



HEALTH QUALITY & SAFETY
COMMISSION NEW ZEALAND
Kupu Taurangi Hauora o Aotearoa

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



2017



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Executive summary

This is the 2017 edition of the Health Quality & Safety Commission's *Window on the Quality of New Zealand's Health Care*. It brings our measures up to date and draws out key messages about the quality of New Zealand's health system.

This document helps the Commission fulfil its statutory responsibility to provide public reports on the quality and safety of health and disability support services.

We draw the following conclusions from our review of the data:

- Fewer New Zealanders are dying from conditions that can be treated, and premature death and disability caused by ill health is reducing.
- The burden of disease from premature death and disability is similar to most other English-speaking and Western European countries, but per-capita expenditure on health care is lower in New Zealand than in most of these countries.
- Where national programmes have concentrated on reducing harm, in most cases these harms have reduced. Significant, sustained reductions for falls in hospital which lead to a broken hip, wound infection following surgery, blood clots following surgery, and infection from central lines in intensive care units have occurred across New Zealand.
- Reported patient experience appears at first sight to be consistently positive. However, patients are less positive when asked about specific processes of care than values such as respect and kindness being shown.
- New Zealand is making progress on integrating care, although this is not consistent across the country. Wide and unexplained variation remains in access to treatments for individual diseases across the country.
- Disparities remain in health outcomes between Māori, Pacific and New Zealand European peoples, and between the wealthiest and poorest New Zealanders. These disparities are not solely due to 'determinants' of health, like socioeconomic status, but instead are compounded by inequitable health care itself.
- Improving quality provides value to the system, which avoids expenditure to resolve harms and potentially wasteful expenditure on services that may not be necessary, and value to New Zealanders, who live longer, healthier lives. We estimate that the subset of reduced harms and potentially wasted expenditure covered in this report has led to avoided costs of \$90 million, and additional value to New Zealanders of nearly \$400 million.

The report concludes by considering the health system's opportunities for further improvement and how the New Zealand Health Strategy and Commission's work can help.



Introduction

Welcome to the third edition of the Commission's *Window on the Quality of New Zealand's Health Care*. The Window focuses on the quality of health services delivered rather than population health, broader measures of system capability, sustainability, workforce or productivity.

It does this through consideration of currently available data collected by the Commission, the Ministry of Health and others, rather than collecting new and unfamiliar data. The majority of reported measures focus on care inside hospitals rather than on GP services or closer to home. From 2018, this focus will widen as data from the System Level Measures Framework, the primary care patient experience survey and the Commission's Whakakotahi primary care quality improvement programme becomes more widely available.

As in previous editions of the Window, we use a modification of Institute of Medicine's dimensions of quality and concentrate on the safety, patient experience, effectiveness, equity and value of delivered health services to provide structure.

Compared with previous editions of this report, there is less emphasis on international comparisons. In part this reflects there having been no new publications from the OECD and Commonwealth Fund (the most robust sources of international comparisons) since the release of the last Window in May 2016.

However, it also reflects the fact that our other two bases of comparison, change over time and variation between different parts of the country, both yield important and interesting results that are reported here.

Although the style of the report has changed a little, what has not changed is our commitment to robust analysis.

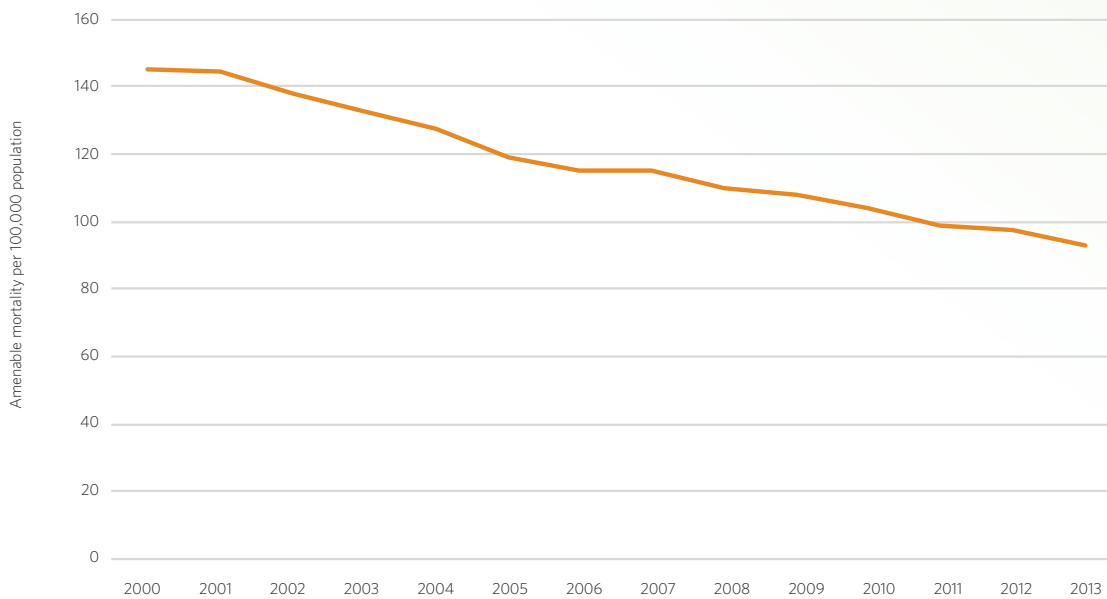


1 A high-level view

Before considering individual dimensions of quality in greater detail, we can get a high-level view of the quality of New Zealand's health system by considering its ultimate outcomes, and provide context by comparing its health care expenditure with that of other developed economies.

Our ultimate outcomes of care – reducing death and disability – are improving and are in line with other countries similar to New Zealand.

Figure 1: Mortality from conditions amenable to health care per 100,000 population aged 0–74, New Zealand, 2000–13 (Source: Ministry of Health)



Amenable mortality measures the number of premature deaths in a country from diseases for which effective and timely care might have prevented deaths before a certain age (see Figure 1). These premature deaths are on a long-term trend of decline in New Zealand, in common with most developed countries.

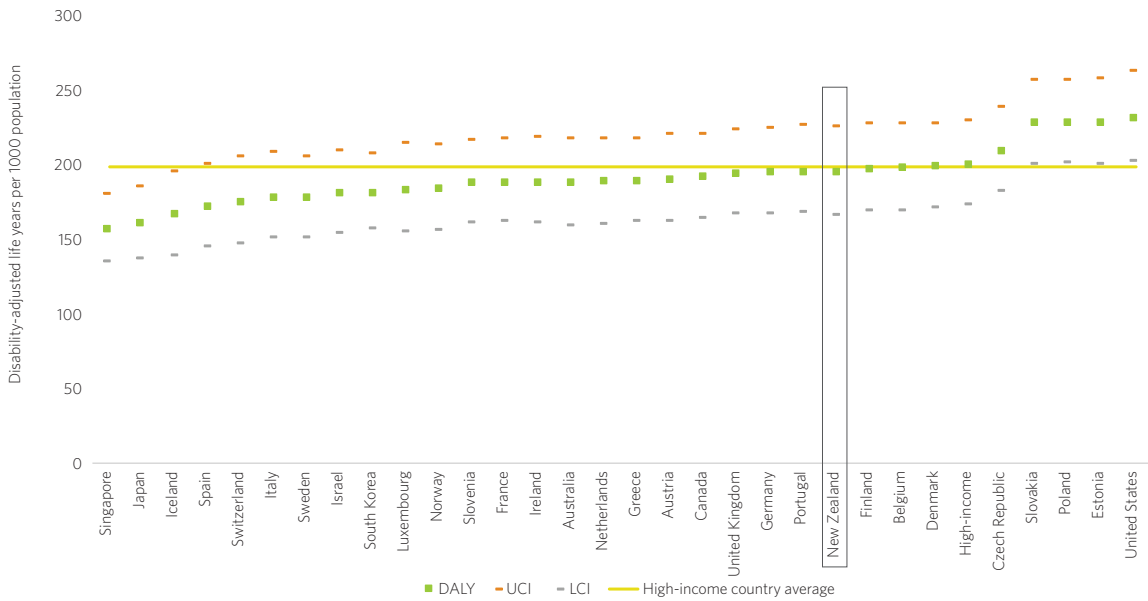
A broader measure of the outcomes of our health care system considers the quality of a person's life as well as the length. Therefore, **disability-adjusted life years** (DALYs – see Box 1) **lost** is a valuable measure because DALYs consider years of life disabled as well as years of life lost to disease and injury. This measure has recently been updated by the Global Burden of Disease Study at the University of Washington up until the end of 2015 (see Figures 2 and 3).¹

¹ Institute for Health Metrics and Evaluation. 2017. *Global Burden of Disease (GBD)*. Institute for Health Metrics and Evaluation, University of Washington. URL: www.healthdata.org/gbd (accessed 21 March 2017).



New Zealand's DALYs lost are consistent with similar nations and very similar to the average of high-income countries globally.

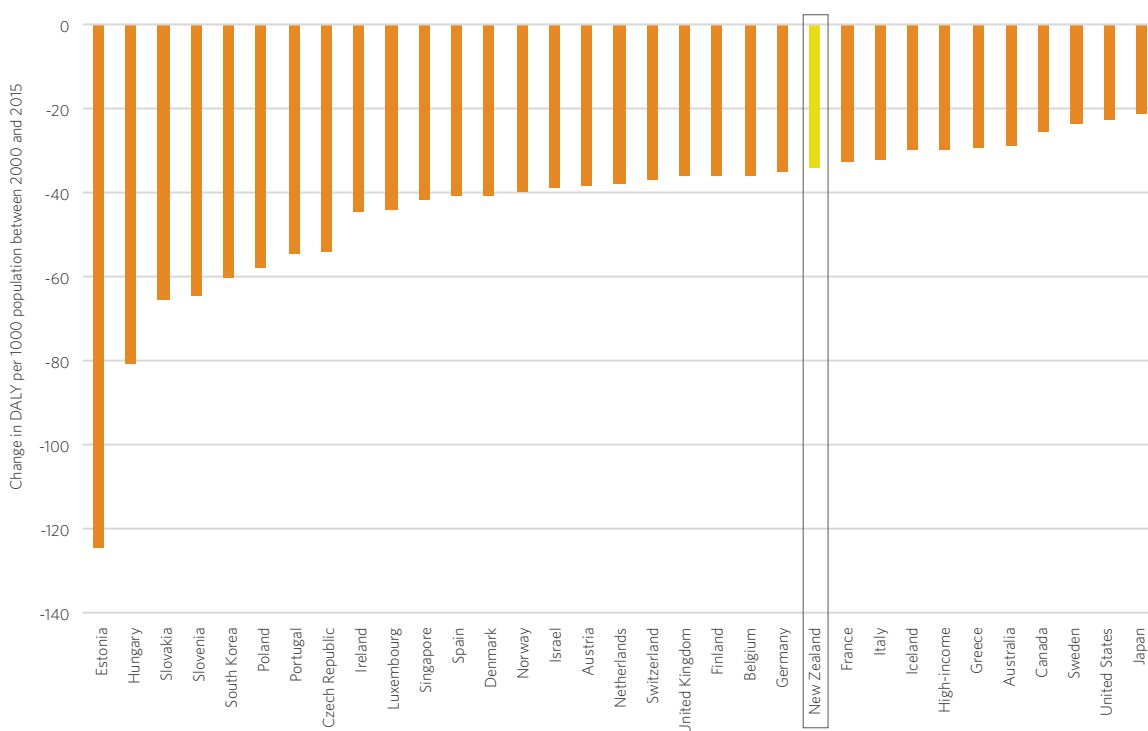
Figure 2: Age standardised disability-adjusted life years (DALYs) lost per 1000 population, high-income countries, 2015 (Source: University of Washington)



Note: UCI = upper confidence interval; LCI = lower confidence interval.

Since 2000, the per-capita DALY rate has fallen slightly more quickly in New Zealand than the average of high-income countries.

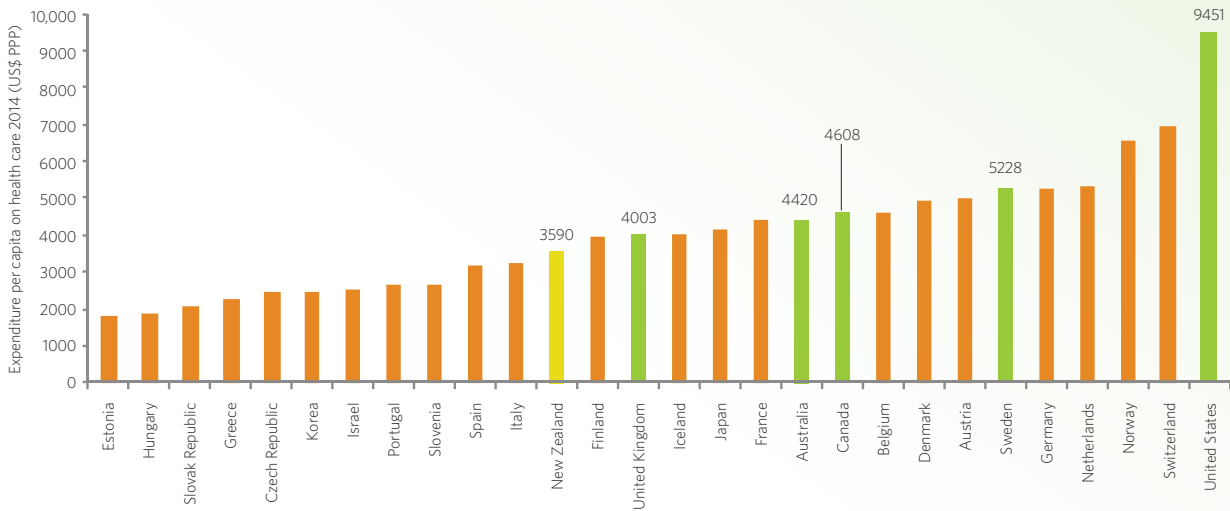
Figure 3: Change in age standardised disability-adjusted life years (DALYs) lost per 1000 population, high-income countries, 2000-15 (Source: University of Washington)



New Zealand spends less on its health care system than most of the English-speaking and Western European countries we usually compare ourselves with (see Figure 4), and has outcomes broadly in line with international norms (see Figure 5). Therefore, it would appear New Zealand's health care system provides good value for money in comparison with many other countries.

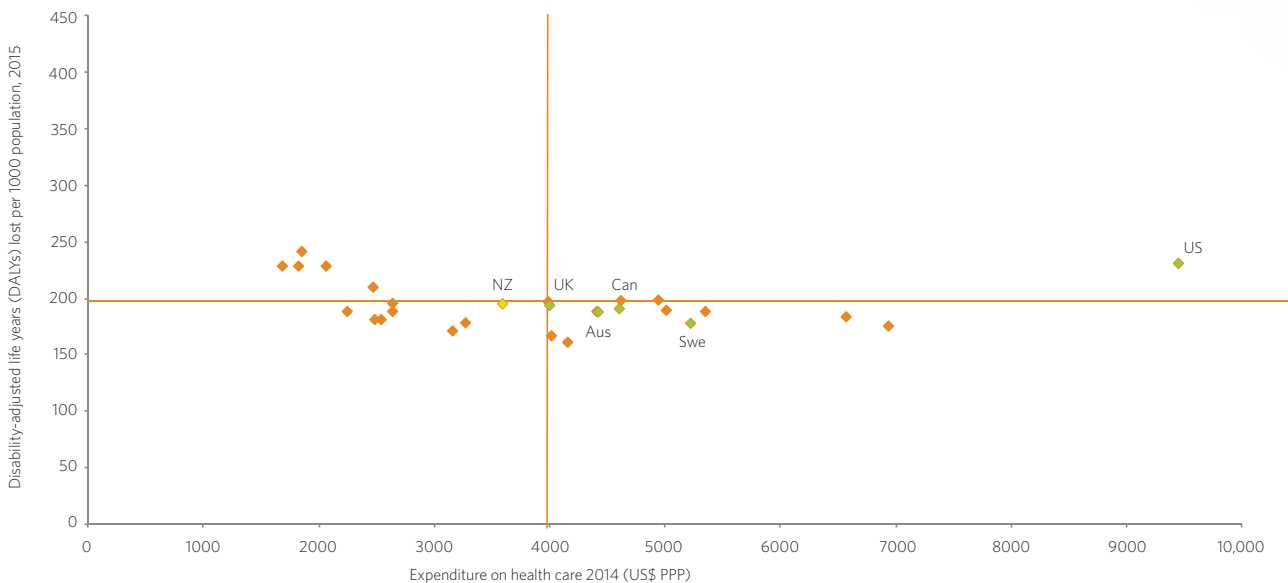
New Zealand continues to have a health care system where cost per capita is lower than most Western European and English-speaking countries.

