



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

Quality and safety markers update

Quarter 1 (January–March) 2019

Contents

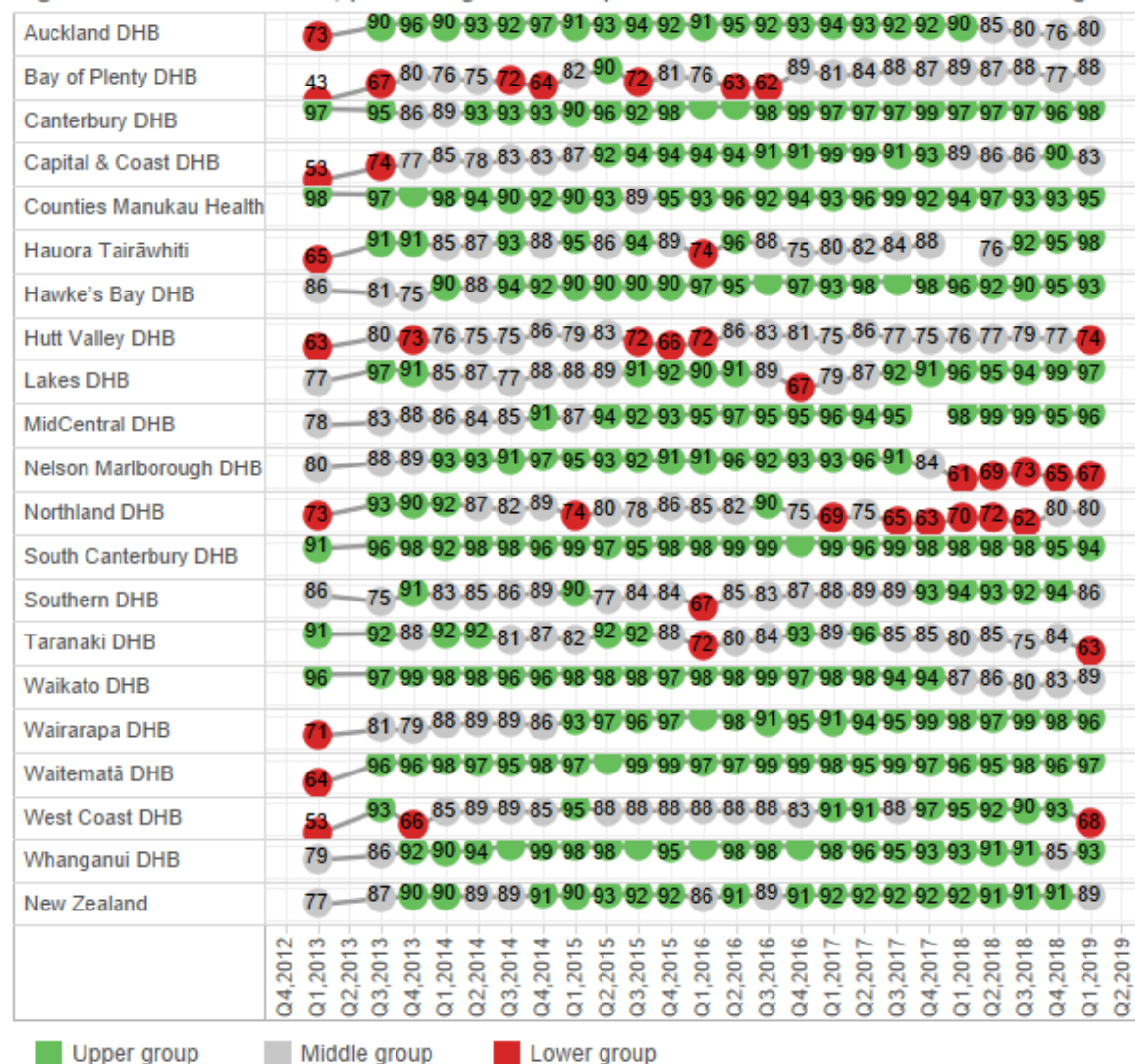
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Falls

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

Nationally, 89 percent of older patients* were assessed for their falls risk in quarter 1, 2019. 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, 10 out of 20 DHBs achieved the expected marker level. Capital & Coast, Hutt Valley, Southern, Taranaki and West Coast DHBs have seen declines in assessments, while Bay of Plenty and Whanganui DHB have seen improvements.

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



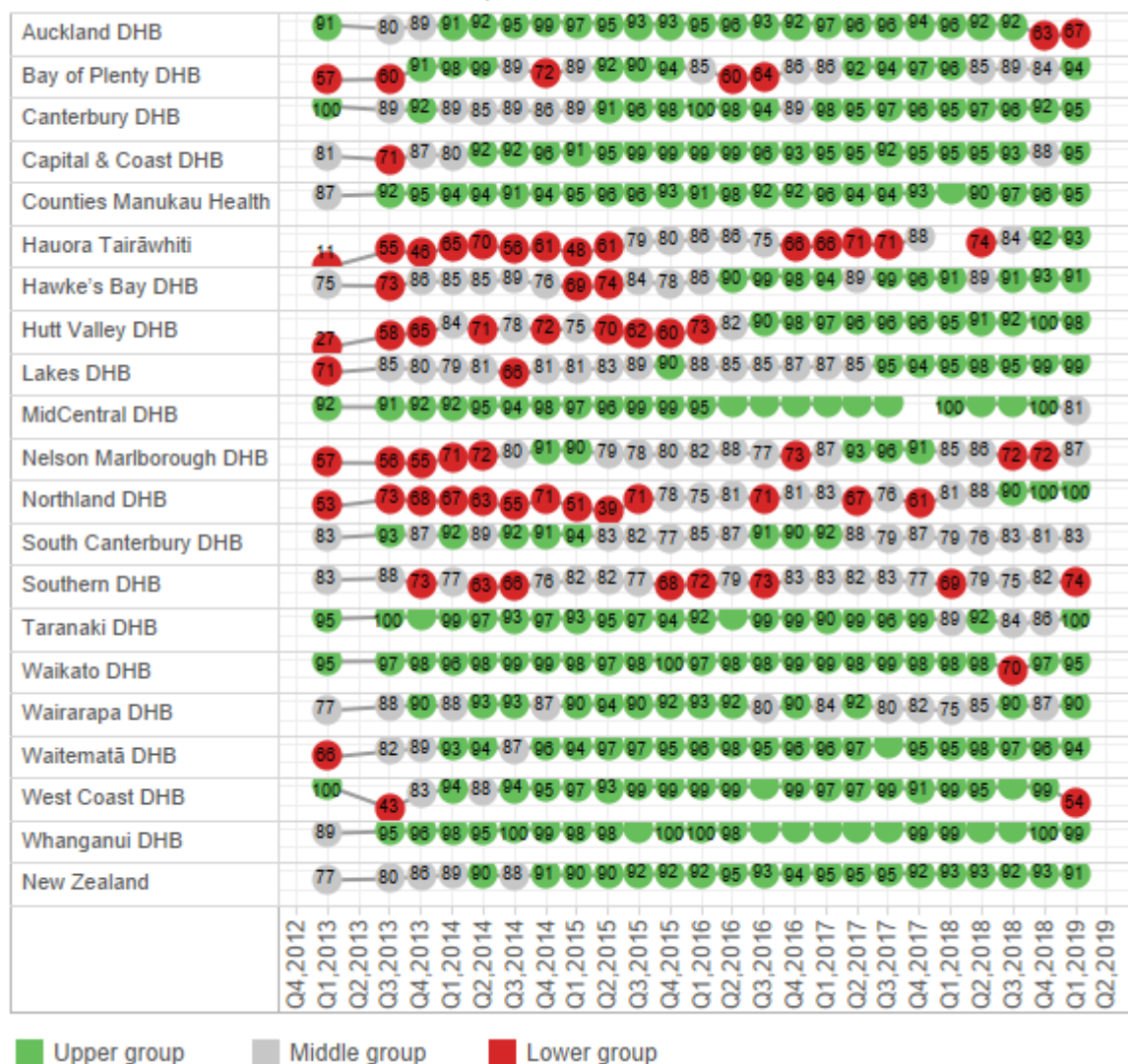
- Upper group: ≥ 90 percent
- Middle group: 75–89 percent
- Lower group: < 75 percent

* 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 91 percent of patients assessed as being at risk of falling had an individualised care plan completed. This measure has increased 14 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. In quarter 1, 2019, there were 14 DHBs in the upper group. MidCentral, Southern and West Coast DHBs have seen a decline in the development of an individualised care plan, while Bay of Plenty, Capital & Coast and Nelson Marlborough DHBs have seen an improvement.

