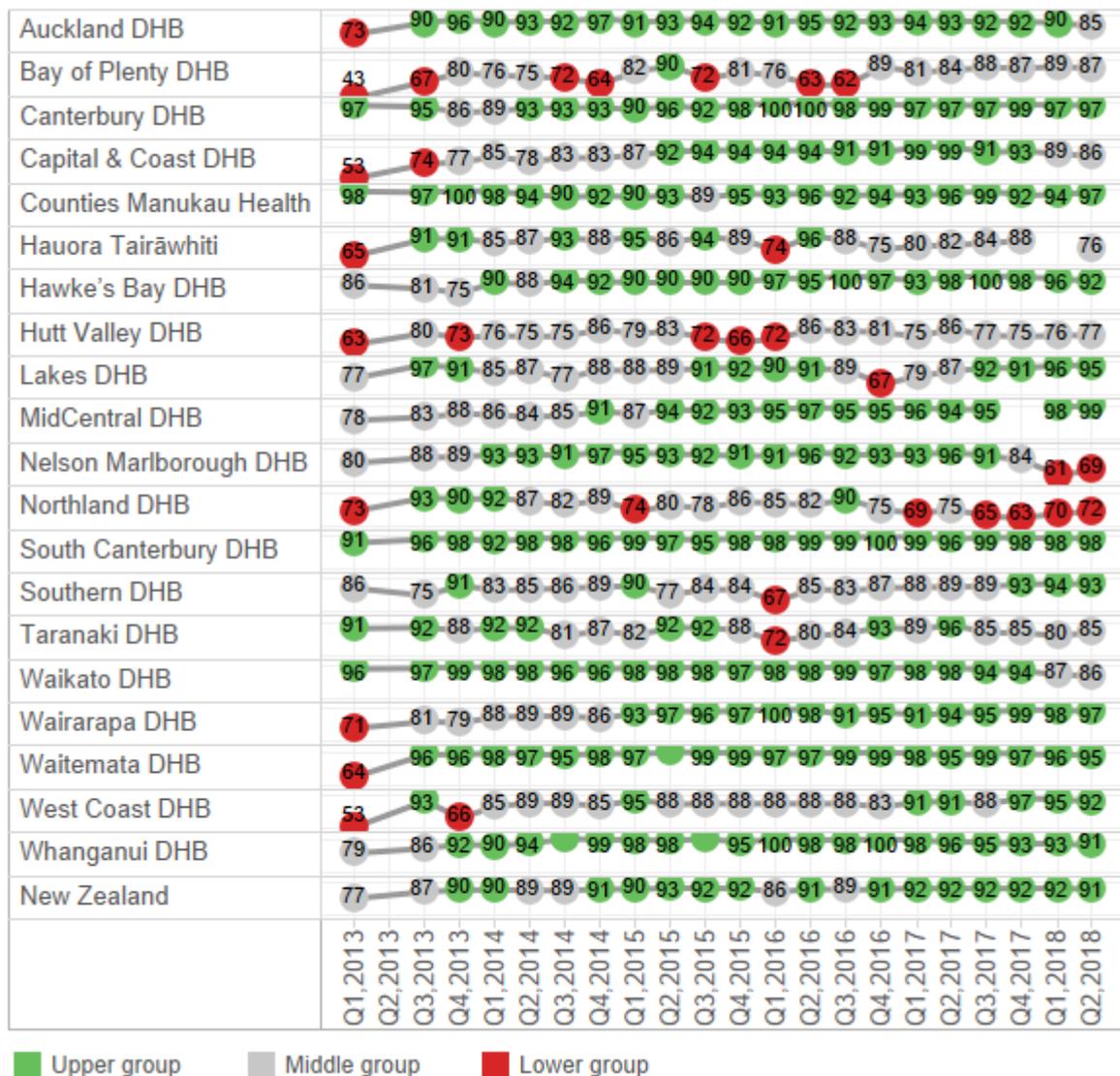


Quality and safety marker update, April to June 2018

Falls

Nationally, 91 percent of older patients* were assessed on their falls risk in quarter 2, 2018. The rate has remained around the expected achievement level of 90 percent since quarter 4, 2013, despite some variations in a few quarters. At the district health board (DHB) level, 11 out of 20 DHBs achieved the expected marker level. Northland DHB is the only DHB to be in the lower group for risk assessments completed in the last four quarters. We are following up with the DHB to understand what is contributing to this result.

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

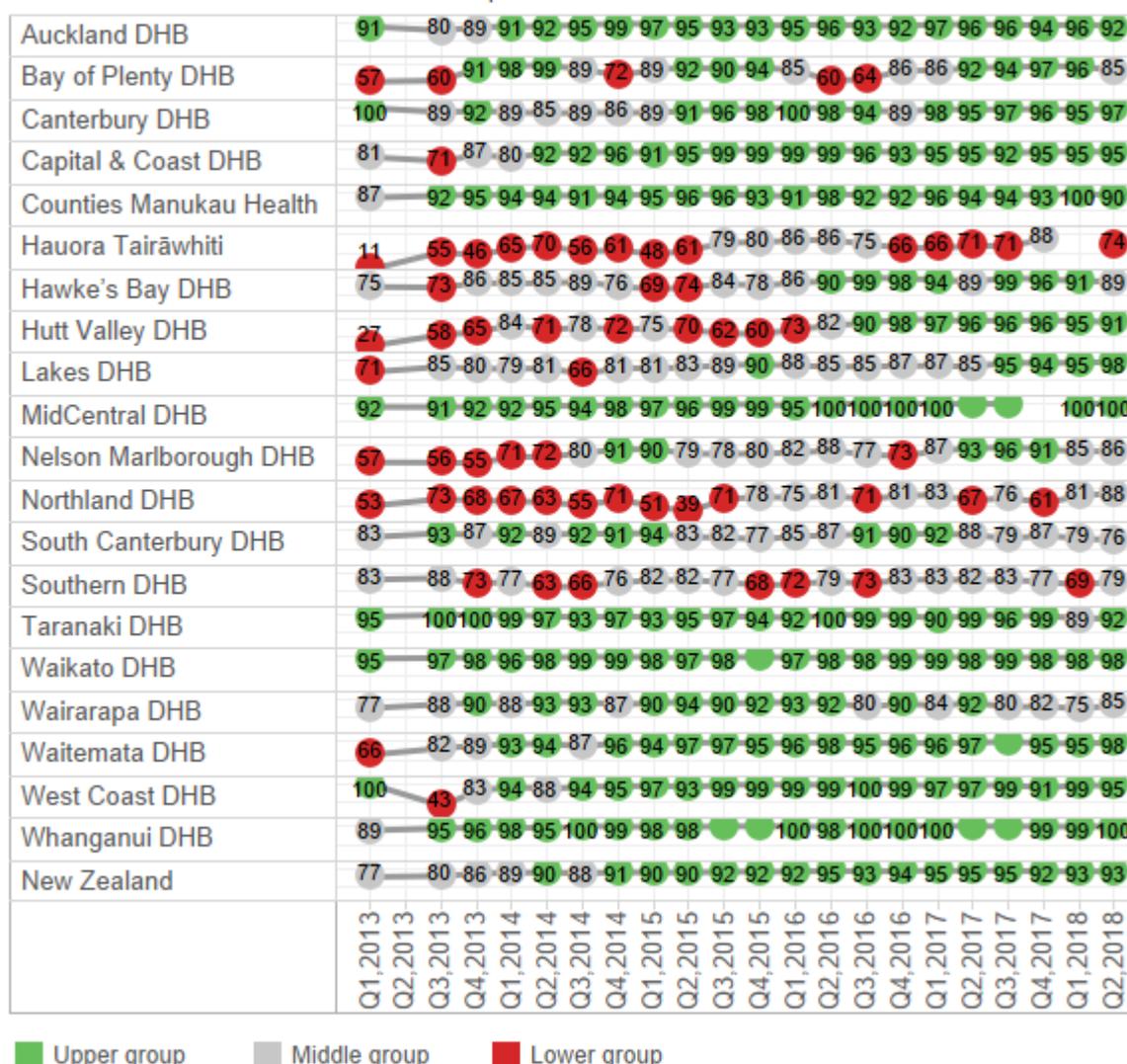


- Upper group: ≥ 90 percent
- Middle group: 75–89 percent
- Lower group: < 75 percent

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

About 93 percent of patients assessed as being at risk of falling had an individualised care plan completed. This measure has increased 16 percentage points compared with the baseline in quarter 1, 2013. Achievements at DHB level vary but, overall, where patients have been assessed to be at risk of falling, completion of individualised care plans for that population group need to be at a consistently high level. We have on average 12 DHBs in the upper group.