Figure 4: Expenditure on health care per head, US\$ purchasing power parity (PPP), 2014
(Source: Organisation for Economic Co-operation and Development)



New Zealand (the yellow dot on Figure 5) remains in the low cost, low DALY loss quadrant, and outperforms other English-speaking developed countries and many Western European ones on this measure.

Figure 5: Expenditure on health care per head, US\$ PPP 2014, versus age standardised disability-adjusted life years (DALYs) lost per 1000 population, high-income countries, 2015
(Source: OECD; University of Washington)



Note: PPP = purchasing power parity.

Box 1: Disability-adjusted life years

Disability-adjusted life years (DALYs) measure the gap between the population's current state of health and that of an ideal population where everyone experiences long lives free from illness or disability. DALYs can be associated with a dollar value to society, as discussed in the Value section (p 34). In this report, we use the DALY measure from the 2016 Ministry of Health report *Health Loss in New Zealand 1990–2013*,* which 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.

* Ministry of Health. 2016. *Health Loss in New Zealand 1990–2013: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study*. Wellington: Ministry of Health.



Figure 5 should be read in conjunction with Figure 4. New Zealand is shown in yellow and key comparator countries in green. The order of each dot from left to right corresponds to each bar in Figure 4. Thus the left-most dot is Estonia and right-most the United States.

Very few countries have a lower DALY loss while spending less per head. Most that do are Mediterranean countries such as Italy and Spain. This is a positive finding and useful context for a more detailed consideration of the quality of our health system. If this is to help us improve, however, we need more detailed and specific measures than these high-level figures.



2 Safety

Our first detailed analysis of the quality of health care concerns the safety of patients and avoidance of harm related to their treatments, whether from errors in treatment, such as medication errors, or adverse events, like in-hospital falls.

New Zealand has undertaken a series of improvement programmes for specific areas of harm over the past decade. These areas now show significant reductions in harm. As highlighted in Table 1, the cumulative effect of these reductions, including an estimate of avoided DALYs, is now substantial. This analysis is limited to the very specific harms that we have measured through the quality and safety markers.² We have not sought to quantify other benefits likely to have resulted (eg, other reduced injuries from falls), so overall reduction in harm is likely to be greater than reported here. In addition, the costs avoided and value provided by these reductions in harm are substantial, as set out in Table 3 below.

Table 1: Examples of the results of New Zealand national patient safety programmes since 2012

| Programme | Aim | Reduction since programme began | Reduced harm since programme begun | DALYs avoided since programme begun |
|----------------------------------|---|---------------------------------|------------------------------------|-------------------------------------|
| Infection prevention and control | Reduce central line associated bacteraemia (CLAB) cases <i>Jan 2012–Dec 2014</i> | 81% reduction | 260 avoided cases of CLAB | 586 |
| | Reduce healthcare associated <i>Staphylococcus aureus</i> infections <i>Jan 2012–Sept 2016</i> | No change | No change | No change |
| | Reduce surgical site infections (SSIs) for hip and knee replacements <i>March 2013–June 2016</i> | 39% reduction | 51 fewer SSIs | 26 |
| Falls | Reduce in-hospital falls with a fractured neck of femur (FNOF) <i>July 2012–Sept 2016</i> | 38% reduction | 85 fewer FNOFs | 140 |
| Safe surgery | Reduce postoperative deep vein thrombosis/pulmonary embolism (DVT/PE) <i>Jan 2013–Sept 2016</i> | 12% reduction | 378 fewer DVT/PE cases | 223 |
| | Reduce postoperative sepsis <i>Jan 2013–Sept 2016</i> | 14% increase | 85 more cases of sepsis | No change |

We currently do not have a DALY value for sepsis so this measure is excluded from this analysis.

² www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/quality-and-safety-markers

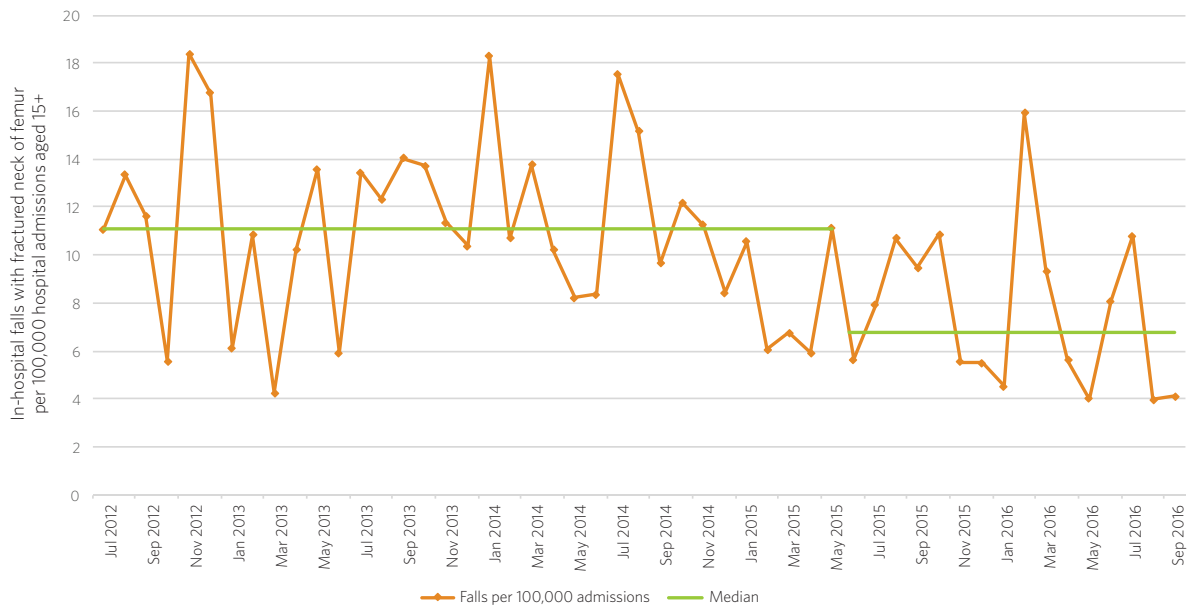


How do we know this?

For all our safety programmes we track change over time in the particular harms we are trying to improve. We can check if significant, sustained changes have taken place by using statistical process control methods.³ We estimate the size of these shifts using predictions based on what would have happened if nothing had changed.

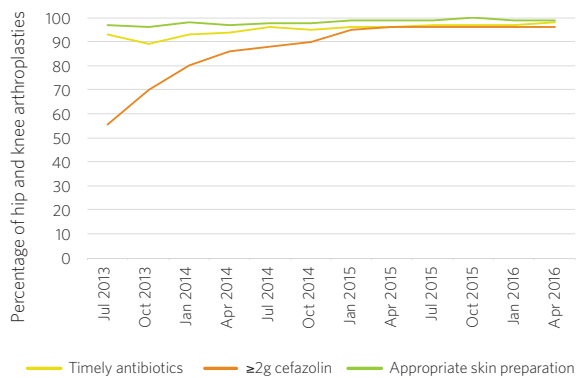
Since late 2015, the rate of falls in hospital that led to a broken hip (known as a fractured neck of femur) has been 30-40 percent lower on average than before the programme started in 2013 (see Figure 6).

Figure 6: In-hospital falls leading to a fractured neck of femur in people aged 15 and over, by month, New Zealand, 2012–16



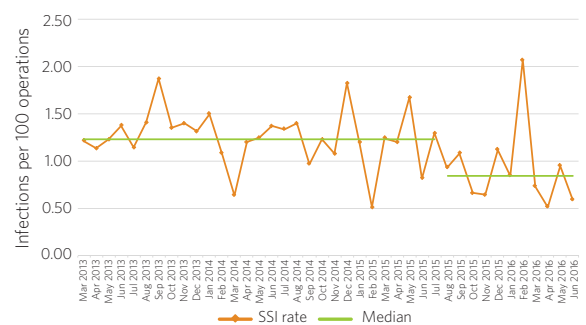
Good practice in avoiding wound infection for hip and knee surgery is now routine...

Figure 7: Hip and knee operations where good practice in antibiotic prophylaxis and skin preparation was followed, by quarter, New Zealand, 2013–16



... and wound infections have reduced 30 percent on average in the past year.

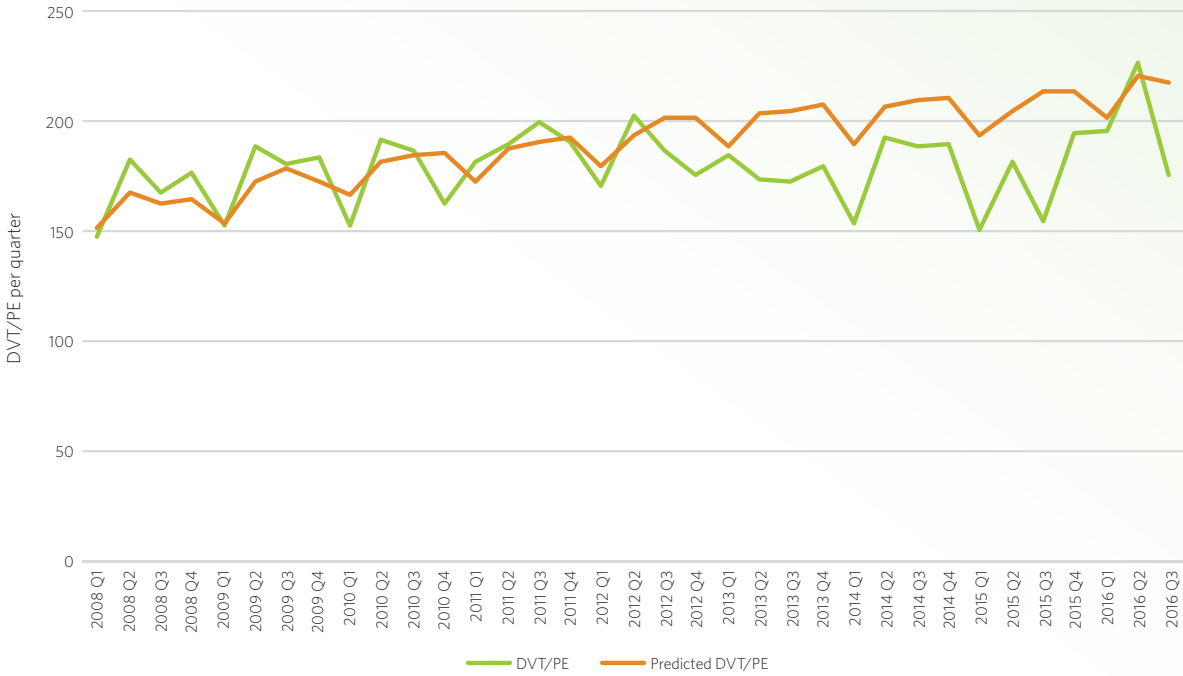
Figure 8: SSIs for hip and knee operations, by month, New Zealand, 2013–16



³ In this document, we use statistical process control to differentiate sustained, meaningful changes (or special cause variation) from this random 'noise', also known as common cause variation. In general, we use the simple 'run chart' to track change over time. Six points one side or other of the median line denote a significant 'shift' in results.

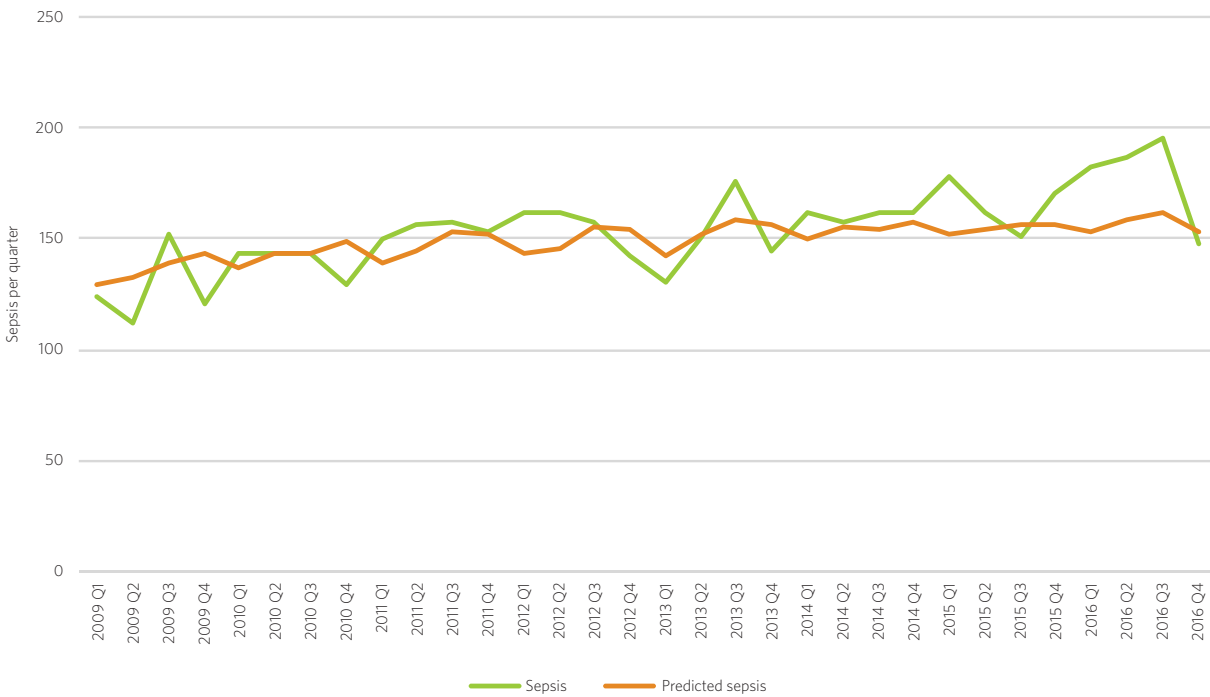
Since 2013, 420 fewer postoperative cases of DVT/PE have occurred than expected from the historic trends between 2006 and 2012.

Figure 9: Postoperative DVT/PE, actual and predicted based on underlying patient risk, by quarter, New Zealand, 2008-16



Not all markers show the same success, however. The other safe surgery marker, postoperative sepsis, does not show the same trend of reduction. If anything, the number increased in 2016.

