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Acknowledgements

The Australian Council on Healthcare Standards (ACHS) would like to thank the healthcare organisations participating in the ACHS Clinical Indicator Program for their data that form the content of this report.

The ACHS Performance and Outcomes Service (POS) also thanks the key people involved in the development and review of the clinical indicators.

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Clinical Indicator Working Parties

The clinical indicators are developed by working parties comprised of practising clinicians (medical officers, nurses, allied health professionals in the pertinent specialty field), representatives of the relevant Australian and New Zealand colleges / associations / societies, consumer representatives, statisticians and ACHS staff.

Each working party meets in person and via teleconference to review the existing indicators and explore areas for new indicators.

The revised version of the indicator set is then endorsed by each of the relevant colleges, associations and societies prior to implementation within the collection.

Indicator sets are regularly reviewed to ensure that:

• they are relevant for clinicians
• they continue to reflect today’s healthcare environment
• there is a consensus on collection and reporting requirements
• the set is regarded as useful for quality improvement.

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<td>Royal Australian and New Zealand College of Psychiatrists, Mental Health Information Strategy Subcommittee, Mental Health Standing Committee, Royal College of Nursing, Australia</td>
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<td>Royal Australian and New Zealand College of Radiologists, Medical Imaging Nurses Association, Australian Institute of Radiography</td>
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Foreword

Now in its 13th year the ACHS Australasian Clinical Indicator Report (ACIR) continues a strong tradition of presenting an important overview of clinical performance based on a broad range of indicators developed for and by the health industry.

The Australian Council on Healthcare Standards (ACHS) has continued its work with a range of medical colleges, specialist societies, associations and other clinical organisations to develop useful clinical indicators to assist healthcare organisations (HCOs) collect data and to support clinical review activities through the ACHS Performance and Outcomes Service (POS).

The ACHS is grateful for the input and specialised knowledge shared from these organisations which have generously provided expert commentary on the relative significance of findings on indicators in their specific areas.

As one of the most influential clinical indicator sets of its kind for the Australasian healthcare system, the ACIR reports on a range of healthcare activities and procedures. Importantly, the data continues to be sourced from different representative strata – state and territory, public and private, metropolitan and rural.

Improvements across the spectrum of health care that continue to be made this year include: emergency department patient waiting times, improvements in the proportion of particular patients receiving both venous thromboembolism and antibiotic prophylaxis, reductions in acquiring methicillin-resistant Staphylococcus aureus for both intensive and non-intensive care patients, documentation of known adverse drug reactions and a reduction in some superficial incisional surgical site infections.

The range of deteriorations was consistent with the numbers from last year’s ACIR, and areas specifically covered; unplanned delay in discharge in day surgery, seclusion of mental health patients, and the number of inpatient falls in patients 65 years or older.

The six-monthly Comparison Reports and the annual Trend Reports provide a key opportunity for HCOs to compare results with their peers and review historical trends. Both reports support benchmarking activities between organisations that can benefit from being able to identify areas in which there may be the potential to improve.

The gradual growth in the acceptance of monitoring clinical indicators has continued and in 2011, a total of 690 HCOs (360 public and 330 private) reported on 353 indicators (342 of which are rate-based), an increase from last year’s 665 contributing organisations.

This compendium of the available national data provides a synopsis of each of the submissions, with key points on any evident trends, strata differences and outlier effects. The full report, available online, includes detailed results for each indicator set. The methodology used is described in the report on Statistical Methods which is also available online.

In compiling the data and assessing the trends, this Report provides a clinical perspective of where there is potential to improve quality and safety. It is through the collaborative effort of all our stakeholders that ACHS is in the privileged position of being able to disseminate this information and I thank everyone for their contributions.

Additionally, each year a topic is chosen for analysis in the early part of the Report. This year the feature is hospital mortality audits, which involves collecting information from deceased patients’ medical records to enable a quantitative and qualitative analysis to be undertaken.

The broad appeal of the Australasian Clinical Indicator Report is that it captures through raw data the ongoing development and improvements of our health system, providing a very comprehensive overview of performance.

There is a rich opportunity to use this information to identify areas where there is significant variation in practice or deteriorating trends for the benefit of governments, health planners and service providers alike.

Adjunct Assoc. Professor Karen Linegar, FCNA
President
September 2012
Key results

This 13th edition of the Australasian Clinical Indicator Report 2004–2011 provides an overview of the analysis of each indicator set for the last eight years, with additional commentary from the collaborating medical colleges, specialist societies and other clinical organisations. Their expertise provides context for any trends or variation observed in the data.

Noteworthy changes over time

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<td><strong>Emergency department patients attended within recommended times</strong>&lt;br&gt;The proportion of patients seen within the recommended times for Australasian Triage Scale (ATS) categories 2, 3, 4 and 5 has continued to improve over the last eight years, with categories 2–4 reaching their highest level in 2011. The percentage of ATS category 1 patients seen immediately remains constant at above 99%. (Emergency Medicine CIs 1.2–1.5)</td>
<td><strong>Unplanned delay in discharge in day surgery</strong>&lt;br&gt;The rate of patients who have an unplanned delayed discharge greater than one hour beyond that expected for the day surgery procedure has steadily increased from 0.28% in 2004 to 0.60% in 2011, its highest level to date. The combined rate of the 40 outlier HCOs is 3.5 per 100 patients. (Day Surgery CI 4.1)</td>
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<tr>
<td><strong>Venous thromboembolism prophylaxis</strong>&lt;br&gt;There has been a steady increase in rates for initiation of appropriate prophylaxis for venous thromboembolism in two patient groups – adult patients admitted to intensive care (within 24 hours of admission) and high risk women undergoing caesarean section. Both these indicators have also substantially increased the number of reporting HCOs. (Intensive Care CI 3.1 and Obstetrics CI 6.1*)</td>
<td><strong>Seclusion of mental health patients</strong>&lt;br&gt;The rate of mental health inpatients having seclusion for more than four hours remains over 53%, and the number of mental health inpatients experiencing major complications while in seclusion has increased from 0.45 per 100 patient separations in 2004 to 0.68 in 2011. The rate at the 80th centile is nearly three times the rate at the 20th centile. (Mental Health Inpatient CIs 5.3 and 5.5)</td>
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<td><strong>Methicillin-resistant Staphylococcus aureus morbidity</strong>&lt;br&gt;The rates of acquired methicillin-resistant Staphylococcus aureus (MRSA) reported for indicators covering both sterile and non-sterile sites have fallen considerably. Separate indicators record rates in intensive care unit (ICU) patients and non-ICU patients. (Infection Control CIs 5.1–5.4)</td>
<td><strong>Hospital admissions with pressure ulcers</strong>&lt;br&gt;The rate for inpatients admitted with pressure areas has increased from 0.28 per 100 patients in 2009 when it was first collected, to 0.40 in 2011. Nevertheless, there is a ten-fold difference between the 80th centile and the 20th centile rates, indicating that considerable improvement is possible. (Hospital-Wide CI 4.4)</td>
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<td><strong>Superficial incisional surgical site infections</strong>&lt;br&gt;Three indicators demonstrated a reduction in rates of superficial incisional surgical site infections (SSIs) – those measuring hip prosthesis procedures, knee prosthesis procedures, and lower segment caesarean sections. (Infection Control CIs 1.1, 1.3 and 1.15)</td>
<td><strong>Inpatient falls in patients 65 years or older</strong>&lt;br&gt;The proportion of inpatients aged 65 years or older who fall has increased since 2005 (when the indicator was first collected) from 0.40% to 0.53% in 2011. The combined rate of the 59 outlier HCOs is 0.88 per 100 patients. (Hospital-Wide CI 4.4)</td>
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* VTE prophylaxis is measured in a number of indicator sets. The improvement was seen in the stated indicators.
Indicators and other measures of health care

Quality improvement is a major focus in Australian health care. To identify exactly what should be improved or what has been improved, it is necessary to measure it. Recognising this, the ACHS established a program of clinical performance measures in 1989. Since the launch of the hospital-wide set of indicators in 1993, the ACHS program has expanded to comprise over 353 indicators grouped into 22 sets.

Providing the data are accurate, clinical indicator results can assist healthcare organisations to identify problem steps in a clinical process and prioritise areas for improvement activity. Continuing to measure following a change in process will assist healthcare organisations to assess the impact of their interventions.

The last decade has witnessed a general international trend in stimulating improvement through the measurement of performance. Some countries have established national indicator programs (Denmark); others have extended their existing programs (United Kingdom, Canada, and the United States).

The Council of Australian Governments (COAG) signed the National Health Reform Agreement in 2011, which included the establishment of a National Health Performance Authority (NHPA). Seventeen (17) hospital performance indicators will be reported regularly under the NHPA Performance and Accountability Framework. These will be mandatory measurements for public and private hospitals, automated by drawing from existing data systems. The Australian Commission on Safety and Quality in Health Care (ACSQHC) is finalising its set of national core indicators of safety and quality for hospitals and day procedure centres.

Measurement for the purpose of improvement is very different to measurement for judgement; clinician disengagement from the process can result in indicator collection and data provision becoming centralised, top-down, burdensome, and clinically irrelevant. When results from measurement programs designed for internal use are made available to external organisations without context, mistrust and ambivalence amongst clinicians can arise.

A wide range of indicators is used in health service delivery, and as there are relatively few indicators that are universally accepted as unambiguous measures of quality, a multi-method approach is often used to provide healthcare organisations with a realistic and comprehensive ‘picture’ of their performance.

Clinical indicators are developed to meet specific goals – they may target sentinel events or monitor the rates of events that are expected to occur with some frequency – usually related to the structure, processes, or outcomes of care. Collection may be automated or self-reported. Self-reported indicators rely on manual entry (and often manual collection) and strict adherence to event definitions.

All indicators are designed to screen, flag, or draw attention to specific clinical issues. They cannot capture the complexity of a clinical process, and should be interpreted as providing a ‘slice’ of reality. Further investigation is needed to understand why outlier results (both high and low performing) and change in performance occur.

Indicator results can assist greatly in improving the quality of health care. It is imperative that a variety of measures are selected with care, to ensure they are relevant to the healthcare organisation and the clinicians delivering care. Healthcare organisations need an effective clinical governance structure, so that results are fed back and discussed with clinicians.

Indicators should be viewed as pointers rather than absolute markers of performance. Results need to be investigated and the findings acted upon if they are to be effective as a quality improvement tool.

References
4 Raleigh VS and Foot C. Getting the measure of quality: opportunities and challenges. London UK; The King’s Fund; 2010.
5 Australian Government Department of Health and Ageing, National Health Reform Agreement. Canberra ACT; Commonwealth of Australia; 2011.
7 Pencheon D. The good indicators guide: understanding how to use and choose indicators. Warwick UK; Association of Public Health Observatories and NHS Institute for Innovation and Improvement; 2008.
Hospital mortality audits: necessary and enlightening

More than a century ago, the public health pioneer and hospital reform advocate, Dr Ernest Amory Codman, instituted regular staff meetings in the Massachusetts General Hospital to review cases. These ‘end results’ meetings became the forerunner of morbidity and mortality meetings, and were part of Codman’s lifelong pursuit to track the outcomes of patient treatments.

Reviewing outcomes was seen by Codman as an opportunity to identify clinical misadventures and served as the foundation for improving the care of future patients. Codman followed up each of his patients for at least one year to observe long-term outcomes, and also kept ‘end result cards’ for every patient he treated, comprising basic demographic data, diagnosis, treatment delivered, and the outcome of that treatment.

He also strongly supported the public reporting of this information, so that patients would be guided in their choices of physicians and hospitals. These efforts led to Codman being acknowledged as the founder of what is today known as ‘outcomes management’.

No ‘gold standard’ for mortality audits

Given that there is substantial evidence to suggest that approximately one in every ten hospitalised patients experiences an adverse event, and that a small proportion of these result in permanent or major disability, and death, it is imperative that healthcare organisations (HCOs) establish a process to review all deaths. A hospital mortality audit involves collecting information from the medical record so that a quantitative and qualitative analysis of the death can be undertaken. The major purpose of a mortality audit is to improve the quality and efficiency of clinical care, and to search for the cause of poor results.1

Jarman, Bottle & Aylin2 consider that information addressing hospital standardised mortality rates and adjusted mortality rates can stimulate a wide range of healthcare improvements that will reduce avoidable deaths. Governments are also becoming increasingly concerned about hospital mortality rates, and are beginning to publish hospital standardised mortality rates (HSMR).3,4 Despite extensive recognition of the importance of this review, there remains no ‘gold standard’ approach to conducting a hospital mortality audit.5

Clinical audit

The Royal Australasian College of Surgeons has long recognised the benefits of clinical audit, viewing it as an essential component of the evidence-based process of performance appraisal.

To this end, surgeons are committed to performing audits through the Australian and New Zealand Audit of Surgical Mortality, a quality assurance project designed to uncover system and process errors associated with surgical mortality at a state and national level.6 These audits comprise an external, independent, peer-review process that reviews the clinical management surrounding deaths that occurred during a surgical admission when patients are admitted under a consultant surgeon.7 This audit system also reviews inpatient mortality where the death may be associated with the provision of anaesthesia.8

Lastly, the Australian and New Zealand Audit of Surgical Mortality process is systematic, routine, objective, and confidential.9 While this clinical specialty is to be commended for its commitment to the delivery of quality care, at many HCOs, surgery comprises a relatively small proportion of admissions.

Reducing the counts

Semmens et al.5 were able to demonstrate a reduction in the overall proportion of deaths associated with a deficiency of care since the Western Australian Audit of Surgical Mortality was established.

Similarly, Wright et al.6 described statistically significant reductions in the hospital standardised mortality ratios during the first three years following implementation of a hospital mortality review program at the Bradford Teaching Hospitals Trust.

In a healthcare consortium study, 12 out of 16 academic medical centres in the United States were able to reduce their mortality index after participating in a project that was aimed at improving risk-adjusted inpatient mortality rates.6 This study identified six key factors that contributed to preventable mortality2:

- delays in responding to deteriorating patients
- suboptimal critical care
- healthcare associated infections
- post-operative complications
- medical errors
- community issues such as the availability of hospice care.

Wright et al.6 consider that the most basic goal in improving the quality of hospital care is to eliminate unnecessary deaths, but this requires the entire health service working across the community to be aligned, committed, and able to provide appropriate end-of-life care. The Bradford experience demonstrated that “good leadership, good information, a quality improvement strategy based on good local evidence and a community-wide approach may be effective in improving the quality of processes of care sufficiently to reduce hospital mortality”.

* Also known as ‘hospital death audits’

† HSMRs measure whether the death rate at a hospital is higher or lower than expected. A high indicator level may be a warning sign that things are going wrong. The HSMR compares the expected rate of death in a hospital with the actual rate of death, after making adjustments for risk.
Mortality intelligence has been used to assess the quality of care since Florence Nightingale’s comparisons of hospitals in the Crimea* and in London in the nineteenth century, and wide unexplained variations in hospital mortality have been a constant finding ever since. The increasing demand for greater clinical accountability requires all hospitals to implement strategies that will reduce preventable mortality.

The ACHS data
It is therefore very pleasing to see that not only has the number of healthcare organisations reporting on the Hospital-Wide CI 5.1: Patient deaths addressed with a clinical audit process increased from 91 to 200 in the eight-year period, but also that the aggregate rate has increased from 77.9% to 94.8%. In 2011, more than 19,200 deaths were addressed within a clinical audit process, with minimal difference between the rate of the best performing 20% HCOs (99.9%) and the rate of the poorest performing 20% HCOs (97.1%). The outlier rate for the 21 outlier HCOs was 67.1 per 100 deaths, and there were no stratum differences.

References

* A semi-autonomous region of Ukraine, located on the northern coast of the Black Sea. Between 1853 and 1856 the Crimea saw fighting between Russia and an alliance that included France, Britain and Turkey.
ACHS Clinical Indicator Program

The ACHS Clinical Indicator Program (CIP), originally known as the Care Evaluation Program, has been operating within the ACHS since 1993, after an initial agreement with the Australian medical colleges in 1989. It has evolved significantly since its inception, and remains the largest national clinical data set across all sectors and areas.