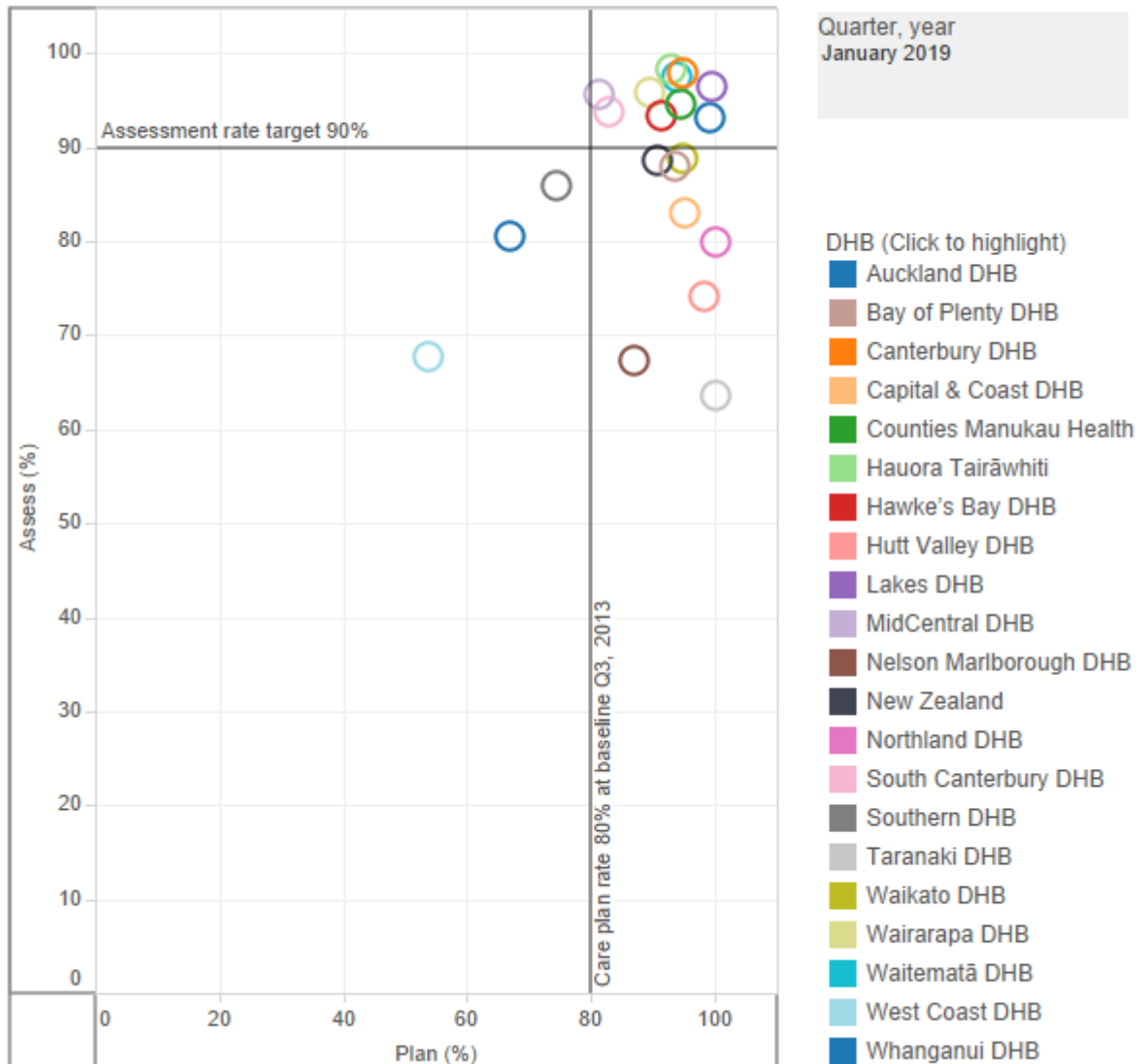
Figure 2: Process marker, percentage of older patients assessed as at risk of falling who received an individualised care plan that addresses these risks



- 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 quarter 1, 2019, 10 DHBs are in this 'ideal' box (see Figure 3), down from 11 DHBs the last quarter. Auckland, Southern and West Coast DHBs are in the lower left corner, which is below the target for assessment and care plan.

Figure 3: Falls assessment compared with care planning

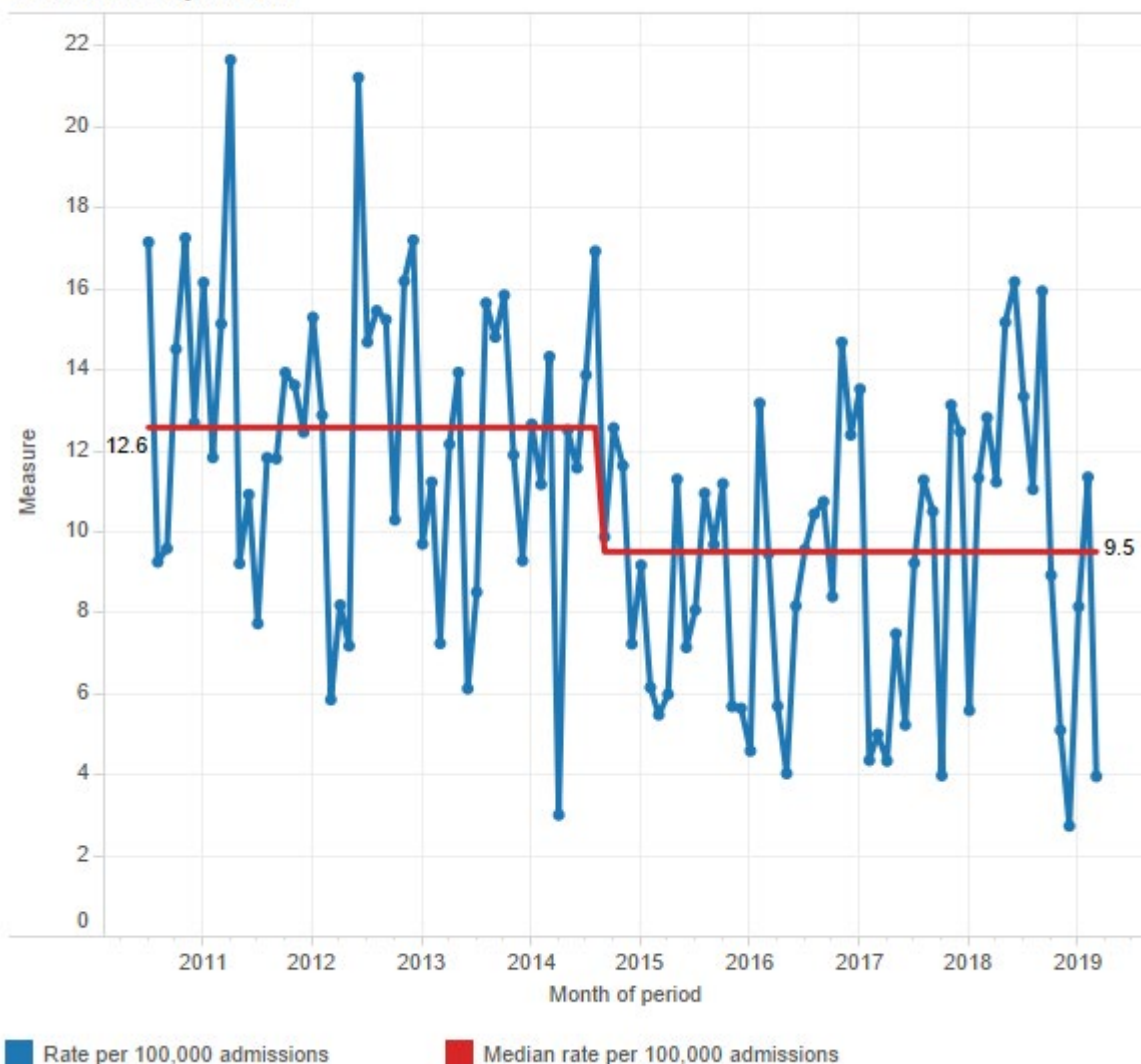


Outcome marker: In-hospital falls resulting in a fractured neck of femur per 100,000 admissions

There were 93 falls resulting in a fractured neck of femur (broken hip) in the 12 months ending March 2019.

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 9.5 per 100,000 admissions, and shown a significant improvement. There was a high number of falls in February to October 2018. While this would normally be an indication of a significant increase in the rate, the subsequent months see a return to the median.

