Health Quality & Safety
Commission New Zealand
Kupu Taurangi Hauora o Aotearoa

Learning from adverse events

Adverse events reported to the Health Quality & Safety Commission

Embargoed until 12 noon, 4 December 2015

1 July 2014 to 30 June 2015

The Health Quality & Safety Commission is grateful to the staff from district health boards and other providers who have collectively contributed to this report, particularly quality and risk managers and their teams.

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

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Foreword

Public reporting of adverse events began with the national serious and sentinel events report 2006–07. The Health Quality & Safety Commission published its first report in 2010.

Since reporting began, event numbers reported by district health boards (DHBs) have increased from 181 to 525 in 2014–15.[1]

These numbers represent a change in health care towards increased transparency and learning from system failings and error. The numbers also reflect a change in the reporting approach of adverse events. The early goals of capturing numbers and encouraging learning from events still remain, but the practice of sharing those learnings is now growing and improving.

This report's title, *Learning from adverse events*, reflects this culture shift. It also reflects how DHBs, other health providers and the Commission are working together to help the sector understand events leading to avoidable harm. If DHBs make improvements to stop events happening again, this will reassure patients and families/whānau that steps are being taken to prevent harm.

This year, we look more closely at reported events by analysing cases of the deteriorating patient. New Zealand's health and disability system has ways to recognise early clinical deterioration in patients. However, the question remains, can we learn more about these events by studying event review cases? We commissioned a thematic analysis of 27 cases to address this question and inform our potential work in this area. In line with international research we found communication remains the main area where improvements could be made to recognise clinical deterioration earlier. We will continue to build a communication focus in our programmes.

This report also describes ways in which the Commission is working to transform the health sector. These include through our Open Book report series, by hosting human factors expert and astronaut Dr James Bagian (in October 2014) and the interagency work of the Information Sharing Forum.

I would like to acknowledge the generosity of the patients and families/whānau affected by the tragic events outlined in this report for taking part in the associated event reviews. Every affected patient engaged in a review helps us improve our work to prevent future adverse events.

I also acknowledge the health providers that contribute to these reports. Each is going through its own transformation, encouraging greater openness and transparency in its own reporting. These providers are increasingly embracing the concept of learning from adverse events, through sharing lessons learnt from individual cases, and by supporting training for staff. Through their openness and support, we can reduce the avoidable patient harm that, sadly, still exists in New Zealand.

Professor Alan Merry, ONZM FRSNZ
CHAIR, *Health Quality & Safety Commission*

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[1] In 2011, the Commission decided to separate DHB mental health and addictions services adverse events from the main report. As a result, mental health and addiction figures were released in a separate report in 2012–13 (see www.hqsc.govt.nz/our-programmes/adverse-events/publications-and-resources/publication/695/) and were then incorporated into the Office of the Director of Mental Health's annual report for 2013 (see www.health.govt.nz/publication/office-director-mental-health-annual-report-2013).

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Executive summary

In 2014–15, 525 adverse events[2] were reported to the Health Quality & Safety Commission (the Commission) by district health boards (DHBs) and 67 events by other providers. The increase from the 181 events reported in 2006–07 reflects an improvement in the processes used by DHBs to identify and review events, rather than an increase in event frequency.

The Commission works with DHBs to encourage an open culture of reporting and consistent application of reporting guidelines, to ensure events are captured appropriately and the sector learns from them.

We are committed to 'shining the light' on patient safety and quality improvement opportunities.

In 2014–15, the Commission continued its focus on falls prevention through its national reducing harm from falls programme. While maintaining its focus on inpatient hospital settings, the programme also expanded its focus to include falls in the community under its 'Stand Up to Falls' campaign approach.[3] In the past, the number of fall-related fractures voluntarily reported was lower than the actual events identified in the National Minimum Dataset (NMDS). This year, although we have an increase in the number of falls reported, comparison with the NMDS shows the number of all fracture events in the NMDS, and those reported as adverse events, are nearly identical. In addition, other fall-related injuries, such as dislocations and subdural haemorrhages, are also now being reported. This shows a commitment to reporting all harm.

The main achievements of the adverse events learning programme in 2014–15 include the visit of Dr James Bagian, the establishment of Open Book learning reports and the evolution of the adverse event training workshops. These activities reflect the Commission's commitment to learning from events and improved reporting.

PATIENT DETERIORATION

The Commission has done a thematic analysis of unrecognised or delayed recognition of clinical deterioration using 27 case review reports from eight DHBs. A well-structured, systematic adverse event review is an important tool for identifying learnings for quality improvement. We have used the thematic analysis to increase our learning about both patient deterioration and the review process.

The analysis shows that, while the New Zealand health and disability system has established processes for recognising patient deterioration, the theme common across events was communication failure.

The analysis findings are in line with the international evidence base and indicate focus areas for quality improvement.

Analysis of the review methodology used by DHBs indicates there should be an increased focus on systemic factors that contribute to events and recommendations could be strengthened. The Commission is supporting these findings with a pilot training programme to help improve the quality of reviews.

The thematic analysis will contribute to the Commission's work plan over the next 12 months, which aims to reduce unrecognised or delayed recognition of patient deterioration and associated adverse events.

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[2] An adverse event is an incident affecting a health and disability consumer that has been classified as severity assessment criteria (SAC) 1 or 2. In general, these incidents have resulted in, or could have resulted in, serious harm or death. For further information on SAC classification of incidents, see www.hqsc.govt.nz/our-programmes/reportable-events/publications-and-resources/publication/636/.

[3] Part of the Commission's national patient safety campaign, *Open for better care.* See www.open.hqsc.govt.nz/falls.

OPPORTUNITIES FOR IMPROVEMENT FOR THE ADVERSE EVENTS LEARNING PROGRAMME

The adverse events learning programme expert advisory group identified the following areas for strengthening and further development in the 2016 review of the national reportable events policy:

1. That all severity assessment criteria (SAC) 1 and 2 cases continue to be reviewed by the provider concerned, consistent with the national reportable events policy.[4]
2. That adverse events are analysed using root cause analysis or equivalent methodology and that a standard template with human factor prompts is developed by the Commission for organisations to use.
3. That greater attention is directed to the recommendations made in adverse event reviews, including consideration of how the recommendation(s) will address the root cause(s) and ensuring the implementation plan is monitored by the organisation's chief executive.
4. That health providers share at least one case for learning with other health providers annually via Open Book reports.

SUMMARY OF ADVERSE EVENTS REPORTING 2014–15

- In 2014–15, 525 adverse events were reported to the Commission by DHBs and 67 by other providers.
- As in previous years, serious harm from falls was the most frequently reported event, with 277 cases. Of these, 84 resulted in the patient suffering a fractured neck of femur (broken hip).
- Clinical management incidents were the next most reported events, with 205 cases relating to delays in treatment, assessment, diagnosis, observation and monitoring (including patient deterioration), among others.
- Incidents involving prescribing, dispensing or administration of medication were the next most frequently reported events, with 23 cases.
- The Commission works with the Director of Mental Health to publish adverse events affecting users of DHB mental health and addictions services. In 2014–15, DHBs reported 181 such events. These will be included in the Office of the Director of Mental Health's annual report.
- Of the 67 adverse events reported to the Commission by other providers, 43 were from the New Zealand Private Surgical Hospitals Association, nine were from ambulance services and 15 were from other providers.

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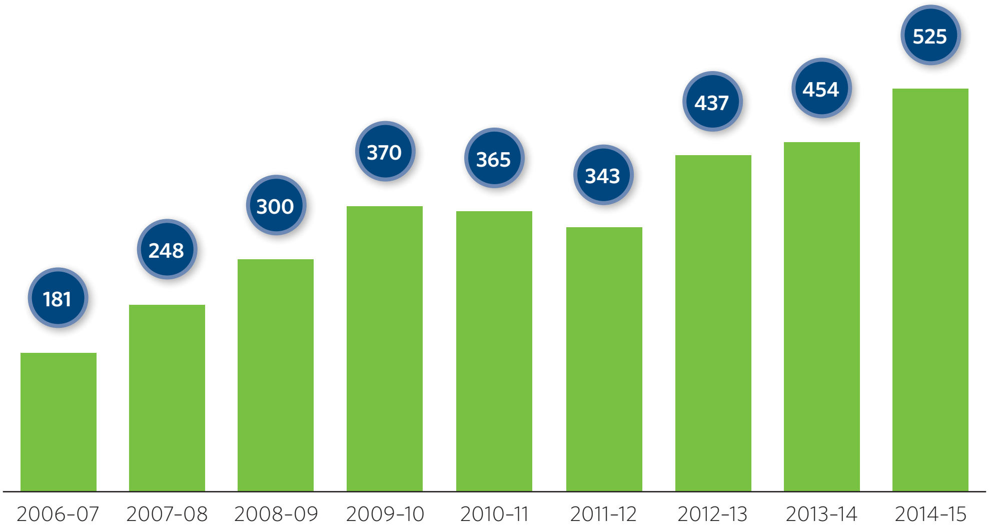
[4] See www.hqsc.govt.nz/our-programmes/reportable-events/national-reportable-events-policy.

Chapter 1: Adverse events reporting 2014–15

TOTAL EVENTS 2014–15

The number of adverse events reported by district health boards (DHBs) between 1 July 2014 and 30 June 2015 increased by 16 percent on the previous year, to 525 (Figure 1).

Figure 1: DHB adverse events (non-mental health), 2006–07 to 2014–15



Note: As mental health adverse event numbers are not included in this figure, numbers prior to 2013 will differ from those previously published in adverse events reports.

Much of this is due to increased reporting of cases where patients suffered a serious injury after falling.