Overview

In the previous edition of this report†, there were 332 CIs collected by the ACHS. A total of 353 CIs have been collected for 2011. This report gives the results for 22 indicator sets; data from the public and private sectors, metropolitan and non-metropolitan HCOs, and Australian states, territories and New Zealand (NZ) are included in this report.

Indicators and submissions

Between 2004 and 2007, the number of HCOs participating in the Clinical Indicator Program increased from 629 to 689, a 10% increase. The number has not altered significantly since then. In 2004, the number of six-monthly data submissions was 27,684 and in 2009 reached a peak of 37,022. In 2011 the total number of six-monthly submissions was 35,158 with similar numbers from the private and public sectors, 16,732 and 18,426 respectively.

Participants can submit their data monthly, three-monthly or six-monthly. Submission is voluntary, and some organisations submit intermittently. Most organisations make two submissions to each of their selected indicators in a year. The data are analysed and HCOs receive general and peer comparison reports every six months.

Table 1 gives the number of indicators and sets, and by sector, the number of reporting HCOs and the number of individual six-monthly indicator data submissions.

Table 1: Indicator sets, CIs, HCOs and data submissions, 2004–2011

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<td>35,413</td>
<td>35,481</td>
<td>36,090</td>
<td>37,022</td>
<td>35,838</td>
<td>35,158</td>
<td>27%</td>
</tr>
</tbody>
</table>

* CI data are submitted every six months. Most HCOs submit data twice a year, however some submit data for half of one year only.

HCOs reporting

For the year 2011, there were similar numbers of public and private HCOs reporting, 360 and 330 respectively. **Table 2** shows the geographic location of the HCOs.

There were 416 metropolitan HCOs and 274 non-metropolitan HCOs participating in the CI program.

**Table 2**: Location of public / private HCOs reporting, 2011

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of HCOs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
</tr>
<tr>
<td>New South Wales</td>
<td>127</td>
</tr>
<tr>
<td>Victoria</td>
<td>66</td>
</tr>
<tr>
<td>Queensland</td>
<td>68</td>
</tr>
<tr>
<td>South Australia</td>
<td>28</td>
</tr>
<tr>
<td>Western Australia</td>
<td>20</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>9</td>
</tr>
<tr>
<td>Tasmania</td>
<td>7</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>1</td>
</tr>
<tr>
<td>New Zealand</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>330</strong></td>
</tr>
</tbody>
</table>

Indicators reported by each hospital

In 2011, the average number of individual indicators reported was 29, with 80% of HCOs reporting between six and 64 indicators. Half of all HCOs reported between 11 and 41 indicators (25th and 75th centiles).

**Figure 1**: Distribution of the number of indicators reported by HCOs, 2004–2011
Table 3 shows that in 2011 there were eight sets with more than 150 HCOs providing data.

While there are six indicator sets where fewer than 50 hospitals contribute, a small number of hospitals may still provide a representative sample of all hospitals in Australia and New Zealand for some indicators, but from a quality improvement perspective, it means that these HCOs have less data with which to determine whether the clinical areas in these sets could potentially improve their performance.

The median number of indicator sets that an HCO submits in each year has remained at four since 2004. The median number of CIs collected by each HCO ranged between 20 and 24 in the years 2004–2011. The mean number of CIs collected has increased from 26 in 2004 to 29 in 2011.

Table 3: HCOs providing data for one or more indicators within each indicator set, 2004–2011

<table>
<thead>
<tr>
<th>Indicator set</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia</td>
<td>326</td>
<td>340</td>
<td>333</td>
<td>330</td>
<td>308</td>
<td>295</td>
<td>288†</td>
<td>292†</td>
</tr>
<tr>
<td>Day Surgery</td>
<td>398</td>
<td>403</td>
<td>415</td>
<td>427</td>
<td>400</td>
<td>392</td>
<td>397</td>
<td>393</td>
</tr>
<tr>
<td>Emergency Medicine</td>
<td>204</td>
<td>219</td>
<td>217</td>
<td>209</td>
<td>211</td>
<td>210</td>
<td>196</td>
<td>195†</td>
</tr>
<tr>
<td>Gastrointestinal Endoscopy</td>
<td>–</td>
<td>–</td>
<td>68*</td>
<td>81</td>
<td>86</td>
<td>88</td>
<td>103</td>
<td>95</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>128</td>
<td>119</td>
<td>123</td>
<td>88</td>
<td>90</td>
<td>84</td>
<td>82</td>
<td>78</td>
</tr>
<tr>
<td>Hospital in the Home</td>
<td>36</td>
<td>42</td>
<td>45</td>
<td>46</td>
<td>48</td>
<td>48</td>
<td>50</td>
<td>40†</td>
</tr>
<tr>
<td>Hospital-Wide</td>
<td>387</td>
<td>412</td>
<td>433</td>
<td>465</td>
<td>460</td>
<td>454</td>
<td>458</td>
<td>481†</td>
</tr>
<tr>
<td>Infection Control</td>
<td>169</td>
<td>233</td>
<td>265</td>
<td>284</td>
<td>320</td>
<td>325</td>
<td>306</td>
<td>324†</td>
</tr>
<tr>
<td>Intensive Care</td>
<td>93</td>
<td>101</td>
<td>104</td>
<td>101</td>
<td>104</td>
<td>105</td>
<td>105</td>
<td>98†</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>146</td>
<td>144</td>
<td>134</td>
<td>124</td>
<td>110</td>
<td>98</td>
<td>81†</td>
<td>84</td>
</tr>
<tr>
<td>Medication Safety</td>
<td>155</td>
<td>150</td>
<td>159</td>
<td>172</td>
<td>174</td>
<td>176</td>
<td>164</td>
<td>284†</td>
</tr>
<tr>
<td>Mental Health Community Based</td>
<td>17</td>
<td>24</td>
<td>32</td>
<td>23</td>
<td>28</td>
<td>28</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Mental Health Inpatient</td>
<td>121</td>
<td>123</td>
<td>121</td>
<td>124</td>
<td>121</td>
<td>124</td>
<td>112†</td>
<td>107</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>220</td>
<td>218</td>
<td>212</td>
<td>210</td>
<td>180†</td>
<td>181</td>
<td>187</td>
<td>186†</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>117</td>
<td>111</td>
<td>100</td>
<td>104</td>
<td>99</td>
<td>86</td>
<td>87</td>
<td>86</td>
</tr>
<tr>
<td>Oral Health</td>
<td>13</td>
<td>10</td>
<td>15</td>
<td>10</td>
<td>14</td>
<td>11</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Paediatric (General &amp; ICU)</td>
<td>68</td>
<td>70</td>
<td>53</td>
<td>53</td>
<td>53</td>
<td>49</td>
<td>46</td>
<td>47</td>
</tr>
<tr>
<td>Pathology</td>
<td>30</td>
<td>33</td>
<td>41</td>
<td>45</td>
<td>37†</td>
<td>49</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Radiation Oncology</td>
<td>15</td>
<td>16</td>
<td>14</td>
<td>16</td>
<td>18†</td>
<td>20</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Radiology</td>
<td>63</td>
<td>63</td>
<td>65</td>
<td>67</td>
<td>65</td>
<td>66</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Rehabilitation Medicine</td>
<td>101</td>
<td>109</td>
<td>107</td>
<td>114</td>
<td>109†</td>
<td>112</td>
<td>122</td>
<td>126</td>
</tr>
<tr>
<td>Surgical</td>
<td>231</td>
<td>217</td>
<td>209</td>
<td>200</td>
<td>192</td>
<td>176</td>
<td>167</td>
<td>168</td>
</tr>
<tr>
<td>Any indicator</td>
<td>629</td>
<td>654</td>
<td>681</td>
<td>689</td>
<td>689</td>
<td>671</td>
<td>665</td>
<td>690</td>
</tr>
</tbody>
</table>

* Indicator set first collected.
† Revised indicator set introduced.
Clinical Indicator trends and variation

Revealing the potential to improve performance

Within an individual facility, fluctuations in performance compared to overall performance of the submitting organisations, may focus attention on areas for further investigation.

From a health system perspective, the goal would be to see an overall trend in the desirable direction. For the majority of indicators which are process-based, a decrease in variation between the best performing organisations and the remainder would demonstrate improvement across the system.

Using trends and variation from a systems perspective

The full report shows the trends in the rates for each CI (if four or more years of data are available) and three measures of the variation in rates between HCOs. The variations in clinical practice are quantified by the differences between the 20th and 80th centiles, the differences between the strata, and the rates for the HCOs that are outliers.

The report also estimates the potential improvement if:

- the mean rate was shifted to the better centile rate,
- the mean rate was shifted to the best stratum rate, and
- outlier HCOs with less desirable rates were to shift their rate to the mean rate.

This is done for each year and is reported in the full report using tables and graphs. The text that summarises the results is divided, where appropriate, into:

- a summary of the trends in the mean rates and centiles,
- a table of the differences in the strata rates if they are statistically significant, and
- the number of outlier HCOs.

To view the results in full and for more information on the methodology used in this report, refer to the documentation available on the ACHS website – http://www.achs.org.au located with the Australasian Clinical Indicator Report, 2004–2011.

Indicator trends 2004–2011

Of the 353 clinical indicators collected in 2011, 343 are rate-based indicators, of which 316 had a desirable direction specified (high or low rates indicating better care). Trends could be analysed for 225 of the rate-based indicators. Indicators were not analysed for trends if there were less than four years of data, no desirable direction or less than five HCOs reporting.

There were 18 sets which had more CIs moving in the desirable direction, than in the undesirable direction. Seven indicator sets had at least two-thirds of all trended indicators improve. They were Emergency Medicine, Hospital-Wide, Intensive Care, Medication Safety, Oral Health, Pathology and Radiation Oncology.

Since the trend in HCOs can be due to a changing mix of contributing HCOs, the indicators were tested again to determine whether the trend remained statistically significant after allowing for changes in the HCOs submitting data. Of those 114 statistically significant trends in the desirable direction, 71 (32% of the number tested) remained significant after allowing for variation in the HCOs submitting, and of those 40 CIs whose trends were deteriorating, 19 (8% of the number tested) remained significant.

One in three indicators, 71 of those tested, showed no trend. The trend results are summarised in Table 4.
### Table 4:
Trends by indicator set: CIs with statistically significant (p<0.05) trends in the desirable / undesirable direction

<table>
<thead>
<tr>
<th>Indicator set</th>
<th>Number of CIs*</th>
<th>Number analysed†</th>
<th>Desirable trend‡</th>
<th>Undesirable trend‡</th>
<th>No trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia</td>
<td>16</td>
<td>4</td>
<td>2 (1)</td>
<td>1 (0)</td>
<td>1</td>
</tr>
<tr>
<td>Day Surgery</td>
<td>7</td>
<td>7</td>
<td>1 (1)</td>
<td>3 (2)</td>
<td>3</td>
</tr>
<tr>
<td>Emergency Medicine</td>
<td>20</td>
<td>7</td>
<td>6 (3)</td>
<td>1 (0)</td>
<td>0</td>
</tr>
<tr>
<td>Gastrointestinal Endoscopy</td>
<td>8</td>
<td>8</td>
<td>3 (1)</td>
<td>2 (0)</td>
<td>3</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>13</td>
<td>13</td>
<td>7 (4)</td>
<td>0 (0)</td>
<td>6</td>
</tr>
<tr>
<td>Hospital in the Home</td>
<td>8</td>
<td>4</td>
<td>2 (1)</td>
<td>0 (0)</td>
<td>2</td>
</tr>
<tr>
<td>Hospital-Wide</td>
<td>15</td>
<td>15</td>
<td>10 (4)</td>
<td>4 (3)</td>
<td>1</td>
</tr>
<tr>
<td>Infection Control</td>
<td>47</td>
<td>33</td>
<td>14 (13)</td>
<td>1 (1)</td>
<td>18</td>
</tr>
<tr>
<td>Intensive Care</td>
<td>15</td>
<td>6</td>
<td>6 (4)</td>
<td>0 (0)</td>
<td>0</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>32</td>
<td>13</td>
<td>5 (5)</td>
<td>0 (0)</td>
<td>8</td>
</tr>
<tr>
<td>Medication Safety</td>
<td>10</td>
<td>5</td>
<td>2 (2)</td>
<td>2 (0)</td>
<td>1</td>
</tr>
<tr>
<td>Mental Health Community Based</td>
<td>6</td>
<td>1</td>
<td>1 (0)</td>
<td>0 (0)</td>
<td>0</td>
</tr>
<tr>
<td>Mental Health Inpatient</td>
<td>28</td>
<td>25</td>
<td>17 (12)</td>
<td>5 (2)</td>
<td>3</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>20</td>
<td>18</td>
<td>3 (3)</td>
<td>9 (3)</td>
<td>6</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>16</td>
<td>11</td>
<td>8 (5)</td>
<td>2 (2)</td>
<td>1</td>
</tr>
<tr>
<td>Oral Health</td>
<td>21</td>
<td>4</td>
<td>2 (0)</td>
<td>0 (0)</td>
<td>2</td>
</tr>
<tr>
<td>Paediatric (General &amp; ICU)</td>
<td>10</td>
<td>3</td>
<td>1 (0)</td>
<td>0 (0)</td>
<td>2</td>
</tr>
<tr>
<td>Pathology</td>
<td>11</td>
<td>11</td>
<td>6 (2)</td>
<td>5 (2)</td>
<td>0</td>
</tr>
<tr>
<td>Radiation Oncology</td>
<td>10</td>
<td>10</td>
<td>7 (4)</td>
<td>0 (0)</td>
<td>3</td>
</tr>
<tr>
<td>Radiology</td>
<td>5</td>
<td>5</td>
<td>2 (2)</td>
<td>1 (1)</td>
<td>2</td>
</tr>
<tr>
<td>Rehabilitation Medicine</td>
<td>6</td>
<td>6</td>
<td>5 (1)</td>
<td>0 (0)</td>
<td>1</td>
</tr>
<tr>
<td>Surgical</td>
<td>19</td>
<td>16</td>
<td>4 (3)</td>
<td>4 (3)</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>225</td>
<td>114 (71)</td>
<td>40 (19)</td>
<td>71</td>
</tr>
</tbody>
</table>

| %                             | 100%           | 51% (32%)       | 18% (8%)         | 32%                |

* Includes rate-based CIs where the desired rate is specified as either high or low.
† Trends are not reported for indicators with less than four years data, or fewer than five HCOs reporting, and only where the desirable rate is specified as either high or low.
‡ The number in brackets is the number of CIs that had statistically significant trends after allowing for changes in the HCOs contributing the data.
Variation in indicator rates

Using odds ratios from the centiles

Given that HCOs may be large or small, there is a need to control for the differences in the random variations or confidence intervals of each HCO. To this end, ‘shrunken rates’ are used.

The standard deviations of these distributions of ‘shrunken rates’ could be presented as a measure of variation between HCOs. These distributions are not symmetrical so the 20th and 80th centiles are reported. The region between these centiles contains the ‘shrunken rates’ for 60% of hospitals and their difference is approximately twice the standard deviation of the rates.

One measure that can be used from the centiles is the odds ratio (OR) of having an event when the poorer rate applies compared to when the better rate applies. We use the odds ratio to select indicators where there is large systematic variation in rates. The odds ratio is the ratio of the odds for the 80th centile and for the 20th centile rates, R(80) and R(20). The formula is as follows:

$$\text{OR} = \frac{R(80)}{1 - R(80)} \times \frac{1 - R(20)}{R(20)}$$

While the formula may appear somewhat daunting, the interpretation is clear. Greater values in the odds ratio indicate greater systematic variation in rates for a given indicator, and it may be appropriate to determine the causes of these variations.

There were 36 CIs where the odds ratios were 1, and 98 CIs in total where the odds ratio was less than 2. Table 5 shows that there are 89 CIs (27% of those tested) with high odds ratios (≥10) in 17 sets, and five sets with over half the CIs having high odds ratios.

