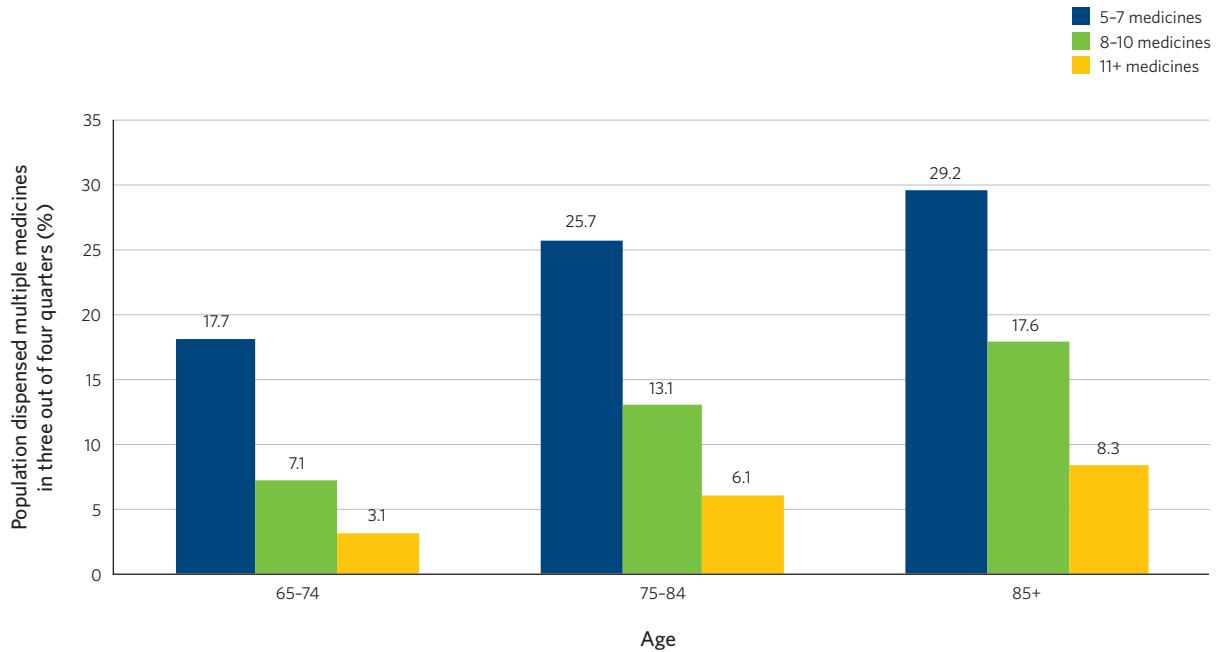
New Zealand has a growing population of older people with more than one health condition – the group most at risk of polypharmacy.

Eighteen percent of New Zealanders aged 65–74 years were dispensed five or more medicines for at least three quarters in 2011 (see Figure 12). This rises to nearly 30 percent for those aged 85 and over. Even more strikingly, over 8 percent of this age group were on no fewer than 11 separate medicines.

35. Patterson SM, Hughes C, Kerse N, et al. Interventions to improve the appropriate use of polypharmacy for older people. *Cochrane Database Syst Rev*, 2012, Issue 16;5, Art. No. CD008165.



Figure 12: Population dispensed multiple medicines in three out of four quarters, 2011



The precise definition of polypharmacy and older people differs between countries, but as Table 7 shows, New Zealand appears to have a polypharmacy rate a little lower than Sweden and considerably lower than Canada.

Table 7: Polypharmacy among older people, New Zealand and international comparators

Country	Polypharmacy among older people
New Zealand	8.3%* (2011)
Australia	N/A
England	N/A
Scotland	N/A
United States	N/A
Canada	30%** (2009) ³⁶
Sweden	12.3%*** (2012) ³⁷

*11+ medicines, 85 years and older

**10+ medicines, 85 years and older

***10+ medicines, 80 years and older

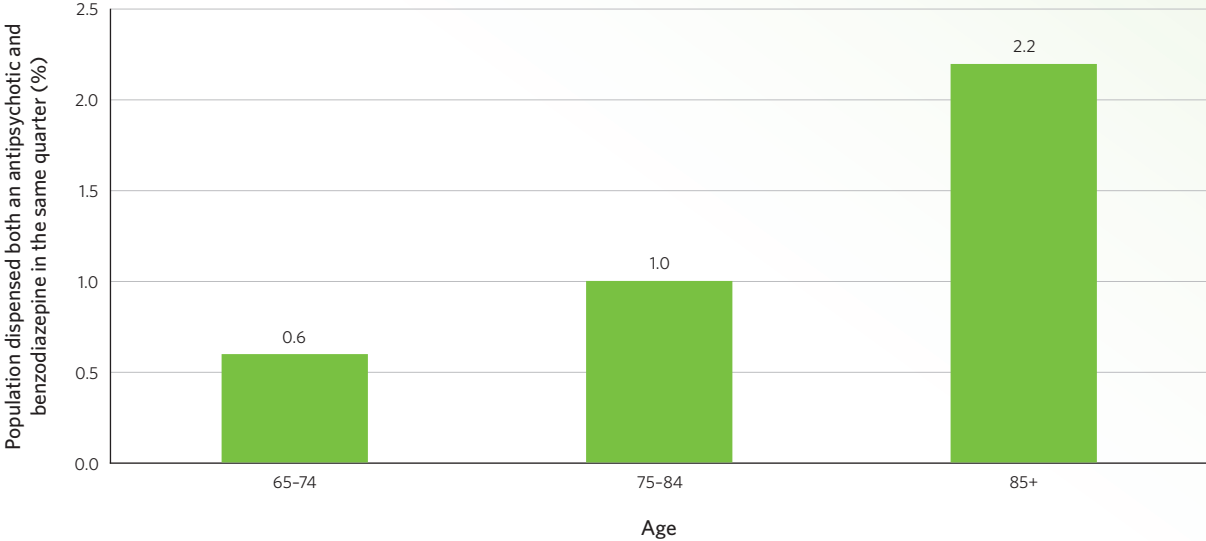
36. Canadian Institute for Health Information. 2011. *Health Care in Canada, 2011*. Ottawa: Canadian Institute for Health Information.

37. Socialstyrelsen. 2013. *Quality and Efficiency in Swedish Healthcare 2012*. Swedish National Board of Health and Welfare and the Swedish Association of Local Authorities and Regions.

In older people, certain classes of medicines carry a substantially higher risk of adverse effects. Two examples are antipsychotics and benzodiazepines. Common adverse effects include impaired functional ability, agitation, confusion, blurred vision, urinary retention, constipation, postural hypotension and falls. These adverse effects increase if both classes are given together. High rates of prescribing may indicate misuse or overuse.

The rates appear low in New Zealand – under 1 percent of patients aged under 85 were given an antipsychotic and a benzodiazepine, and around 2 percent for those 85 and over (see Figure 13).

Figure 13: Population dispensed both an antipsychotic and a benzodiazepine in the same quarter, 2011



2.5 Conclusion

With the exception of postoperative sepsis and DVT/PE, this small number of measures of patient safety suggests New Zealand’s health services are probably as safe as other comparable jurisdictions. Processes that should improve safety seem to be improving, but as yet there is little evidence of improved outcomes. There may be many reasons for this, but it is clear there is still considerable room for improvement.



3 Is our health care a good experience?

Understanding how patients experience their health care is vital to improving patient safety and the quality of service delivery. Better experience, developing partnerships with patients, and patient- and family-centred care are linked to improved health, clinical, financial, service and satisfaction outcomes.^{38,39,40,41}

The Commission introduced a patient experience survey in New Zealand’s hospitals in August 2014. This survey runs every quarter, surveying inpatients aged 15 and over in all DHBs. It asks patients about four ‘domains’ of care:

- communication
- partnership (involvement and engagement of the patient and their family/whānau in care)
- coordination of care
- physical and emotional needs.

There was a national response rate of 24 percent to the first survey and 27 percent to the second. Participants were asked to rate their experience in each domain out of 10. The early results for the country were high, as set out in Tables 8–10 below.

Table 8: Average inpatient rating out of 10 for the four domains of experience, New Zealand, August and November 2014

	August 2014	November 2014
Communication	8.2 (8.1–8.3)	8.3 (8.2–8.4)
Partnership	8.3 (8.2–8.4)	8.5 (8.4–8.6)
Coordination of care	8.2 (8.1–8.3)	8.4 (8.3–8.5)
Physical and emotional needs	8.5 (8.4–8.6)	8.6 (8.5–8.7)

95% CIs in parenthesis

There was consistency between both survey periods and between each of the domains. Most respondents to the survey gave positive responses to most questions. However, there were some consistently high- and low-scoring questions across the two survey periods.

38. Picker Institute Europe. *Why patients should share in decision-making*. Oxford: Picker Institute Europe. URL: <http://www.pickereurope.org/> (accessed July 2015).

39. Balik B, Conway J, Zipperer L, et al. 2011. *Achieving an Exceptional Patient and Family Experience of Inpatient Hospital Care*. IHI Innovation Series white paper. Cambridge, MA: Institute for Healthcare Improvement. URL: <http://www.ihl.org/resources/Pages/IHIWhitePapers/AchievingExceptionalPatientFamilyExperienceInpatientHospitalCareWhitePaper.aspx> (accessed July 2015).

40. Agency for Healthcare Research and Quality. 2010. Consumer Assessment of Healthcare Providers and Systems. *The Clinical Case for Improving Patient Experience*. URL: <https://cahps.ahrq.gov/quality-improvement/improvement-guide/why-improve/Improving-Patient-Experience.html> (accessed July 2015).

41. Agency for Healthcare Research and Quality. 2010. Consumer Assessment of Healthcare Providers and Systems. *The Business Case for Improving Patient Experience*. URL: <https://www.cahps.ahrq.gov/Quality-Improvement/Improvement-Guide/Why-Improve/Business-Case.html> (accessed July 2015).

Table 9: Highest- and lowest-scoring questions (percentage of responders giving the most positive response), November 2014

Highest-scoring questions	November 2014
Overall, did you feel staff treated you with respect and dignity while you were in the hospital?	87% (85-89%)
Overall, did you feel staff treated you with kindness and understanding while you were in the hospital?	85% (83-86%)
Do you think the hospital staff did everything they could to help control your pain?	82% (80-84%)
Lowest-scoring questions	
Do you feel you received enough information from the hospital on how to manage your condition after your discharge?	61% (59-64%)
Did the hospital staff include your family/whānau or someone close to you in discussions about your care?	55% (53-58%)
Did a member of staff tell you about medication side effects to watch for when you went home?	47% (45-50%)

95% CIs in parenthesis

The proportion of patients reporting they were treated with dignity, respect, kindness and compassion is high. However, there were lower positive responses for these questions: sufficient information about how to manage the patient's condition on discharge; involvement of family/whānau; sufficient information about medication side effects on discharge.

3.1 International comparison

The survey uses questions developed by the Picker Institute, which are used in many jurisdictions. Eight out of twenty questions in the survey are identical to those used in the long-running NHS England survey, and individual questions are used and reported in several jurisdictions. These international results provide context to New Zealand's survey. The English survey is reported comprehensively enough for us to make comparisons. On the common questions, New Zealand uniformly has a significantly greater proportion of responders giving a more positive answer. This may, in part, reflect differences in survey administration and response rates.



Table 10: Comparison of survey results (identical questions only) of the most recently published New Zealand and England inpatient surveys

	New Zealand (November 2014)	England (2014) ⁴²	Canada* (2011)	Sweden (2012)
When you had important questions to ask a doctor, did you get answers that you could understand? (Yes, always)	78% (76–80%)	68%	74%	
Did you have confidence and trust in the doctors treating you? (Yes, always)	85% (83–87%)	80%		
Did you have confidence and trust in the nurses treating you? (Yes, always)	82% (81–84%)	78%		
Were you involved as much as you wanted to be in decisions about your care and treatment? (Yes, definitely)	69% (67–71%)	56%		
Do you think the hospital staff did everything they could to help control your pain? (Yes, definitely)	82% (80–84%)	70%	78%	
Before the operation did staff explain the risks and benefits in a way you could understand? (Yes, completely)	86% (83–88%)	82%		
Did staff tell you how the operation went in a way you could understand? (Yes, completely)	76% (73–78%)	68%		
Overall, did you feel staff treated you with respect and dignity while you were in the hospital? (Yes, always)	87% (85–89%)	81%		85%**

*Ontario

**Actual question asked: 'Did you feel that you were treated respectfully and considerately?'

95% CIs in parenthesis for New Zealand figures

Box 5: Timely access to care

Ensuring timely access to care has been a major priority of the Ministry of Health's targets regime, with three targets concentrating on this area. These are:

- shorter stays in emergency departments (95 percent of patients will be admitted, discharged or transferred from an emergency department within six hours)
- improving access to elective surgery – which should shorten time spent waiting for care (the volume of elective surgery will be increased by at least 4000 discharges per year)
- shorter waits for cancer treatment (all patients who are ready for treatment wait less than four weeks for radiotherapy or chemotherapy).

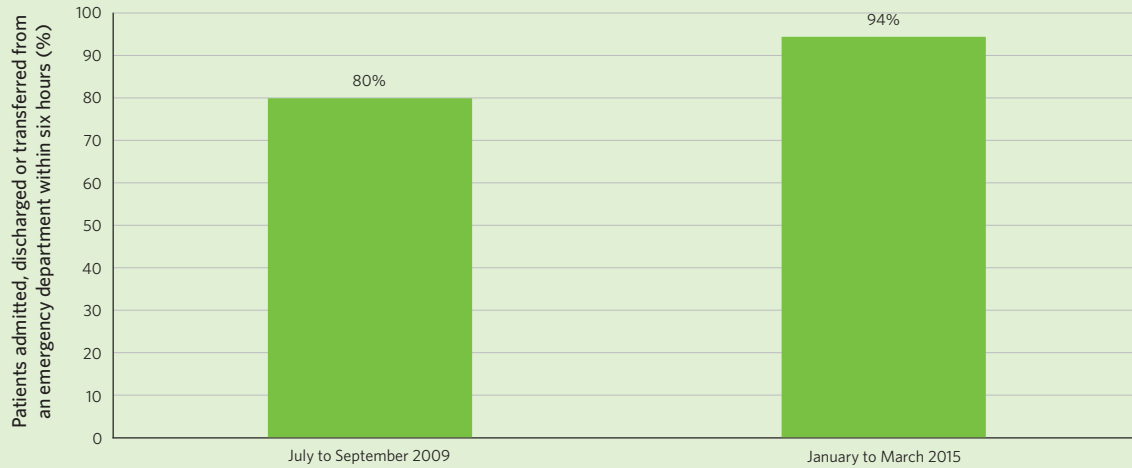
Progress against these measures is well reported by the Ministry and a comprehensive overview of what happened in these areas is provided in the Ministry's report *Targeting Waiting Times*.⁴³

42. Care Quality Commission. 2015. *National NHS patient survey programme. National results from the 2014 Inpatient Survey*. London: Care Quality Commission. URL: <http://www.cqc.org.uk/sites/default/files/201500519%20NHS%20Inpatient%20Survey%202014%20National%20summary%20and%20results%20tables%20FINAL.pdf> (accessed July 2015).

43. Ministry of Health. 2013. *Targeting Waiting Times*. Wellington: Ministry of Health.

What is clear is that the proportion of patients in emergency departments admitted, discharged or transferred within six hours has increased markedly since the introduction of the target, as set out in Figure 14.

Figure 14: Patients admitted, discharged or transferred from an emergency department within six hours



Admission for elective surgery is a multi-stage process, and overall time spent waiting for an operation is a product of the interaction of these stages. Specific waiting standards are set for different parts of the process (first specialist appointment, commitment to treatment, treatment, etc) and measured through the Elective Services Patient Flow Indicators (ESPIs).⁴⁴

Since January 2015 there has been a waiting time standard of a maximum of four months (reduced from five months) for both first specialist appointment and treatment once a commitment to treat was made. By March 2015 the position was as follows.