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

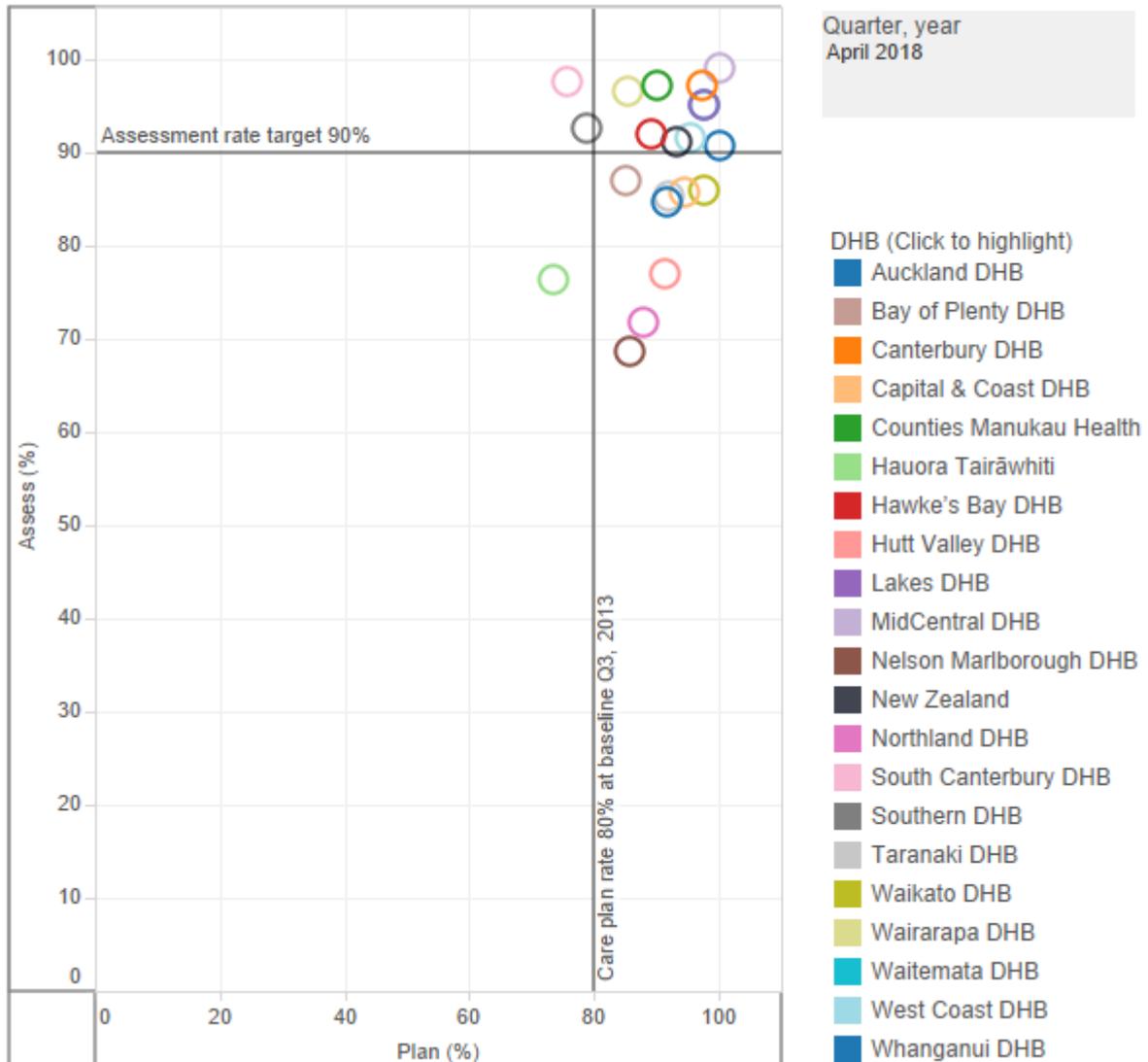


- Upper group: ≥ 90 percent
- Middle group: 75–89 percent
- Lower group: < 75 percent

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). Five DHBs sat at the top right corner in quarter 1, 2013; in the current quarter, nine DHBs are in this 'ideal' box (see Figure 3), down from 10 in the last quarter.

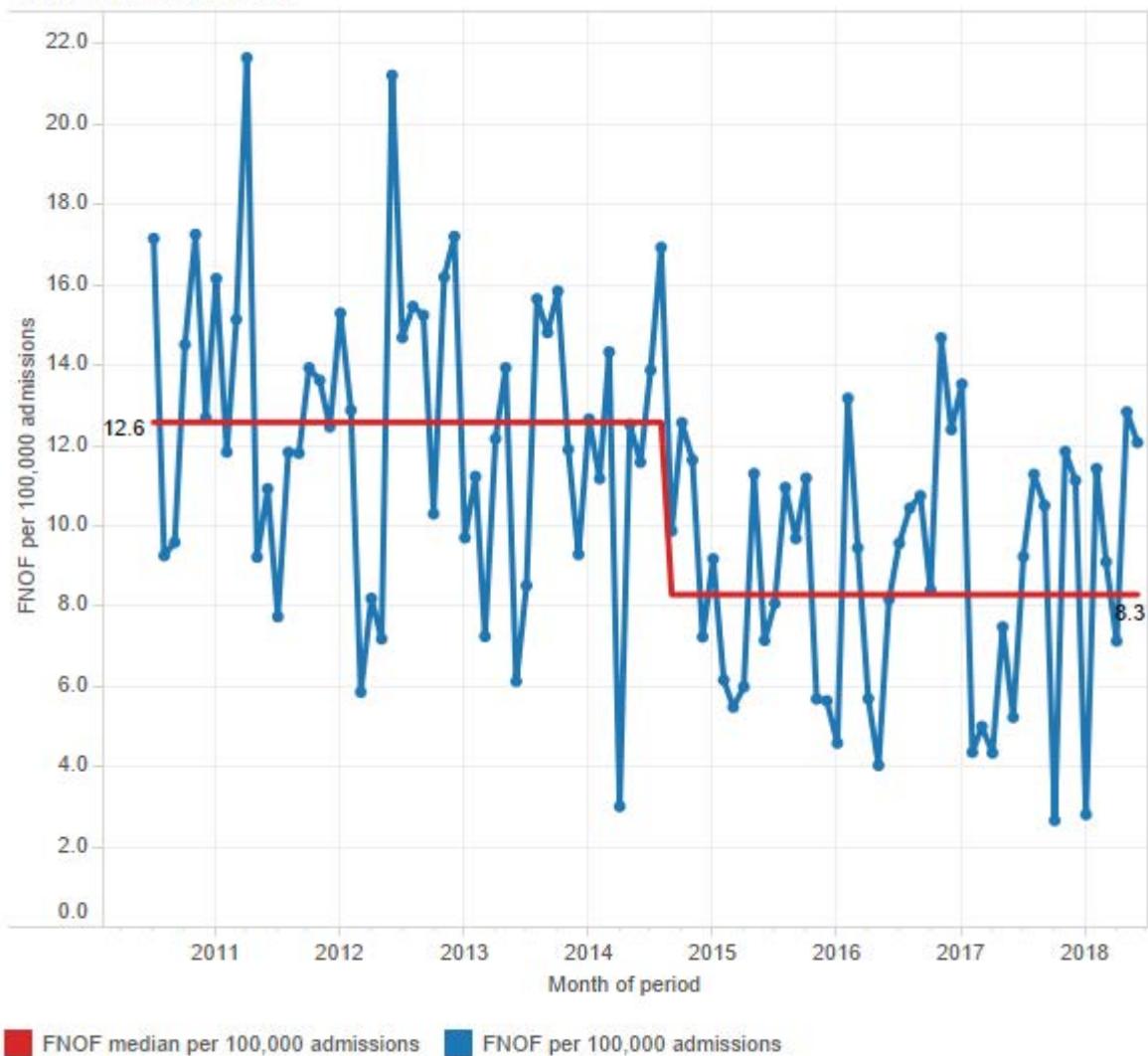
Figure 3: Falls assessment compared with care planning



There were 83 falls resulting in a fractured neck of femur (broken hip) in the 12 months ending June 2018.

To control the impact of changes in the number of admissions per month, Figure 4 shows in-hospital falls causing a fractured neck of femur per 100,000 admissions. The median of this measure was 12.6 in the baseline period of July 2010 to June 2012. It has moved down since September 2014, to 8.3 per 100,000 admissions, and shown a significant improvement.

