



HEALTH QUALITY & SAFETY  
COMMISSION NEW ZEALAND

*Kupu Taurangi Hauora o Aotearoa*

## **Quality and safety markers update**

Quarter 4 (October–December) 2018

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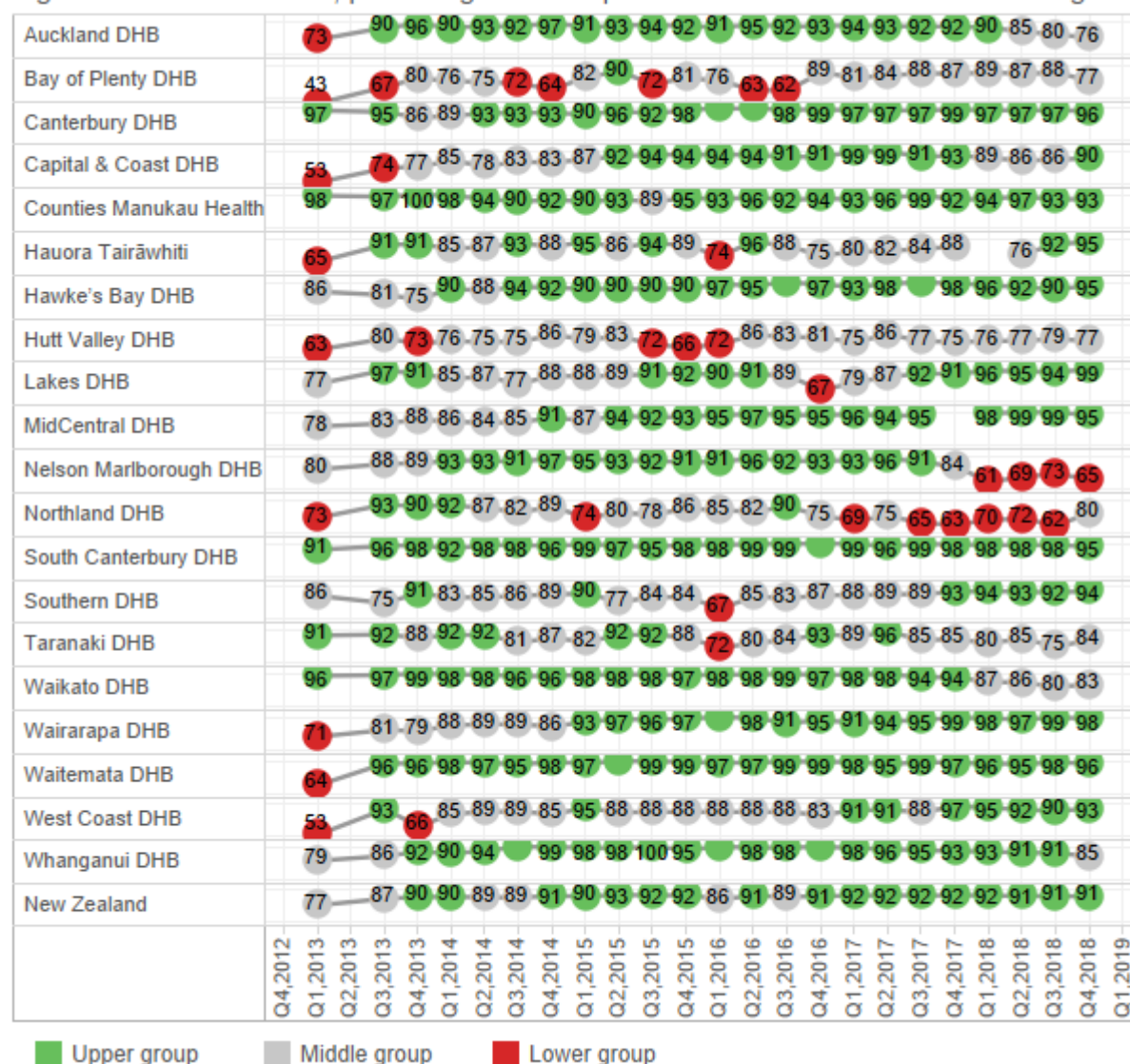
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## Falls

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

Nationally, 91 percent of older patients\* were assessed on their falls risk in quarter 4, 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, 12 out of 20 DHBs achieved the expected marker level. Auckland, Nelson Marlborough and Waikato DHBs have seen declines, while Hauora Tairāwhiti and Northland DHB have seen improvements.

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



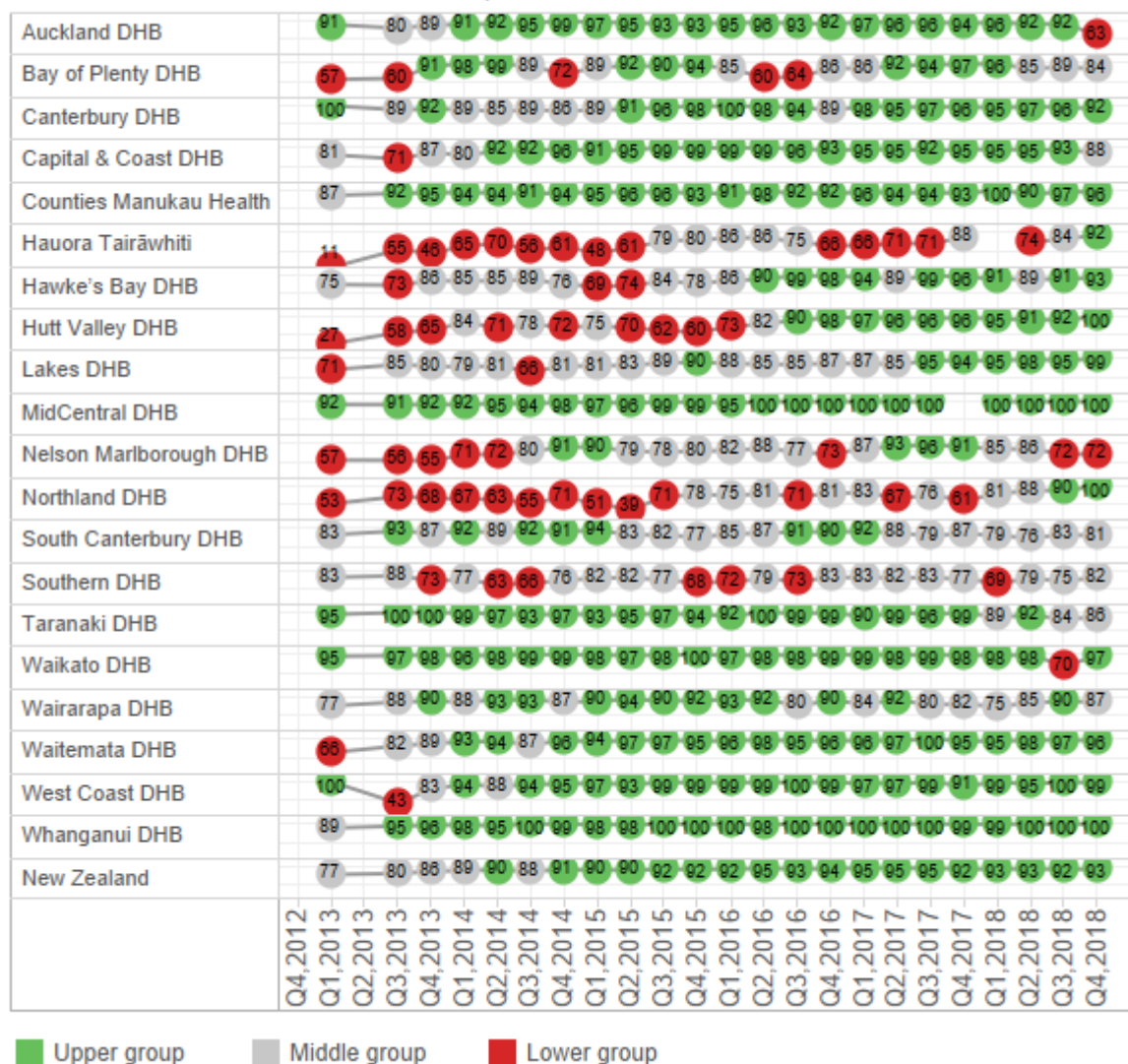
- Upper group: ≥ 90 percent
- Middle group: 75–89 percent
- Lower group: < 75 percent

\* 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 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. In quarter 4, 2018, there were 12 DHBs in the upper group. Auckland, Nelson Marlborough, South Canterbury and Southern DHBs have seen a decline, while Hauora Tairāwhiti and Northland DHB have seen an improvement.