In 2011, the Health Quality & Safety Commission (the Commission) decided to separate DHB mental health and addictions services adverse events from the main report. It also decided to support the mental health sector in its specific approach to reviewing and reporting adverse events. As a result, mental health and addiction figures were released in a separate report in 2012–13[5] and were then incorporated into the Office of the Director of Mental Health's annual report for 2013.[6]

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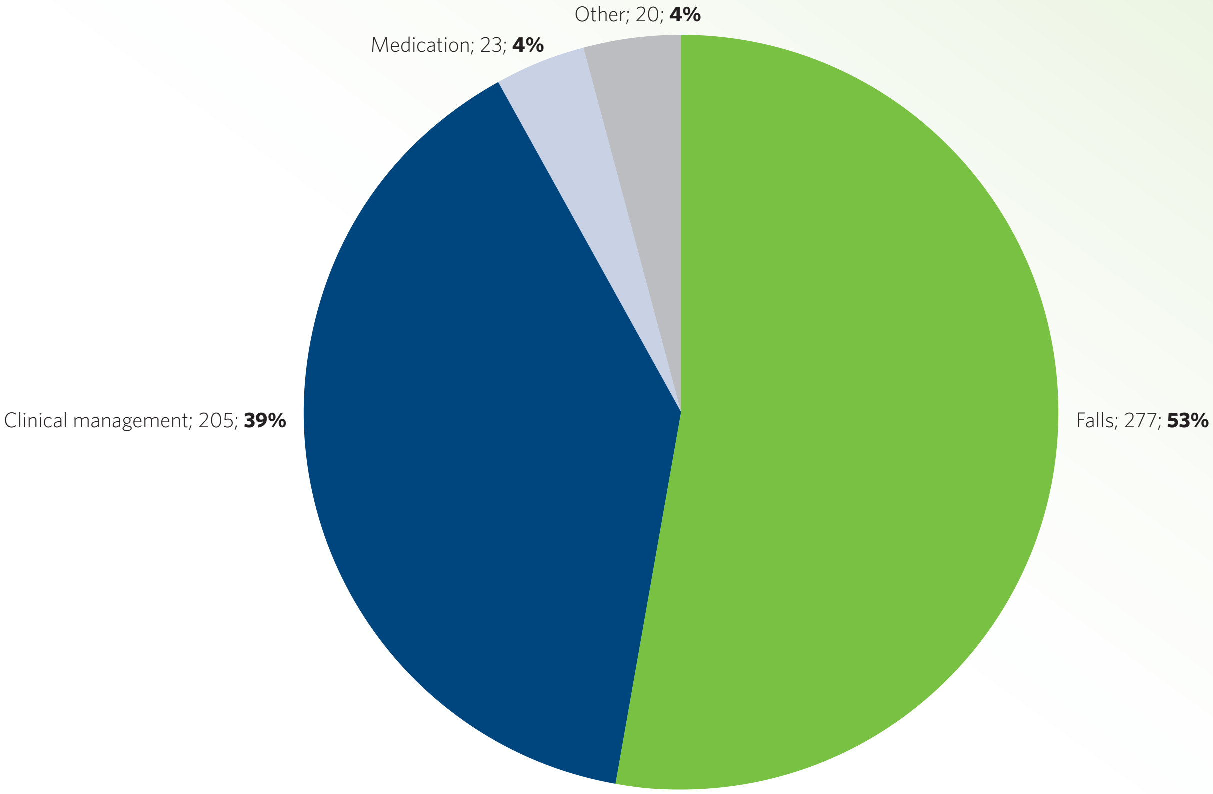
[5] See www.hqsc.govt.nz/our-programmes/adverse-events/publications-and-resources/publication/695.

[6] See www.health.govt.nz/publication/office-director-mental-health-annual-report-2013.

Figure 2: DHB adverse events by event type, 2014–15



As in every year since the Commission began reporting on adverse events, serious harm from falls were the most frequently reported events (Figure 2). In 2014–15, there were 277 cases, making up 53 percent of total events reported. Clinical management events were the next most common (205 events, 39 percent) and medication events the third (23 events, 4 percent).

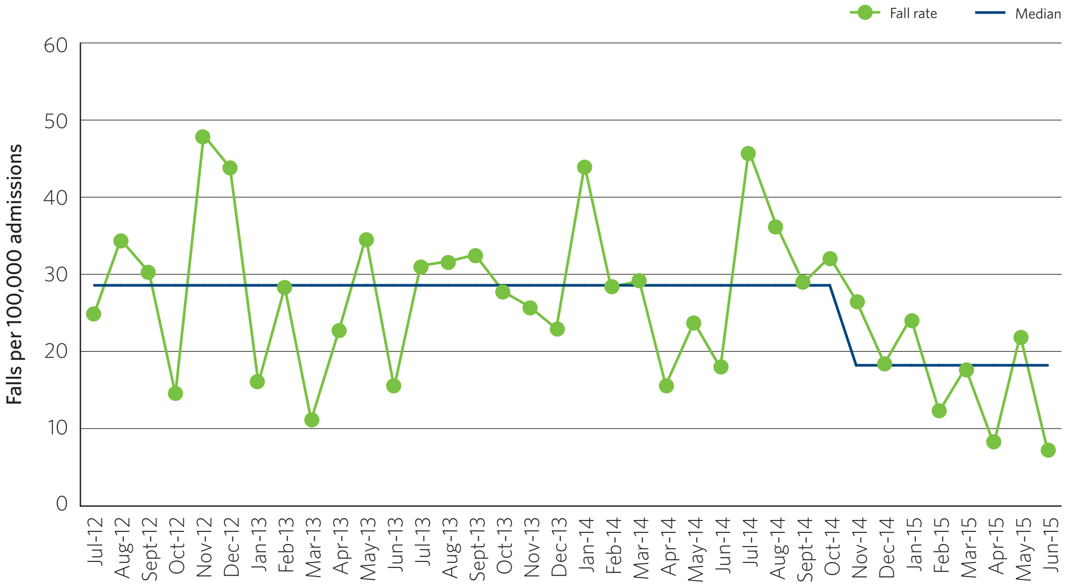
FALLS EVENTS 2014–15

In 2014–15, the Commission continued to focus on falls prevention through the national reducing harm from falls programme. While maintaining a focus on inpatient hospital settings, the programme also expanded its focus to include falls in the community under its 'Stand Up to Falls' campaign approach. The programme has promoted the need for an integrated approach to falls and fracture prevention. DHBs are working more closely with their community, aged care and primary care partners to ensure seamless and improved care for older people and others at risk.

Conversations about falls prevention between health professionals and patients need to happen early. This identifies falls risk factors early, and allows for strategies to be put in place to address those risks. In the long term, this will have a positive impact on bone health and a flow-on reduction in falls resulting in injury.

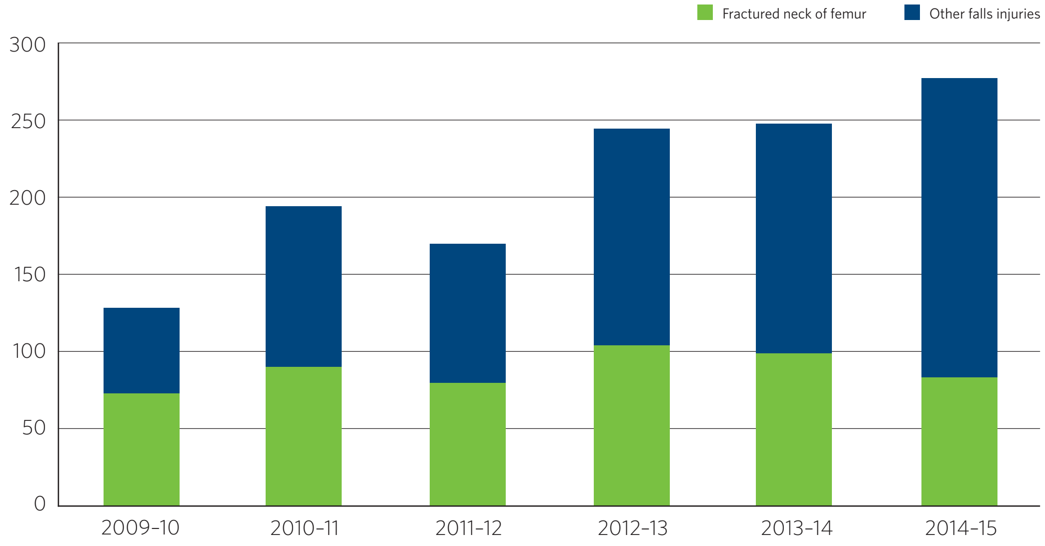
In the last six months we have started to see the success of this approach. There have been significantly fewer falls resulting in a fractured neck of femur since November 2014 onwards (Figure 3). This reduction is significant and sustained, and has a meaningful impact on people's lives. Death, disability and loss of quality of life and independence are all common consequences of a fractured neck of femur. The level of reduction seen has saved around $1.5 million in avoided additional health care costs.

Figure 3: In-hospital falls with fractured neck of femur per 100,000 admissions aged 15 and over, 2012–15 (routine hospital data)



This reduction, identified from routine hospital data, is mirrored in the adverse events reports received by the Commission (see Figure 4). Adverse events data shows a 14 percent reduction, from 98 to 84 incidents. However, Figure 4 also shows a notable increase in reports of other fall-related injuries, from 150 to 193.

Figure 4: Falls adverse events including fractured neck of femur, 2009–10 to 2014–15



We encourage DHBs to report to us all SAC 1 and 2 falls (which now include all minor and major fractures) and review those cases to identify systems learnings and implement improvements.

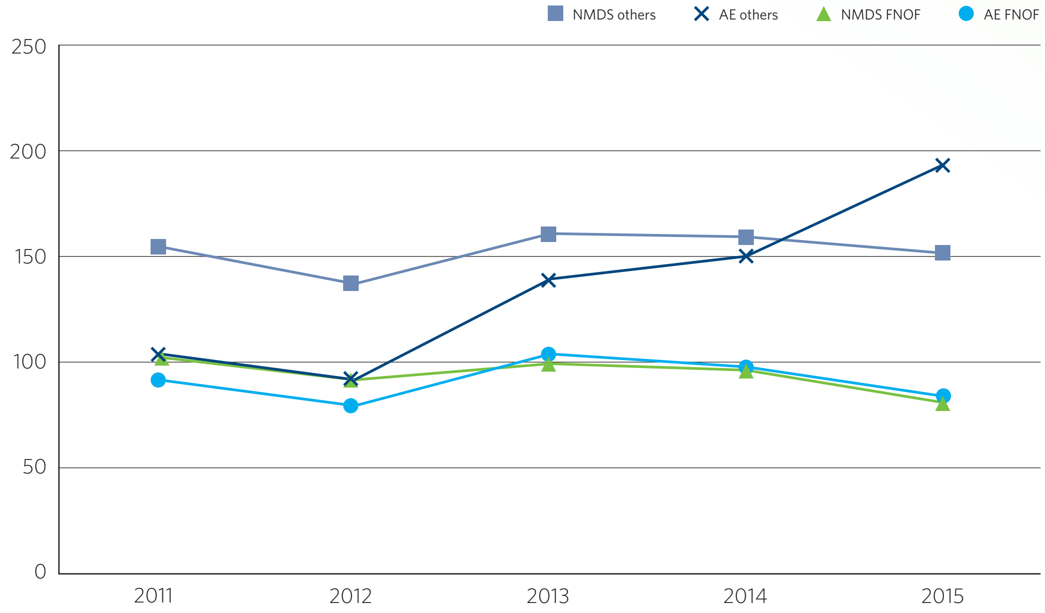
This increase prompts the question, is the rise in numbers due to better reporting, or is there a genuine increase in other falls? To answer this, we compared the number of fractures reported via adverse event reports with the numbers identified in the National Minimum Dataset (NMDS). The NMDS data differs from the adverse events reports because it has been collected in a mandated and consistent way for many years, with no judgement about what is or is not an adverse event. The NMDS data should therefore provide a more consistent baseline against which to compare the adverse event reporting.