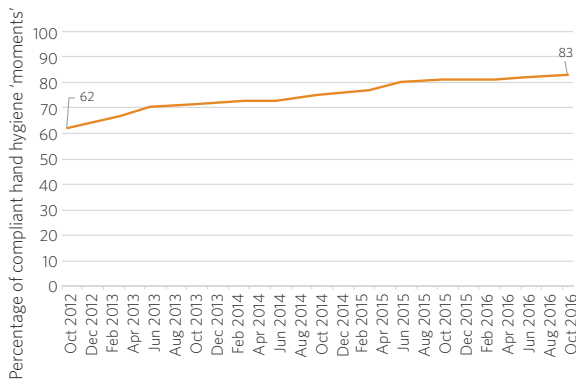
Figure 10: Postoperative sepsis, actual and predicted based on underlying patient risk, by quarter, New Zealand, 2009-16





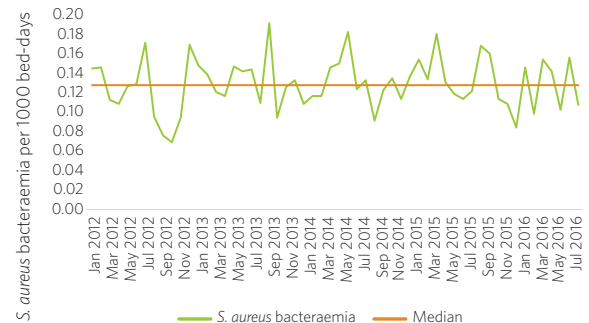
Meanwhile, hand hygiene practice in our hospitals has steadily improved...

Figure 11: Hospital hand hygiene compliance rate, New Zealand, 2012-16



... but it has not had much effect on *Staphylococcus aureus* infection rates.

Figure 12: *Staphylococcus aureus* bacteraemia rate per 1000 bed-days, by month, New Zealand, 2012-16



The consistent *S. aureus* infection rate could be caused by a number of factors, which means the infection rate could be being affected by other factors even if hand washing has improved. There is also potential inconsistency in recording, which leads those infections that are related to health care (and thus affected by hand washing in hospitals) to be conflated with those contracted in the community. The Commission will be working in the coming year to improve recording.

Great progress in some areas; a way to go in others: What underpins this?

The reductions in serious patient harm over the past three years are a notable achievement for New Zealand's health sector. The commitment shown across the sector to changing and improving practice and responding to the Commission's *Open for better care* campaign has been remarkable and has yielded results of real value for New Zealand. However, we know safety issues remain that have a substantial burden of harm, such as adverse drug events and pressure injuries.

Medication-related harm to patients remains substantial in our system. Eight percent of people who responded to the Commission's primary care patient experience survey⁴ reported being given the wrong drug or dose, either from prescription or dispensing, in the previous 12 months. Of these people, 46 percent sought medical advice or attention as a result. Similarly, a recent study of six large district health boards (DHBs) showed 28 percent of inpatients suffered some form of medication-related harm.⁵ While medication harm is common, it is a complex issue. For example, some medication harm is not caused by error and many errors cause no harm. These issues are discussed in Box 2.

While we may never reach a position where no safety issues occur, a health system that has safety 'designed in' will allow issues to be quickly identified as they emerge. Systems will be designed to avoid 'gaps' where harm can occur as a result of poor communication, delayed access, insufficient resources, ineffective clinical handovers, and failure to engage with the patient and their family and whānau. The culture of safe organisations will encourage team working and openness.

The Commission's 2016 report *Learning from adverse events 2015-16*⁶ notes that reported harms are often the result of gaps in the system rather than specific poor practices (eg, not washing hands). This includes situations such as when a patient's condition deteriorates while they are in hospital but this is not picked up through good monitoring (25 such cases were reported in 2015-16). Failures of parts of the system to ensure continuity of care also occur, resulting in delays in treatment and diagnosis, leading to worse and, at times, very harmful outcomes. Common themes underpinning these stories include failures in communication and handover, including failure to involve the patient's family and whānau, as well as problems with access, equipment, IT systems and workloads.

4 Based on August and November 2016 survey rounds, which were undertaken by about 10 percent of practices.

5 Robb G, Loe EA, Maharaj A, et al. Medication-related patient harm in New Zealand hospitals. [In press.]

6 Health Quality & Safety Commission. 2016. *Learning from adverse events 2015-16: Adverse events reported to the Health Quality & Safety Commission 1 July 2015 to 30 June 2016*. Wellington: Health Quality & Safety Commission. URL: www.hqsc.govt.nz/our-programmes/adverse-events/publications-and-resources/publication/2684 (accessed 21 March 2016).

From the patient's perspective, harm that results from poor continuity of care inside a complex system is no different from that caused by the types of poor practice (described above) we have had success in addressing. Yet the causes and solutions are different. The progress made in changing practice to reduce patient harm from issues like SSIs, falls and DVT/PE does not necessarily help solve continuity of care issues in ophthalmology, for example. No clear 'bundle' of interventions exists that a clinician can put in place to prevent a delay in referral through the system.

An open culture, where failures can be safely and honestly reported and reflected upon, and communication is routine, frank and open, is essential for achieving a consistent culture of safety. Does New Zealand health care have such a culture? Much evidence exists that such a culture is embraced by most who work in our health and disability services, but, unfortunately, evidence also shows improvement is still needed.

For example, we would expect to see more consistent follow-up of incidents than currently happens. Considerable variation occurred between DHBs in reporting summaries of the analyses and recommendations for changes following serious adverse events. In 2015-16, these analyses and recommendation reports were received for 42 percent of reported events, but this varied dramatically between DHBs. Some submitted analyses and recommendations for all events and some for none. The availability and openness of such reports is a marker of how well a culture that learns from mistakes is embedded.

We have also commissioned surveys of the safety and quality culture inside health services. A survey of around 4000 health professionals employed by DHBs in 2015⁷ and their perceptions of quality and safety in their services had broadly positive results. However, the survey also revealed a number of areas where, despite the majority of people responding positively, a substantial minority did not agree that their services behaved safely. Behind seemingly positive results are important 'minority opinions' that may point to issues of safety in an otherwise high-functioning system.

At first sight, there are a number of positive features to the safety culture in New Zealand. For example, the following safety specific results were recorded:

- In this clinical area, it is easy to speak up if I perceive a problem with patient care (71 percent).
- People and processes are in place to identify, analyse and act upon all adverse events to prevent future occurrences (71 percent).
- This organisation has zero tolerance for patient harm anywhere in the organisation (74 percent).
- This organisation informs patients and their families when adverse events occur (71 percent).

However, this implies that a quarter of respondents believed that their organisation tolerated patient harm, and 30 percent neither found it easy to speak up about patient care, nor were aware of processes to identify, analyse and act upon adverse events.

In addition, there was a consistent pattern of concern with the coordination of care. Substantial proportions of respondents took a negative view on several key statements:

- The DHB's structure and work processes impede coordination across departments and work groups (48 percent agreed or strongly agreed).
- Patient care is well coordinated across different parts of the DHB (40 percent agreed or strongly agreed).
- Patient care is well coordinated between the DHB and outside providers (37 percent agreed or strongly agreed).
- There is little coordination of quality improvement efforts across departments and work groups (33 percent agreed or strongly agreed while 23 percent disagreed or strongly disagreed).

7 Martin G, Mason D, Lovelock K, et al. 2015. *Health Professionals' Perceptions of Quality Survey: A report for the Health Quality and Safety Commission*. Wellington: Health Quality & Safety Commission. URL: www.hqsc.govt.nz/assets/General-PR-files-images/Perceptions-of-quality-survey-Oct-2015.pdf (accessed 21 March 2016).



Similarly, the 2015 surgical safety culture survey⁸ of patient safety perceptions and experiences of surgical team members across New Zealand had generally positive results. Once again, however, in the minority negative responses we can see a number of weaker areas that suggest an open safety culture is not yet consistent across the country. These related to the following:

- 38 percent of respondents did not agree that surgical team members were open to change to improve patient safety, even if it meant slowing down.
- 31 percent of respondents did not agree that surgical team members share information when it becomes available.
- 25 percent of respondents did not agree that surgical team members were eager to help one another.
- 35 percent did not agree that potential errors or mistakes are pointed out without raised voices or condescending remarks.
- 33 percent found it difficult to discuss medical mistakes.
- 38 percent of respondents felt the pressure to move from case to case gets in the way of safety.

These results align with a report from the Royal Australasian College of Surgeons' expert advisory group on discrimination, bullying and sexual harassment.⁹ The report describes bullying as 'endemic' in surgery and highlights a culture of fear and reprisal. In response, the Royal Australasian College of Surgeons noted that such behaviours 'impair teams, and put patient care and patient safety at risk'.¹⁰

The surgical safety culture survey is currently being repeated. Understanding what changes, if any, have occurred over the past two years will help us understand how New Zealand's surgical safety culture is developing.

Box 2: Medication safety and opioids

A troubling result is hiding in plain sight in the latest two iterations of the primary care patient experience survey. Over 90 percent (n=3374) of patients stated they had no experience of medication error in the previous 12 months. However, this means that 8 percent (n=283) did. Furthermore, 46 percent (130/283) of those patients reported they were forced to seek medical advice or attention because of this error.

Once in hospital, the risk of a medication error is increased.

Medication harm

Previous studies have found drug-related adverse events in New Zealand's public hospitals comprised 12.3 percent of all adverse events causing permanent disability or death, of which 44 percent were considered highly preventable.^{11,12} Based on 2010 adverse drug event collaborative trigger tool data, around 30 percent of patients experienced a medication-related harm (28.9/100 admissions). Most were in the lower severity harm scales; however, 3.7 percent were classified as causing death or permanent harm.¹³

- 8 Health Quality & Safety Commission. 2015. *Surgical Culture Safety Survey Research Report*. Wellington: Health Quality & Safety Commission. URL: www.hqsc.govt.nz/our-programmes/safe-surgery-nz/publications-and-resources/publication/2406/ (accessed 21 March 2017).
- 9 Royal Australasian College of Surgeons. 2015. *Expert Advisory Group on Discrimination, Bullying And Sexual Harassment Advising the Royal Australasian College of Surgeons: Report to Royal Australasian College of Surgeons*. Melbourne: Royal Australasian College of Surgeons. URL: www.surgeons.org/media/22086656/EAG-Report-to-RACS-FINAL-28-September-2015-.pdf (accessed 21 March 2017).
- 10 Royal Australasian College of Surgeons. 2015. *Building Respect, Improving Patient Safety: RACS action plan on discrimination, bullying and sexual harassment in the practice of surgery*. Melbourne: Royal Australasian College of Surgeons. URL: www.surgeons.org/media/22260415/RACS-Action-Plan_Bullying-Harassment_F-Low-Res_FINAL.pdf (accessed 21 March 2017).
- 11 Davis P, Lay-Yee R, Briant R, et al. 2002. Adverse Events in New Zealand Public Hospitals I: Occurrence and impact. *New Zealand Medical Journal* 115(1167): U271.
- 12 Davis P, Lay-Yee R, Briant R, et al. 2003. Adverse Events in New Zealand Public Hospitals II: Preventability and clinical context. *New Zealand Medical Journal* 116(1183): U624.
- 13 Seddon ME, Jackson A, Cameron C, et al. 2013. The Adverse Drug Event Collaboration: A joint venture to measure medication-related patient harm. *New Zealand Medical Journal* 126(1368): 9-20.

Such trigger tools are used to identify, quantify and track patient harm from adverse drug events by routine review of a randomly selected group of patient records. 'Triggers' are flags for harm and prompt an in-depth examination of a record to identify if and what kind of patient harm has occurred. A recent study of two years of trigger tool data from six DHBs supports the earlier findings: medication-related harm occurred at a rate of 34.7 per 100 admissions and 42.5 per 1000 bed-days and 28 percent of patients experienced one or more medication-related harms.¹⁴

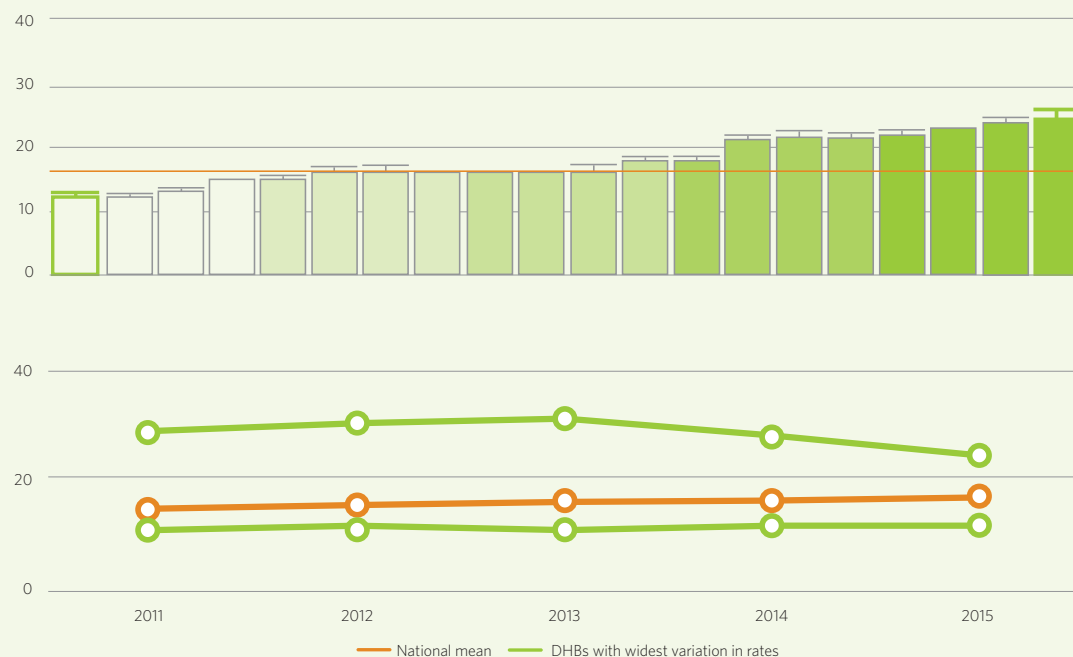
The main medicines causing the greatest amount of harm are opioids, in particular, morphine and oxycodone.

Opioid use in New Zealand is rising and practice is diverging

A strong opioid is one classed as step 3 on the World Health Organization analgesic 'ladder' classification system for cancer pain management, after weaker opioids and non-opioids such as nonsteroidal anti-inflammatory drugs and paracetamol. These include oxycodone, morphine and fentanyl.¹⁵

Prescribing of opioids in New Zealand is on the rise. This is despite limited evidence of usefulness for non-cancer pain and increasing evidence of their role in adverse events and harms, including tolerance, addiction, overdose and death.^{16, 17, 18, 19, 20} Also, more than two-fold variation exists in the opioid dispensing behaviour of DHBs (see Figure 13).

Figure 13: Strong opioid dispensing rates by DHB, New Zealand, total 2015 and by year, rate per 1000



14 Robb G, Loe EA, Maharaj A, et al. Medication-related patient harm in New Zealand hospitals. [In press.]

15 World Health Organization. 2017. WHO's Cancer Pain Ladder for Adults. URL: www.who.int/cancer/palliative/painladder/en/ (accessed 21 March 2017).

16 Savvas S, Gibson S. 2015. Pain management in residential aged care facilities. *Australian Family Physician* 44(4): 198-203. URL: www.racgp.org.au/afp/2015/april/pain-management-in-residential-aged-care-facilities/ (accessed 21 March 2017).

17 Martin L, Laderman M, Hyatt J, et al. 2016. *Addressing the Opioid Crisis in the United States: IHI innovation report*. Cambridge, Massachusetts: Institute for Healthcare Improvement. URL: www.ihl.org/resources/Pages/Publications/Addressing-Opioid-Crisis-US.aspx (accessed 7 April 2017).

18 Best Practice Advocacy Centre New Zealand. 2014. Identifying and managing addiction to opioids. *Best Practice Journal* 64: 16-25.

19 Söderberg KC, Laflamme L, Möller J. 2013. Newly initiated opioid treatment and the risk of fall-related injuries: A nationwide, register-based, case-crossover study in Sweden. *CNS Drugs* 27(2): 155-61. Doi: 10.1007/s40263-013-0038-1.

20 Ray WA, Chung CP, Murray KT, et al. 2016. Prescription of long-acting opioids and mortality in patients with chronic noncancer pain. *Journal of the American Medical Association* 315(22): 2415-23. Doi: 10.1001/jama.2016.7789.