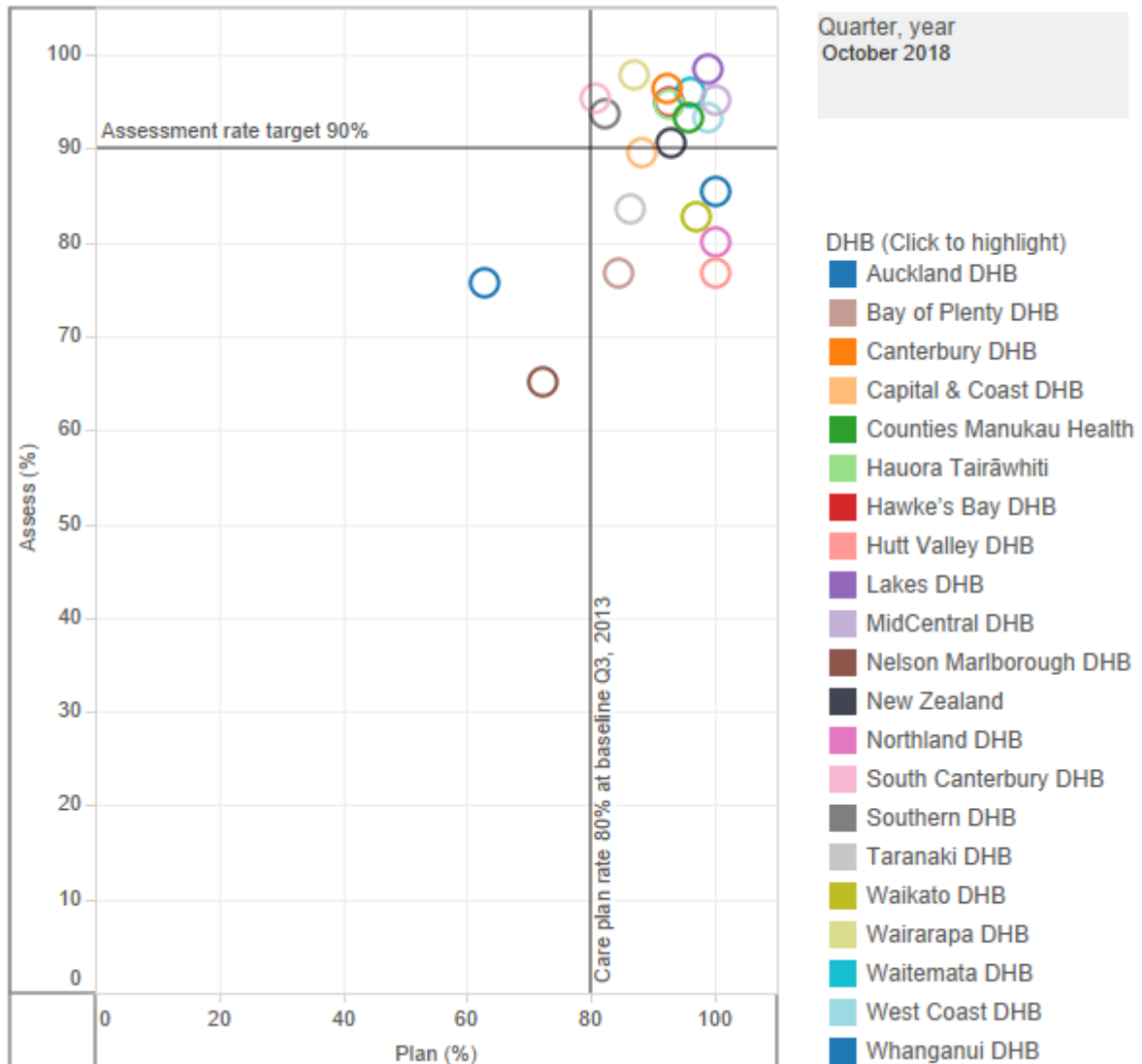
Figure 2: Process marker, percentage of older patients assessed as at risk of falling who received an individualised care plan that addresses these risks



- 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 4, 2018, 11 DHBs are in this 'ideal' box (see Figure 3), up from 10 DHBs the last quarter. Auckland DHB and Nelson Marlborough DHB are in the lower left corner, which is under the target for assessment and care plan.

Figure 3: Falls assessment compared with care planning

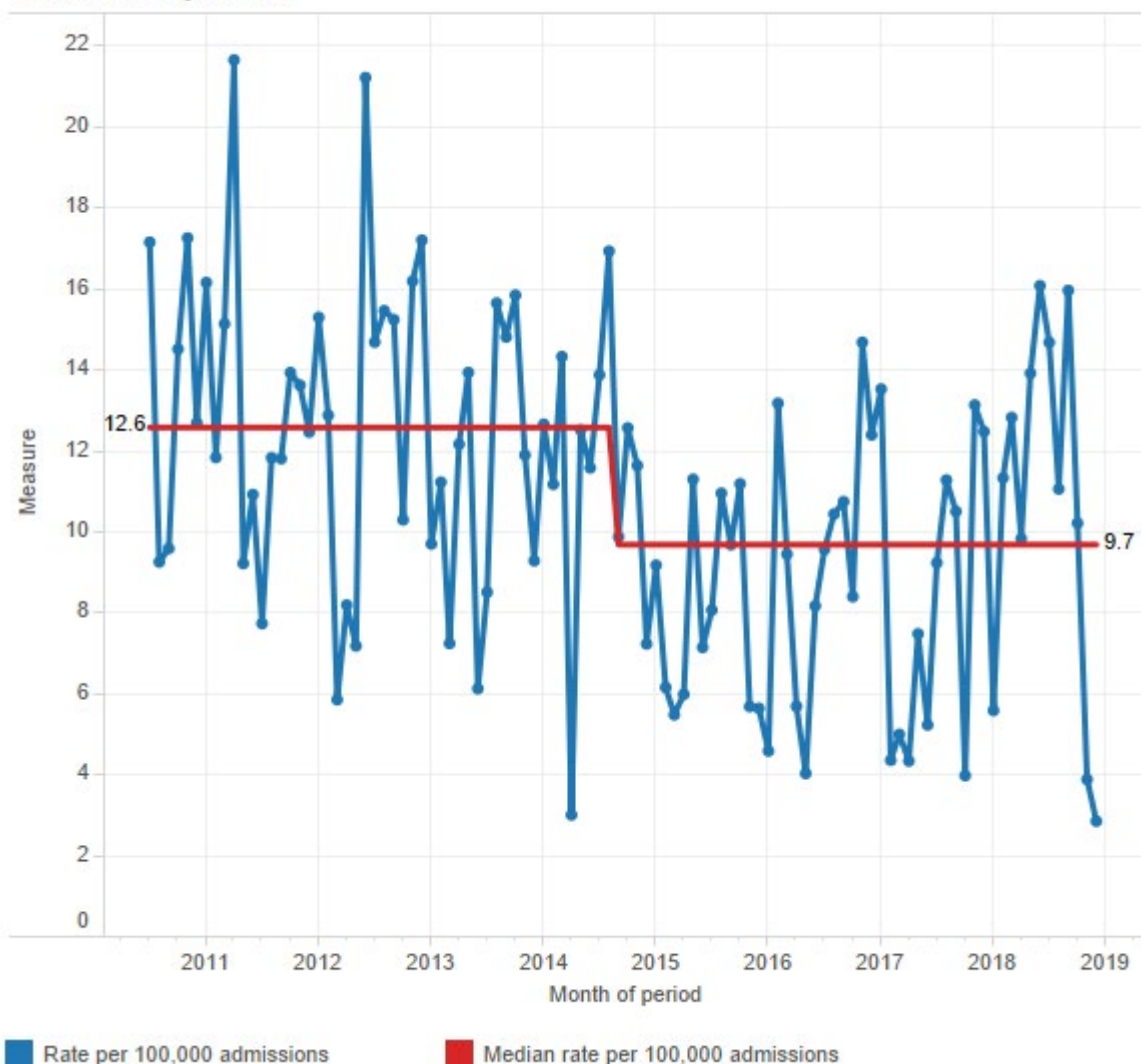


## Outcome marker: In-hospital falls resulting in a fractured neck of femur per 100,000 admissions

There were 97 falls resulting in a fractured neck of femur (broken hip) in the 12 months ending December 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 9.7 per 100,000 admissions, and shown a significant improvement. There was a high number of falls in February to October 2018, which may be an indication of a significant increase in the rate. This will be closely monitored over the coming quarters.

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

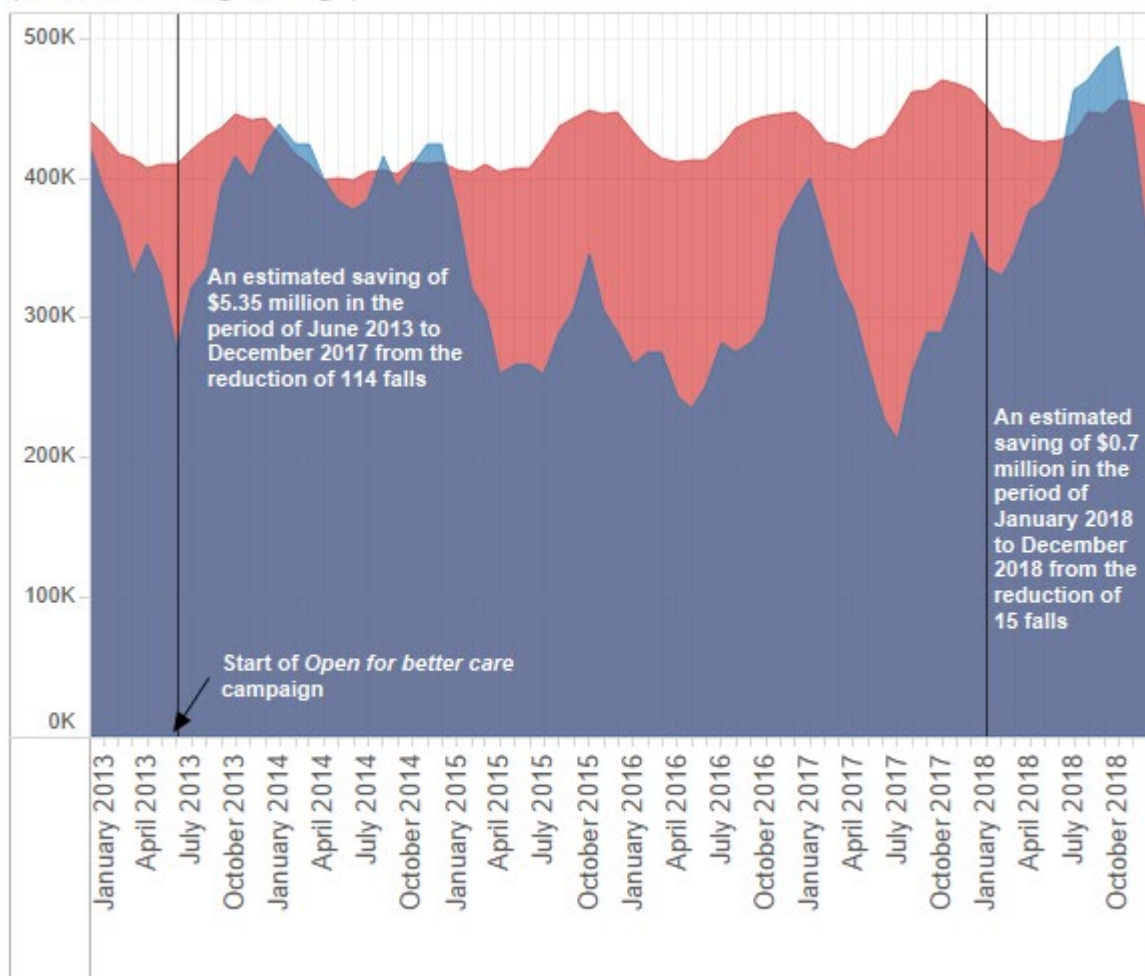


The number of 97 in-hospital falls resulting in a fractured neck of femur is significantly lower than the 112 we would have expected this year, given the falls rate observed in the period between July 2010 and June 2012. The reduction is estimated to have saved \$0.7 million in the year ending December 2018, based on an estimate of \$47,000<sup>1</sup> 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.<sup>2</sup>

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 \$0.97 million in total avoidable costs since December 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 (red)      Observed cost (blue)

<sup>1</sup> de Raad J-P. 2012. *Towards a value proposition: scoping the cost of falls*. Wellington: NZIER.  
<sup>2</sup> *Ibid.*

## Hand hygiene

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

### Process marker 1: Percentage of opportunities for hand hygiene taken

The process marker has not been updated this quarter, as we don't collect process data in quarter 4.

