QSMs April – June 2019

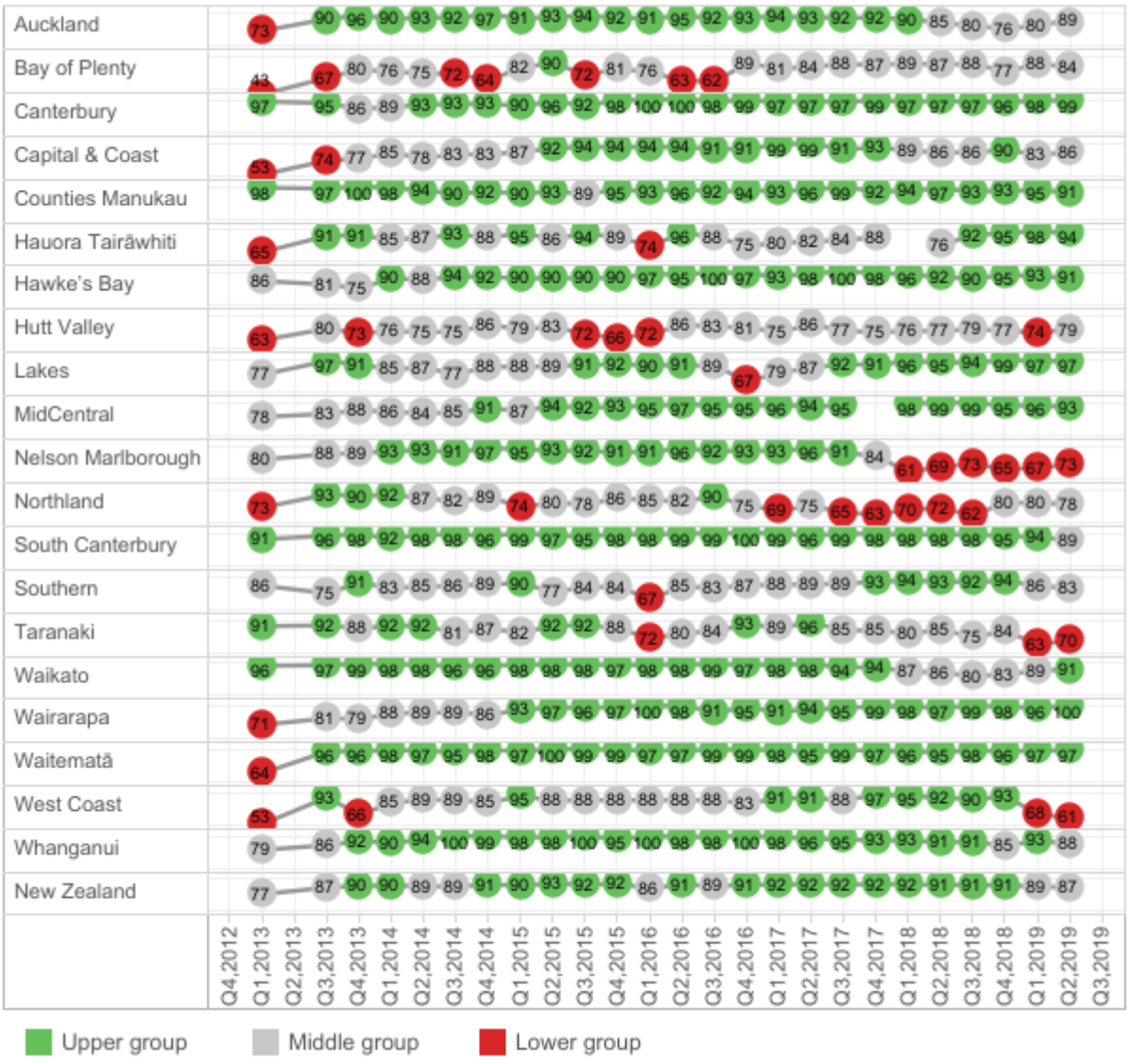
Falls

Process marker 1: Percentage of older people assessed for the risk of falling

Nationally, 87 percent of older patients* were assessed for their falls risk in quarter 2, 2019 (Figure 1). This marker has dropped below the expected achievement level of 90 percent for the last two quarters. Prior to this, the target was achieved most quarters since quarter 4, 2013.

At the district health board (DHB) level, nine out of 20 DHBs achieved the expected marker level for this current quarter and three of them have remained at this level for at least six continuous quarters. Bay of Plenty, Hutt Valley, Northland and Taranaki DHBs have consistently not met the expected marker level since quarter 4, 2012. Nelson Marlborough DHB has moved to the lower group in the assessment for the risk of falling from quarter 4, 2017 due to data collection changes.

Figure 1: Process marker, percentage of older patients assessed for the risk of falling



- Upper group: ≥ 90 percent
- Middle group: 75–89 percent
- Lower group: < 75 percent

* Patients aged 75+ (55+ for Māori and Pacific peoples)

Process marker 2: Percentage of older people assessed as at risk of falling who received an individualised care plan that addresses these risks

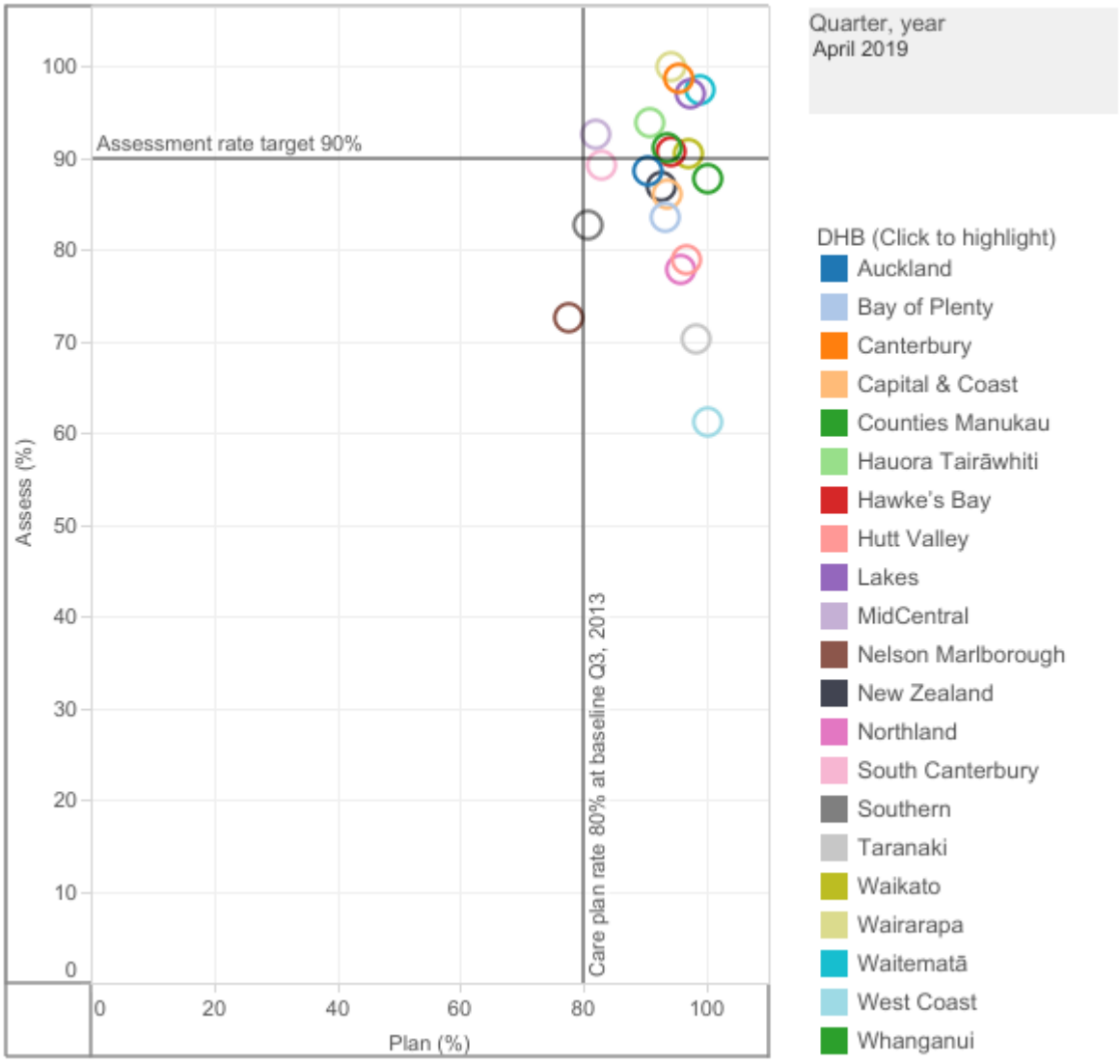
About 93 percent of patients assessed as being at risk of falling had an individualised care plan completed (Figure 2). This measure has increased 16 percentage points compared with the baseline in quarter 1, 2013. Achievements vary across DHBs. In quarter 2, 2019, there were 16 DHBs in the upper group compared to 14 in quarter 1, 2019. Nelson Marlborough, South Canterbury and Southern DHBs have been consistently lower than the national average in the development of an individualised care plan. Northland has remained in the upper group since quarter 4, 2018. Canterbury, Counties Manukau, Hutt Valley, Waitematā and Whanganui DHBs have been consistently present in the upper group for more than six consecutive quarters.

Figure 2: Process marker, percentage of older patients assessed as at risk of falling who received an individualised care plan that addresses these risks

-
- Upper group: ≥ 90 percent
- Middle group: 75–89 percent
- Lower group: < 75 percent

When assessments and care plans are plotted against each other, a trend of movement over time is shown from the bottom left corner (low assessment and individualised care plan) to the top right corner (high assessment and individualised care plan) in Figure 3. Five DHBs sat at the top right corner in quarter 1, 2013; in quarter 2, 2019, nine DHBs are in this 'ideal' box (see Figure 3), down from ten DHBs the last quarter. Ten DHBs met the care plan rate target but did not meet the assessment rate baseline.

Figure 3: Falls assessment compared with care planning



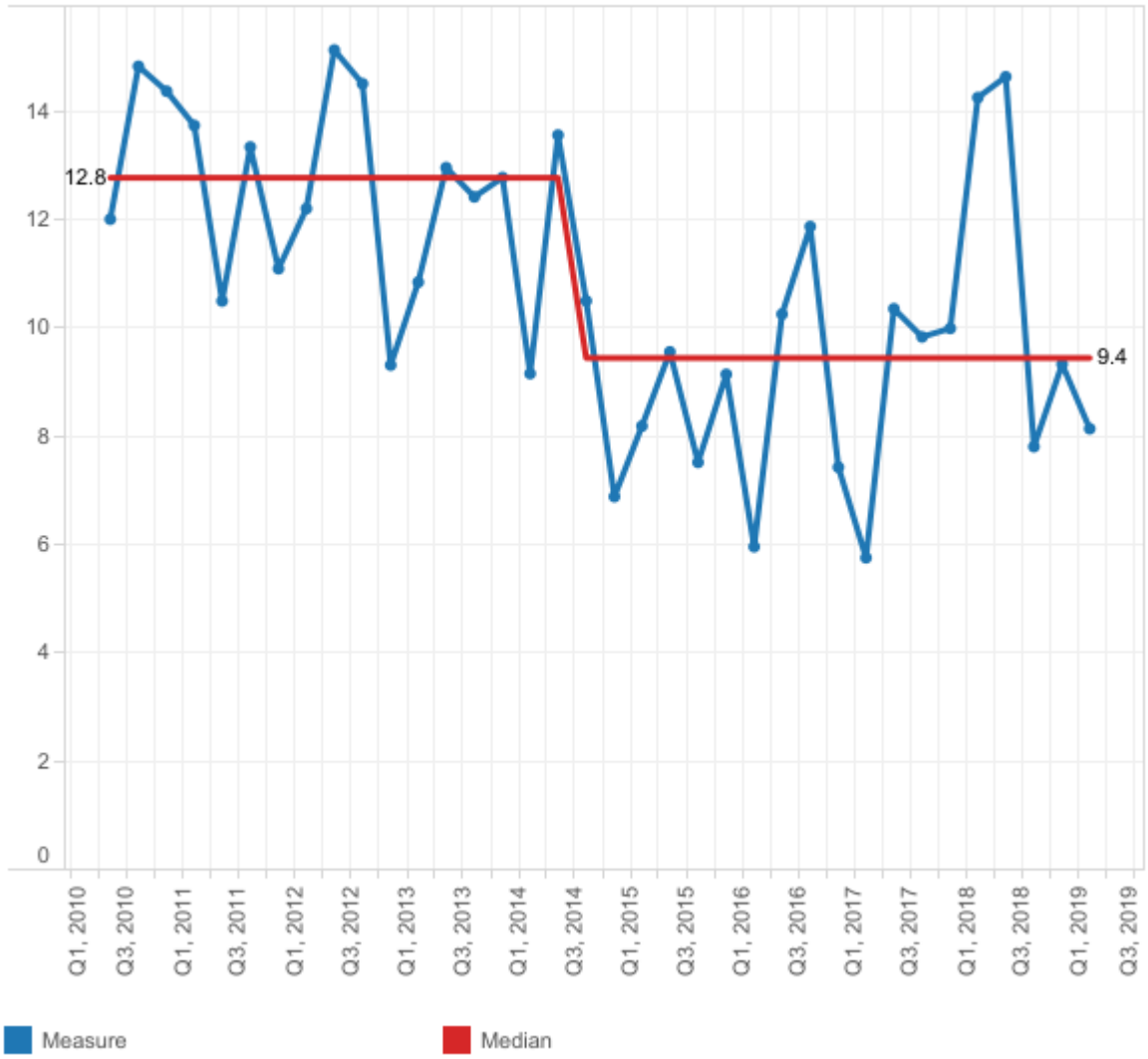
Outcome marker: In-hospital falls resulting in a fractured neck of femur per 100,000 admissions

There were 92 falls resulting in a fractured neck of femur (broken hip) in the 12 months ending June 2019.