Table 5: Odds ratios for CIs in each set – a high odds ratio reveals high systemic variation

<table>
<thead>
<tr>
<th>CI set</th>
<th>Number of CIs</th>
<th>CIs tested*</th>
<th>OR: 1 to &lt;2</th>
<th>OR: 2 to &lt;10</th>
<th>OR: ≥10</th>
<th>% CIs tested with OR ≥10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia</td>
<td>16</td>
<td>16</td>
<td>1</td>
<td>3</td>
<td>12</td>
<td>75%</td>
</tr>
<tr>
<td>Day Surgery</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>Emergency Medicine</td>
<td>20</td>
<td>19</td>
<td>4</td>
<td>7</td>
<td>8</td>
<td>42%</td>
</tr>
<tr>
<td>Gastrointestinal Endoscopy</td>
<td>8</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>13</td>
<td>13</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Hospital in the Home</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Hospital-Wide</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>10</td>
<td>5</td>
<td>33%</td>
</tr>
<tr>
<td>Infection Control</td>
<td>47</td>
<td>41</td>
<td>24</td>
<td>13</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>Intensive Care</td>
<td>15</td>
<td>15</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>40%</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>32</td>
<td>29</td>
<td>13</td>
<td>9</td>
<td>7</td>
<td>24%</td>
</tr>
<tr>
<td>Medication Safety</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>Mental Health Community Based</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>83%</td>
</tr>
<tr>
<td>Mental Health Inpatient</td>
<td>28</td>
<td>27</td>
<td>7</td>
<td>9</td>
<td>11</td>
<td>41%</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>20</td>
<td>20</td>
<td>7</td>
<td>10</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>16</td>
<td>12</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>8%</td>
</tr>
<tr>
<td>Oral Health</td>
<td>21</td>
<td>21</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>29%</td>
</tr>
<tr>
<td>Paediatric (General &amp; ICU)</td>
<td>10</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>Pathology</td>
<td>11</td>
<td>11</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Radiation Oncology</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>Radiology</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Rehabilitation Medicine</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>67%</td>
</tr>
<tr>
<td>Surgical</td>
<td>19</td>
<td>16</td>
<td>9</td>
<td>7</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>343</strong></td>
<td><strong>324</strong></td>
<td><strong>98</strong></td>
<td><strong>137</strong></td>
<td><strong>89</strong></td>
<td><strong>27%</strong></td>
</tr>
</tbody>
</table>

* The odds ratio can only be counted where the rate is not zero or 100%.
Indicators with significant variations between strata

For each indicator, the detailed results identify whether there were statistically different mean rates for 2011 between the three strata: Australian states and territories and NZ, public / private and metropolitan / non-metropolitan. This section summarises those results, by identifying the stratum that explains most of the variation in 2011. Table 6 shows the number of indicators that were analysed, and how many had significant stratum differences by indicator set.

Table 6: Indicators whose mean rates were statistically significantly different by Australian state / NZ, public / private, metropolitan / non-metropolitan, 2011

<table>
<thead>
<tr>
<th>CI set</th>
<th>Number of CIs</th>
<th>Tested CIs</th>
<th>State / NZ</th>
<th>Public / Private</th>
<th>Metropolitan / Non-metro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia</td>
<td>16</td>
<td>15</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Day Surgery</td>
<td>7</td>
<td>7</td>
<td>–</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Emergency Medicine</td>
<td>20</td>
<td>10</td>
<td>4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Gastrointestinal Endoscopy</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>13</td>
<td>13</td>
<td>4</td>
<td>3</td>
<td>–</td>
</tr>
<tr>
<td>Hospital in the Home</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>Hospital-Wide</td>
<td>15</td>
<td>15</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Infection Control</td>
<td>47</td>
<td>28</td>
<td>9</td>
<td>8</td>
<td>–</td>
</tr>
<tr>
<td>Intensive Care</td>
<td>15</td>
<td>13</td>
<td>4</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>32</td>
<td>9</td>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Medication Safety</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Mental Health Community Based</td>
<td>6</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mental Health Inpatient</td>
<td>28</td>
<td>27</td>
<td>8</td>
<td>4</td>
<td>–</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>20</td>
<td>19</td>
<td>7</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>16</td>
<td>10</td>
<td>4</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Oral Health</td>
<td>21</td>
<td>3</td>
<td>1</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Paediatric (General &amp; ICU)</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>Pathology</td>
<td>11</td>
<td>11</td>
<td>9</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Radiation Oncology</td>
<td>10</td>
<td>7</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Radiology</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Rehabilitation Medicine</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Surgical</td>
<td>19</td>
<td>15</td>
<td>5</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>343</strong></td>
<td><strong>238</strong></td>
<td><strong>73</strong></td>
<td><strong>46</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

* At least 10 HCOs must submit data for the indicator to be tested.

There were 73 indicators with significant differences in mean rates between states and territories of Australia / NZ with more occurring in Infection Control (9), Mental Health Inpatient (8), Obstetrics (7) and Pathology (9). This is similar to the result from 2010. Significant differences between the mean rates for the public and private strata were found in 46 CIs, with most of these being in Obstetrics (8), Infection Control (8) and Intensive Care (8). There were ten CIs with significant differences between metropolitan and non-metropolitan participants, three of which were from the Anaesthesia set.
Outliers

Indicators and HCOs with significantly different rates

The reporting of HCOs that are outliers is more relevant to the individual HCOs. Participating HCOs receive reports identifying those areas where their rates are significantly different. Outliers are summarised in this report to show that they occur in all sets, and in sufficiently large numbers to suggest that all HCOs would benefit from reviewing their results.

This section uses the data for 2011 to identify desirable and less desirable rates. If a shrunken rate was more than three standard errors from the overall rate, this was considered to be statistically significant. These rates are called outliers.

Of the 343 rate-based CIs (with rates between 0 and 100%) and 35,158 six-monthly data submissions, those indicators with no preferred direction or indicators that had less than 20 six-monthly data submissions in 2011 were excluded. There remained 218 indicators and 32,751 individual data submissions.

For the 218 rate-based CIs that had a desirable direction and more than 20 six-monthly data submissions, a summary of the number of outlier data submissions is given in Table 7.

The proportion of data submissions that were outliers with a desirable direction was 14%, the proportion with less desirable rates was 12% and the remaining 74% of submissions were not outliers. These proportions varied between the specialties.

More than 15% of six-monthly data submissions in the Emergency Medicine, Gastrointestinal Endoscopy, Intensive Care, Oral Health, Pathology and Rehabilitation Medicine indicator sets were statistically significant in the undesirable direction. Three of these six indicator sets had a greater number of six-monthly data submissions in the favourable direction than in the unfavourable direction.

Table 7: Indicators, healthcare organisations and data submissions, 2011

<table>
<thead>
<tr>
<th>CI set</th>
<th>Number of CIs</th>
<th>CIs tested*</th>
<th>HCOs</th>
<th>Data submissions</th>
<th>% poorer†</th>
<th>% better†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia</td>
<td>16</td>
<td>12</td>
<td>292</td>
<td>2,335</td>
<td>12%</td>
<td>35%</td>
</tr>
<tr>
<td>Day Surgery</td>
<td>7</td>
<td>7</td>
<td>393</td>
<td>4,023</td>
<td>12%</td>
<td>17%</td>
</tr>
<tr>
<td>Emergency Medicine</td>
<td>20</td>
<td>9</td>
<td>195</td>
<td>1,885</td>
<td>22%</td>
<td>44%</td>
</tr>
<tr>
<td>Gastrointestinal Endoscopy</td>
<td>8</td>
<td>8</td>
<td>95</td>
<td>960</td>
<td>18%</td>
<td>2%</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>13</td>
<td>11</td>
<td>77</td>
<td>679</td>
<td>9%</td>
<td>1%</td>
</tr>
<tr>
<td>Hospital in the Home</td>
<td>8</td>
<td>6</td>
<td>37</td>
<td>272</td>
<td>7%</td>
<td>3%</td>
</tr>
<tr>
<td>Hospital-Wide</td>
<td>15</td>
<td>14</td>
<td>481</td>
<td>5,445</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Infection Control</td>
<td>47</td>
<td>26</td>
<td>321</td>
<td>3,796</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Intensive Care</td>
<td>15</td>
<td>13</td>
<td>97</td>
<td>1,085</td>
<td>19%</td>
<td>26%</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>32</td>
<td>6</td>
<td>66</td>
<td>159</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Medication Safety</td>
<td>10</td>
<td>7</td>
<td>264</td>
<td>692</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>Mental Health Community Based</td>
<td>6</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mental Health Inpatient</td>
<td>28</td>
<td>26</td>
<td>107</td>
<td>2,763</td>
<td>14%</td>
<td>17%</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>20</td>
<td>19</td>
<td>186</td>
<td>4,763</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>16</td>
<td>8</td>
<td>88</td>
<td>555</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Oral Health</td>
<td>21</td>
<td>1</td>
<td>12</td>
<td>21</td>
<td>29%</td>
<td>29%</td>
</tr>
<tr>
<td>Paediatric (General &amp; ICU)</td>
<td>10</td>
<td>3</td>
<td>43</td>
<td>125</td>
<td>7%</td>
<td>14%</td>
</tr>
<tr>
<td>Pathology</td>
<td>11</td>
<td>11</td>
<td>42</td>
<td>458</td>
<td>26%</td>
<td>30%</td>
</tr>
<tr>
<td>Radiation Oncology</td>
<td>10</td>
<td>5</td>
<td>18</td>
<td>131</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td>Radiology</td>
<td>5</td>
<td>5</td>
<td>60</td>
<td>301</td>
<td>8%</td>
<td>19%</td>
</tr>
<tr>
<td>Rehabilitation Medicine</td>
<td>6</td>
<td>6</td>
<td>126</td>
<td>1,310</td>
<td>17%</td>
<td>13%</td>
</tr>
<tr>
<td>Surgical</td>
<td>19</td>
<td>15</td>
<td>167</td>
<td>993</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>218</td>
<td>687</td>
<td>32,751</td>
<td>12%</td>
<td>14%</td>
</tr>
</tbody>
</table>

* CIs with no preferred direction or less than 20 reports are excluded.
† The percentage of reports that were statistically significantly better or poorer are given. Statistical significance is 3 standard errors.
Those indicators with a high proportion of outliers were usually associated with process measures, such as access block in emergency departments and intensive care units, delays in reporting test results in pathology, and documentation of processes in rehabilitation medicine and intensive care.

Each of the 218 indicators tested was categorised according to whether there were:
- no outlier six-monthly data submissions
- at least one outlier with undesirable rates, none with desirable rates
- at least one outlier with desirable rates, none with undesirable rates, and
- outliers with both desirable and undesirable rates.

Table 8 reveals that 28 of the 218 indicators had no outlier six-monthly data submissions and 126 CIs included both poorer and better six-monthly data submissions as outliers.

### Table 8:
Indicators with six-monthly data submissions that were outliers in 2011*

<table>
<thead>
<tr>
<th>Outlier category</th>
<th>Number of CIs</th>
<th>% of CIs</th>
<th>Data submissions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Range</td>
</tr>
<tr>
<td>No outliers</td>
<td>28</td>
<td>13%</td>
<td>20–289</td>
</tr>
<tr>
<td>Undesirable rates only</td>
<td>58</td>
<td>27%</td>
<td>20–564</td>
</tr>
<tr>
<td>Desirable rates only</td>
<td>6</td>
<td>3%</td>
<td>20–75</td>
</tr>
<tr>
<td>Outliers – both†</td>
<td>126</td>
<td>58%</td>
<td>20–716</td>
</tr>
<tr>
<td>Total</td>
<td>218</td>
<td>100%</td>
<td>20–716</td>
</tr>
</tbody>
</table>

* CIs with no preferred direction or less than 20 six-monthly data submissions were excluded.
† Both desirable and undesirable outliers
Can outlier rates be used to rank HCOs?

This has been suggested as a way to improve quality, even though the research literature, in general, does not support the use of ‘league tables’.

For the 28 CIs with no outliers, the variation between HCOs was not statistically significant. This means that any ranking would be equivalent to that obtained from tossing a coin or a die. For the remaining 190 CIs, 184 (84% of the 218 tested) have six-monthly data submissions that are outliers in the undesirable direction (with or without other outlier submissions in the desirable direction).

Each of the 657 HCOs that submitted one or more of 218 indicators tested was categorised according to whether there were:

- no outlier data submissions,
- at least one outlier with undesirable rates, none with desirable rates,
- at least one outlier with desirable rates, none with undesirable rates,
- outliers with both desirable and undesirable rates.

The analyses of the outlier rates by HCO reveal that the desirable rates do not cluster into HCOs that have better performance, but that both desirable and undesirable rates occur in 66% of HCOs (Table 9). Furthermore, the table shows that HCOs that report fewer indicators (mean of 11 six-monthly data submissions and seven indicators) have less likelihood of having both desirable and undesirable rates compared to those reporting a greater number of indicators (mean of 62 six-monthly data submissions and 35 indicators).

<table>
<thead>
<tr>
<th>Outlier category</th>
<th>Number of HCOs</th>
<th>% of HCOs</th>
<th>Number of CIs</th>
<th>Data submissions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Range Median Mean</td>
<td>Range Median Mean</td>
</tr>
<tr>
<td>No outliers</td>
<td>74</td>
<td>11</td>
<td>1–76 7 11</td>
<td>1–42 5 7</td>
</tr>
<tr>
<td>Undesirable rates only</td>
<td>84</td>
<td>12</td>
<td>1–64 15 19</td>
<td>1–32 11 12</td>
</tr>
<tr>
<td>Desirable rates only</td>
<td>75</td>
<td>11</td>
<td>1–76 24 27</td>
<td>1–47 13 16</td>
</tr>
<tr>
<td>Outliers – both†</td>
<td>454</td>
<td>66</td>
<td>3–241 51 62</td>
<td>3–144 30 35</td>
</tr>
<tr>
<td>Total</td>
<td>687</td>
<td>100</td>
<td>1–241 36 48</td>
<td>1–144 20 27</td>
</tr>
</tbody>
</table>

* CIs with no preferred direction or less than 20 six-monthly data submissions were excluded.
† Both desirable and undesirable outliers

These results show that:

- for each indicator, the majority of six-monthly data submissions (74%) are not statistically different from the average, however,
- most HCOs have some clinical areas with rates that are outliers.

This suggests that indicators have a greater role in identifying areas for review, rather than for ranking performance.
About the Australasian Clinical Indicator Report (ACIR)

**Printed report – a summary**

This report summarises the data collected during 2011 by the ACHS Clinical Indicator Program (CIP), and in those years since 2004 when the indicator has been available for collection.

The report uses tables to summarise the CIP, its membership and any significant trends or variation in the data over time. Reviewing trends and variation can suggest areas where there is greatest scope to improve practice.

The summary of results section on page 20 describes observations drawn from the data across groups of indicators with a common theme. Within each set of indicators, subheaders provide guidance to the groups of indicators. Those with a common theme bear the same major number (e.g. 1), with individual indicators identified after the decimal point (i.e. 1.1, 1.2 etc).

To capture the context and circumstances that influence the data, the ACHS relies on the expertise of the medical colleges, specialist societies and other clinical organisations with which it collaborates. Their comments and expert feedback follow the summaries of the data.

**Full report – available online**

Every year, the ACIR lists collective performance against each of the ACHS clinical indicators. This information is published on the ACHS website: http://www.achs.org.au/cireports/.

In the full report, each indicator collected in 2011 has a table (shaded green) that describes the indicator, its intent, numerator and denominator. Tables summarise the data submitted in every year since 2004 that the indicator has been available.

For indicators of interest, readers of this summary report should turn to the full report online to better understand the true granularity of the data.

For indicators launched before 2009, trends in the rates over time are reported and the data are displayed using a line graph. More than three years of data are needed to display a trend.

Three measures of variation in rates between healthcare organisations (HCOs) are included; these are quantified by the differences between the 20th and 80th centiles.

Where significant differences between strata have occurred in 2011, these data are reported in additional tables, and the information is illustrated graphically using box plots.

Outlier information is displayed through funnel plots.

The full report also statistically estimates the potential improvement for all eligible indicators, if changes in the distribution of data were achieved.