First, we consider falls with a fractured neck of femur. The NMDS count (labelled 'NMDS FNOF' in Figure 5) was higher than the adverse events reported until 2013. Since then, improved reporting means these two measures are nearly identical – varying only through timing of reporting.

For other adverse events, however, the pattern is different. The line in Figure 5 called 'NMDS others' shows all other fracture cases associated with a fall in hospital from the NMDS data. These figures have been relatively consistent since 2010–11, with a slight reduction since 2012–13.

The adverse events group (labelled 'AE others') should contain all these fractures plus other serious harm events, such as major dislocations and subdural haemorrhages. We should expect this figure to be slightly higher than the 'NMDS others' fractures. However, until 2014–15 this was not the case. For the first time this year, the adverse events reports are closer to where we expect them to be in relation to the count of other fractures. We conclude that reporting of adverse events has improved, with a commitment to reporting all harm.

Figure 5: Comparison of the quality and safety marker data (from the National Minimum Dataset) and adverse event reporting of falls, 2011–15



Notes:
NMDS others = all falls resulting in a fracture other than fractured neck of femur recorded in the NMDS
AE others = all fall-related harm reported via adverse event reporting and not including FNOF
NMDS FNOF = all falls resulting in a fractured neck of femur recorded in the NMDS
AE FNOF = all falls resulting in a fractured neck of femur reported via adverse event reporting

CLINICAL MANAGEMENT EVENTS 2014–15

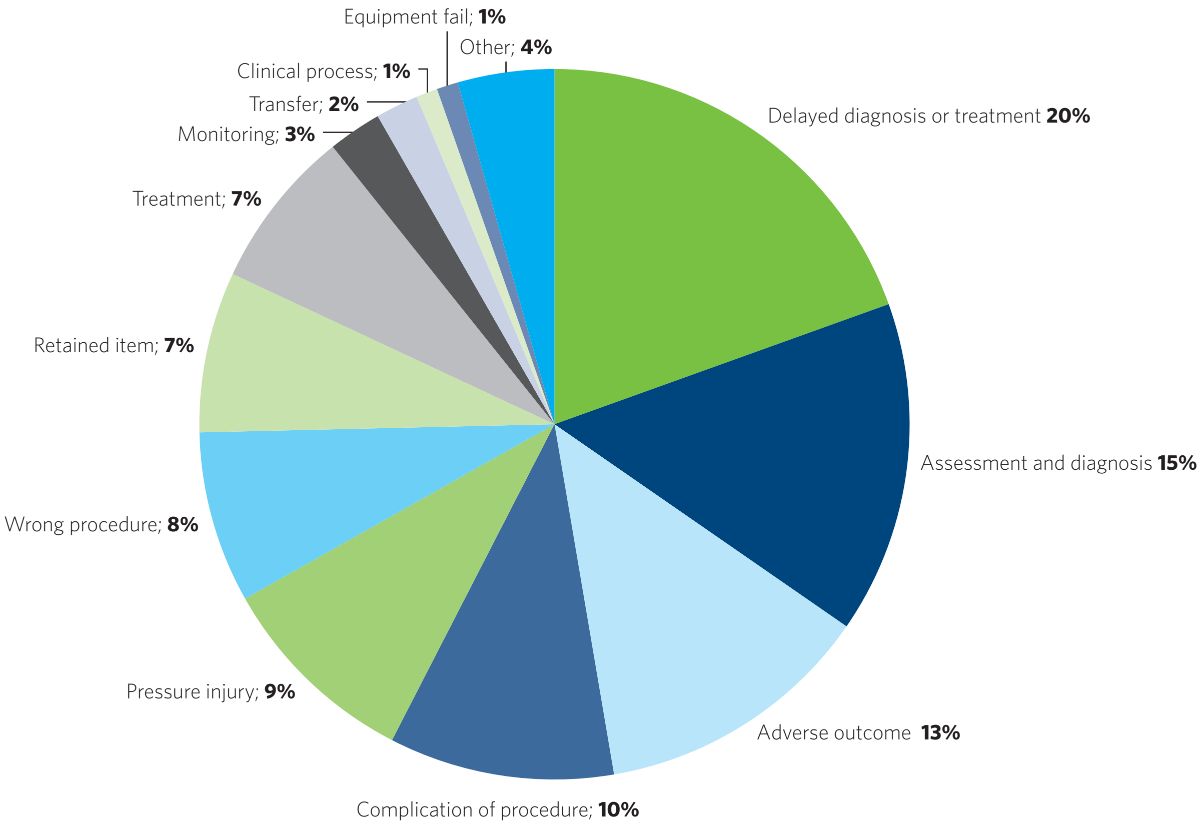
In 2014–15, 205 clinical management events were reported, the second largest group of adverse events after falls.

Figure 6 shows each clinical management event type as a percentage of the total clinical management events reported. It is important to note complex adverse events can at times be classified under different categories. The principle category is a subjective decision. Only root cause analyses can identify the underlying causal factors. The numbers in Figure 6 are not based on root cause analysis, as not all adverse events will have a root case analysis done.

The categories differ somewhat from previous years and specify a greater degree of detail to better understand the various contributors. As an example, pressure injuries are now reported separately rather than being captured in the general care section as they were in previous reports. The wording of some categories has changed: observation events have been renamed monitoring events, and incorrect process has been renamed wrong procedure. A breakdown of wrong procedures and a comparison with previous years' reports is available on the Commission's website.[7]

Deteriorating patient events are captured as part of monitoring events but can also be recorded in other categories, as explained above. This suggests delays in detecting and responding appropriately to clinical deterioration are probably under-reported and under-reviewed.

Figure 6: Clinical management events, 2014–15



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[7] See www.hqsc.govt.nz/assets/Reportable-Events/Publications/comparison-of-wrong-procedure-adverse-events-Dec-2015.pdf.

Table 1 shows the number of clinical management events recorded for each sub-group.

Table 1: Clinical management events per sub-group, 2014–15

Clinical management event	Events per sub-group
Delayed diagnosis or treatment	40
Assessment and diagnosis	31
Adverse outcome	26
Complication of procedure	21
Pressure injury	19
Wrong procedure	16
Retained item	15
Treatment	15
Monitoring	5
Transfer	4
Clinical process	2
Equipment fail	2
Other	9
Total	**205**

Pressure injuries

The Commission understands that pressure injuries are likely to be under-reported across the sector. In 2014–15, the Northern region DHBs (Auckland, Counties Manukau, Waitemata and Northland) have started reporting all of the highest grade pressure injuries (grade III and IV) to us. We support and encourage this approach from all health providers, as this is a highly preventable area of harm. We also encourage providers to complete the necessary ACC treatment injury claim forms to ensure any patient who has experienced harm from a pressure injury is receiving the right entitlements to support their treatment and rehabilitation.

Chapter 2: Adverse events reported by other providers 2014–15

A total of 67 adverse events were reported to the Commission by other providers.

PRIVATE SURGICAL HOSPITALS

The New Zealand Private Surgical Hospitals Association (NZPSHA) represents the interests of private surgical hospitals. Twenty-five organisations are members, responsible for 37 hospitals where nearly 162,000 patients are treated each year (50 percent of all elective surgery in New Zealand).

A requirement of NZPSHA membership is involvement in the reporting of clinical indicators (including adverse events). The Injury Prevention Research Unit of the University of Otago analyses these figures and reports back to member organisations without identifying individual providers, other than providers' own figures.

Between 1 July 2014 and 30 June 2015, the NZPSHA reported 43 SAC 1 or 2 incidents from 161,995 admissions. This figure cannot be compared directly with DHB-reported events because the reporting criteria differ. Private surgical hospitals have a broader range of cases classified as a SAC 1 than DHBs. We aim to address this variation as part of the national reportable events policy review in 2016.

AMBULANCE SERVICES

Between 1 July 2014 and 30 March 2015, ambulance services reported nine adverse events. Two were clinical management events, one was a transport-related event, three related to equipment and three were other types of events. For more information see the Ministry of Health's website: www.health.govt.nz/new-zealand-health-system/key-health-sector-organisations-and-people/naso-national-ambulance-sector-office/emergency-ambulance-services-eas/performance-quality-and-safety/reportable-events.

ALL OTHER REPORTING

The national reportable events policy was designed for DHBs. However, the patient safety and quality improvement systems supported by the policy are increasingly relevant to other organisations. The review of the policy in 2016 will consider how reporting can meet the needs of both DHBs and other organisations.

Other providers (excluding private surgical hospitals) reported 15 adverse events to the Commission in 2014–15:

- Aged residential care: Five events, all relating to serious harm from falls.
- Primary health organisations: Four events, including two relating to clinical administration, one relating to a fall and one relating to medication.
- Other private providers: Two providers each reported one event relating to clinical management.
- Hospice: One event relating to serious harm from a fall.
- Disability services provider: One event relating to clinical management.
- New Zealand Defence Force: One event relating to clinical management.
- Breast Screening Unit: One event relating to documentation.

The Commission welcomes reporting by other providers. This signals a culture of openness and a desire to learn from adverse events. We encourage these reports to continue and anticipate the number of events reported to us will increase as reporting is embedded further into practice.

Chapter 3: Clinical deterioration – a thematic analysis of deteriorating patient adverse events

INTRODUCTION

A well-structured, systematic adverse event review is an important tool for identifying learnings for quality improvement. To learn more about patient deterioration and the review process, we have analysed the findings and recommendations from the deteriorating patient reviews.

Clinical deterioration can happen at any point in a patient's illness, but patients are especially vulnerable after surgery and during recovery from critical illness. Patients whose clinical condition is deteriorating need timely recognition and appropriate expert care. This has been shown to reduce adverse events, such as unexpected cardiac arrest, or unplanned admission to an intensive care unit.

Patients deteriorate for many reasons. The problem is failure to recognise, failure to escalate care and failure to respond appropriately.