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           | 85                | 86           | 85           | 85                | 86           |              |
| Bay of Plenty DHB       | 43           | 59                | 67           | 65           | 75                | 80           | 77           | 77                | 80           | 83           | 83                | 82           | 78           | 81                | 81           | 85           | 83                | 83           | 81           |
| Canterbury DHB          | 60           | 65                | 67           | 68           | 68                | 67           | 62           | 73                | 77           | 78           | 78                | 78           | 79           | 83                | 81           | 80           | 81                | 82           | 81           |
| Capital & Coast DHB     | 60           | 62                | 75           | 71           | 75                | 75           | 76           | 72                | 79           | 81           | 80                | 78           | 82           | 79                | 76           | 84           | 82                | 80           | 82           |
| Counties Manukau Health | 59           | 70                | 72           | 75           | 72                | 74           | 77           | 81                | 78           | 77           | 81                | 83           | 81           | 84                | 84           | 85           | 87                | 87           | 87           |
| Hauora Tairāwhiti       | 74           | 73                | 79           | 78           | 81                | 70           | 72           | 69                | 72           | 73           | 73                | 73           | 69           | 72                | 71           | 71           | 64                | 66           |              |
| Hawke's Bay DHB         | 54           | 65                | 73           | 72           | 70                | 72           | 81           | 81                | 85           | 86           | 90                | 87           | 88           | 89                | 87           | 88           | 89                | 85           | 87           |
| Hutt Valley DHB         | 47           | 62                | 73           | 82           | 61                | 50           | 60           | 66                | 78           | 78           | 80                | 80           | 80           | 80                | 82           | 80           | 78                | 79           | 81           |
| Lakes DHB               | 62           | 64                | 71           | 68           | 74                | 79           | 86           | 80                | 82           | 77           | 73                | 82           | 80           | 82                | 81           | 84           | 82                | 77           | 81           |
| MidCentral DHB          | 65           | 72                | 70           | 72           | 66                | 72           | 72           | 76                | 78           | 75           | 75                | 81           | 81           | 79                | 81           | 79           | 75                | 79           | 78           |
| Nelson Marlborough DHB  | 50           | 55                | 64           | 67           | 70                | 71           | 75           | 74                | 80           | 81           | 75                | 76           | 81           | 78                | 81           | 79           | 80                | 81           | 85           |
| Northland DHB           | 77           | 73                | 68           | 76           | 69                | 66           | 76           | 80                | 84           | 83           | 86                | 87           | 88           | 86                | 87           | 84           | 87                | 88           | 88           |
| South Canterbury DHB    | 60           | 54                | 63           | 72           | 75                | 86           | 78           | 84                | 84           | 80           | 72                | 67           | 80           | 66                | 76           | 79           | 75                | 82           | 83           |
| Southern DHB            | 63           | 62                | 59           | 69           | 72                | 75           | 76           | 78                | 85           | 86           | 85                | 83           | 86           | 83                | 86           | 82           | 82                | 82           | 81           |
| Taranaki DHB            | 65           | 64                |              | 83           | 71                | 68           | 60           | 69                | 77           | 77           | 84                | 78           | 78           | 70                | 72           | 73           | 82                | 78           | 66           |
| Waikato DHB             | 67           | 60                | 72           | 66           | 71                | 76           | 79           | 77                | 82           | 79           | 83                | 86           | 87           | 84                | 85           | 82           | 84                | 83           | 78           |
| Wairarapa DHB           | 71           | 68                | 77           | 78           | 82                | 81           | 80           | 79                | 80           | 81           | 79                | 87           | 81           | 81                | 82           | 93           | 90                | 87           | 82           |
| Waitemata DHB           | 62           | 73                | 74           | 71           | 75                | 79           | 80           | 80                | 80           | 85           | 81                | 83           | 85           | 86                | 86           | 88           | 89                | 90           | 89           |
| West Coast DHB          | 66           | 66                | 73           | 71           | 72                | 77           | 80           | 81                | 83           | 86           | 78                | 81           | 79           | 80                | 82           | 79           | 78                | 82           | 81           |
| Whanganui DHB           | 70           | 74                | 75           | 77           | 78                | 79           | 83           | 82                | 84           | 85           | 84                | 84           | 84           | 85                | 86           | 87           | 86                | 88           | 84           |
| New Zealand             | 62           | 67                | 71           | 71           | 73                | 73           | 75           | 77                | 80           | 81           | 81                | 82           | 83           | 84                | 84           | 85           | 85                | 85           | 85           |
|                         | 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 |

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.

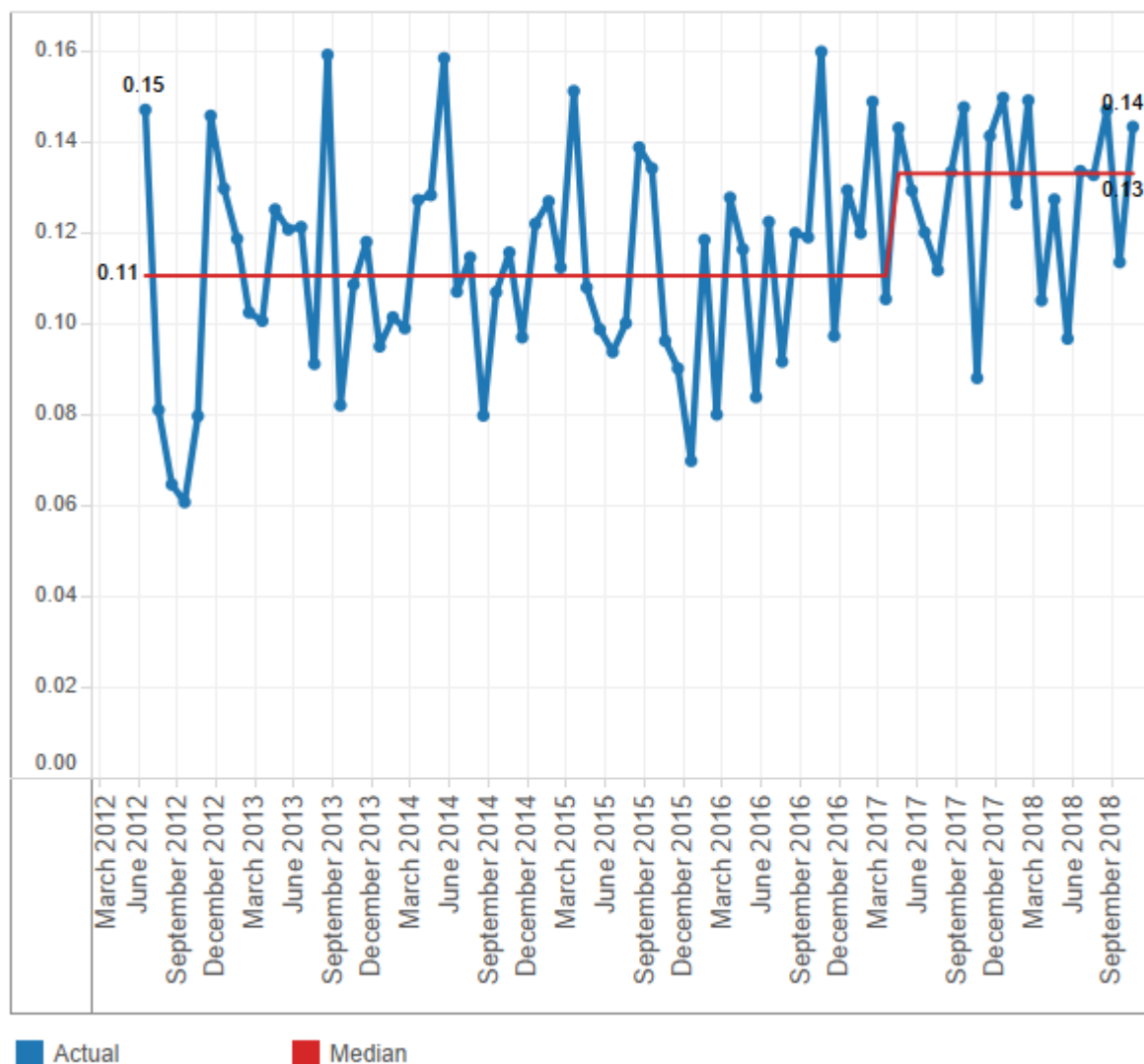


## Outcome marker: Healthcare associated *Staphylococcus aureus* bacteraemia (SAB) per 1,000 bed-days

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. This is concerning and will be closely monitored over the next couple of quarters.