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

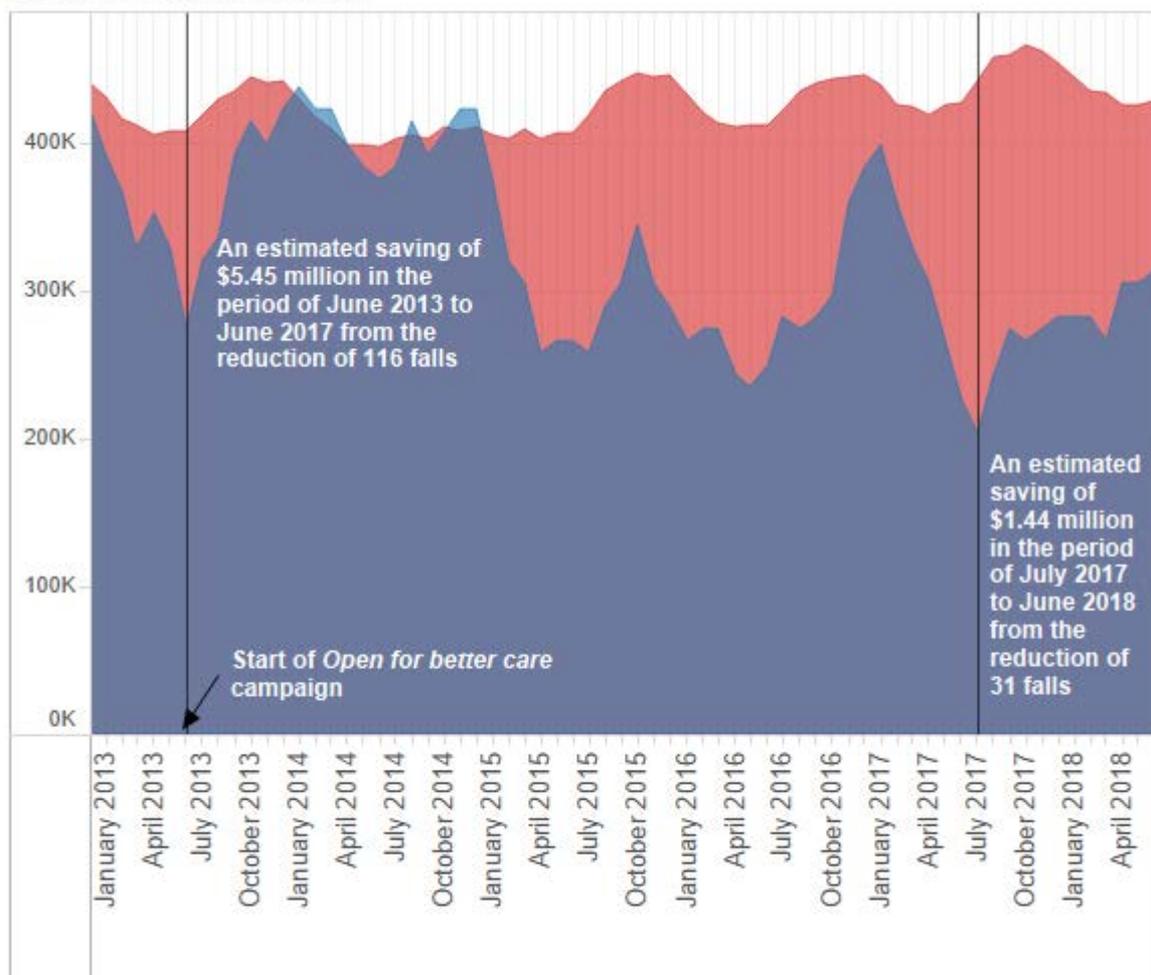


The number of 83 in-hospital falls resulting in a fractured neck of femur is significantly lower than the 114 we would have expected this year, given the falls rate observed in the period between July 2010 and June 2012. The reduction is estimated to have saved \$1.44 million in the year ending June 2018, based on an estimate of \$47,000¹ for a fall with a fractured neck of femur.

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 each time it occurs.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 a residential care facility, the reduction in falls represents \$1.97 million in total avoidable costs since July 2017.

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

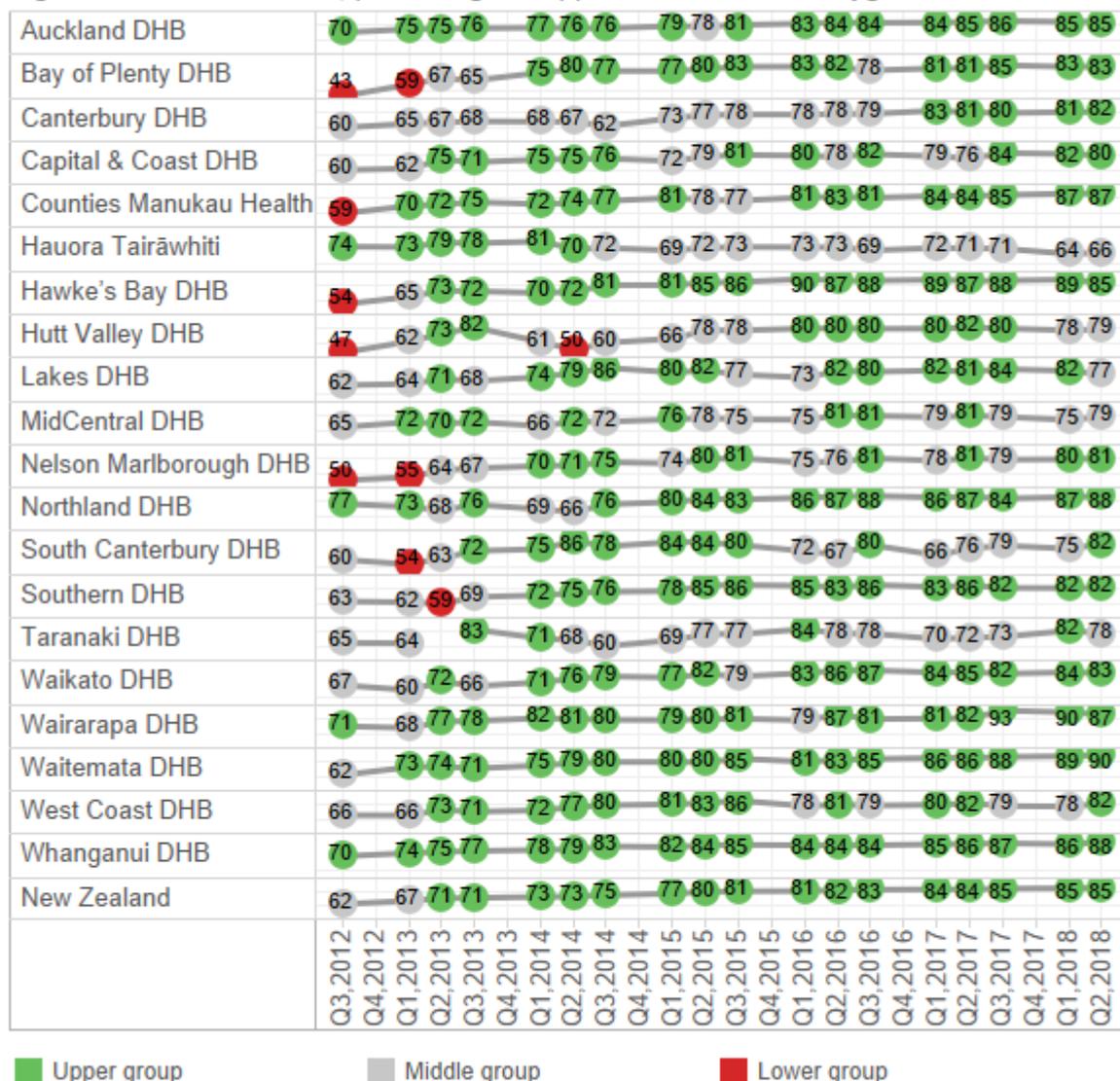
¹ de Raad J-P. 2012. *Towards a value proposition: scoping the cost of falls*. Wellington: NZIER.

² *Ibid.*

Hand hygiene

National compliance with the five moments for hand hygiene remains high. Nationally, DHBs maintained an average of 85 percent compliance in quarter 2, 2018, compared with 62 percent in the baseline in quarter 3, 2012.

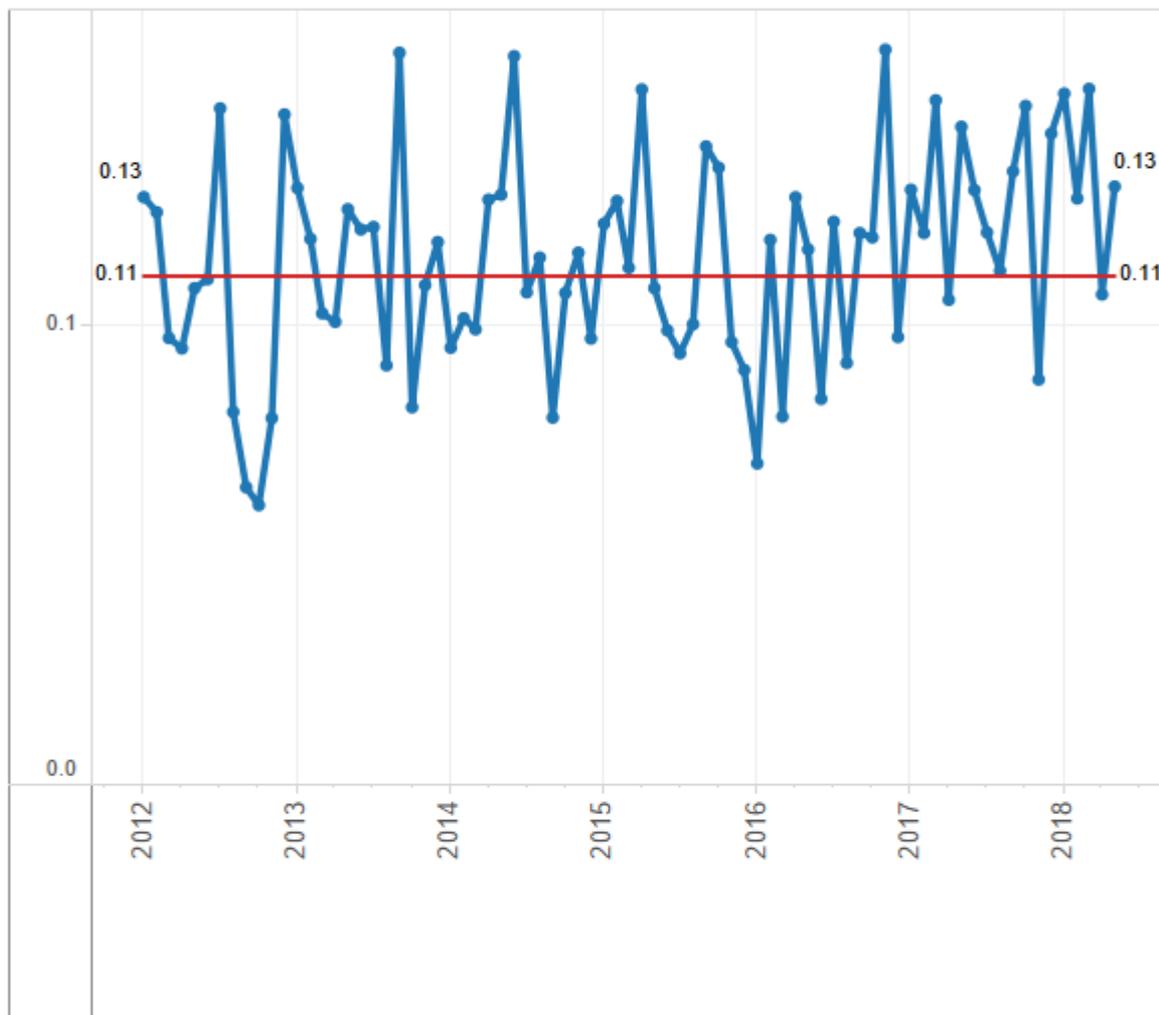
Figure 6: Process marker, percentage of opportunities for hand hygiene taken



- 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; therefore, no data point is shown specifically for quarter 4 in any year.