Table 11: Performance against selected Elective Services Patient Flow Indicators, March 2015

Measure	Number of patients	Patients affected (%)
ESPI 2. Patients waiting longer than the required timeframe (four months) for their first specialist assessment	262	0.3
ESPI 5. Patients given a commitment to treatment but not treated within the required timeframe	332	1.1

44. Ministry of Health. nd. Latest summary – Elective Services Patient Flow Indicators (ESPIs). Wellington: Ministry of Health. URL: <http://www.health.govt.nz/our-work/hospitals-and-specialist-care/elective-services/elective-services-and-how-dhbs-are-performing/latest-summary-elective-services-patient-flow-indicators-espis> (accessed July 2015).



This shows that a vast majority of patients receive care within the waiting time standard, even though the standard has become progressively tougher.

A Ministry of Health review of the quality dimensions of elective waiting time goals found no evidence that pursuit of waiting time goals had resulted in unintended consequences (eg, restricting access to surgery in order to reduce the number of patients added to the waiting list), but noted that there was 'no robust national outcome data on those patients not accepted for a First Specialist Assessment or treatment'.⁴⁵ As elective activity increases, the potential for variation in thresholds for gaining access to treatment could change. This sort of analysis lends itself to an Atlas of Healthcare Variation approach.

3.2 Conclusion

Early results from the patient experience survey are encouraging, especially the very high levels of patients who believe they were treated with respect, dignity, kindness and compassion. However, not all patients feel as involved in their care as they should, and there is a pattern of not enough information being provided, particularly on discharge from hospital.

45. Ministry of Health. 2013. *Quality Dimensions of the Elective Waiting Time Goals - High Level Review*. Wellington: Ministry of Health.

4 Is our health care the right kind of care?

Safe health care does not necessarily mean good care. A high-quality health system will provide the most effective treatments available at the right time and in the right place. To review this we can look at the ultimate outcomes of care, how well different health services are organised around the patient, and whether or not the right treatments are provided for individual conditions.

4.1 Ultimate outcomes of care – reducing death and disability where we can

Why does this matter?

Using measurements of death and disability to reflect quality of health care has become increasingly common in the last 10 years, because avoiding early death and disability is a key aim of health systems. There is some controversy about how closely these measures relate to quality of care – for example, how many in-hospital deaths are truly preventable? Similarly, to what extent do population death and disability measures demonstrate the quality of a health system rather than the social determinants of health?

We look at two measures reflecting the effectiveness of health systems: deaths that are potentially avoidable through health care, and the burden of disease in DALYs (see Box 3).

What do we know?

A. Deaths potentially avoidable through health care (amenable mortality)

Amenable mortality measures premature deaths for a number of diseases for which effective health interventions might have prevented deaths before a certain age. The most recent international data available relates to 2006–07.

In New Zealand, this measure shows a dramatic reduction in amenable mortality rates for those aged under 75, from 115 deaths per 100,000 population to only 79 per 100,000 between 1997–98 and 2006–07 (see Figure 15).⁴⁶ This reduction was also seen internationally, and New Zealand remained within the highest quartile for amenable mortality rates amongst the study set of 16 high-income nations. This particular set is not the full OECD set of nations. An older analysis of 31 nations⁴⁷ identified that New Zealand had a below OECD average amenable mortality rate (85 per 100,000 compared to 95 per 100,000 for the whole OECD).

Interpretation of this measure is complex. The Ministry of Health⁴⁸ notes that it is flawed to assume the higher amenable mortality rate in New Zealand, compared with Australia, points to a less effective health system: ‘Once corrected for differences in non-amenable mortality (as a proxy for underlying ‘structural’ factors), no difference in amenable mortality remains (or a slight New Zealand advantage is seen in recent years), suggesting that the two health systems are in fact performing at a similar level of effectiveness.’ In other words, the difference in amenable mortality may be partly due to underlying, unavoidable factors and differences in populations, rather than the quality of health care delivered.

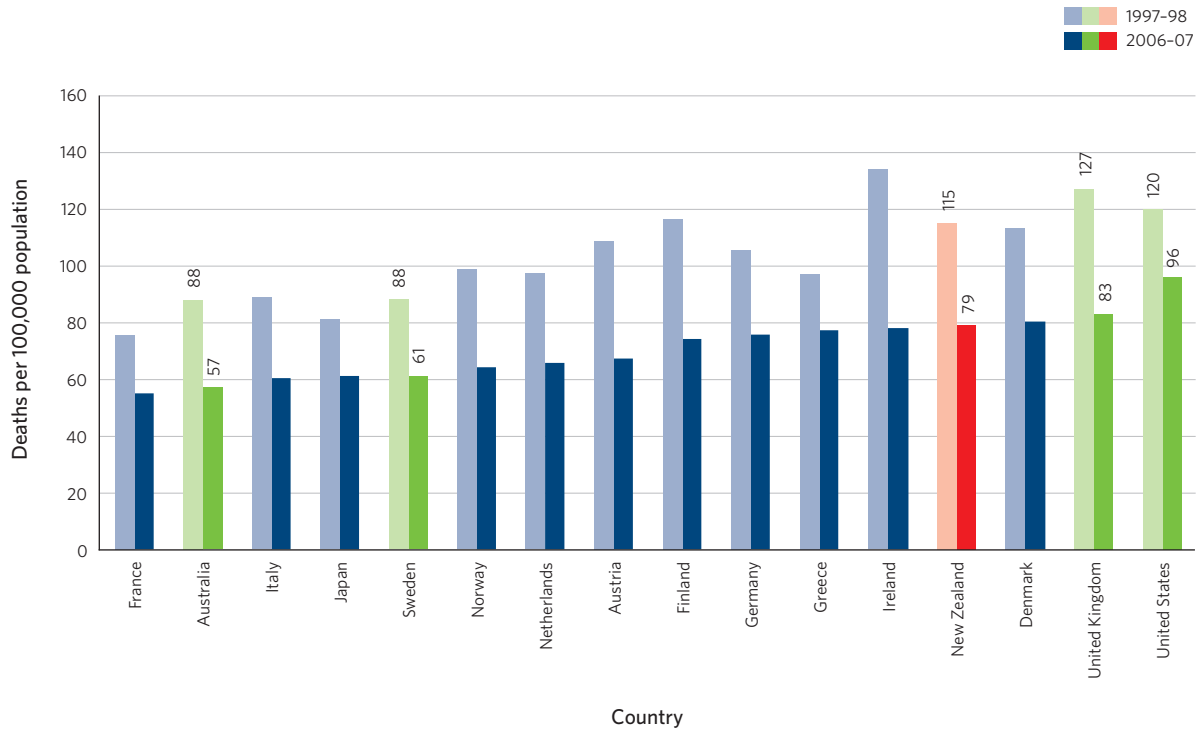
46. Nolte E, McKee M. 2011. Variations in Amenable Mortality—Trends in 16 High-Income Nations. *Health Policy* 103(1):47–52.

47. Gay G, Paris V, Devaux M, et al. 2011. Mortality Amenable to Health Care in 31 OECD Countries: Estimates and Methodological Issues. OECD Health Working Papers. URL: http://www.oecd-ilibrary.org/social-issues-migration-health/mortality-amenable-to-health-care-in-31-oecd-countries_5kgj35f9f8s2-en (accessed July 2015).

48. Ministry of Health. 2010. *Saving Lives: Amenable mortality in New Zealand, 1996–2006*. Wellington: Ministry of Health. URL: <http://www.health.govt.nz/publication/saving-lives-amenable-mortality-new-zealand-1996-2006> (accessed July 2015).



Figure 15: Age-standardised amenable mortality rates for people aged under 75 years, by country, 1997-98 and 2006-07 (Nolte/McKee definition)



Overall amenable mortality hides the fact there are specific deaths or deaths of particular groups of people where deaths are notably more common. In New Zealand the work of the mortality review committees has been a feature of the system’s response to these specific problems. Since the Commission’s inception, these have come under the Commission’s work programme, and analytic and other support has been provided by Commission staff. We report their progress in Box 6.

Box 6: Mortality review committees

The Commission hosts national mortality review committees – statutory committees that review particular deaths or the deaths of particular people, in order to learn how best to prevent these deaths. There are currently four ongoing committees dedicated to reviewing:

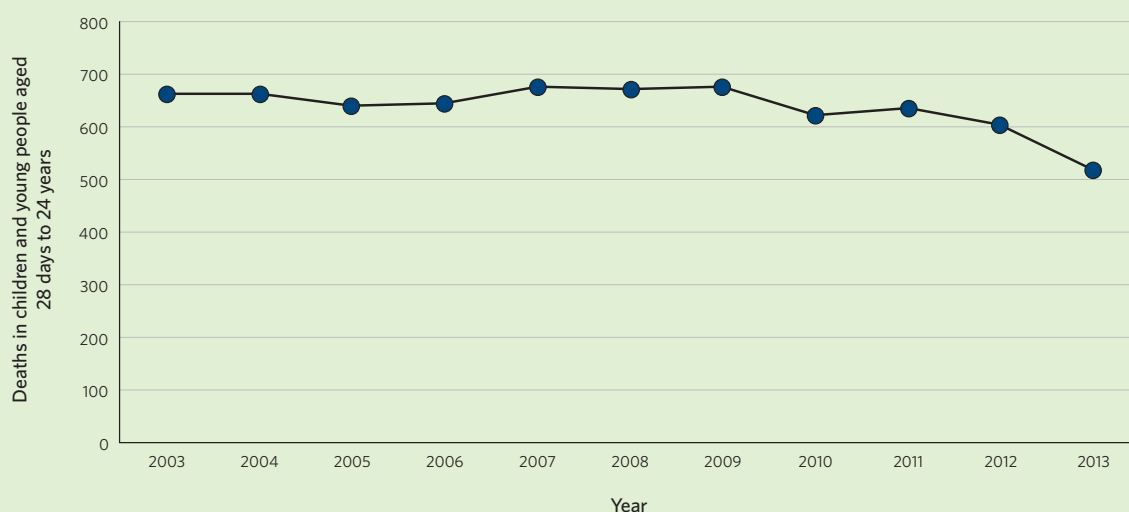
- the deaths of children and young people
- babies and mothers where death is caused by pregnancy or childbirth
- deaths associated with surgery
- deaths resulting from family violence.

In each case the ultimate aim is reduction in these specific deaths, and all make policy and operational recommendations for how this could be achieved. We report results for these committees here.

Child and Youth Mortality Review Committee

The Child and Youth Mortality Review Committee has existed since 2002. In this time the annual number of deaths has fallen from 638 to 515. As Figure 16 makes clear, this fall has largely been concentrated since 2009.

Figure 16: Deaths in children and young people aged 28 days to 24 years, 2003-13



This reduction has been driven largely by a reduction in sudden unexplained death in infancy (28 days to one year), which fell from 56 in 2009 to 36 in 2013, and transport-related deaths in people aged 15-24 years, which halved from 141 in 2007 to 73 in 2013.

Perinatal and Maternal Mortality Review Committee

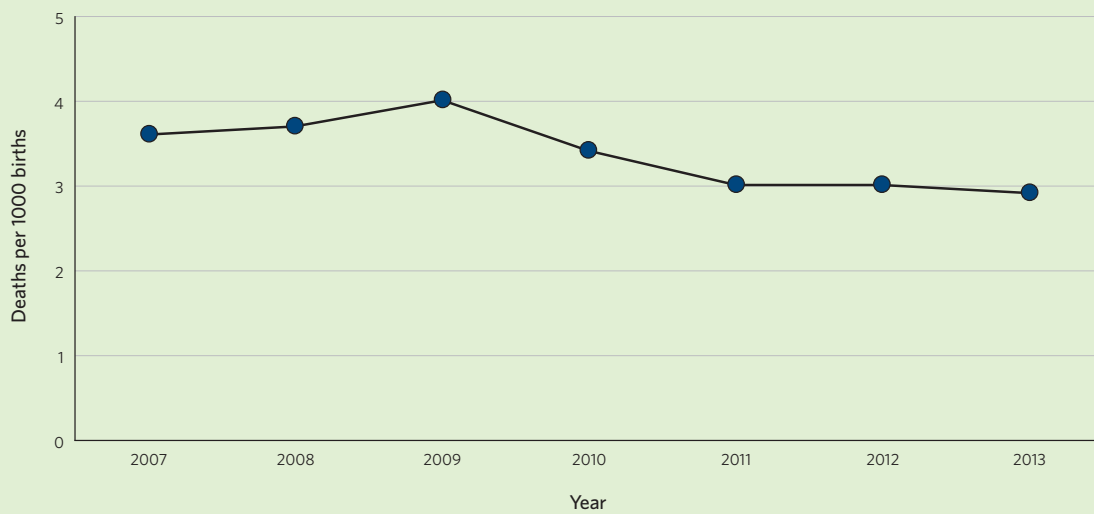
The Perinatal and Maternal Mortality Review Committee exists to reduce deaths of mothers and babies. Their recently published ninth annual report (covering data to 2013)⁴⁹ found a significant reduction in perinatal related mortalities⁵⁰ (that is, deaths of babies under 28 days and stillbirths) from 4 per 1000 births in 2009 to under 3 per 1000 in 2013. This has been driven in part by a significant reduction in stillbirths at term from 117 in 2007 to 69 in 2013.

49. PMMRC. 2015. *Ninth Annual Report of the Perinatal and Maternal Mortality Review Committee: Reporting mortality 2013*. Wellington: Health Quality & Safety Commission. URL: <http://www.hqsc.govt.nz/our-programmes/mrc/pmmrc/publications-and-resources/publication/2123> (accessed July 2015).

50. Using the internationally comparable WHO definition.



Figure 17: Perinatal related mortality per 1000 births, 2007-13



Perioperative Mortality Review Committee

The Perioperative Mortality Review Committee is the newest of the ongoing mortality review committees, founded in 2010. Much of the Committee's work to date has been focused on developing appropriate metrics for what is a complex area. This has included work with WHO metrics such as death on the day of surgery. This commitment has led the Lancet Commission on Global Surgery to comment that New Zealand has the best perioperative mortality data in the world. However, reduction in perioperative mortality requires more than just good measurement and the Committee remains focused on improving the safety of surgery from these baselines.

Family Violence Death Review Committee

New Zealand's family violence deaths constitute nearly half of all homicides in New Zealand, an average of 35 per year.⁵¹ This has remained broadly consistent for the last 10 years. The Family Violence Death Review Committee's most recent (fourth) annual report called for a radical change in the way New Zealand responds to its most dangerous and chronic cases of family violence. In particular, the Committee urged support services and society in general to take more responsibility for preventing abusers from using violence, rather than expecting the victims of family violence to keep themselves and their children safe.

51. Health Quality & Safety Commission. 2014. *Fourth annual report: January 2013 to December 2013*. Wellington: Health Quality & Safety Commission. URL: <http://www.hqsc.govt.nz/our-programmes/mrc/fvdr/publications-and-resources/publication/1600/> (accessed July 2015).