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



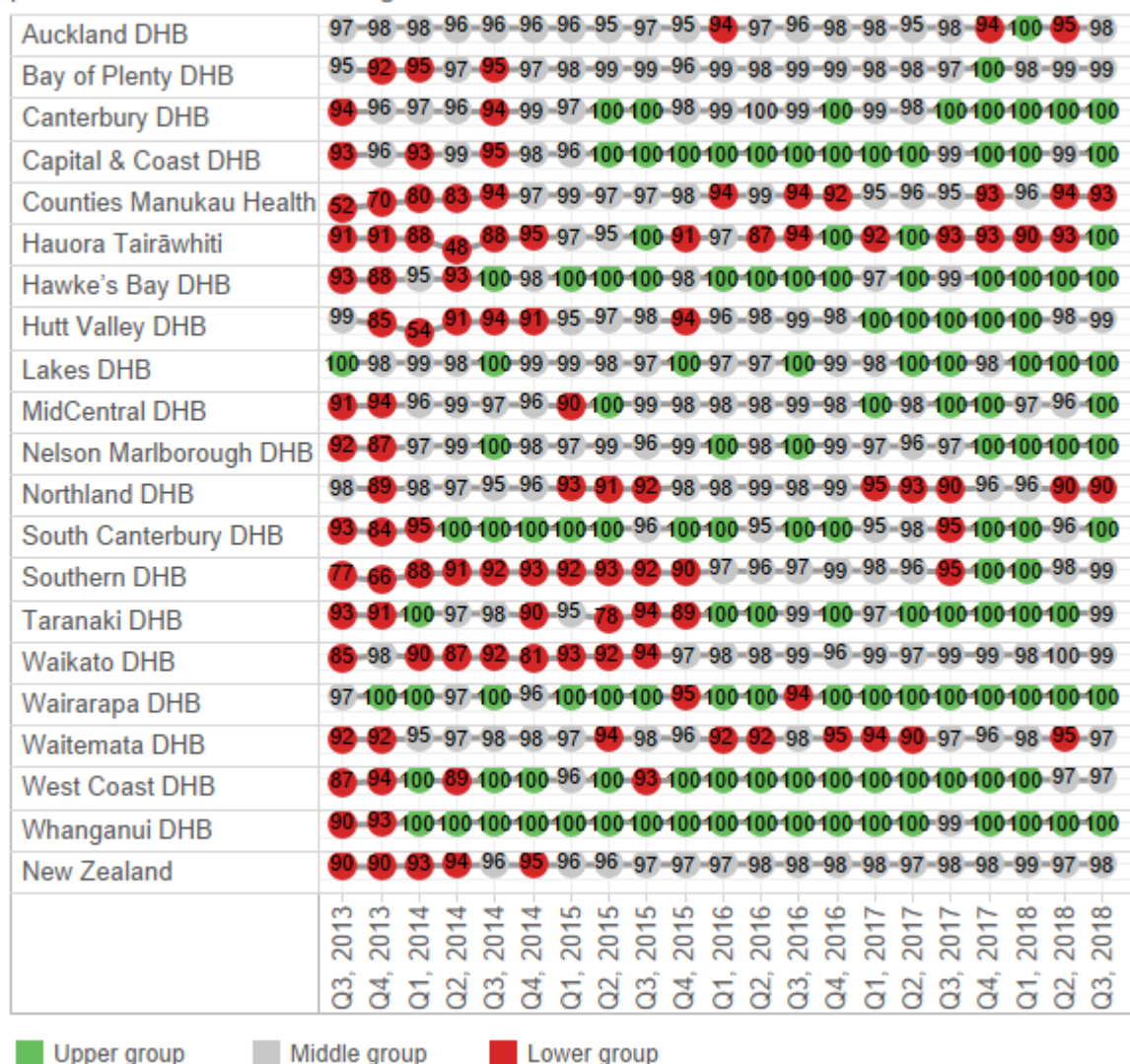
## Surgical site infection improvement (SSII) – orthopaedic surgery

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 3, 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 3, 2018, 98 percent of hip and knee arthroplasty procedures involved the giving of an antibiotic within 60 minutes before knife to skin. Ten DHBs achieved the national goal. Counties Manukau Health and Northland DHB have been in the lower group consistently over the last year.

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



■ 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. Eighteen DHBs reached the threshold level of 95 percent compared with only three in the baseline quarter.<sup>3</sup>

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

|                         |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |    |
|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----|
| Auckland DHB            | 85       | 92       | 96       | 95       | 95       | 98       | 100      | 98       | 96       | 94       | 96       | 96       | 98       | 95       | 98       | 95       | 97       | 96       | 96       | 93       | 96       |    |
| Bay of Plenty DHB       | 72       | 93       | 93       | 95       | 95       | 99       | 99       | 96       | 99       | 97       | 99       | 97       | 98       | 99       | 97       | 97       | 97       | 98       | 97       | 99       | 99       |    |
| Canterbury DHB          | 46       | 54       | 65       | 86       | 95       | 97       | 97       | 97       | 97       | 98       | 96       | 98       | 97       | 98       | 98       | 98       | 99       | 99       | 99       | 99       | 99       |    |
| Capital & Coast DHB     | 100      | 98       | 97       | 96       | 99       | 98       | 98       | 98       | 100      | 99       | 99       | 99       | 98       | 98       | 99       | 98       | 99       | 99       | 100      | 100      | 100      |    |
| Counties Manukau Health | 68       | 78       | 82       | 90       | 98       | 98       | 100      | 98       | 99       | 100      | 97       | 99       | 95       | 99       | 99       | 97       | 100      | 99       | 96       | 98       | 96       |    |
| Hauora Tairāwhiti       | 96       | 92       | 87       | 96       | 92       | 98       | 97       | 98       | 100      | 97       | 97       | 94       | 100      | 100      | 100      | 92       | 91       | 90       | 100      | 97       | 100      |    |
| Hawke's Bay DHB         | 11       | 36       | 61       | 71       | 85       | 89       | 93       | 97       | 99       | 94       | 97       | 99       | 97       | 98       | 98       | 98       | 98       | 99       | 99       | 99       | 97       |    |
| Hutt Valley DHB         |          | 89       | 96       | 97       | 94       | 100      | 100      | 100      | 99       | 97       | 97       | 96       | 99       | 98       | 98       | 100      | 95       | 99       | 100      | 100      | 99       |    |
| Lakes DHB               | 96       | 94       | 96       | 95       | 95       | 99       | 97       | 96       | 96       | 98       | 97       | 96       | 99       | 99       | 98       | 99       | 98       | 96       | 100      | 100      | 97       |    |
| MidCentral DHB          | 2        |          | 3        | 4        | 8        | 10       | 95       | 98       | 98       | 96       | 96       | 98       | 97       | 99       | 99       | 99       | 97       | 98       | 99       | 96       | 96       | 94 |
| Nelson Marlborough DHB  | 26       | 69       | 93       | 99       | 99       | 97       | 100      | 99       | 99       | 100      | 97       | 98       | 98       | 99       | 94       | 99       | 100      | 97       | 95       | 100      | 97       |    |
| Northland DHB           | 56       | 90       | 95       | 98       | 94       | 93       | 96       | 95       | 93       | 98       | 100      | 98       | 96       | 96       | 96       | 98       | 93       | 96       | 99       | 97       | 95       |    |
| South Canterbury DHB    | 76       | 51       | 97       | 91       | 93       | 95       | 95       | 94       | 93       | 92       | 97       | 94       | 95       | 90       | 92       | 98       | 85       | 93       | 95       | 94       | 92       |    |
| Southern DHB            | 22       | 45       | 65       | 81       | 77       | 81       | 90       | 93       | 96       | 94       | 96       | 95       | 94       | 97       | 97       | 95       | 94       | 97       | 96       | 96       | 97       |    |
| Taranaki DHB            | 15       | 24       | 15       | 29       | 35       | 41       | 30       | 66       | 51       | 51       | 57       | 67       | 83       | 94       | 90       | 97       | 96       | 98       | 92       | 92       | 99       |    |
| Waikato DHB             | 76       | 78       | 87       | 93       | 94       | 95       | 90       | 93       | 94       | 94       | 95       | 97       | 95       | 94       | 97       | 96       | 94       | 94       | 95       | 97       | 97       |    |
| Wairarapa DHB           | 90       | 88       | 81       | 94       | 100      | 94       | 100      | 100      | 100      | 95       | 100      | 97       | 100      | 100      | 100      | 97       | 100      | 100      | 100      | 100      | 97       |    |
| Waitemata DHB           | 66       | 72       | 82       | 97       | 96       | 98       | 97       | 93       | 96       | 95       | 95       | 94       | 95       | 97       | 96       | 97       | 97       | 97       | 96       | 97       | 99       |    |
| West Coast DHB          | 13       | 61       | 30       | 95       | 100      | 100      | 96       | 100      | 96       | 95       | 100      | 95       | 95       | 96       | 100      | 95       | 93       | 100      | 100      | 97       | 100      |    |
| Whanganui DHB           | 9        | 69       | 95       | 94       | 95       | 99       | 100      | 92       | 98       | 99       | 100      | 98       | 98       | 100      | 98       | 96       | 98       | 100      | 100      | 100      | 100      |    |
| New Zealand             | 55       | 68       | 78       | 85       | 88       | 90       | 95       | 95       | 96       | 96       | 96       | 96       | 96       | 97       | 97       | 97       | 97       | 97       | 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 |    |