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

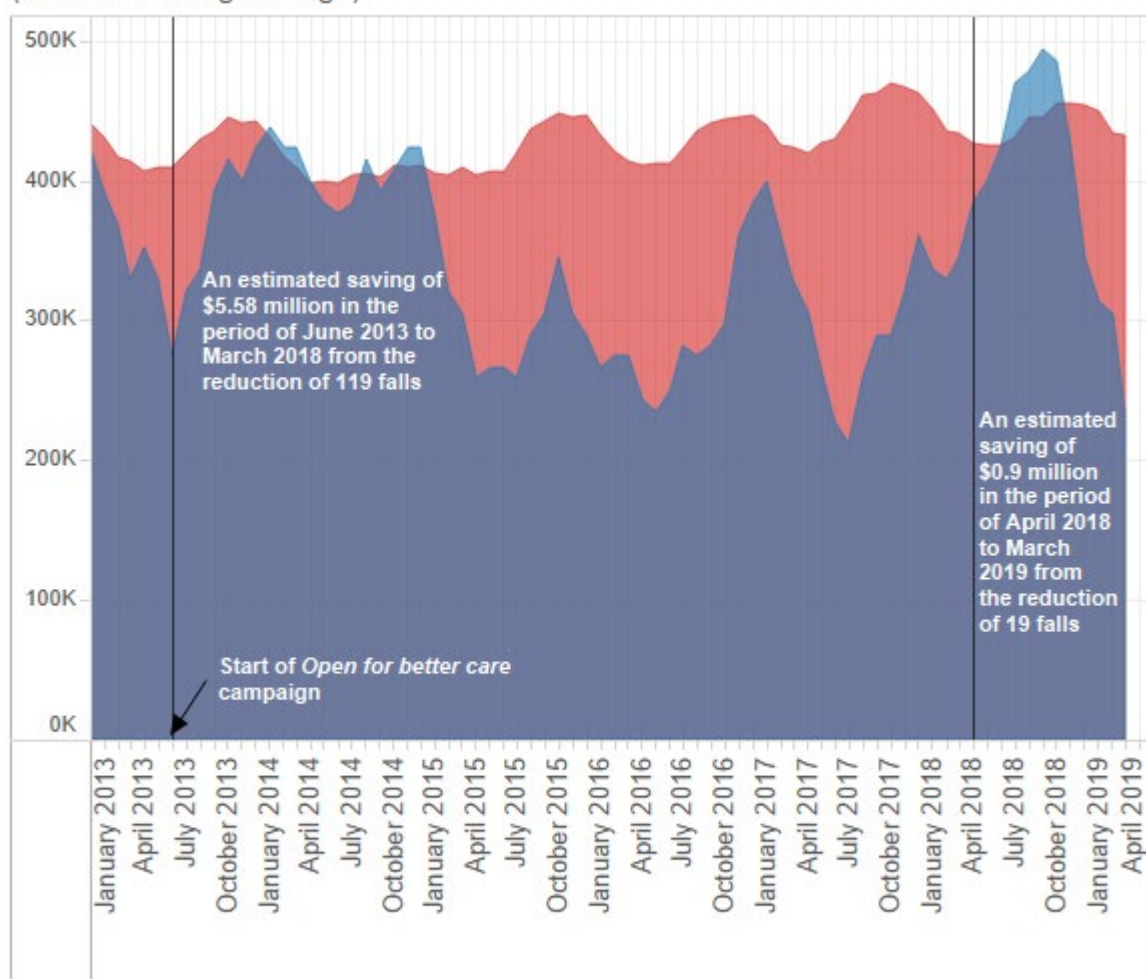


The number of 93 in-hospital falls resulting in a fractured neck of femur is significantly lower than the 112 we would have expected this year, given the falls rate observed in the period between July 2010 and June 2012. The reduction is estimated to have saved \$0.9 million in the year ending March 2019, 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 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 \$1.2 million in total avoidable costs since March 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 (red) Observed cost (blue)

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.

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 86 percent compliance for the period November 2018 – March 2019 compared with 62 percent in the baseline in July–October 2012.

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

Auckland DHB	70	75	75	76	77	76	76	79	78	81	83	84	84	84	85	86	85	85	86	86
Bay of Plenty DHB	43	59	67	65	75	80	77	77	80	83	83	82	78	81	81	85	83	83	81	76
Canterbury DHB	60	65	67	68	68	67	62	73	77	78	78	78	79	83	81	80	81	82	81	82
Capital & Coast DHB	60	62	75	71	75	75	76	72	79	81	80	78	82	79	76	84	82	80	82	83
Counties Manukau Health	59	70	72	75	72	74	77	81	78	77	81	83	81	84	84	85	87	87	87	87
Hauora Tairāwhiti	74	73	79	78	81	70	72	69	72	73	73	73	69	72	71	71	64	66		72
Hawke's Bay DHB	54	65	73	72	70	72	81	81	85	86	90	87	88	89	87	88	89	85	87	88
Hutt Valley DHB	47	62	73	82	61	50	60	66	78	78	80	80	80	80	82	80	78	79	81	83
Lakes DHB	62	64	71	68	74	79	86	80	82	77	73	82	80	82	81	84	82	77	81	82
MidCentral DHB	65	72	70	72	66	72	72	76	78	75	75	81	81	79	81	79	75	79	78	79
Nelson Marlborough DHB	50	55	64	67	70	71	75	74	80	81	75	76	81	78	81	79	80	81	85	88
Northland DHB	77	73	68	76	69	66	76	80	84	83	86	87	88	86	87	84	87	88	88	88
South Canterbury DHB	60	54	63	72	75	86	78	84	84	80	72	67	80	66	76	79	75	82	83	84
Southern DHB	63	62	59	69	72	75	76	78	85	86	85	83	86	83	86	82	82	82	81	81
Taranaki DHB	65	64		83	71	68	60	69	77	77	84	78	78	70	72	73	82	78	66	70
Waikato DHB	67	60	72	66	71	76	79	77	82	79	83	86	87	84	85	82	84	83	78	79
Wairarapa DHB	71	68	77	78	82	81	80	79	80	81	79	87	81	81	82	93	90	87	82	94
Waitematā DHB	62	73	74	71	75	79	80	80	80	85	81	83	85	86	86	88	89	90	89	89
West Coast DHB	66	66	73	71	72	77	80	81	83	86	78	81	79	80	82	79	78	82	81	84
Whanganui DHB	70	74	75	77	78	79	83	82	84	85	84	84	84	85	86	87	86	88	84	85
New Zealand	62	67	71	71	73	73	75	77	80	81	81	82	83	84	84	85	85	85	85	86
	Jul–Oct 2012	Nov 2012–Mar 2013	Apr–Jun 2013	Jul–Oct 2013	Nov 2013–Mar 2014	Apr–Jun 2014	Jul–Oct 2014	Nov 2014–Mar 2015	Apr–Jun 2015	Jul–Oct 2015	Nov 2015–Mar 2016	Apr–Jun 2016	Jul–Oct 2016	Nov 2016–Mar 2017	Apr–Jun 2017	Jul–Oct 2017	Nov 2017–Mar 2018	Apr–Jun 2018	Jul–Oct 2018	Nov 2018–Mar 2019

■ Upper group

■ Middle group

■ Lower group

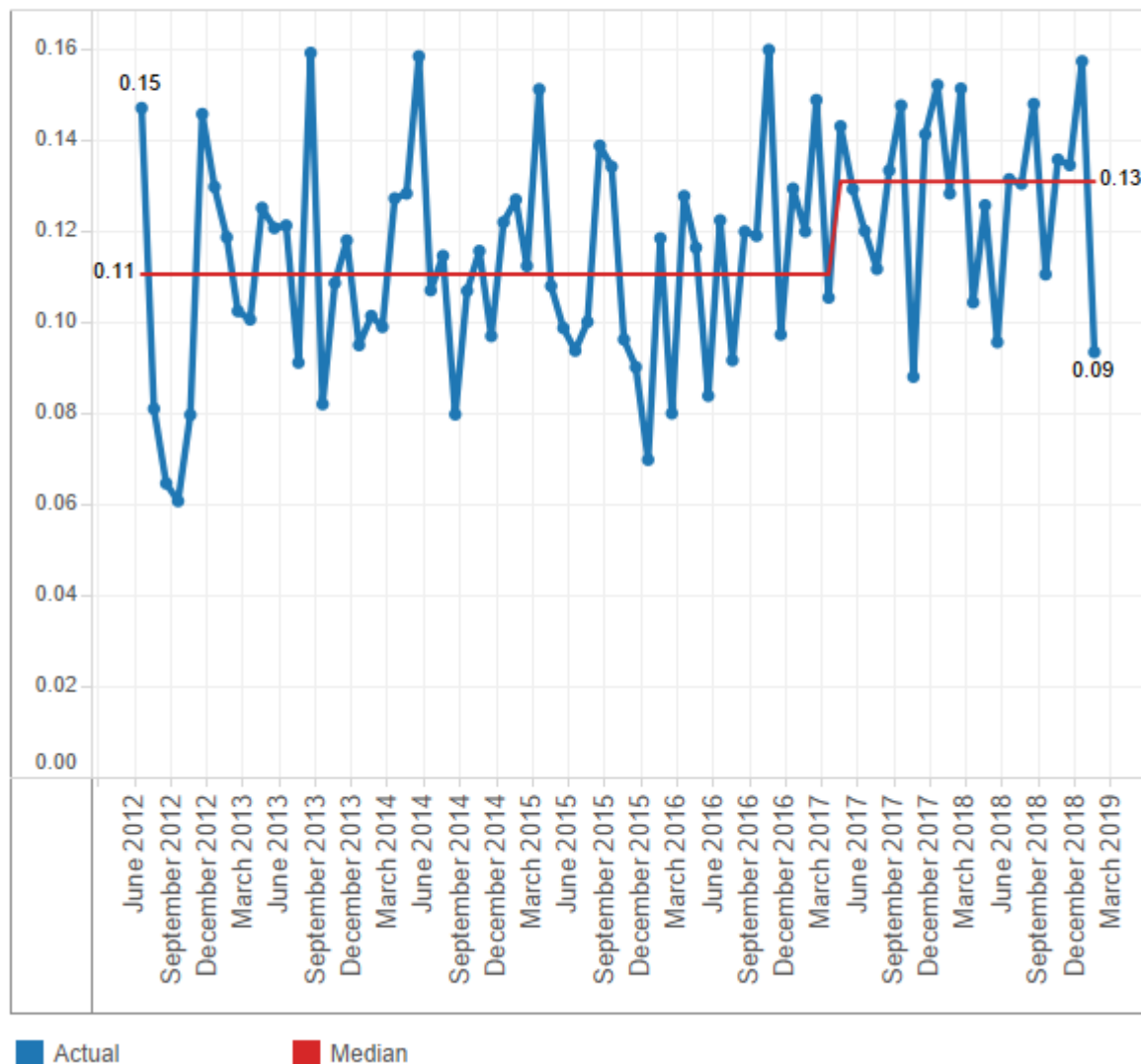
- Upper group: ≥ 70 percent before quarter 3, 2014; 75 percent in quarters 3 and 4, 2014; and 80 percent since quarter 1, 2015
- Middle group: 60 percent to target.
- Lower group: < 60 percent
- Hand hygiene national compliance data is reported three times every year, not quarterly

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. The final month 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 4, 2018.

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 4, 2018, 98 percent of hip and knee arthroplasty procedures involved the giving of an antibiotic within 60 minutes before knife to skin. Twelve DHBs achieved the national goal. In quarter 4, 2018 Counties Manukau Health has moved to the middle group. Northland DHB remains in the lower group.