The value of keeping going

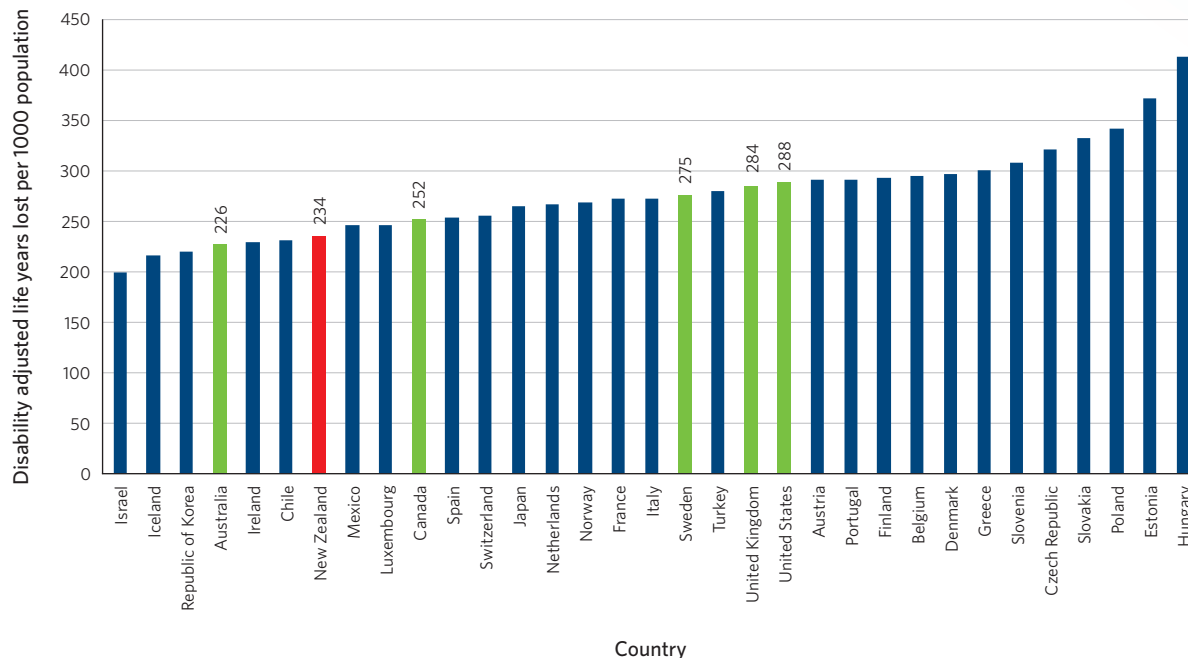
The mortality review committees show the value of perseverance. Long-term commitments to addressing many potential causes systematically and consistently lay behind the recent improvements seen by the Child and Youth Mortality Review Committee and the Perinatal and Maternal Mortality Review Committee. These have shown pronounced improvements in the last five years following several years of work. Complex problems such as these take time, consistent action and perseverance. For many improvement areas, improved outcomes take several years' concerted efforts and a combination of many different actions.

B. Disability adjusted life years lost to disease and injury

The mortality-based approach addresses the issue of living longer, but ignores the related issue of people living better. The measure of DALYs lost to disease and injury seeks to address this. It not only includes years of life lost but also estimates the quality of life lost as a result of disease and injury (known as years of life with a disability), allowing international comparisons.

A recent update of the measure has been developed by the WHO as part of the global burden of disease study.⁵² This shows that in 2012 New Zealand was in the lowest quartile for DALY burden of high-income countries, with 234 DALYs lost per 1000 population, as shown in Figure 18.

Figure 18: Disability adjusted life years lost per 1000 population, by country, 2012



52. World Health Organization. nd. Health statistics and information systems. Global health estimates. Estimates for 2000–2012. Disease burden. Geneva: World Health Organization. URL: http://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html (accessed July 2015).



4.2 Measures of integration and effectiveness

Good integration of care services is an increasing priority for health systems in the developed world. Poorly integrated care results in people 'falling through the gaps' until the most urgent, intensive and expensive hospital care is required. Two measures giving an insight to this issue are the impact on hospital bed use of older people who are repeatedly admitted into hospital as an emergency, and availability of community follow-up for mental health patients within seven days of discharge.

A. Occupied bed-days for older people admitted two or more times as an acute admission per year

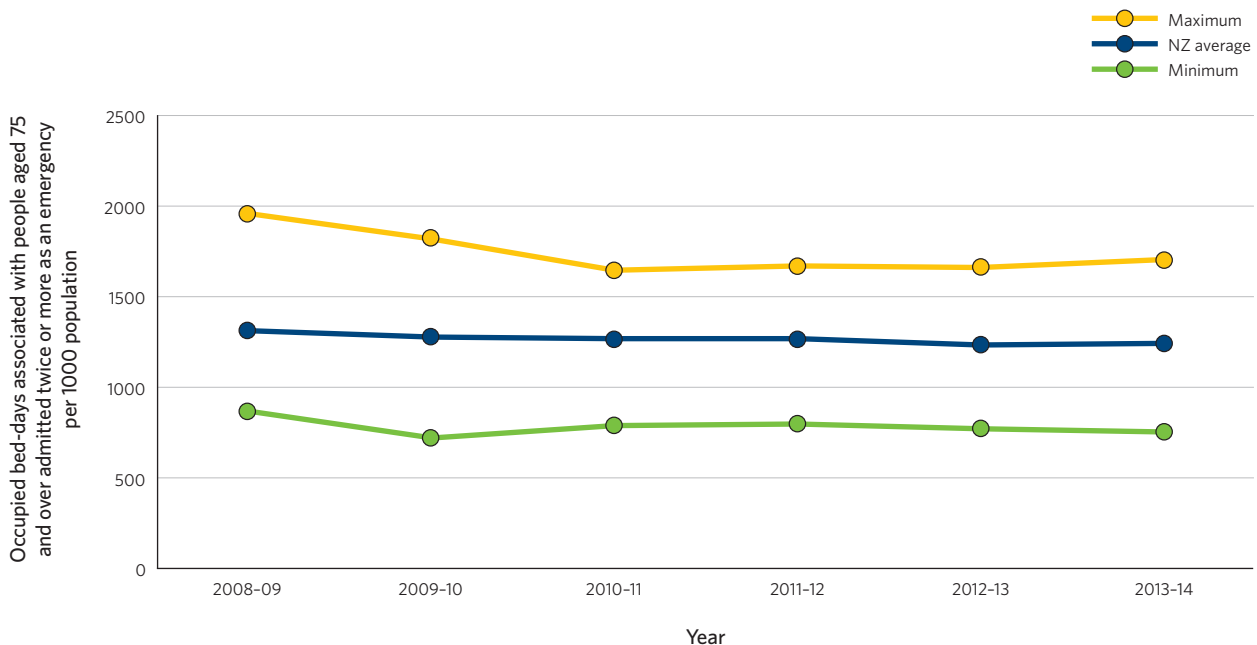
Why does this matter?

This indicator shows the effectiveness of the integration of primary, acute and long-stay care, both in avoiding unnecessary admissions and quickly 'stepping down' to less intensive forms of care. It has an advantage over the commonly used avoidable hospitalisation measures by considering both ends of a hospital stay. A low number of occupied bed-days per capita and low regional variation are desirable.

What do we know?

There has been a statistically significant reduction in the occupied bed-day rate associated with this group of patients over the last five years (see Figure 19) from 1303 occupied bed-days per 1000 population aged 75 and over in 2008-09, to 1234 in 2013-14. However, the two-fold variation that exists between different parts of the country suggests the rate could be further improved through widespread adoption of the integration practices seen in areas with the lowest rates.

Figure 19: Occupied bed-days associated with people aged 75 and over admitted twice or more as an emergency per 1000 population, 2008-09 to 2013-14, national average and highest and lowest DHB values



Good integration of care, especially for older people, is increasingly recognised as a key to achieving the Triple Aim, yet this measure is underused. Comparable data is only available from England. New Zealand has a 40 percent lower level of bed occupancy and considerably less regional variation.

Table 12: Occupied bed-days associated with people aged 75 and over admitted to hospital as an emergency two or more times, New Zealand and international comparators

Country	Occupied bed-days per 1000 population		
	Average	Minimum	Maximum
New Zealand (2013-14)	1234 (1230-1238)	748 (732-764)	1696 (1682-1710)
Australia	N/A		
England ⁵³ (2011-12)	2020	854	5500
Scotland	N/A		
United States	N/A		
Canada	N/A		
Sweden	N/A		

95% CIs in parenthesis for New Zealand figures

B. Mental health community follow-up post-discharge

Why does this matter?

People who have been in hospital because of a serious mental health issue or episode and who get support from community mental health services when they leave hospital are less likely to come to harm or be readmitted. This support after hospital discharge is critical, as these people are particularly vulnerable and have a higher risk of suicide.

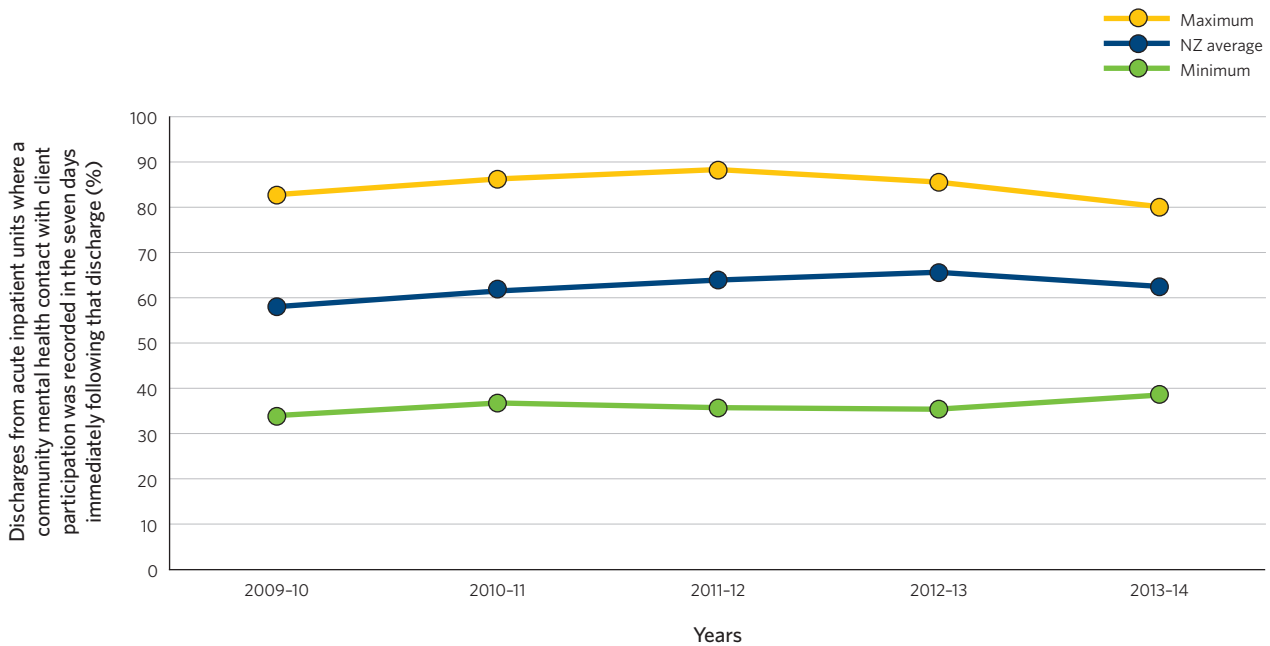
What do we know?

The New Zealand Mental Health and Addiction Services' Key Performance Indicator framework has collected this indicator since 2009-10. There was a significant increase in the percentage accessing community follow-up between 2009-10 and 2012-13, but the national rate fell significantly in 2013-14 (see Figure 20). A target of 90 percent was set for this measure but this had not been achieved anywhere in the country by 2012-13.

53. Care Quality Commission, personal communication.



Figure 20: Discharges from acute inpatient units where a community mental health contact with client participation was recorded in the seven days immediately following that discharge, 2009-10 to 2013-14, national average and highest and lowest DHB values



There are few published international comparators for this measure, but Table 13 suggests over twice the percentage of mental health service users had a community contact in New Zealand as in Ontario.

Table 13: Mental health patients followed up in the community within seven days of discharge, New Zealand and international comparators, 2012-13

Country	Percentage of mental health patients followed up in the community within seven days of discharge
New Zealand	66%
Australia	N/A
England	N/A
Scotland	N/A
United States	N/A
Canada*	28% ⁵⁴
Sweden	N/A

*Ontario

54. Health Quality Ontario. 2013. *Measuring up - 2012/13*. Toronto: Health Quality Ontario.

4.3 Doing the right thing – following good health care practice

We have good evidence of how to treat some diseases. Where patients are not being treated in this way, they are likely to be sicker or take longer to recover. Two examples of this are the use of allopurinol in patients with gout, and use of metformin and insulin for patients with diabetes.

A. Gout – allopurinol

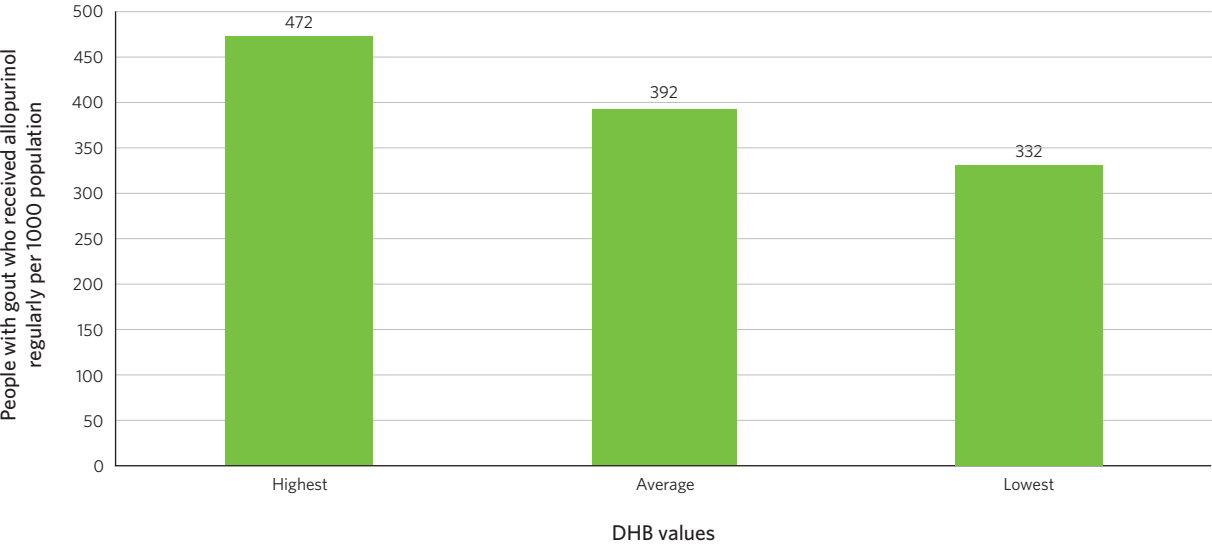
Why does this matter?

Gout is the most common form of inflammatory arthritis, estimated to affect approximately 3.75 percent of adult New Zealanders. This is high compared with gout rates internationally, with particularly high rates for Māori and Pacific peoples. Long-term, urate-lowering therapy (of which allopurinol is the most commonly prescribed) is used to prevent acute gout flares and prevent tophus formation, bony erosions and permanent disability in people with gout. Many studies have demonstrated underuse of allopurinol, meaning gout patients who could benefit from long-term control of their condition and avoidance of acute flares are potentially missing out.

What do we know?

Data from 2011 has shown that nationally only about 40 percent of people with gout had allopurinol dispensed in three of the previous four quarters (the pattern we would expect for long-term prescribing of this therapy). The variation in dispensing rate between the highest and lowest dispensing DHBs was 40 percent (see Figure 21). Although this is a smaller variation than many measures revealed by the Atlas, it is a statistically significant difference. Perhaps more striking still is that in all parts of the country, fewer than half of patients with gout are receiving a recommended treatment, which suggests some patients may not be receiving the best care possible.