To control the impact of changes in the number of admissions and to capture special causes of variation with a more robust time-series, the results will be reported quarterly instead of monthly. Figure 4 shows the quarterly rate of in-hospital falls causing a fractured neck of femur per 100,000 admissions.

The median of this measure was 12.8 in the baseline period of July 2010 to June 2012. It had moved down since September 2014, to 9.4 per 100,000 admissions, and shown a significant improvement. This reduction is supported by the observed improvement in the assessment and plan process markers results. There are some variations, especially in quarter 2, and quarter 3, 2018. Further analysis needs to understand the causes of these variations.

Figure 4: Outcome marker, in-hospital falls with fractured neck of femur per 100,000 admissions by quarter

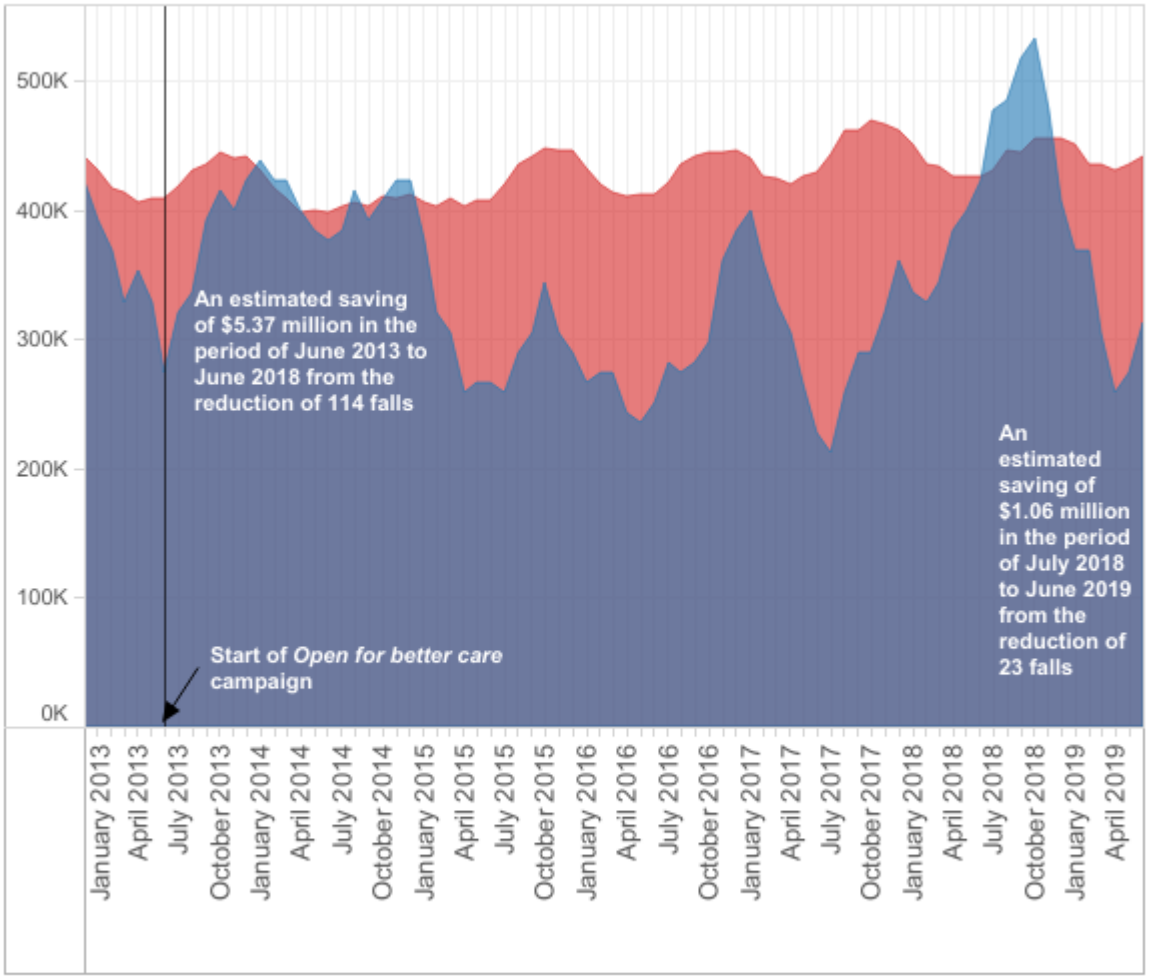


The number of 92 in-hospital falls resulting in a fractured neck of femur is significantly lower than the 115 we would have expected this year, given the falls rate observed in the period between July 2010 and June 2012. The in-hospital falls reduction is estimated to have saved $1.06 million from July 2018 up until June 2019. This is based on an estimate of $47,000[1] for a fall with a fractured neck of femur (Figure 5).

We know some of these patients are likely to be admitted to aged residential care on discharge from hospital, which is estimated to cost $135,000 per occurrence.[2]

If we conservatively estimate that 20 percent of the patients who avoided a fall-related fractured neck of femur would have been admitted to an aged residential care facility, the reduction in falls represents $1.46 million in total avoidable costs since July 2018.

Figure 5: Cost/saving associated with in-hospital falls with fractured neck of femur (6-month moving average)



The saving is based on an estimated cost of $47,000 for a fall with a fractured neck of femur.

Expected cost Observed cost

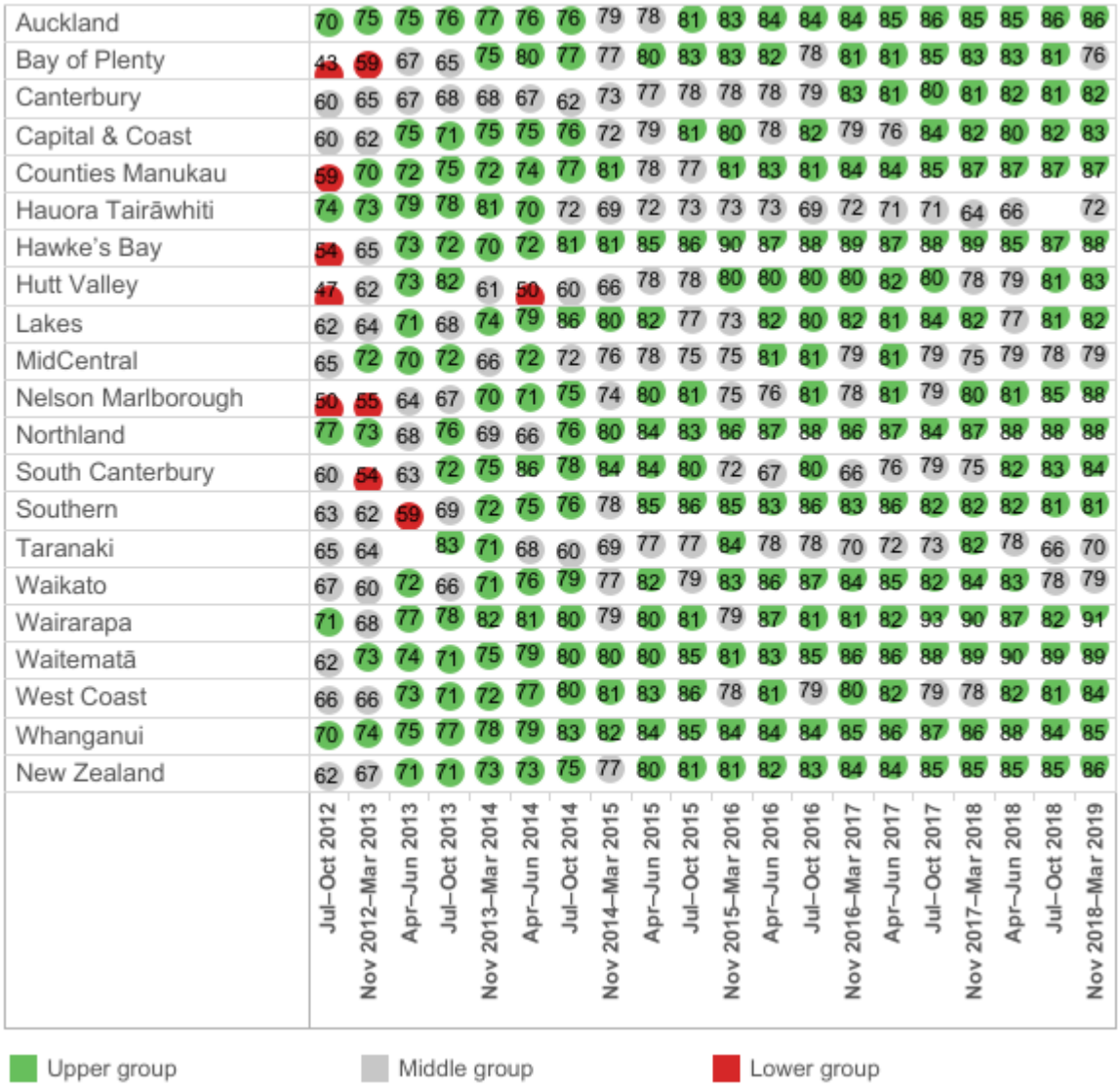
Hand hygiene

National compliance with the five moments for hand hygiene remains high.

Process marker 1: Percentage of opportunities for hand hygiene taken

National compliance with the five moments for hand hygiene remains high. Nationally, DHBs maintained an average of 85 percent compliance for the period April–June 2019 compared with 62 percent in the baseline in July–October 2012. Hauora Tairāwhiti and Taranaki DHBs have been consistently below the national target of 80 percent.