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	95	98	100	
Bay of Plenty DHB	95	92	95	97	95	97	98	99	99	96	99	98	99	99	98	98	97	100	98	99	99	100	
Canterbury DHB	94	96	97	96	94	99	97	100	100	98	99	100	99	100	99	98	100	100	100	100	100	100	
Capital & Coast DHB	93	96	93	99	95	98	96	100	100	100	100	100	100	100	100	99	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	94	93	98	
Hauora Tairāwhiti	91	91	88	48	88	95	97	95	100	91	97	87	94	100	92	100	93	93	90	93	100	100	
Hawke's Bay DHB	93	88	95	93	100	98	100	100	100	98	100	100	100	100	97	100	99	100	100	100	100	100	
Hutt Valley DHB	99	85	54	91	94	91	95	97	98	94	96	98	99	98	100	100	100	100	100	98	99	100	
Lakes DHB	100	98	99	98	100	99	99	98	97	100	97	97	100	99	98	100	100	98	100	100	100	100	
MidCentral DHB	91	94	96	99	97	96	90	100	99	98	98	98	99	98	100	98	100	100	97	96	100	99	
Nelson Marlborough DHB	92	87	97	99	100	98	97	99	96	99	100	98	100	99	97	96	97	100	100	100	100	100	
Northland DHB	98	89	98	97	95	96	93	91	92	98	98	99	98	99	95	93	90	96	96	90	90	85	
South Canterbury DHB	93	84	95	100	100	100	100	100	96	100	100	95	100	100	95	98	95	100	100	96	100	100	
Southern DHB	77	66	88	91	92	93	92	93	92	90	97	96	97	99	98	96	95	100	100	98	99	95	
Taranaki DHB	93	91	100	97	98	90	95	78	94	89	100	100	99	100	97	100	100	100	100	99	97		
Waikato DHB	85	98	90	87	92	81	93	92	94	97	98	98	99	96	99	97	99	99	98	100	99	99	
Wairarapa DHB	97	100	100	97	100	96	100	100	100	95	100	100	94	100	100	100	100	100	100	100	100	100	
Waitematā DHB	92	92	95	97	98	98	97	94	98	96	92	92	98	95	94	90	97	96	98	95	97	97	
West Coast DHB	87	94	100	89	100	100	96	100	93	100	100	100	100	100	100	100	100	100	100	97	97	100	
Whanganui DHB	90	93	100	100	100	100	100	100	100	100	100	100	100	100	100	99	100	100	100	100	98	98	
New Zealand	90	90	93	94	96	95	96	96	97	97	97	97	98	98	98	98	97	98	98	99	97	98	98
	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	Q2, 2018	Q3, 2018	Q4, 2018	Q1, 2019

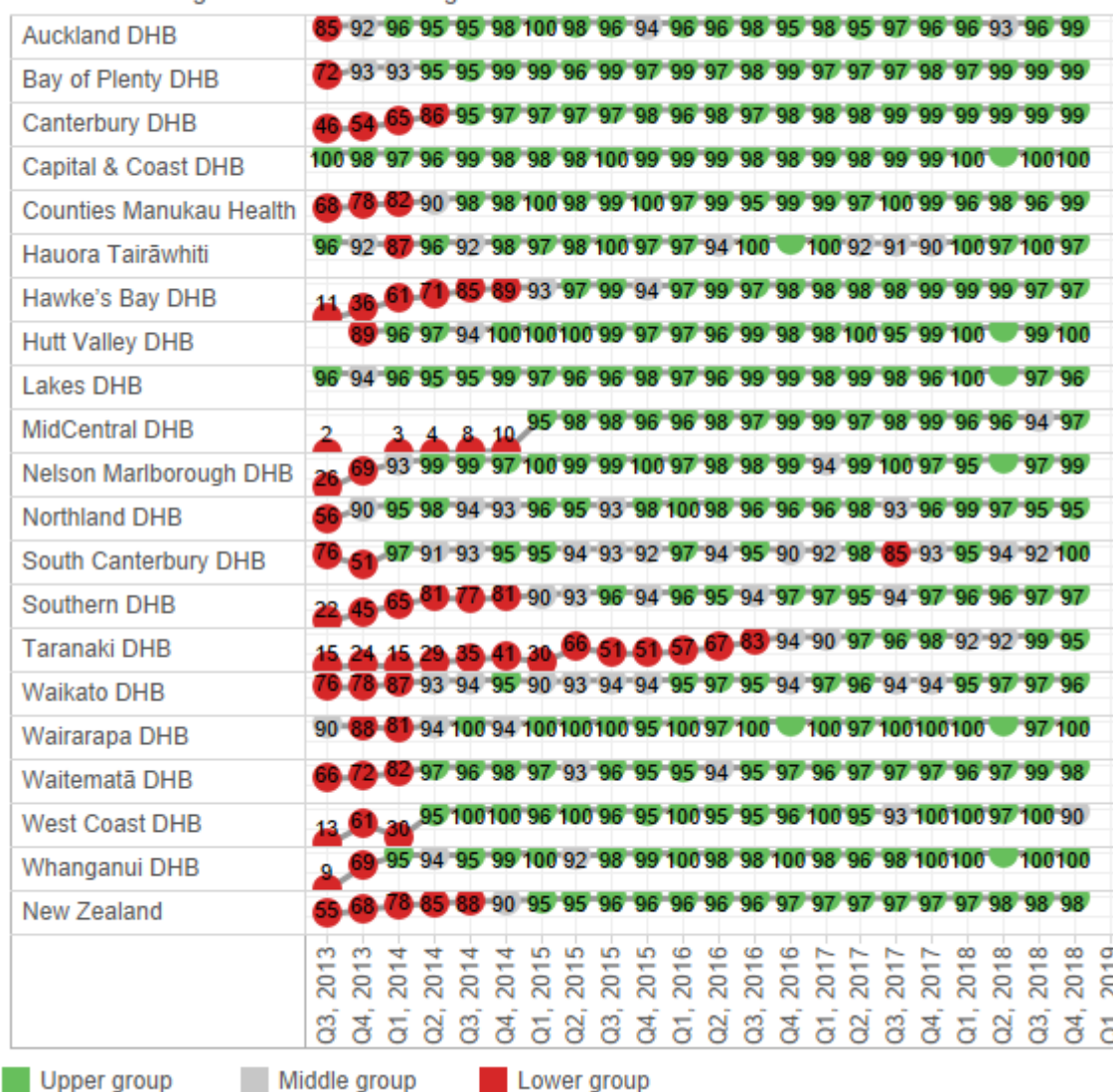
■ Upper group
 ■ Middle group
 ■ Lower group

- 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, 98 percent of hip and knee arthroplasty procedures received the recommended antibiotic and dose. Nineteen of the twenty DHBs reached the threshold level of 95 percent compared with only three in the baseline quarter.³

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



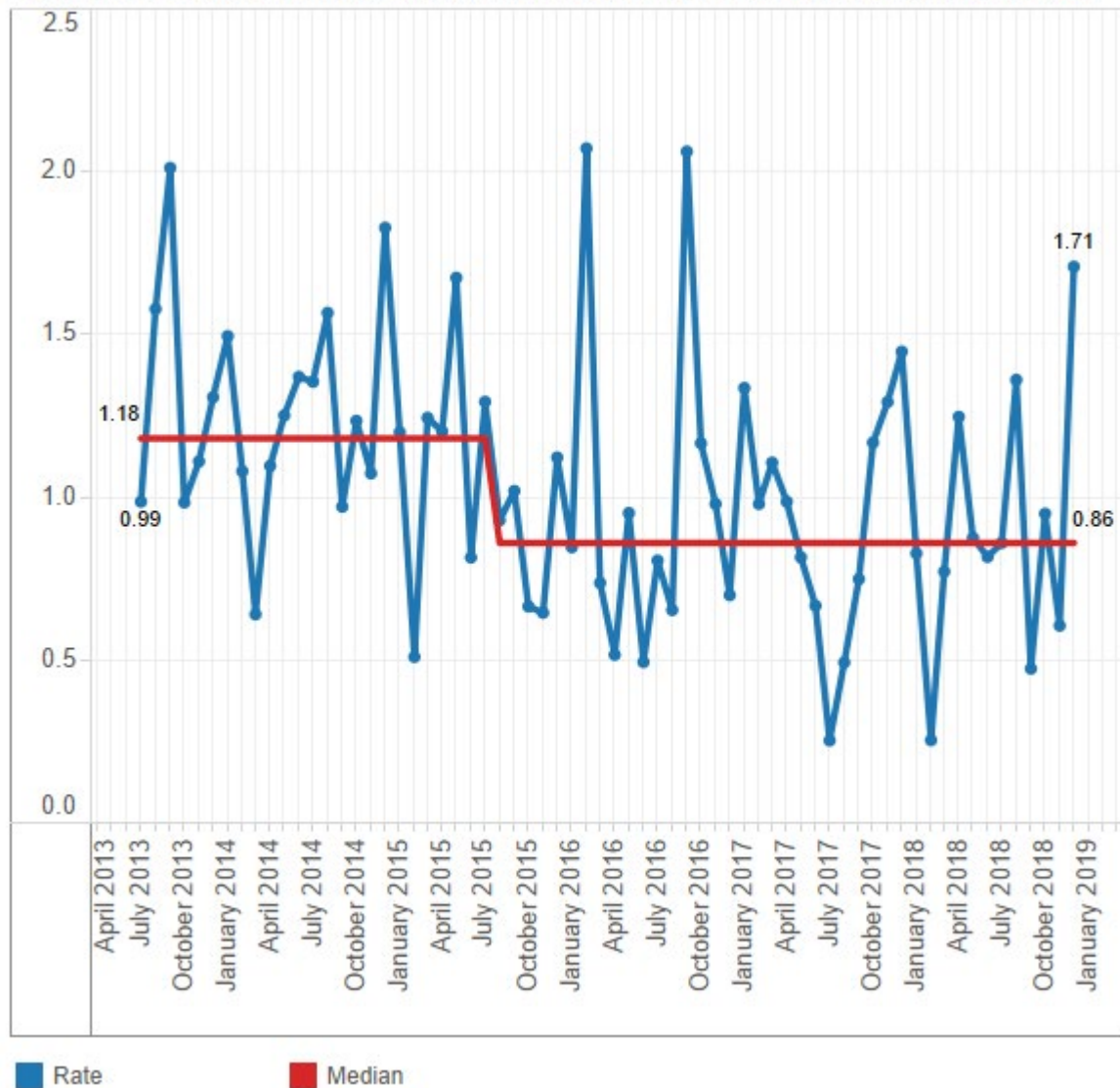
- Upper group: ≥ 95 percent
- Middle group: 90–94 percent
- Lower group: < 90 percent

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.