The hand hygiene outcome marker is 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) In quarter 2, 2017, the calculation method for the denominator changed so the definition for calculating DHB bed-days is applied consistently. Figure 7 (monthly healthcare associated SAB per 1,000 bed-days) displays the recalculation of the entire series using the new method. The final month is omitted, due to denominator completeness issues.

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



Actual Median adjusted

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, 2018.

During quarter 3, 2017, the SSII programme worked with DHBs to reconcile and review the historic programme data. This report reflects the changes made to historic data as a result. In December 2017, the group boundaries for the process markers changed to match the SSII programme reports.

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, 2018, 99 percent of hip and knee arthroplasty procedures involved the giving of an antibiotic within 60 minutes before knife to skin. Thirteen DHBs achieved the national goal. This is the highest number of DHBs achieving the goal historically.

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

Auckland DHB	97	98	98	96	96	96	96	95	97	95	94	97	96	98	98	95	98	94	100
Bay of Plenty DHB	95	92	95	97	95	97	98	99	99	96	99	98	99	99	98	98	97	100	98
Canterbury DHB	94	96	97	96	94	99	97	100	100	98	99	100	99	100	99	98	100	100	100
Capital & Coast DHB	93	96	93	99	95	98	96	100	100	100	100	100	100	100	100	99	100	100	100
Counties Manukau Health	52	70	80	83	94	97	99	97	97	98	94	99	94	92	95	96	95	93	96
Hauora Tairāwhiti	91	91	88	48	88	95	97	95	100	91	97	87	94	100	92	100	93	93	90
Hawke's Bay DHB	93	88	95	93	100	98	100	100	100	98	100	100	100	100	97	100	99	100	100
Hutt Valley DHB	99	85	54	91	94	91	95	97	98	94	96	98	99	98	100	100	100	100	100
Lakes DHB	100	98	99	98	100	99	99	98	97	100	97	97	100	99	98	100	100	98	100
MidCentral DHB	91	94	96	99	97	96	90	100	99	98	98	98	99	98	100	98	100	100	97
Nelson Marlborough DHB	92	87	97	99	100	98	97	99	96	99	100	98	100	99	97	96	97	100	100
Northland DHB	98	89	98	97	95	96	93	91	92	98	98	99	98	99	95	93	90	96	96
South Canterbury DHB	93	84	95	100	100	100	100	100	96	100	100	95	100	100	95	98	95	100	100
Southern DHB	77	66	88	91	92	93	92	93	92	90	97	96	97	99	98	96	95	100	100
Taranaki DHB	93	91	100	97	98	90	95	78	94	89	100	100	99	100	97	100	100	100	100
Waikato DHB	85	98	90	87	92	81	93	92	94	97	98	98	99	96	99	97	99	99	98
Wairarapa DHB	97	100	100	97	100	96	100	100	100	95	100	100	94	100	100	100	100	100	100
Waitemata DHB	92	92	95	97	98	98	97	94	98	96	92	92	98	95	94	90	97	96	98
West Coast DHB	87	94	100	89	100	100	96	100	93	100	100	100	100	100	100	100	100	100	100
Whanganui DHB	90	93	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99	100	100
New Zealand	90	90	93	94	96	95	96	96	97	97	97	98	98	98	98	97	98	98	99
	Q3, 2013	Q4, 2013	Q1, 2014	Q2, 2014	Q3, 2014	Q4, 2014	Q1, 2015	Q2, 2015	Q3, 2015	Q4, 2015	Q1, 2016	Q2, 2016	Q3, 2016	Q4, 2016	Q1, 2017	Q2, 2017	Q3, 2017	Q4, 2017	Q1, 2018

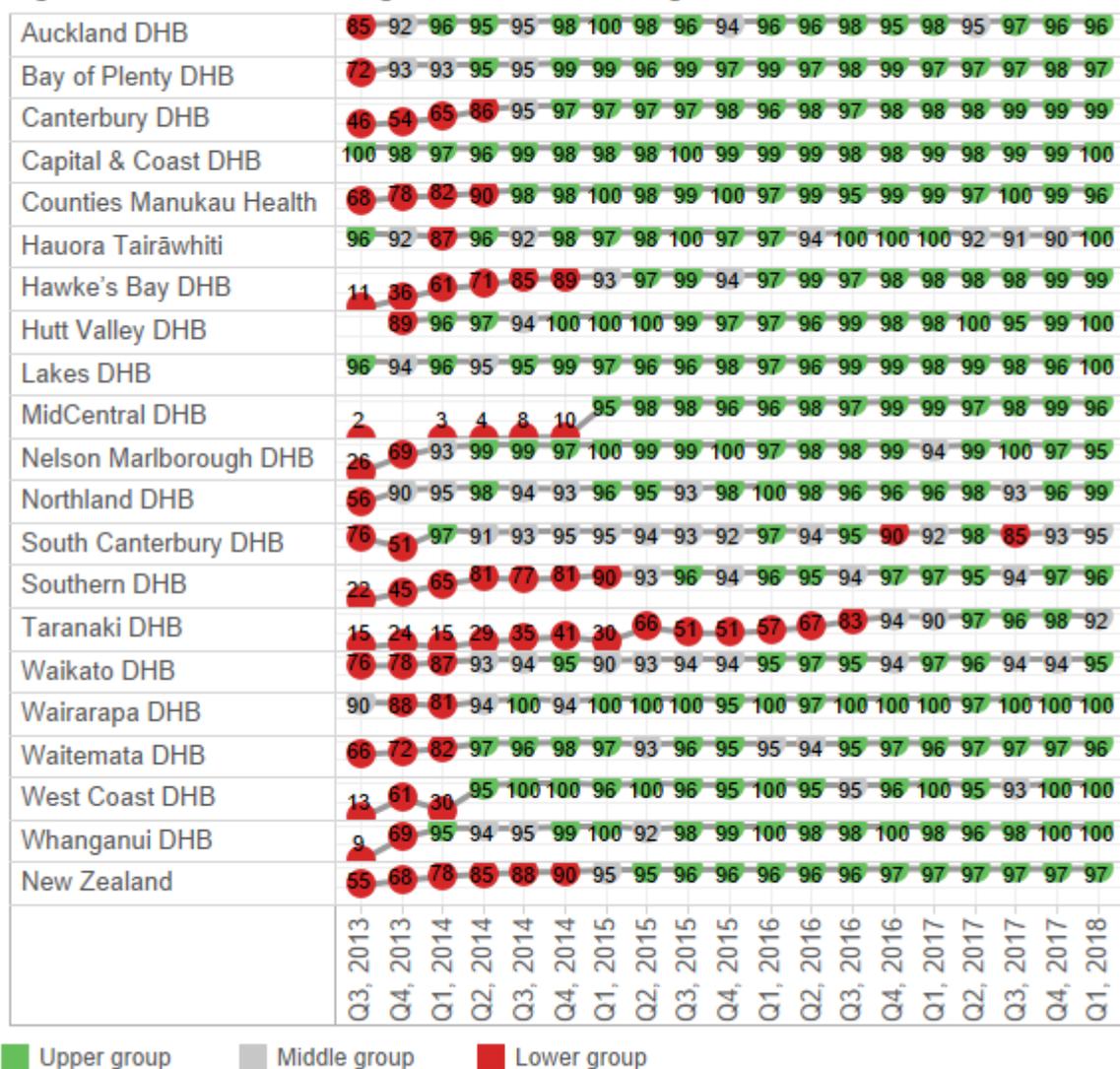
■ Upper group
 ■ Middle group
 ■ Lower group

- 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. Eighteen DHBs reached the threshold level of 95 percent compared with only three in the baseline quarter.²