**Statistical methods**

A description of the statistical methods used to report the data is also available online located with the ACIR. It describes how to read, understand and use the full report.

**CI User Manuals**

CIP members can read more details about the individual indicators in the ACHS CI user manuals. Separate copies for each set of indicators can be accessed from the ACHS website. The user manuals include information such as:

- the rationale for development of the CI
- suggested sources for data collection
- desired rates (i.e. should the organisation be aiming for a high or low rate?)
- stratification variables
- data cleaning rules
- uses of indicator data as evidence for accreditation
- definition of terms
- numerator and denominator details.

Also included are blank templates to assist HCOs to collect their data and retain details of their collection.
Summary of results

A summary of the main observations for each set of indicators follows. Full details and charts for every clinical indicator (or CI) can be accessed in the full report available from the ACHS website, http://www.achs.org.au/.

Anaesthesia

Of the 16 indicators in this set, four were analysed for trend. Two improved and one deteriorated.

Preanaesthesia period

CI 1.1: Preanaesthesia consultation by anaesthetist documented (H)
In 2011, there were 138,621 patients reported from 67 HCOs. The annual rate was 99.8 per 100 patients. In 2011, there were ten outlier submissions from eight HCOs whose combined excess was 207 fewer documented preanaesthesia assessments.

CI 1.2: Anaesthesia risks and benefits documented (H)
In 2011, there were 50,280 patients reported from 35 HCOs. The annual rate was 89.9 per 100 patients. In 2011, there were nine outlier submissions from seven HCOs whose combined excess was 3,970 fewer patients who have documentation of risks and benefits.

CI 1.3: History of PONV – prophylactic anti-emetic administered (H)
In 2011, there were 287 patients reported from 12 HCOs. The annual rate was 77.4 per 100 patients. The fitted rate deteriorated from 93.1 to 89.6, a change of 3.5 per 100 patients.

Intraoperative period

CI 2.1: Presence of trained assistant to the anaesthetist (H)
In 2011, there were 166,685 patients reported from 37 HCOs. The annual rate was 95.7 per 100 patients. There were four outlier submissions from three HCOs whose combined excess was 6,135 fewer procedures with a trained assistant to the anaesthetist present.

CI 2.2: Anaesthesia records – compliance with ANZCA requirements (H)
In 2011, there were 193,963 patients reported from 68 HCOs. The annual rate was 97.9 per 100 patients. The fitted rate improved from 93.4 to 97.2, a change of 3.8 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.8 per 100 patients. In 2011, there were 17 outlier submissions from 11 HCOs whose combined excess was 3,142 fewer compliant anaesthesia submissions.
Patient recovery period
These indicators monitor the incidence of clinical events during recovery from anaesthesia.

CI 3.1: Recovery – relief of respiratory distress (L)
In 2011, there were 1,340,421 patients reported from 221 HCOs. The annual rate was 0.050 per 100 patients. In 2011, there were 24 outlier submissions from 18 HCOs whose combined excess was 253 more patients who require intervention to relieve respiratory distress.

CI 3.2: Recovery – PONV treatment according to approved protocol (L)
In 2011, there were 624,672 patients reported from 113 HCOs. The annual rate was 0.98 per 100 patients. In 2011, there were 36 outlier submissions from 24 HCOs whose combined excess was 3,721 more patients requiring this treatment.

CI 3.3: Recovery – temperature <36 °C (L)
In 2011, there were 1,127,016 patients reported from 194 HCOs. The annual rate was 2.3 per 100 patients. In 2011, there were 60 outlier submissions from 41 HCOs whose combined excess was 18,586 more patients with a temperature of less than 36 °C.

CI 3.4: Recovery – severe pain not responding to protocol, anaesthetist review (L)
In 2011, there were 1,345,989 patients reported from 223 HCOs. The annual rate was 0.43 per 100 patients. The fitted rate improved from 0.47 to 0.38, a change of 0.085 per 100 patients. In 2011, there were 43 outlier submissions from 31 HCOs whose combined excess was 2,702 more patients who have severe pain NOT responding to pain protocol.

CI 3.5: Recovery – unplanned stay >2 hours for medical reasons (L)
In 2011, there were 1,218,461 patients reported from 210 HCOs. The annual rate was 1.1 per 100 patients. In 2011, there were 42 outlier submissions from 30 HCOs whose combined excess was 7,114 more patients who have an unplanned stay of longer than two hours.

Post-operative period
CI 4.1: Unplanned admission to ICU within 24 hours of a procedure (L)
In 2011, there were 949,869 patients reported from 132 HCOs. The annual rate was 0.19 per 100 patients. In 2011, there were 28 outlier submissions from 18 HCOs whose combined excess was 772 more patients having an unplanned admission to ICU within 24 hours of a procedure.

Management of acute pain
CI 5.1: Regularly recorded post-operative pain intensity scores (H)
In 2011, data across 13,293 patients were reported from 13 HCOs. The annual rate was 95.7 per 100 patients. In 2011, there were six outlier submissions from four HCOs whose combined excess was 321 fewer surgical patients having pain intensity scores recorded.

CI 5.2: Anaesthetist review following post-operative epidural analgesia (H)
In 2011, there were 1,541 patients reported from 13 HCOs. The annual rate was 99.6 per 100 patients. In 2011, there was one outlier submission with an excess of one patient.

Obstetric anaesthesia care
CI 6.1 Obstetrics – post-dural puncture headache (L)
In 2011, there were 8,214 patients reported from 17 HCOs. The annual rate was 0.43 per 100 patients. There was no significant trend in the fitted rate.

CI 6.2: Obstetrics – surgery within 30 minutes of LSCS request (H)
In 2011, there were 845 patients reported from 12 HCOs. The annual rate was 94.2 per 100 patients. In 2011, there were three outlier submissions from two HCOs whose combined excess was 34 fewer patients who commence surgery within 30 minutes of a request for a lower segment caesarean section (LSCS).

CI 6.3: Obstetrics – spinal / epidural risks and benefits documented (H)
In 2011, there were 1,786 patients reported from six HCOs. The annual rate was 83.8 per 100 patients. In 2011, there were three outlier submissions from two HCOs whose combined excess was 147 fewer obstetric patients who have documentation of risks and benefits.
Expert commentary

Australian and New Zealand College of Anaesthetists (ANZCA)

The number of HCOs reporting on the different clinical indicators varies greatly and for some CIs is very low. Nevertheless, the data provide an insight into aspects of peripoperative care in Australia, illustrating both current practice and developing trends.

Preanaesthesia period

The rate of 99.8% for CI 1.1: Preanaesthesia consultation by anaesthetist documented reflects the acceptance of the importance of the preoperative assessment in reducing anaesthetic morbidity and mortality. The outlier rate of 93.1%, though not ideal, was a significant improvement on 2010 when it was 39%.

There remains limited use by anaesthetists of printed material and separate documentation or consent forms for the risks and benefits of anaesthesia and related procedures. Nevertheless, more hospitals are incorporating an area on the anaesthetic form that allows at least some acknowledgement of discussion of consent. Despite this, in 2011 there was a fall in CI 1.2: Anaesthesia risks and benefits documented from 97% to 90%. The fact that discussion of risks and benefits is more common in private (94.7%) than public (77.6%) HCOs probably reflects the greater degree of direct responsibility felt in private facilities, and the fact that often junior medical staff are assessing patients preoperatively in the public sector. The low non-metropolitan and outlier rates may reflect a need to update paperwork to encourage documentation of risk disclosure discussion.

It is very difficult to make meaningful comment about CI 1.3: History of PONV – prophylactic anti-emetic administered when only 12 HCOs have reported and the total number of patients reviewed is 287. Data collection for this indicator is labour intensive with a requirement to obtain details about previous anaesthetic history and also drugs administered. An anaesthetic technique such as regional anaesthesia may be deliberately employed in a patient with a significant history and anti-emetics may not then be necessary. This effective management would not be reflected in the data collected.

Intraoperative period

Although the rate for CI 2.1: Presence of trained assistant to the anaesthetist has fallen from 99% in 2010 to 96% in 2011, NSW reports a 100% compliance rate. Of concern is the rate of 82% in Qld, as well as the general outlier rate of 58%. Every anaesthetist recognises that no procedure should be commenced without the presence of a trained assistant. There are an increasing number of stand-alone units for day case procedures. However, without further data analysis, it is impossible to ascertain whether staffing levels are inadequate in such institutions or in major hospitals under budgetary constraints particularly in, for example, endoscopy suites. Analysis of data for individual states is important and if the trend continues in 2012 further investigation would be important.

At nearly 98%, compliance of anaesthesia records with ANZCA requirements (CI 2.2) is the highest rate since 2004. However the outlier rate of 88% is well below acceptable. Judgement of whether an anaesthetic record is compliant or not may be somewhat subjective and based on legibility, frequency of documented observations, etc. It is not a binary assessment. Nevertheless, an accurate anaesthetic record represents a minimum standard.

Patient recovery period

A significant number of HCOs collect the data for CI 3.1: Recovery – relief of respiratory distress. This is almost certainly due to an appreciation by HCOs of the potential detrimental consequences to patients of an adverse respiratory event in recovery. It also has implications for recovery room staffing. In 2011, the rate of patients requiring tracheal intubation or laryngeal mask insertion in recovery was five patients in 10,000. This seems acceptably low. The outlier rate of 40 per 10,000 patients is comparatively much higher and cause for concern. Further information is required to make comment on likely causative factors.

The rate of one patient in 100 treated or even four patients in 100 (as represented by the outlier HCOs) in the data set for CI 3.2: Recovery – PONV treatment according to approved protocol does not reflect the true incidence of post-operative nausea and vomiting (PONV).

This result probably indicates that most hospitals do not have a formalised protocol for management of PONV. Management of this common problem involves pre- and intra-operative measures and anaesthetists will order post-operative anti-emetics dependent upon the agents that have already been given.

In 2011, CI 3.3: Recovery – temperature <36 °C became reportable; this was a change from 35 °C previously. Many hospitals are only now reporting according to this change – 23 patients in 1,000 is an increase from 2010 (1.8%) but is very low considering the change in reportable temperature. A significant rise may therefore be seen when 2012 data is collected. Individual hospitals may be alarmed when they see a significant change in their CI rate, but this change will inevitably lead to improved patient management, with pre-warming etc.

Although the rate for CI 3.4: Recovery – severe pain not responding to protocol, anaesthetist review has increased from 0.34% in 2010 to 0.43% in 2011, this represents one additional patient in 1,000 requiring assessment by an anaesthetist. Of more interest is the fact that in the
best performing HCOs, the rate was 0.045% versus 0.55% in the poorest performing HCOs. This, however, may be reflected by the type of procedures performed in different hospitals. For example, many private institutions perform high numbers of endoscopies or superficial procedures under regional anaesthesia that are unlikely to have pain management problems.

There are many reasons for a prolonged recovery room stay, some of which would be picked up by the previous clinical indicators i.e. inadequate pain control, hypothermia, nausea and vomiting. Excessive sedation, prolonged block and surgical issues may also be implicated. The rate for CI 3.5: Recovery – unplannedstay >2 hours for medical reasons is similar to 2010 at about one patient in 100. The outlier rate of five in 100 could reflect a difference in patient population and complexity of surgery, and should not necessarily be criticised. Patients should not be transferred from a closely monitored environment to the ward unless they are stable and clinically optimised.

Post-operative period

Although the rate for CI 4.1: Unplanned admission to ICU within 24 hours of a procedure of about two patients per 1,000 is similar to 2010, the outlier rate of seven per 1,000 is a cause for some concern (there were 18 outlier HCOs of 132 HCOs reporting). It would be interesting to know whether more complex procedures were being performed in these hospitals than previously, and whether there were medical staffing issues. In addition, it raises the possibility of transfer out of the primary hospital to a facility with an intensive care unit (ICU).

Management of acute pain

There were only 21 submissions from 13 HCOs regarding CI 5.1: Regularly recorded post-operative pain intensity scores in surgical patients staying at least one night and receiving acute pain management. Although many institutions do not have an acute pain service there seems to be widespread use of pain assessment tools for major surgery. Obviously, many HCOs have chosen not to report on this CI. The definition of the denominator population is very broad and this also makes the significance of the data difficult to assess.

Similarly, very few HCOs have reported on CI 5.2: At least daily anaesthetist review following post-operative epidural analgesia. However both the numerator and denominator are clearly defined and ideally there should be 100% compliance. In fact, for the HCOs reporting, this was close to being achieved.

Obstetric anaesthesia care

Very few hospitals report clinical indicators related to management of the obstetric patient. This is unfortunate as maternal morbidity and mortality has enormous social impact and the data are often used to benchmark the quality of health care of a nation.*

The rate of CI 6.1: Obstetrics – post-dural puncture headache remains relatively unchanged and low at approximately one in 200.

Although only 12 hospitals (representing 845 patients) reported on CI 6.2: Obstetrics – surgery within 30 minutes of LSCS request, analysis of the data reveals that there was an improvement from 77% in 2010 to 94% in 2011.

Perhaps more important, however, was the identification of a significant difference between metropolitan and non-metropolitan hospitals with 97% of metropolitan hospitals achieving the defined goal, but only 72% of the non-metropolitan patients receiving surgery within the 30 minute time frame. This most likely reflects the limited number of anaesthetists and theatres available for urgent lower segment caesarean section (LSCS) in-hours in a smaller non-metropolitan hospital and greater distances required for medical and nursing staff to travel in the out-of-hours situation.

Although there was a significant improvement in CI 6.3: Obstetrics – spinal analgesia / epidural risks and benefits documented to 84% of patients receiving these neuraxial procedures, two fewer HCOs reported and in the three outliers, just over half had risks documented. The importance of documenting such risks still needs emphasis and for obstetric patients, this means provision of information electively in the antenatal setting.

Expert commentary continued: Australian and New Zealand College of Anaesthetists (ANZCA)

**Expert commentary**

**Australian Society of Anaesthetists (ASA)**

**Preanaesthesia period**

The results for CI 1.1: Preanaesthesia consultation by anaesthettist documented are excellent (99.8%), however the ASA has concerns regarding the reliability of this data. In particular, were the preoperative consultations conducted before the patients were transferred to the operating theatre? As far as the ASA is aware, all institutions collect this data by chart review and using this method it is not always obvious when the consultation was conducted. Most anaesthetic charts do not distinguish between consultations conducted in the induction room and those conducted before transfer to the operating theatre. In addition, modern operating theatres have admission times staggered throughout the day which does not facilitate anaesthetists’ access to the patients before their transfer to theatre.

Expert commentary continued: Australian Society of Anaesthetists (ASA)

The Australian Society of Anaesthetists (ASA) supports separate consultations prior to operating theatre transfer.

On the face of it, there appears to have been a significant decline in results for CI 1.2: Anaesthesia risks and benefits documented from 97.2% to 89.9% in the last year but a detailed look at the results shows that private (94.7%) and metropolitan (95.2%) institutions fared far better than public (78%) and non-metropolitan (70%) facilities.

A detailed look at the results shows that two non-metropolitan public facilities had very poor results (about 20% and 40%) which appear to have skewed the results dramatically, since there were only nine non-metropolitan respondents.

Presumably, data for CI 1.3: History of PONV – prophylactic anti-emetic administered are collected by noting when post-operative nausea and vomiting (PONV) is mentioned in the preoperative assessment and then correlating this with whether prophylaxis has been administered.

Overall the figures are small, with 12 institutions reporting on a total of fewer than 300 patients whereas, in 2006, 14 institutions reported on ten times as many patients. The numbers are so small now that the reliability of the results (77%) is questionable. Unless the preoperative assessment form specifically addresses the question of previous PONV, there will be doubt about whether significant numbers of patients are being missed. In addition, this question does not detect situations where the anaesthetist adjusted the anaesthetic technique because of a history of PONV to, for example, regional anaesthesia and sedation, or total intravenous general anaesthesia.

Patient recovery period

CI 3.1: Recovery – relief of respiratory distress is a good indicator of the standard of practice and the hard end points mean that data collection is likely to be reliable. The result of about one incident per 2,000 anaesthetics is reasonable, especially in the face of a population that is gradually becoming more obese, and as a result, more difficult to manage. The presence today of a reversing agent for non-depolariser muscle relaxants may assist in improvement in this indicator.