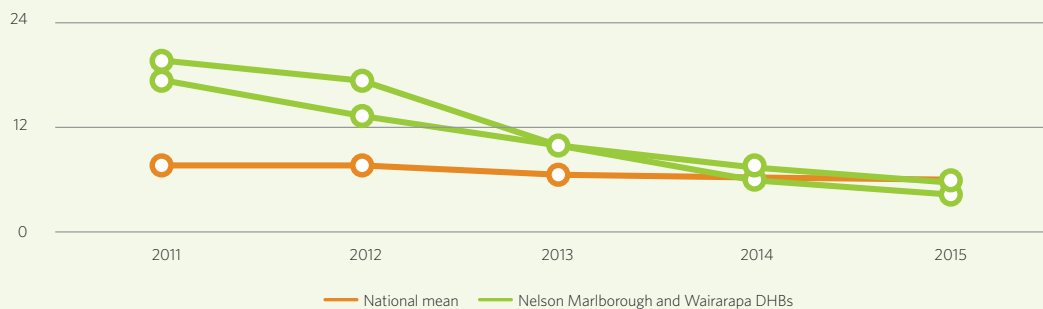
As Figure 13 shows, in 2015, 16.4 per 1000 New Zealanders were dispensed a strong opioid, a rate that appears to have been fairly stable (14.3 per 1000) since 2011. However, behind an apparently very small and gradual rise lie 12,000 more New Zealanders in absolute numbers who were dispensed a strong opioid between 2011 and 2015. Morphine prescribing, in particular, is increasing, from 7.5 to 11 per 1000 – nearly 17,600 more people.^{21, 22}

The good news: oxycodone and the safe use of opioids national formative collaborative

Oxycodone is a good example of success in making targeted efforts to improve safety and address inexplicable variation in dispensing behaviour. Dispensing rates of oxycodone in New Zealand increased by 249 percent between 2007 and 2011.²³ Since then, inter-DHB cooperation and rising awareness of harms have led to significant reductions in oxycodone dispensing rates, from 7.3 per 1000 people nationally in 2011 to 5.4 per 1000 in 2015 – 7800 fewer people.

Two high-prescribing DHBs – Nelson Marlborough and Wairarapa – have reduced dispensings of oxycodone by 70–80 percent in four years and have fallen below the national mean (see Figure 14).¹⁹

Figure 14: People dispensed oxycodone by DHB, total by year, New Zealand, 2011-15, rate per 1000



At Compass Primary Health Organisation (PHO) in Wairarapa, General Manager Practice Development Justine Thorpe says, 'Given the commitment to patient safety and quality improvement within the region's health services, it really wasn't that hard to get people on board with the needed change.'

The publication of Atlas of Healthcare Variation data showing Wairarapa DHB had high opioid prescribing numbers, and the adverse media attention that followed, created what Justine calls 'a burning platform for change'. In response, Compass PHO via the Tihei Wairarapa Alliance assembled a multidisciplinary team to address the issue. The team met monthly and included a community pharmacist, a clinical pharmacist, an orthopaedic surgeon, a hospital pain management nurse, the hospital manager, a GP leader and Justine. Quality of data was crucial and, by using Atlas data as a prompt, the team carefully investigated the national collections and individual GP practices' patient management systems to identify prescribing patterns. Who was taking what and why, and was it advisable to review? They got to know their population in detail.

Several actions resulted across care settings: education, feedback and peer support to GPs; Masterton Medical, the region's largest practice, developed a new policy and a shared agreement between GPs and patients who are prescribed opioids, which they shared across all practices: patients agreed to no lost or repeat prescriptions and three-monthly review. Wairarapa Hospital emergency department (ED) implemented a policy where no more than two days' pain prescribing would be given out in ED.

- 21 Davis A, Davis K, Gerard C, et al. 2016. Opioid rain: Opioid prescribing is growing and practice is diverging. *New Zealand Medical Journal* 129(1440): 11-17.
- 22 Health Quality & Safety Commission. 2017. Atlas of Healthcare Variation: Opioids. URL: www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/opioids (accessed 21 March 2017).
- 23 Best Practice Advocacy Centre New Zealand. 2014. Identifying and managing addiction to opioids. *Best Practice Journal* 64: 16-25.

The team identified three main points for success:

- 1 A burning platform – the need to change resulting from the Atlas.
- 2 A common goal and a shared outcome. Having the right people at the table, engaged in that goal, as well as an engaged sector.
- 3 High-quality data.

Oxycodone prescribing has fallen significantly, and strong and weak opioid prescribing generally has reduced against a rising national trend. With limited pain management services, Wairarapa faces challenges in pain management for its population. Most of those prescribed opioids were older Europeans, many with long-term conditions, such as osteoarthritis, or waiting for hip or knee replacement surgery.

However, extensive – more than three-fold – variation exists between many other DHBs in oxycodone prescribing: 1.3 people per 1000 (and falling) in Capital & Coast DHB, compared with 12.3 per 1000 in Bay of Plenty DHB in 2015. Furthermore, prescribing of fentanyl – another strong opioid with associated risks^{24,25} – is rising year on year in roughly half of all DHBs, despite clear evidence of consistently low usage in one large DHB. In fact, fentanyl dispensing varied 16-fold between DHBs in 2015.

The Commission partnered with 20 DHB hospitals in a national ‘formative’ collaborative, with the aim of reducing opioid-related harm by 25 percent in participating hospital areas by April 2016.

Three separate bundles of care processes were introduced to address the three main areas of harm identified, as well as an overarching composite care bundle, known as the ‘How-to guide’.²⁶ Half of the eligible DHBs (those with sufficient baseline data) showed greater than 25 percent relative harm reduction, with a measurable increase in team quality improvement capability. A national interprofessional network focused on opioid safety was established. Overall reduction in harm from opioids has been achieved across participating teams, ranging from a 13 percent to 74 percent improvement.

Such collaboratives work by quickly spreading high expectations and safe practices across the country.



24 Medsafe. New Zealand Data Sheet. Fentanyl Sandoz. *Fentanyl transdermal patch*. URL: www.medsafe.govt.nz/profs/datasheet/f/fentanyl_sandoz_patch.pdf (accessed 21 March 2016).

25 Doris MK, Sandilands EA. 2015. Life-threatening opioid toxicity from a fentanyl patch applied to eczematous skin. *BMJ Case Reports*. 29 April; pii: bcr2014208945; doi: 10.1136/bcr-2014-208945.

26 Available at: www.hqsc.govt.nz/our-programmes/medication-safety/projects/collaborative/how-to-guide-reducing-opioid-related-harm-through-the-use-of-care-bundles.



3 Patient experience

How patients experience care is an important part of quality of care. Better experience, developing partnerships with patients, and patient- and family-centred care are linked to improved health, clinical, financial and satisfaction outcomes.²⁷ The Commission currently conducts an inpatient experience survey, and more recently a primary care patient experience survey.

Since it began, our in-hospital patient experience survey has shown patients consistently report a relatively positive experience of care across all four domains covered.

Figure 15: Domain scores for in-hospital patient experience survey, New Zealand, 2014-16

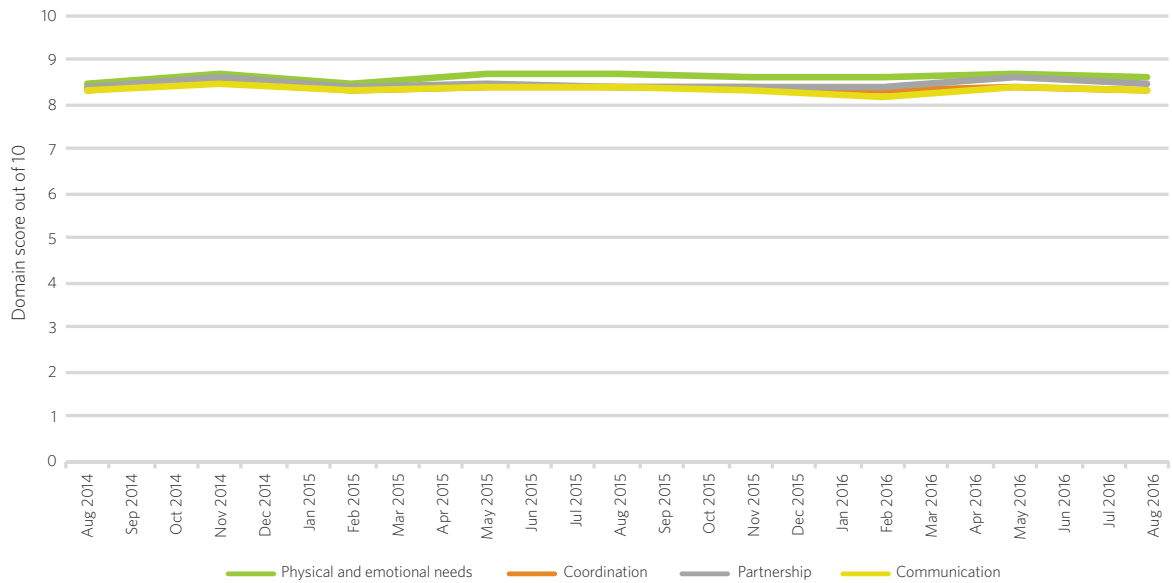
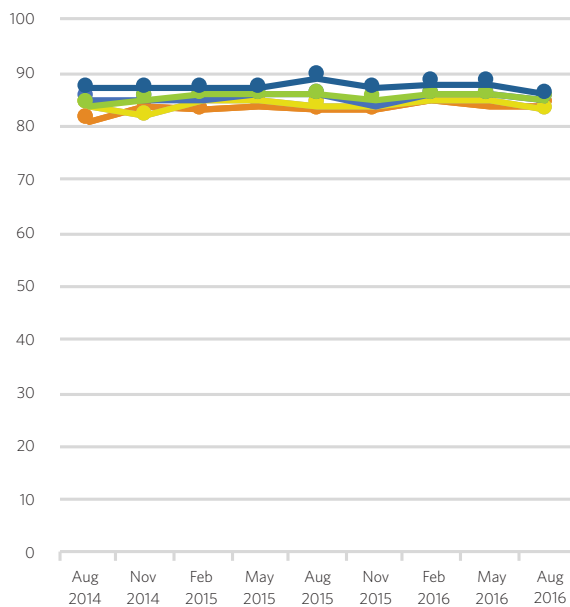
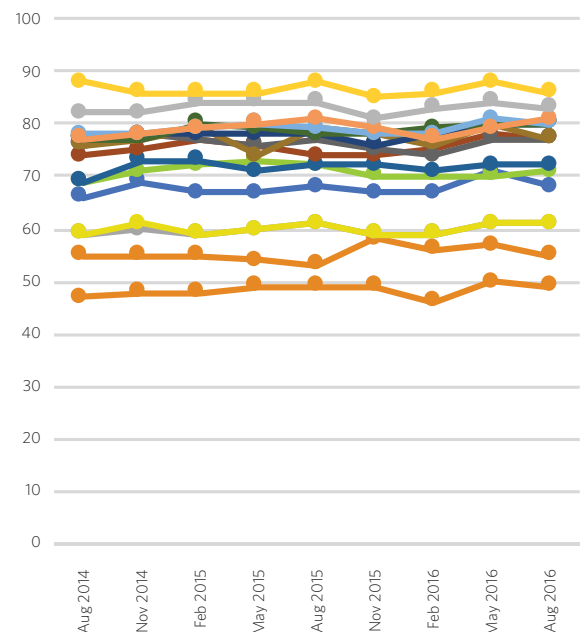


Figure 16: Individual, in-hospital patient experience survey, New Zealand, August 2014 to August 2016 (percentage of respondents choosing the most positive option)

While questions asking about subjective qualities like respect and kindness scored uniformly well...



...responses were far more mixed for hard, objective measures of what was done and when.



27 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: www.ihl.org/resources/Pages/IHIWhitePapers/AchievingExceptionalPatientFamilyExperienceInpatientHospitalCareWhitePaper.aspx (accessed July 2015).

Table 2: Classification of subjective and objective questions for in-hospital patient experience survey, New Zealand, August 2016

| SUBJECTIVE QUESTIONS | Percentage giving most positive answer | OBJECTIVE QUESTIONS | Percentage giving most positive answer |
|--|--|---|--|
| Overall did you feel staff treated you with respect and dignity while you were in hospital? | 86 | Before the operation did staff explain the risks and benefits in a way you could understand? | 86 |
| Overall did you feel staff treated you with kindness and understanding while you were in hospital? | 85 | Do you think the hospital staff did everything they could to help control your pain? | 83 |
| Did you have confidence and trust in the doctors treating you? | 85 | If you needed help from the staff getting to the toilet or using a bedpan, did you get it in time? | 81 |
| Did you have confidence and trust in the other members of the team treating you? | 84 | Did you feel other staff listened to what you had to say? | 80 |
| Did you have confidence and trust in the nurses treating you? | 83 | Did you feel nurses listened to what you had to say? | 80 |
| | | Did you feel doctors listened to what you had to say? | 80 |
| | | Did staff tell you how the operation went in a way you could understand? | 77 |
| | | When you had important questions to ask a doctor, did you get answers you could understand? | 77 |
| | | Was cultural support available when you needed it? | 77 |
| | | Was your condition explained to you in a way that you could understand? | 72 |
| | | Were you given conflicting information by different staff members? | 71 |
| | | Were you involved as much as you wanted to be in decisions about your care and treatment? | 68 |
| | | Do you feel you received enough information from the hospital on how to manage your condition after your discharge? | 61 |
| | | Did the hospital staff include your family/whānau or someone close to you in discussions about your care? | 55 |
| | | Did a member of staff tell you about medication side effects to watch for when you went home? | 49 |



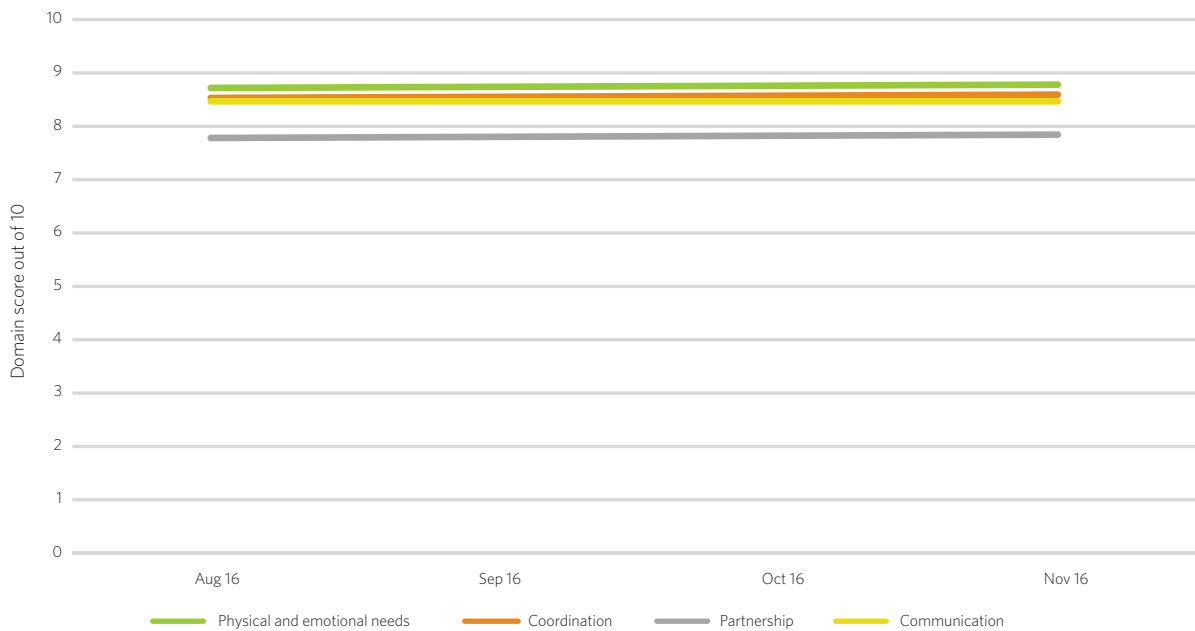


There is a marked difference in the answers given to relatively subjective questions about the humanity of care (shown in the left-hand diagram of Figure 16) and those that ask objective questions about what was done. More than eight out of ten patients give the most positive possible answer to the former, which are closer to measures of satisfaction. These questions include whether patients felt that they were treated with dignity and respect or kindness and compassion; and whether patients had confidence in the doctors, nurses and other health professionals treating them. Although these scores look very positive they are difficult to interpret. On one hand, what proportion of patients not feeling they were treated with respect is acceptable? On the other, to what extent do the responses to such questions reflect expectation rather than experience?