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

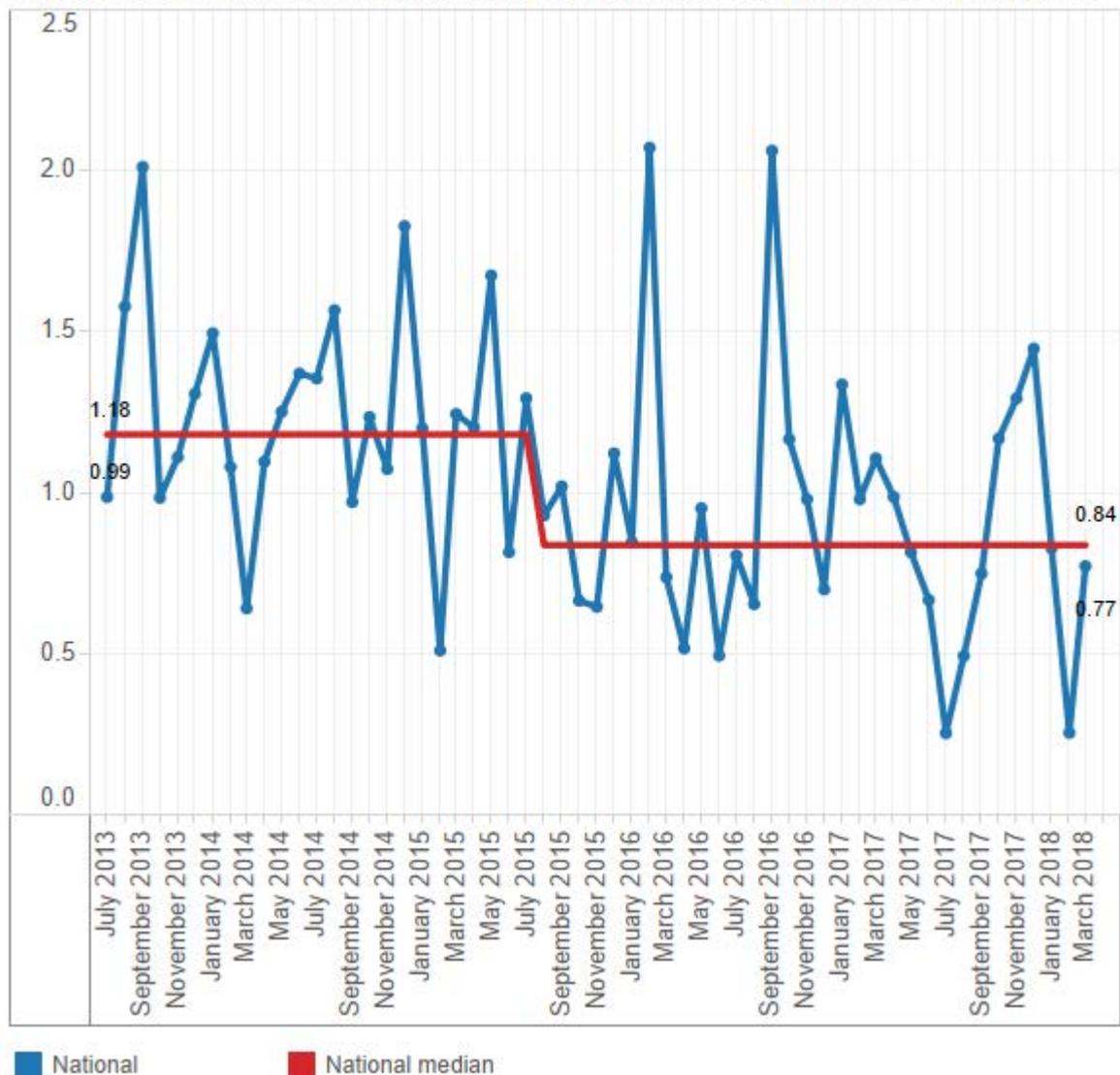
² In quarter 1, 2015, 1.5 g or more of cefuroxime was accepted as an alternative agent to 2 g or more of cefazolin for routine antibiotic prophylaxis for hip and knee replacements. This improved the results of this process measure for MidCentral DHB significantly, from 10 percent before the change to 96 percent immediately after the change. It also increased the national result from 90 percent to 95 percent in quarter 1, 2015.

Outcome marker

The outcome marker is SSIs per 100 hip and knee operations. In quarter 1, 2018, there were 15 surgical site infections out of 2420 hip and knee arthroplasty procedures, the SSI rate was 0.6 percent. A shift in the median is detected from August 2015 with the reduction being from 1.18 percent SSIs during the baseline period to 0.84 percent following it.

During the reduction period, there are spikes in February and September 2016. Examination of the September DHB-level data shows the number of SSIs increased by one or two cases in seven DHBs compared with their baseline levels of zero or one case per month. Figures in both February and September 2016 are higher outliers. They indicate some one-time occurrences of special cause variation.

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

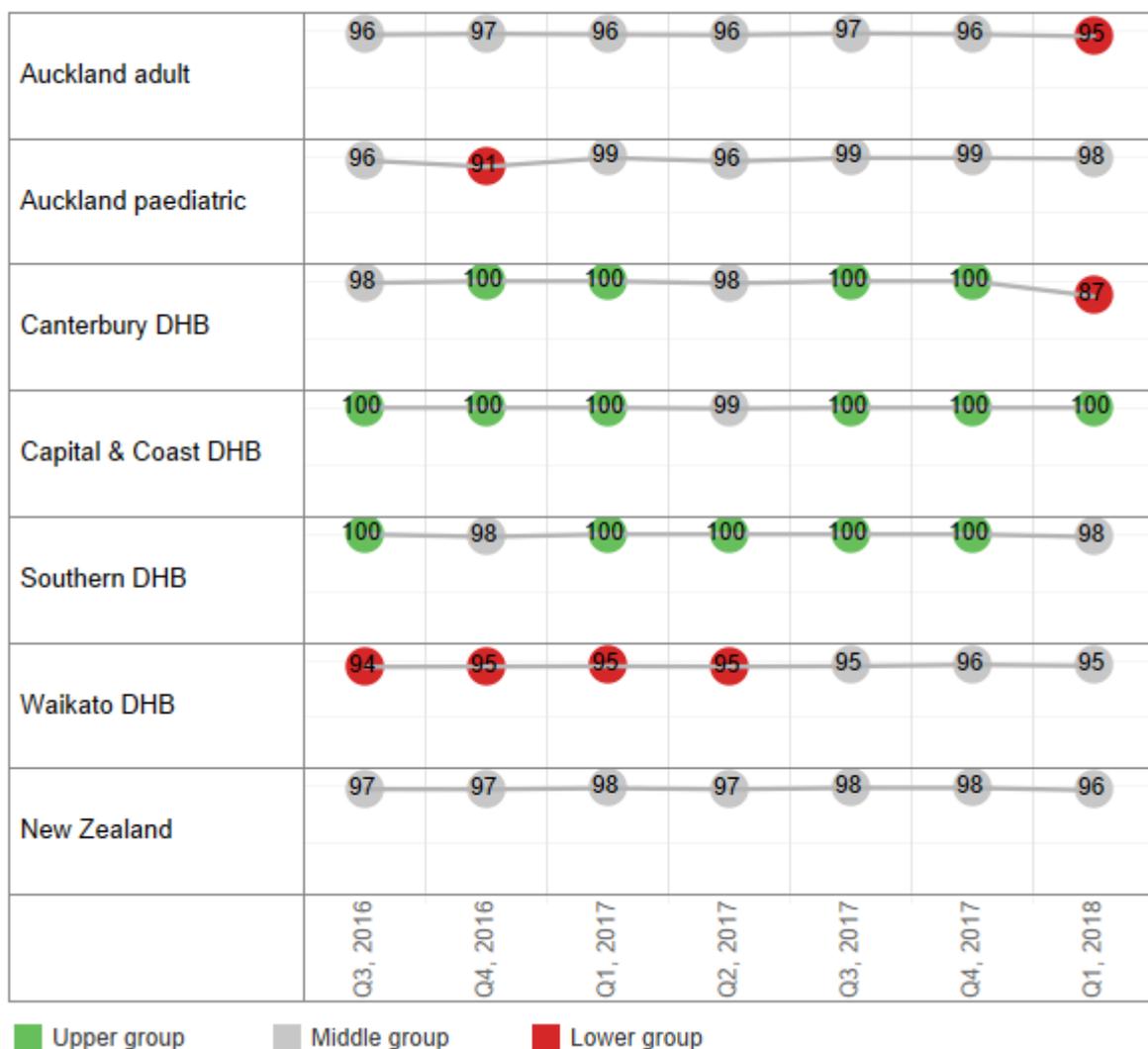


SSI improvement – cardiac surgery

This is the seventh 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 QSMs for orthopaedic surgery.

Process marker 1 is ‘timing’, which requires an antibiotic to be given 0–60 minutes before knife to skin. The target is 100 percent of procedures achieving this marker. Capital & Coast DHB achieved the target this quarter.

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 is 'dosing', which requires the antibiotic prophylaxis of choice to be ≥ 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, except Auckland paediatric and Canterbury, achieved the target this quarter.