Figure 21: People with gout who received allopurinol regularly per 1000 population (quarter 2, 2011), national average and highest and lowest DHB values





B. Diabetes - metformin and insulin

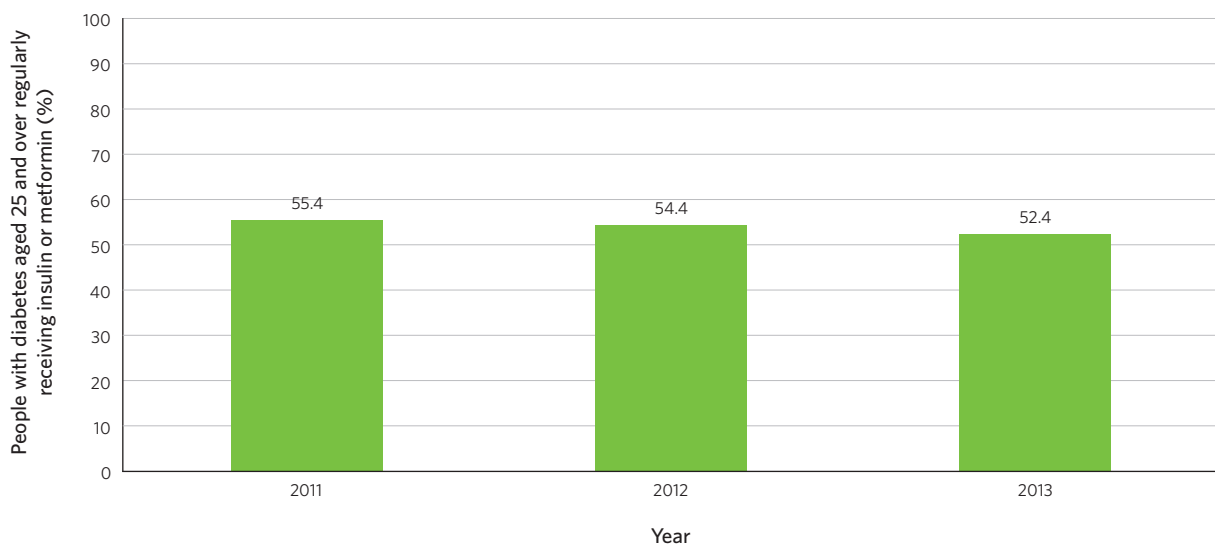
Why does this matter?

Diabetes affects an estimated 242,000 people in New Zealand. A further 500,000 are believed to have pre-diabetes. If the current trend continues, the number of people with diabetes in New Zealand is expected to double in the next 20 years to around 10 percent of the population. While increasing rates of diabetes are common across developed nations, the diabetes rate in New Zealand is particularly high. The percentage of hospital bed-days occupied by patients with diabetes increased from 9 to 14 percent between 2011 and 2013.

What do we know?

Good glycaemic control has a clear benefit on outcomes. If a patient does not reach an agreed glycated haemoglobin (HbA1c) target with lifestyle modifications, drug therapy is recommended, of which insulin and metformin have proven effectiveness.⁵⁵ Among people aged 25 and over with diabetes, only about half regularly had one of these two drugs dispensed. There was a small but statistically significant decline in each year (see Figure 22).

Figure 22: People with diabetes aged 25 and over regularly receiving insulin or metformin, 2011-13



4.4 Conclusion

On the high-level measure of helping people to live longer, healthier lives, the results from New Zealand's health system are not as good overall as Australia's, but better than the health systems in the US and UK. Overall, New Zealand has better results than the OECD average on both these measures, although this is arguably distorted by the inclusion of former Soviet bloc countries. More detailed measures, concentrating on parts of the system, show a level of variation around the country which suggests improvements remain possible.

55. New Zealand Guidelines Group. 2012. *New Zealand Primary Care Handbook 2012. 3rd edition*. Wellington: New Zealand Guidelines Group.

5 Is health care fairly available to all?

Fairness and equity is an important measure of the quality of a health system. People should get the same quality of care regardless of their gender, ethnicity, geographic location and socioeconomic status.⁵⁶

Reflecting this, the Atlas considers variations by ethnicity and age as well as by geography, where data is available.

5.1 Ethnicity

Why does this matter?

Different health status between different ethnic groups is apparent worldwide, and New Zealand is no exception. For example, there is a difference of more than five years in life expectancy between Māori and New Zealand European populations in New Zealand.⁵⁷ DHBs have a responsibility to assist the Crown in fulfilling its obligations under the Treaty of Waitangi, guided by the New Zealand Health and Disability Services (Safety) Act 2001,⁵⁸ which requires DHBs to take active steps to reduce health disparities by improving health outcomes for Māori. Below, we look at one area where concerted effort has reduced inequity and a number of areas where inequity remains.

Childhood immunisation

There has been a large reduction in unequal access to childhood immunisation over the last five years. In 2009, 73 percent of Māori children received all vaccinations by 24 months, compared with 84 percent for New Zealand European children. In six years, this difference has reduced to just two percentage points, no longer statistically significant (92 percent compared with 94 percent – see Figure 23). Box 7 describes this achievement in more detail.

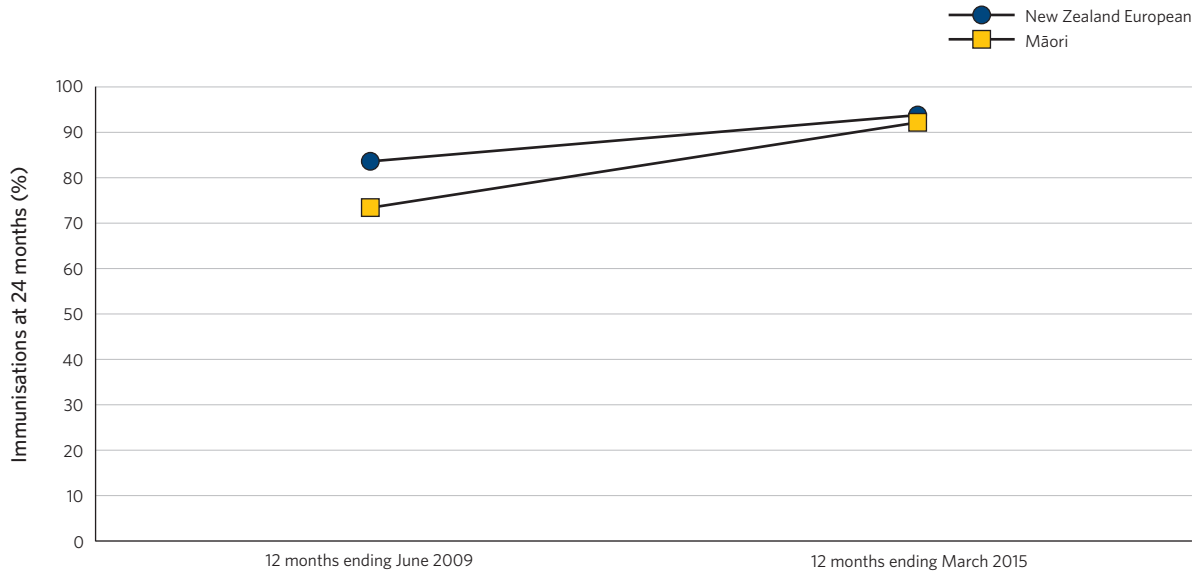
56. 'A health care system cannot claim to provide "best care" – or hope to achieve it – if subgroups of the population are receiving suboptimal care or care that does not meet the health care system's promulgated standards. For any organization to pride itself on providing "best care," inequities in access, use, and outcomes of health care must be scrutinized and the critical injustice they create remedied.' Mayberry RM, Nicewander DA, Qin H, Ballard DJ. 2006. Improving quality and reducing inequities: a challenge in achieving best care. *Proc (Bayl Univ Med Cent)* 19(2): 103-18.

57. Office of the Auditor-General. nd. United Nations' Madrid Indicators. Indicator 23: Life expectancy. Wellington: Office of the Auditor-General. URL: <http://oag.govt.nz/2013/ageing/our-ageing-population/indicator-23> (accessed July 2015).

58. Health and Disability Services (Safety) Act 2001. URL: <http://www.legislation.govt.nz/act/public/2001/0093/latest/DLM119975.html>.



Figure 23: Immunisations at 24 months, New Zealand European and Māori, change between June 2009 and March 2015



The change achieved means New Zealand is similar to Australia in having virtually identical immunisation rates between indigenous children and others.

Table 14: Childhood immunisation rates for indigenous and overall populations, New Zealand and international comparators

Country	All immunisations undertaken at 24 months, whole population and indigenous population
New Zealand (March 2015)	93.2% all (92.8–93.6%), 92.3% Māori (91.5–93.1%)
Australia (2011–12)	93% all, 92% Aboriginal and Torres Strait Islanders ⁵⁹
England	N/A
Scotland	N/A
United States	N/A
Canada	N/A
Sweden	N/A

95% CIs in parenthesis for New Zealand figures

59. National Health Performance Authority. 2013. *Healthy Communities: Immunisation rates for children in 2011/12*. Sydney: National Health Performance Authority.

Box 7: Immunisation in New Zealand, 2008-14

The increase in both the rate of immunisation in New Zealand and the near elimination of ethnic and socioeconomic disparities is remarkable and discussed at length in the Ministry of Health publication *Targeting Prevention*.⁶⁰ This details the multi-faceted approach taken to increase uptake: dedicated time to remind parents of babies due a vaccination; education and support for parents; in-home immunisation to address lack of transport or resources to visit a clinic; working with parents as immunisation advocates; and collaboration with Plunket and other community providers to find and immunise children not enrolled with GPs.

Gout and ethnicity

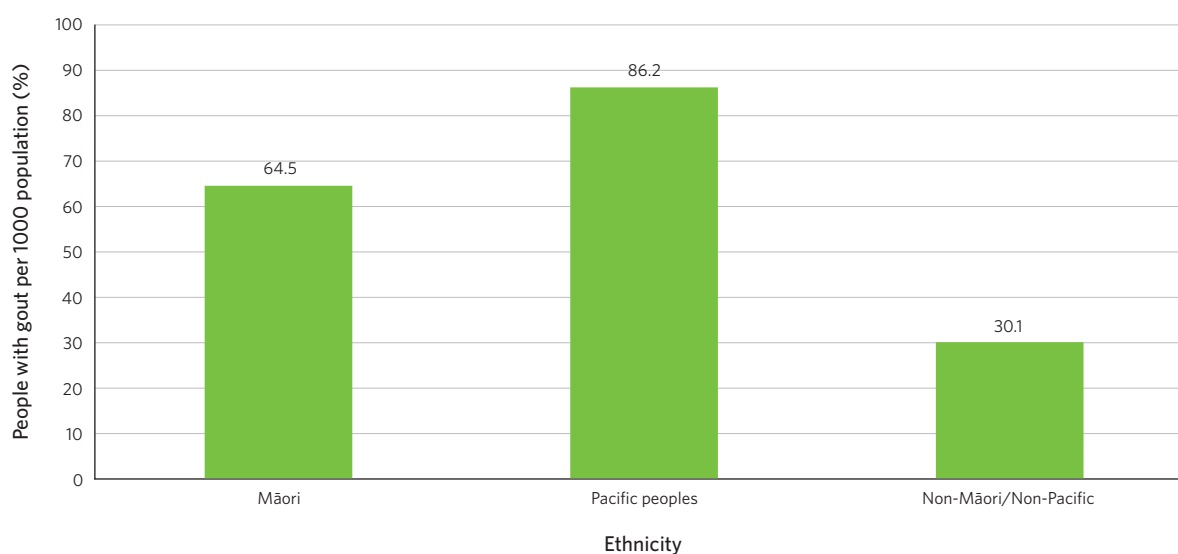
Why does this matter?

Gout is the most common form of inflammatory arthritis, estimated to affect approximately 3.75 percent of adult New Zealanders. This is high compared with gout rates internationally.

What do we know?

Both Māori and Pacific peoples are significantly more likely to have gout than other populations (see Figure 24). Access to the correct therapy is a matter of equity and justice.

Figure 24: People with gout per 1000 population, by ethnicity, 2011

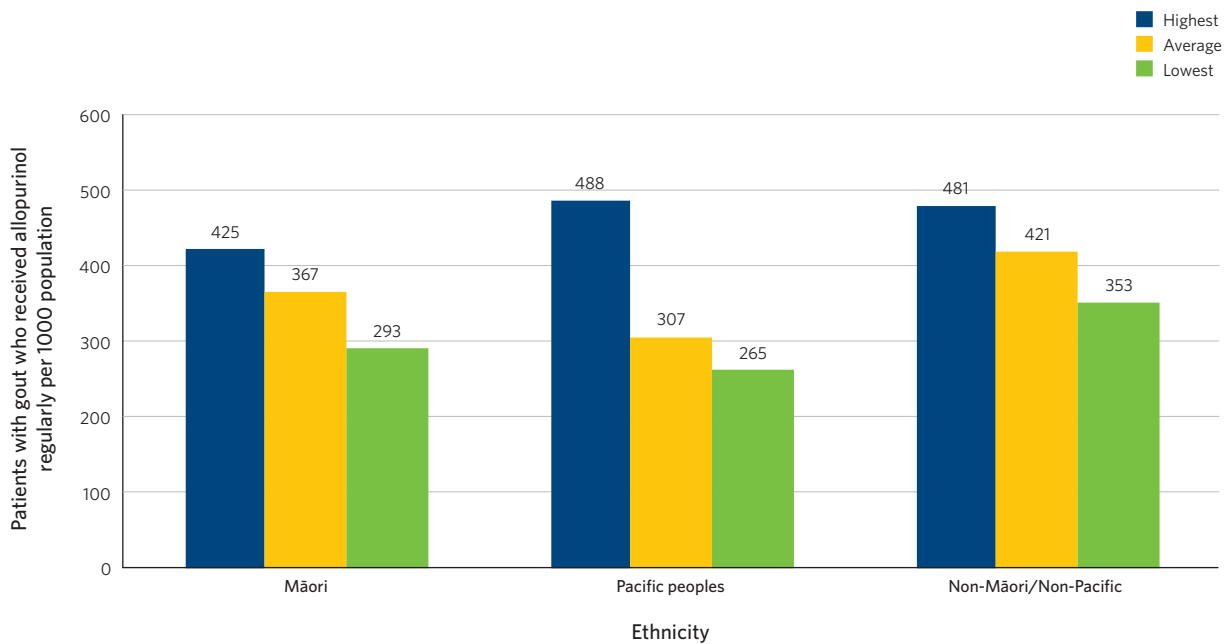


60. Ministry of Health. 2013. *Targeting Prevention*. Wellington: Ministry of Health.



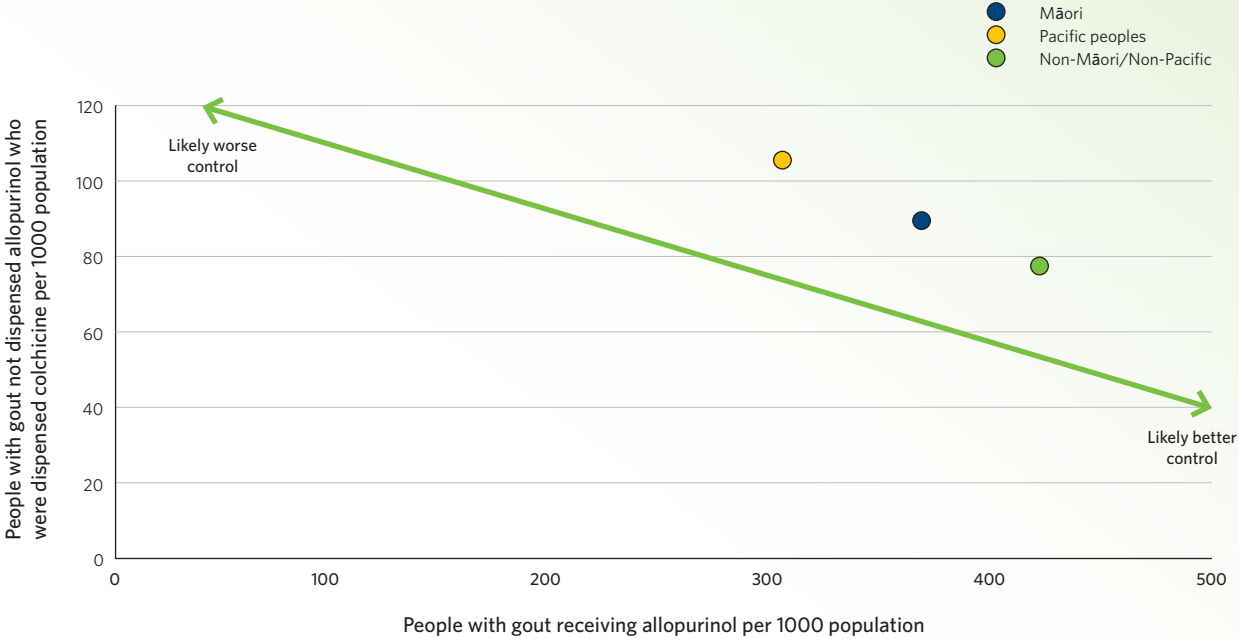
As noted above, long-term, urate-lowering therapy (of which allopurinol is the most commonly prescribed) is effective to prevent acute gout flares and can reduce the risks of permanent disability in people with gout, but only 40 percent of gout patients receive this. Further, as Figure 25 shows, Māori and Pacific populations, despite being more likely to have gout, are significantly less likely to receive this therapy.