By contrast the questions about objective experience had both more variation in response, and less positive responses; with typically only between 50 and 75 percent of patients giving the most positive response. In particular, fewer than half of responders felt that they were 'definitely' told about the medication side effects to watch out for when they went home, while inclusion of family and whānau in discussions about care, and receiving sufficient information about how to manage their condition after discharge, also had fewer positive responses.

A comprehensive patient experience survey in primary care is being rolled out. Early results suggest similar patterns of experience.

Figure 17: Domain scores for primary care patient experience survey, New Zealand, 2016

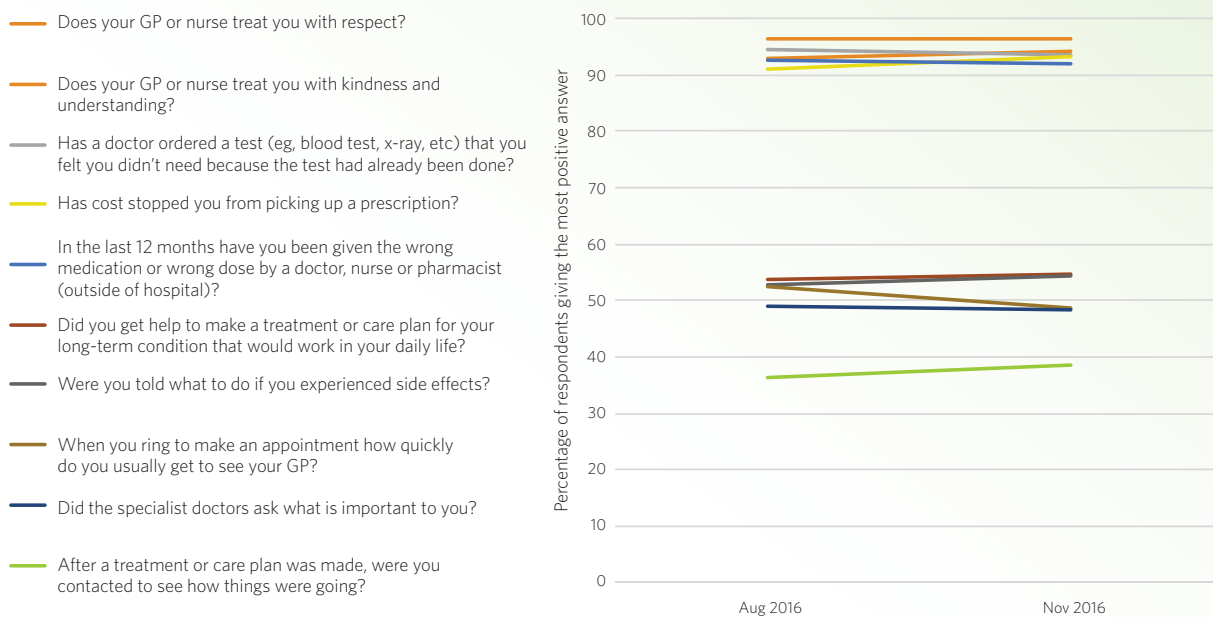


Although the primary care patient experience survey has not yet been rolled out across the entire country, the 2016 results show a similar pattern: broadly positive responses achieved consistently (albeit across only two iterations of the survey). The partnership domain, which reflects patients' involvement in their own care, performs noticeably less well than other domains.

This may reflect weakness in making and following up care plans for patients with long-term conditions. The primary care patient experience survey concentrates in particular on the coordination of services around the patient. As noted above, poor coordination of care can threaten patient safety. Ensuring that care is well coordinated also increases its effectiveness and achieves better outcomes. We consider this in the next section.

In Figure 18 below we see low scores – just over 50 percent of patients with long-term conditions – who responded they got help in making a treatment or care plan for their long-term conditions that would help in their daily life. Very low scores are also evident for whether patients were contacted after a treatment or care plan was put in place to see how things were going.

Figure 18: Most and least positively answered questions, primary care patient experience survey, New Zealand, 2016



Detailed explanations of the in-hospital and primary care patient experience surveys, together with how they are analysed, can be found at www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/health-quality-and-safety-indicators/patient-experience.

Box 3: What's hidden in the text: A qualitative analysis of the national in-hospital patient experience survey

The numbers are clear... or are they?

To date, quantitative data from the national inpatient experience survey has been at the forefront of attention for quality improvement managers. The results are encouraging: New Zealand hospitals scored an average of 8.4 out of 10 across all areas in the November 2015 quarterly survey. This is similar to results throughout the 11 quarterly surveys undertaken.

However, the data hide the variation in and outlier cases of poor patient experience. Analysis of the consumer stories and recommendations within the survey's comment section provides useful information for quality improvement activities that are both meaningful and relevant to patients.

Since the inpatient experience survey was implemented in July 2014, three questions have consistently scored lower than others.

- 4.** Did a member of staff tell you about medication **side effects** to watch for when you went home?
- Yes, completely
 - Yes, to some extent
 - No
 - I did not need an explanation
 - N/A

- 7.** Did the hospital staff include your family/whanau or someone close to you in discussions about your care?
- Yes, always
 - Yes, sometimes
 - No
 - I did not want them included
 - N/A

- 10.** Do you feel you received enough information from the hospital on how to manage your condition after your discharge?
- Yes, definitely
 - Yes, to some extent
 - No
 - I did not need any help in managing my condition



We undertook a national qualitative analysis of patient comments in the August and November 2015 surveys to understand more about these low scores. Issues for improvement highlighted by consumers are oriented either in the deficit model (what was not done) or the strengths-based model (what could be done). Both models of comments provide opportunity for providers to improve their care.

Stories behind the numbers: Health literacy and what to do about it

Question 4: Did a member of staff tell you about medication side effects to watch for when you went home?

Over 50 percent of patients responded negatively to Question 4, and it routinely scores 10 percent below the next lowest question. Several stories within the free text sections of the survey mentioned that people were dispensed medication without being told what it was, why they were given it or what the potential side effects might be.

'The morning after surgery I was given a handful of pills with no explanation what they were or what for. After taking them I became nervous and vomited three times. I remarked that I hadn't had a meal for 30 hours. The nurse said, "Maybe we should have waited until after breakfast." I agreed!'

'They never told me about the meds [sic] I was given when I left, to which [I] had all the side effects and I had to go to my GP as I thought I was having a stroke, it was terrible.'

Unequal levels of knowledge are a major and easily forgotten feature of health care. The hospital setting is exceptionally familiar to those working within it while exceptionally unfamiliar to those using it. This tension between the exceptional and the routine is where vital communication can fail, often with either or both the consumer or provider being unaware that it has. Health literacy is a significant issue in New Zealand. In 2006, a survey showed that more than half of adult New Zealanders had health literacy skills 'insufficient to cope with the health literacy demands they typically face'.²⁸ This extends across all ages and ethnic groups.²⁹

Therefore, the universal precautions approach, endorsed by the US Agency for Healthcare Research and Quality,³⁰ is an appropriate response. This assumes that, because patients may have some degree of difficulty when in health environments, a common approach should be used with all health care consumers. The approach involves first ascertaining what the patient already knows, sharing information to build their understanding of their health issues and proposed treatment, and then checking this has been understood. The Commission has trialled a simple three-part tool underpinned by this approach, to structure interaction with consumers:²⁷

Step 1: Checking consumer knowledge – finding out what people know.

Step 2: Building health literacy skills and knowledge – linking back to what people already know.

Step 3: Checking or teach-back – checking information was clear and, if not, returning to Step 2.

This tool is now in use and is being adapted by other health providers, such as DHB outpatient services. The Commission has developed *Let's PLAN for better care* from the consumer perspective – a health literacy initiative that draws on this thinking to help consumers prepare well for their visit to the GP or other primary care health professional.³¹

28 Ministry of Health. 2010. *Kōrero Mārama: Health Literacy and Māori: Results from the 2006 Adult Literacy and Life Skills Survey*. Wellington: Ministry of Health. URL: www.health.govt.nz/system/files/documents/publications/korero-marama.pdf (accessed 21 March 2017).

29 Walsh C, Shuker C, Merry AF. 2015. Health literacy: From the patient to the professional to the system. *New Zealand Medical Journal* 128(1423): 10-16.

30 Agency for Healthcare Research and Quality (AHRQ). 2016. AHRQ Health Literacy Universal Precautions Toolkit. URL: www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/index.html (accessed 21 March 2017).

31 Health Quality & Safety Commission. *Let's PLAN for better care* resources. URL: www.hqsc.govt.nz/our-programmes/partners-in-care/publications-and-resources/publication/2424/ (accessed 7 April 2017).

Involving whānau – not everyone thinks the same

Question 7: Did the hospital staff include your family/whānau or someone close to you in discussions about your care?

'My family were not involved but that was ok as I was fully capable of understanding my own treatment. I am sure if I had wanted them involved it would have been possible.'

'I would have liked to have had my wife present when the doctors came around but she struggled to be let in to see them. My memory is such that I rely on her to take in information as my main carer.'

A total of 429 respondents (14 percent) answered 'No' to Question 7. Of those, 52 percent gave an overall rating of 8 or higher for Partnership. The paradox of a negative response with a positive overall score highlights the differing attitudes on family/whānau involvement. Further supported by the quotes above: some patients feel capable of making decisions for themselves, and where family/whānau were not included, this did not negatively affect their experience.

People who provided negative comments about the inclusion of their family/whānau in decisions about their care often either relied on, or were relied on by, family/whānau members as their main carers. Seeking better ways to identify this category of patients is a major quality improvement opportunity.

Importantly, attitudes about family and whānau involvement are not consistent, and so the wishes of the individual patient need consideration. Good care provides the opportunity to include a patient's family/whānau in their care pathway. The survey comments often indicated that this opportunity was missed.

Integrating care outside of hospital

Question 10: Do you feel you received enough information from the hospital on how to manage your condition after your discharge?

'I was very keen to leave hospital but was not given any information on diet or wound care at discharge. My GP provided me with this information.'

'Everything was great until it came time to be discharged, then there was a huge lack of info re [sic] the meds I was sent home with and details of what I was and wasn't allowed to do post-op.'

The discharge process was the least positive reported experience, with a large number of respondents commenting their discharge was not handled well enough. Forty percent of respondents noted they did not receive enough information on how to manage their condition after being discharged.

The comments above highlight the patients' readiness to return home and their wanting to understand how to best integrate care into their out-of-hospital routine. Often, when a respondent provided a negative score, their comments cited the lack of preparation and information provided about their current condition and/or how to continue their care at home.

Why does this matter?

The comments outline the stories behind the numbers and can inspire meaningful quality improvement based on consumer experiences and feedback. The surveys' free text section is a unique channel of communication: responders are able to reflect on their experience when back in their familiar environment and provide thoughtful and honest comments as appropriate.

There are opportunities to positively impact patient/whānau experience of health care in these comments. While the numbers for each patient experience domain might seem clear in the score, they are ambiguous on what action should be taken to make improvements. Reading and analysing the patient comments can directly contribute to an improvement plan. Numbers may not inspire, but stories do.



4 Effectiveness

A high-quality health care system will provide the most effective treatment 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. The first of these is covered in the opening high-level view. The latter two are considered here.

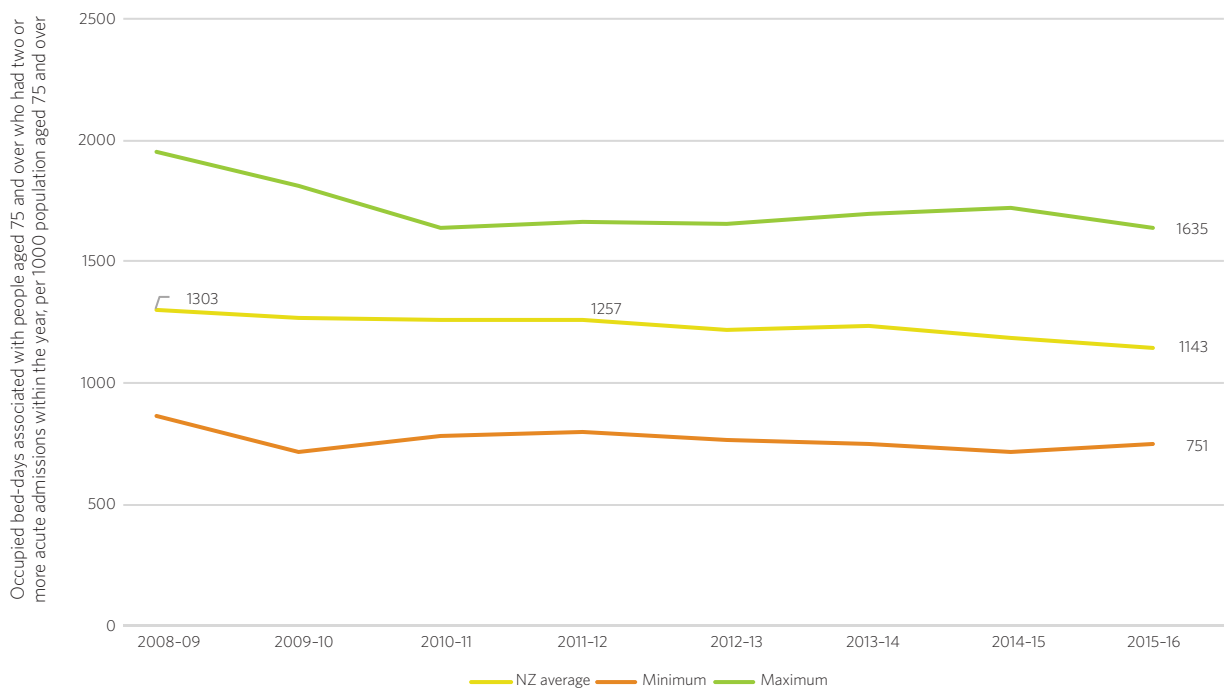
Integrating care – New Zealand is making progress, although not consistently

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.

Occupied bed-days used by older people admitted to hospital as an emergency twice or more in a year is a useful measure to show how well provision of primary, acute and long-stay care meets the needs of the population. When there is too little care outside of hospital, or different parts of the system fail to work through together effectively, people ‘fall through the gaps’ and are more likely to end up entering hospital as an emergency. We wish to avoid unnecessary acute hospital admissions among the group of patients most likely to be heavy users of acute health services, and address their problems earlier, with less intensive forms of care. It also frees up resources that can increase access to services like elective surgery. This group of patients is also critical in how their hospital use affects the total number of acute hospital bed-days, one of the System Level Measures adopted by the Ministry of Health.