■ Upper group   ■ Middle group   ■ Lower group

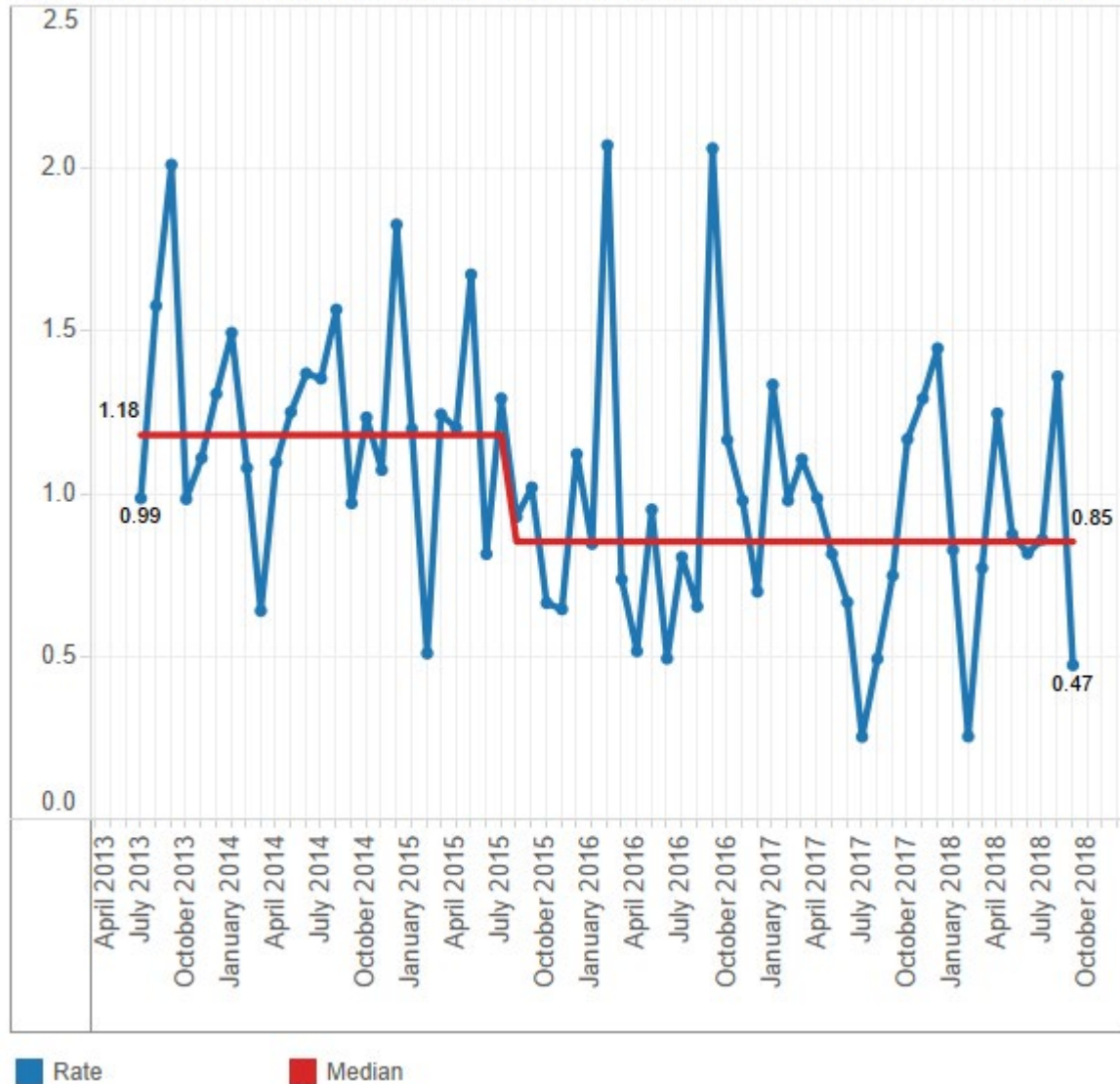
- Upper group: ≥ 95 percent
- Middle group: 90–94 percent
- Lower group: < 90 percent

<sup>3</sup> 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 3, 2018, there were 24 SSIs out of 2,572 hip and knee arthroplasty procedures, an SSI rate of 0.93 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 0.85 percent after it.

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



## SSI improvement – cardiac surgery

This is the eighth 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. Capital & Coast and Southern DHBs 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  $\geq 2$  g or more of cefazolin for adults and  $\geq 30$  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 Canterbury and Southern 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 Auckland adult, achieved the target this quarter.

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



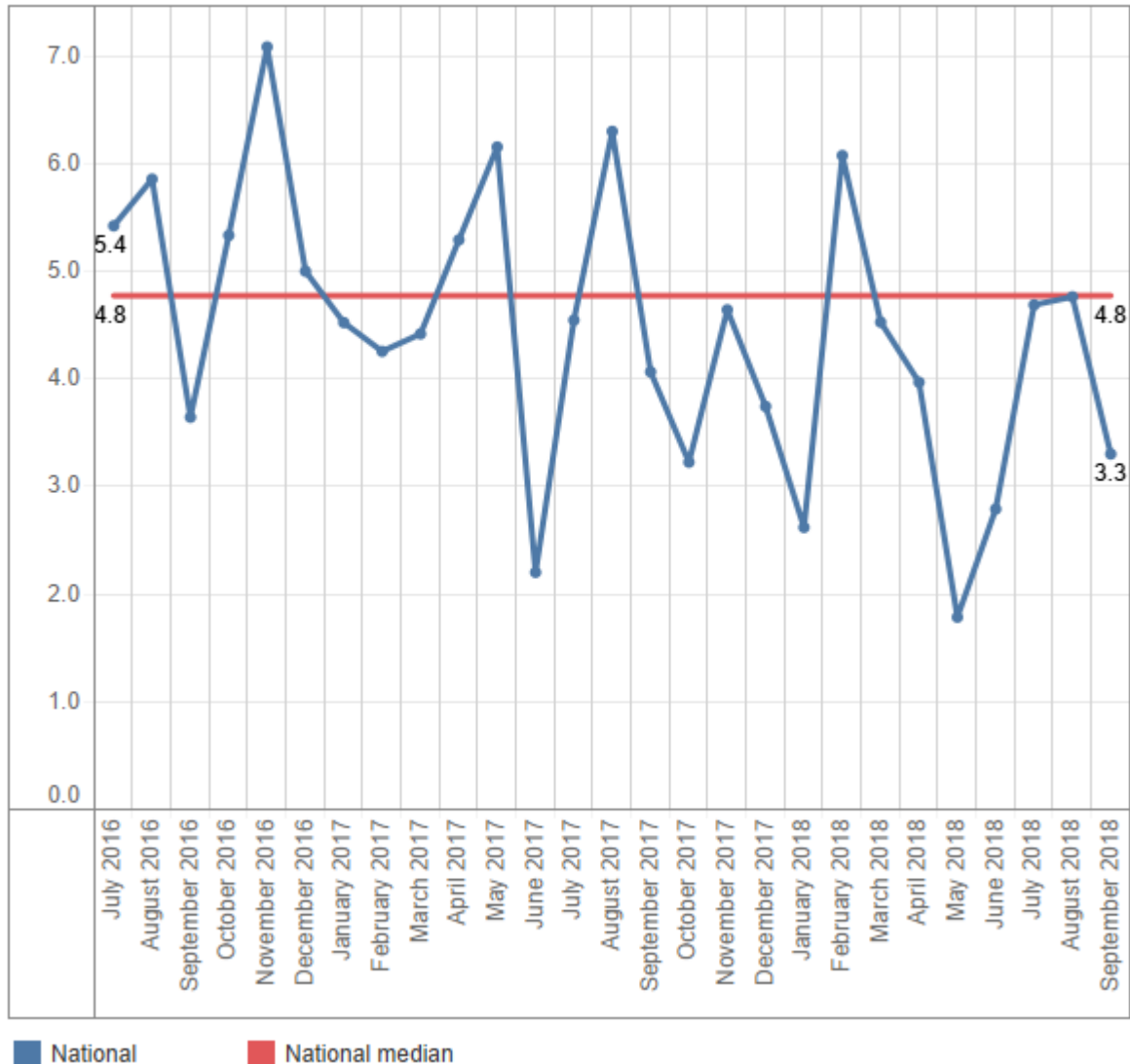
Note: New Zealand is 100 percent, but not green as colouring is applied to raw data, but displayed data is rounded up.

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

## Outcome marker: SSIs per 100 procedures rate

In quarter 3, 2018, there were 28 SSI cases in 656 procedures, an infection rate of 4.3 percent. The latest 7 points are on or below the median. The median will not be adjusted until 12 months after the initial rate drop because of data completeness.

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





## Safe surgery

This is the 10th 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. Thirteen out of the 20 DHBs achieved 50 audits for all three parts in quarter 4, 2018. 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            | 89      | 98       | 84       |
| Bay of Plenty DHB       | 83      | 90       | 76       |
| Canterbury DHB          | 54      | 55       | 56       |
| Capital & Coast DHB     | 52      | 52       | 50       |
| Counties Manukau Health | 859     | 861      | 824      |
| Hauora Tairāwhiti       | 51      | 55       | 51       |
| Hawke's Bay DHB         | 56      | 114      | 64       |
| Hutt Valley DHB         | 2       | 5        | 4        |
| Lakes DHB               | 10      | 10       | 7        |
| MidCentral DHB          | 51      | 64       | 50       |
| Nelson Marlborough DHB  | 16      | 28       | 11       |
| Northland DHB           | 53      | 57       | 52       |
| South Canterbury DHB    | 0       | 80       | 80       |
| Southern DHB            | 44      | 58       | 21       |
| Taranaki DHB            | 52      | 64       | 50       |
| Waikato DHB             | 0       | 0        | 0        |
| Wairarapa DHB           | 35      | 54       | 42       |
| Waitemata DHB           | 51      | 53       | 50       |
| West Coast DHB          | 57      | 63       | 54       |
| Whanganui DHB           | 61      | 65       | 55       |