Figure 25: People with gout who received allopurinol regularly per 1000 population, by ethnicity (quarter 2, 2011), national average and highest and lowest DHB values



As well as being statistically significant, this result may well be clinically meaningful as evidenced by the use of colchicine frequently prescribed as treatment for acute gout flares. The proportion of people dispensed colchicine but not allopurinol gives an indication about how well gout is being managed. Pacific and Māori populations are significantly more likely to be dispensed colchicine, which suggests that gout is less well managed in these populations - the very people most likely to suffer from gout.

Figure 26: Allopurinol and colchicine dispensing, by ethnicity, 2011



Diabetes and ethnicity

Why does this matter?

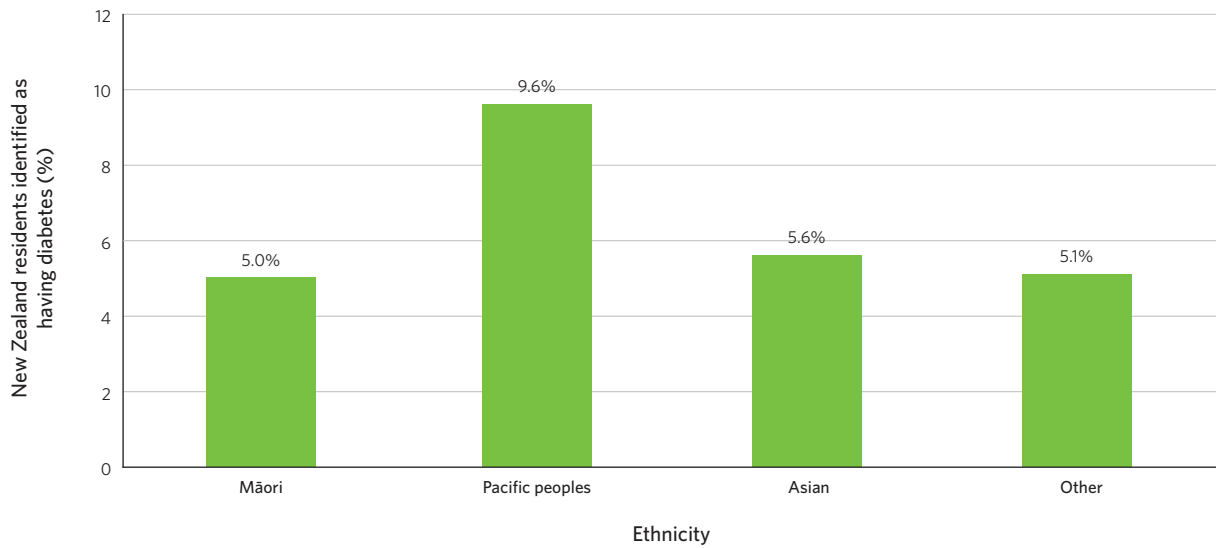
Diabetes affects an estimated 242,000 people in New Zealand. If the current trend continues, the number of people with diabetes in New Zealand is expected to double in the next 20 years.

What do we know?

Diabetes is significantly more prevalent in Pacific populations than any other group. Asian populations are also significantly more likely to have diabetes than Māori and Other (primarily European) groups, although this difference is relatively small (see Figure 27).

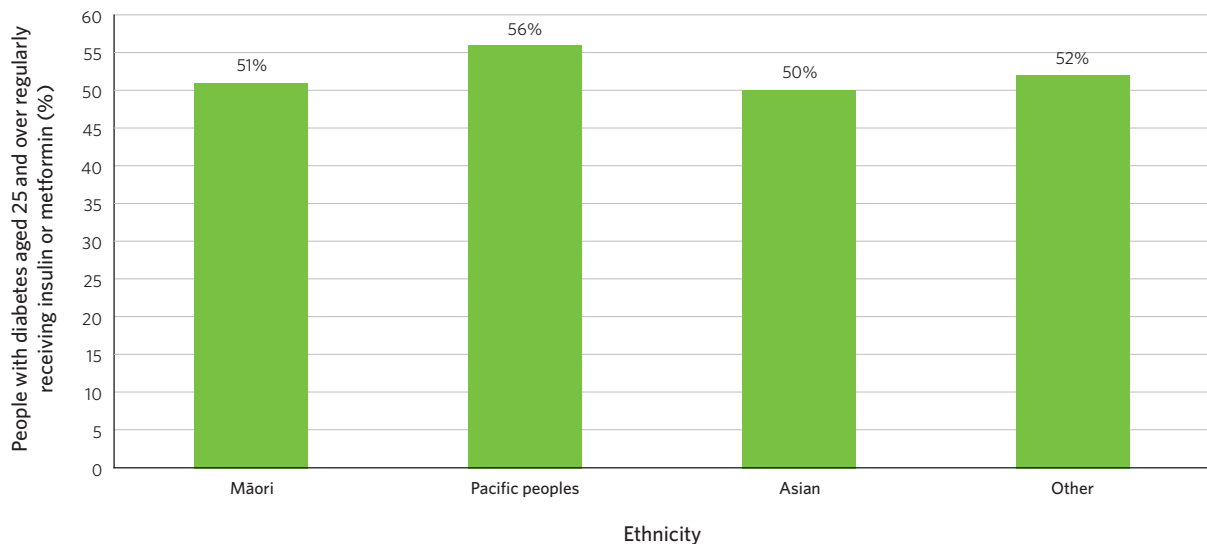


Figure 27: New Zealand residents identified as having diabetes, by ethnicity, 2013



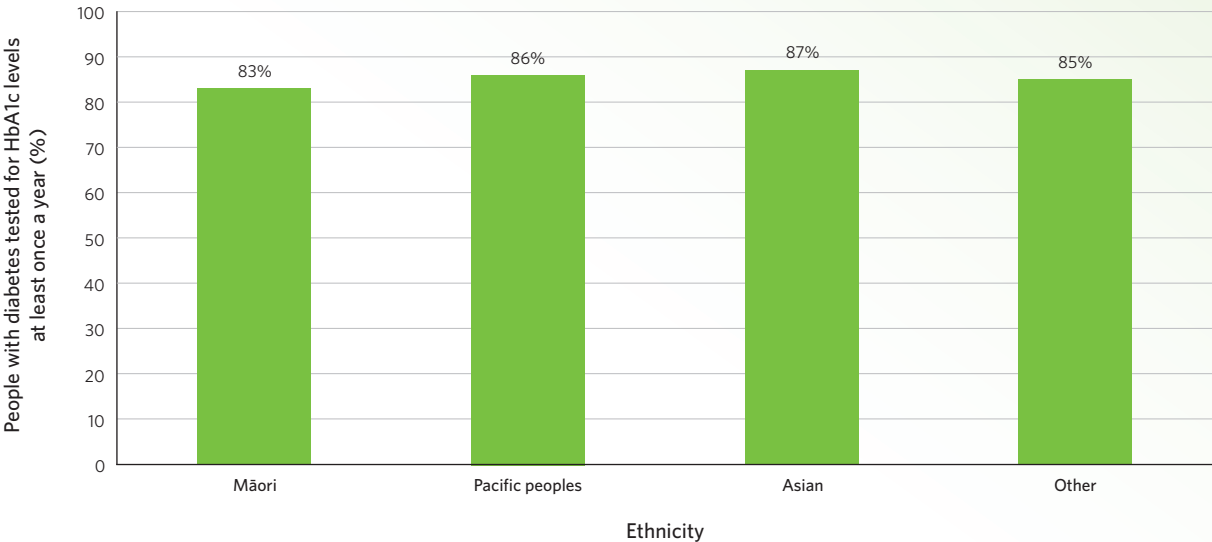
In contrast to gout, pharmaceutical use for diabetes (metformin and insulin) is relatively consistent by ethnicity, although Pacific populations have a slightly but significantly higher rate of receiving insulin and metformin than other groups, as Figure 28 shows.

Figure 28: People with diabetes aged 25 and over regularly receiving insulin or metformin, by ethnicity, 2013



Regular monitoring of HbA1c is vital to ensure good glycaemic control and reduce the likelihood of complications developing. Around 85 percent of New Zealanders with diabetes have one or more tests each year. The rate of monitoring among Māori was slightly but significantly lower than the other groups.

Figure 29: People with diabetes tested for HbA1c levels at least once a year, by ethnicity, 2013



5.2 Socioeconomic deprivation

Why does this matter?

The link between socioeconomic deprivation and poorer health outcomes is well established.^{61,62,63} Those with lower incomes and social status often have less access to healthy lifestyles (healthy food, good quality housing, etc), as well as increased stress and anxiety. In addition to these disadvantages, those who most need health care can be those least likely to get it.⁶⁴ This might be because of the cost of accessing care, or because care is not culturally appropriate – for example, the consumer may feel judged or uncomfortable.

61. Marmot M. 2004. *The Status Syndrome: How Social Standing Affects Our Health and Longevity*. Times Books.
62. Deaton A. 2002. Policy implications of the gradient of health and wealth. *Health Aff (Millwood)* 21(2): 13–30.
63. Sorlie PD, Backlund E, Keller JB. 1995. US mortality by economic, demographic, and social characteristics: the National Longitudinal Mortality Study. *Am J Public Health* 85(7): 949–56.
64. Hart JT. 1971. The inverse care law. *Lancet* 1(7696): 405–12.



What do we know?

Barriers to access

The most recent Commonwealth Fund survey of developed countries, published in 2014, considered New Zealand against 10 other health systems. Broadly, New Zealand's health care was comparable with the average, but it was ranked second last in 'equity', with only the US considered less equitable.⁶⁵

This inequity was mainly due to access to care. Once able to access care, New Zealanders on below-average incomes considered it good care. The survey showed that 23 percent of New Zealanders on below-average incomes who had a medical problem didn't make an appointment with a doctor because of the cost. This is second only to the US, where it is 39 percent. New Zealand also compares very poorly with Australia at 14 percent, Canada at 7 percent and the UK at 1 percent.

Sixty-four percent of people on below-average incomes found medical treatment difficult to access afterhours compared with 42 percent of those on above-average incomes. This 22 percentage point difference is the largest income gap in the group of 11 developed countries studied. In Australia, for instance, people found it difficult to access care out of hours (58 percent reported this), but there was no difference between rich and poor (see Table 15).

The Commonwealth Fund survey predates the recent extension of free health care to under-13s in New Zealand, which may impact on future patient experience.

65. Davis K, Stremikis K, Squires D, et al. 2014. *Mirror, mirror on the wall: how the performance of the U.S. health care system compares internationally, 2014 Update*. New York: The Commonwealth Fund. URL: http://www.commonwealthfund.org/-/media/files/publications/fund-report/2014/jun/1755_davis_mirror_mirror_2014.pdf (accessed July 2015).

Table 15: Equity of access, New Zealand and international comparators, 2013

	Equity measures, raw scores (adapted from Commonwealth Fund)													
	Below-average incomes							Above-average incomes						
	New Zealand	Australia	United Kingdom	United States	Canada	Sweden	New Zealand	Australia	United Kingdom	United States	Canada	Sweden		
Had medical problem but did not visit doctor because of cost in the past year	23%	14%	1%	39%	7%	5%	15%	5%	3%	17%	4%	2%		
Somewhat or very difficult to get care in the evenings, on weekends, or holidays (base: sought afterhours care)	64%	58%	40%	70%	67%	67%	42%	58%	30%	53%	59%	63%		
Did not get recommended test, treatment or follow-up because of cost in the past year	9%	10%	1%	31%	14%	7%	2%	6%	2%	11%	4%	2%		
Did not fill prescription or skipped doses because of cost in the past year	18%	14%	4%	30%	8%	4%	9%	8%	2%	12%	4%	1%		



5.3 Conclusion

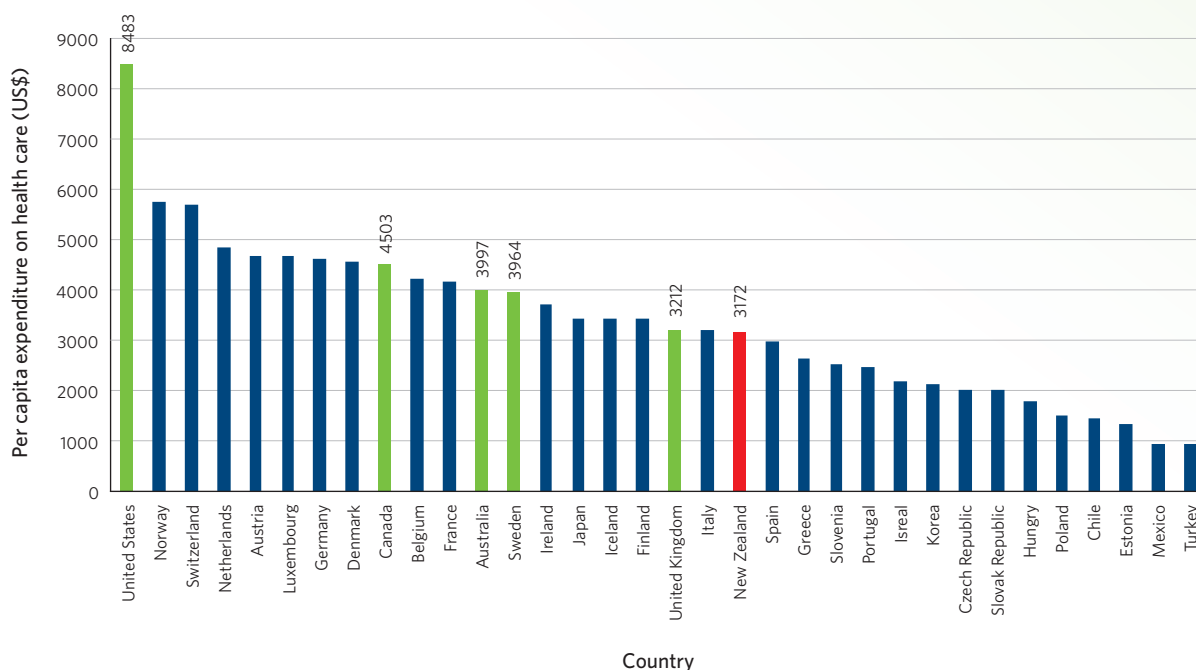
Equity is a relatively weak area of quality in New Zealand's health system. Both socioeconomic barriers to accessing care, and variation in care received by different ethnic groups for chronic diseases such as gout, suggest our system needs to do more to deliver good health for all populations. We know from the example of childhood immunisation, and the similarity in the management of diabetes between ethnic groups, that equity is possible.