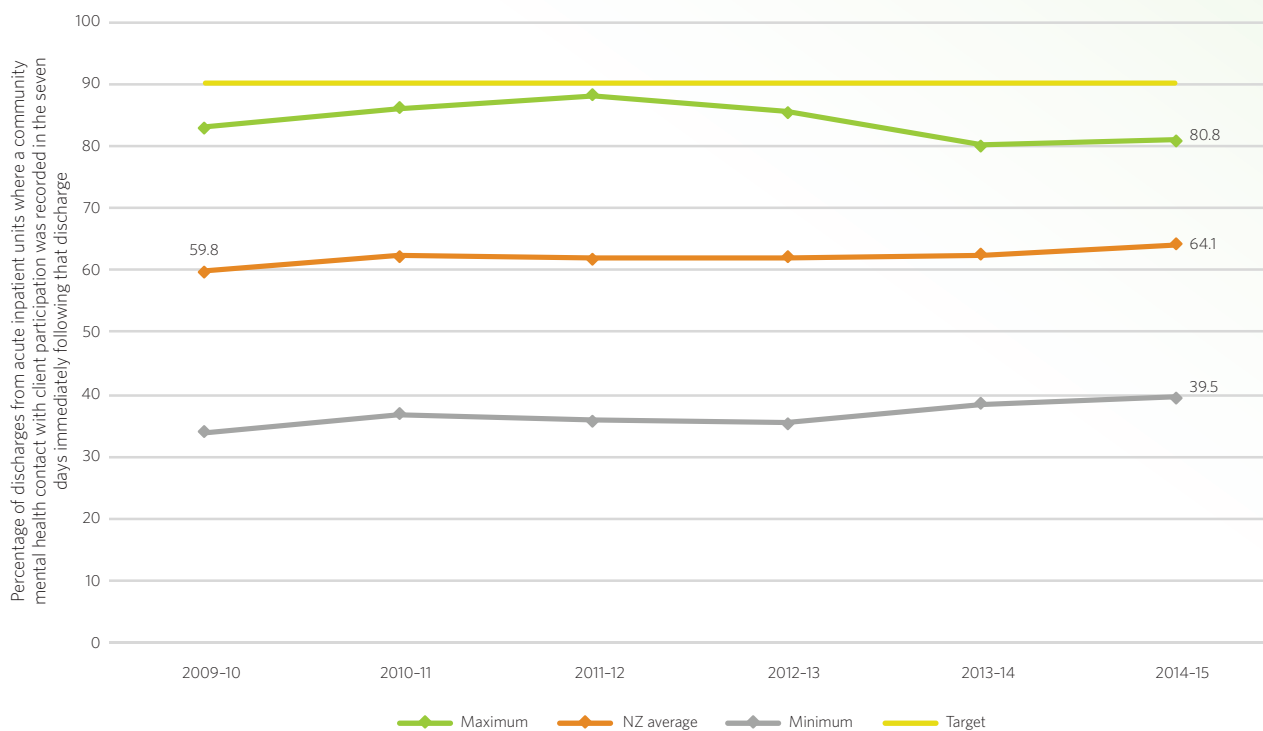
Across the country there is a reduction in the per-capita bed-day use by this cohort of about 13 percent since 2012 (see Figure 19). Since 2012, this equates to a cumulative reduction of 95,000 occupied bed-days. However, wide variations between DHBs remain.

Figure 19: Occupied bed-days associated with people aged 75 and over who had two or more acute admissions within the year, per 1000 population aged 75 and over, New Zealand, 2008–16



A similar measure for a different group of patients is community follow-up within seven days of discharge from hospital (see Figure 20). This is a key performance indicator for mental health and addiction services in New Zealand. It is an important measure because people who have been in hospital because of a serious mental health issue or episode, who get support from community mental health services when they leave, are less likely to come to harm or be readmitted. These people are particularly vulnerable and have a higher risk of suicide. The data published in the Commission's Atlas of Healthcare Variation shows a consistent national average in the low to mid 60s. This remains variable across the country, and nowhere reaches the clinically agreed target level.

Figure 20: Percentage of discharges from acute inpatient units where a community mental health contact with client participation was recorded in the seven days immediately following that discharge, national average and highest and lowest DHB values, New Zealand, 2009-15



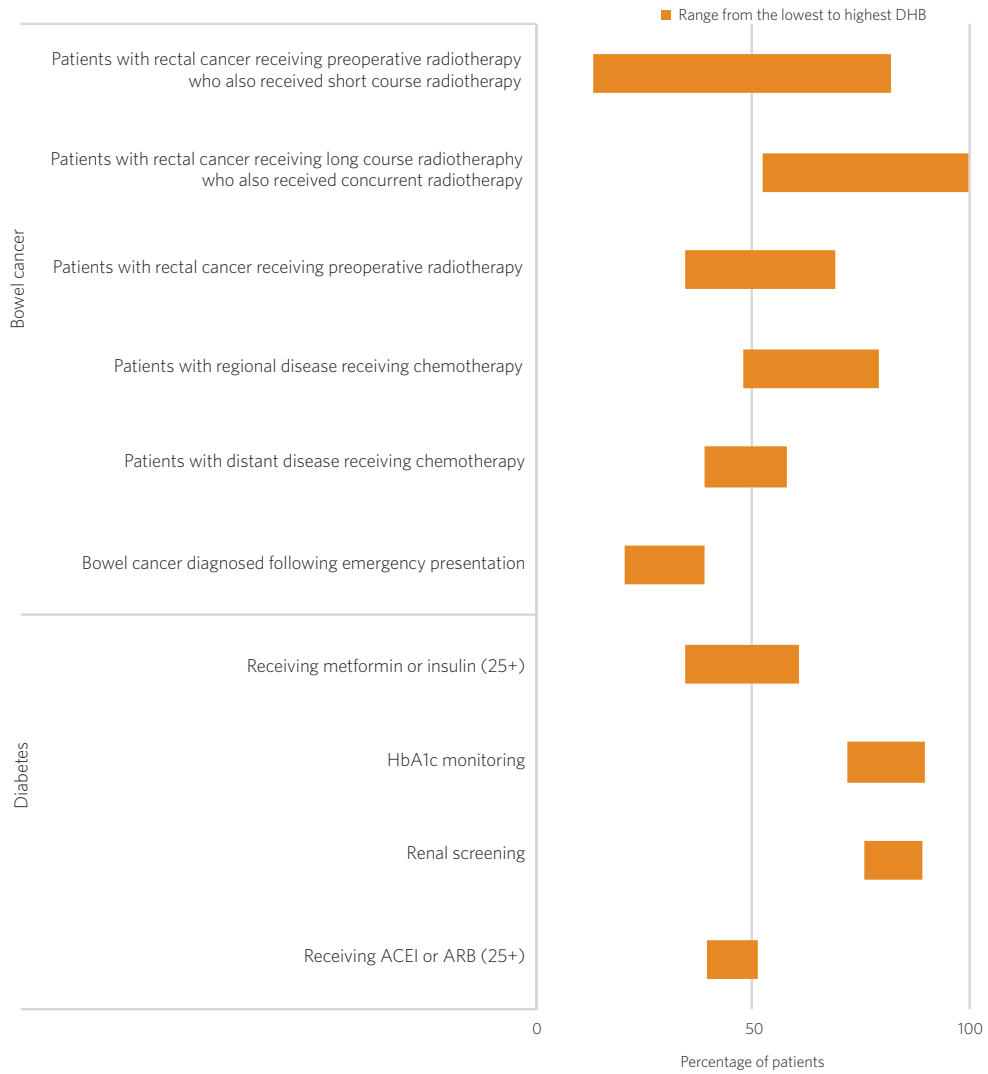
Wide and unexplained variation remains in access to treatments for individual diseases across the country

Since first being published in 2012, the Atlas of Healthcare Variation has shown variations in treatment patterns and outcomes between different populations and parts of the country. In this year's Window, we concentrate on one Atlas domain that has been updated with new data, diabetes, and one that is new this year, bowel cancer.

The first six bars in Figure 21 show the range in the proportion of bowel cancer patients receiving different treatments across DHBs. These show very different patterns of care for the rectal cancer measures in particular (the first three bars in the graph). This analysis tends to support the view that there is no consensus on the relative merits of long-course and short-course radiotherapy and widespread variation in practice results from this. For the four diabetes measures, by contrast, most DHBs have quite similar patterns of care for these four treatments, although in each case there are low outliers. Patients may benefit from investigation into the reasons for these.



Figure 21: Proportion of diabetes and bowel cancer patients receiving potentially recommended treatments, by DHB, New Zealand, 2015



5 Equity

Why equity matters

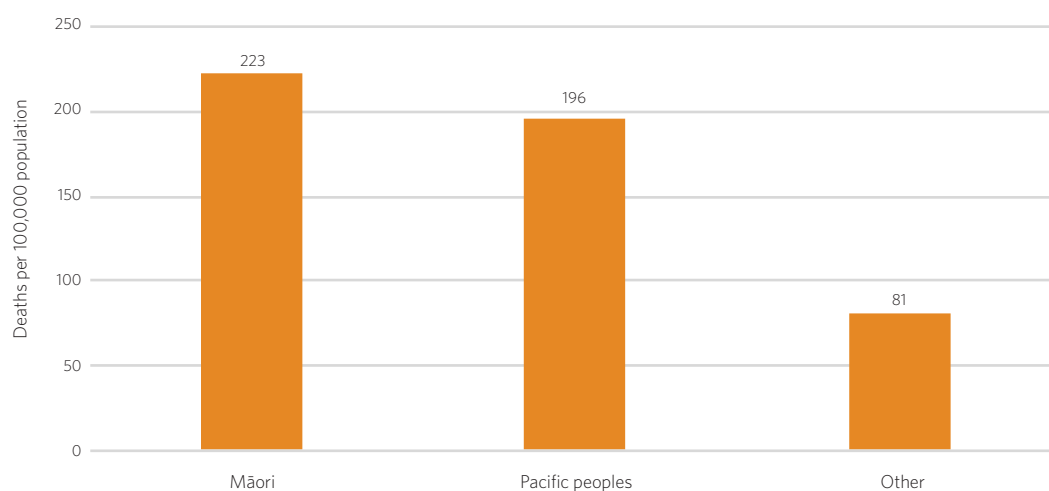
Huge disparities remain in health outcomes between Māori, Pacific and New Zealand European peoples, and between the wealthiest and poorest New Zealanders. This is despite our apparent ability to positively affect inequity in targeted areas, such as immunisation. The data in this sections suggests these disparities are not solely due to 'determinants' of health like socioeconomic status, but instead are compounded by inequitable health care itself.

Equity is about fairness and human rights. It recognises that people differ in their ability to attain or maintain health. Sometimes, underlying determinants of health cannot be changed: age is a good example. However, many factors that influence health can be modified by the health care sector itself: how easy it is to access and pay for services, staffing, available technology and medicines, the amount and outcomes of care provided, and whether services meet the social and cultural needs of their populations.

This is a challenge for New Zealand's health system, as previous Windows have highlighted. Inequity in access, experience and outcome is large, widespread and cannot all be explained by the effects of the broader inequalities in New Zealand society.

While mortality from conditions that are amenable to health care has fallen dramatically in the past 15 years, two- to three-fold variations between ethnic groups remain striking, with Māori and Pacific peoples having rates between two and three times higher than those of other populations (Figure 22).

Figure 22: Mortality from conditions amenable to health care per 100,000 population, aged 0-74 by ethnicity, New Zealand, 2013 (Source: Ministry of Health)



The mortality review committees' reports corroborate this finding. Māori are 62 percent more likely to die after surgery;³² and Māori mothers twice as likely to die in childbirth than New Zealand European mothers.³³

This inequality in ultimate outcomes is matched by different levels of access to health care, different experiences of health care once accessed and different patterns of treatment between groups.

32 Perioperative Mortality Review Committee. 2016. *Fifth report of the Perioperative Mortality Review Committee*. URL: www.hqsc.govt.nz/our-programmes/mrc/pomrc/publications-and-resources/publication/2541.

33 Perinatal and Maternal Mortality Review Committee. 2016. *Tenth Annual Report of the Perinatal and Maternal Mortality Review Committee*. URL: www.hqsc.govt.nz/our-programmes/mrc/pmmrc/publications-and-resources/publication/2550.



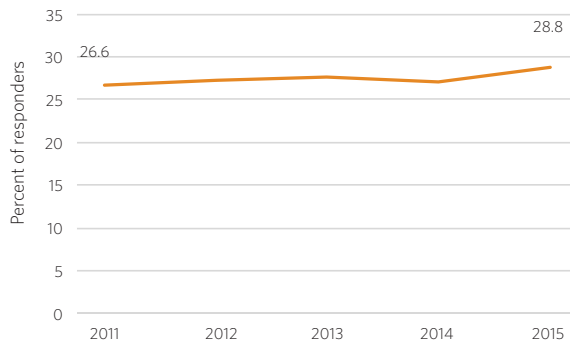
Access to health care

In terms of access, the Ministry of Health’s New Zealand Health Survey provides a useful whole population view. The survey samples all New Zealanders, not just those who access health services – this is essential for understanding the experiences of those who have not been able to access these services.

The most recent survey results suggest a small, statistically significant increase has occurred in the already substantial proportion of responders who have been unable to access primary health care when they needed it. Māori, women and people living in deprived areas are all 1.5 to 2 times more likely to report unmet need for primary health care than non-Māori, men and people living in affluent areas (see Figures 23 and 24).³⁴

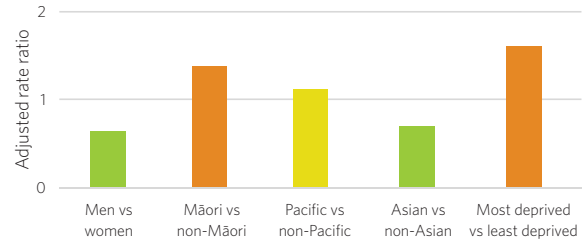
The proportion of people who had one or more types of unmet need for primary health care the past 12 months is growing...

Figure 23: Proportion of responders who experienced one or more types of unmet need for health care in the past 12 months, New Zealand, 2011-15 (Source: Ministry of Health)



... and Māori, women and people living in deprived areas are more likely to report unmet needs.

Figure 24: Ratio of proportion of responders experiencing unmet needs by group, New Zealand, 2011-15 (Source: Ministry of Health)



Note: Green is significantly lower; yellow no significant difference; orange significantly higher.

Experience of health care

Access to health care in New Zealand is inequitable. Once health care has been accessed, however, there are more disparities. Over 10 iterations of the in-hospital patient experience survey, Māori respondents were less likely to report a positive experience of care for most questions asked. These less-positive experiences are in most cases both statistically significant and expressed consistently over time.



34 Ministry of Health: Annual Update of Key Results 2015/16: New Zealand Health Survey. URL: minhealthnz.shinyapps.io/nz-health-survey-2015-16-annual-update.

The in-hospital patient experience survey shows that, once health care is accessed, Māori consumers frequently have a worse experience of many aspects of care. Responses to the in-hospital patient experience survey, 2014-16, Māori and non-Māori are shown below.

Māori consumers are **consistently** and **significantly** less likely to:



Always get answers they could understand when they had important questions to ask a doctor

Have their condition explained to them in a way they could **completely** understand

Always feel that doctors listened to what they had to say

Always feel that nurses listened to what they had to say

Never get conflicting information from different staff members

Definitely think that hospital staff did everything they could to control their pain

Believe their hospital room or ward was **very** clean

Always feel staff treated them with respect and dignity while they were in the hospital

Māori consumers are **significantly** less likely to:



Always feel that other members of the health care team listened to what they had to say

Always feel staff treated them with kindness and understanding while they were in the hospital

Māori consumers are **consistently** and **significantly** more likely to:



Definitely be told about what medication side effects to watch for when they went home

Always have family/whānau included in discussions about their care



Beyond reported experience, it is also clear the pattern of care received differs between groups. Māori, Pacific and low-income populations are less likely to receive recommended care. We have highlighted the inequitable use of pharmaceutical therapies for gout in previous editions of the Window. The publication in 2016 of the Atlas of Healthcare Variation Equity Explorer shows further instances of this pattern of inequitable care.