Figure 6: Process marker, percentage of opportunities for hand hygiene taken

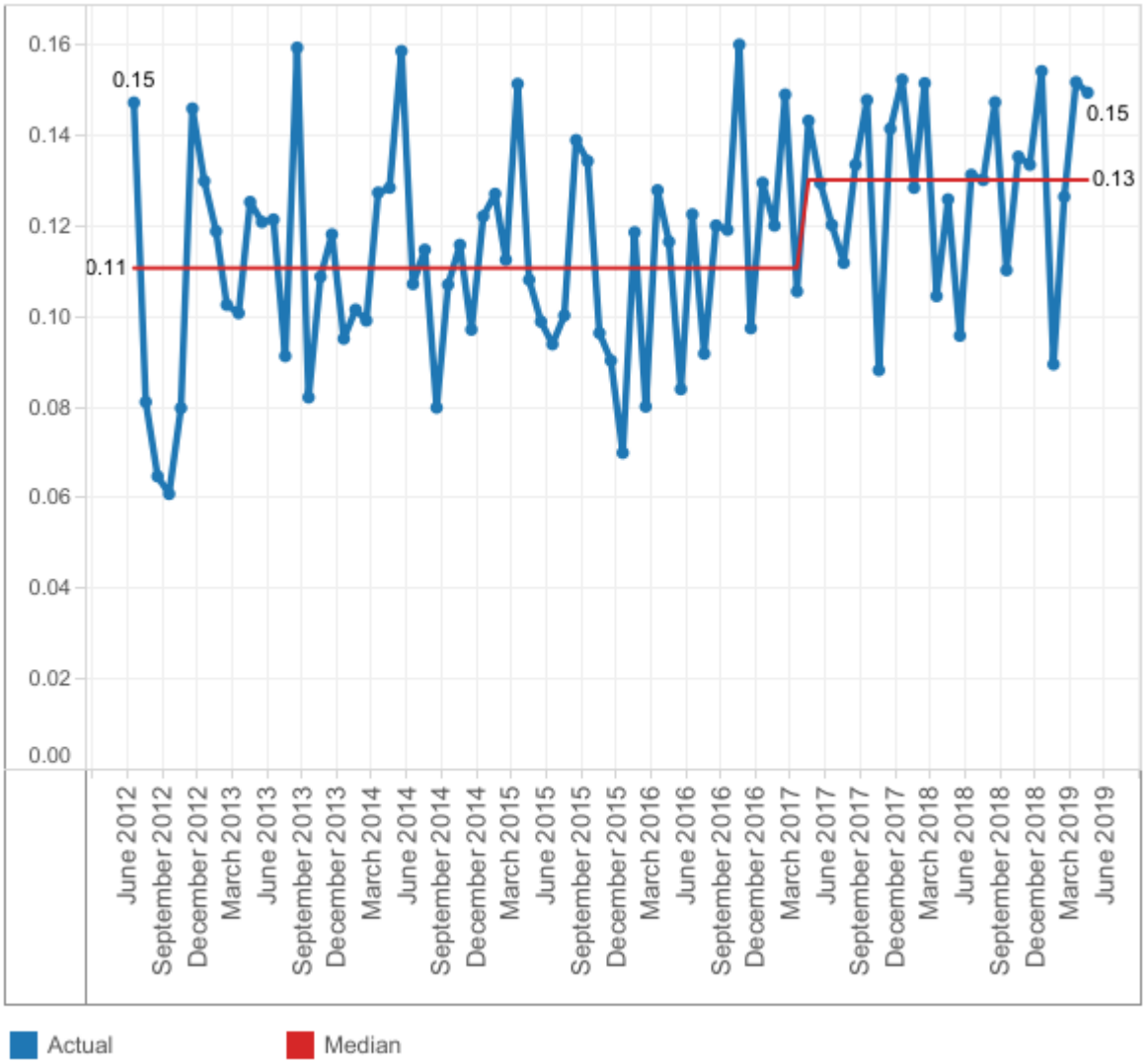


- Upper group: ≥ 70 percent before quarter 3, 2014, 75 percent in quarters 3 and 4, 2014, and 80 percent since quarter 1, 2015.
- Middle group: 60 percent to target.
- Lower group: < 60 percent.
- Hand hygiene national compliance data is reported three times every year, not quarterly.

Outcome marker: Healthcare associated *Staphylococcus aureus* bacteraemia (SAB) per 1,000 bed-days

Healthcare associated SAB can be associated with medical devices or surgical procedures which means the onset of symptoms may occur outside of the hospital (community onset). Figure 7 displays the monthly healthcare associated SAB per 1,000 bed-days. Data for the last month, June, is omitted, due to denominator completeness issues. From May 2017, the median has significantly increased from 0.11 to 0.13 per 1,000 bed-days. We are working with DHBs to better understand this shift and will monitor closely in the coming quarters.

Figure 7: Outcome marker, *Staphylococcus aureus* bacteraemia per 1,000 bed-days by month



Surgical site infection improvement (SSII) – orthopaedic surgery

As the Commission uses a 90-day outcome measure for surgical site infection (SSI), the data runs one quarter behind other measures. Information in this section relates to hip and knee arthroplasty procedures from quarter 3, 2013 to quarter 1, 2019.

Process marker 1: Antibiotic administered in the right time

For primary procedures, an antibiotic should be administered in the hour before the first incision ('knife to skin'). As this should happen in all primary cases, the threshold is set at 100 percent. In quarter 1, 2019, 98 percent of hip and knee arthroplasty procedures involved the giving of an antibiotic within 60 minutes before knife to skin. Six DHBs achieved the national goal. Counties Manukau, Northland and Waitematā DHBs have consistently been below the upper group since quarter 3, 2013.

Figure 8: Process marker, percentage of hip and knee arthroplasty primary procedures where antibiotic given 0–60 minutes before 'knife to skin'

-
- Upper group: 100 percent
- Middle group: 95–99 percent
- Lower group: < 95 percent

Process marker 2: Right antibiotic in the right dose – cefazolin 2 g or more or cefuroxime 1.5 g or more

In the current quarter, 97 percent of hip and knee arthroplasty procedures received the recommended antibiotic and dose. Seventeen of the 20 DHBs reached the threshold level of 95 percent compared with only three in the baseline quarter.[3] In quarter 1, 2019, West Coast DHB has moved to the lower group.

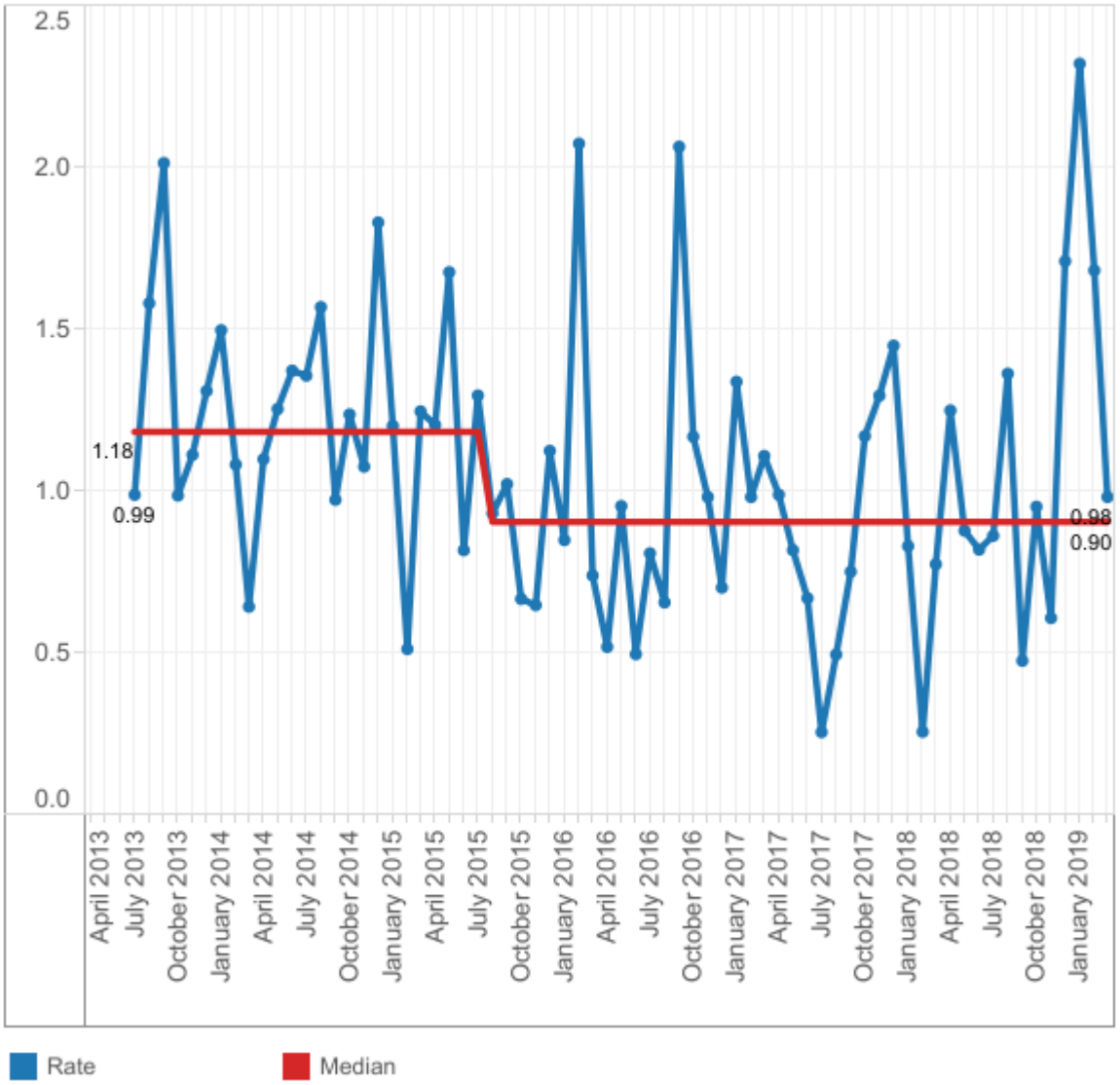
Figure 9: Process marker, percentage of hip and knee arthroplasty procedures where 2 g or more cefazolin or 1.5 g or more cefuroxime given

-
- Upper group: ≥ 95 percent
- Middle group: 90–94 percent
- Lower group: < 90 percent

Outcome marker: SSIs per 100 hip and knee operations

In quarter 1, 2019 (January up until March) there were 38 SSIs out of 2,442 hip and knee arthroplasty procedures, a quarterly SSI rate of 1.56 percent, which is higher than the current median of 0.9 percent since August 2015. There were four consecutive points above the median since December 2018 and a peak rate of 2.32 percent in January 2019. It could be an early indication of a significant upwards shift, but we will monitor closely in the coming quarters. Information on the month of April is not reported.

Figure 10: Outcome marker, surgical site infections per 100 hip and knee operations



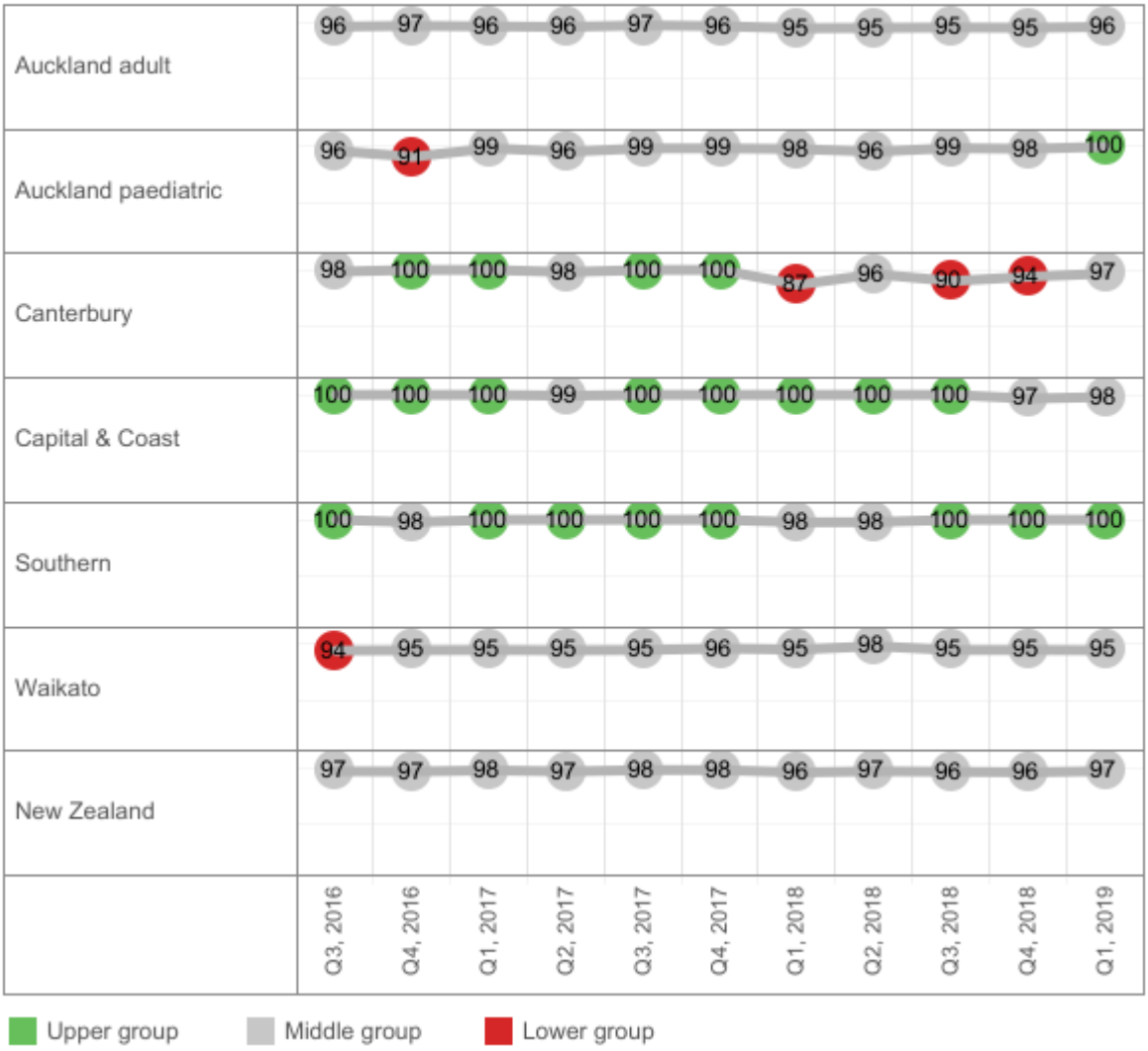
Surgical site infection improvement (SSII) – cardiac surgery

This is the tenth quality and safety marker (QSM) report for cardiac surgery. Since quarter 3, 2016 all five DHBs performing cardiac surgery have submitted process and outcome marker data from all cardiac surgery procedures, including coronary artery bypass graft with both chest and donor site, and with chest site only. There are three process markers and one outcome marker, which are similar to the markers for orthopaedic surgery.