Outcome marker: SSIs per 100 hip and knee operations

In quarter 4, 2018 there were 26 SSIs out of 2,583 hip and knee arthroplasty procedures, an SSI rate of 1.01 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 0.86 percent after it.

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



SSI improvement – cardiac surgery

This is the ninth 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 100 percent of procedures achieving this marker. Southern 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: Dosing – correct antimicrobial prophylaxis used in at least 95 percent of procedures

The antibiotic prophylaxis of choice is 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 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

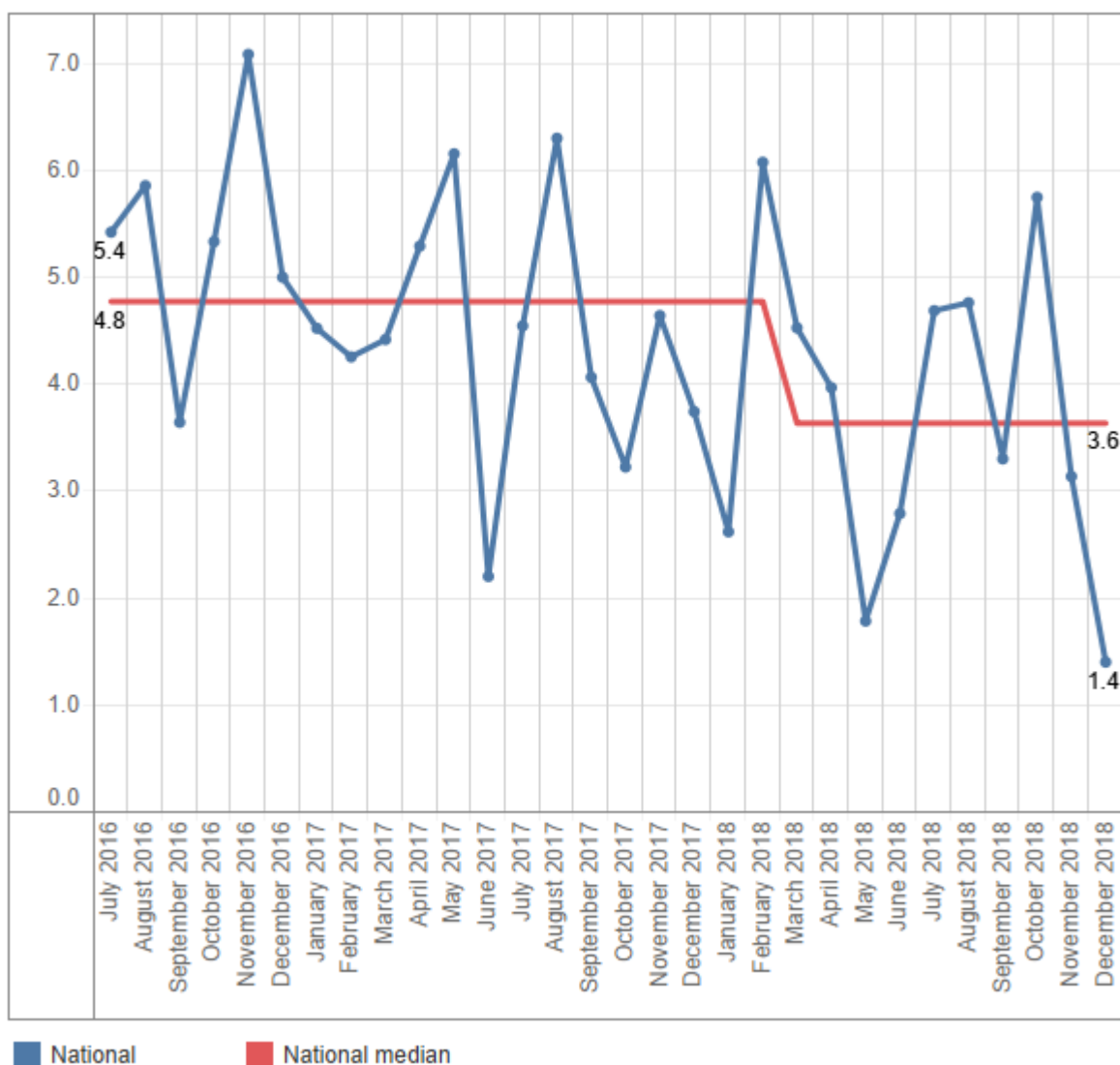


- Upper group: 100 percent
- Middle group: 95–99 percent
- Lower group: < 95 percent

Outcome marker: SSIs per 100 procedures rate

In quarter 4, 2018 we see the median shift downwards for the first time from 4.8 SSI cases per 100 cardiac procedures to 3.6. This is a significant improvement since the beginning of the Surgical Site Infection Improvement 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 11th 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. Thirteen out of the 20 DHBs achieved 50 audits for all three parts in quarter 1, 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 DHB	68	72	64
Bay of Plenty DHB	74	69	62
Canterbury DHB	54	75	54
Capital & Coast DHB	50	55	50
Counties Manukau Health	765	782	755
Hauora Tairāwhiti	60	57	48
Hawke's Bay DHB	58	89	58
Hutt Valley DHB	49	47	13
Lakes DHB	20	19	12
MidCentral DHB	52	51	41
Nelson Marlborough DHB	32	37	27
Northland DHB	57	67	53
South Canterbury DHB	3	65	52
Southern DHB	58	60	50
Taranaki DHB	51	51	42
Waikato DHB	0	0	0
Wairarapa DHB	58	68	58
Waitematā DHB	57	53	51
West Coast DHB	53	53	52
Whanganui DHB	74	78	74

■ 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 13 DHBs that achieved 50 audits in each checklist, seven 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	Q2, 2018	Q3, 2018	Q4, 2018	Q1, 2019	Baseline	Rolling	Q2, 2018	Q3, 2018	Q4, 2018	Q1, 2019	Baseline	Rolling	Q2, 2018	Q3, 2018	Q4, 2018	Q1, 2019
Auckland DHB	98	98	98		98	97	93	98	98		98	94	98	96	94		98	94
Bay of Plenty DHB	97	100	99	100	100	100	96	99	100	100	99	99		98	97	100	100	97
Canterbury DHB	91	100	100	100	98	100	92	99	99	100	98	99	96	100	100	100	98	100
Capital & Coast DHB	96	100	98	100	100	100	97	100	100	100	100	100	97	100	100	98	100	100
Counties Manukau Health	99	100	100	100	100	100	100	100	100	100	100	100	99	100	100	100	100	99
Hauora Tairāwhiti	100	100	100	98	100	100	99	99	98	96	100	100		100	100	98	100	
Hawke's Bay DHB		96		95	95	98	78	77	82	75	76	78		86		84	84	88
Hutt Valley DHB									98									
Lakes DHB																		
MidCentral DHB	96	97	94	96	98	98	92	90	93	94	80	96	97		95	100	100	
Nelson Marlborough DHB	88						93						91					
Northland DHB		98	100	100	96	95	91	96	95	97	96	97		97		98	100	96
South Canterbury DHB								81	76	75	83	100		79	70	78	80	100
Southern DHB				96		95	98			100	98	92			98		100	
Taranaki DHB					79	75						58	73				96	
Waikato DHB	81						67											
Wairarapa DHB	97			89		90	98	97		95	100	99			94		100	
Waitematā DHB	96	99	98	100	100	98	96	99	100	98	98	100	94	99	98	98	100	98
West Coast DHB		100	100	100	100	100		100	100	100	100	100		100	100	100	100	100
Whanganui DHB		89	95	85	85	92		97	100	96	94	96		98	100	98	96	99
New Zealand	93	97	97	96	98	98	93	95	95	94	95	97	94	97	95	96	98	99