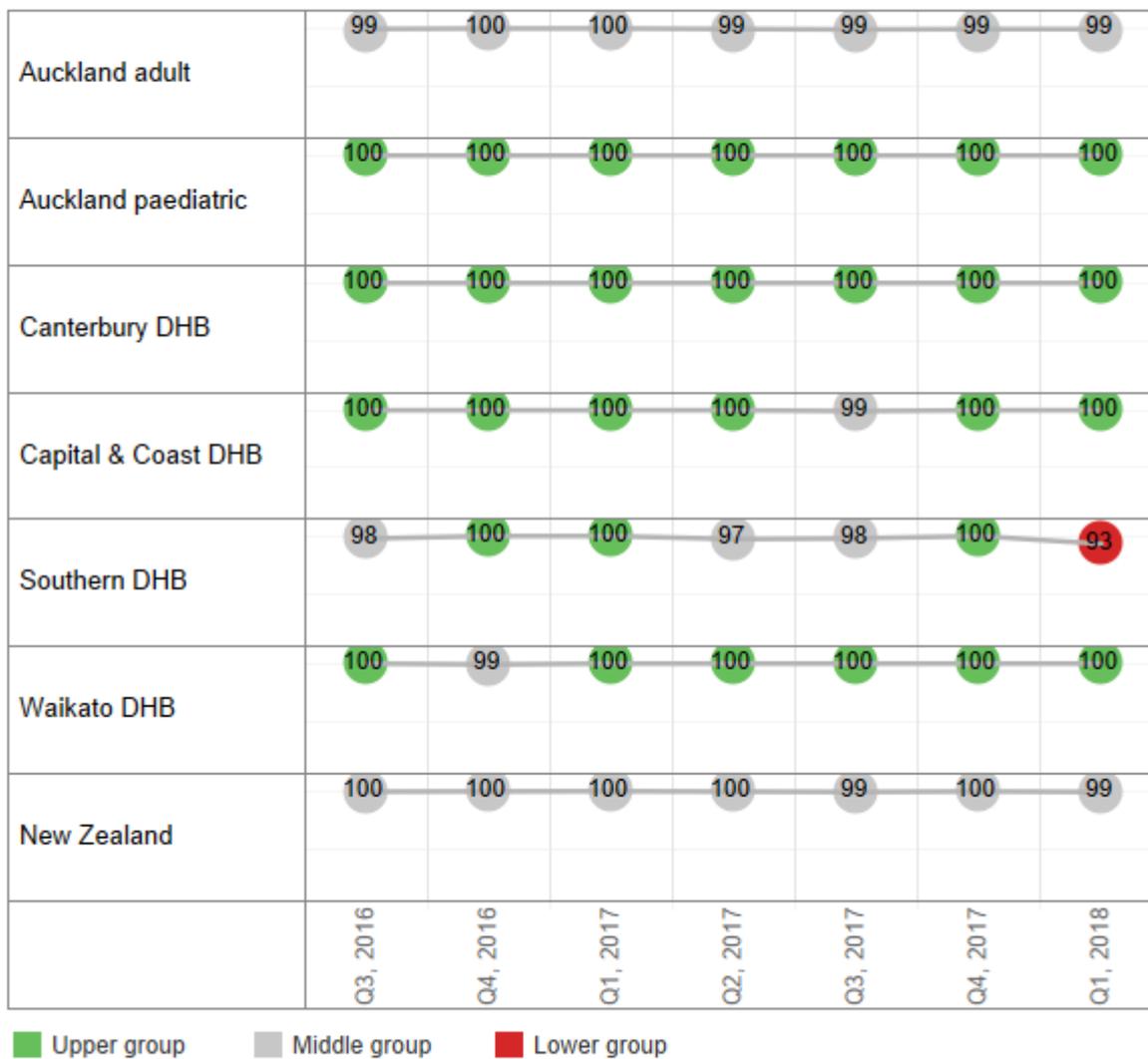
Figure 12: Process marker, percentage of cardiac procedures where the first choice for antimicrobial prophylaxis is 2 g or more of cefazolin



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

Process marker 3 is 'skin preparation', which requires use of an appropriate skin antiseptics in surgery using alcohol/chlorhexidine or alcohol/povidone iodine. The target is 100 percent of procedures achieving this marker. All DHBs, except Auckland adult and Southern, achieved the target this quarter.

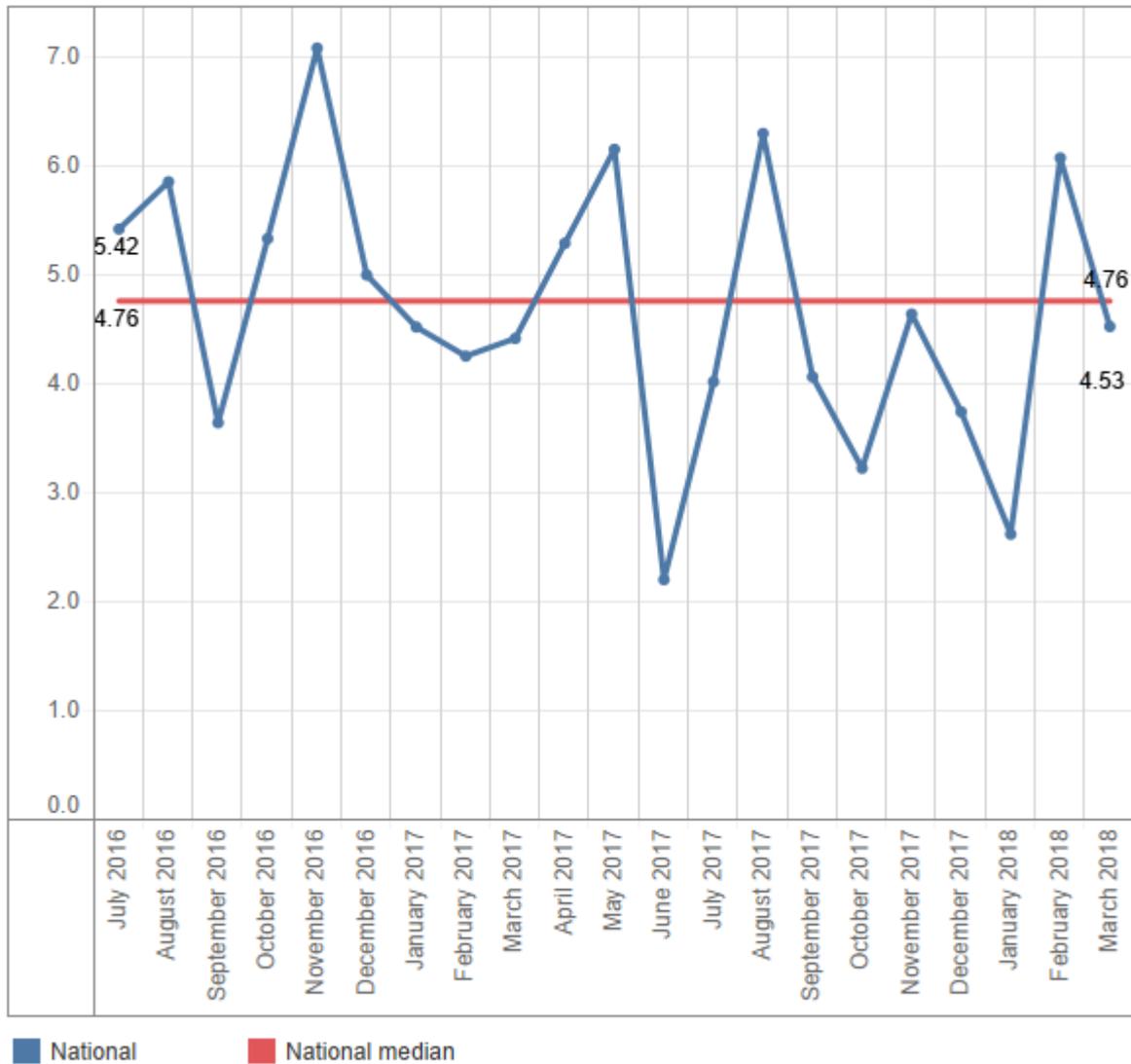
Figure 13: Process marker, percentage of cardiac procedures where alcohol based skin antiseptics is always used



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

The outcome marker is SSIs per 100 procedures rate. In quarter 1, 2018, there were 30 SSI in 686 procedures, an infection rate of 4.4 percent. Compared with baseline median of 5.2 percent, there is no indication of a significant shift.

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



Safe surgery

This is the eighth 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, for each part of the checklist, how many audits were undertaken. Ten out of the 20 DHBs achieved 50 audits for all three parts in quarter 2, 2018.

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 DHB	58	65	50
Bay of Plenty DHB	83	81	71
Canterbury DHB	58	70	56
Capital & Coast DHB	57	56	51
Counties Manukau Health	518	515	475
Hauora Tairāwhiti	57	62	54
Hawke's Bay DHB	40	72	29
Hutt Valley DHB	47	53	35
Lakes DHB	36	36	24
MidCentral DHB	53	55	57
Nelson Marlborough DHB	24	32	29
Northland DHB	51	55	49
South Canterbury DHB	0	106	103
Southern DHB	3	3	2
Taranaki DHB	11	14	9
Waikato DHB	30	35	22
Wairarapa DHB	42	49	33
Waitemata DHB	56	61	56
West Coast DHB	54	59	56
Whanganui DHB	61	73	56

■ Target achieved

■ Fewer than 50 observations

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 10 DHBs that achieved 50 audits in each checklist, nine 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): Baseline Q3, 2016

	Sign in						Time out						Sign out					
	Baseline	Rolling	Q3, 2017	Q4, 2017	Q1, 2018	Q2, 2018	Baseline	Rolling	Q3, 2017	Q4, 2017	Q1, 2018	Q2, 2018	Baseline	Rolling	Q3, 2017	Q4, 2017	Q1, 2018	Q2, 2018
Auckland DHB	98	99	100	96	98	98	93	95	95	91	98	98	98	90	100	100	99	94
Bay of Plenty DHB	97	99	100	100	99	99	96	100	99	100	100	99	99	100	100	99	97	
Canterbury DHB	91	98	97	98	99	100	92	97	94	99	95	99	96	99	98	100	97	100
Capital & Coast DHB	96		100		98	98	97	98	100	91	99	100	97	100		100	100	
Counties Manukau Health	99	99	98	96	100	100	100	100	100	100	100	100	99	97	100	93	95	100
Hauora Tairāwhiti	100	100	100	100	100	100	99	98	98	98	97	98	99	98	100	98	100	100
Hawke's Bay DHB			97				78	86	87	88	87	82		97				
Hutt Valley DHB			98	92	100			97	96	92	100	98			94	88		
Lakes DHB				96	82					96	98				98			
MidCentral DHB	96	95	93	94	100	94	92	97	95	100	100	93	97	98	100	98	100	95
Nelson Marlborough DHB	88		91	100			93	99	96	98	100		91	91	67	75		
Northland DHB		92	84	96		100	91	92	97	92		95		96	100			
South Canterbury DHB								84	84	93	83	76		82	83	96	78	70
Southern DHB			88	98			98		99					82				
Taranaki DHB																		
Waikato DHB	81	60		48	59		67	53	76		40			97				
Wairarapa DHB	97		96				98		97					98				
Waitemata DHB	96	99	100	98	98	98	96	99	100	100	97	100	94	98	100	92	100	98
West Coast DHB		99	94	100	100	100		99	96	100	100	100		99	96	100	100	100
Whanganui DHB		82	64	82	92	95		96	94	92	100	100		98	100	96	97	100
New Zealand	93	95	94	95	95	97	93	94	95	95	94	95	94	94	96	94	93	95

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: Q2, 2017 to Q1, 2018.