The overall rate for CI 3.2: Recovery – PONV treatment according to approved protocol has improved on last year and is surprisingly good at about one per 100 patients in recovery, although the 24 outlier institutions had an average result of about four per 100 patients. This may reflect the fact that some institutions deal with groups of patients more likely to have post-operative nausea than others e.g. young females having general anaesthetics.

In general, the course of events is pain, then intravenous narcotic, then nausea, then anti-emetics.

The incidence for CI 3.3: Recovery – temperature <36 °C has climbed dramatically since last year because the threshold for reporting has risen from 35 °C to 36 °C to take into account recent evidence that even small drops in core temperature have significant deleterious outcome effects (from one in 500 last year to 2.3 per 100 in the latest report). The 41 outlier HCOs had an incidence of 12.3 per 100 patients.

Most practising anaesthetists worry about the reliability of this data collection when ‘typanic probe’ recording devices are used, but very few anaesthetists in recent times would not be concerned about genuine hypothermia. This is an area where feedback from the recovery room can influence anaesthetists’ intraoperative management. Since these data are collected on all patients, it would seem an easy area for all anaesthetists to conduct personal audits of their practice.

The recent data may also reflect the limitations of circulating warm air devices in maintaining core temperature when large portions of the body are exposed at the surgical site.

Severe pain in recovery that does not respond to protocol and requires review by an anaesthetist (CI 3.4) continues to be an uncommon event (fewer than one in 200 cases admitted to Post-Anaesthetic Care Unit or PACU) although there had been a rise of about 10% in the last year. It is uncommon and this reflects the fact that most institutions utilise systems for nurses to give intravenous narcotics by protocol in PACU.

Stays in the Post-Anaesthetic Care Unit (PACU) of more than two hours for medical reasons (CI 3.5) occur in about one in 100 admissions to PACU. This often reflects ongoing hypothermia or relative hypotension, both of which are best managed in PACU. It is important that individual anaesthetists are aware of when their patients are staying for a long time in recovery, so that their intraoperative management can be reviewed.
Post-operative period

Unplanned admission to the Intensive Care Unit (ICU) within 24 hours of a procedure (CI 4.1) occurs in about one in 200 theatre cases but rates vary widely depending, presumably, on the hospital casemix e.g. whether the hospital treats serious trauma. Obviously, the rate also is dependent on the availability of ICU beds and may reflect nursing wishes regarding whether certain cases are best managed in that particular institution.

Some institutions have policies of admitting certain categories of surgery “routinely” to ICU e.g. revision hips. This will artificially reduce this indicator because none of these cases will become “unexpected” ICU admissions.

Management of acute pain

CI 5.1: Regularly recorded post-operative pain intensity scores has been reported by surprisingly few institutions (13 in 2011) and this is odd since most would consider this core business on the surgical ward. Of those that did look at this indicator, that incidence was about 96%, but there is no way of knowing whether these results can be extrapolated to all the other institutions.

However, those that did submit data for CI 5.2: At least daily anaesthetist review following post-operative epidural analgesia had almost universal compliance (99.6%). The data do not allow a comparison between public and private institutions. One would imagine that it was not universally done in the private sector although most private institutions have an acute pain service run by a registered nurse (RN).

The small numbers submitting data might also reflect the fact that fewer epidurals are inserted for post-operative pain relief as a result of the rise of alternative regimes e.g. abdominal field blocks such as TAP® regional blocks or lower limb peripheral nerve blocks, less invasive surgical techniques such as laparoscopic bowel resection techniques, and the almost universal use of chemical prophylaxis for deep vein thrombosis (DVT).

Obstetric anaesthesia care

Data for the three obstetric indicators are infrequently submitted although they seem to reflect core business in any obstetric unit.

CI 6.1: Obstetrics – post-dural puncture headache is an uncommon complication in the 17 HCOs reporting results. Over the last seven years, the incidence has varied between 0.29% and 0.52%.

CI 6.2: Obstetrics – surgery within 30 minutes of LSCS request was submitted by 12 HCOs. There has been a dramatic improvement from 77% to 94% in the last year. There is, however, a disparity on the raw data between metropolitan and non-metropolitan centres (97% vs 72%) but a detailed look at these data showed that one non-metropolitan centre dramatically skewed the results. It is surprising that so few centres are reporting on this indicator which probably reflects how difficult it is accurately to collect the data retrospectively from the patients’ notes.

There was a marked improvement in CI 6.3: Obstetrics – spinal analgesia / epidural analgesia risks and benefits documented from 58% to 84% in this indicator from the six hospitals reporting. It is surprising that so few centres reported on this indicator as most HCOs have well-established paperwork systems to deal with this issue.

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Expert commentary continued: Australian Society of Anaesthetists (ASA)

Preanaesthesia period

The rate for CI 1.1: Pre-anaesthesia consultation by anaesthetist documented has increased from 96.5% in 2010 to 99.8% in 2011. The improvement is likely to have resulted from a number of factors. These include the education and change management processes surrounding the general trend to day-of-surgery admission (DOSA). This change has seen the preoperative consultation move predominantly to the DOSA area where the hospital record of the patient is readily accessible / available as compared with a ward consultation or phone consultation where the hospital record is not necessarily readily available.

Data for administration of a prophylactic anti-emetic to patients with a history of post-operative nausea and vomiting (CI 1.3) were submitted by 12 HCOs. It appears that the poorest 20% HCO rate has decreased from 81.6% in 2010 to 58.9% in 2011, while the best 20% HCO rate has increased from 99.3% to 99.6%.

The non-metropolitan HCO rate (81.9%) was lower than the metropolitan HCO rate (99.6%). Of the reporting HCOs, six were from NSW and their stratum rate was 59.9% in comparison with the other states combined (98.6%).

Low reporting of this clinical indicator may be related to the limited time that clinical staff have available for administrative tasks and limited awareness of the reporting requirements of this clinical indicator. HCOs should be encouraged to find quick and simple methods for building the reporting of clinical indicators into standard practice.

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Expert commentary

Australian Society of Post Anaesthesia and Anaesthesia Nurses (ASPAAN)

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* Revision of total hip replacement is a more complex procedure than the original operation, because there is a reduced amount of bone available in which to set the prosthesis.
† Transversus abdominis plane (TAP) block
Intraoperative period

Challenges in fulfilling requirements for CI 2.1: Presence of trained assistant to the anaesthetist may relate to workforce planning issues. Over time, we are seeing a decrease in the number of experienced nurses and a resultant slow increase in the number of untrained and inexperienced staff being available to assist. Of concern is the Qld rate of 81.4%, noting that Qld is increasingly reliant on anaesthetic technicians rather than registered nurses (RNs) to fulfil these criteria.

Patient recovery period

CI 3.1: Recovery – relief of respiratory distress was well-reported and continued to have a low rate, which decreased from 0.063% in 2010 to 0.050% in 2011. Ongoing low rates can be attributed to good intraoperative and appropriate post-operative management.

Eighteen (18) outlier HCOs were responsible for an outlier HCO rate of 0.41 per 100 patients.

Ensuring appropriate nursing skill mix and achievement of at least minimum levels of postgraduate qualified nurses (in perioperative or critical care advanced clinical nursing) in rostering the post-anaesthetic care unit (PACU) will help to maintain these rates.

The decrease in rate for CI 3.2: Recovery – PONV treatment according to approved protocol from 1.37% in 2010 to 0.98% in 2011 may relate to better education supporting prophylaxis and improved early intervention in the post-anaesthetic care unit (PACU).

The rate for CI 3.3: Recovery – temperature <36 °C increased from 0.18% in 2010 to 2.32% in 2011. There has been a change in reporting criteria for this clinical indicator from patients with temperature <35 °C to <36 °C. A trend is yet to be established, although higher rates would be anticipated.

The rate for CI 3.4: Recovery – severe pain not responding to protocol, anaesthetist review increased from 0.34% in 2010 to 0.43% in 2011, with the best 20% HCO rate of 0.045% and the poorest 20% HCO rate of 0.55%.

The increase in rates for both CIs 3.4 and 3.5 may be related to increased reporting of these clinical indicators (CIs).

Post-operative period

CI 4.1: Unplanned admission to ICU within 24 hours of a procedure was first collected in 2010 and had a rate of 0.17%, and this rate remained similar in 2011 at 0.19%. This low result may be related to appropriate preoperative selection and work up of patients, and early intervention through MET* calls decreasing the requirement for unplanned intensive care unit (ICU) admission.

The rate for CI 5.5: Recovery – unplanned stay >2 hours for medical reasons increased from 1.02% in 2010 to 1.10% in 2011, with 21 more HCOs reporting this indicator. The best 20% HCO rate has deteriorated from 0.088% to 0.10%, however the poorest 20% HCO rate has improved from 1.13% to 1.01%.

The increase in rates for both CIs 3.4 and 3.5 may be related increased reporting of these clinical indicators (CIs).

* Calls to the Medical Emergency Team
Of the seven indicators for day surgeries, one improved and three deteriorated. The majority of patients (71–80%) were from private HCOs in all indicators.

**Cancellation of booked procedures**

CI 1.1: Booked patients failing to arrive (L) In 2011, there were 984,854 patients reported from 304 HCOs. The annual rate was 0.82 per 100 patients. The fitted rate deteriorated from 0.77 to 0.89, a change of 0.13 per 100 patients. In 2011, there were 74 outlier submissions from 48 HCOs whose combined excess was 4,557 more patients who failed to arrive.

CI 1.2: Cancellation after arrival – pre-existing medical condition (L) In 2011, there were 1,159,367 patients reported from 340 HCOs. The annual rate was 0.23 per 100 patients. The fitted rate deteriorated from 0.17 to 0.22, a change of 0.050 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.049 per 100 patients. In 2011, there were 57 outlier submissions from 45 HCOs whose combined excess was 1,215 more patients whose procedure was cancelled due to a pre-existing medical condition.

CI 1.3: Cancellation after arrival – acute medical condition (L) In 2011, there were 1,136,820 patients reported from 337 HCOs. The annual rate was 0.26 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were 62 outlier submissions from 45 HCOs whose combined excess was 1,015 more patients whose procedure was cancelled due to an acute medical condition.

CI 1.4: Cancellation after arrival – administrative / organisational reasons (L) In 2011, there were 1,144,397 patients reported from 342 HCOs. The annual rate was 0.63 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were 105 outlier submissions from 71 HCOs whose combined excess was 3,999 more patients whose procedure was cancelled for administrative / organisational reasons.

**Unplanned return to operating room**

CI 2.1: Unplanned return to operating / procedure room (L) In 2011, there were 1,097,532 patients reported from 318 HCOs. The annual rate was 0.047 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were 21 outlier submissions from 17 HCOs whose combined excess was 147 more patients having an unplanned return to the operating / procedure room.

**Unplanned transfer**

CI 3.1: Unplanned transfer or overnight admission following a procedure (L) In 2011, there were 1,245,973 patients reported from 354 HCOs. The annual rate was 1.16 per 100 patients. The fitted rate improved from 1.8 to 1.2, a change of 0.58 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.58 per 100 patients. In 2011, there were 120 outlier submissions from 80 HCOs whose combined excess was 5,070 more patients who had an unplanned transfer or overnight admission.

**Delayed patient discharge**

CI 4.1: Unplanned delayed discharge >1 hour (L) In 2011, there were 891,743 patients reported from 265 HCOs. The annual rate was 0.60 per 100 patients. The fitted rate deteriorated from 0.30 to 0.65, a change of 0.35 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.35 per 100 patients. In 2011, there were 53 outlier submissions from 40 HCOs whose combined excess was 3,196 more patients who have their discharge delayed by more than one hour.
Expert commentary
Australian Day Hospital Association (ADHA)

Cancellation of booked procedures

The improved result in CI 1.1: Booked patients failing to arrive is noted, having decreased by 0.11 since 2010. The 2011 result is the lowest that this has been since 2006, which may be attributable to improved preadmission planning.

The significant deterioration in results in CI 1.2: Cancellation after arrival – pre-existing medical condition may be related to the ageing population as well as differences in opinion regarding a patient’s suitability for day surgery that can exist between the surgeon and the anaesthetist. These factors combined can influence this outcome. Well considered, preadmission assessment of the patient by the admitting facility may contribute to an improvement in this area.

The rate for CI 1.3: Cancellation after arrival – acute medical condition has remained consistent since 2010 and is also slightly better than in 2009. This would indicate that preadmission assessment is identifying acute conditions.

Though there was no significant trend identified, the difference between the public and private rate for CI 1.4: Cancellation after arrival – administrative / organisational reasons is clear (1.87% vs 0.18%).

Unplanned return to operating room

Despite no significant trends in the fitted or stratum rate, there is an opportunity to improve. An analysis of the types of procedures and/or any common patient attributes would be of interest to determine whether there is anything valuable in these data for unplanned return to operating / procedure room (CI 2.1) that could impact day hospital practice, procedure and admission criteria.

Unplanned transfer

Some improvement has been evident in rates for unplanned transfer or overnight admission following a procedure (CI 3.1) as a whole, however again, the significantly lower transfer rate in the private sector compared to the public is worthy of highlighting. This may be related to the integrated style of day facility that exists in the public sector as opposed to the private day hospital sector in which it is not as easy to facilitate a patient transfer. In itself, this possibly leads to better patient selection, preparation and structuring of operating lists. There is, however, still room for further improvement in both healthcare sectors.

Delayed patient discharge

Defining CI 4.1: Unplanned delayed discharge >1 hour remains difficult given the breadth of procedures being performed in the day hospital setting and the variation in expected length of stay. These results should show some improvement in the next reporting period as a better understanding and appreciation of the new definitions develops.

Expert commentary
Australian Day Surgery Council (ADSC)

Cancellation of booked procedures

It is difficult to comment on data for CI 1.1: Booked patients failing to arrive and CI 1.2: Cancellation after arrival – pre-existing medical condition without further information, such as the number of procedures that were open access endoscopy, how many patients received preadmission calls to confirm attendance etc. These issues will be addressed in the revised indicators.

The rate for CI 1.3: Cancellation after arrival – acute medical condition has remained relatively constant since 2004 (0.25–0.28%).

Despite this low rate, it still infers that 2,236 patients would not be cancelled due to an acute medical condition, after arriving for a day procedure, if all HCOs could perform at the rate achieved by the best performing 20% of HCOs (0.063%).

Cancelling is not necessarily a negative; it could be the safest thing for the patient and shows respect by team and management. Again, the level of preadmission assessment would need to be taken into account, to see whether those who were cancelled had been assessed by the facility.

The rate for CI 1.4: Cancellation after arrival – administrative / organisational reasons has remained relatively constant since 2004 (0.54–0.64%), however the best 20% HCO rate is 0.042% and the poorest 20% HCO rate is 1.10%. This has produced high centile gains of 6,687 patients. The public HCO rate is much higher than the private HCO rate (1.87% vs 0.18%).

The category, ‘cancellation for administrative / organisational reasons’, is used for anything that does not fit into the other categories – so CI 1.4 can include cancellations that are not necessarily due to administrative issues. The revised indicators will address this.
Summary of results:

Day Surgery

Expert commentary continued: Australian Day Surgery Council (ADSC)

**Unplanned return to operating room**

CI 2.1: Unplanned return to operating / procedure room has not changed a great deal since 2005 (0.042–0.049%). There were 17 outlier HCOs in 2011 who produced an outlier HCO rate of 0.47%. Despite the rate for this indicator being extremely low, it has produced centile gains of 360 patients and outlier gains of 148 patients.

Return to theatre is not necessarily a negative; it shows early intervention for a range of issues (such as a haematoma), recognised early with action taken to avoid any long term adverse outcomes.

**Unplanned transfer**

CI 3.1: Unplanned transfer or overnight admission following a procedure has gradually improved since 2004 to its best rate of 1.16%, however the private rate remains much lower than the public rate (0.93% vs 1.98%). There were 80 outlier HCOs with an outlier HCO rate of 2.9 per 100 patients. The best 20% HCO rate is 0.11% and the poorest HCO rate is 1.84%, resulting in very high centile, stratum and outlier gains.