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, 2018 to Q1, 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 and Wairarapa DHBs achieved the target in all three parts. Twelve other DHBs achieved the target in one or two parts – an increase from nine 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	Q2, 2018	Q3, 2018	Q4, 2018	Q1, 2019	Baseline	Rolling	Q2, 2018	Q3, 2018	Q4, 2018	Q1, 2019	Baseline	Rolling	Q2, 2018	Q3, 2018	Q4, 2018	Q1, 2019
Auckland DHB	97	94	95		92	94	94	93	95		89	93	93	92	89		91	93
Bay of Plenty DHB	88	98	95	100	100	99	87	98	96	98	99	100		97	91	100	99	100
Canterbury DHB	88	100	98	100	100	100	76	97	94	99	98	97	65	93	93	96	93	91
Capital & Coast DHB	86	87	80	87	87	96	91	90	89	76	96	96	94	88	88	88	90	86
Counties Manukau Health	99	98	100	97	96	99	99	100	100	100	99	100	94	94	99	94	93	94
Hauora Tairāwhiti	85	84	74	81	90	90	89	84	82	76	87	91		89	85	82	94	
Hawke's Bay DHB		96		97	96	95	81	87	85	79	94	91		94		93	94	94
Hutt Valley DHB									98									
Lakes DHB																		
MidCentral DHB	95	97	94	100	98	96	87	99	100	100	96	100	85		93	100	100	
Nelson Marlborough DHB	57						87						66					
Northland DHB		100	100	100	98	100	79	96	94	93	98	98		90		88	94	92
South Canterbury DHB								70	59	70	55	97		55	46	58	41	83
Southern DHB				98		95	93			100	100	100				100		94
Taranaki DHB					93	97					84	89						92
Waikato DHB	97						92											
Wairarapa DHB	96			92		96	99	98		98	100	100				98		100
Waitematā DHB	83	90	85	96	88	89	86	95	92	94	94	100	91	96	95	100	92	98
West Coast DHB		99	100	98	100	96		100	100	100	100	100		96	96	100	96	90
Whanganui DHB		95	91	93	96	99		89	92	87	84	92		91	96	84	89	95
New Zealand	90	96	95	96	96	97	89	95	93	93	95	97	84	91	90	91	91	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: Q4, 2017 to Q1, 2019.

- Target achieved
- Less than 75%
- Between 75% and the target
- 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 1, 2019, 13 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

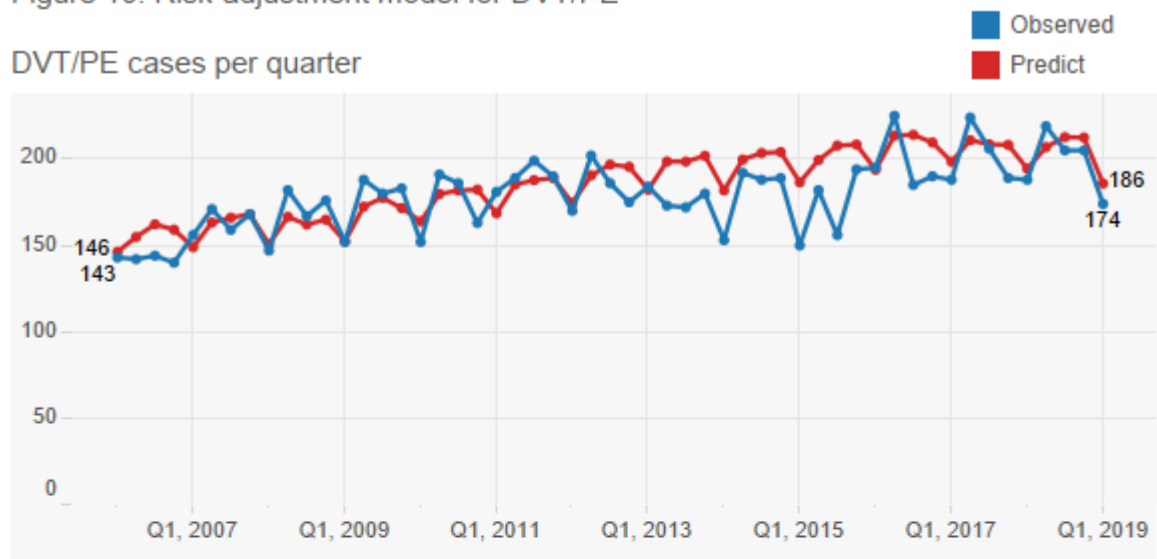
	2017		2018				2019
	Q4	Q3	Q1	Q2	Q4	Q3	Q1
Auckland DHB			4	1	8	3	2
Bay of Plenty DHB	11	20	15	11	17	16	7
Canterbury DHB		1					
Capital & Coast DHB	6		3				
Counties Manukau Health	462	311	496	531	875	761	790
Haoura Tairāwhiti							
Hawke’s Bay DHB		7					
Hutt Valley DHB		14					5
Lakes DHB	11	12	22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

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 markers.

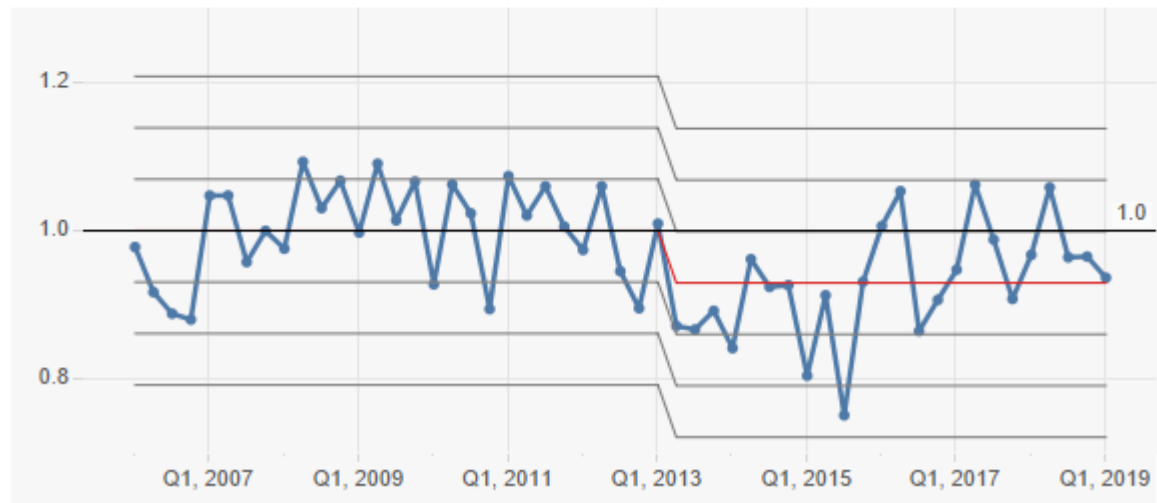
The model is used to identify how likely patients being operated on were to develop sepsis or DVT/PE based on factors such as their condition, health history and the operation being undertaken. From this, we can calculate how many patients we would have predicted to develop sepsis or DVT/PE based on 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.

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. Over the past three years, a higher number of cases of DVT/PE have been observed in the second quarter.

Figure 19: Risk-adjustment model for DVT/PE



Control chart, O/E ratio per quarter



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

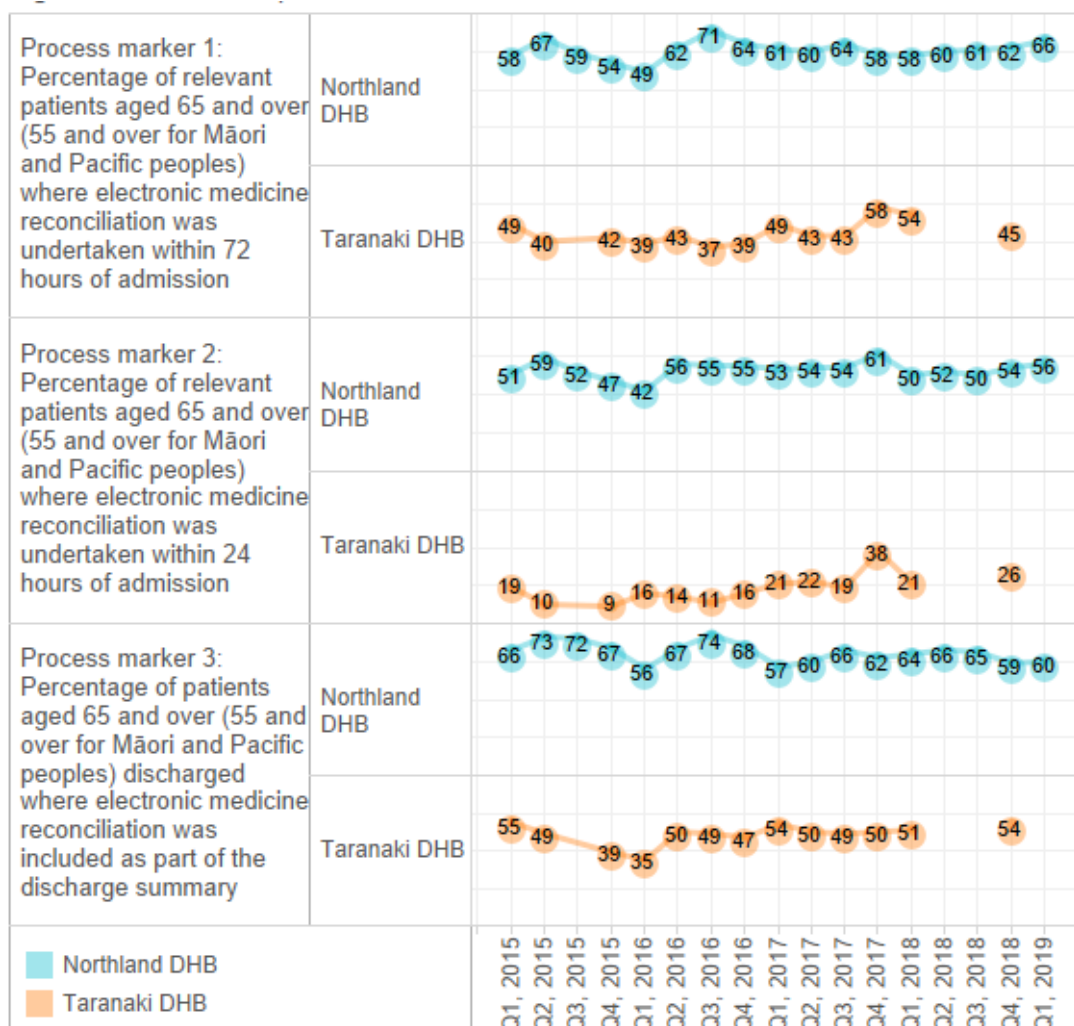
DHB	Status
Auckland	Implemented
Canterbury	Implemented
Counties Manukau Health	Implemented
Northland	Implemented
Taranaki	Implemented
Waitematā	Implemented
Bay of Plenty	Not implemented
Capital & Coast	Not implemented
Hauora Tairāwhiti	Not implemented
Hawke's Bay	Not implemented
Hutt Valley	Not implemented
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.