Process marker 1: Timing – an antibiotic to be given 0–60 minutes before knife to skin

The target is for 100 percent of procedures to achieve this marker. Auckland DHB paediatric achieved the target this quarter and Southern DHB has continued to meet the target for three successive quarters.

Figure 11: Process marker, percentage of cardiac procedures where antimicrobial prophylaxis is administered as a single dose 0–60 minutes before knife to skin

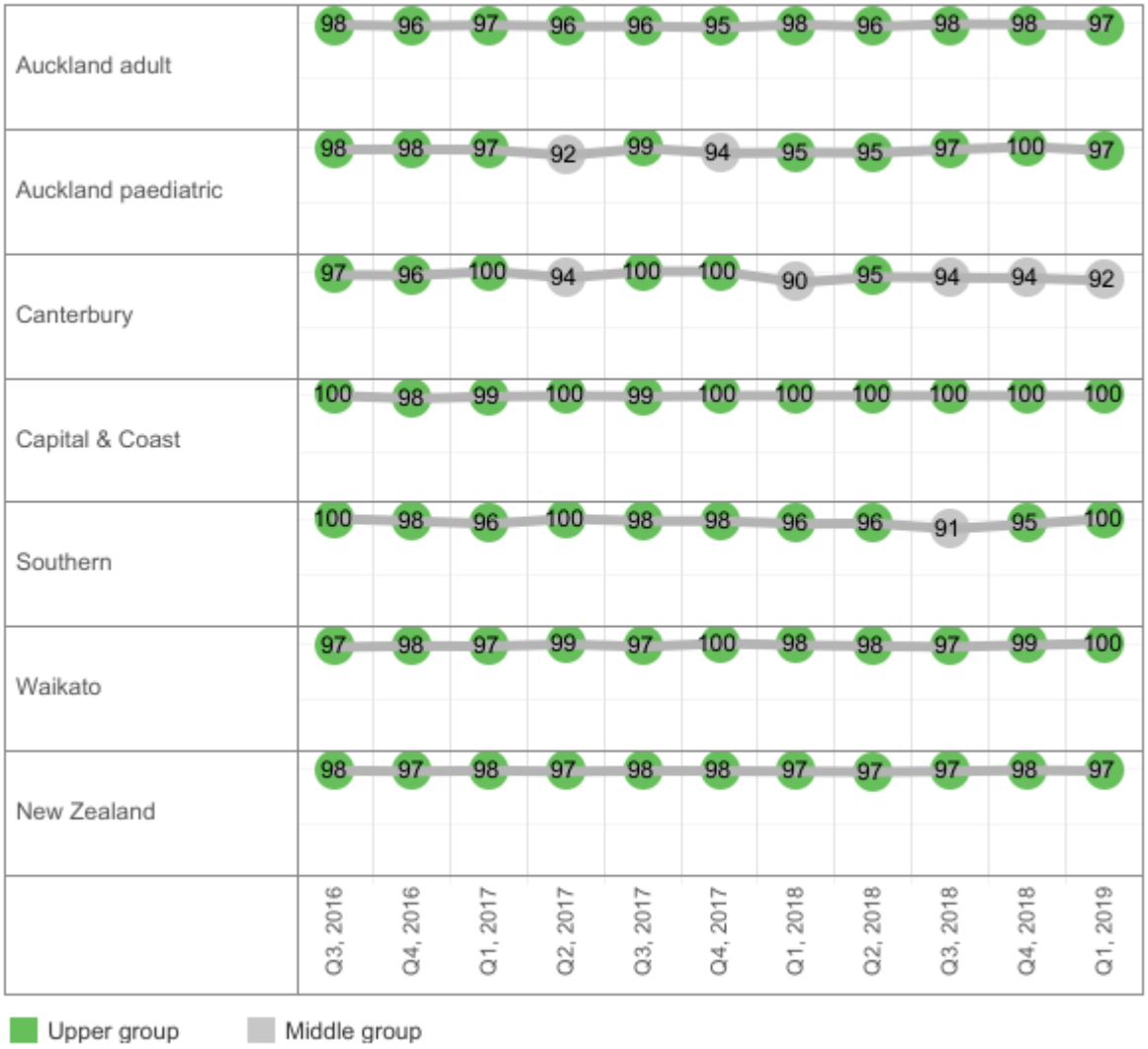


-
- Upper group: 100 percent
- Middle group: 95–99 percent
- Lower group: < 95 percent

Process marker 2: Dosing – correct antimicrobial prophylaxis used in at least 95 percent of procedures

The antibiotic prophylaxis of choice is ≥ 2 g or more of cefazolin for adults and ≥ 30 mg/kg of cefazolin for paediatric patients, not to exceed the adult dose. The target is that either dose is used in at least 95 percent of procedures. All DHBs performing cardiac surgery except Canterbury achieved the target this quarter.

Figure 12: Process marker, percentage of cardiac procedures where the first choice for antimicrobial prophylaxis is 2 g or more of cefazolin



-
- Upper group: > 95 percent
- Middle group: 90-95 percent
- Lower group: < 90 percent

Process marker 3: Skin preparation – appropriate skin antisepsis is always used

Appropriate skin antisepsis in surgery involves alcohol/chlorhexidine or alcohol/povidone iodine. The target is 100 percent of procedures achieving this marker. All DHBs except Southern achieved the target this quarter.

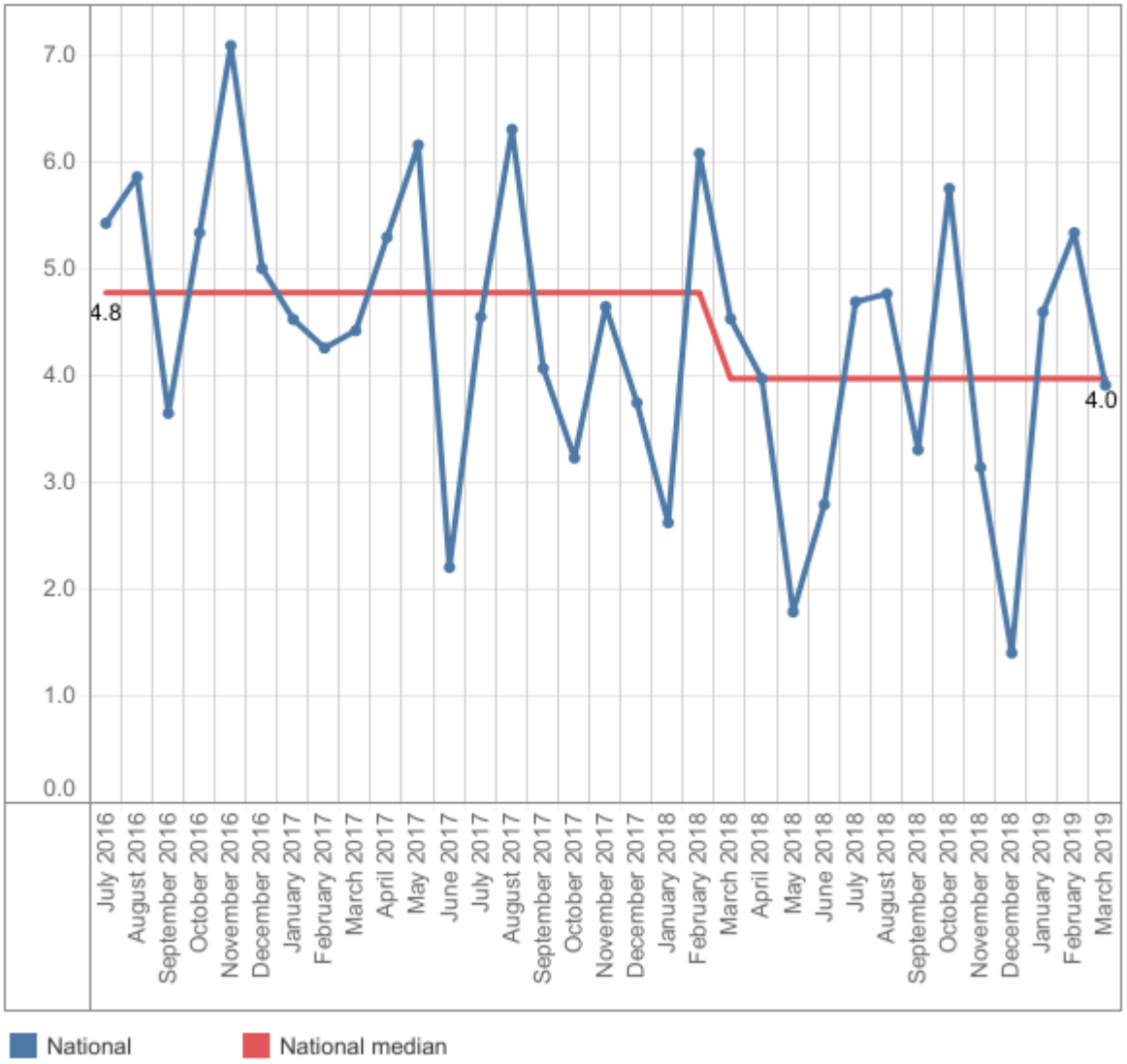
Figure 13: Process marker, percentage of cardiac procedures where alcohol-based skin antisepsis is always used

-
- Upper group: 100 percent
- Middle group: 95–99 percent
- Lower group: < 95 percent

Outcome marker: SSIs per 100 procedures rate

In March 2018 we see the median shift downwards from 4.8 SSI cases per 100 cardiac procedures to 4.0. This is a significant improvement since the beginning of the SSII Programme. Cardiac surgical services in DHBs are dedicated to ensuring high compliance with the process measures in addition to implementing other quality improvement activities such as an anti-staphylococcal bundle.

Figure 14: Outcome marker, surgical site infections per 100 cardiac operations



Safe surgery

This is the twelfth report for the safe surgery QSM, which measures levels of teamwork and communication around the paperless surgical safety checklist.

Direct observational audit was used to assess the use of the three surgical checklist parts: sign in, time out and sign out. A minimum of 50 observational audits per quarter per part is required before the observation is included in uptake and engagement assessments. Rates are greyed out in the tables below where there were fewer than 50 audits.

Figure 15 shows how many audits were undertaken for each part of the checklist. Fifteen out of the 20 DHBs achieved 50 audits for all three parts in quarter 2, 2019. Counties Manukau Health has a large auditor cohort, which explains its high numbers.

Figure 15: Observations – number of observational audits carried out (minimum of 50 per three months per checklist part)

	Sign in	Time out	Sign out
Auckland	86	91	61
Bay of Plenty	79	88	73
Canterbury	79	81	67
Capital & Coast	62	53	50
Counties Manukau	844	860	834
Hauora Tairāwhiti	48	45	25
Hawke's Bay	59	113	58
Hutt Valley	68	71	53
Lakes	63	61	58
MidCentral	52	54	53
Nelson Marlborough	52	56	60
Northland	74	73	53
South Canterbury	0	8	6
Southern	71	76	69
Taranaki	52	55	47
Waikato	8	4	3
Wairarapa	51	55	50
Waitematā	48	52	46
West Coast	50	51	51
Whanganui	62	68	51
New Zealand	1,908	2,015	1,768

Fewer than 50 observations Target achieved

Rates for uptake (all components of the checklist were reviewed by the surgical team) are only presented where at least 50 audits were undertaken for a checklist part. Uptake rates were calculated by measuring the number of audits of a part where all components of the checklist were reviewed against the total number of audits undertaken.

The components for each part of the checklist are shown in the poster on the right. Of the 15 DHBs that achieved 50 audits in each checklist, 11 achieved the 100 percent uptake target in at least one part of the checklist, during the current quarter (see Figure 16). Data is not presented where there were fewer than 50 audits.