The New Zealand health and disability sector has established strategies to improve the recognition of and response to patient deterioration. These include the use of early warning scores, simulation training, rapid response teams and better communication at patient handover.

Timely, effective recognition and response to deterioration is important because there may be a narrow timeframe in which to reverse or reduce the amount of associated physiological damage. It is an essential component of safe, high-quality health care. It reduces avoidable mortality and morbidity, the length of patient stay and associated health care costs. This has been recognised by many countries, with standards and guidance developed.[8]

Despite the introduction of systems to better recognise and manage clinical deterioration, some patients who become acutely unwell in hospital may still not have their deterioration recognised or responded to in a timely manner. The adverse events learning programme expert advisory group has found that providers inconsistently identify and respond to clinical deterioration, potentially leading to preventable harm or inappropriate care. For these reasons the recognition and management of patient deterioration remains a high priority for the sector.

The case study on page 15 gives an example of delayed recognition of clinical deterioration. Cases of delayed recognition and response to clinical deterioration are reported worldwide.

By understanding where clinical processes fail, and the complex reasons why failure happens, health care organisations can prioritise and target their efforts to improve patient safety.[9] The National Health Service (NHS) National Patient Safety Agency undertook a review to understand why deterioration incidents happen, using focus groups, structured interviews, a literature analysis and a thematic analysis of 51 root cause analysis reports.[10]

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[8] Australian Commission on Safety and Quality in Health Care. 2010. *National Consensus Statement: Essential elements for recognising and responding to clinical deterioration.* Sydney: Australian Commission on Safety and Quality in Health Care. URL: www.safetyandquality.gov.au/wp-content/uploads/2012/01/national_consensus_statement.pdf (accessed September 2015); Scottish Intercollegiate Guidelines Network (SIGN). 2014. *Care of deteriorating patients.* (SIGN publication no.139). Edinburgh: SIGN. URL: www.sign.ac.uk (accessed October 2015).

[9] NHS National Patient Safety Agency. 2007. *Safer care for the acutely ill patient: learning from serious incident. NHS England.* URL: www.nrls.npsa.nhs.uk/resources/?EntryId45=59828 (accessed November 2015).

[10] *Ibid.*

The Commission has reviewed adverse events involving harm caused by delayed recognition of patient deterioration, to better understand the factors involved from a New Zealand perspective.

The following sections provide an overview of our review findings and conclude with comments on how the results compare with the international literature and the main opportunities for improvement and focus in the future.

REVIEW PROCESS

Between 2011–12 and 2014–15, New Zealand providers reported 60 adverse events to us involving clinical deterioration. We approached the organisations involved to ask for more detailed reviews. We received 27 from eight DHBs in time to be included in the qualitative thematic analysis.

The analysis focused on two areas:

- the human factor issues identified in reviews as causal and contributing to the deterioration
- the review recommendations made for improvement and prevention.

Although the depth of analysis that can be gained from a small number of cases is limited, even in the 27 reviews we assessed, common themes were identified. A similar thematic analysis approach could be used in future years on other topics.

The analysis did not look at whether or not the recommendations were implemented by the eight DHBs because this was out of the project scope, but it has been identified as an area for future focus.

A 78-year-old woman, Mrs X, was admitted to the surgical ward for elective surgery. She had several long-term conditions, including diabetes, kidney disease and heart disease. Her surgery went well and she was stable immediately after the operation. However, over the next two days she complained of breathlessness and chest pain, and her blood pressure became low.

Mrs X was seen by the cardiology team and thought to have had a heart attack. She was booked for a coronary angiogram (heart artery dye test) later the next day. Her blood pressure continued to be low. As no clear cause was evident for her low blood pressure, no intervention was started for this as there were concerns that treatments could worsen some of her other medical conditions.

Mrs X was transferred to another ward before her angiogram. Following the angiogram, Mrs X was again moved to a different ward for observation. Her blood pressure continued to be low but was not noticeably different from her pre-angiogram blood pressure. The importance of the slight difference in blood pressure from the admission baseline was not appreciated. Mrs X was therefore considered to be stable after the angiogram and was transferred back to the surgical ward where she was originally admitted. On return, the nurses noticed she was cold, clammy and confused in comparison to admission a few days earlier. Due to these concerns the emergency medical team was called. Mrs X was transferred to an intensive care unit and was found to have kidney failure. The prolonged period of low blood pressure may have worsened her existing kidney disease. Sadly, Mrs X died.

A review of the case identified that the slow deterioration was not obviously apparent because of the specialities, wards and teams involved during the multiple transfers within the hospital. It was not until the return to the original surgical ward that the degree of deterioration was recognised.

cont. over page

The review identified opportunities for:

- better communication at handovers and transfers of care between wards and teams
- better discussion and documentation relating to the escalation and potential need for increased care.

The various ward transfers and focus on the angiogram test drew attention away from the persistent low blood pressure and the small but important change from baseline.

ANALYSIS OF CAUSAL AND CONTRIBUTING FACTORS

The analysis was guided by the examination of factors identified in international frameworks for the study of human error in patient safety and adverse events.

These frameworks aim to aid understanding of the causes and consequences of contributors to error at the organisational and policy level, and at the level of situational preconditions, working conditions and system processes.

A description of the factors is given in Appendix B. They are:

- external policy context
- processes
- working conditions
- situational factors
- organisational factors.

Various factors can directly cause patient deterioration or add to it. They range from interactions between the clinician and patient, and can include broader issues relating to the health service management and funding. These factors are collectively known as 'human factors' and have been identified as affecting patient safety and adverse events.[11]

FINDINGS FROM DHB REVIEWS

Our thematic analysis was limited because of the:

- small number of cases analysed
- wide variety of clinical circumstances reported
- lack of a standardised approach in the reviews
- focus by DHB reviewers on the reporting of patient and individual clinician factors rather than team and organisational factors.

Figure 7 shows the overall frequency of reporting in terms of raw numbers of the causal and contributory factors identified in the analysis. Each theme area is addressed in further detail below and the main findings or most common issues discussed.

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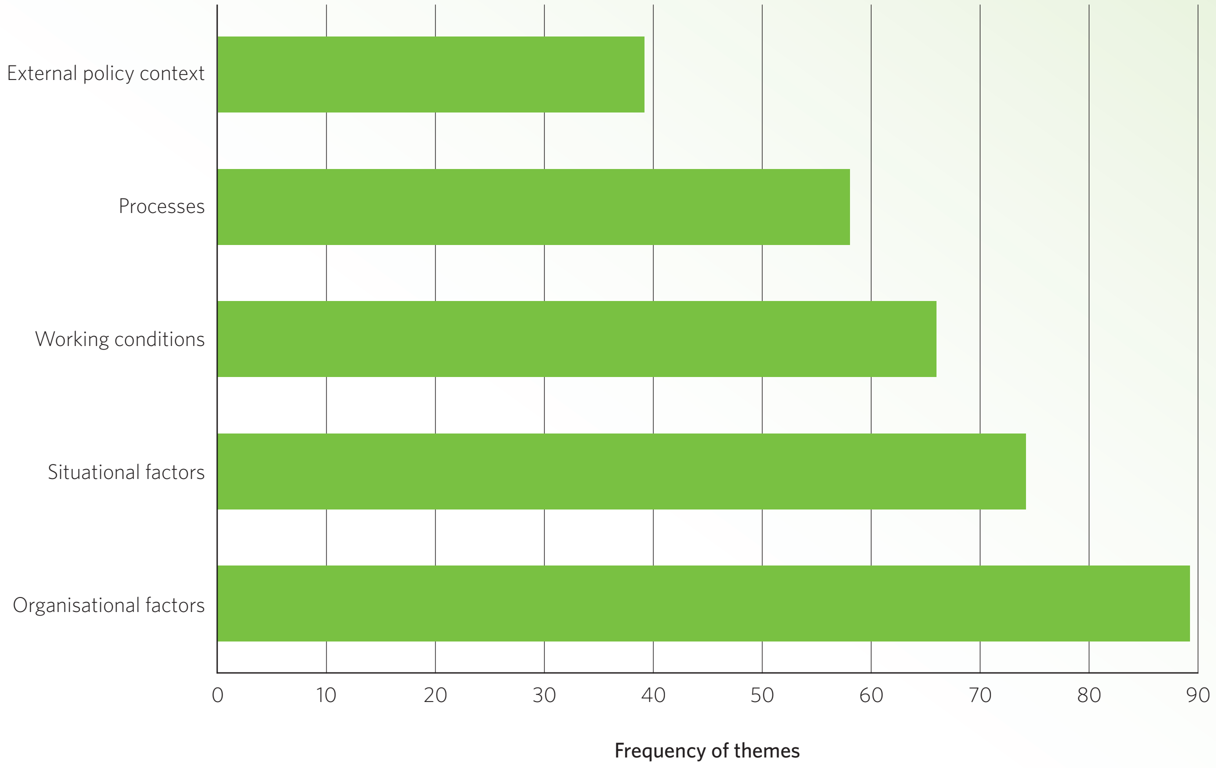
[11] Lawton R, McEachan RC, Giles SJ, et al. 2012. Development of an evidence-based framework of factors contributing to patient safety incidents in hospital settings: A systematic review. *BMJ Quality & Safety* 21(5): 369–80. DOI: 10.1136/bmjqs-2011-000443 (accessed November 2015).

Figure 7: Overall frequency of reporting in reviews (raw numbers) of causal and contributory factors



DETAILS OF THE CAUSAL AND CONTRIBUTING FACTORS

External policy context

Decisions made outside health care organisations may (unintentionally) be contributing factors in patient deterioration.[12]

Because these external factors are outside the immediate environment, it is harder for reviewers to make the link between them and patient deterioration when reporting and reviewing adverse events. As a result, this area had the least emphasis across the reports, as shown in Figure 7.

Where the link was noted, it generally related to bed management challenges, having inadequate staffing to meet demand, or staff lacking the right skill set and level of expertise.