Figure 22: eMedRec process markers



Patient deterioration

This is the fourth 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 New Zealand percentage 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
Auckland DHB		100	100	100	100
Bay of Plenty DHB	100	100	100	100	100
Canterbury DHB	100	100	100	100	100
Capital & Coast DHB	100		100	88	100
Counties Manukau Health	100	100	100	100	100
Hauora Tairāwhiti	100	100	100		100
Hawke's Bay DHB	0	83	83	83	83
Hutt Valley DHB	100	100	100		100
Lakes DHB	83	83	100	100	100
MidCentral DHB	100	100	100	100	100
Nelson Marlborough DHB	90	90	89	89	89
Northland DHB	45	80	70	70	70
South Canterbury DHB	0	0	0	50	100
Southern DHB*		0	0	0	0
Taranaki DHB	100	100	100	100	100
Waikato DHB	100		100	100	100
Wairarapa DHB	100	100	100	100	100
Waitematā DHB*	0	0	0	0	0
West Coast DHB	0	100	100	100	100
Whanganui DHB	100	100	100	100	100
New Zealand	96	97	98	96	98

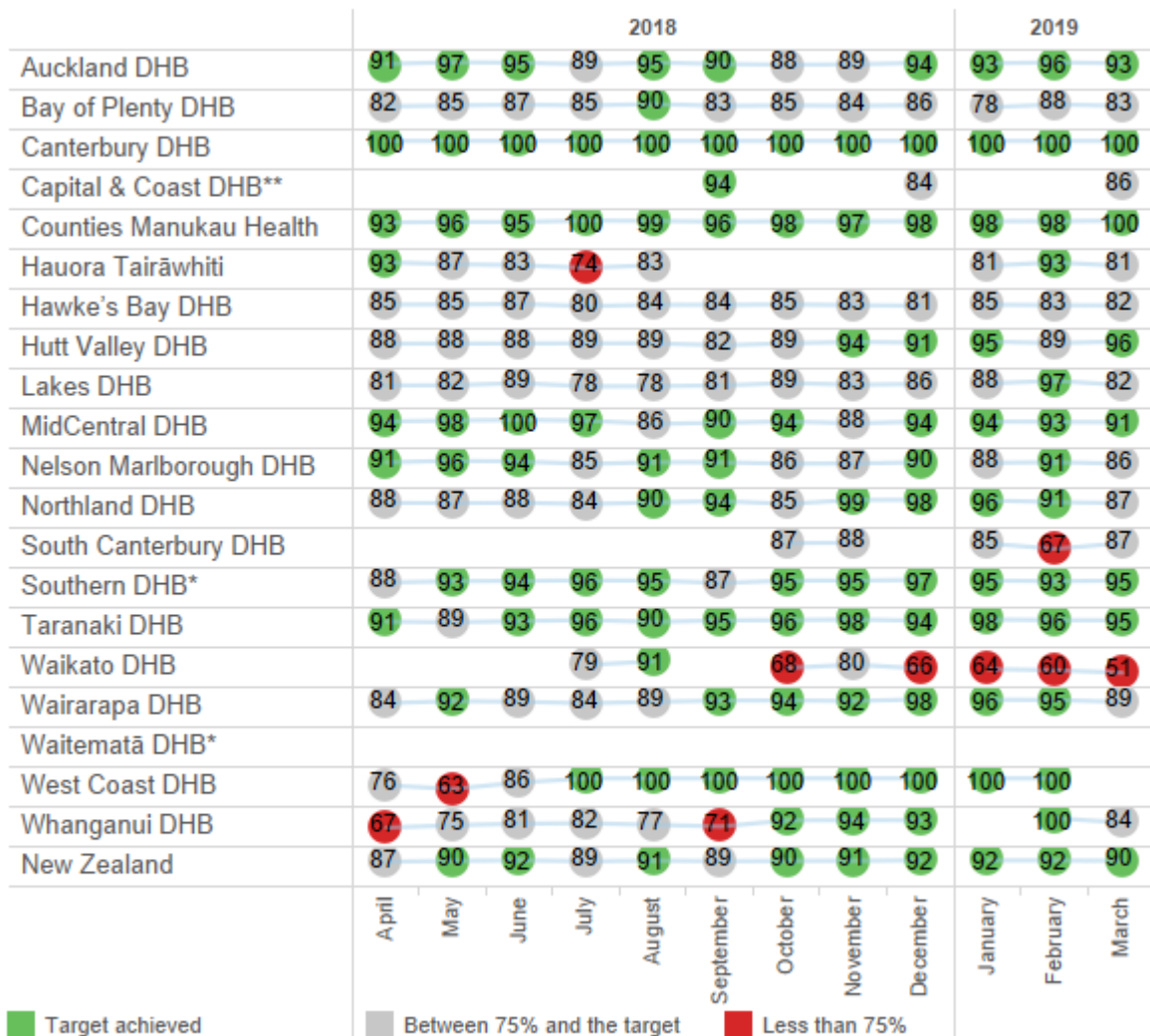
*Yet to implement the New Zealand early warning score.

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 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 91 percent for this quarter.

19 DHBs (95 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



*Yet to implement the New Zealand early warning score.

**Only report quarterly.

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 65 percent, a decrease from the previous quarter. There was also 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 18 DHBs (90 percent) submitted data for this measure.

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

	2018										2019		
Auckland DHB	87	83	83	93	86	79	91	94	80	80	98	85	
Bay of Plenty DHB	31	22	50	40	50	62	63	68	100	57	63	43	
Canterbury DHB	67	54	53	52	51	52	56	45	71	66	77	58	
Capital & Coast DHB**						97			99			75	
Counties Manukau Health	75	27	53	56	100	67	69	78	100	86	89	88	
Hauora Tairāwhiti	100											50	
Hawke's Bay DHB	73	40	33	69	50	58	85	75	90	100	69	40	
Hutt Valley DHB	14	25	40	33	20	17	36	0	20	43	33	100	
Lakes DHB		0	100	0	20	50	50	100	0		100	100	
MidCentral DHB	75	100	93	75	78	86	80	71	89	56	100	44	
Nelson Marlborough DHB	66	75	67	44	50	50	79	73	57	67	25	33	
Northland DHB	28	42	37	15	14	57	75	20	67	50	75	67	
South Canterbury DHB							100	100		67	75	60	
Southern DHB*	23	30	15	44	28	38	30	36	49	34	48	41	
Taranaki DHB	88	100	100	100	60	83	60	100	60	33	50	100	
Waikato DHB				100	100							100	
Wairarapa DHB	75	100		100	67	100	67		100	33		100	
Waitematā DHB*													
West Coast DHB													
Whanganui DHB		60	80	100	100	50		100	33		0	53	
New Zealand	58	55	59	62	56	68	72	68	84	60	72	63	
	April	May	June	July	August	September	October	November	December	January	February	March	

*Yet to implement the New Zealand early warning score.

**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 show a national rate of 1.3 cardiopulmonary arrests per 1,000 admissions for this quarter. Seventeen 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

	2018										2019		
Auckland DHB	1.3	2.6	1.0	1.5	1.4	2.1	1.9	2.5	0.7	0.3	0.5	1.7	
Bay of Plenty DHB	1.2	2.7	1.1	1.7	1.0	2.8	2.0	2.7	1.1	0.6	1.2	1.6	
Canterbury DHB	1.6	1.2	2.6										
Capital & Coast DHB				0.5	1.6	1.7	0.0	2.6	4.0	3.8	0.9	1.6	
Counties Manukau Health	0.5	0.9	0.2	0.2	0.7	1.2	1.0	0.8	0.8	1.6	1.1	1.0	
Hauora Tairāwhiti	6.1	2.7	0.0	5.5	0.0	2.8				2.7	3.1	0.0	
Hawke's Bay DHB	3.2	0.7	2.2	0.7	1.4	0.7	0.0	1.4	0.0	2.2	2.2	1.4	
Hutt Valley DHB	0.0	1.0	4.1	3.8	3.7	3.8	2.9	2.9	5.0	1.1	2.2	3.4	
Lakes DHB	1.3	0.0	1.3	2.5	0.0	2.3	0.0	0.0	2.4	1.3	1.5	0.0	
MidCentral DHB	2.6	0.8	1.6	1.6	2.2	3.1	3.2	1.6	0.0	2.5	1.7	2.4	
Nelson Marlborough DHB	2.2	2.0	1.4	0.0	0.0	0.0	0.0	1.0	1.0	1.9	1.1	1.0	
Northland DHB	5.8	3.3	0.7	2.9	2.1	1.4	3.9	2.8	2.9	3.4	2.2	0.7	
South Canterbury DHB	2.8	0.0	0.0	2.4	0.0	0.0				0.0	0.0	0.0	
Southern DHB*													
Taranaki DHB	0.0	3.0	1.0	3.0	3.7	2.0	3.9	0.0	4.1	0.0	0.0	0.0	
Waikato DHB													
Wairarapa DHB	0.0	2.8	0.0	8.9	2.7	0.0	0.0	0.0	0.0	0.0	0.0	3.0	
Waitematā DHB*	1.9	0.2	0.7	2.2	1.1	0.7	0.5	1.7	0.8	0.0	0.5	0.2	
West Coast DHB	4.4	4.1	4.2	20.7	3.9	4.8	0.0	4.2	0.0	0.0	0.0	4.2	
Whanganui DHB	0.0	3.4	1.7	3.6	6.4	3.5	3.5	0.0	0.0	2.1	4.0	7.6	
New Zealand	1.7	1.5	1.3	1.9	1.5	1.7	1.4	1.7	1.4	1.3	1.1	1.3	
	April	May	June	July	August	September	October	November	December	January	February	March	

*Yet to implement the New Zealand early warning score.