■ 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, 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)

|                         | Sign in  |         |          |          |          |          | Time out |         |          |          |          |          | Sign out |         |          |          |          |          |
|-------------------------|----------|---------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|
|                         | Baseline | Rolling | Q1, 2018 | Q2, 2018 | Q3, 2018 | Q4, 2018 | Baseline | Rolling | Q1, 2018 | Q2, 2018 | Q3, 2018 | Q4, 2018 | Baseline | Rolling | Q1, 2018 | Q2, 2018 | Q3, 2018 | Q4, 2018 |
| Auckland DHB            | 98       | 99      |          | 98       |          | 98       | 93       | 98      |          | 98       |          | 98       | 98       | 96      |          | 94       |          | 98       |
| Bay of Plenty DHB       | 97       | 99      | 99       | 99       | 100      | 100      | 96       | 100     | 100      | 100      | 100      | 99       |          | 99      | 99       | 97       | 100      | 100      |
| Canterbury DHB          | 91       | 99      | 99       | 100      | 100      | 98       | 92       | 98      | 95       | 99       | 100      | 98       | 96       | 99      | 97       | 100      | 100      | 98       |
| Capital & Coast DHB     | 96       | 99      | 98       | 98       | 100      | 100      | 97       | 100     | 99       | 100      | 100      | 100      | 97       | 100     | 100      | 100      | 98       | 100      |
| Counties Manukau Health | 99       | 100     | 100      | 100      | 100      | 100      | 100      | 100     | 100      | 100      | 100      | 100      | 99       | 99      | 95       | 100      | 100      | 100      |
| Hauora Tairāwhiti       | 100      | 100     | 100      | 100      | 98       | 100      | 99       | 98      | 97       | 98       | 96       | 100      |          | 99      | 98       | 100      | 98       | 100      |
| Hawke's Bay DHB         |          | 95      |          |          | 95       | 95       | 78       | 79      | 87       | 82       | 75       | 76       |          | 86      |          |          | 84       | 84       |
| Hutt Valley DHB         |          |         | 100      |          |          |          |          |         | 100      | 98       |          |          |          |         | 88       |          |          |          |
| Lakes DHB               |          |         | 82       |          |          |          |          |         | 98       |          |          |          |          |         |          |          |          |          |
| MidCentral DHB          | 96       | 97      | 100      | 94       | 96       | 98       | 92       | 91      | 100      | 93       | 94       | 80       | 97       | 99      | 100      | 95       | 100      | 100      |
| Nelson Marlborough DHB  | 88       |         |          |          |          |          | 93       |         | 100      |          |          |          | 91       |         | 75       |          |          |          |
| Northland DHB           |          |         |          | 100      | 100      | 96       | 91       | 93      |          | 95       | 97       | 96       |          |         |          |          | 98       | 100      |
| South Canterbury DHB    |          |         |          |          |          |          |          | 79      | 83       | 76       | 75       | 83       |          | 76      | 78       | 70       | 78       | 80       |
| Southern DHB            |          |         |          |          | 96       |          | 98       |         |          |          | 100      | 98       |          |         |          |          | 98       |          |
| Taranaki DHB            |          |         |          |          |          | 79       |          |         |          |          |          |          |          |         |          |          |          | 96       |
| Waikato DHB             | 81       |         | 59       |          |          |          | 67       |         | 40       |          |          |          |          |         |          |          |          |          |
| Wairarapa DHB           | 97       |         |          |          | 89       |          | 98       |         |          |          | 95       | 100      |          |         |          |          | 94       |          |
| Waitemata DHB           | 96       | 99      | 98       | 98       | 100      | 100      | 96       | 98      | 97       | 100      | 98       | 98       | 94       | 99      | 100      | 98       | 98       | 100      |
| West Coast DHB          |          | 100     | 100      | 100      | 100      | 100      |          | 100     | 100      | 100      | 100      | 100      |          | 100     | 100      | 100      | 100      | 100      |
| Whanganui DHB           |          | 89      | 92       | 95       | 85       | 85       |          | 98      | 100      | 100      | 96       | 94       |          | 98      | 97       | 100      | 98       | 96       |
| New Zealand             | 93       | 97      | 95       | 97       | 96       | 98       | 93       | 94      | 94       | 95       | 94       | 95       | 94       | 95      | 93       | 95       | 96       | 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: Q1, 2018 to Q4, 2018.

- Target achieved
- Less than 75%
- Between 75% and the target
- 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, MidCentral and West Coast DHBs achieved the target in all three parts. Nine other DHBs achieved the target in one or two parts – an increase from five DHBs last quarter. Data are not presented where there were fewer than 50 audits.

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 | Q1, 2018 | Q2, 2018 | Q3, 2018 | Q4, 2018 | Baseline        | Rolling | Q1, 2018 | Q2, 2018 | Q3, 2018 | Q4, 2018 | Baseline        | Rolling | Q1, 2018 | Q2, 2018 | Q3, 2018 | Q4, 2018 |
| Auckland DHB            | 97             | 93      |          | 95       |          | 92       | 94              | 92      |          | 95       |          | 89       | 93              | 91      |          | 89       |          | 91       |
| Bay of Plenty DHB       | 88             | 97      | 92       | 95       | 100      | 100      | 87              | 96      | 92       | 96       | 98       | 99       |                 | 92      | 81       | 91       | 100      | 99       |
| Canterbury DHB          | 88             | 97      | 93       | 98       | 100      | 100      | 76              | 95      | 88       | 94       | 99       | 98       | 65              | 93      | 90       | 93       | 96       | 93       |
| Capital & Coast DHB     | 86             | 83      | 80       | 80       | 87       | 87       | 91              | 88      | 90       | 89       | 76       | 96       | 94              | 88      | 85       | 88       | 88       | 90       |
| Counties Manukau Health | 99             | 98      | 98       | 100      | 97       | 96       | 99              | 100     | 100      | 100      | 100      | 99       | 94              | 95      | 98       | 99       | 94       | 93       |
| Hauora Tairāwhiti       | 85             | 82      | 82       | 74       | 81       | 90       | 89              | 82      | 84       | 82       | 76       | 87       |                 | 89      | 94       | 85       | 82       | 94       |
| Hawke's Bay DHB         |                | 97      |          |          | 97       | 96       | 81              | 87      | 90       | 85       | 79       | 94       |                 | 93      |          |          | 93       | 94       |
| Hutt Valley DHB         |                |         | 100      |          |          |          |                 |         | 100      | 98       |          |          |                 |         | 91       |          |          |          |
| Lakes DHB               |                |         | 82       |          |          |          |                 |         | 66       |          |          |          |                 |         |          |          |          |          |
| MidCentral DHB          | 95             | 98      | 98       | 94       | 100      | 98       | 87              | 99      | 100      | 100      | 100      | 96       | 85              | 97      | 96       | 93       | 100      | 100      |
| Nelson Marlborough DHB  | 57             |         |          |          |          |          | 87              |         | 56       |          |          |          | 66              |         | 8        |          |          |          |
| Northland DHB           |                |         |          | 100      | 100      | 98       | 79              | 95      |          | 94       | 93       | 98       |                 |         |          |          | 88       | 94       |
| South Canterbury DHB    |                |         |          |          |          |          |                 | 67      | 77       | 59       | 70       | 55       |                 | 56      | 71       | 46       | 58       | 41       |
| Southern DHB            |                |         |          |          | 98       |          | 93              |         |          |          | 100      | 100      |                 |         |          |          | 100      |          |
| Taranaki DHB            |                |         |          |          |          | 93       |                 |         |          |          |          | 84       |                 |         |          |          |          | 92       |
| Waikato DHB             | 97             |         | 100      |          |          |          | 92              |         | 96       |          |          |          |                 |         |          |          |          |          |
| Wairarapa DHB           | 96             |         |          |          | 92       |          | 99              |         |          |          | 98       | 100      |                 |         |          |          | 98       |          |
| Waitemata DHB           | 83             | 91      | 93       | 85       | 96       | 88       | 86              | 92      | 90       | 92       | 94       | 94       | 91              | 95      | 95       | 95       | 100      | 92       |
| West Coast DHB          |                | 99      | 96       | 100      | 98       | 100      |                 | 100     | 100      | 100      | 100      | 100      |                 | 98      | 98       | 96       | 100      | 96       |
| Whanganui DHB           |                | 92      | 88       | 91       | 93       | 96       |                 | 89      | 93       | 92       | 87       | 84       |                 | 89      | 86       | 96       | 84       | 89       |
| New Zealand             | 90             | 95      | 94       | 95       | 96       | 96       | 89              | 93      | 91       | 93       | 93       | 95       | 84              | 90      | 88       | 90       | 91       | 91       |

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: Q1, 2018 to Q4, 2018.

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 4, 2018, 11 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 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

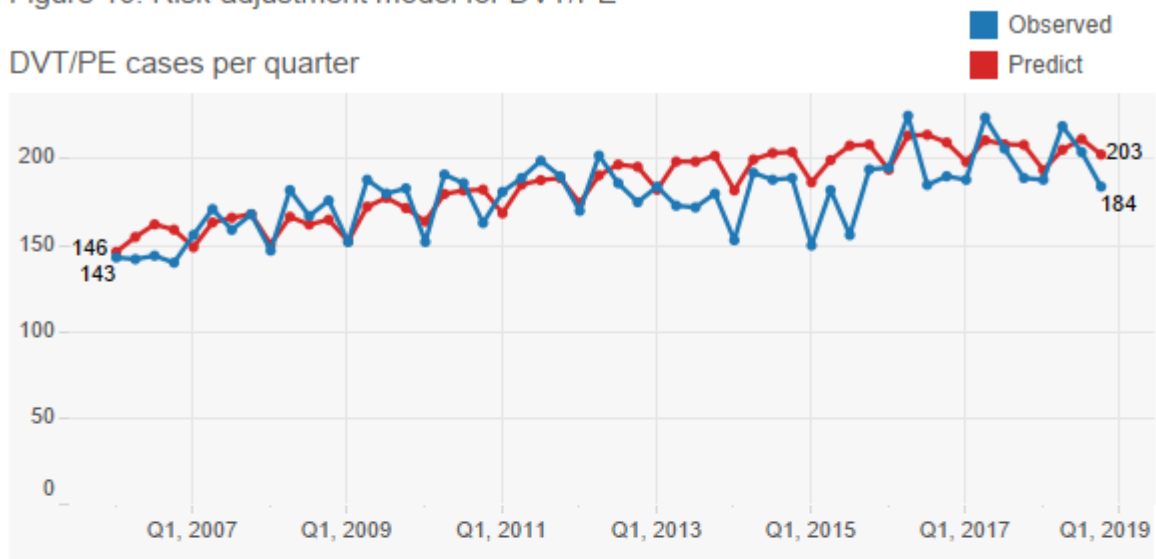
|                         | 2017 |     | 2018 |     |     |     |
|-------------------------|------|-----|------|-----|-----|-----|
|                         | Q3   | Q4  | Q1   | Q2  | Q3  | Q4  |
| Auckland DHB            |      |     | 4    | 1   | 3   | 8   |
| Bay of Plenty DHB       | 20   | 11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

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.