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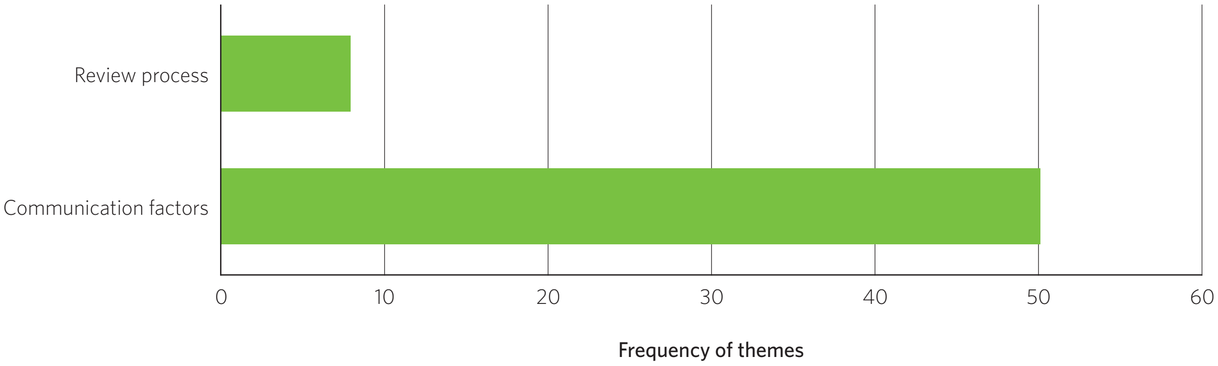
[12] Health Quality & Safety Commission. 2015. *Open Book: Epidural medicines through intravenous lines.* Wellington: Health Quality & Safety Commission. URL: www.hqsc.govt.nz/our-programmes/adverse-events/publications-and-resources/publication/2338/ (accessed October 2015).

> ‘Human factors discovers and applies information about human behaviour, abilities, and limitations, and then applies them to the design of tools, tasks, and environments. In the health sector this includes the understanding and design of a wide range of procedures, workspaces, equipment, and team tasks in clinical settings to ensure productive, safe, comfortable, and effective healthcare systems.’[13]
>
> ***Associate Professor Samuel G Charlton***
>
> University of Waikato, member of the adverse events learning programme expert advisory group

Processes

This area covers communication failures and the processes used to review patients. Communication failure was found in our thematic analysis to be the single biggest contributing cause to unrecognised patient deterioration (Figure 8). This is consistent with much of the international literature, including the NHS National Patient Safety Agency review.[14]

Figure 8: Processes – number of times (raw numbers) communication and review processes were reported



Recurring communication failures identified in the DHB reviews included:

- inadequate handover between shifts or across specialties
- poor communication with patients and their families/whānau when they raised an issue of concern
- information about patient deterioration not being recorded and communicated at handovers, either between shifts or across speciality areas.

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[13] Henriksen K, Dayton E, Keyes MA, et al. 2008. Understanding Adverse Events: A Human Factors Framework. In RG Hughes (ed). *Patient Safety and Quality: An Evidence-Based Handbook for Nurses.* Rockville (MD): Agency for Healthcare Research and Quality. URL: www.ncbi.nlm.nih.gov/books/NBK2666/ (accessed November 2015).

[14] Lawton et al 2012, *op.cit.*; NHS National Patient Safety Agency 2007, *op.cit.*

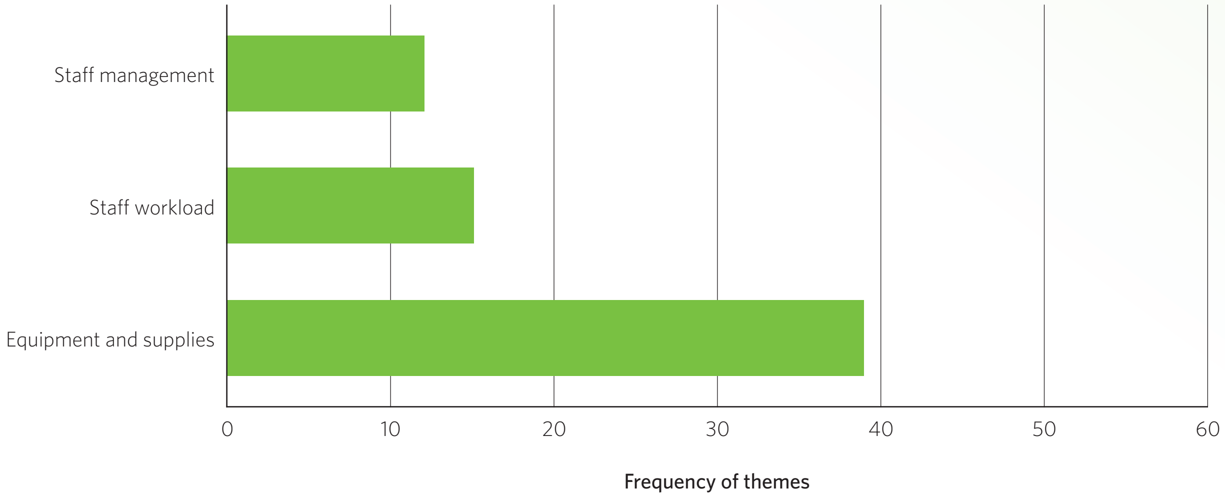
Working conditions

This area covers the immediate working conditions associated with adverse events. Examples include:

- availability and functioning of equipment and supplies
- management and allocation of staff to ensure an adequate mix of expertise
- staffing levels and availability for the volume of work, for example, the impact of a large accident bringing many casualties to an emergency department
- quality of direct local supervision and leadership, for example, whether or not clear lines of responsibility exist to clarify accountability of staff members and delineate their roles. Direct supervision may be more of an issue out of hours, when senior staff are often on call from home.

Working conditions identified in the reports are shown in Figure 9.

Figure 9: Working conditions – number of times (raw numbers) staff management, staff workload and equipment were reported



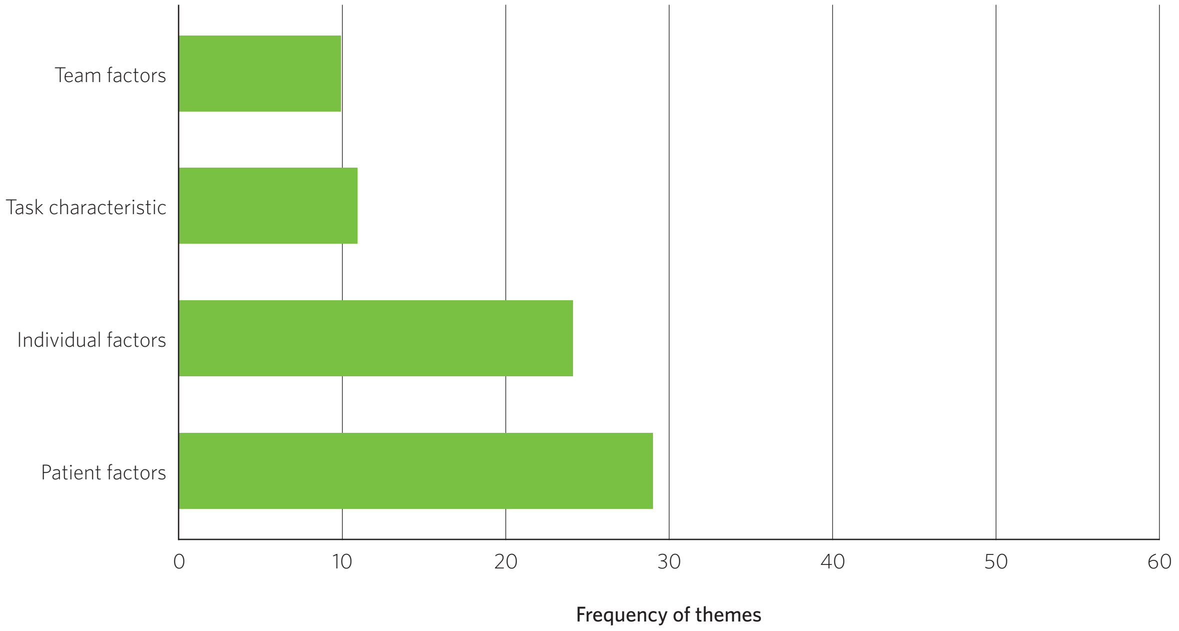
The DHB reviews highlighted access to appropriate and functioning equipment as a common contributor to identifying and treating unexpected patient deterioration. In some cases the equipment was not immediately available. In most instances staff were unfamiliar with the specialist equipment, either because it was not in their area of specialisation or because of inexperience.

Situational factors

This area covers individual staff factors (such as inexperience) and team factors, and how these affect safety. It includes the use of team briefings and checklists by surgical teams, as well as task-specific factors (eg, the complexity of the procedure) and patient factors (eg, a language barrier that may make understanding the patient's concerns more challenging).

The frequency of these reported factors (raw numbers) is shown in Figure 10.

Figure 10: Situational factors – number of times (raw numbers) team, task, individual and patient factors were reported



Situational factors for clinicians included suboptimal supervision of junior staff out of hours because senior staff were on call but off site, and, for both nursing and medical staff, fatigue due to long working hours.

Patient factors revolved around complex clinical conditions or age that may have masked the early signs leading to deterioration.

With the increasing age and complexity of the population, patients often need input from several specialities when admitted. They may be nursed in a 'home ward' but require input and equipment from other areas. The home ward staff could be unfamiliar with the equipment and procedures of a different specialist area. One example is specialist surgical equipment unfamiliar to staff in a care of the elderly ward. This complexity contributed to patient deterioration, particularly when there was more than one specialty involved, and when roles and responsibilities, and escalation to more senior and expert care were not clearly defined. This is captured under task characteristic factors in Figure 10.

Organisational factors

Organisational factors include the physical environment, such as the layout of a unit, which may make it difficult to see all patients from a central point (eg, the use of single and four-bed rooms rather than nightingale wards). It also looks at policies and procedures, whether they exist, and if they are hard to understand or of otherwise poor quality.