Figure 16: Percentage of audits where all components of the checklist were reviewed (target 100 percent)

	Sign in						Time out						Sign out					
	Baseline	Rolling	Q3, 2018	Q4, 2018	Q1, 2019	Q2, 2019	Baseline	Rolling	Q3, 2018	Q4, 2018	Q1, 2019	Q2, 2019	Baseline	Rolling	Q3, 2018	Q4, 2018	Q1, 2019	Q2, 2019
Auckland	98	99		98	97	100	93	98		98	94	100	98	97		98	94	98
Bay of Plenty	97	100	100	100	100	100	96	99	100	99	99	100		99	100	100	97	100
Canterbury	91	99	100	98	100	99	92	99	100	98	99	100	96	100	100	98	100	100
Capital & Coast	96	100	100	100	100	100	97	100	100	100	100	100	97	100	98	100	100	100
Counties Manukau	99	100	100	100	100	100	100	100	100	100	100	100	99	99	100	100	99	97
Hauora Tairāwhiti	100	100	98	100	100		99	99	96	100	100				98	100		
Hawke's Bay		94	95	95	98	90	78	78	75	76	78	83		87	84	84	88	95
Hutt Valley						93						96						98
Lakes						100						100						100
MidCentral	96	98	96	98	98	98	92	90	94	80	96	93	97		100	100		100
Nelson Marlborough	88					100	93					98	91					97
Northland		96	100	96	95	95	91	94	97	96	97	88		98	98	100	96	96
South Canterbury								83	75	83	100			83	78	80	100	
Southern		96	96		95	100	98	97	100	98	92	99			98		100	100
Taranaki				79	75	44		70		58	73	73				96		
Waikato	81						67											
Wairarapa	97		89		90	80	98	97	95	100	99	95		98	94		100	98
Waitematā	96	100	100	100	98		96	99	98	98	100	100	94		98	100	98	
West Coast		100	100	100	100	100		100	100	100	100	100		100	100	100	100	100
Whanganui		90	85	85	92	98		96	96	94	96	99		98	98	96	99	100
New Zealand	93	97	96	98	98	97	93	96	94	95	97	97	94	98	96	98	99	98

For more information about rounding and colouring, see the note.
Baseline = the average of the first 4 quarters of the programme from Q3, 2016 to Q2, 2017.
Rolling = the average of the latest 4 quarters: Q3, 2018 to Q2, 2019.

Target achieved
Between 75% and the target
Less than 75%
Fewer than 50 observations

The levels of team engagement with each part of the checklist were scored using a seven-point Likert scale developed by the World Health Organization. A score of 1 represents poor engagement from the team and 7 means team engagement was excellent. The target is that 95 percent of surgical procedures score engagement levels of 5 or above. As Figure 17 shows, for the latest quarter Bay of Plenty, Hawke's Bay, MidCentral, Northland, Southern, Wairarapa and Whanganui DHBs achieved the target in all three parts. Eight other DHBs achieved the target in one or two parts – a decrease from twelve DHBs last quarter. Data are not presented where there were fewer than 50 audits.

Figure 17: Percentage of audits with engagement scores of 5 or higher (target 95 percent)

	Sign in engage						Time out engage						Sign out engage					
	Baseline	Rolling	Q3, 2018	Q4, 2018	Q1, 2019	Q2, 2019	Baseline	Rolling	Q3, 2018	Q4, 2018	Q1, 2019	Q2, 2019	Baseline	Rolling	Q3, 2018	Q4, 2018	Q1, 2019	Q2, 2019
Auckland	97	95		92	94	99	94	92		89	93	92	93	93		91	93	95
Bay of Plenty	88	100	100	100	99	100	87	99	98	99	100	100		100	100	99	100	100
Canterbury	88	100	100	100	100	99	76	98	99	98	97	96	65	92	96	93	91	88
Capital & Coast	86	90	87	87	96	92	91	91	76	96	96	96	94	85	88	90	86	76
Counties Manukau	99	98	97	96	99	99	99	100	100	99	100	100	94	94	94	93	94	94
Hauora Tairāwhiti	85	87	81	90	90		89	85	76	87	91				82	94		
Hawke's Bay		96	97	96	95	98	81	90	79	94	91	96		95	93	94	94	98
Hutt Valley						97						93						96
Lakes						71						77						67
MidCentral	95	99	100	98	96	100	87	99	100	96	100	98	85		100	100		98
Nelson Marlborough	57					100	87					98	66					74
Northland		99	100	98	100	99	79	96	93	98	98	95		93	88	94	92	98
South Canterbury								74	70	55	97			60	58	41	83	
Southern		98	98		95	99	93	100	100	100	100	100			100		94	100
Taranaki				93	97	91		81		84	89	83				92		
Waikato	97						92											
Wairarapa	96		92		96	100	99	100	98	100	100	100		99	98		100	100
Waitematā	83	93	96	88	89		86	97	94	94	100	98	91		100	92	98	
West Coast		96	98	100	96	90		99	100	100	100	96		92	100	96	90	78
Whanganui		97	93	96	99	100		90	87	84	92	99		91	84	89	95	98
New Zealand	90	96	96	96	97	97	89	96	93	95	97	97	84	92	91	91	93	93

For more information about rounding and colouring, see the note.
Baseline = the average of the first 4 quarters of the programme from Q3, 2016 to Q2, 2017.
Rolling = the average of the latest 4 quarters: Q3, 2018 to Q2, 2019.

Target achieved
Between 75% and the target
Less than 75%
Fewer than 50 observations

The safe surgery quality and safety domain now includes a start-of-list briefing measure to reinforce the importance of the briefing as a safe surgery intervention. The measure is described as 'Was a briefing including all three clinical teams done at the start of the list?'

Figure 18 shows, in quarter 2, 2019, 12 DHBs reported that a start-of-list briefing was happening. There is no specific target for this part of the measure; the aim is to have all 20 DHBs increasingly undertaking and reporting briefings over time. The programme team continues to work with the auditing teams to increase data submission rates so the report better matches practice in DHBs.

Figure 18: Briefings – the number of times a briefing, including all three clinical teams, was done at the start of the list

	2017		2018				2019	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Auckland			4	1	3	8	2	1
Bay of Plenty	20	11	15	11	16	17	7	13
Canterbury	1							
Capital & Coast		6	3					
Counties Manukau	311	462	496	531	761	875	790	873
Haoura Tairāwhiti								
Hawke's Bay	7							
Hutt Valley	14						5	4
Lakes	12	11	22	15	8	5	7	20
MidCentral	2	2			2	2	1	1
Nelson Marlborough			6					
Northland	18	6	5	7	12	26	18	20
South Canterbury			2				5	2
Southern	13	5			11	5	6	3
Taranaki	3							
Waikato	1		7	2				
Wairarapa		3		2	9	6	26	32
Waitematā		10	36	23	13	13	27	21
West Coast	12	9	12	14	9	13	6	
Whanganui					5	5	6	12

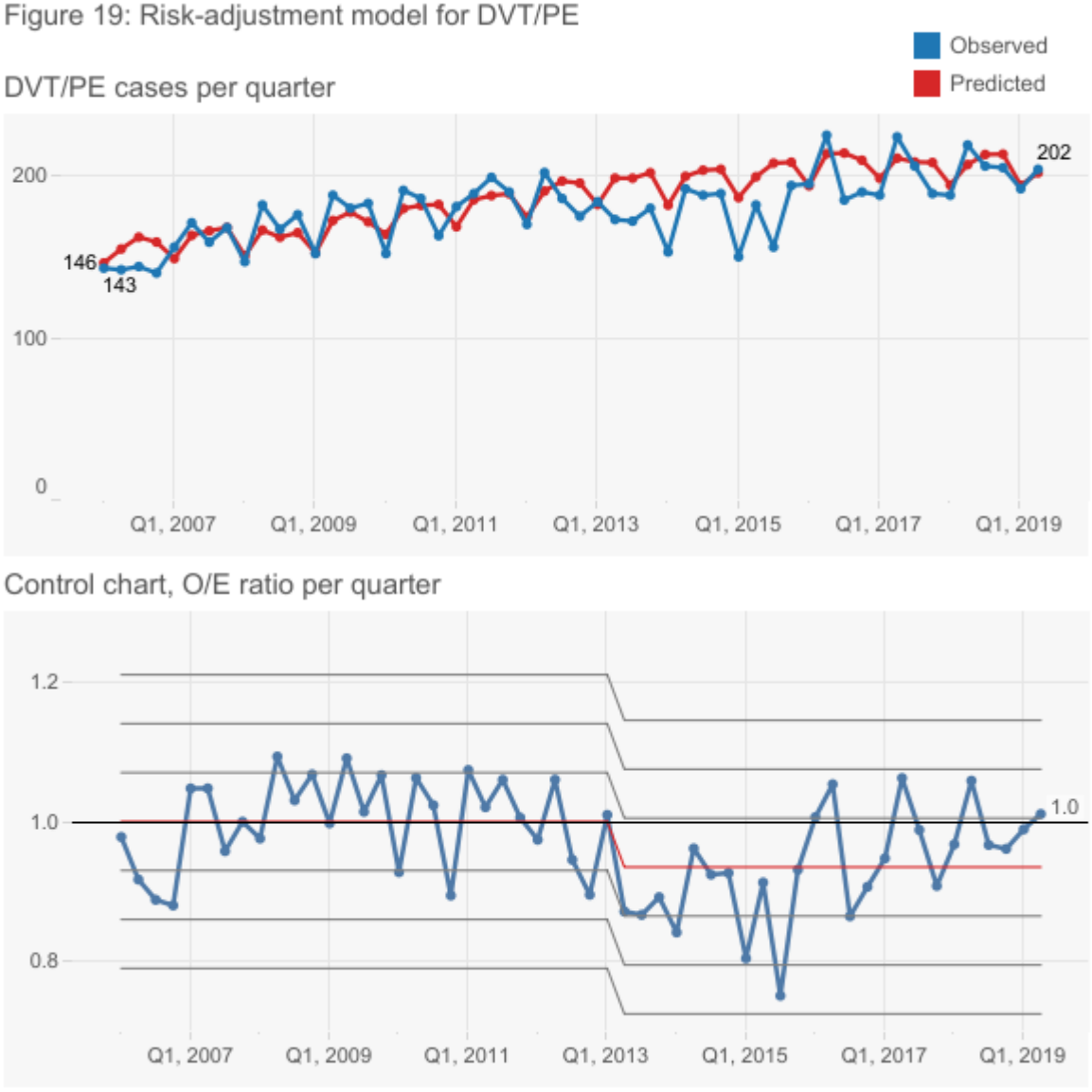
The rates of postoperative sepsis and deep vein thrombosis/pulmonary embolism (DVT/PE) are the two outcome markers for safe surgery. The rates have fluctuated over time. To understand the factors driving the changes and to provide risk-adjusted outcomes in the monitoring and improvement of surgical QSMs, we have developed a risk-adjustment model for these two outcome markers.

The model identifies how likely patients being operated on were to develop sepsis or DVT/PE based on factors such as their condition, health history and the operation being undertaken. From this, we calculated how many patients would be predicted to develop sepsis or DVT/PE based on historic trends. We then compare how many patients actually developed sepsis or DVT/PE to create an observed/expected (O/E) ratio. If the O/E ratio is more than 1 then there are more sepsis or DVT/PE cases than expected, even when patient risk is taken into account. A ratio of less than 1 indicates fewer sepsis or DVT/PE cases than expected.

Figure 19 shows the DVT/PE risk-adjustment model results in two charts. The O/E ratio control chart shows there were 11 consecutive quarters in which the observed numbers

were below the expected numbers since quarter 2, 2013. This indicates a statistically significant downwards shift, taking into account the increasing number of high-risk patients treated by hospitals and more complex procedures undertaken by hospitals. Over the past three years, a higher number of cases of DVT/PE have been observed in the second quarter. In the most recent six quarters, the O/E ratio is higher than the median value of 0.93. We will closely monitor this in future quarters to see if there is enough evidence of a shift up.

Figure 19: Risk-adjustment model for DVT/PE



Medication safety – electronic medicine reconciliation

This quality and safety domain focuses on medicine reconciliation where the process is supported with electronic data capture. Medicine reconciliation is a process by which health professionals accurately document all medicines a patient is taking and their adverse reactions history (including allergy). The information is then used during the patient's transitions in care. An accurate medicines list can be reviewed to check the medicines are appropriate and safe. Medicines that should be continued, stopped or temporarily stopped can be documented on the list. Reconciliation reduces the risk of medicines being:

- omitted
- prescribed at the wrong dose
- prescribed to a patient who is allergic
- prescribed when they have the potential to interact with other prescribed medicines.