Equity Explorer – unwarranted variation in treatment for different groups?

After publishing 16 domains in a map-based format, the Atlas of Healthcare Variation published a new and distinct domain in June 2016: the Equity Explorer. The shift in focus to highlight inequity has shown clear instances of unwarranted variation between groups of people within the same areas of New Zealand alongside the unwarranted variation between different areas of New Zealand.

The Equity Explorer extends and reinterprets some of the work of the Atlas. While Atlas domains across many conditions have shown inequities between population groups, these were not highlighted and could easily be missed. The Equity Explorer is designed to show demographic inequity clearly. To do this, it makes several changes from the usual Atlas approach.

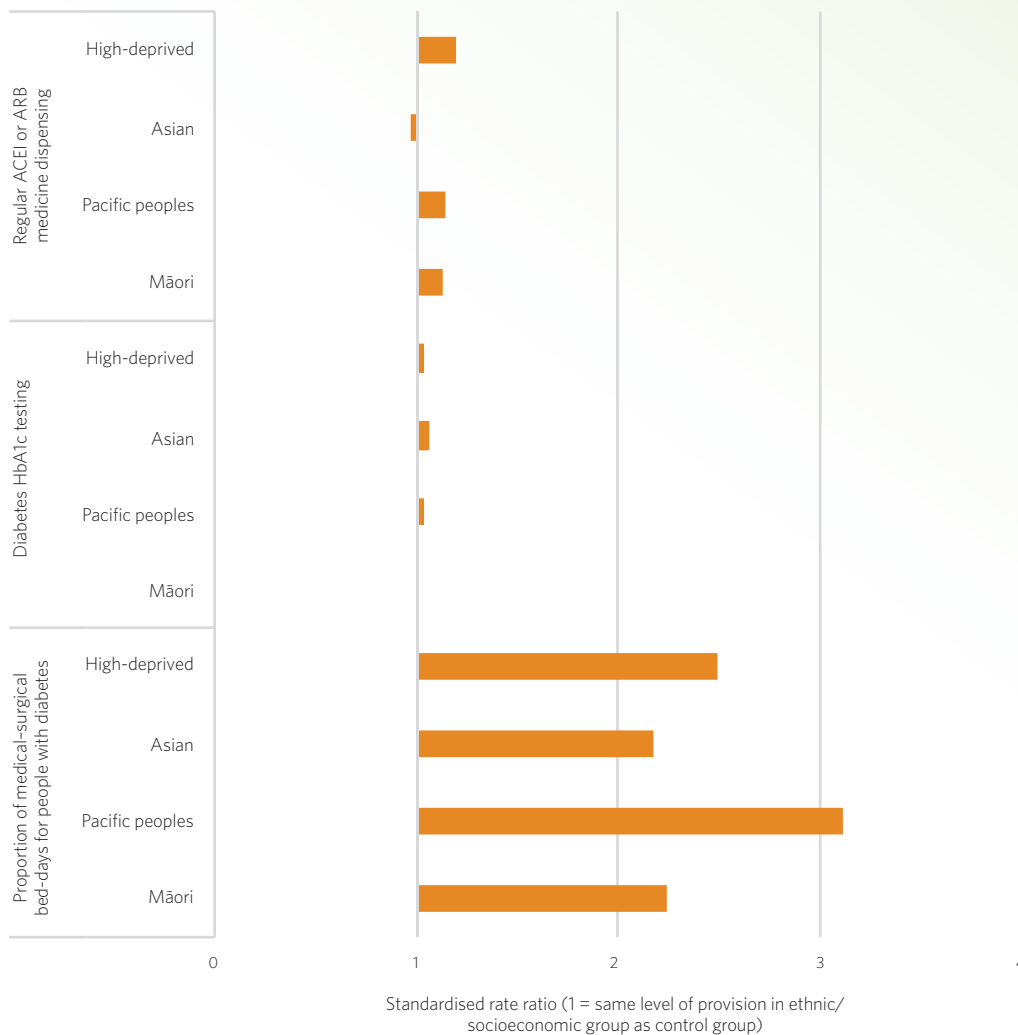
- It highlights process measures alone – the kinds of care given – because they are more amenable to change.
- It looks specifically at the *absolute and relative size of the differences* between population groups, rather than purely presenting different numbers for different groups, because these absolute numbers can be small.
- It makes other technical changes, such as age standardisation, use of total response ethnicity and socioeconomic gradients.
- It presents variation within as well as across DHBs.
- To facilitate this, rather than using the map format of other Atlas domains, it instead provides an interactive data sheet with graphical presentations of the data.

Deconstructing and repackaging the data in this way highlights the differences in health care provided to people from different ethnic and socioeconomic groups, and that this varies within and between DHBs. Overall, the equity picture is mixed. For some indicators, a clear ethnic or socioeconomic gradient is evident, for others it is not.

For diabetes, the Equity Explorer prompts questions about how effective efforts to address population-level problems seem to fail different ethnic and socioeconomic groups. An example looking at diabetes is set out below.

In 2014, Māori, Pacific and Asian peoples with diabetes spent more days in hospital than New Zealand Europeans with diabetes, as did people from socioeconomically deprived areas – between two and three times as many. But New Zealand as a whole and most DHBs show no systemic inequity between ethnic or socioeconomic groups in how long-term preventive medicines are prescribed nor how regularly blood tests to check long-term glucose control are taken.

Figure 25: Standardised rate ratio for regular ACEI or ARB medicine dispensing, diabetes HbA1c testing, and proportion of medical-surgical bed-days for people with diabetes by ethnic and socioeconomic group, New Zealand, 2014



Note: ACEI = angiotensin-converting enzyme inhibitor; ARB = angiotensin II receptor blocker; HbA1c = glycated haemoglobin.

The data represented in Figure 25 suggests a situation where system structures and processes appear to work for HbA1c testing and medicines to prevent long-term complications across the population, but perhaps are not having the required effect to reduce diabetic complications for those admitted to hospital. DHBs can use their local data, such as HbA1c screening results, to investigate this further.





Box 4: How inequity happens – stomach cancer

A striking example is provided here of how social determinants of health, variation in access to health services, provision of the most appropriate treatment and experience of care interact to compound inequity in outcomes in New Zealanders' experience of stomach cancer, by Diana Sarfati, Virginia Signal and Andrea Teng.

The key pathway for greater rates of stomach cancer in Māori and Pacific in New Zealand is the increased risk of being infected by *Helicobacter pylori* in childhood, associated with poverty and household crowding. Chronic *H. pylori* infection in the stomach increases the risk of stomach cancer in adults. Furthermore, after diagnosis with stomach cancer, Māori are less likely to be seen by a specialist surgeon and have poorer survival.

Stomach cancer was the fourth most common cancer for Māori males and seventh most common for Māori females from 1996 to 2001.³⁵ Stomach cancer incidence and mortality has declined for all ethnic groups in New Zealand, in line with international trends, but substantial inequity persists, with Māori and Pacific peoples having rates 3–6 times higher than New Zealand Europeans.^{36, 37, 38}

Between 2006 and 2011, stomach cancer was a top contributor to the ethnic gap in cancer incidence and mortality, making up 9 percent of the rate difference in cancer mortality for Māori males, 7 percent for Māori females, 16 percent for Pacific males and 20 percent for Pacific females. Stomach cancer was second only to lung cancer as a contributor to ethnic inequalities in mortality for both Māori and Pacific males.³⁹

So, the question is, what causes this high rate of stomach cancer among Māori and Pacific peoples? The strongest modifiable risk factor for stomach cancer is infection with *Helicobacter pylori*, a bacterium that lives in the stomach lining. Infection with *H. pylori* is common and, although most people with the infection are not obviously affected by it, a small proportion (1–2 percent) develop stomach cancer. Nearly all patients who develop cancer in the distal part of the stomach have been infected with *H. pylori*, and in nine out of ten cases the cancer is due to *H. pylori*.⁴⁰ A much higher incidence of distal stomach tumours has been reported in Māori when compared with non-Māori.^{41, 42, 43}

So, does the difference in *H. pylori* infection explain the ethnic disparities in cancer incidence? Recent research says yes: although rates are declining in general, *H. pylori* infection is substantially higher among Māori and Pacific peoples.⁴⁴ These high rates of *H. pylori* infection have also been found to account for 50–80 percent of the excess distal stomach cancer incidence among Māori and Pacific peoples living in New Zealand.⁴⁵

35 Robson B, Purdie G, Cormack D. 2006. *Unequal impact: Māori and non-Māori cancer statistics 1996–2001*. Wellington: Ministry of Health.

36 NZ Census Mortality and Cancer Trends Study Data Explorer. No date. URL: <https://nzcms-ct-data-explorer.shinyapps.io/version8/> (accessed 23 March 2017).

37 Teng AM, Atkinson J, Disney G, et al. 2016. Ethnic inequalities in cancer incidence and mortality: Census-linked cohort studies with 87 million years of person-time follow-up. *BMC Cancer* 16(1): 755.

38 Blakely T, Shaw C, Atkinson J, et al. 2010. *Cancer Trends: Trends in incidence by ethnic and socioeconomic group, New Zealand 1981–2004*. Wellington: University of Otago and Ministry of Health.

39 Teng et al 2016, *op.cit.*

40 Plummer M, Franceschi S, Vignat J, et al. 2015. Global burden of gastric cancer attributable to *Helicobacter pylori*. *International Journal of Cancer* 136(2): 487–90.

41 Armstrong RW, Borman B. 1996. Trends in incidence rates of adenocarcinoma of the oesophagus and gastric cardia in New Zealand, 1978–1992. *International Journal of Epidemiology* 25(5): 941–7.

42 Biggar M, Srinivasa S, Wickramarachchi S, et al. 2011. Gastric cancer location and histological subtype in Pacific people and Māori defies international trends. *New Zealand Medical Journal* 124: 39–44.

43 Signal V, Sarfati D, Cunningham R, et al. 2015. Indigenous inequities in the presentation and management of stomach cancer in New Zealand: A country with universal health care coverage. *Gastric Cancer* 18(3): 571–9.

44 McDonald AM, Sarfati D, Baker MG, et al. 2015. Trends in *Helicobacter pylori* infection among Maori, Pacific, and European Birth cohorts in New Zealand. *Helicobacter* 20(2): 139–45.

45 Teng AM, Blakely T, Baker MG, et al. 2016. The contribution of *Helicobacter pylori* to excess gastric cancer in Indigenous and Pacific men: A birth cohort estimate. *Gastric Cancer* (advanced access). Doi: 10.1007/s10120-016-0671-8.

So why do Māori and Pacific peoples have higher rates of *H. pylori* infection? Infection with *H. pylori* most commonly occurs during childhood,⁴⁶ and almost all childhood infections are more common among Māori and Pacific peoples.^{47, 48, 49, 50} One of the most important drivers for this is household overcrowding,⁵¹ with Māori and Pacific children substantially more likely to be living in overcrowded conditions.^{52, 53, 54, 55}

This inequity is compounded by inequities in cancer care. Internationally, a large body of work clearly shows that minority ethnic groups tend to receive poorer quality health care than the majority group(s).⁵⁶ New Zealand is no exception, with good evidence that Māori patients receive poorer quality cancer care than non-Māori.⁵⁷ In the case of stomach cancer, Māori patients are less likely to receive their surgical care in a main centre and are substantially less likely to be treated by a specialist surgeon than non-Māori.⁵⁸

Cancer survival can be a useful indicator of the overall effectiveness of a country's cancer screening, diagnostic and treatment services. Inequitable survival between population groups then provides an indirect marker of the equity of access to, and quality of, those services. From 1991 to 2004, Māori with stomach cancer had excess 25 percent greater mortality than non-Māori.⁵⁹ Māori diagnosed with stomach cancer between 2006 and 2008 appear to have had a 30 percent poorer survival rate than non-Māori.⁶⁰ Stage at diagnosis does not appear to be a contributor to this differential survival, with no difference in stage between Māori and non-Māori seen in two studies based on clinical note review and accurate stage data.^{61, 62}

Therefore, we see a compounding of inequity for Māori and Pacific peoples along the entire pathway of distal stomach cancer, from determinants to risk factors to treatment and, ultimately, survival.



46 McDonald et al 2015, *op.cit.*

47 Baker M, McNicholas A, Garrett N, et al. 2000. Household crowding a major risk factor for epidemic meningococcal disease in Auckland children. *Pediatric Infectious Disease Journal* 19(10): 983-90.

48 Baker MG, Barnard LT, Kvalsvig A, et al. 2012. Increasing incidence of serious infectious diseases and inequalities in New Zealand: A national epidemiological study. *Lancet* 379(9821): 1112-9.

49 Jaine R, Baker M, Venugopal K. 2011. Acute rheumatic fever associated with household crowding in a developed country. *Pediatric Infectious Disease Journal* 30(4): 315-9.

50 O'Sullivan CE, Baker MG, Zhang J. 2011. Increasing hospitalizations for serious skin infections in New Zealand children, 1990-2007. *Epidemiology & Infection* 139(11): 1794-804.

51 Baker MG, McDonald AM, Zhang J, et al. 2013. *Infectious Diseases Attributable to Household Crowding in New Zealand: A systematic review and burden of disease estimate*. Wellington: University of Otago and Ministry of Health.

52 Baker et al 2000, *op.cit.*

53 Baker et al 2012, *op.cit.*

54 Jaine et al 2011, *op.cit.*

55 O'Sullivan et al 2011, *op.cit.*

56 Smedley B, Stith A, Nelson A (eds). 2002. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: National Academic Press.

57 Hill S, Sarfati D, Robson B, et al. 2013. Indigenous inequalities in cancer - what role for health care? *ANZ Journal of Surgery* 83: 36-41.

58 Signal et al 2015, *op.cit.*

59 Soeberg M, Blakely T, Sarfati D, et al. 2012. *Cancer Trends: Trends in Survival by Ethnic and Socioeconomic Group, New Zealand 1991-2004*. Wellington: University of Otago and Ministry of Health.

60 Signal V. 2016. *Making Sense of Stomach Cancer Inequities in Aotearoa New Zealand*. Wellington: University of Otago.

61 Biggar et al 2011, *op.cit.*

62 Signal et al 2015, *op.cit.*



6 Value

Value in health care is commonly defined as outcomes of care divided by the cost of health care. Under this definition, Figure 5 above would suggest that New Zealand gets fairly typical outcomes for relatively low cost per capita – indicating a system that provides good value for money.

However, the situation is not straightforward. Like nearly all developed countries, New Zealand has increased both its absolute expenditure and the proportion of its national income spent on health services since 2000. Plus, demand for health expenditure, especially as new treatments and therapies become available, is only likely to increase.

Increasing the quality of care can help reduce costs. Better-quality care eliminates wasteful expenditure and also provides value in terms of adding years of healthy life to the citizens who are the ultimate funders of health care. The 2016 Window introduced an approach to estimating the value provided by health services. Box 5 outlines this approach in more detail.

Avoided expenditure associated with poor-quality care is estimated to be around \$90 million since 2012. The additional value associated with avoided disability-adjusted life years (DALYs) and avoided deaths among babies, children and young people is closer to \$400 million.

Table 3: Estimates of avoided costs and value resulting from avoided harm

| | Avoided costs of harm (\$m) | Added value of avoided DALYs (\$m) | Potentially wasted expenditure avoided (\$m) | Value of saved lives (\$m) |
|---|-----------------------------|------------------------------------|--|----------------------------|
| CLAB cases | 5.2 | 106 | | |
| Healthcare associated <i>S. aureus</i> | - | | | |
| SSIs | 1.9 | 4.3 | | |
| In-hospital falls with FNOF | 3.5 | 23 | | |
| Postoperative DVT/PE | 7.9 | 40 | | |
| Postoperative sepsis | - | - | | |
| Occupied bed-days for older people repeatedly admitting acutely | | | 72 | |
| Child and youth deaths (SUDI and transportation) | | | | 175 |
| Stillbirths | | | | 38 |
| TOTALS | 18.5 | 173 | 72 | 213 |

Note: CLAB = central line associated bacteraemia; DVT/PEs = deep vein thrombosis/pulmonary embolism; FNOF = fractured neck of femur; SSI = surgical site infection; SUDI = sudden unexpected death in infancy.