Private day surgeries are mostly stand-alone facilities without the capacity for overnight care. Therefore, preadmission assessment and patient education are very high priority. Patients at risk of converting to overnight may not be admitted by these facilities.

**Delayed patient discharge**

Reporting rates for CI 4.1: Unplanned delayed discharge >1 hour remain lower than for the other indicators, and eight fewer HCOs reported in 2011 compared with 2010. The rate has continued to increase since 2004 (0.28%), reaching its highest rate in 2011 at 0.60%. The best 20% HCO rate is 0.022% and the poorest 20% HCO rate is 0.60%. There were 40 outlier HCOs responsible for an outlier HCO rate of 3.5 per 100 patients.

This is another area for confusion regarding how to collect the data; delay in discharge for one speciality is very different to another. The revised indicators should assist with this.
Of the 20 indicators in this set, six CIs had sufficient data to be tested for trend. Five CIs demonstrated improvement, three of which were statistically significant after allowing for the changing composition of contributing HCOs over time. One indicator deteriorated.

Between 92% and 100% of patients were from public HCOs in all indicators.

Waiting time

CI 1.1: ATS Category 1 – attended immediately (H)
In 2011, there were 30,126 patients reported from 182 HCOs. The annual rate was 99.5 per 100 patients. The fitted rate improved from 99.2 to 99.3, a change of 0.16 per 100 patients. In 2011, there were 19 outlier submissions from 16 HCOs whose combined excess was 90 fewer patients allocated to ATS Category 1 who are attended to immediately.

CI 1.2: ATS Category 2 – attended within 10 minutes (H)
In 2011, there were 426,766 patients reported from 191 HCOs. The annual rate was 78.7 per 100 patients. The fitted rate improved from 72.8 to 77.7, a change of 4.9 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 5.3 per 100 patients. There were 73 outlier submissions from 50 HCOs whose combined excess was 17,768 fewer patients allocated to ATS Category 2 attended to within ten minutes.

CI 1.3: ATS Category 3 – attended within 30 minutes (H)
In 2011, there were 1,490,161 patients reported from 190 HCOs. The annual rate was 63.7 per 100 patients. The fitted rate improved from 60.4 to 63.4, a change of 3.0 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.4 per 100 patients. In 2011, there were 73 outlier submissions from 50 HCOs whose combined excess was 93,778 fewer patients allocated to ATS Category 3 who are attended to within 30 minutes.

CI 1.4: ATS Category 4 – attended within 60 minutes (H)
In 2011, there were 1,935,913 patients reported from 188 HCOs. The annual rate was 69.2 per 100 patients. The fitted rate improved from 62.6 to 68.4, a change of 5.8 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 5.6 per 100 patients. In 2011, there were 98 outlier submissions from 63 HCOs whose combined excess was 108,975 fewer patients allocated to ATS Category 4 who are attended to within 60 minutes.

CI 1.5: ATS Category 5 – attended within 120 minutes (H)
In 2011, there were 472,599 patients reported from 188 HCOs. The annual rate was 86.5 per 100 patients. The fitted rate improved from 85.1 to 86.5, a change of 1.4 per 100 patients. In 2011, there were 72 outlier submissions from 47 HCOs whose combined excess was 17,920 fewer patients allocated to ATS Category 5 who are attended to within 120 minutes.

Acute myocardial infarction (AMI) management

CI 2.1: Thrombolytic therapy administration to AMI patients within 30 minutes (H)
In 2011, there were 205 patients reported from 33 HCOs. The annual rate was 70.7 per 100 AMI patients receiving thrombolytic therapy within 30 minutes.

Access block

CI 3.1: Total ED time >8 hours (L)
In 2011, there were 621,461 patients reported from 61 HCOs. The annual rate was 55.6 per 100 patients. The fitted rate deteriorated from 59.3 to 51.6, a change of 7.7 per 100 patients. In 2011, there were 53 outlier submissions from 34 HCOs whose combined excess was 46,017 more patients whose total ED time exceeded eight hours.

The indicator that was numberered CI 3.2 in 2010 and earlier, monitored the transition of mental health or critical care patients from the ED to an inpatient unit; this was split into two separate indicators according to the patient category – mental health (CI 3.2) or critical care (CI 3.3).

CI 3.2: ED time following decision to admit >4 hours for mental health patients (L)
In the second half of 2011 (2H2011), there were 6,320 patients reported from 21 HCOs. The annual rate was 52.8 per 100 patients. The top 20% of HCOs had 34.8% of mental health patients waiting more than four hours in ED for an inpatient bed, while the bottom 20% had 67.1%. In 2011, the potential gains totalled 1,310 fewer mental health patients whose total ED time awaiting admission exceeded four hours, corresponding to a reduction by approximately one-third.

CI 3.3: ED time following decision to admit >4 hours for critical care patients (L)
In the second half of 2011 (2H2011), there were 4,562 patients reported from 18 HCOs. The annual rate was 52.8 per 100 patients. In 2011, there were seven outlier submissions from seven HCOs whose combined excess was 544 more critical care patients whose total ED time awaiting admission exceeded four hours.

Mental health assessment turnaround time

CI 4.1: Mean time from referral to assessment by a mental health worker (L)
In 2011, there were 1,816 patients reported from three HCOs. The overall mean was 65.1 minutes.

CI 4.2: Median time from referral to assessment by a mental health worker (L)
In 2011, there were 1,476 patients reported from two HCOs. The overall mean (of the medians) was 65.1 minutes.
Paediatric patient management

CI 5.1: Mean time of first antibiotic administration in septic infants < 28 days (L) In 2011, there were seven patients reported from two HCOs. The overall mean was 133 minutes.

CI 5.2: Receipt of salbutamol therapy within 30 minutes of arrival for patients presenting with asthma (L) In 2011, there were 103 patients with acute asthma reported from two HCOs. The annual rate was 49.5 per 100 patients.

Discharge communication

CI 6.1: Discharge communication for patients ≥ 65 years (H) In 2011, there were 5,491 patients reported from three HCOs. The annual rate was 87.0 per 100 patients. In 2011, there was one outlier submission from one HCO whose combined excess was 300 fewer patients receiving discharge communication.

CI 6.2: Documented risk assessment for patients ≥ 65 years (H) In 2011, there were 3,369 patients reported from two HCOs. The annual rate was 30.6 per 100 patients. In 2011, there was one outlier submission whose combined excess was 254 fewer patients having documented risk assessment.

Pain management

CI 7.1: Documented initial pain assessment score – abdominal or limb pain (H) In 2011, there were 1,523 patients reported from three HCOs. The annual rate was 96.7 per 100 patients. There were two outlier submissions from two HCOs whose combined excess was 46 fewer patients having initial pain assessment.

CI 7.2: Documented reassessment pain score – abdominal or limb pain (H) In 2011, there were 39 patients reported from two HCOs. The annual rate was 61.5 per 100 patients.

CI 7.4: Analgesic given within 30 minutes – paediatric limb fracture (H) In 2011, 100 patients were reported by a single HCO. The annual rate was 49.0 per 100 patients.

Patients who did not wait

CI 8.1: Patients who did not wait† – mental health (L) In 2011, there were 6,483 mental health patients who did not wait in ED reported from seven HCOs. The annual rate was 4.1 per 100 patients. There was one outlier submission whose combined excess was 93 more mental health patients who did not wait.

CI 8.2: Patients who did not wait† (L) In 2011, there were 391,092 patients reported from 20 HCOs. The annual rate was 4.2 per 100 patients. Seven outlier submissions from seven HCOs accounted for a combined excess of 3,798 more patients who did not wait.

Expert commentary

Australasian College for Emergency Medicine (ACEM)

Waiting time

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Despite gradual improvements in waiting times across all five triage categories, approximately one-third of patients are not seen within the recommended time frames. This is particularly evident in the Triage Category 3 and 4 patient groups which make up almost 80% of the emergency presentations reported by submitting HCOs. Appropriately, the Category 1 and 2 patients are seen within their recommended times at the highest rates (CI 1.1 and 1.2). This demonstrates that the key focus of emergency departments (EDs) is on providing immediate emergency care to the sickest patients.

Category 3 and 4 patients include a wide range of different illnesses and injuries which are generally not time critical. This heterogeneous group of patients are managed in a number of different areas of an ED reflecting the fact that some of this patient group have complex conditions requiring a bed and cubicle whilst others may be ambulant with a single system injury and can be managed in fast track or minor complaints areas. With greater streaming of patients into different areas and models of care within a single emergency department, along with effective deployment of nurse practitioners to

† Patients who leave the ED after their health complaint and personal details are noted, but before any treatment has commenced.
many EDs, the flow within many areas has improved markedly, although access to ED cubicle beds has not shown a significant improvement.

The 2011 access block rate of 29 patients per 100 admissions with an ED stay of greater than eight hours (CI 3.1) is slightly better than the 2010 rate of 31.1 per 100 patients, but continues to reflect unnecessary length of stay in the ED and diminished capacity of the department to accept new patients requiring a cubicle and bed assessment and care.

It has been predicted that lessening access block and the greater availability of ED capacity will lead to improvements in waiting times for the Category 3 and 4 patients (improvements in waiting times for the availability of ED capacity will lead to access block and the greater capacity of the department to accept new patients requiring a cubicle and bed assessment and care.

It has been predicted that lessening access block and the greater availability of ED capacity will lead to improvements in waiting times for the Category 3 and 4 patients (improvements in waiting times for the availability of ED capacity will lead to access block and the greater capacity of the department to accept new patients requiring a cubicle and bed assessment and care.

Another important dimension of enhanced waiting time performance relates to staff and training. Across the health system, ED presentations continue to rise and often outstrip enhancements in clinical staff numbers to meet this demand, and maintain or improve performance.

**Acute myocardial infarction (AMI) management**

In 2011, CI 2.1 changed its definition to ‘receiving thrombolytic therapy within 30 minutes’ whereas in previous years, the CI was ‘receiving thrombolytic therapy within 60 minutes’. In 2011, the annual rate of thrombolyis provided within 30 minutes was reported from a total of 33 HCOs as 70.7. This compares very favourably with a rate of 83.8% within 60 minutes as reported in 2010.

It is noted that 33 HCOs reported this CI in 2011 compared with 52 in 2010. With the increasing prevalence and availability of percutaneous angiography and percutaneous transluminal coronary angioplasty, this indicator (CI) has been relocated to the cardiac suite of indicators. This CI has been relocated to the cardiac suite of indicators reflecting the fact that ‘door-to-balloon time’ is primarily dependent on availability and activation of cardiac catheterisation personnel and facilities.

**Access block**

This important measure of emergency patient flow to admitting wards (CI 3.1) showed minimal change in 2011 when compared with previous years. The exception was in WA where access block was reported as 10.4 per 100 patients compared with an overall rate of 29 per 100 patients. This result reflects a maturing ‘four-hour rule’ process introduced throughout WA in 2009. Hospitals streamline ED admission and discharge processes aiming to limit patient stays within emergency departments (EDs) to four hours or less. The National Emergency Access Target was introduced across Australia in 2012 in a staged manner leading towards a time when the target will require that at least 90% of patients leave the ED (admitted, transferred or discharged) within four hours of arrival.

Currently, hospitals in different jurisdictions across Australia are at varying stages of implementing strategies. If the experience in WA is replicated in other states, then this access block should improve markedly over the next three years.

In previous years, ED times following a decision to admit critical care and mental health patients were reported together as one single indicator result – CI 3.2: ED time following decision to admit >4 hours.

Following recommendations from the Emergency Medicine Clinical Indicator Working Party, and taking into consideration the very different issues affecting each of these patient groups, this indicator (CI) has been split into two.

The 2011, CI 3.2: ED time following decision to admit >4 hours for mental health patients reports ‘access block’ for mental health patients by measuring the numbers of patients with an ED time of greater than four hours until leaving the ED following a ‘decision to admit’. In 2011, the annual rate was 55.6 per 100 patients, which reflects ongoing scarcity of inpatient mental health beds across most jurisdictions.

The 2011, CI 3.3: ED time following decision to admit >4 hours for critical care patients reports ‘access block’ for critical care patients by measuring the numbers of critical care patients with an ED time of greater than four hours until leaving the ED following a ‘decision to admit’. In 2011, the annual rate was 52.8 per 100 patients which reflects ongoing challenges and supply/demand issues for access to critical care beds.

**Mental health assessment turnaround time**

In 2011, two new indicators were introduced to measure both the mean time (CI 4.1) and the median time (CI 4.2) from referral to assessment by a mental health worker, in an attempt to quantify these time periods across HCOs. In 2011, only three HCOs reported on this data making it impossible to draw any conclusions.

A potential confounder to the interpretation of this indicator will be the ‘rules’ governing the timing of referral from emergency department (ED) staff to mental health workers.

Self-poisoned patients* represent a large group of patients referred from ED for mental health assessment
Expert commentary continued: Australian College for Emergency Medicine (ACEM)

and this referral could occur early in the patient’s care episode – when many patients are suffering the effects of their poisoning, an interview or assessment by a mental health worker is impossible – or much later in their ED stay when they have recovered from the poisoning effects and are considered competent to participate in an interview or assessment. If the referral from ED is made early in the patient’s care episode – in order to notify the mental health worker that the patient will require an assessment in the future – then the time from referral to assessment will likely be far longer compared to making the referral to mental health when the patient is considered suitable for assessment.

Paediatric patient management

Both CI 5.1 and CI 5.2 (Waiting times for antibiotics in septic infants, and salbutamol therapy for acute asthma) seek to capture times to important therapies in specific cohorts of patients and are based on evidence of benefit of early treatment following recognition and diagnosis.

Only seven patients were reported for CI 5.1: Mean time of first antibiotic administration in septic infants <28 days. No conclusions should be drawn from such limited data.

In 2011, only two HCOs reported on CI 5.2: Receipt of salbutamol therapy within 30 minutes of arrival for patients presenting with asthma.

The low rates of reporting for these indicators can be explained. The first reason is that they are new indicators for 2011 amongst a large suite of new indicators and hospitals are deciding on which indicators to ‘invest’ their resources. The second reason is that neither of these indicators is able to be obtained by data reporting mechanisms. In the great majority of hospitals, obtaining the times to antibiotics or salbutamol therapy will require chart audit which is a time-consuming exercise.

Discharge communication

Both these new indicators for 2011 were reported by only small numbers of hospitals – three reported CI 6.1: Provision of discharge communication for patients ≥65 years of age discharged from ED and two HCOs reported for CI 6.2: Documented risk assessment for patients ≥65 years of age discharged from ED.

Given the extent and volume of work in this area, it was surprising to see such a low reporting rate on these indicators. The explanation is likely to be the lack of any electronic system for capturing the nature and timing of pain assessments and interventions within our patient management systems so there is a reliance on manual chart audit to capture these times. Until we are able to reliably capture this type of clinical data in an electronic database which allows interrogation and reporting (as with patient waiting times), then it is unlikely that we will achieve high numbers of HCOs having the resources to reliably report these data.

Pain management

Four new indicators were introduced to the Emergency Medicine CI set in 2011 relating to pain management for emergency department (ED) patients:

• CI 7.1: Documented initial pain assessment score – adult patients presenting with abdominal or limb pain
• CI 7.2: Documented reassessment pain score – adult patients presenting with abdominal or limb pain
• CI 7.3: Receipt of analgesic therapy within 30 minutes of arrival – adult patients presenting with abdominal or limb pain
• CI 7.4: Receipt of analgesic therapy within 30 minutes of arrival – paediatric patients presenting with limb fracture.

Their introduction recognises that pain is a very common presenting complaint for emergency patients and its effective recognition and management is an important dimension of the quality of care provided by emergency medicine.

The numbers of HCOs reporting data for these four indicators was very low in 2011 with, at most, three HCOs submitting data.

Current numbers of reporting facilities fail to provide a clear representative performance across these indicators. This is a disappointing result given the widespread view within emergency medicine that provision of quality pain management is a key role and objective of emergency departments (EDs), and the number of recent project initiatives that have focused on timely and effective pain management (e.g. The National Institute of Clinical Studies Emergency Care Community of Practice 2008 Pain Management Project, and the Queensland Centre for Health Improvement Clinical Practice Improvement Payment for Emergency Departments focusing on ‘time to analgesia’).