The introduction of electronic medicine reconciliation (eMedRec) allows reconciliation to be done more routinely, including at discharge. There is a national programme to roll out eMedRec throughout the country. Figures 20 and 21 show there are six DHBs that have implemented the system to date. Further uptake of eMedRec is limited until the IT infrastructure is improved in each DHB hospital.

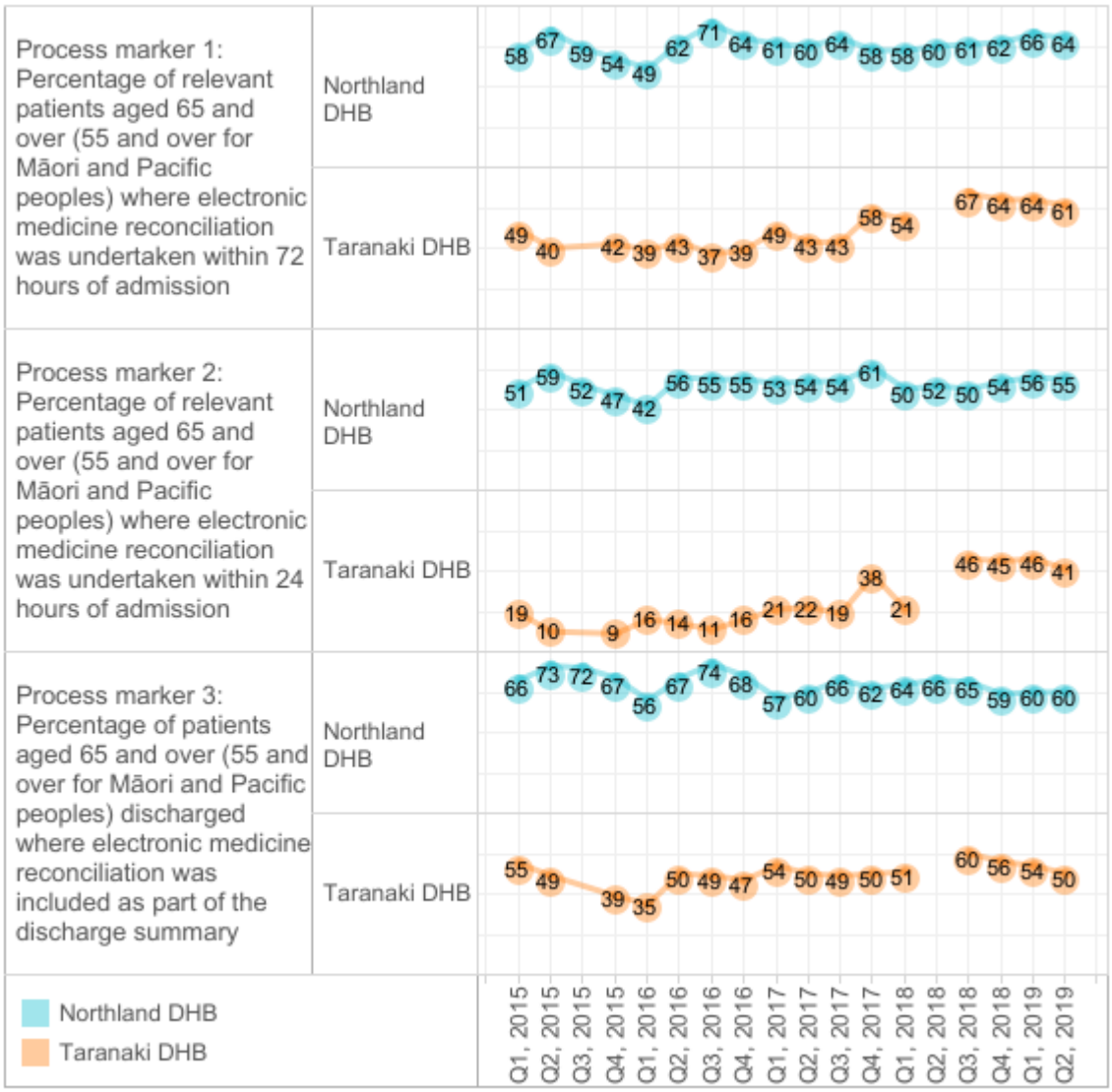
Figure 20: Structure marker, implementation of eMedRec

DHB	Status
Auckland	Implemented
Canterbury	Implemented
Counties Manukau Health	Implemented
Northland	Implemented
Taranaki	Implemented
Waitematā	Implemented
Bay of Plenty	Not implemented
Capital & Coast	Not implemented
Hauora Tairāwhiti	Not implemented
Hawke's Bay	Not implemented
Hutt Valley	Not implemented
Lakes	Not implemented
MidCentral	Not implemented
Nelson Marlborough	Not implemented
South Canterbury	Not implemented
Southern	Not implemented
Waikato	Not implemented
Wairarapa	Not implemented
West Coast	Not implemented
Whanganui	Not implemented

Figure 21: Structure markers, eMedRec implementation

Structure marker	Auckland DHB	Canterbury DHB	Counties Manukau Health	Northland DHB	Taranaki DHB	Waitematā DHB
Structure 1: eMedRec implemented anywhere in the DHB (yes/no)	Yes	Yes	Yes	Yes	Yes	Yes
Structure 2: Number and percentage of relevant wards with eMedRec implemented	32	60	29	6	7	33
	100%	100%	97%	61%	58%	87%

Within the six DHBs that have implemented eMedRec, only Northland and Taranaki DHB hospitals are reporting their process markers. Figure 22 shows the process marker change over time for these two DHBs. Further work is being undertaken on refining and agreeing the eMedRec marker definitions. Once this has been achieved the other DHB hospitals using eMedRec will report their process markers.



Patient deterioration

This is the fifth quarter that structural, process and outcome measures for the patient deterioration QSMs have been reported.

DHBs were asked to provide both process and outcome measure data by ethnicity where possible. Despite an increase in ethnicity data submitted from the previous quarter, we have not included this in the national report because the majority of DHBs were still unable to submit. We acknowledge that, for some DHBs, it will take more time to start collecting and submitting ethnicity-level data.

Structural measure: Eligible wards using the New Zealand early warning score

The structural measure demonstrates the progress DHBs have made towards implementing improvements to their recognition and response systems and aligning with the New Zealand early warning score (NZEWS).

The majority of DHBs (90 percent, n=18) have now implemented or are in the process of implementing the NZEWS in their hospitals. We have also seen an increase in the use of the

tool across all eligible wards from the last quarter (now at 98 percent). Note: the structure measure of national level is calculated based only on those DHBs that have implemented the NZEWS.

Figure 23: Percentage of eligible wards using the New Zealand early warning score

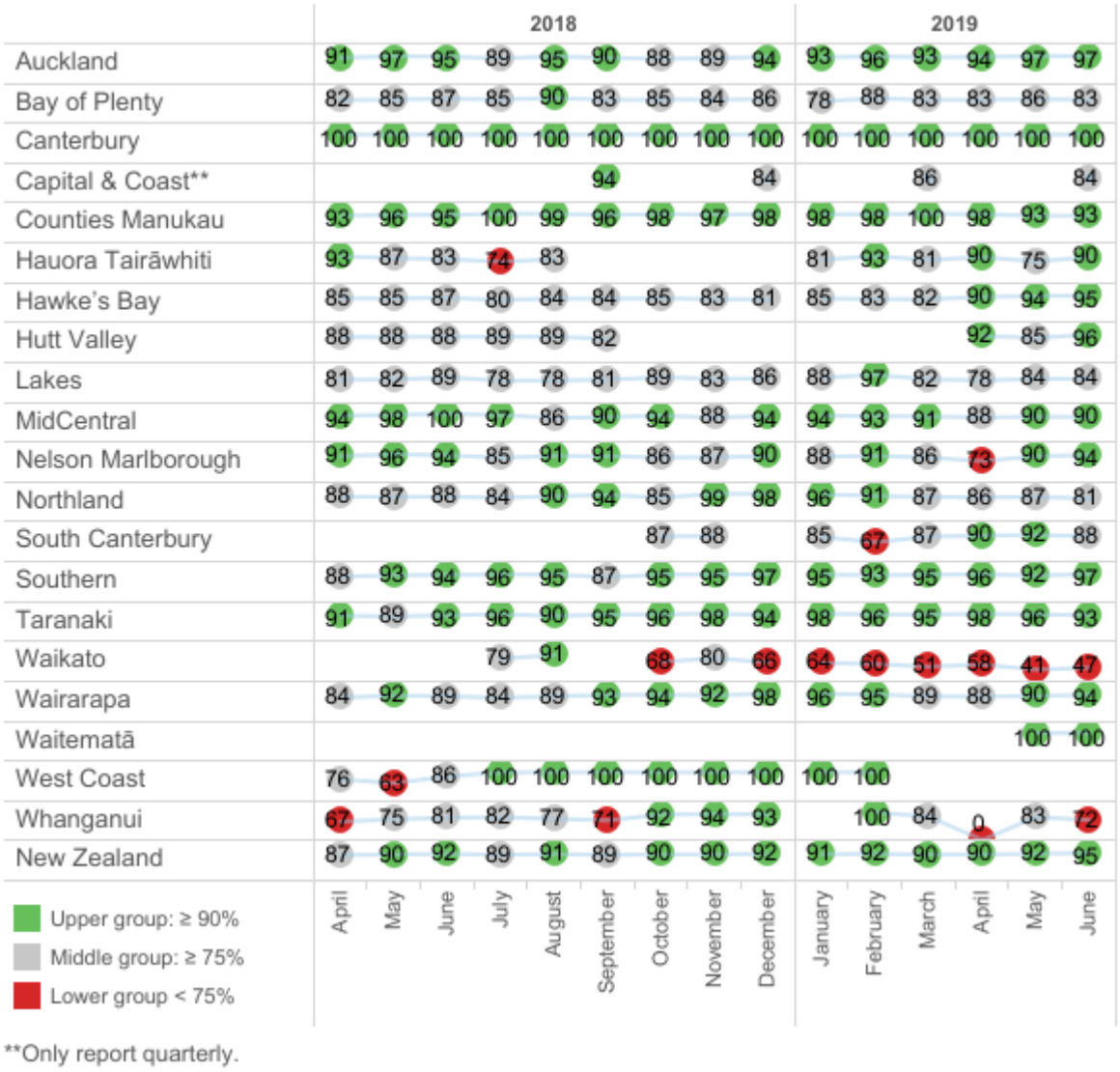
	2018				2019	
	Q1	Q2	Q3	Q4	Q1	Q2
Auckland		100	100	100	100	100
Bay of Plenty	100	100	100	100	100	100
Canterbury	100	100	100	100	100	100
Capital & Coast	100		100	88	100	100
Counties Manukau	100	100	100	100	100	100
Hauora Tairāwhiti	100	100	100		100	100
Hawke's Bay	0	83	83	83	83	100
Hutt Valley	100	100	100		100	100
Lakes	83	83	100	100	100	100
MidCentral	100	100	100	100	100	100
Nelson Marlborough	90	90	89	89	89	89
Northland	45	80	70	70	70	100
South Canterbury	0	0	0	50	100	75
Southern		0	0	0	0	71
Taranaki	100	100	100	100	100	100
Waikato	100		100	100	100	100
Wairarapa	100	100	100	100	100	100
Waitematā	0	0	0	0	0	100
West Coast	0	100	100	100	100	100
Whanganui	100	100	100	100	100	100
New Zealand	96	97	98	96	98	98

Process measure 1: Correct calculation of early warning score

The first process measure (Figure 24) shows the percentage of audited patients with an early warning score calculated correctly for the most recent set of vital signs. This measure demonstrates how the recognition part of the system is working through the correct use of the NZEWS. We've introduced a threshold to indicate relative groupings for this quarter. Results for this measure show a national figure of 94 percent for this quarter.

Eighteen DHBs (90 percent) submitted data for this measure. Those using an electronic vital signs system in all their eligible wards will be able to achieve 100 percent consistently for this measure. While Southern DHB is yet to implement the NZEWS, they have reported data using their existing EWS.