Using the method described in Box 5, we can estimate the avoided costs and provided value. The first two columns in Table 3 draw on the data given in Table 1. The third column is based on the avoided bed-days associated with the reduction in occupied bed-days for older people admitting acutely more than once, as shown in Figure 19. The estimate of the values of lives saved derives from the reductions in child and youth deaths and still births noted in the reports of the Child and Youth and Perinatal and Maternal Mortality Review Committees.

Box 5: What is the value of quality?

The Commission measures the value provided by the New Zealand health system. This is deliberate and important. A high-quality system is one that is accessible, avoids waste and harm, provides value and is financially sustainable. For this reason, the New Zealand Triple Aim seeks to provide 'best value for public health system resources' alongside 'improved outcomes and experience of care for the individual' and 'improved health and equity for all populations'.

Value is becoming increasingly important in health care. The financial pressures on all health systems internationally are growing, with demographic, epidemiological and technological changes all increasing demand. To meet these demands without services becoming unaffordable requires a focus on providing value to consumers and avoiding expenditure that provides little benefit.

In last year's edition of the Window, we considered various approaches to measuring value in the health system. In this year's edition, we apply some of these approaches.

What does value mean?

The New Zealand Triple Aim's definition of the system aim 'best value for public health system resources' is a subtle but important development of the original US goal of minimising 'cost per capita'.

Expenditure on health care per person helps us to compare expenditure over time and across countries but is less useful in helping us understand how much value a health system is providing. This is partly because the measure of 'cost per capita' ignores the outcomes being achieved in a health system in terms of helping people live longer, healthier lives. An expensive system may provide both excellent results and considerable waste, while a cheaper one may produce mediocre results but have little waste in the system. The first will look more expensive while the second will look cheap; but neither is necessarily providing better *value* than the other. Both can produce better value for money by reducing waste in the first country and improving outcomes in the second.

How do we measure value?

The different methods we use to measure value are briefly described below.

Value to the system

Avoided costs of harm – this can be thought of as 'what expenditure we avoid by preventing harm'. When we develop a safety programme (for example, for infections, falls or safe surgery), we review the evidence of what it costs health services to treat one of these harms, for example, through longer hospital stays, additional surgery or additional drugs. For example, the cost of treating a fractured neck of femur following an in-hospital fall has been estimated at an average of \$47,000.

We can calculate the expected numbers of a specific harm based on historic trends and compare this with the actual number of harms following the introduction of a new programme. If we multiply this by the cost per harm we know the gross costs that we have avoided, as per the following equation:⁶³

63 De Raad JP. 2012. *Towards a Value Proposition... Scoping the Cost of Falls*. Wellington: New Zealand Institute of Economic Research.



$$\left(\begin{array}{c} \text{Predicted} \\ \text{harms} \end{array} - \begin{array}{c} \text{observed} \\ \text{harms} \end{array} \right) \times \begin{array}{c} \text{cost per} \\ \text{harm} \end{array} = \begin{array}{c} \text{avoided cost} \\ \text{of harm} \end{array}$$

Potentially wasted expenditure – this can be thought of as ‘what we spend on things we possibly should not be doing’. Some health service activities may be unnecessary or unwanted, others may not deliver positive outcomes (are ineffective), while still others may be the result of system failures elsewhere. An example of the last point is that at least some acute hospital admissions may be preventable by improving access to the right care at the right time, closer to home. Where widespread variation occurs in a treatment or form of health care across the country that is not easy to explain, this can be a clue for wasted expenditure.

The approach for estimating potentially wasted expenditure is essentially the same as for avoided costs of harm. An expected number of events we wish to reduce (for example, preventable hospital admissions for a specific procedure or occupied bed-days for specific types of admissions) can be calculated based on historic trends and compared with actual events – actual events are subtracted from expected events and the resulting difference is multiplied by a cost per event. The resulting figure is the avoided cost. This money can then be spent on providing other, effective, services.

One point worth mentioning is that, even if we avoid potentially wasted expenditure, it does not necessarily mean it is better spent elsewhere.

$$\left(\begin{array}{c} \text{Predicted} \\ \text{events} \end{array} - \begin{array}{c} \text{observed} \\ \text{events} \end{array} \right) \times \begin{array}{c} \text{cost per} \\ \text{event} \end{array} = \begin{array}{c} \text{avoided wasted} \\ \text{expenditure} \end{array}$$

Together, these two measures provide an estimate of the resources released to provide more services to more people by improving quality.

Value to society

Gaining years of life in good health

Health economists and researchers use the concept of a disability-adjusted life year (DALY) to measure the effect on individuals and populations of specific illnesses and harms. The DALY combines the likely shortening of life (years of life lost) with the loss of quality of life (years of life disabled).

The DALY is often used at an overarching population level to estimate a ‘global burden’ of disease and harm but can be used to estimate an average DALY cost per harm. These estimates are available in academic literature for many of the harms with which we are concerned.

For example, we can estimate an average DALY cost of about 1.6 for each fractured neck of femur. Avoiding the harm means the average individual will avoid losing this many years of life in good health.

A value to the gained year of health life is assigned using the New Zealand estimate of the value of a statistical life. This is based on what New Zealanders state they are willing to pay in improving roads to save a life. In 2014, this stood at \$3.95 million per life. Using a method developed by Accident Compensation Corporation (ACC) economists, which takes into account a person’s age and estimates remaining life expectancy, this converts to a value of about \$180,000 per year of healthy life gained for a 40-year-old person.

For example, using our estimated DALY figures for fractured neck of femur, this gives a value to society of about \$288,000 per avoided fractured neck of femur.

$$\left(\left(\begin{array}{c} \text{Predicted} \\ \text{harms} \\ - \\ \text{observed} \\ \text{harms} \end{array} \right) \times \text{DALYs} \right) \times \text{value of a year of life} = \text{value of years of a healthy life gained}$$

Avoided deaths – a similar approach can be used to identify value-associated changes in death rates in specific groups.

The Commission has four mortality review committees that review, analyse and make recommendations to reduce deaths in four groups: children and young people, mothers and newborns, people undergoing surgical operations, and people who die as a result of family violence. Since 2010, significant reductions have been achieved in the death rate among children and young people (the focus of the Child and Youth Mortality Review Committee) and a significant reduction has occurred in stillbirths (a focus of the Perinatal and Maternal Mortality Review Committee).

We use a slight revision of the ACC method to calculate the value of these avoided deaths. Because these avoided deaths are mainly for children, the estimate of remaining life expectancy is increased to 80 years, which reduces the value of a year of healthy life gained to around \$147,000. For each year of survival, we discount the value of a year of healthy life by 3.5 percent (so the second year of healthy life gained is worth \$142,000, and so on). The figures are then summed to create the total estimate of value. Thus, a death avoided in 2010 would be worth \$684,000 by 2015 (\$147,000 + \$142,000 + \$137,000 + \$132,000 + \$127,000), while one avoided in 2014 would be worth \$147,000.

$$\left(\begin{array}{c} \text{Predicted} \\ \text{deaths} \end{array} - \begin{array}{c} \text{observed} \\ \text{deaths} \end{array} \right) \times \text{value of a year of life discounted} = \text{value of deaths avoided}$$

Together, these two measures use a pre-existing definition of the value of a life to provide an estimate of the broader value to society provided by the better outcomes resulting from improving quality.



7 Opportunities

This review of the quality of New Zealand's health services shows both successes and opportunities for further improvement in the areas of equity, safety, culture, quality and value, and unwarranted variation. The work of the Commission, the aims of the Ministry of Health's New Zealand Health Strategy,⁶⁴ and the newly developed System Level Measures Framework align to help achieve these improvements.

For example, the importance of equity is explicitly recognised in the New Zealand Health Strategy's strapline that 'All New Zealanders live well, stay well and get well'. An emphasis on equitable outcomes for all population groups, and the design and implementation of a health system that can achieve this, permeates the strategy throughout. The strategy's 'roadmap of actions'⁶⁵ turns this emphasis into concrete action. Examples include actions to make the health system more responsive to people (Action 2), actions to provide a great start for children, family and whānau (Action 9) and the use of targeted investments for populations with high needs (Action 18).

The System Level Measures Framework is an important tool to help tackle inequity in our system. The high-level measures chosen – mortality amenable to health care, acute hospital bed-days for adults, ambulatory sensitive hospitalisation in children, and patient experience – are all ones where there is considerable inequity in New Zealand (as shown for example in Figure 22). The System Level Measures Framework is designed to allow local health services the flexibility to identify and tackle inequity, explicitly encouraging local services to set targets for reducing inequities,⁶⁶ and providing supporting data for individual population groups.⁶⁷

The Commission also has an important role to play. We will continue to provide information by different population groups, highlighting inequities in our reporting. Our Atlas of Healthcare Variation will continue to be enhanced to make these inequities clear. More than this, our improvement work will increasingly focus on areas of inequity. For example, our Whakakotahi primary care improvement project with the National Hauora Coalition in 2017 will concentrate on improving outcomes for Māori and Pacific patients with gout.

The reductions in selected harms reported in Table 1 show clearly that the quality improvement approach to addressing patient safety is successful for those areas at which it is targeted. The importance of safe care is again explicitly recognised in the Health Strategy theme of value and high performance and has specific roadmap actions to enhance this (eg, Action 19). This makes explicit the link between quality and value that we have considered in this report. Both in terms of avoiding expenditure which is either wasteful or required only to put right harms caused to patients and in terms of the value provided to society more broadly, high-quality health care provides good value. Reflecting the New Zealand Triple Aim priority of securing best value for public health system resources,⁶⁸ we will continue to show these benefits for all our work.

Part of doing this is reducing unwarranted variation that can lead to wasteful expenditure on care which may be neither needed nor wanted and which is unlikely to bring benefit, or alternatively mean needed services are not provided. The Health Strategy explicitly recognises that reducing such variation is required in a high-performing system. Since 2012 the Commission's Atlas of Healthcare Variation has highlighted such variation for numerous services and conditions. We noted above use of the data to change the management of opioids in Wairarapa. Similar stories can be told around the country for different subjects from asthma to polypharmacy to falls. In 2017 and beyond we will accelerate these efforts, providing more tools and data to allow local services to understand and reduce unwarranted variation.

64 Minister of Health. 2016. *New Zealand Health Strategy: Future direction 2016*. Wellington: Ministry of Health. URL: www.health.govt.nz/system/files/documents/publications/new-zealand-health-strategy-futuredirection-2016-apr16.pdf

65 Minister of Health. 2016. *New Zealand Health Strategy: Roadmap of actions 2016*. Wellington: Ministry of Health. URL: www.health.govt.nz/system/files/documents/publications/new-zealand-health-strategy-roadmapofactions-2016-apr16.pdf

66 [www.health.govt.nz/new-zealand-health-system/system-level-measures-framework/system-level-measures-framework-questions-and-answers#What should the main focus of improvement plans be?](http://www.health.govt.nz/new-zealand-health-system/system-level-measures-framework/system-level-measures-framework-questions-and-answers#What%20should%20the%20main%20focus%20of%20improvement%20plans%20be?)

67 nsfl.health.govt.nz/dhb-planning-package/system-level-measures-framework

68 www.hqsc.govt.nz/about-the-commission

In general, the quality of New Zealand's health services is improving. Further improvements are possible and necessary. The focus provided by the New Zealand Health Strategy, the implementation of the System Level Measures Framework, and the development of the health system's capacity to improve its quality, provide a firm basis to make these improvements.





The window on quality - what changed from 2012 to 2016

| Safety | Experience |
|--|---|
| <p>In-hospital falls with fractured neck of femur 38% reduction</p> <p>↓</p> | <p>In-hospital survey patients experience of communication 8.3/10 No change</p> <p>→</p> |
| <p>Compliance with WHO five moments for hand hygiene 21% increase</p> <p>↑</p> | <p>In-hospital survey patients experience of partnership 8.5/10 No change</p> <p>→</p> |
| <p><i>Staphylococcus aureus</i> bacteraemia rates No change</p> <p>→</p> | <p>In-hospital survey patients experience of coordination of care 8.3/10 No change</p> <p>→</p> |
| <p>Postoperative sepsis 9% increase</p> <p>↑</p> | <p>In-hospital survey patients experience of physical and emotional needs being met 8.6/10 No change</p> <p>→</p> |
| <p>Postoperative DVT/PE 12% reduction</p> <p>↓</p> | |
| <p>Surgical site infection 39% reduction</p> <p>↓</p> | |
| | |
| | |
| | |

SYMBOLS

DIRECTION OF TRAVEL

 Green arrow - statistically significant improvement  Yellow arrow - no statistically significant change

 Red arrow - statistically significant deterioration  Grey arrow - insufficient data

ABBREVIATIONS | DALYs = disability-adjusted life years | DVT/PE = deep vein thrombosis/pulmonary embolism | CLAB = central line associate bacteraemia | HbA1c = glycated haemoglobin | QSI = quality and safety indicator | WHO = World Health Organization

| Effectiveness | Equity | Value |
|---|---|--|
| <p>Age standardised amenable mortality rates (2013 compared with 2009)</p> <p>14% reduction</p> <p></p> | <p>Age standardised amenable mortality rates 2013</p> <p>Māori 2.76 times higher Pacific 2.42 times higher than non-Māori non-Pacific</p> | <p>CLAB</p> <p>Avoided costs of harm \$5.2m Added value of avoided DALYs lost \$106m</p> |
| <p>DALYs per 100,000 population (2015 compared with 2000)</p> <p>34 per 1000 population reduction</p> <p></p> | <p>Unmet need for health care</p> <p>Māori 1.38 times more likely to reported unmet need than non-Māori Most deprived 1.61 times more likely to report unmet need than least deprived Pacific as likely to report unmet need as non-Pacific</p> | <p>Staphylococcus aureus bacteraemia</p> <p>No avoided costs of harm or added value</p> |
| <p>Occupied bed-days associated with people aged 75 and over who admitted to hospital as an emergency two or more times (QSI) 2016</p> <p>9% reduction</p> <p></p> | <p>Diabetes treatment</p> <p>No variance in access to HbA1c testing and regular ACEI and ARB dispensing for patients with diabetes between ethnic or socioeconomic groups Higher proportion of hospital bed-days taken up by patients with diabetes among Māori (2.2-fold), Pacific (3.1-fold), Asian (2.2-fold) populations and people living in highly deprived areas (2.5-fold)</p> | <p>Surgical site infections</p> <p>Avoided costs of harm \$2m Added value of avoided DALYs lost \$4.7m</p> |
| <p>Community follow-up of mental health patients</p> <p>No change</p> <p></p> | | <p>In-hospital falls with fractured neck of femur</p> <p>Avoided costs of harm \$3.9m Added value of avoided DALYs lost \$25m</p> |
| <p>People with diabetes receiving recommended treatments</p> <p>No change</p> <p></p> | | <p>Postoperative DVT/PE</p> <p>Avoided costs of harm \$7.9m Added value of avoided DALYs lost \$40m</p> |
| | | <p>Postoperative sepsis</p> <p>Additional costs of harm \$2.8m</p> |
| | | <p>Occupied bed-days associated with people aged 75 and over who admitted to hospital as an emergency two or more times</p> <p>Avoided potentially wasted expenditure \$72m</p> |
| | | <p>Value of avoided child and youth deaths (2010-14)</p> <p>\$175m</p> |
| | | <p>Value of avoided stillbirths (2010-14)</p> <p>\$38m</p> |

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