6 Is our health care good value for money?

6.1 What is value in health care? And do we have it?

A commonly used definition of value in health care is outcomes of care divided by the cost of health care. Under this definition, New Zealand, which spends less on its health care system than most comparable countries (see Figure 30), and has outcomes broadly in line with international norms, has a health care system which appears to provide good value for money.

Figure 30: Per capita expenditure on health care (US\$), 2011



In nearly all developed countries comparable to New Zealand, health care expenditure lies somewhere between 8 and 12 percent of GDP,⁶⁶ typically growing by around 2 percent since 2000. New health spending does not always generate new health benefits and may reduce the population's overall health status by taking away funds that could have been spent on things that influence good health, such as education, good housing, transport and healthy eating.

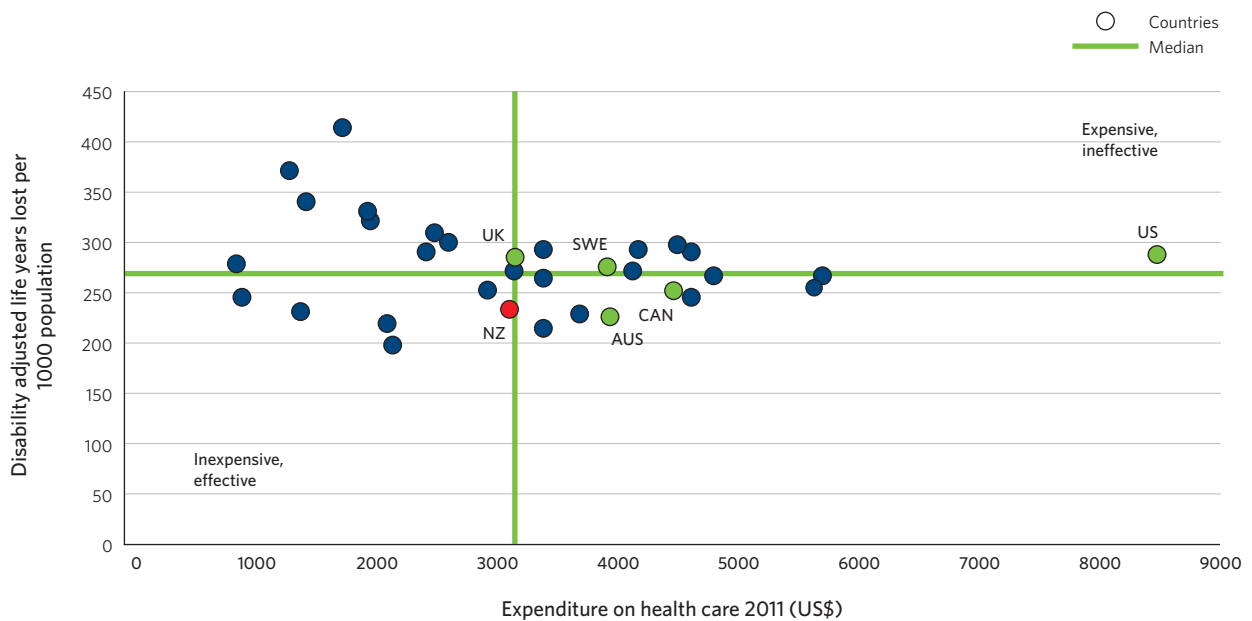
66. OECD Data. 2013. Health resources: Health spending. URL: <https://data.oecd.org/healthres/health-spending.htm> (accessed July 2015).



If we look at measures of living well and long, there is little evidence that more expenditure equals better results. When we compare, by country, years of life lost or disabled with expenditure on health care, New Zealand sits somewhere in the middle on expenditure and yet has fewer years of life lost or disabled than many similar countries and many that spend more. In Figure 31 we see expenditure on health care plotted against DALYs⁶⁷ lost for relatively wealthy countries within the OECD. Each dot represents a country (our common comparator group is shown in green and labelled).

This suggests New Zealand's health services are getting good results for a reasonable cost. Because there is no evidence that spending more money guarantees better results, it is likely that a good health system uses resources wisely and remains affordable.

Figure 31: Expenditure on health care (source OECD) and disability adjusted life years lost per 1000 population (source WHO), by country, 2011



A more full and detailed consideration of value requires us to consider components beyond good outcomes for the resources spent:

- Doing it right - avoiding unnecessary costs caused by harm: for example, not having extended stays in hospital due to infection or other misadventure.
- Doing the right thing - avoiding unwarranted overtreatment or investigation and ensuring care is well coordinated and avoids more intensive interventions.

These concepts help us to consider whether we are making progress in providing better value for money, and whether there are areas we could improve still further.

67. One DALY can be thought of as one lost year of 'healthy' life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.

6.2 Increasing value in health care

Doing it right - avoided costs of harm

Why does this matter?

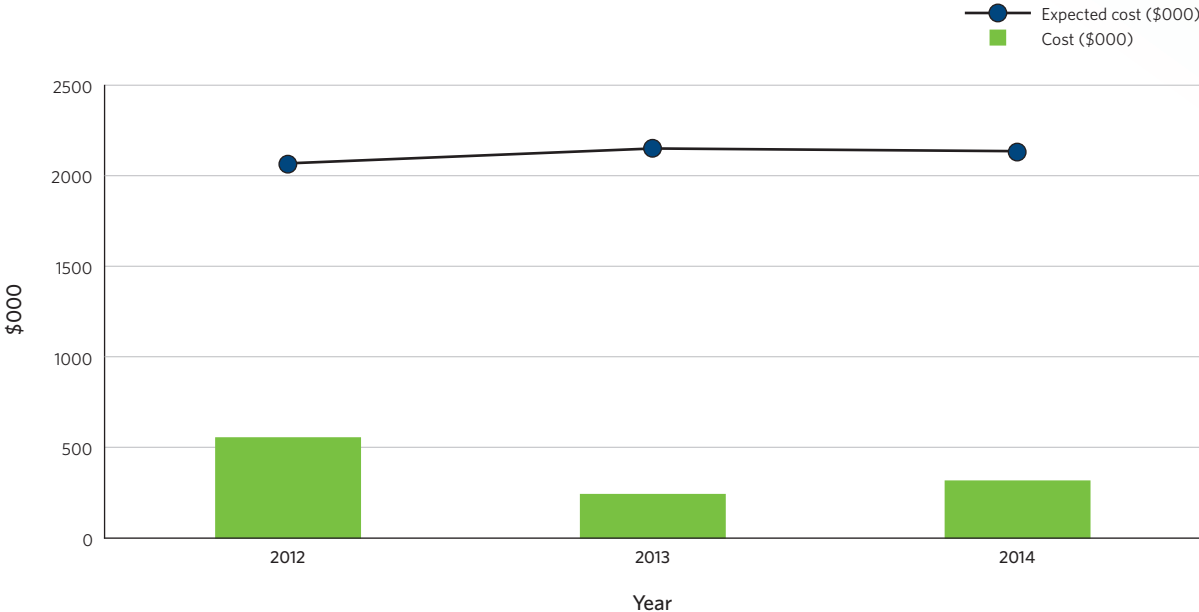
As well as being damaging to patients, harm from treatment is expensive to put right. Hospital stays become longer (at an estimated cost of \$770 a day). Additional treatments, medications and further surgery may be required. For this reason, we always seek to estimate the cost of harm and how much of these may have been avoided in our evaluation of patient safety programmes. In each case we use a conservative estimate of the cost of harm.

What do we know?

Central line associated bacteraemia

The cost of a case of CLAB has been conservatively estimated at \$20,000.⁶⁸ This means the costs (and savings if we avoid these costs) quickly build up. Based on our national baseline rate of 3.3 cases of CLAB per 1000 line days in 2012, we would expect just over \$2 million in costs attributable to CLAB per year. As Figure 32 shows, the costs of CLAB to the New Zealand health care system have in fact ranged from \$200,000 to \$500,000 a year since 2012. The national programme to reduce cases of CLAB in New Zealand ICUs has provided our health care system with savings of more than \$5 million to date.

Figure 32: Cost and expected cost of CLABs in ICUs, 2012-14



68. Seddon ME, Hocking CJ, Mead P, et al. 2011. Aiming for zero: decreasing central line associated bacteraemia in the intensive care unit. *NZMJ* 124(1339): 9-21.



Doing the right thing – uncoordinated care and unwarranted variations in treatment

Why does this matter?

Poor coordination of care means patients do not receive care when and where they need it, which can result in them needing urgent hospital care later on. This is particularly the case for older people. As well as the human cost in older people losing their independence and being exposed to risk in entering hospital, acute admission to hospital for this group carries a financial cost.⁶⁹

There is also the risk our health care system will give people treatments and investigations that are not needed, could have been avoided, or are unlikely to provide any substantial benefit to the patient. Use of treatments unlikely to benefit the patient are an unnecessary risk for that patient and an unnecessary use of health dollars that could be spent elsewhere.

The Academy of Medical Royal Colleges in the UK in 2014⁷⁰ estimated the cost of unnecessary or ill-coordinated treatment in the UK to be around NZ\$4 billion. The New England Healthcare Institute in 2008 estimated that misuse, overuse and underuse of medication in the US cost US\$60 billion, overuse of emergency department care cost US\$20 billion, and unexplained variation in medical and surgical services led to potentially avoidable costs of US\$600 billion.⁷¹

What do we know?

Costs associated with unwarranted variations in treatment

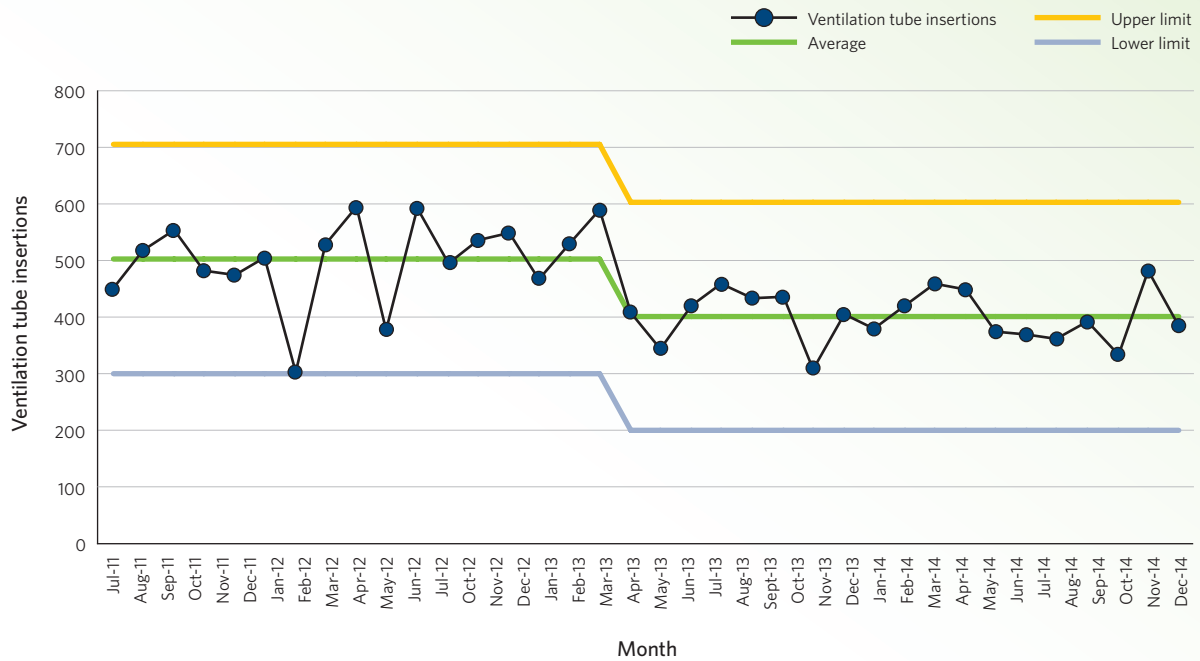
The Atlas has demonstrated that reductions in unwarranted variation and potential overtreatment are achievable with the change in rate of insertion of ventilation tubes (commonly known as grommets) for treatment of otitis media (middle ear infection) with a sustained reduction in operations from December 2012 onwards (see Figure 33). We estimate that since June 2012 this reduction has led to a total of 2100 fewer operations being undertaken, saving nearly \$4 million.

69. Currie C. 2010. Health and social care of older people: could policy generalise good practice? *Journal of Integrated Care* 18(6): 19–26.

70. Academy of Medical Royal Colleges. nd. *Protecting resources, promoting value*. London: Academy of Medical Royal Colleges. URL: <http://www.aomrc.org.uk/general-news/protecting-resources-promoting-value.html> (accessed July 2015).

71. New England Healthcare Institute. 2008. *Waste and Inefficiency in the U.S. Health Care System*. Cambridge, MA: New England Healthcare Institute.

Figure 33: Ventilation tube insertions, 2011-14



Cost of cancelled operations

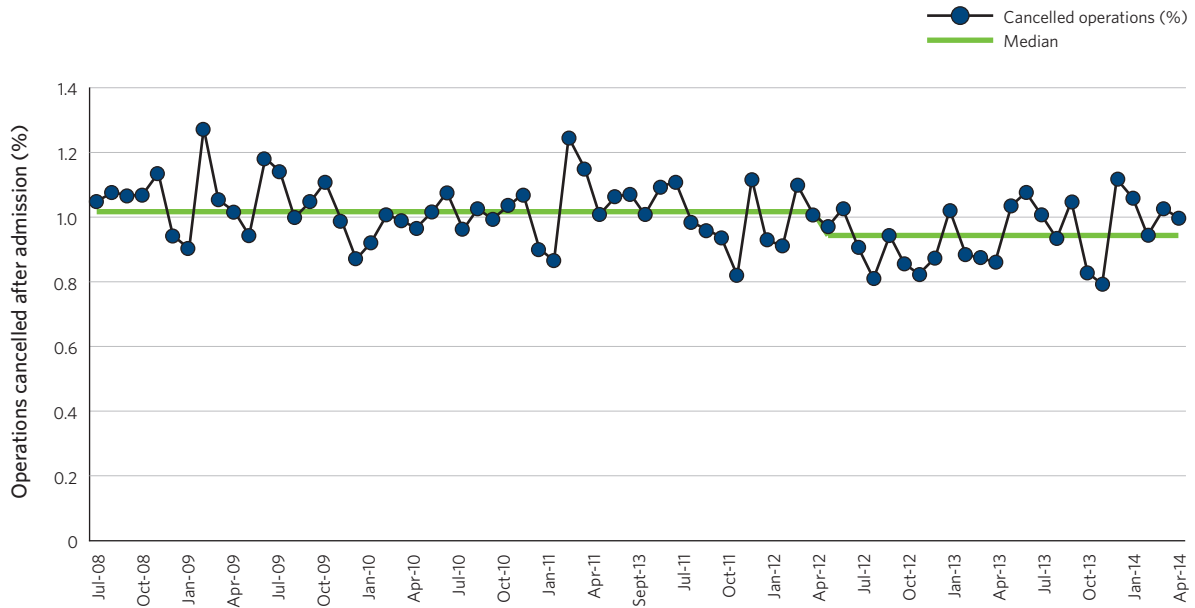
A final measure of poorly coordinated care is that of cancelled operations following admission. Not only is this a poor experience for patients, it may also show where a system is under stress and running too close to capacity, and where failures in communication and coordination are creating waste and poorly managed demand.

Between 2008 and 2012 around 1 percent of operations were cancelled after admission relatively consistently. This is just over 5000 operations a year. Assuming the cost of a cancelled operation is equivalent to one wasted bed-day, this is a cost of \$4 million every year.