Figure 24: Percentage of early warning score calculated correctly



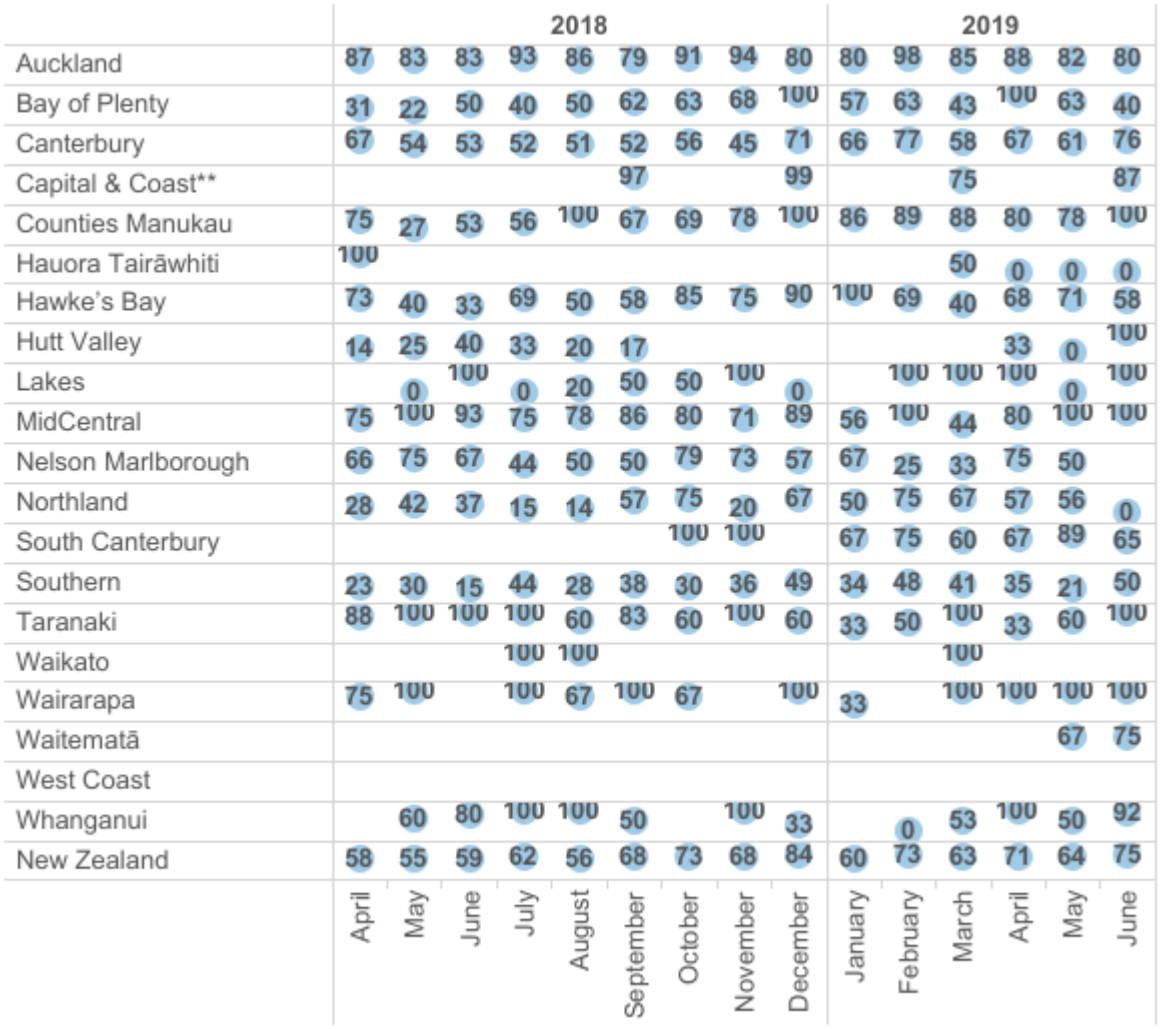
**Only report quarterly.

Process measure 2: Appropriate response to escalations

The second process measure (Figure 25) shows the percentage of audited patients that triggered an escalation of care and received the appropriate response to that escalation as per the DHB's agreed escalation pathway. This measure demonstrates how the response part of the system is working through the appropriate response to care that has been escalated.

The national figure for this measure was 75 percent, an increase from the previous quarter of 64 percent. There was considerably more variation between DHBs than for the first process measure, highlighting an opportunity for improvement. The Commission is currently working with DHBs to understand this variation in particular regarding the consistency of data collected, the sample size and timeframes regarding the escalation pathway. A total of 17 DHBs (85 percent) submitted data for this measure.

Figure 25: Percentage of patients that triggered an escalation of care and received the appropriate response



**Only report quarterly.

Outcome measure 1: Rate of in-hospital cardiopulmonary arrests (preliminary results)

The following outcome measures will be used over time to determine whether the improvements to hospitals' recognition and response systems have improved patient outcomes. Both measures are shown in a rate per 1,000 admissions. It is important to note that the preliminary admissions data used to calculate the rate is taken from the National Minimum Dataset (NMDS) at a DHB level and may differ from rates generated from administrative systems locally.

The results (Figure 26) show a national rate of 1.5 cardiopulmonary arrests per 1,000 admissions for this quarter. Fifteen DHBs provided data for this measure. Canterbury DHB is not displayed this quarter because it is currently developing systems to capture cardiac arrest data.

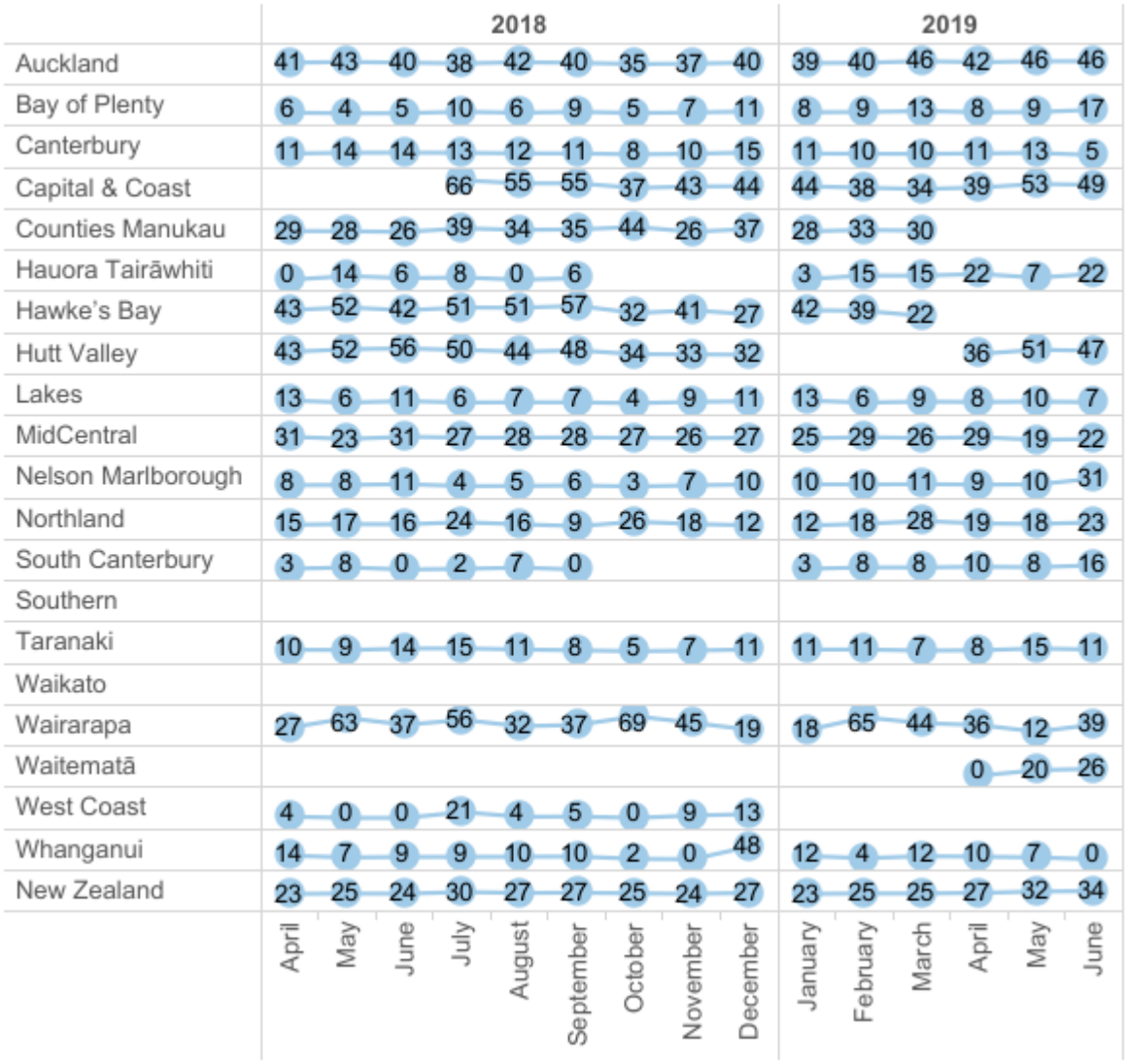
Figure 26: Rate of in-hospital cardiopulmonary arrests in adult inpatient wards, units or departments per 1,000 admissions

Outcome measure 2: Rate of rapid response escalations (preliminary results)

The second outcome measure (Figure 27) shows the rate of rapid response escalations per 1,000 admissions (excluding those mentioned previously). Consistent with the previous quarter, the results showed a national rate of 32 events per 1,000 admissions. Fifteen DHBs (75 percent) provided data for this measure.

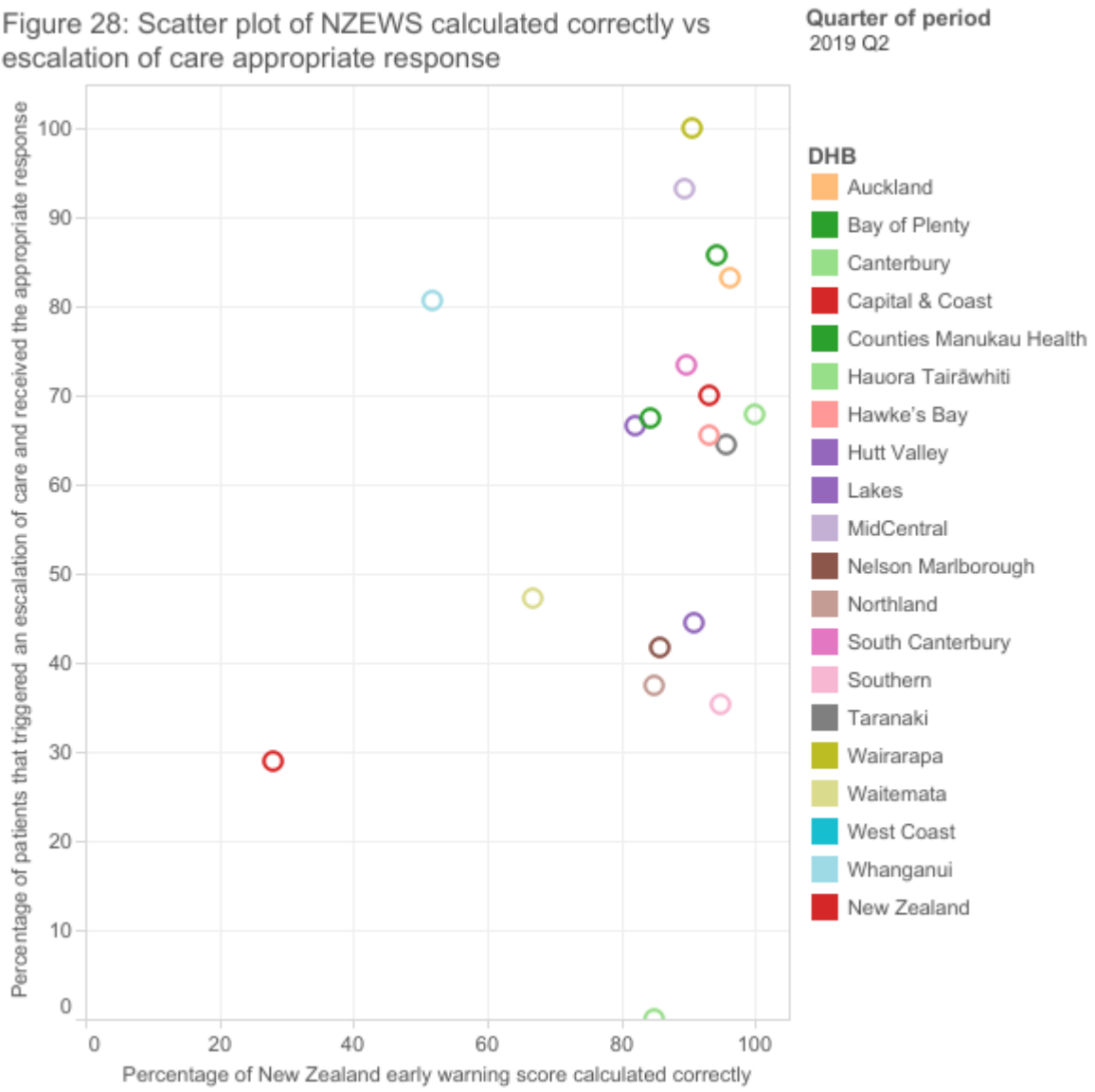
International research has shown that an effective recognition and response system will result in an inverse relationship between outcome measures 1 and 2 (ie, a higher rate of rapid response escalations with a lower rate of in-hospital cardiopulmonary arrests). Another outcome measure used internationally is unplanned admissions to intensive care units. See the patient deterioration domain of the Atlas of Healthcare Variation for these data.