- 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, Counties Manukau Health, MidCentral and West Coast DHBs achieved the target in all three parts and three other DHBs achieved the target in one or two parts. Data is not presented where audits were fewer than 50. As this is only the eighth quarter in which DHBs have measured the impact of the safe surgery programme, the focus is still on embedding the programme and the auditing method. Better results are expected in subsequent quarters.

Note: the numbers in Figures 16 and 17 have been rounded but the colours are assigned based on whether the target was achieved.

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, 2017	Q4, 2017	Q1, 2018	Q2, 2018	Baseline	Rolling	Q3, 2017	Q4, 2017	Q1, 2018	Q2, 2018	Baseline	Rolling	Q3, 2017	Q4, 2017	Q1, 2018	Q2, 2018
Auckland DHB	97	93	100	87		95	94	87	89	78		95	93		96			89
Bay of Plenty DHB	88	96	96	100	92	95	87	93	93	92	92	96		85	81	88	81	91
Canterbury DHB	88	96	97	98	93	98	76	89	83	91	88	94	65	87	82	84	90	93
Capital & Coast DHB	86		95		80	80	91	91	99	84	90	89	94		98		85	88
Counties Manukau Health	99	99	99	98	98	100	99	100	99	99	100	100	94	98	98	96	98	99
Hauora Tairāwhiti	85	81	83	84	82	74	89	76	60	75	84	82		83	74	77	94	85
Hawke's Bay DHB			95				81	86	89	81	90	85			77			
Hutt Valley DHB			84	89	100			96	90	94	100	98				91	91	
Lakes DHB				26	82					66	66					44		
MidCentral DHB	95	97	98	98	98	94	87	99	96	100	100	100	85	93	90	92	96	93
Nelson Marlborough DHB	57		98	95			87	69	92	53	56		66		42	20	8	
Northland DHB		98	96	98		100	79	94	94	93		94			96	74		
South Canterbury DHB								74	68	85	77	59		69	70	84	71	46
Southern DHB			79	90			93		96						72			
Taranaki DHB																		
Waikato DHB	97	97		100	100		92	94	92		96				81			
Wairarapa DHB	96		100				99		99						100			
Waitemata DHB	83	89	94	84	93	85	86	89	84	89	90	92	91	91	83	94	95	95
West Coast DHB		99	100	100	96	100		99	96	100	100	100		97	100	94	98	96
Whanganui DHB		84	66	89	88	91		81	65	79	93	92		84	67	88	86	96
New Zealand	90	93	92	92	94	95	89	91	90	89	91	93	84	87	85	86	88	90

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: Q2, 2017 to Q1, 2018.

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

The safe surgery QSM 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, 2018, nine DHBs reported 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 will work with the auditing teams to increase data collection 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	
	Q3	Q4	Q1	Q2
Auckland DHB			4	1
Bay of Plenty DHB	20	11	15	11
Canterbury DHB	1			
Capital & Coast DHB		6	3	
Counties Manukau Health	311	462	496	531
Haoura Tairāwhiti				
Hawke's Bay DHB	7			
Hutt Valley DHB	14			
Lakes DHB	12	11	22	15
MidCentral DHB	2	2		
Nelson Marlborough DHB			6	
Northland DHB	18	6	5	7
South Canterbury DHB			2	
Southern DHB	13	5		
Taranaki DHB	3			
Waikato DHB	1		7	2
Wairarapa DHB		3		2
Waitemata DHB		10	36	23
West Coast DHB	12	9	12	14
Whanganui DHB				

The rates for 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 measures.

The model is used to identify 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 can calculate how many patients we would have predicted to develop sepsis or DVT/PE based on historic trends. We can then compare how many patients actually did develop 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.

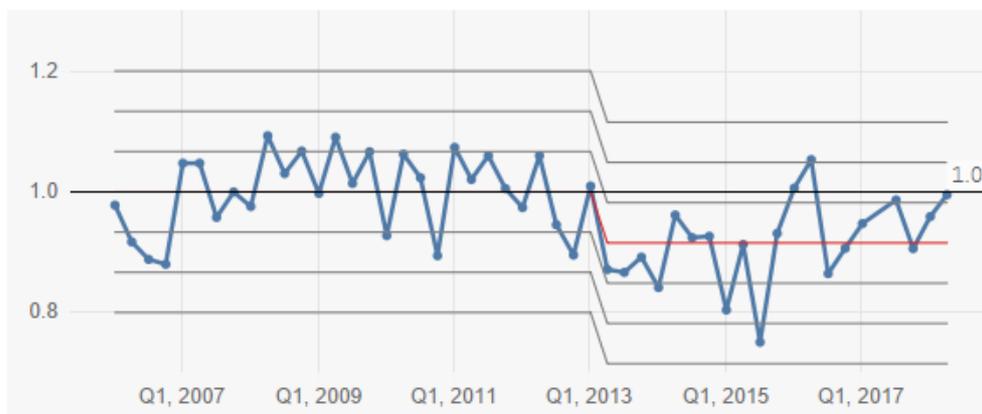
We are currently reviewing and analysing the definition of postoperative sepsis. We will update the O/E ratio charts in the next quarter's report.

Figure 19 shows the DVT/PE risk-adjustment model results in two charts. Using the same methodology as above, 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.

Figure 19: Risk-adjustment model for DVT/PE



Control chart, O/E ratio per quarter



Medication safety

The QSM for medication safety focuses on medicine reconciliation. This 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; Figure 20 shows there are five 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
Canterbury	Implemented
Counties Manukau Health	Implemented
Northland	Implemented
Taranaki	Implemented
Waitemata	Implemented
Auckland	Not 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	Northland DHB	Taranaki DHB	Counties Manukau Health	Waitemata DHB	Canterbury DHB
Structure 1: eMedRec implemented anywhere in the DHB (yes/no)	Yes	Yes	Yes	Yes	Yes
Structure 2: Number and percentage of relevant wards with eMedRec implemented	6	7	29	33	60
	61%	58%	97%	87%	100%

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

Figure 22: eMedRec process markers



Patient deterioration

This is the first quarter that structural, process and outcome measures for the patient deterioration QSMs are reported. DHBs were also asked to submit the outcome measures for the January to March 2018 quarter. Not all DHBs submitted their data for these measures.

DHBs were asked to provide both process and outcome measure data by ethnicity groups where possible. We have not provided ethnicity-level data for this national report as very few DHBs were able to submit this for the quarter. 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 as at 30 June 2018. The majority of DHBs (80 percent, n=16) have now implemented (or are in the process of implementing) the New Zealand early warning score (NZEWS) in their hospitals. Of those DHBs, many have achieved significant spread across their hospitals, with 82 percent of eligible wards using it.

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

DHB	2018	
	Q1	Q2
Auckland DHB		100.0
Bay of Plenty DHB	100.0	100.0
Canterbury DHB	100.0	100.0
Capital & Coast DHB	100.0	85.7
Counties Manukau Health	100.0	100.0
Hauora Tairāwhiti	100.0	100.0
Hawke's Bay DHB	0.0	83.3
Hutt Valley DHB	100.0	
Lakes DHB	83.0	83.3
MidCentral DHB	100.0	100.0
Nelson Marlborough DHB	90.0	90.0
New Zealand		82.1
Northland DHB	45.0	80.0
South Canterbury DHB	0.0	0.0
Southern DHB		0.0
Taranaki DHB	100.0	100.0
Waikato DHB	100.0	
Wairarapa DHB	100.0	100.0
Waitemata DHB	0.0	0.0
West Coast DHB	0.0	100.0
Whanganui DHB	100.0	100.0

Waikato and Hutt Valley are missing because they have not submitted data for this quarter.

Process measure 1: Correct calculation of early warning score

The first process measure 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 use of the New Zealand early warning score. Results for this measure revealed a national figure of 90.2 percent.

A total of 16 DHBs submitted data for this measure (14 from the group that have implemented the NZEWS and two from the group yet to implement). Those using an electronic vital signs system will be able to consistently achieve 100 percent for this measure.