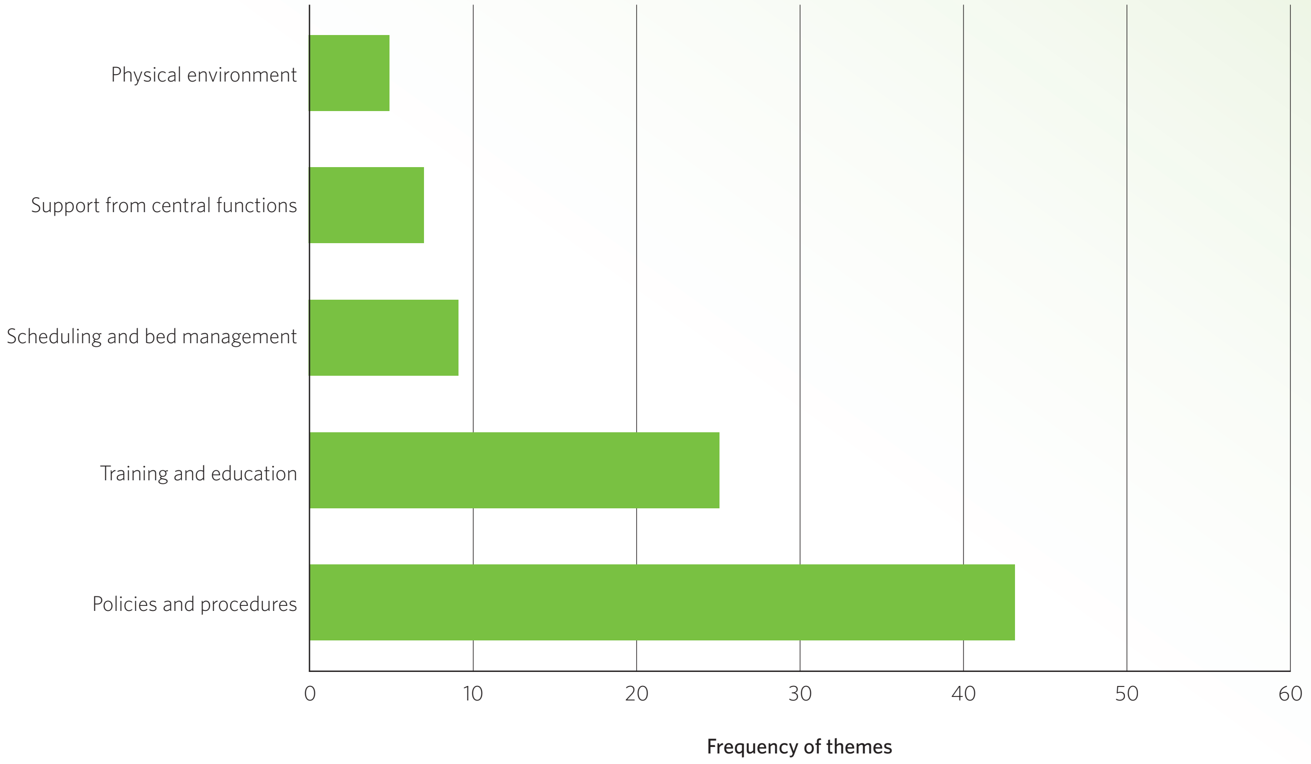
Support from central functions addresses the availability and adequacy of central services, such as access to computers or clinically related services (for example, radiology, pharmacy and phlebotomy).

Scheduling and bed management looks at whether there is planning of elective surgery to manage staff demand and system capacity better.

Training and education looks at access to correct, timely and appropriate training, both specific (eg, task related, such as insertion of intravenous cannulas) and general (eg, organisational related, such as orientation to key policies and documents).

Unrecognised patient deterioration can be caused by factors beyond the immediate clinician–patient interface and relates to the organisational factors shown in Figure 11.

Figure 11: Organisational factors – number of times (raw numbers) various organisational factors were reported



The DHB reviews identified the greatest number of issues in this area, particularly those relating to the development and/or adherence to policies and procedures, and the need for appropriate training and education.

Much of the reporting on policy and procedures highlighted the need for their development as a result of an incident. The need for training and education was to raise awareness of policies and procedures. Training and education was recommended for junior staff in the use of specialist equipment with which they may be unfamiliar, particularly out of hours when senior staff may not be immediately available on site.

Issues relating to the availability or adequacy of central functions (computer access or central services, such as radiology and laboratories) to support units and wards were reported less frequently, as were staff scheduling and bed management.

SUMMARY OF MAIN THEMES FROM DHB REVIEWS OF CAUSAL AND CONTRIBUTING FACTORS

The Commission's thematic analysis of 27 DHB case reviews highlighted the following main issues:

1. Communication failure was the individual theme with the highest level of reporting.
2. There is a need for development and/or adherence to policies and procedures, and appropriate staff training and education.

3. The reviews focused on the individual patient or clinician involved and less on factors like external policy context, support from central functions, staff management and workload. This was seen as an important omission because identifying and addressing these broader system issues has the potential to prevent a greater number of adverse events than a focus on individual patient or clinician factors.
4. Many of the frequent factors identified may be relatively easily addressed, such as: access to the correct equipment and supplies; ensuring there is regular and appropriate training and education; and developing appropriate policies and procedures. These factors can all be addressed at a broader organisational level.
5. Addressing more complex or unpredictable factors may require investment in the leadership skills of frontline clinicians, such as: effective communication; identifying and responding to unique patient-level issues; and addressing inexperience or attitudinal issues in individual staff members.

COMPARISON WITH INTERNATIONAL FINDINGS

Our thematic analysis generally matched findings reported in the international literature, in which communication failure was also the most commonly reported individual factor.[15]

Some factors present in the international literature were not reported as often as expected in our analysis. One such area was the structure and functioning of the clinical team, which has received a lot of focus internationally.[16]

Another area relates to the pressures on workload created by poor patient flow and bed management. While there is evidence of this being a cause in some of the New Zealand DHB cases we reviewed, it is not reported at the level seen in other countries.[17]

Under-reporting in these two areas may be because they are either not major contributing factors or because of the inability of or lack of focus in the review process to examine factors existing beyond the patient–clinician interface. Only 27 reports were reviewed and may not reflect fully all the issues existing in the sector.

The NHS National Patient Safety Agency's findings identified similar themes, for example: communication and documentation of plans; training and education; equipment issues; and difficulties with multi-speciality involvement in terms of roles and responsibilities.

ANALYSIS OF THE DHB REVIEW RECOMMENDATIONS

Across the 27 reports reviewed, we identified and analysed 129 recommendations. These are summarised in Table 2. A summary of the frequency of recommendations made is shown in Figure 12.

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[15] NHS National Patient Safety Agency 2007, *op. cit.* Lawton et al 2012, *op.cit.*

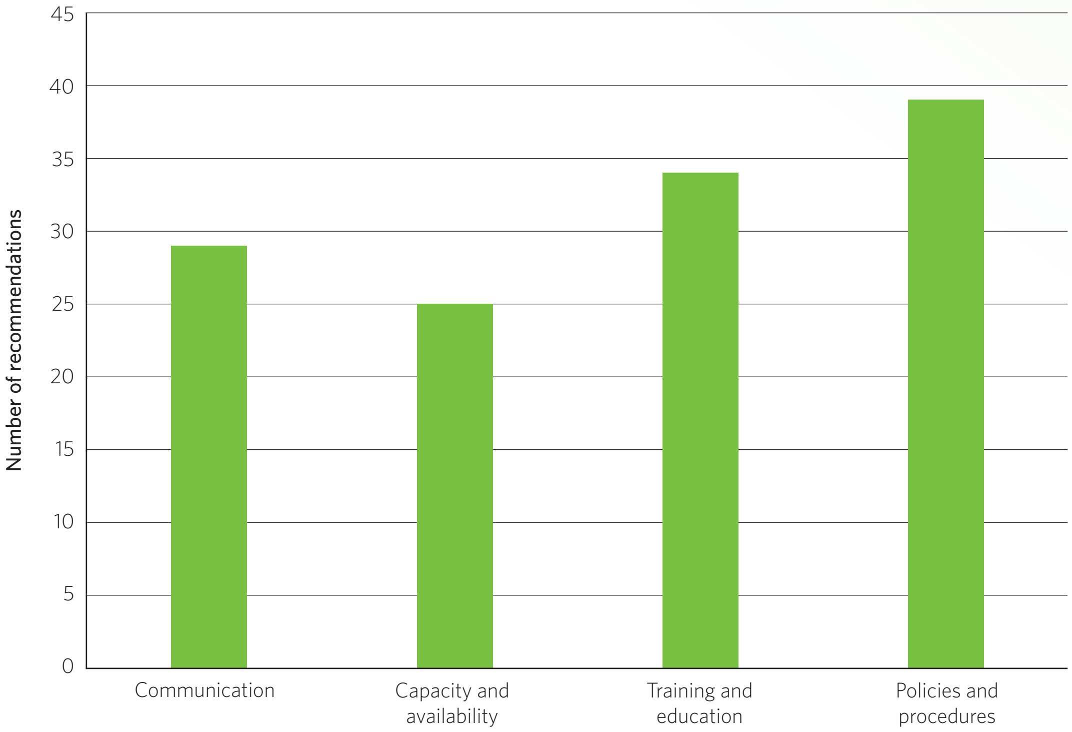
[16] Leonard M, Graham S, Bonacum D. 2004. The human factor: The critical importance of effective teamwork and communication in providing safe care. *Quality and Safety in Health Care* 13(Suppl 1): i85–i90; Singer SJ, Vogus TJ. 2013. Reducing hospital errors: Interventions that build safety culture. *Annual Review of Public Health* 34: 373–96.

[17] Goulding L, Adamson J, Watt I, et al. 2012. Patient safety in patients who occupy beds on clinically inappropriate wards: a qualitative interview study with NHS staff. *BMJ Quality & Safety* 21(3): 218–24; Kuntz L, Mennicken R and Scholtes S. 2014. Stress on the ward: Evidence of safety tipping points in hospitals. *Management Science* 61(4): 754–71.