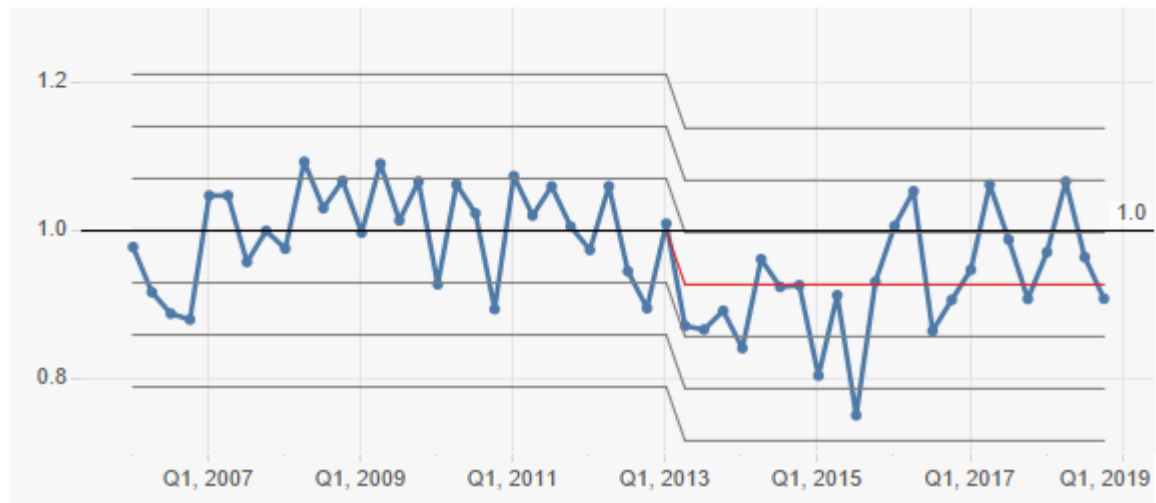
The model is used to identify how likely patients being operated on were to develop sepsis or DVT/PE based on factors such as their condition, health history and the operation being undertaken. From this, we can calculate how many patients we would have predicted to develop sepsis or DVT/PE based on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

The quality and safety domain 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 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     |
| Waitemata               | 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 |

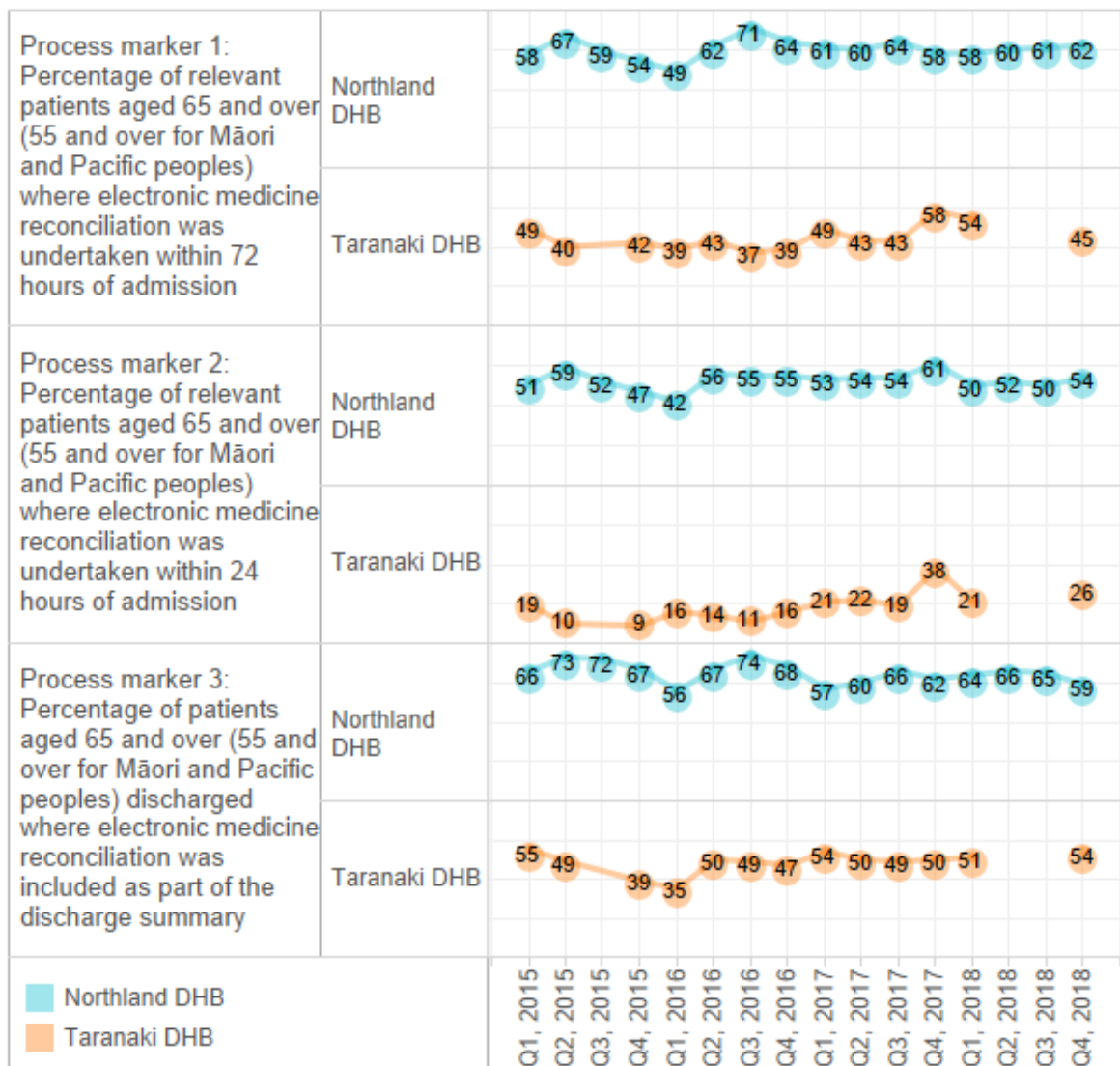
Figure 21: Structure markers, eMedRec implementation

| Structure marker  | Auckland DHB | Canterbury DHB | Counties Manukau Health | Northland DHB | Taranaki DHB | Waitemata 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 third 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 decrease in the use of the tool across all eligible wards from the last quarter (now at 96 percent). Note: the New Zealand percentage is calculated based on only those DHBs that have implemented the NZEWS.

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

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

\*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. Results for this measure revealed a national figure of 91 percent.

A total of 16 DHBs (80 percent) submitted data for this measure. Those using an electronic vital signs system will be able to achieve 100 percent consistently for this measure. Southern DHB is yet to implement the NZEWS, but is using its existing EWS.

Figure 24: Percentage of early warning score calculated correctly

|                         | 2018  |     |      |      |        |           |         |          |          |
|-------------------------|-------|-----|------|------|--------|-----------|---------|----------|----------|
|                         | April | May | June | July | August | September | October | November | December |
| Auckland DHB            | 91    | 97  | 95   | 89   | 95     | 90        | 88      | 89       | 94       |
| Bay of Plenty DHB       | 82    | 85  | 87   | 85   | 90     | 83        | 85      | 84       | 86       |
| Canterbury DHB          | 100   | 100 | 100  | 100  | 100    | 100       | 100     | 100      | 100      |
| Capital & Coast DHB     |       |     |      |      |        | 94        |         |          | 84       |
| Counties Manukau Health | 93    | 96  | 95   | 100  | 99     | 96        | 98      | 97       | 98       |
| Hauora Tairāwhiti       | 93    | 87  | 83   | 74   | 83     |           |         |          |          |
| Hawke's Bay DHB         | 85    | 85  | 87   | 80   | 84     | 84        | 85      | 83       | 81       |
| Hutt Valley DHB         | 88    | 88  | 88   | 89   | 89     | 82        |         |          |          |
| Lakes DHB               | 81    | 82  | 89   | 78   | 78     | 81        | 89      | 83       | 86       |
| MidCentral DHB          | 94    | 98  | 100  | 97   | 86     | 90        |         |          |          |
| Nelson Marlborough DHB  | 91    | 96  | 94   | 85   | 91     | 91        |         |          |          |
| Northland DHB           | 88    | 87  | 88   | 84   | 90     | 94        | 85      | 99       | 98       |
| South Canterbury DHB    |       |     |      |      |        |           | 87      | 88       |          |
| Southern DHB*           | 88    | 93  | 94   | 96   | 95     | 87        | 95      | 95       | 97       |
| Taranaki DHB            | 91    | 89  | 93   | 96   | 90     | 95        | 96      | 98       | 94       |
| Waikato DHB             |       |     |      | 79   | 91     |           | 68      | 80       | 66       |
| Wairarapa DHB           | 84    | 92  | 89   | 84   | 89     | 93        | 94      | 92       | 98       |
| Waitemata DHB*          |       |     |      |      |        |           |         |          |          |
| West Coast DHB          | 76    | 63  | 86   | 100  | 100    | 100       | 100     | 100      | 100      |
| Whanganui DHB           | 67    | 75  | 81   | 82   | 77     | 71        | 92      | 94       | 93       |
| New Zealand             | 87    | 90  | 92   | 89   | 91     | 89        | 90      | 91       | 92       |