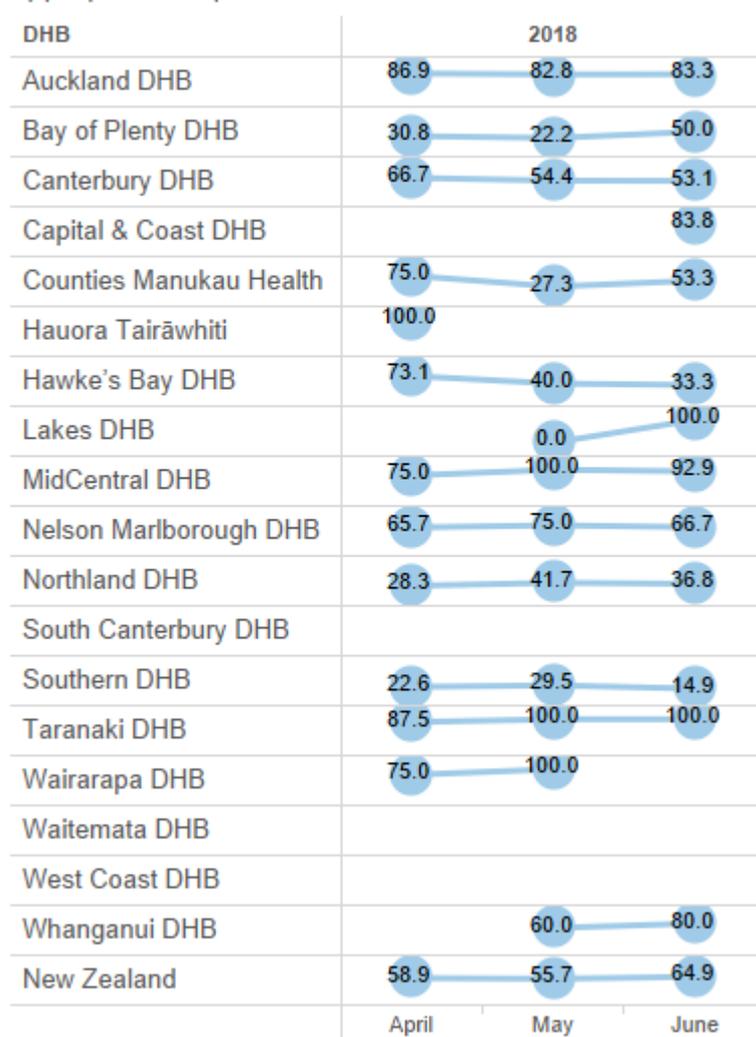
Figure 24: Process measure 1: percentage of early warning score calculated correctly.

DHB	2018		
	April	May	June
Auckland DHB	90.8	96.5	94.7
Bay of Plenty DHB	81.6	84.7	87.1
Canterbury DHB	100.0	100.0	100.0
Counties Manukau Health	93.3	95.6	95.5
Hauora Tairāwhiti	93.3	86.7	83.3
Hawke's Bay DHB	84.7	85.4	86.9
Hutt Valley DHB	87.5	88.0	88.5
Lakes DHB	80.7	81.5	88.9
MidCentral DHB	94.4	97.7	100.0
Nelson Marlborough DHB	90.8	96.0	93.8
Northland DHB	88.0	87.3	88.5
South Canterbury DHB			
Southern DHB	88.1	93.0	94.1
Taranaki DHB	91.1	88.7	92.7
Wairarapa DHB	84.1	91.7	89.1
Waitemata DHB			
West Coast DHB	75.7	62.9	85.7
Whanganui DHB	66.7	75.0	80.9
New Zealand	87.3	90.0	92.1

Process measure 2: Appropriate response to escalations

The second process measure 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 60.6 percent. There was also considerably more variance between DHBs than for the first process measure, highlighting an opportunity for improvement. Approximately 15 DHBs submitted data for this measure (14 from the group that have implemented the NZEWS and one from the group yet to implement).

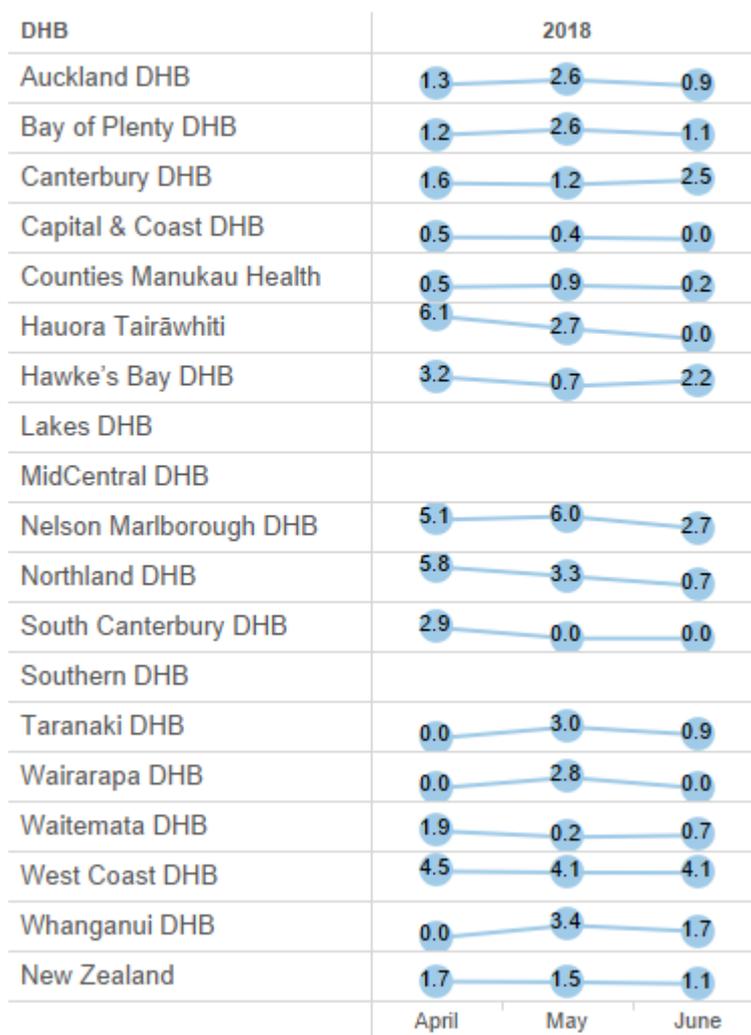
Figure 25: Process measure 2: percentage of patients that triggered an escalation of care and received the appropriate response



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 those generated from administrative systems locally.

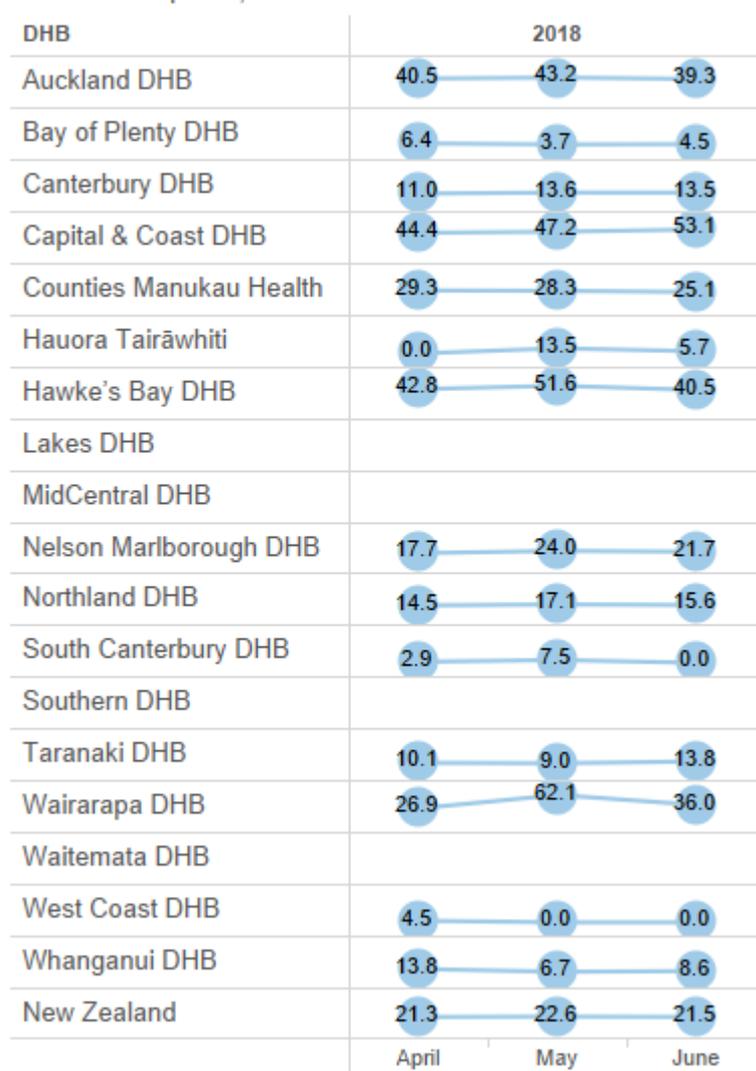
Figure 26: Outcome measure 1: rate of in-hospital cardiopulmonary arrests in adult inpatient wards, units or departments per 1,000 admissions



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

The second outcome measure shows the rate of rapid response escalations per 1,000 admissions (excluding those mentioned previously). The results showed a national rate of 20.9 events per 1,000 admissions. A total of 15 DHBs provided data for this measure (14 from the group who have implemented the NZEWS and two from the group yet to implement).

Figure 27: Outcome measure 2: rate of rapid response escalations per 1,000 admissions



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 this data.