Table 2: Types of recommendations made in the reviews

Recommendations	Types of recommendations explicitly made in the reviews
Communication	Recommendations to improve communication processes (oral or written)
Capacity and availability	Recommendations to improve the capacity of staff and availability of equipment (including beds)
Training and education	Recommendations for staff training and education
Policies and procedures	Recommendations to change the way procedures should be done
Resources	Recommendations about the need for new resources

Figure 12: Review recommendations made (raw numbers) by theme



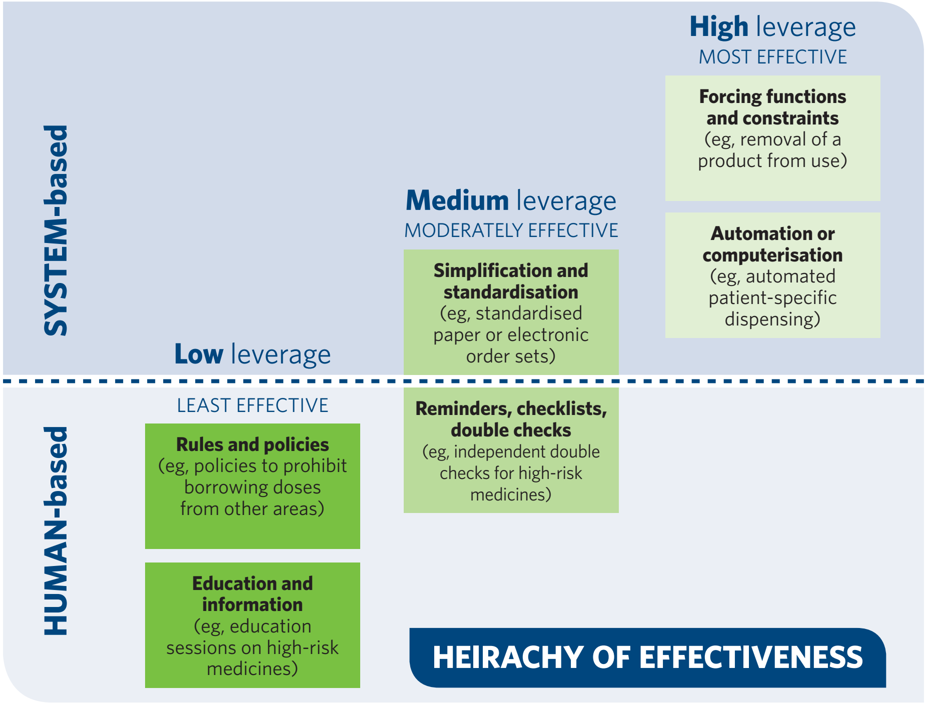
As Figure 12 shows, although communication is the most important contributing factor, policies and procedures, and training and education were the focus of most recommendations (these are the weakest areas in terms of effecting change, as shown in Figure 13). Recommendations focused on the need to develop policies and procedures as opposed to making sure existing policies were followed.

Communication recommendations focused on the development of written materials and more effective patient and family/whānau communication (with decisions recorded better in patient notes).

Several recommendations were made about the need to ensure the correct equipment was available, and for there to be the correct mix of staffing levels to ensure junior staff have adequate and timely access to senior staff.

Recommendations on training and education were task specific and related to the particular context of the adverse event.

Figure 13: Hierarchy of effectiveness of recommendations


High leverage
MOST EFFECTIVE
Forcing functions and constraints (eg, removal of a product from use)
Automation or computerisation (eg, automated patient-specific dispensing)
Medium leverage
MODERATELY EFFECTIVE
Simplification and standardisation (eg, standardised paper or electronic order sets)
Reminders, checklists, double checks (eg, independent double checks for high-risk medicines)
Low leverage
LEAST EFFECTIVE
Rules and policies (eg, policies to prohibit borrowing doses from other areas)
Education and information (eg, education sessions on high-risk medicines)
SYSTEM-based
HUMAN-based
HEIRACHY OF EFFECTIVENESS

OPPORTUNITIES FOR FOCUS

This is the first time DHB adverse event reviews have been analysed using a qualitative thematic approach. This allowed us to begin determining areas for focus, improvement and strengthening learnings.

The DHB reviews varied in the extent of the analysis of the contributing factors along with the need for more consistency. Often, the focus was on the immediate context of the patient–clinician interface. While this is an important area to address, factors beyond this, in terms of the broader organisation and externally, will often be the underlying cause of an adverse event.

The organisations involved used a root cause analysis approach for their in-depth reviews, to improve their quality, consistency and breadth. A standardised template with human factor prompts for all organisations to use is worth considering. This would establish a more robust national picture and allow appropriate interventions to be developed.

Greater skill and attention should also be directed to recommendations. As noted, the most common recommendations focused on:

- improving documentation of clinical handover
- developing clear policies and procedures
- improving the access of junior staff to appropriate senior staff for timely advice
- improving communication with patients and their families/whānau when they identify changes in a patient's clinical condition.

Providers have the opportunity to strengthen their recommendations by ensuring these are more focused on medium and high leverage actions, such as standardisation or automation.

Improvements could be made in making a causal link between the analysis of the event, the root cause(s) and the associated recommendation(s). Many reports did not make the link between these areas. Knowledge of these links increases the depth of learning and its transfer to other contexts in the organisation. This transfer of learning will support the identification and addressing of issues that contribute to recognising, escalating and responding to patient deterioration.

The final area for improvement could be to increase the focus on review recommendations and monitoring, for example, who is responsible for acting on recommendations, and consideration of how the recommendation(s) would address the root cause(s). By consistently including these points in reviews, changes are more likely to be made and lessons learnt.

PATIENT AND FAMILY/WHĀNAU INVOLVEMENT IN ESCALATION

Our analysis did not look at family/whānau involvement in escalating their concerns about a patient's clinical deterioration, but this is an emerging area. One of the DHB reviews noted poor communication with a family/whānau when they had identified a concern.

A recent paper reviewed the literature on consumer participation in the early detection of deterioration, with 11 studies identified.[18] This approach has been introduced in some overseas jurisdictions and is being piloted, or considered for piloting, in some New Zealand DHBs.[19] More needs to be learnt from these approaches and the importance of empowering family/whānau to be a respected early warning resource.

Family/Whānau involvement

In hospitals that have introduced family/whānau escalation, fears of the system becoming overwhelmed were almost completely unfounded…

… Introducing patient/family escalation increases the number of staff-initiated calls. This seems sensible. Not only does publicity around family activation inevitably come to the attention of staff, but there may also be a perception of 'if I don't call, they will'. This can't be a bad thing…

… families and patients feel safer knowing they can call for back-up if the primary nurse/doctor doesn't listen to them. All these schemes seem to rate highly in patient satisfaction…

… it's just another eye on the patient from someone who is often physically present for longer periods, knows the patient's baseline better and can pick up subtle changes such as altered behaviour or mood in the absence of vital sign changes, and is also more likely to be a constant presence over multiple staff shift changes.

Dr Alex Psirides

Clinical lead for the Commission's deteriorating patient programme, intensive care specialist and clinical leader Adult Flight Retrieval Service, Capital & Coast DHB, senior clinical lecturer, Otago School of Medicine

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[18] Vorwerk J, King L. 2015. Consumer participation in early detection of the deteriorating patient and call activation to rapid response systems: A literature review. *Journal of Clinical Nursing* DOI: 10.1111/jocn.12977 (accessed November 2015).

[19] Clinical Excellence Commission. 2015. *Partnering with Patients, REACH – Patient and Family Escalation.* URL: www.cec.health.nsw.gov.au/programs/partnering-with-patients/pwp-reach (accessed October 2015).

CONCLUSION

The findings presented in this report are based on 27 reviews provided by eight DHBs over the past two years. Due to the small sample, the results cannot be generalised across the New Zealand health and disability system. However, they are likely to indicate areas of focus for the review of cases of the delayed recognition and response to clinical deterioration. The findings are generally in line with the international evidence base.

This initial analysis, and the associated areas for improvement, will contribute to the Commission's work plan over the next 12 months. A scoping exercise is underway to consider a potential improvement programme for the early recognition of patient deterioration. One likely area of focus will be communication and the involvement of patients and families/whānau in raising concerns.

OPPORTUNITIES FOR IMPROVEMENT

- Communication – this will be an area of focus for the potential deteriorating patient programme. In addition, the Commission continues to build a communication focus into its programmes. Examples include surgical team briefings and debriefings, and health literacy initiatives, such as *Let's PLAN for better care*[20] and the patient safety card[21] developed for Patient Safety Week 2015.
- Review process – the adverse events learning programme expert advisory group has found the following areas that can be strengthened and developed in the 2016 review of the national reportable events policy. DHBs may wish to consider these areas in their review processes:
    1. That all SAC 1 and 2 cases of unrecognised clinical deterioration continue to be reviewed by the provider concerned, consistent with the national reportable events policy.
    2. That adverse events are analysed using root cause analysis or equivalent methodology and that a standard template with human factor prompts is developed by the Commission for organisations to use.
    3. That greater attention is directed to the recommendations made in adverse event reviews, including consideration of how the recommendation(s) will address the root cause(s) and ensuring the implementation plan is monitored by the organisation's chief executive.
- Shared learning – health providers will share at least one case for learning with other health providers annually through the Open Book reports.

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[20] See www.open.hqsc.govt.nz/patient-safety-week/lets-plan.

[21] See www.open.hqsc.govt.nz/assets/Open-for-better-care/PR-files--images/PSW_2015/PSW_Patient_Safety_Card.pdf.

Chapter 4: Expert commentary

DETECTING THE DETERIORATING HOSPITAL PATIENT – A NATIONAL APPROACH

Dr Alex Psirides

Bringing appropriate expertise to the bedside of a deteriorating hospital patient is sometimes difficult. Patients may become sicker over a period of time despite (or, in fact, because of) appropriate treatment. Junior staff may fail to recognise this slow decline and, even if they act, may not be able to prevent it. The endpoint of this process may mean patients progress to suffer a cardiac arrest, an event from which, despite many advances in intensive care, only one-in-five people will leave hospital alive.

Twenty-five years ago, intensive care doctors began to notice patients being admitted to their units after an in-hospital cardiac arrest often had documented signs of deterioration beginning some hours or even days before. In many cases, these signs had either not been acted upon or the treatment initiated had been inappropriate. It was suggested that, if this decline had been addressed earlier, and with appropriate expertise, it may have been reversed.

Medical emergency teams (METs) consisting of medical and nursing staff with acute medicine expertise were set up to respond to such events. To trigger a 'MET call', a system was required to recognise at-risk patients based on the vital signs already collected and recorded by hospital staff. Eighteen years ago, early warning scores (EWS) were born. The concept is relatively simple – different vital signs (heart rate, respiratory rate, systolic blood pressure, oxygen saturation and so on) are assigned increasing scores the further they deviate from normal. These scores are added to produce a single aggregate EWS. This, or a single high score in any one vital sign (such as a patient with low oxygen levels), can be used to trigger a MET response. The score can be easily calculated by the bedside for any complete set of observations, and a mandatory escalation pathway that matches patient sickness with expert response can be followed. Not surprisingly, several observational studies over the years have shown hospitals with more MET calls have fewer unexpected cardiac arrests.

Recent surveys of New Zealand DHBs have shown a marked variance in the way EWS are assigned, recorded and the triggers used. The response a patient receives if indicated can vary depending on the size of the hospital and time of day. There is also evidence that vital sign chart design affects the ability of staff to recognise and respond to deteriorating patients. Internationally, large data sets are now available to calibrate recognition systems based on patient physiology and outcome data. As such, an evidence-based approach to EWS in New Zealand would seem both timely and necessary.

If cardiac arrest teams are the ambulance at the bottom of the cliff then METs are the fence at the top. It may be time to apply the same philosophy that led to a national medication chart programme to reduce medication errors, to detecting and responding to another high-risk event – the deteriorating hospital patient.