Additionally, there was the publication in 2011 of the Emergency Care Acute Pain Management Manual6 under the auspices of the National Health and Medical Research Council (NHMRC) which was endorsed by the Australasian College of Emergency Medicine (ACEM), National Institute of Clinical Studies (NICS) and the College of Emergency Nursing Australasia (CENA), as well as the 2010 publication of the third edition of Australia and New Zealand College of Anaesthesia (ANZCA)’s Acute Pain Management: Scientific Evidence6.

Patients who did not wait

Two indicators focus on this measure of access to care – one which addresses mental health patients as a specific cohort within the emergency department (ED) (CI 8.1) and the second which reports the ‘did-not-wait’ (DNW) rate of all ED presentations (CI 8.2).
Expert commentary continued: Australian College for Emergency Medicine (ACEM)

These new indicators have had reasonable reporting rates with CI 8.1: Patients presenting with a mental health complaint who did not wait being reported by seven HCOs and CI 8.2: Total number of patients who did not wait reported by 20 HCOs.

The annual DNW rate for CI 8.1 was 4.13 per 100 mental health presentations and for CI 8.2, the annual rate was 4.16 per 100 patients for all groups. The similarity of these rates in 2011 broadly suggests that mental health patients are experiencing similar access to emergency department assessment as all other patients. Experience suggests that the DNW rate is strongly influenced by waiting time performance as departments with low waiting times generally have a low associated DNW rate.

References

Expert commentary
College of Emergency Nursing Australasia (CENA)

Waiting time

The rate for CI 1.1: ATS Category 1 – attended immediately has remained at the highest reported levels for its eight-year reporting period, although the centile gains are 145 patients. Emergency clinicians believe that care for the critically unwell patient is their core business. This consistent positive result is because they have policies and procedures to manage ATS Category 1 patients immediately.

CI 1.2: ATS Category 2 – attended within 10 minutes has increased to its highest rate in the eight-year time period (78.7%), and the denominator, at 426,766, is larger than ever. The poorest 20% HCO rate is 72.8% and the best 20% HCO rate is 94.3%, with extremely large centile gains of 66,415.

Emergency clinicians have reaffirmed their role and recognise resuscitation of the time critical patient as their priority.

Although these results are reassuring, for ATS Category 1, 19 HCOs were outliers and reported rates of 91% and for ATS Category 2, 50 HCOs reported rates of 66.7% which means significant numbers in some organisations are not being seen within appropriate time frames. Almost 10% of Category 1 patients in outlier organisations were not seen within target time. This outcome may be a reflection of data collection methods, but if accurate, is of concern.

CI 1.3: ATS Category 3 – attended within 30 minutes has shown minimal increase to its highest rate in the eight-year time period (63.7%), and the denominator is very large (1,490,161). The poorest 20% HCO rate is 59.4% and the best 20% HCO rate is 93.2%, leading to extremely large centile gains of 439,793 patients, stratum gains of 161,151 patients, and outlier gains of 93,778 patients. The WA HCO rate was the lowest at 53.5%, while the Vic HCO rate was the highest at 74.7%.

There are larger numbers of presentations with a fairly static rate for CI 1.3. Many new initiatives have been put in place to improve patient flow, however, these strategies are likely to have limited effect where there is substantial access block and ED cubicles are blocked by admitted patients. ATS Category 3 patients are more likely to need a cubicle than those with lower acuity so delays to access suitable assessment and treatment spaces can impact significantly where the target is to be seen within 30 minutes.

Implementation of the ‘four-hour rule’ process does not appear to have made a substantial impact on WA. The Vic rate was the highest but there had also been a drop of 64,295 in presentations in Vic.

CI 1.4: ATS Category 4 – attended within 60 minutes has increased to its highest rate in the eight-year time period (69.2%), with the denominator being the lowest it has been in the last three years. The poorest 20% HCO rate was 63.2% and the best 20% HCO rate was 95.3%.

There was improvement on the previous three years, and the spread of results seems to have narrowed for CI 1.4: ATS Category 4 – attended within 60 minutes. This may be a result of the implementation of strategies to improve performance in larger numbers of EDs that have focused on this patient group e.g. fast track models, greater use of nurse practitioners (NPs) and other mid-level providers. There has been considerable effort (formal and informal) within the ED community to share performance improvement initiatives with colleagues.

As with the previous indicator, ED designs recognise that the priority 5 patients (CI 1.5) require, in many cases, a separate stream that can be managed by ED clinicians in rapid assessment-type clinics. These patients are of low acuity and can be managed effectively by alternative models of care that provide a rapid discharge service.
Expert commentary continued: College of Emergency Nursing Australasia (CENA)

Acute myocardial infarction (AMI) management
CI 2.1 previously addressed thrombolytic therapy for AMI patients within 60 minutes, and had a rate of 83.8% in 2010 for 52 reporting organisations. Only 33 HCOs have reported this indicator in 2011 and the rate is 70.7%. The change in target goal (from 60 to 30 minutes) would explain the drop from 2010. The denominator for these indicators is fairly low making this data less broad reaching than previously.

Access block
Although access block has improved since 2008, when CI 3.1: Total ED time >8 hours peaked at 34.3%, a rate of 29.0% remains substantial and is a reflection of the challenges faced by the ED. The improvements are likely to be a result of attempts by departments to prepare for the widespread introduction of the four-hour access target. The rate for WA is significantly lower at 10.4% (and would have probably been less if the one outlier from WA had performed better). The WA experience demonstrates that there is likely to be room for significant improvement, which will need to come from organisational improvements, not just ED-focused initiatives.

The wide variation between the best centile rate at 35% and the poorest performing centile at 67.1% for mental health patients being discharged from the emergency department within four hours (CI 3.2) indicates that resources available to each ED are markedly different.

Mental health assessment turnaround time
The difference in the three HCOs reporting CI 4.1: Mean time from referral to assessment by a mental health worker once again indicates the variable resources that HCOs provide for mental health patients.

For instance, the HCO that has the largest number of presentations also has the shortest mean referral time of 23 minutes.

Only two HCOs reported CI 4.2: Median time from referral to assessment by a mental health worker. The low participation rate is disappointing, but the participating HCOs had good rates.

Paediatric patient management
Only two HCOs reported on CI 5.1: Mean time of first antibiotic administration in septic infants <28 days with a mean time of 133 minutes – the low response with only two HCOs reporting is disappointing, despite this indicator being collected for the first time in 2011.

Only two HCOs reported on CI 5.2: Receipt of salbutamol therapy within 30 minutes of arrival for patients presenting with asthma with a rate of 49.5%. It is difficult to determine whether the result is positive; we can only assume that it is not, as only 50% of these asthma patients are receiving meaningful treatment within 30 minutes.

Discharge communication
Only three HCOs reported CI 6.1: Provision of discharge communication for patients ≥65 years of age discharged from ED and two reported CI 6.2: Documented risk assessment for patients ≥65 years of age discharged from ED.

It is encouraging that at these three organisations, 87% of patients discharged home receive some form of discharge information. This is significant in emergency medicine because a non-compliant discharge will result in a higher probability of the patient re-presenting to the ED within 28 days. A discharge letter to the patient or to their local general practice (LGP) is a matter of professional responsibility, and it is negligent not to provide one.

Pain management
There were very few reporting HCOs for CI Area 7 – the pain management indicators. CENA believes that the early assessment of pain levels, and the treatment and subsequent monitoring of pain are an important aspect of ED nursing in providing comfort to the patient. CENA regards this to be an effective measure to quantify the quality of care that is provided by the ED clinician to their patients with limb and abdominal pain.

Patients who did not wait
There were 20 reporting HCOs for CI 8.2: Total number of patients who did not wait, with a rate of 4.16%. The best 20% HCO rate is 1.83% and the poorest 20% HCO rate is 6.40%, with centile gains of 9,098 patients and outlier gains of 3,799.

Reporting rates for this indicator were surprisingly low given that this parameter is a key performance indicator (KPI) for EDs, and therefore part of the minimum data set. Fail-to-wait rates are surprisingly low considering the waiting times in EDs, and are likely to reflect the few alternatives that are often available to patients.

In conclusion
The rates of reporting for CIs 3.2–8.1 were extremely low, making it difficult to comment on the results. Emergency clinicians are clear that performance measures should address parameters other than ‘time to be seen’. The data collection burden associated with many of these indicators is likely to be responsible for the extremely low reporting rates. Strategies to improve data collection will need to be explored to address this deficit.
In this indicator set, less than 20% of the data came from public HCOs.

**Colonoscopy**

CI 1.1: Incomplete colonoscopies (L) In 2011, there were 116,478 colonoscopies reported from 68 HCOs. The annual rate was 1.2 per 100 colonoscopies. The fitted rate deteriorated from 1.1 to 1.2, a change of 0.15 per 100 colonoscopies. In 2011, there were 19 outlier submissions from 12 HCOs whose combined excess was 618 more colonoscopies performed that could not be completed.

CI 1.2: Treatment for possible perforation post-polypectomy (L) In 2011, there were 56,630 patients reported from 83 HCOs. The annual rate was 0.035 per 100 patients. There was no significant trend in the fitted rate.

CI 1.3: Treatment for possible perforation unrelated to polypectomy (L) In 2011, there were 78,209 patients reported from 81 HCOs. The annual rate was 0.033 per 100 patients. The fitted rate has gradually improved from 0.073 in 2006 to 0.030 in 2011, a change of 0.043 per 100 patients.

CI 1.4: Bleeding post-polypectomy (L) In 2011, there were 53,863 patients reported from 74 HCOs. The annual rate was 0.21 per 100 patients. The fitted rate deteriorated from 0.16 to 0.21, a change of 0.050 per 100 patients. In 2011, there was a single outlier submission – the excess was two more patients who had bleeding post-polypectomy.

**Gastroscopy**

CI 2.1: Treatment for possible perforation related to dilatation (L) In 2011, there were 4,014 patients reported from 58 HCOs. The annual rate was 0.22 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were two outlier submissions from different HCOs whose combined excess was two more patients treated for possible perforation.

CI 2.2: Treatment for possible instrument-related perforation post-gastroscopy (L) In 2011, there were 73,102 patients reported from 65 HCOs. The annual rate was 0.011 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were two outlier submissions from two HCOs whose combined excess was two more patients treated for possible perforation.

CI 2.3: Treatment for possible perforation following upper GIT polypectomy (L) In 2011, there were 4,685 patients reported from 56 HCOs. The annual rate was zero. The fitted rate improved from 0.11 to 0.006, a change of 0.11 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.088 per 100 patients.

**Complications of sedation**

CI 3.1: Overnight stay resulting from aspiration (L) In 2011, there were 168,506 patients reported from 64 HCOs. The annual rate was 0.017 per 100 patients. The fitted rate improved from 0.029 to 0.019, a change of 0.011 per 100 patients.

**Expert commentary**

**Australian Day Surgery Council (ADSC)**

**Colonoscopy**

The CI 1.1 rate reached its lowest level in 2009 (0.91%) but is 1.24% in 2011. The best 20% HCO rate is 0.29% and the poorest 20% HCO rate is 2.03%, with centile gains of 1,107 patients. The public HCO rate (3.17%) is much higher than the private HCO rate (0.82%).

The majority of the endoscopies in private hospital settings are stand-alone day hospital cases carried out by experienced endoscopists.

Public hospital cases are often done by trainees so a lower completion rate is expected. The completion rate is extremely high and, in general, if the definition of ‘incomplete’ was adhered to, a completion rate of around 95% would be expected.

The rate for CI 1.2: Treatment for possible perforation post-polypectomy has remained extremely low since 2006, and is 0.035% in 2011.

The rate for CI 1.3: Treatment for possible perforation unrelated to polypectomy has remained extremely low since 2006, and is 0.033% in 2011. There were no outliers or stratum differences.

There are two possible reasons for the low result: (1) The true rate is unknown as the perforated patient does not return to the original hospital. This could be the case in a stand-alone day hospital (not equipped to treat complication). (2) Larger polyps are often treated as overnight cases.
Expert commentary continued: Australian Day Surgery Council (ADSC)

Improvements in technology and technique have meant that small perforations can be treated and also can be prevented.

The rate for CI 1.4: Bleeding post-polypectomy has gradually increased since 2008 (0.13%) to its highest rate of 0.21% in 2011, with six fewer HCOs reporting on this indicator compared to 2010. Bleeding can occur at the time of the procedure and this can be dealt with more easily with improvements in technology. Haemorrhage may occur up to 14 days post-procedure and as in the scenarios for Cls 1.2 and 1.3, the patient may present to an emergency department of a large hospital.

Complications of sedation
CI 3.1: Overnight stay resulting from aspiration has remained unchanged from 2010, currently at 0.017%. A low rate is expected.

In conclusion
It is likely that these figures are under-reported, however this serves as an important contemporary dataset.

Expert commentary
Gastroenterological Nurses College of Australia (GENCA)

Colonoscopy
The incomplete colonoscopy rate (CI 1.1) reached its lowest level in 2009 (0.91%) but is currently 1.24% in 2011. GENCA acknowledges that The National Bowel Screening Program has increased the number of colonoscopies being performed both in public and private organisations over the past three years. In the public organisations, there are a large number of colonoscopy procedures performed by training endoscopists and this may contribute to the increase in CI 1.1: Incomplete colonoscopies.

The continued low rate (0.035% in 2011) of perforation post-polypectomy (CI 1.2) may indicate the continual improvement in technique for removal of polyps and the ongoing training and education provided. The same would apply for CI 1.3: Treatment for possible perforation unrelated to polypectomy which has remained very low since 2006 (0.033% in 2011).

Gastroscopy
More complex gastroenterological procedures are now being performed with endoscope.

GENCA acknowledges the low rate of perforation associated with oesophageal dilation and the high standard achieved (Cls 2.1–2.3). Gastroscopy and associated treatments are considered safe procedures for patients, however it is noted that perforation or bleeding are a rare complication.

Complications of sedation
CI 3.1: Overnight stay resulting from aspiration has remained unchanged from 2010, currently at 0.017%. GENCA acknowledges the unchanged aspiration rates post sedation; however notes that there are data in 2011 for 3,000 more procedures performed with sedation, despite one less HCO submitting data. This may reflect the provision of anaesthetic services during this procedure and the improvement in fasting guidelines.
These indicators have been collected since 2007. In 2011, 78 HCOs submitted to this set. Overall, 50% of procedures were reported by public HCOs.

There has been an improvement in the rate for both of the transfusion indicators, and an overall improvement in the rate of seven of the 13 indicators with no deteriorations in rates. There are no stratum differences that are significant over consecutive years.

The rates in those indicators related to injury, CIs 2.1, 3.1–3.3, 5.1–5.3, averaged between 0.25% and 0.65% over the five-year period. The 80th centile rates for the three CIs relating to prophylaxis, CIs 6.1, 7.1 and 7.2 are close to 100% and variation between HCOs as measured by the difference between the 20th and 80th centile rates has diminished. The improvements in these indicators were not present after adjusting for differences over the years in the HCOs contributing.

Blood transfusion

CI 1.1: Gynaecological surgery for benign disease – unplanned blood transfusion (L) In 2011, there were 40,661 patients reported from 57 HCOs. The annual rate was 0.81 per 100 patients. The fitted rate improved from 1.1 to 0.68, a change of 0.42 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.42 per 100 patients. In 2011, there were four outlier submissions from three HCOs whose combined excess was 20 more patients receiving an unplanned blood transfusion.

CI 1.2: Gynaecological surgery for malignant disease – unplanned blood transfusion (L) In 2011, there were 2,068 patients reported from 31 HCOs. The annual rate was 7.1 per 100 patients. The fitted rate improved from 12.2 to 7.1, a change of 5.1 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 5.1 per 100 patients. In 2011, there were two outlier submissions from two HCOs whose combined excess was 16 more patients receiving an unplanned blood transfusion.