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). Consistent with the previous quarter, the results showed a national rate of 26 events per 1,000 admissions. Sixteen DHBs (80 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 this data.

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

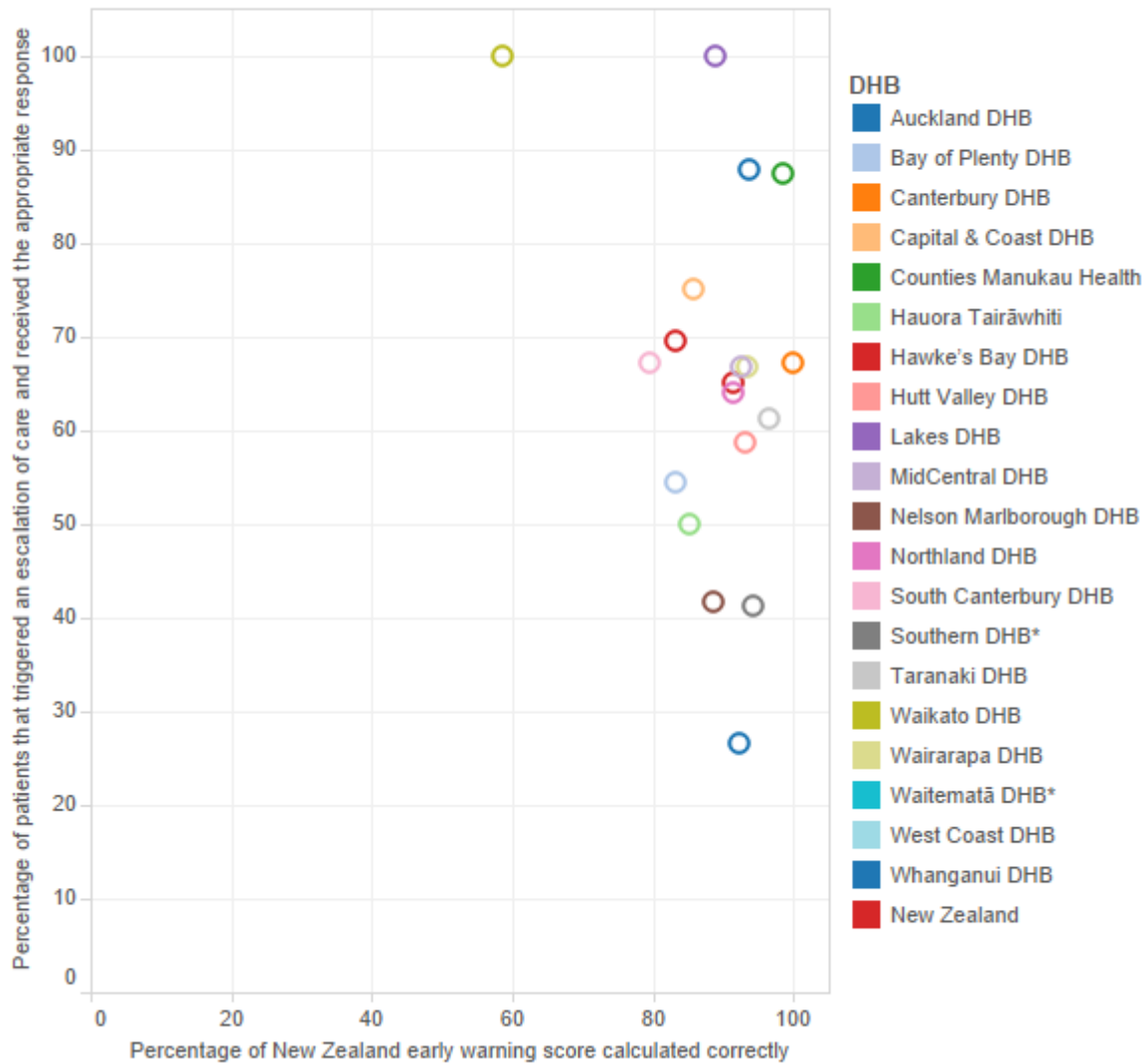
	2018									2019		
Auckland DHB	41	43	40	37	42	40	35	37	40	39	40	45
Bay of Plenty DHB	6	4	5	10	6	9	5	7	11	8	9	12
Canterbury DHB	11	14	14	13	12	11	8	10	15	11	11	18
Capital & Coast DHB				66	55	55	37	43	44	44	38	33
Counties Manukau Health	29	28	26	39	34	35	44	27	37	29	33	32
Hauora Tairāwhiti	0	14	6	8	0	6				3	15	16
Hawke's Bay DHB	43	52	42	52	51	57	32	41	27	42	39	21
Hutt Valley DHB	43	52	56	50	44	48	34	33	32	31	45	75
Lakes DHB	13	6	11	6	7	7	4	9	11	13	6	9
MidCentral DHB	31	23	31	28	28	28	27	26	27	25	29	26
Nelson Marlborough DHB	8	8	11	4	5	6	3	7	10	10	10	11
Northland DHB	15	17	16	24	16	9	26	18	12	12	18	27
South Canterbury DHB	3	8	0	2	7	0				3	8	7
Southern DHB*												
Taranaki DHB	10	9	14	15	11	8	5	7	11	11	11	7
Waikato DHB												
Wairarapa DHB	27	63	37	56	32	37	69	45	19	18	64	42
Waitematā DHB*												
West Coast DHB	4	0	0	21	4	5	0	8	13			
Whanganui DHB	14	7	9	9	10	10	2	0	48	12	4	11
New Zealand	23	25	24	30	27	28	25	24	27	24	26	28
	April	May	June	July	August	September	October	November	December	January	February	March

*Yet to implement the New Zealand early warning score.

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 in the reported rates of appropriate response.

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

Quarter of Period
2019 Q1



Pressure injury

We aim to reduce the occurrence of and harm from pressure injuries (PIs). PIs (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.

PIs 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 PI QSM in July 2018 the majority of DHBs (95 percent, n=19) are now submitting data. This is the first quarter that process and outcome measures have been reported publicly. Following 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 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 81 percent.

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

	2019
Auckland DHB	87
Bay of Plenty DHB	75
Canterbury DHB	92
Capital & Coast DHB	96
Counties Manukau Health	88
Hawke's Bay DHB	40
Hutt Valley DHB	62
Lakes DHB	58
MidCentral DHB	92
Nelson Marlborough DHB	36
Northland DHB	43
South Canterbury DHB	83
Southern DHB	80
Taranaki DHB	88
Waikato DHB	80
Wairarapa DHB	76
Waitematā DHB	85
West Coast DHB	68
Whanganui DHB	84
New Zealand	81
	8

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

The second process measure 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 80 percent.

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

	2019
Auckland DHB	89
Bay of Plenty DHB	81
Canterbury DHB	87
Capital & Coast DHB	80
Counties Manukau Health	90
Hawke's Bay DHB	73
Hutt Valley DHB	78
Lakes DHB	60
MidCentral DHB	91
Nelson Marlborough DHB	56
Northland DHB	93
South Canterbury DHB	14
Southern DHB	
Taranaki DHB	100
Waikato DHB	83
Wairarapa DHB	28
Waitematā DHB	68
West Coast DHB	60
Whanganui DHB	100
New Zealand	80
	Q1

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 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 3.5 percent. 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

	2019
Auckland DHB	2.4
Bay of Plenty DHB	5.2
Canterbury DHB	4.4
Capital & Coast DHB	
Counties Manukau Health	2.7
Hawke's Bay DHB	14.6
Hutt Valley DHB	7.5
Lakes DHB	10.5
MidCentral DHB	1.2
Nelson Marlborough DHB	9.2
Northland DHB	2.1
South Canterbury DHB	4.2
Southern DHB	10.2
Taranaki DHB	7.2
Waikato DHB	3.5
Wairarapa DHB	3.0
Waitematā DHB	0.6
West Coast DHB	2.0
Whanganui DHB	1.8
New Zealand	3.5
	Q1

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

The second outcome measure 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 1.4 percent. 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

	2019
Auckland DHB	0.5
Bay of Plenty DHB	5.2
Canterbury DHB	2.0
Capital & Coast DHB	
Counties Manukau Health	0.2
Hawke's Bay DHB	0.0
Hutt Valley DHB	2.5
Lakes DHB	0.0
MidCentral DHB	0.4
Nelson Marlborough DHB	5.4
Northland DHB	1.1
South Canterbury DHB	0.0
Southern DHB	0.5
Taranaki DHB	1.8
Waikato DHB	0.9
Wairarapa DHB	0.0
Waitematā DHB	2.1
West Coast DHB	1.3
Whanganui DHB	0.0
New Zealand	1.4
	Q1