However, in the last year (2012-13), this has reduced to around 0.9 percent, a small drop but one which is statistically significant and equates to 600 cancellations avoided across the country (see Figure 34).



Figure 34: Operations cancelled after admission, 2008-13



International comparisons are limited as only England also publishes this measure, and has an identical rate. While a significant reduction is good, we are not able to say how this compares internationally.

Table 16: Elective operations cancelled after admission, New Zealand and international comparators, 2013

Country	Elective operations cancelled after admission
New Zealand	0.91% (0.87-0.94%)
Australia	N/A
England	0.9% ⁷²
Scotland	N/A
United States	N/A
Canada	N/A
Sweden	N/A

95% CIs in parenthesis for New Zealand figure

72. NHS England. *Cancelled Elective Operations*. URL: <http://www.england.nhs.uk/statistics/statistical-work-areas/cancelled-elective-operations/> (accessed July 2015).

6.3 Opportunities for further improvement

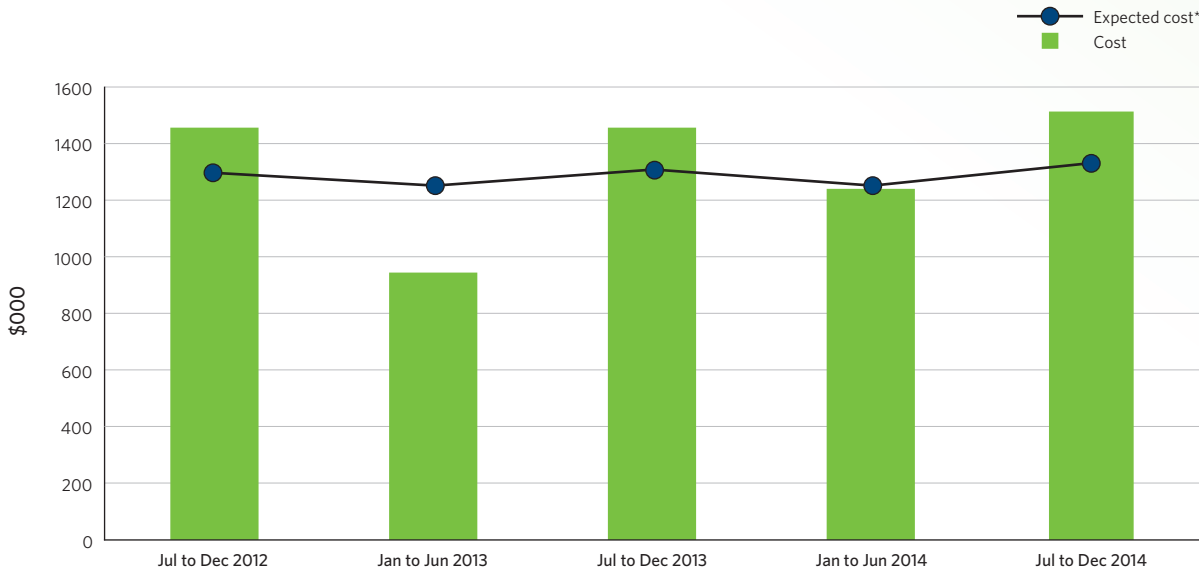
Doing it right - avoided cost of harm

Falls with fractured neck of femur

The cost of a fall with a fractured neck of femur is estimated at between \$27,000 and \$150,000 depending upon the outcome (and whether the injury leads to admission to a residential care home on discharge from hospital). There is a strong argument to consider the costs of all older people who fall and break their hip regardless of where this occurs. As there are over 3000 such cases a year, these costs are close to \$100 million a year.

There are around 100 such falls a year in New Zealand hospitals, costing a minimum of \$2.7 million in extended hospital stays alone. We noted in Figure 1 that falls have remained constant over the last two and a half years, and it is no surprise that costs have remained consistent.

Figure 35: Cost and expected cost of in-hospital falls with fractured neck of femur, 2012-14



*Expected cost is calculated based on 2011-12 fall with fractured neck of femur age standardised rate to later year hospital admissions

Doing the right thing - uncoordinated care and unwarranted variations in treatment

The cost of occupied bed-days for older people admitted two or more times as an acute admission per year

We considered the occupied bed-days for older people admitted two or more times as an acute admission per year in section 4.2. In 2013-14 we estimate these events cost around \$267 million.⁷³

It is likely some of these events were avoidable. The significant reduction in the rate of occupied bed-days per 1000 population between 2008-09 and 2013-14 equates to 19,000 bed-days being avoided (allowing for the growth in the number of older people). At a conservative estimate this difference is the equivalent of \$15 million hospital expenditure avoided.

73. Based on a conservative estimate of a hospital bed-day costing \$770.



Further costs may be avoidable. If all DHBs matched the level of admission of the current lowest DHB for admissions amongst older people, 136,000 hospital bed-days (costing \$105 million) could be avoided. If even the level of admission of the lowest quartile of DHBs was matched, the figures are 66,000 bed-days and \$51 million. These are worthwhile sums to recycle elsewhere in the health system, but may, by international standards, be relatively low. A study of the NHS in England (roughly 10 times the size and 13 times the cost of the New Zealand health system) found that potentially avoidable costs associated with this issue were around \$4 billion – something like 40 times the New Zealand figure.

Table 17: Potentially avoidable expenditure on hospitalisation of older people with multiple acute admissions, 2008-09 and 2013-14

	2008-09	2013-14
Bed-days associated with older people admitted acutely more than once in the year ('000)	366	347
Cost of bed-days (\$m)	282	267
Potential avoidable bed-days if all DHBs in line with lowest DHB ('000)		136
Avoidable cost (\$m)		105
Potential avoidable bed-days if all DHBs in line with lowest quartile ('000)		66
Avoidable cost (\$m)		51

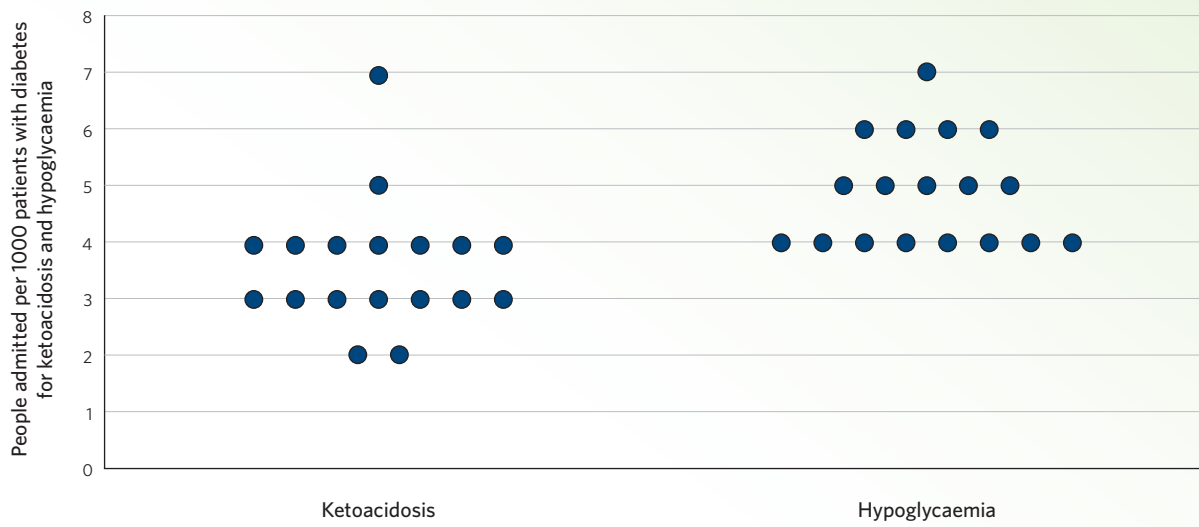
Costs associated with unwarranted variations in treatment

Estimating the total extent and cost of unwarranted variation in health care in New Zealand is extremely difficult, but is possible for some individual conditions. The Atlas highlights variation at this level. We present data for hospital admissions for diabetes and gout using a frequency diagram that highlights the scale and nature of variation rather than providing a geographic context. In both cases admissions should be rare, and are a marker of quality of coordination and care outside the hospital.

How much can be saved?

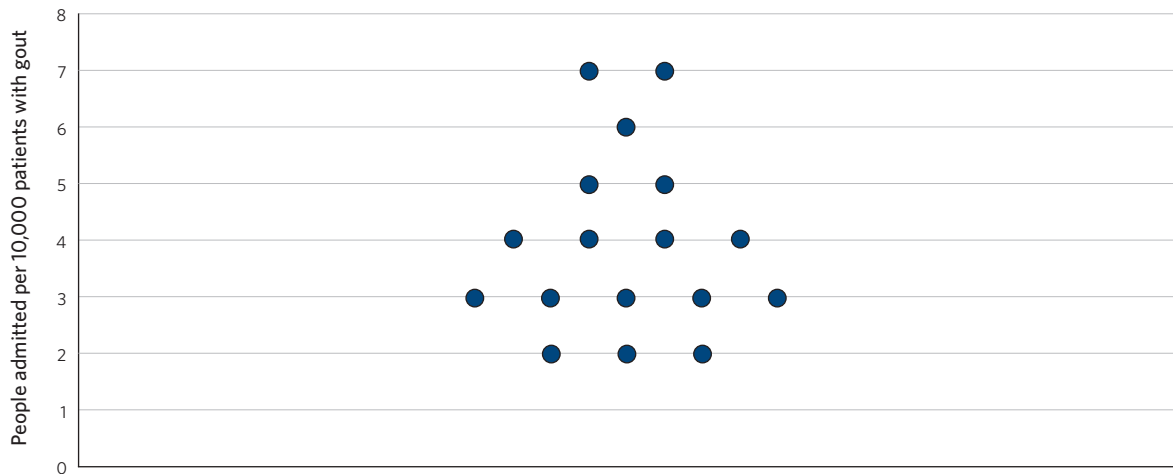
Figure 36 shows the number of patients admitted per 1000 patients with diabetes for two diabetes-related diagnoses – ketoacidosis and hypoglycaemia – by DHB. Both should be rare events, so this is a measure where a higher admission rate is likely to represent a worse outcome. Each dot on the graph represents a DHB. For both ketoacidosis and hypoglycaemia there is a variation in admission rate of two to three times between the DHBs with the highest and lowest admission rates. We estimate that if the higher admission rates were reduced to those of the lowest quartile, around \$600,000 in costs of hospital admissions a year could be avoided on these two diagnoses alone. In 2013 there were around 4000 patients in these two categories.

Figure 36: People admitted per 1000 patients with diabetes for ketoacidosis and hypoglycaemia, by DHB, 2013



A similar analysis can be undertaken for gout. Figure 37 shows a 3.5-fold variation between DHBs for gout admissions. Reducing all DHB admission rates to the lowest quartile would remove the need for around 1000 hospital bed-days (about a quarter of the total). This would mean around \$750,000 a year not spent on hospitalising these patients.

Figure 37: People admitted per 10,000 patients with gout, by DHB, 2011





6.4 Conclusion

Compared with other systems the New Zealand system is relatively good value for money, and in many areas is becoming more efficient. However, there is room for improvement. The expenditure per head on health care in New Zealand is low compared with most other industrialised nations, but over 10 percent of GDP is spent on health care, so dramatic increases in health care expenditure are probably unaffordable. The pressures caused by a population making increased use of health services, and the availability of more complex treatments, means providing high-quality care and avoiding harm and unnecessary treatment are more important than ever. Only a high-quality public health service will be sustainable in the 21st century.

7 Conclusions

The New Zealand health system scores well on many of the dimensions of quality, with most comparative measures showing New Zealand to be broadly similar to or slightly better than other countries. This is despite New Zealand having a relatively inexpensive system by international standards, indicating it is providing good value for money.

There are several areas of clear improvement:

- CLAB has been almost eliminated in ICUs.
- Mortality amenable to health care declined over 30 percent in the 10 years from 1997.
- Immunisation rates have increased.
- Inequity in the provision of immunisation has reduced.
- Cancelled operations inside hospitals have reduced.

There are significant improvements in some quality and safety practices:

- hand hygiene in hospitals
- use of surgical safety checklists
- good practice in avoiding SSIs
- assessing for the risk of in-hospital falls and making plans to address this for individual patients.

However, related outcomes, such as in-hospital falls with harm, and *S aureus* infections, have not changed. It may take further time for these process improvements to translate to improved outcomes. In many cases, like SSI reductions, a time lag on improved outcomes following improved processes is expected and normal.

However, New Zealand's is far from being a perfect system. In all aspects of quality there are opportunities to improve. For example, safety issues remain, even in areas where there has been a national focus. Similarly, although patient experience in our hospitals is generally positive, there are specific areas of involvement and coordination of care which require improvement.

Equity is a weak point in the quality of New Zealand's health system – in terms of ethnicity and socioeconomic status. Ensuring everyone has access to the same high-quality services regardless of income or ethnic background is essential.

This report has implications for a wide range of people, and we draw out some of these in the remainder of this section.

7.1 What does this mean for patients and the public?

One of the reasons for making information about the quality of the system available is to encourage patients to be partners in their own care. We know that a majority of both patients and the public want to know how good the system is, and value transparency.

The patient experience survey generally gives good results, with most patients reporting a positive experience. However, the survey also shows patients do not feel they and their families/whānau are fully involved in their care.

One of the benefits of involving patients more in their own care is that some issues of quality are likely to be addressed. For example, unwarranted variation in treatments for particular conditions is often associated with systems which don't prioritise what matters most to patients. We know that reducing this unwarranted variation is an area where New Zealand's health services could improve.



The Commission has made increasing health literacy one of its priorities. Health literacy (being able to obtain, understand and use basic health information to navigate health services and make appropriate health decisions) is the foundation of the greater involvement of patients in their own care. An understanding of the overall performance of the system using the sort of information contained within this report is one aid to enhancing health literacy. Another is *Let's PLAN for better care*, a health literacy initiative developed by the Commission to help consumers prepare well for their visit to the GP or other primary care health professional.

Let's PLAN encourages people to plan ahead for practice visits and ask questions during their visits so they understand fully their diagnosis and treatment. It also suggests questions they can ask pharmacy staff when they pick up their medicine.

7.2 What does this mean for individual health professionals?

There is clear evidence that practice has changed for the better in some areas. For example, there has been an increase in hand hygiene compliance rates from 60 to 77 percent in two years, and the insertion bundle is now almost always used when inserting central lines in ICUs.

However, questions remain. Is there room for further improvement? Why are good hand hygiene practices not being followed 23 percent of the time? Are improvements sustainable and does the system have the capacity to make improvements without concerted national efforts?

The national patient experience survey shows how highly New Zealanders rated their experience of the 'humanitarian' aspects of care. When asked whether they were treated with dignity and respect in their most recent hospital stay, 87 percent of patients answered 'yes, always', and when asked if they were treated with kindness and compassion, 85 percent answered the same way. However, patients were less happy about how they were involved in decisions about their care.

This lack of involvement may be reflected in the high degree of unwarranted variation in treatment for individual conditions, as shown in the Atlas. In this respect, New Zealand is much like other affluent countries. In 21st century health care, the ability to understand the causes of variation in practice and identify and address where this variation is unwarranted is a key clinical skill. The Atlas and the related 'Find my Patients' tools are building blocks to support the development of this in New Zealand.

7.3 What does this mean for health service leaders?

Improvement in practice – for example, in the provision and equity of provision of childhood immunisation, and in various national patient safety programmes such as infection prevention and control, and in-hospital falls – shows clearly that New Zealand's health system has the leadership to achieve real change when time, money and priority are directed at a problem.

This capacity will be needed, as the next set of challenges facing health care are likely to be still more complex. The Atlas frequently shows variation is unlikely to be caused by patient need or preference alone. Often these variations reflect systems which are not well integrated around the patient and their needs and wants.