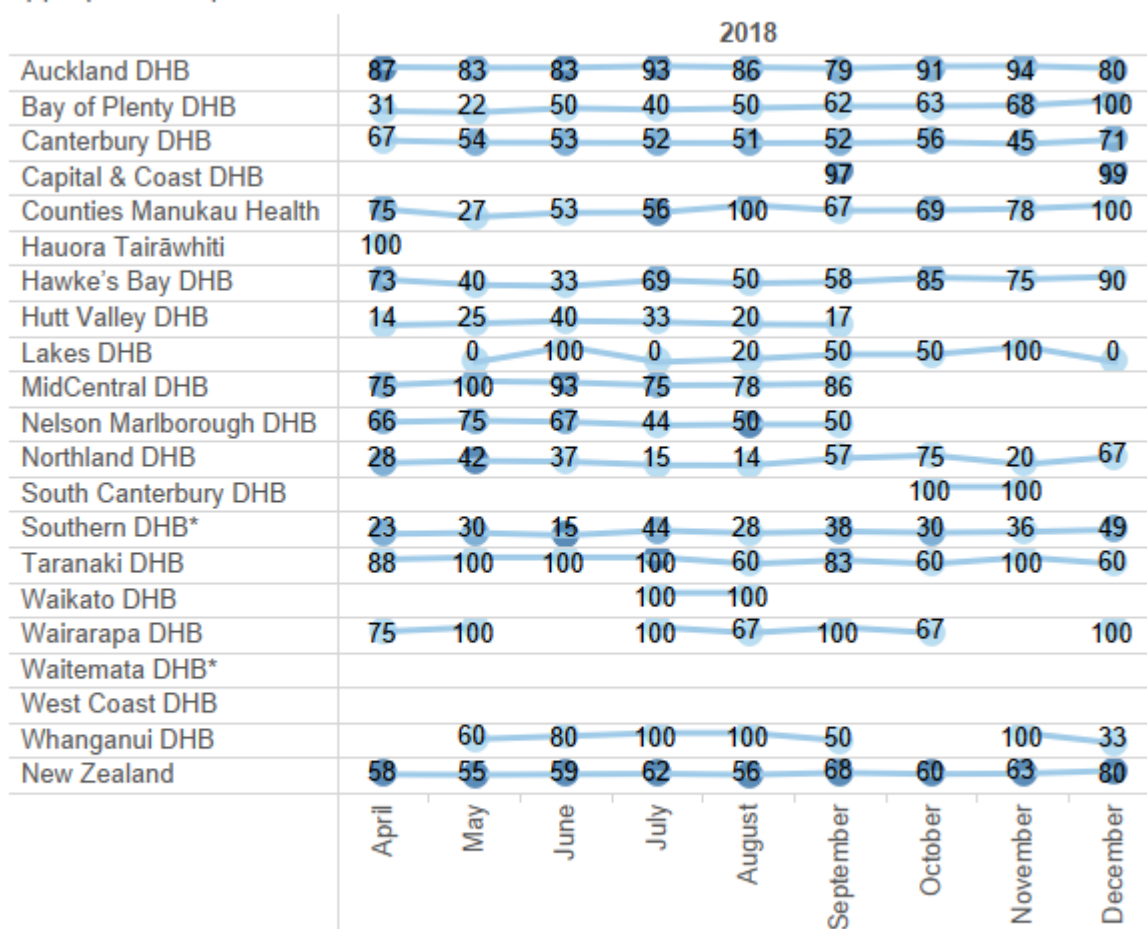
\*Yet to implement the New Zealand early warning score.

## 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 75 percent, an increase from the previous quarter. There was also considerably more variance between DHBs than for the first process measure, highlighting an opportunity for improvement. A total of 14 DHBs (70 percent) submitted data for this measure.

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



\*Yet to implement the New Zealand early warning score.

Numerator size

Large Medium Small

## 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 1.4 cardiopulmonary arrests per 1,000 admissions for this quarter. A total of 14 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  |     |      |      |        |           |         |          |          |
|-------------------------|-------|-----|------|------|--------|-----------|---------|----------|----------|
|                         | April | May | June | July | August | September | October | November | December |
| Auckland DHB            | 1.3   | 2.6 | 1.0  | 1.4  | 1.4    | 2.1       | 1.9     | 2.5      | 0.7      |
| Bay of Plenty DHB       | 1.2   | 2.7 | 1.1  | 1.7  | 1.0    | 2.7       | 2.0     | 2.7      | 1.1      |
| Canterbury DHB          | 1.6   | 1.2 | 2.6  |      |        |           |         |          |          |
| Capital & Coast DHB     |       |     |      | 0.5  | 1.6    | 1.7       | 0.0     | 2.6      | 3.9      |
| Counties Manukau Health | 0.5   | 0.9 | 0.2  | 0.2  | 0.7    | 1.2       | 1.0     | 0.8      | 0.8      |
| Hauora Tairāwhiti       | 6.2   | 2.7 | 0.0  | 5.5  | 0.0    | 2.8       |         |          |          |
| Hawke's Bay DHB         | 3.2   | 0.7 | 2.2  | 0.7  | 1.3    | 0.7       | 0.0     | 1.4      | 0.0      |
| Hutt Valley DHB         | 0.0   | 1.0 | 4.1  | 3.8  | 3.7    | 4.2       |         |          |          |
| Lakes DHB               | 1.3   | 0.0 | 1.3  | 2.5  | 0.0    | 2.2       | 0.0     | 0.0      | 2.3      |
| MidCentral DHB          | 2.6   | 0.8 | 1.6  | 1.6  | 2.2    | 3.0       |         |          |          |
| Nelson Marlborough DHB  | 2.6   | 3.4 | 2.2  | 0.0  | 0.0    | 0.0       |         |          |          |
| Northland DHB           | 5.8   | 3.3 | 0.7  | 2.9  | 2.1    | 1.3       | 3.9     | 2.8      | 2.8      |
| South Canterbury DHB    | 2.8   | 0.0 | 0.0  | 2.4  | 0.0    | 0.0       |         |          |          |
| Southern DHB*           |       |     |      |      |        |           |         |          |          |
| Taranaki DHB            | 0.0   | 3.0 | 1.0  | 3.0  | 5.5    | 1.9       | 3.9     | 0.0      | 4.0      |
| Waikato DHB             |       |     |      |      |        |           |         |          |          |
| Wairarapa DHB           | 0.0   | 2.8 | 0.0  | 8.8  | 2.7    | 0.0       | 0.0     | 0.0      | 0.0      |
| Waitemata DHB*          | 1.9   | 0.2 | 0.7  | 2.2  | 1.1    | 0.7       | 0.5     | 1.7      | 0.7      |
| West Coast DHB          | 4.5   | 4.1 | 4.2  | 20.6 | 3.9    | 4.3       | 0.0     | 4.2      | 0.0      |
| Whanganui DHB           | 0.0   | 3.4 | 1.7  | 3.6  | 6.4    | 3.4       | 3.5     | 0.0      | 0.0      |
| New Zealand             | 1.7   | 1.6 | 1.3  | 1.9  | 1.5    | 1.7       | 1.3     | 1.7      | 1.4      |

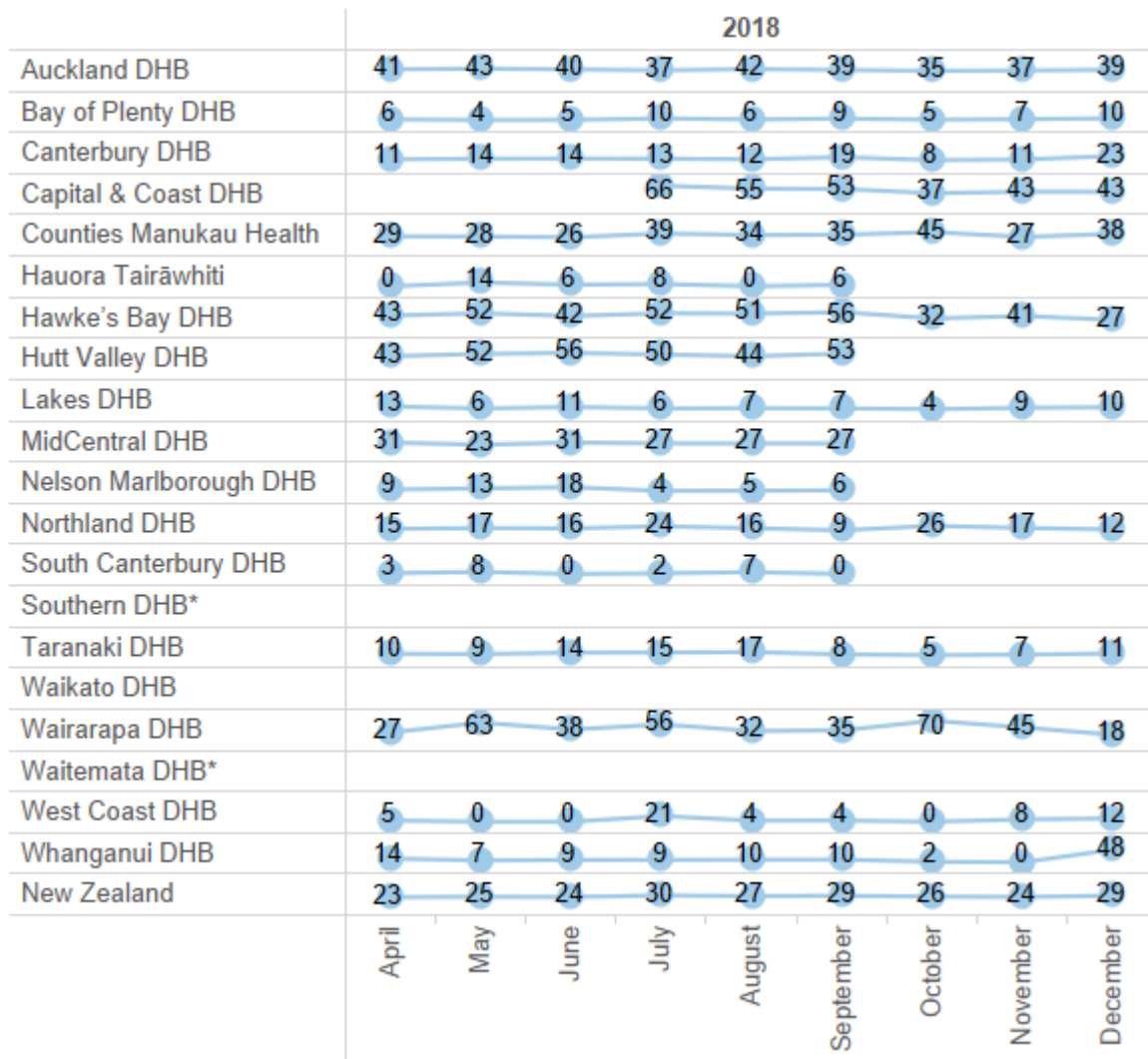
\*Yet to implement the New Zealand early warning score.

## 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 25 events per 1,000 admissions. A total of 14 DHBs (70 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



\*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. There is more spread for the second process marker, which shows two distinct groups: those that achieve higher than 70 percent and those that do not. This will be investigated in the next QSM report.

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