Figure 27: Rate of rapid response escalations per 1,000 admissions



To further investigate the relationship between process measures 1 and 2 we have developed a scatterplot. The aim over time, is to have all DHBs locate in the top right corner which reveals a high rate of NZEWS scoring accuracy and appropriate response. It shows all DHBs that supplied data had a high rate of early warning score calculated correctly but there is more variation across all DHBs in the reported rates of appropriate response.

Figure 28: Scatter plot of NZEWS calculated correctly vs escalation of care appropriate response



Pressure injury

We aim to reduce the occurrence of and harm from pressure injuries. Pressure injuries (also known as pressure ulcers, decubitus ulcers, pressure areas and bed sores) are a cause of preventable harm for people using health care services, including hospital, aged residential care and home or community care.

Pressure injuries are often avoidable, have significant negative impact on patient's lives, whānau, and those providing their care, increase hospital length of stay and are associated with extra resource consumption.

Following implementation of the pressure injury QSM in July 2018 the majority of DHBs (95 percent, n=19) are now submitting data. This is the second quarter that process and outcome measures have been reported publicly. Following a review of data this quarter we are planning to engage with DHBs to better understand local data collection processes.

Process measure 1: percentage of patients with a documented and current pressure injury risk assessment

The first process measure (Figure 29) shows the percentage of patients with a documented and current pressure injury risk assessment. This measure is used to monitor how well DHBs are conducting pressure injury risk assessments and recognising at-risk patients. This includes those at risk of developing a pressure injury and those with an existing pressure injury.

Results for this measure revealed a national figure of 83 percent, an increase from 81 percent during last quarter.

A total of 19 DHBs (95 percent) submitted data for this measure.

Figure 29: Percentage of patients with a documented and current pressure injury assessment

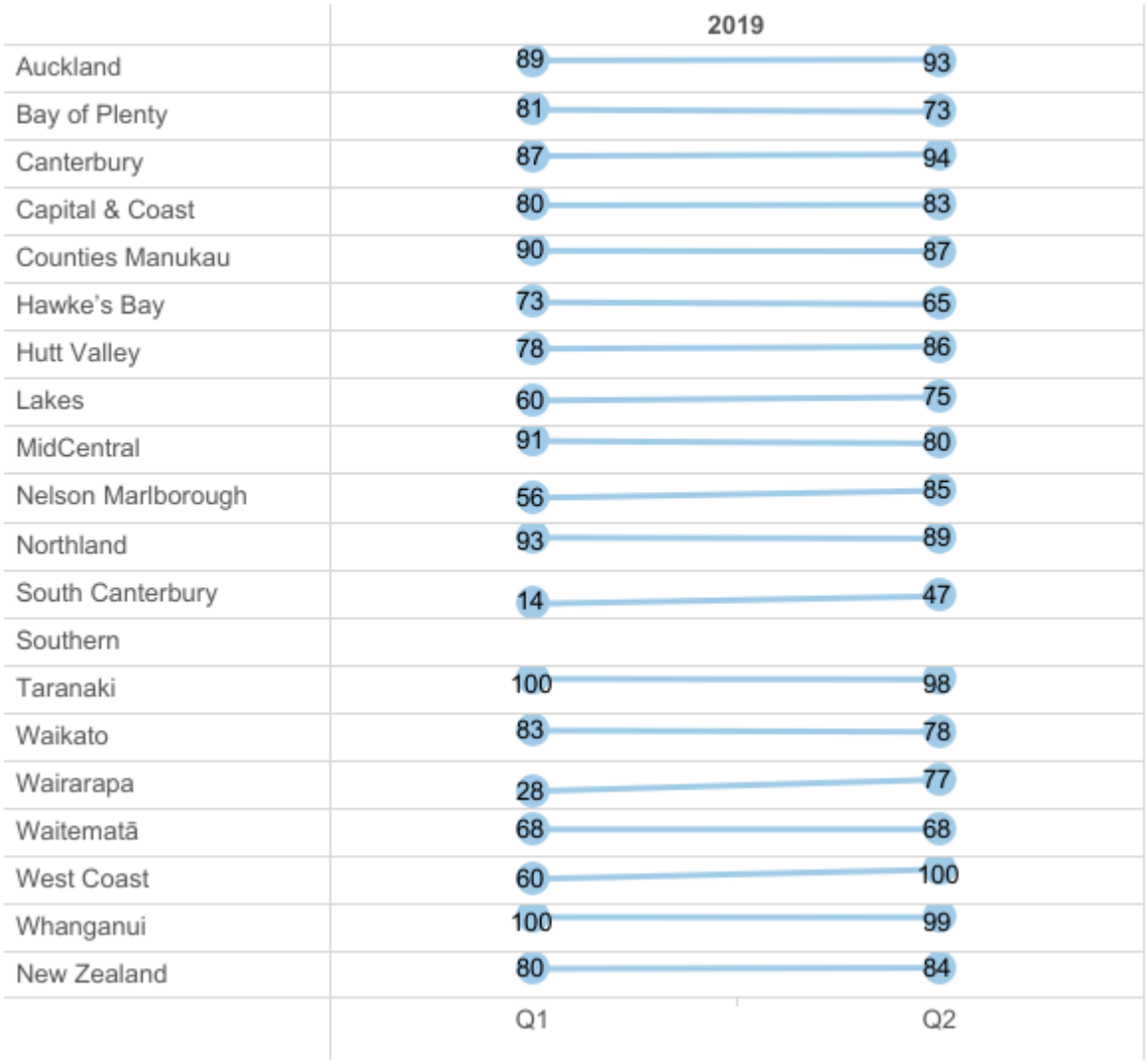
Process measure 2: Percentage of at-risk patients with a documented and current individualised care plan

The second process measure (Figure 30) shows the percentage of at-risk patients with a documented and current individualised care plan designed to address any risk (prevention) or manage any existing pressure injuries. This measure is used to monitor how well DHBs are putting in actions to prevent or manage pressure injuries for at-risk patients.

The national figure for this measure was a rate of 84 percent, an increase from 80 percent during last quarter.

A total of 18 DHBs (90 percent) submitted data for this measure.

Figure 30: Percentage of patients with a documented and current individualised care plan



Outcome measure 1: Percentage of patients with hospital-acquired pressure injury

The following outcome measures will be used over time to determine whether the improvements to prevention and management of pressure injuries have improved patient outcomes.

The first outcome measure (Figure 31) shows the percentage of patients with hospital acquired pressure injuries (ie, pressure injuries that formed while the patient was in hospital).

The national figure for this measure was a rate of 4.1 percent, an increase from 3.5 percent during last quarter. There is also considerable variation between DHBs highlighting an opportunity for improvement. We are working with DHBs to improve consistency of data collection.

A total of 18 DHBs (90 percent) submitted data for this measure.

Figure 31: Percentage of patients with a hospital-acquired pressure injury

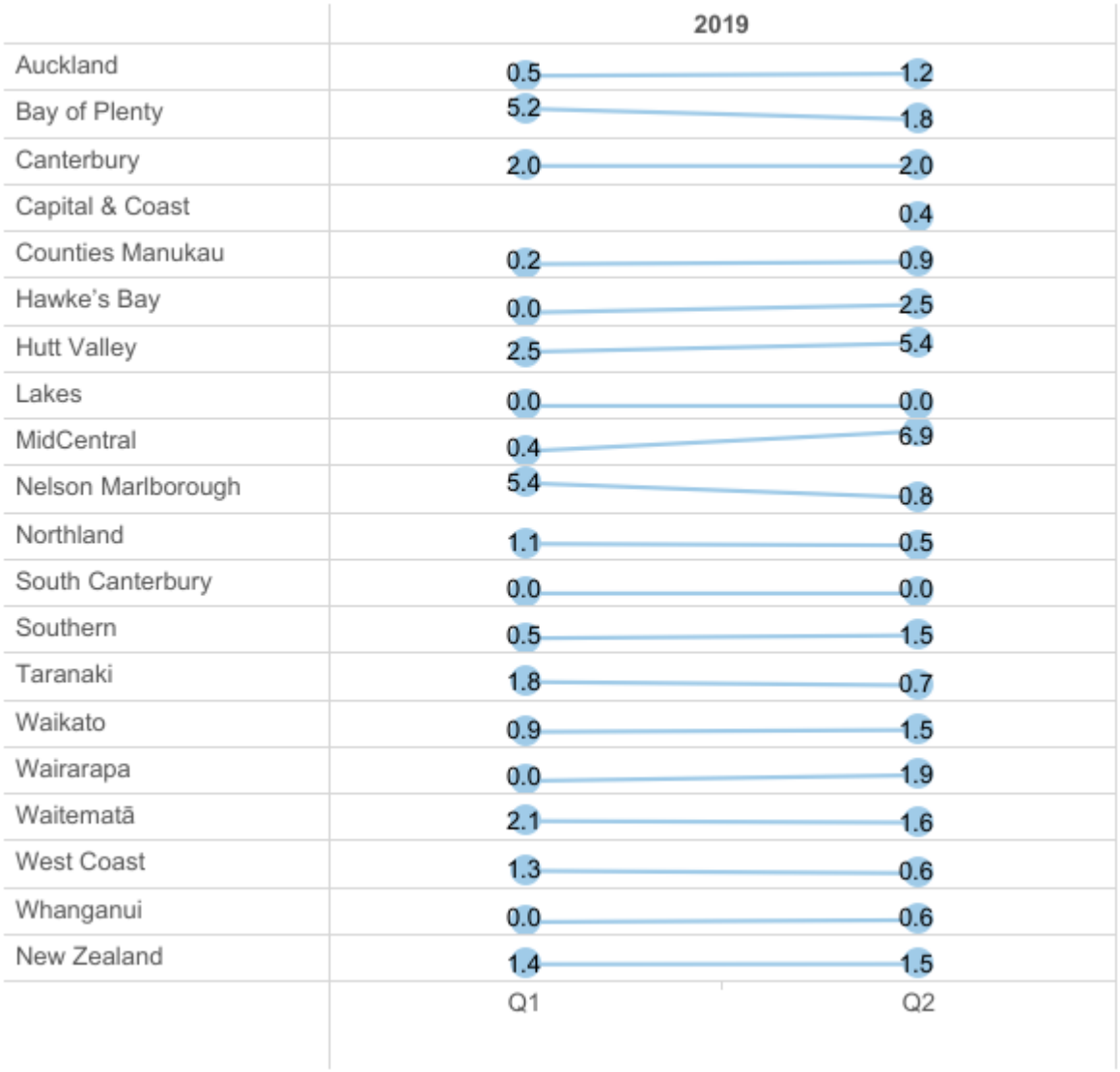
Outcome measure 2: Percentage of patients with a non-hospital-acquired pressure injury

The second outcome measure (Figure 32) shows the percentage of patients with non-hospital-acquired pressure injuries (ie, patients that arrived at hospital with a pressure injury that was formed in aged residential care, at home or in community care.)

The national figure for this measure was a rate of 1.5 percent, a small increase from 1.4 percent during last quarter. There is also considerable variation for this outcome measure highlighting an opportunity for improvement.

A total of 18 DHBs (90 percent) submitted data for this measure.

Figure 32: Percentage of patients with a non-hospital-acquired pressure injury



References

1. de Raad J–P. 2012. *Towards a value proposition: scoping the cost of falls*. Wellington: NZIER.
2. *Ibid*.
3. In quarter 1, 2015, 1.5 g or more of cefuroxime was accepted as an alternative agent to 2 g or more of cefazolin for routine antibiotic prophylaxis for hip and knee replacements. This improved the results of this process measure for MidCentral DHB significantly, from 10 percent before the change to 96 percent immediately after the change. It also increased the national result from 90 percent to 95 percent in quarter 1, 2015.