We know, for example, there is considerable variation in the extent to which older people enter and remain in hospital following unplanned emergency admissions. We also know a large minority of patients do not always feel they are as involved in their care as they would like to be, or feel they are not given sufficient information to allow effective self-management when they leave hospital.

These issues are not unique to New Zealand. They are reported throughout the developed world. This does not mean they are any less pressing, nor the need to find a solution to them any less urgent.

Appendix 1: Sources

We have set out to include only measures which have already been published. For some measures references are given in the text. This appendix shows where the data has been previously published and where methodologies are available to allow replication.

There are 35 separate measures in the report: 17 refer to hospital care, 10 to the interface of care or cover the whole system, 7 to primary care and one covers mental health services.

In-hospital falls leading to a fractured neck of femur

Previously published:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/quality-and-safety-markers/qsms-october-december-2014/>

Methodology/Definition:

<https://www.hqmnz.org.nz/measures/system/in-hospital-falls-associated-with-fractured-neck-of-femur>

Central line insertions in ICUs compliant with the insertion bundle

Previously published:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/quality-and-safety-markers/qsms-october-december-2014/>

Methodology/Definition:

<http://www.hqsc.govt.nz/assets/Infection-Prevention/Catheter-Related-Bloodstream-Infections/CLAB-Annual-Report-Feb-2013.pdf>

CLAB per 1000 line days

Previously published:

<http://www.handhygiene.org.nz/images/stories/HHNZDOWNLOADS/National%20Hand%20Hygiene%20Report%2001%20November%202014%20to%2031%20March%202015%20Final.pdf>

Methodology/Definition:

http://handhygiene.org.nz/index.php?option=com_content&view=article&id=24&Itemid=139

S aureus bacteraemia per 1000 bed-days

Previously published:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/quality-and-safety-markers/qsms-october-december-2014/>

Methodology/Definition:

http://handhygiene.org.nz/index.php?option=com_content&view=article&id=39&Itemid=258

Hip and knee operations where good practice in antibiotic prophylaxis and skin preparation was followed

Previously published:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/quality-and-safety-markers/qsms-october-december-2014/>

Methodology/Definition:

<http://www.hqsc.govt.nz/assets/Infection-Prevention/Surgical-Site-Infection-Surveillance/SSII-Programme-National-Orthopaedic-Report-Sep-2014.pdf>



Surgical site infection for hip and knee operations

Previously published:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/quality-and-safety-markers/qsms-october-december-2014/>

Methodology/Definition:

<http://www.hqsc.govt.nz/assets/Infection-Prevention/Surgical-Site-Infection-Surveillance/SSII-Programme-National-Orthopaedic-Report-Sep-2014.pdf>

Postoperative sepsis per 1000 at-risk admissions

Previously published:

<http://www.oecd.org/els/health-systems/Health-at-a-Glance-2013.pdf>

Methodology/Definition:

<http://www.oecd.org/els/health-systems/Health-at-a-Glance-2013.pdf>

Postoperative sepsis and DVT/PE per 100,000 discharges

Previously published:

<http://www.oecd.org/els/health-systems/Health-at-a-Glance-2013.pdf>

Methodology/Definition:

<http://www.oecd.org/els/health-systems/Health-at-a-Glance-2013.pdf>

Postoperative DVT/PE per 1000 at-risk admissions

Previously published:

<https://prezi.com/dbzsrwws2s45/health-quality-and-safety-indicators-june-2014/>

Methodology/Definition:

<https://www.hqmnz.org.nz/measures/system/incidence-rate-of-postoperative-sepsis>

Population dispensed multiple medications in three out of four quarters; Population dispensed both an antipsychotic and a benzodiazepine in the same quarter

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/polypharmacySF/atlas.html>

Methodology/Definition:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/polypharmacySF/atlas.html>

Average inpatient rating out of 10 for the four domains of experience; Highest and lowest scoring questions (percentage of responders giving the most positive response)

Previously published:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/health-quality-and-safety-indicators/patient-experience/adult-inpatient-experience/>

Methodology/Definition:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/PR/patient-experience-methodology-and-procedures-Jul-2014.pdf>

Age-standardised amenable mortality rates for people aged under 75 years (Nolte/McKee definition)

Previously published:

<http://www.commonwealthfund.org/publications/in-the-literature/2011/sep/variations-in-amenable-mortality>

Methodology/Definition:

[http://www.healthpolicyjrnl.com/article/S0168-8510\(11\)00159-X/pdf](http://www.healthpolicyjrnl.com/article/S0168-8510(11)00159-X/pdf)

Disability adjusted life years lost per 1000 population

Previously published:

http://www.who.int/healthinfo/global_burden_disease/GHE_DALY_2012_country.xls?ua=1

Methodology/Definition:

http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/

Occupied bed-days associated with people aged 75 and over admitted twice or more as an emergency per 1000 population

Previously published:

<https://prezi.com/dbzsrwws2s45/health-quality-and-safety-indicators-june-2014/>

Methodology/Definition:

<https://www.hqmnz.org.nz/measures/staying-healthy/occupied-bed-days-for-people-aged-75-admitted-as-an-emergency-2-times-or-more-per-year>

Discharges from acute inpatient units where a community mental health contact with client participation was recorded in the seven days immediately following that discharge

Previously published:

<http://www.ndsa.co.nz/OurServices/MentalHealth/KPIFramework.aspx>

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/MentalHealthSF/atlas.html>

Methodology/Definition:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/MentalHealthSF/atlas.html>

People with gout who received allopurinol regularly

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/goutSF/atlas.html>

Methodology/Definition:

http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/goutSF/Methodology_gout_v4.pdf

People with diabetes aged 25 and over regularly receiving insulin or metformin

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/diabetesSF/atlas.html>

Methodology/Definition:

http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/diabetesSF/Methodology_diabetes.pdf

Immunisations at 24 months

Previously published:

<http://www.health.govt.nz/our-work/preventative-health-wellness/immunisation/immunisation-coverage/national-and-dhb-immunisation-data>

Methodology/Definition:

<http://www.health.govt.nz/our-work/preventative-health-wellness/immunisation/immunisation-coverage/questions-and-answers-immunisation-coverage#1>

Gout prevalence

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/goutSF/atlas.html>

Methodology/Definition:

http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/goutSF/Methodology_gout_v4.pdf



Allopurinol and colchicine dispensing by ethnicity

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/goutSF/atlas.html>

Methodology/Definition:

http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/goutSF/Methodology_gout_v4.pdf

New Zealand residents identified as having diabetes

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/diabetesSF/atlas.html>

Methodology/Definition:

http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/diabetesSF/Methodology_diabetes.pdf

People with diabetes tested for HbA1c levels at least once a year, by ethnic group

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/diabetesSF/atlas.html>

Methodology/Definition:

http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/diabetesSF/Methodology_diabetes.pdf

Equity of access, New Zealand and international comparators

Previously published:

http://www.commonwealthfund.org/-/media/files/publications/fund-report/2014/jun/1755_davis_mirror_mirror_2014.pdf

Methodology/Definition:

http://www.commonwealthfund.org/-/media/files/publications/fund-report/2014/jun/1755_davis_mirror_mirror_2014.pdf

Per capita expenditure on health care (US\$)

Previously published:

<http://www.oecd.org/els/health-systems/oecd-health-statistics-2014-frequently-requested-data.htm>

Methodology/Definition:

<http://www.oecd.org/els/health-systems/oecd-health-statistics-2014-frequently-requested-data.htm>

Expenditure on health care and disability adjusted life years lost by country

Previously published:

<http://www.oecd.org/els/health-systems/oecd-health-statistics-2014-frequently-requested-data.htm>

http://www.who.int/healthinfo/global_burden_disease/GHE_DALY_2012_country.xls?ua=1

Methodology/Definition:

<http://www.oecd.org/els/health-systems/oecd-health-statistics-2014-frequently-requested-data.htm>

http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/

Cost and expected cost of CLABs in ICUs

Previously published:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/quality-and-safety-markers/qsms-october-december-2014/>

Methodology/Definition:

<http://www.hqsc.govt.nz/assets/Infection-Prevention/Catheter-Related-Bloodstream-Infections/CLAB-Annual-Report-Feb-2013.pdf>

Ventilation tube insertions per 1000 children aged 0–14 years

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/surgicalSF/atlas.html>

Methodology/Definition:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/surgicalSF/atlas.html>

Operations cancelled after admission

Previously published:

<https://prezi.com/dbzsrwws2s45/health-quality-and-safety-indicators-june-2014/>

Methodology/Definition:

<https://www.hqmnz.org.nz/measures/planned-care/cancellation-of-surgery-by-the-hospital-during-the-admission>

Cost and expected cost of in-hospital falls with fractured neck of femur

Previously published:

<http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/quality-and-safety-markers/qsms-october-december-2014/>

Methodology/Definition:

<https://www.hqmnz.org.nz/measures/system/in-hospital-falls-associated-with-fractured-neck-of-femur>

Patients admitted per 1000 patients with diabetes for ketoacidosis and hypoglycaemia

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/diabetesSF/atlas.html>

Methodology/Definition:

http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/diabetesSF/Methodology_diabetes.pdf

People admitted per 10,000 patients with gout

Previously published:

<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/goutSF/atlas.html>

Methodology/Definition:

http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/Atlas/goutSF/Methodology_gout_v4.pdf



Appendix 2: Why this framework? Why these measures? What is missing?

Using metrics to make sense of something as complex as a health care system requires a coherent framework if we are to avoid getting lost in the myriad available measures. In writing this report we have had two fundamental questions to answer:

- What are the dimensions of quality that interest us?
- What measurements can we use to describe these dimensions?

Our framework is described above, but was chosen as it draws heavily on frameworks which are well tested and recognised both in New Zealand and internationally: the Triple Aim and the Institute of Medicine's six dimensions of quality.

Regardless of the framework chosen, what measures best populate it is inevitably contentious. We have adopted a fundamental principle of only using pre-existing and currently publicly available measures. The reason for this is three-fold.

First, the measures already have some provenance. Often they will have been through consultative processes, or had expert groups involved in their design. Therefore, these measures have the second advantage that the debate about them concerns how they should be interpreted and acted upon rather than their construction and data sources. The third advantage is that some degree of international comparison is usually possible. In some cases there is widespread use of these measures (eg, for the OECD patient safety set), but for nearly all, some comparisons are possible.

We recognise that at times this means potentially excellent measures have been excluded, or important topics are not considered in the framework, as potentially useful measures are either not defined, calculated or published. We recognise this is the first iteration of this report, and we have the opportunity to add new measures over time.

However, there is a logic to which measures are in each part of the framework, as follows.

Safety: One apparently ideal measure of safety – total amount of avoidable harm in the system – is very difficult, and very expensive to measure accurately, and may actually do more harm than good by discouraging open reporting of problems. However, there is a range of common harms around falls, infection, perioperative complications and so forth that have been addressed by the *Open for better care* campaign and which we can measure, at least to some extent. In some cases, we can report on safe practice of care, as well as, or rather than, outcomes. These are not in themselves measures of harm, but show how widespread safe practice to avoid harm is.

Patient experience: The introduction of the in-hospital patient experience survey was the first time New Zealand had a universal, comparative tool to measure objective patient experience (as opposed to patient satisfaction). This tool runs quarterly and is starting to produce a consistent pattern of results. The tool is designed around four domains shown in the literature to be critical to understanding patient experience: communication (between patients and staff); partnership (how well patients and the family/whānau and carers are involved in decisions about their care); coordination (how well different parts of care are organised around the needs of the patient); and how well physical and emotional needs are met.

While this approach is well supported by evidence, and the use of an internationally validated tool allows comparison with other jurisdictions, the current tool, which focuses only on in-hospital care, is inevitably limited. For 2015–16 and beyond, the Commission is working with the Ministry of Health and the primary care

sector to develop a survey which covers a broader range of care, outside of hospital, with particular emphasis on how well care is organised around the needs of patients.

Effectiveness: Recognising that an ultimate goal of health services is to help people live longer and better, we have included measures of mortality and burden of disease. We have chosen internationally published measures specifically to allow comparison. We recognise these measures are affected by things well beyond the immediate control of health systems (economic prosperity, housing, transport, education and so forth).

For lower-level contributory measures of effectiveness, we have concentrated on two specific concepts: integration of care and provision of the 'right care'. We believe integration of care becomes increasingly important as the proportion of the population who are very old, and have multiple illnesses, increases. Knowing how best to balance their different needs and treat them as people with life goals that matter, rather than as a set of health problems, will be essential if we are to have a sustainable health system that truly does help people live lives that are both longer and better. We have selected two relevant measures for this report, one in general health care and one in mental health care, which provide an insight into integration of care.

Understanding whether or not a system is providing the 'right care' is complex. However, seeking to understand variation in how apparently similar patients are treated and whether or not this variation can be justified by the differences in patients' needs or preferences is a key first step to doing this. This is the purpose of the Atlas, key highlights from which are reported here.

Equity: To date, the Commission has not sought to develop an overarching measure of equity, instead stratifying its other measures by different groups (eg, ethnicity, sociodemographic status). The measures reported here look at difference in access to care between different ethnic and income groups, and compare differences in treatment patterns for specific diseases between different ethnic groups.

The Commission is developing an Atlas specifically focused on equity in 2015-16. Results from this will be commented on in future reports and may in time allow us to develop a robust overarching measure of equity.

Value: Value in health care is often described as outcomes divided by cost. Comparing the DALYs metric with total expenditure on health allows an estimation of value of the whole system. However, more meaningful measures need to be considered at a lower level. We present a range of measures which fall into one of three categories of cost which should be avoidable: estimated costs of harm (ie, what are the additional costs generated to treat a patient harmed by the system?); estimated costs of poor integration; and estimated costs of unwarranted variation. In each case, the likelihood is that increased costs will be associated with worse outcomes (eg, the harm caused to an individual patient or the loss of benefit caused by having care that was not well integrated), so each represents an occasion where outcomes worsen as costs increase, making both sides of the equation less positive.



Appendix 3: Commission data and reports

One of the Commission's key roles is to publish information about the quality of health care in New Zealand. This involves comparing health care services across the country and comparing what we do with the rest of the world.

Our work in measurement and evaluation highlights the state of health care in New Zealand. The Commission produces regular reports about serious adverse events, quality and safety metrics, mortality (from the mortality review committees) and patient experience of health services. To provide this information, the Commission has a range of different measurement programmes, each with a slightly different focus.

- **Quality and safety indicators**

Quality and safety indicators are a set of high-level measures providing a clear picture of the quality and safety of health services in New Zealand.

- **The Atlas of Healthcare Variation**

The Atlas shows variation between the health care received by people in different geographical regions. It stimulates questions and debate about why there is such variation and identifies more appropriate service delivery, which should then lead to improvements in health care services.

- **Quality and safety markers**

Quality and safety markers track and incentivise progress in four critical areas of safety and quality: reducing harm from falls, healthcare associated infections, surgery and medication.

- **Quality accounts**

Quality accounts require health care providers to give an account for the quality of their services in a similar way to financial accounts showing how an organisation used its money. Quality accounts were adopted by DHBs in 2013.

The Commission undertook a long consultative process with the sector throughout 2012 and 2013 to develop the quality and safety indicator set that most effectively captures our system. The set has grown, developed and been refined over three separate updates since. A wide selection from the set forms the backbone of this report.

The development of the Atlas⁷⁴ has given us further useful data. Meanwhile, in the last two years, there have been recent new analyses and updates from the WHO, the OECD and the Commonwealth Fund, all of which supplement the quality and safety indicator set to form our indicator compendium as set out in Table 1.

74. Health Quality & Safety Commission. nd. New Zealand Atlas of Healthcare Variation. Wellington: Health Quality & Safety Commission. URL: <http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/> (accessed July 2015).