Chapter 5: Adverse events learning programme 2014–15

The goal of the adverse events learning programme is for the sector to learn from adverse events, improve their review and reporting, and prevent events from happening in the future. The programme aims to:

- develop capability to improve the review and reporting of adverse events
- improve reporting to support quality improvement activities
- collate and report adverse events from all health and disability providers
- collaborate with other agencies with a responsibility for safety and quality of health and disability services.

The adverse events learning programme would like to acknowledge Dr David Sage and the leadership he provided this programme over a number of years as the clinical lead of adverse events within the Commission and chair of the expert advisory group. Dr Sage's experience contributed to the development and structure of the adverse events work programme. He remains involved as a member of the Open Book editorial group and the adverse events learning programme expert advisory group.

The programme would also like to acknowledge the excellent work of Matthew Pitt, former senior advisor, reportable events, who worked on the programme since the Commission started reporting on adverse events until May this year.

PATIENT SAFETY WEEK AND DR JAMES BAGIAN

In 2014, the Commission coordinated New Zealand's first Patient Safety Week. This is now an annual event representing a commitment to consumers and patients that New Zealand's health services strive to provide the best and safest care possible.

As part of Patient Safety Week activities in 2014, the Commission welcomed human factors specialist Dr James Bagian to New Zealand.

Dr Bagian is director of the Center for Healthcare Engineering and Patient Safety at the University of Michigan in the USA. His career has included being an astronaut, pilot, freefall parachutist, mountaineer and anaesthetist, and former head of patient safety at the US Veterans Health Administration.

He spoke to three regional workshops about the parts of a safety system and the importance of teamwork and communication for quality.

Dr Bagian's main message to the Commission and wider health sector highlighted the need to focus on the quality of reviews by building sector capability, to prioritise cases for review so resources can be better targeted and to review close calls. The review of close calls enables essential learning to take place where no harm occurred.

OPEN BOOK

In November 2014, the Commission launched the Open Book report series.[22]

Open Book reports alert providers to the main findings of adverse event reviews. The reports emphasise changes implemented by a provider to stop a similar event happening again. The accessibility of the Open

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[22] Available on the Commission's website: www.hqsc.govt.nz/our-programmes/adverse-events/projects/open-book.

Book format, using information directed to particular services, allows the learning to be shared quickly between organisations. We advise other providers to consider Open Book reports, and whether the changes made are relevant to their own local systems.

Eight Open Book reports were published to June 2015.

We would like to thank the various organisations involved for their commitment to learning from adverse events, and for sharing these cases with the wider sector.

ADVERSE EVENT REVIEW WORKSHOPS

Improving the quality of adverse event reviews is a priority. The Commission laid the foundation for ongoing adverse event training by holding two workshops in 2015. The two-day workshops ran in Auckland in August and Wellington in September.

The programme was designed to support staff from all health sector organisations. Over 100 people took part in the workshops from hospice, DHBs, private surgical hospitals and aged care providers. Topics covered included:

- the family's experience
- open communication
- patient safety culture
- human factors
- root cause analysis
- writing a good review
- creating recommendations.

The adverse event workshop pilots will be reviewed, with a plan to run them in 2016. Further reporting on the workshops will be provided in next year's learning from adverse events report.

REVIEW OF THE NATIONAL REPORTABLE EVENTS POLICY

A review of the national reportable events policy will take place in 2016. The policy underpins the reporting relationship between DHBs and the Commission. In 2015, we began identifying high-level sector feedback to include in the three-yearly review of the policy. The areas to be examined in the analysis and consultation in 2016 may include:

- severity assessment codes and criteria
- never events
- review tools and templates
- reporting pathways and forms
- enabling reporting by non-DHB health providers
- near-miss reporting
- quarterly reporting of adverse events by DHBs.

INFORMATION SHARING FORUM

The Commission continues to work in partnership with other agencies to support the Information Sharing Forum. This includes representatives from the ACC, the Ministry of Health and the Office of the Health and Disability Commissioner. The Forum meets quarterly under a memorandum of understanding signed in May 2014 to cooperate on issues relating to adverse event information collection, review and sharing.

SUICIDE MORTALITY REVIEW COMMITTEE

The Commission's annual report for 2013–14 introduced work being done by the Suicide Mortality Review Committee (SuMRC) in partnership with the Commission and Ministry of Health. This section provides an update on the SuMRC's progress.

Suicide continues to be a significant issue for Aotearoa New Zealand. In 2012, 549 New Zealanders took their own lives. Suicide rates for males, youth, those aged 40–44 years and Māori are disproportionately high.[23] The overall suicide rate has dropped by 19.5 percent since it peaked in 1998, driven by a decrease in male suicide.

The *New Zealand Suicide Prevention Action Plan 2013–2016* specified an action for the Commission and the Ministry of Health to trial a suicide mortality review mechanism.[24] The aims of the study were to:

- improve knowledge of contributing factors and patterns of suicidal behaviour
- better identify the main intervention points for suicide prevention
- gather information on how suicide mortality review might look and operate in New Zealand.

The trial SuMRC was established in June 2014.

During the planning phase, the epidemiology of suicide in New Zealand was reviewed by the associated expert advisory group, and the SuMRC agreed to focus on three population groups with particularly high rates of suicide. These groups made up 71 percent of all deaths by suicide during the five-year period between 1 January 2007 and 31 December 2011. They are:

- rangatahi Māori (Māori youth) aged 15–24 years at the time of their death[25]
- men aged 25–64 years at the time of their death
- users of specialist mental health services, defined as those who had face-to-face contact with specialist mental health or addiction services in the year before their death.

A research group from the University of Otago (Wellington) undertook data collection and analysis as delegated agents of the SuMRC. The SuMRC is currently completing its pilot report.

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[23] Health Quality and Safety Commission. 2015. Suicide Mortality Review Committee data. Unpublished.

[24] Ministry of Health. 2013. *New Zealand Suicide Prevention Action Plan 2013–2016*. Wellington: Ministry of Health.

[25] The original intent was to include a focus on alcohol and drug involvement for the rangatahi Māori sub-group, but significant variation in the collection of alcohol and drug information made this unfeasible.

TRIGGER TOOLS

The Commission has developed, and continues to support, a work programme to encourage the use of trigger tools in New Zealand.

Trigger tools are ways of identifying and documenting patient harm. They use a systematic record review process on a randomly selected set of medical records using triggers as flags for patient harm. The purpose is not only to count harms but, more importantly, to identify themes, so steps can be taken to reduce the risk of harm and improve the patient experience of care.

The third national trigger tool workshop was held on 9 March 2015 at Ko Awatea in Auckland. It was sponsored by the Commission and *First, Do No Harm*.[26] The workshop was attended by nearly 60 people, including teams from 12 DHBs and private provider Southern Cross Hospitals.

The theme for the workshop was 'Getting a handle on patient harm – how do you know your systems are safe?' This reflected the journey the Commission's trigger tool programme has taken over the past three years, from implementing trigger tools to using data for improvement, and now using trigger tools in the broader context of patient safety.

In New Zealand, trigger tools are used by several hospitals. A primary care trigger tool has recently been trialled by a number of primary care practices in the Auckland region.

The workshop covered how trigger tools are used in primary care as a reflective process, particularly how they can create a focus on patient safety, and how they generate valuable staff discussion about ways to improve system safety and reliability.

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[26] *First, Do No Harm* is a patient safety campaign including Auckland DHB, Counties Manukau Health, Waitemata DHB and Northland DHB. More information is available at: www.firstdonoharm.org.nz.

Appendix A: Adverse events learning programme expert advisory group 2014–15

Jane Bawden (LLB/LLM Hons)	*Consumer representative*
Professor Samuel Charlton	*Waikato University*
Dr Denys Court	*Auckland DHB*
Dr George Downward	*Canterbury DHB (30 June 2014 to November 2014)*
Diana Gunn	*Canterbury DHB*
Dr Colin McArthur	*Auckland DHB*
Julie Patterson (Chair)	*Whanganui DHB*
Gillian Robb	*Health Quality & Safety Commission*
Dr David Sage	*Programme clinical lead (2014–15)*
Dr Iwona Stolarek	*Health Quality & Safety Commission (programme clinical lead 2015–16)*
Richard Whitney	*Mercy Hospital Dunedin for NZPSHA*

Appendix B: Human factors descriptors

Code	Description
External policy context	**Factors in the policy environment noted as affecting the process or outcome**
Design of equipment and supplies	The design of equipment and supplies to overcome physical and performance levels
External policy context	Nationally driven policies and directives that affect the level and quality of resources available to hospitals
Processes	**A description of the care processes applied**
Communication failure	Communication did not take place in keeping with communication systems and policies
Review process	Process used to review the patient
Working conditions	**A description of the immediate working conditions associated with the event**
Equipment and supplies	Availability and functioning of equipment and supplies
Staff management	The appropriate management and allocation of staff to ensure adequate skill mix and staffing levels for the volume of work
Supervision and leadership	The availability and quality of direct and local supervision and leadership
Staff workload	Level of activity and pressures on time during a shift
Level of responsibility	Existence of clear lines of responsibility that clarify accountability of staff members and delineate their role
Situational factors	**A description of the situation linked to the event**
Individual factors	Characteristics of the person delivering the care that may contribute in some way to failures. Examples include inexperience, stress, personality and attitudes
Team factors	Any factor related to the working of different professionals within a group that they may be able to change to improve safety
Task characteristic	Factors related to specific patient-related tasks that may make individuals vulnerable to error
Patient factors	Those features of the patient that make caring for them more difficult and therefore more prone to error. These might include abnormal physiology, language difficulties, personality characteristics (eg, aggressive attitude)

Code	Description
Organisational factors	**Organisational context factors that are noted as affecting either the process or outcomes**
Physical environment	Features of the physical environment that help or hinder safe practice. This refers to the layout of a unit, the fixtures and fittings and the level of noise, lighting, temperature and so on
Policies and procedures	The existence of formal and written guidance for the appropriate conduct of work tasks and processes. This can also include situations where procedures are available but are contradictory, incomprehensible or of otherwise poor quality
Support from central functions	Availability and adequacy of central services in supporting the functioning of wards and/or units. This might include information technology, human resources or clinically related services such as radiology, pharmacy or phlebotomy
Training and education	Access to correct, timely and appropriate training, both specific (eg, task related) and general (eg, organisational related)
Scheduling and bed management	Adequate scheduling to manage patient throughput, thereby minimising delays and excessive workload

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