Laparoscopic surgery

CI 3.1: Laparoscopic gynaecological surgery – injury to a major viscus with repair (L) In 2011, there were 13,314 patients reported from 56 HCOs. The annual rate was 0.62 per 100 patients. The fitted rate improved from 0.82 to 0.53, a change of 0.28 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.28 per 100 patients. In 2011, there were two outlier submissions from two HCOs whose combined excess was four more patients receiving an injury to a major viscus with repair, during laparoscopic gynaecological surgery.

CI 3.2: Laparoscopic hysterectomy – injury to ureter (L) In 2011, there were 1,507 patients reported from 28 HCOs. The annual rate was 0.066 per 100 patients. There was no significant trend in the fitted rate.

CI 3.3: Laparoscopic hysterectomy – injury to bladder (L) In 2011, there were 1,500 patients reported from 27 HCOs. The annual rate was 0.47 per 100 patients. There was no significant trend in the fitted rate. In 2011, there was one outlier submission whose combined excess was two more patients receiving a bladder injury.

Laparoscopic management of an ectopic pregnancy

CI 4.1: Laparoscopic management of ectopic pregnancy (H) In 2011, there were 763 patients reported from 33 HCOs. The annual rate was 82.8 per 100 patients. The fitted rate improved from 70.5 to 84.0, a change of 13.5 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 13.0 per 100 patients. In 2011, a single outlier submission had a combined excess of eight fewer patients having laparoscopic management.

Urogynaecology

CI 5.1: Pelvic floor repair – injury to major viscus (L) In 2011, there were 3,268 patients reported from 35 HCOs. The annual rate was 0.80 per 100 patients. There was no significant trend in the fitted rate.

CI 5.2: Pelvic floor repair – injury to ureter (L) In 2011, there were 2,506 patients reported from 29 HCOs. The annual rate was 0.16 per 100 patients. There was no significant trend in the fitted rate.

CI 5.3: Pelvic floor repair – injury to bladder (L) In 2011, there were 2,514 patients reported from 30 HCOs. The annual rate was 0.40 per 100 patients. There was no significant trend in the fitted rate.
Antibiotic prophylaxis
CI 6.1: Hysterectomy – antibiotic prophylaxis (H)
In 2011, there were 849 patients reported from 18 HCOs. The annual rate was 96.9 per 100 patients. The fitted rate improved from 91.2 to 97.8%, a change of 6.6 per 100 patients. There was one outlier submission.

Thromboprophylaxis
CI 7.1: Hysterectomy – thromboprophylaxis to moderate- to high-risk patients >40 years (H)
In 2011, there were 620 patients reported from 12 HCOs. The annual rate was 96.1 per 100 patients. The fitted rate improved from 87.2 to 91.9, a change of 4.7 per 100 patients. There was one outlier submission.

CI 7.2: Pelvic floor surgery – thromboprophylaxis to moderate- to high-risk patients >40 years (H)
In 2011, there were 310 patients reported from ten HCOs. The annual rate was 85.8 per 100 patients. The fitted rate improved from 81.2 to 87.1, a change of 5.9 per 100 patients. There were two outlier submissions from two HCOs whose combined excess was 12 fewer patients who receive thromboprophylaxis.

Blood transfusion
The rate for unplanned blood transfusions during gynaecological surgery for benign disease (CI 1.1) remains low, with the private rate much lower than the public rate. The 2011 data show only three outlier HCOs accounting for an outlier rate of 3.1 per 100 procedures.

The incidence of unplanned blood transfusion is low in gynaecology. The fact that the incidence is less than in the previous years is pleasing. There are a number of possible reasons, including:
1. better case selection, particularly for hysterectomy
2. less major surgery being performed, with more abnormal uterine bleeding being treated with intrauterine-progesterone releasing devices (e.g. Mirena®), or by second generation endometrial ablation techniques (e.g. NovaSure®, Thermachoice®) – this has resulted in fewer women needing major surgery, including hysterectomy
3. better, and earlier, diagnostic methods for complications of pregnancy, including miscarriage and ectopic pregnancy
4. better compliance with blood transfusion guidelines
5. better surgical training at registrar level, and at post-Fellowship level in association with groups such as the Australasian Gynaecological Endoscopy Society (AGES).

The rate in private HCOs should be lower than in public HCOs, as:
• consultants will be doing the bulk of the surgery
• acuity is lower, casemix is different, as the sickest patients are likely to be in public care
• private patients tend to be less obese.

Very few HCOs report on CI 2.1: Gynaecological surgery – injury to a major viscus with repair; the rate for CI 1.2: Gynaecological surgery for malignant disease – unplanned blood transfusion, and the rate has decreased in the last year to its lowest level.

Many HCOs may not report on this indicator, as the data captured here will be reported as a sentinel event, and different state jurisdictions have different reporting requirements for these. RANZCOG would expect that the incidence of these sorts of complications would be very low, and perhaps they should be included as sentinel events only, to encourage accurate reporting.

Injury to a major viscus
The College (RANZCOG) expects the rate for CI 2.1: Gynaecological surgery – injury to a major viscus with repair to be low, and would expect it to be lower in private practice, as consultants are doing the bulk of the operations, and casemix in the public system is likely to include more complex cases, with the most obese patients. It is not clear why NSW would have a higher rate than the other states in 2010 and 2011; the answer to that question should come from an analysis of these data.
Summary of results:
Gynaecology

Expert commentary continued: Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)

Laparoscopic surgery
CI 3.1: Laparoscopic gynaecological surgery – injury to a major viscus with repair remains low at a rate of 0.62%, however the private rate is much lower than the public rate, and Qld’s rate is the highest (0.88%) while NSW has the lowest rate (0.43%).

RANZCOG would expect the incidence of these injuries to drop, as surgeons become more experienced and proficient in the performance of gynaecological surgery laparoscopically. When laparoscope-assisted vaginal hysterectomy (LAVH) was introduced, it seemed there was a definite learning curve, with less experienced surgeons having higher rates of ureteric and bladder injuries. Over time, those rates have dropped, and it is hoped that those surgeons providing instruction in laparoscopic surgery are able to train new surgeons so that they may not have those problems as they learn.

Other educational activities, such as ‘Anatomy of Complications’ workshops, and skills lab teaching and simulation, have also played a role in producing better-trained surgeons.

Both CIs 3.2 and 3.3 (Laparoscopic hysterectomy – injury to ureter / injury to bladder, respectively) have reached their lowest rates since 2007.

The low rates are likely to reflect a number of things including:
1. better surgical training prior to undertaking the procedures, especially new procedures
2. better case selection, with surgeons opting for different ways to perform hysterectomy depending on their skills and the indication, whether by the vaginal or abdominal route,
3. better operative techniques and equipment, with for example, the availability of the McCartney tube to facilitate vaginal incision at laparoscopic hysterectomy, reducing the incidence of bladder injury.

Laparoscopic management of an ectopic pregnancy
CI 4.1: Laparoscopic management of ectopic pregnancy remains high at 82.8%. The College, however, would like these data to be higher, ideally approaching 100%.

Urogynaecology
Reporting rates for CIs 5.1–5.3, 6.1 and 7.1–7.2 are lower than for the other indicators.

RANZCOG expects the data for CI 5.1: Pelvic floor repair – injury to major viscus, CI 5.2: Pelvic floor repair – injury to ureter and CI 5.3: Pelvic floor repair – injury to bladder, to be low. Given the rarity of these conditions, they may be better picked up through sentinel event monitoring.

Antibiotic and thrombo-prophylaxis
For indicators CI 6.1: Hysterectomy – antibiotic prophylaxis, CI 7.1: Hysterectomy – thromboprophylaxis to moderate-to high-risk patients >40 years and CI 7.2: Pelvic floor surgery – thromboprophylaxis to moderate-to high-risk patients >40 years, it may be that hospitals have multiple reporting requirements, and only report back to state jurisdictions, and not to the ACHS.

Through its journals, RANZCOG has promoted the evidence-based use of antibiotics for some gynaecological procedures, and most state networks have guidelines on this. The use of antibiotics intraoperatively should be a focus of audit in HCOs to ensure compliance with published guidelines.
Summary of results:
Hospital in the Home

VERSION 4

Of the eight indicators in this set, four were tested for trend. There was an improvement in the rate for CI 1.2. There was a decrease in the rate for CI 3.1 for which the desirable rate is not specified.

Between 85% and 98% of patients in each indicator are from public HCOs and between 73% and 86% are from metropolitan HCOs. Stratum differences are not consistent over the years from 2004.

Patient safety and selection
These indicators review the appropriateness of patient selection and their safety in a hospital-in-the-home (HITH) setting.

CI 1.1: HITH admission – ≥1 unexpected telephone call (L) In 2011, there were 11,771 patients reported from 23 HCOs. The annual rate was 3.3 per 100 patients. There were six outlier submissions from four HCOs whose combined excess was 134 more patients making unexpected telephone calls.

CI 1.2: HITH admission – 1 unscheduled staff callout (L) In 2011, there were 14,184 patients reported from 23 HCOs. The annual rate was 3.3 per 100 patients. There were six outlier submissions from four HCOs whose combined excess was 134 more patients making unexpected telephone calls.

CI 1.3: HITH admission – >1 unscheduled staff callout (L) In 2011, there were 13,096 patients reported from 27 HCOs. The annual rate was 0.34 per 100 patients. There was no significant trend in the fitted rate. In 2011, there was one outlier submission whose combined excess was two more patients having more than one unscheduled callout.

Program interruption
CI 2.1: Unplanned return to hospital – did not return to HITH program (L) In 2011, there were 20,434 patients reported from 35 HCOs. The annual rate was 2.3 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were seven outlier submissions from six HCOs whose combined excess was 57 more patients having an unplanned return to hospital and not returning to the HITH program.

CI 2.2: Unplanned return to hospital – transferred back to HITH program within 24 hours (N) In 2011, there were 19,225 patients reported from 33 HCOs. The annual rate was 2.1 per 100 patients.

CI 2.3: Unplanned return to hospital – transferred back to the HITH program (N) In 2011, there were 23,900 patients reported from 37 HCOs. The annual rate was 3.7 per 100 patients. The fitted rate decreased from 4.7 to 4.0, a change of 0.71 per 100 patients.

Unexpected deaths
CI 3.1: Unexpected death during HITH admission (L) In 2011, there were 15,067 patients reported from 22 HCOs. The annual rate was 0.013 per 100 patients.

CI 3.2: Unexpected deaths after unplanned return to hospital during HITH admission (L) In 2011, there were 15,067 patients reported from 22 HCOs. The annual rate was 0.040 per 100 patients.
Expert commentary

Hospital in the Home Society of Australasia (HHSA)

Patient safety and selection

Appropriate selection of patients for management at home (HITH admission) as a substitute for inpatient care is important. This enables patient care requirements to be matched to the capabilities of the care team in order to deliver safe and effective care. Included in this is the capacity to detect and respond to changes in the patient’s condition and needs. Unexpected telephone calls from patients (CI 1.1: HITH admission – ≥1 unexpected telephone call) may be due to positive or negative changes in the patient’s condition or needs and may reflect inappropriate patient selection, amongst other things. HITH services should have mechanisms in place to ensure a timely and appropriate response to unexpected telephone calls from patients.

Unscheduled staff callouts (CI 1.2: HITH admission – 1 unscheduled staff callout and CI 1.3: HITH admission – >1 unscheduled staff callout) may be due to changes in the patient’s condition and so may reflect inappropriate patient selection. These indicators may also reflect a care team response to appropriate vigilance and monitoring and a willingness to minimise unnecessary hospital attendance. The annual rates for these indicators are low and stable. This is reassuring given the heterogeneity of both HITH services themselves and the conditions managed by HITH services.

As there is no defined desirable rate, HITH services with rates substantially above or below the mean should examine their data both for reliability and completeness of counting and for evidence of clinical variation where calls and call outs are due to changes in the patient’s condition. HITH services should also examine their individual data for trends over time to detect possible changes in quality or service delivery.

Program interruption

Unplanned returns to hospital (Cls 2.1–2.3) may be either patient- or HITH service-initiated events. They may be due to changes in the patient’s condition being managed by HITH, development of complications of treatment, changes in a comorbid condition or development of a new condition. Unplanned returns to hospital may also reflect patient access to other non-HITH healthcare services. They may potentially reflect inappropriate patient selection, amongst other things.

The rates for unplanned returns to hospital are low and remain stable. As there is no defined desirable rate, HITH services with rates substantially above or below the mean should examine their data both for reliability and completeness of counting and for evidence of clinical variation. HITH services should also examine their individual data for trends over time to detect possible changes in quality or service delivery.

Unexpected deaths

The rate of unexpected deaths during a HITH admission (CI 3.1) is very low, at one death per 7,692 admissions. The rate of unexpected deaths subsequent to an unplanned return to hospital during a HITH admission (CI 3.2) is very low, at one death per 2,500 admissions. Unexpected deaths in HITH patients should be very low. HITH services should routinely audit all unexpected deaths on their service and following a return to hospital.
Of the 15 indicators in this set, 14 had sufficient data to be tested for trend. Ten indicators demonstrated improvement, four of which were statistically significant after allowing for the changing composition of contributing HCOs over time. Five indicators deteriorated, three of which were statistically significant after allowing for the changes in the contributing HCOs.

Public rates were statistically significantly higher than private rates over the years of collection in Area 1: Unplanned hospital readmissions and in Area 4: Inpatient falls. There were no other stratum differences that were consistent over time.

### Hospital readmissions

**CI 1.1: Unplanned and unexpected readmissions within 28 days (L)** In 2011, there were 2,968,475 separations reported from 293 HCOs. The annual rate was 1.1 per 100 separations. The fitted rate improved from 1.8 to 1.3, a change of 0.50 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.47 per 100 separations. In 2011, there were 114 outlier submissions from 81 HCOs whose combined excess was 14,170 more unplanned readmissions within 28 days.

**CI 1.2: Unplanned and unexpected readmissions within 14 days (L)** In 2011, there were 1,235,062 separations reported from 127 HCOs. The annual rate was 0.90 per 100 separations. The fitted rate improved from 1.7 to 1.1, a change of 0.59 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.52 per 100 separations. In 2011, there were 36 outlier submissions from 28 HCOs whose combined excess was 3,945 more unplanned readmissions within 14 days.

### Return to operating room

**CI 2.1: Unplanned return to the operating room during same admission (L)** In 2011, there were 1,921,969 patients reported from 263 HCOs. The annual rate was 0.32 per 100 patients. The fitted rate improved from 0.47 to 0.31, a change of 0.16 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.16 per 100 patients. In 2011, there were 55 outlier submissions from 37 HCOs whose combined excess was 1,370 more patients having an unplanned return to the operating room.

### Pressure ulcers

**CI 3.1: Inpatients who develop ≥1 pressure ulcers (L)** In 2011, there were 11,473,949 patients reported from 373 HCOs. The annual rate was 0.074 per 100 patients. The fitted rate improved from 0.078 to 0.073, a change of 0.005 per 100 patients. In 2011, there were 74 outlier submissions from 53 HCOs whose combined excess was 2,363 more patients who develop one or more pressure ulcers.

**CI 3.2: Inpatients admitted with ≥1 pressure ulcers (L)** In 2011, there were 2,512,072 patients reported from 294 HCOs. The annual rate was 0.40 per 100 patients. In 2011, there were 106 outlier submissions from 70 HCOs whose combined excess was 3,935 more patients who are admitted with one or more pressure ulcers.

### Inpatient falls

**CI 4.1: Inpatient falls (L)** In 2011, there were 12,660,376 bed days reported from 402 HCOs. The annual rate of falls during an admission was 0.37 per 100 bed days. The fitted rate deteriorated from 0.35 to 0.37, a change of 0.017 per 100 bed days. In 2011, there were 166 outlier submissions from 118 HCOs whose combined excess was 7,906 more inpatient falls.

**CI 4.2: Inpatient falls requiring intervention (L)** In 2011, there were 9,662,078 bed days reported from 318 HCOs. The annual rate of falls during an admission was 0.11 per 100 bed days. The fitted rate improved from 0.12 to 0.11, a change of 0.010 per 100 bed days. In 2011, there were 77 outlier submissions from 60 HCOs whose combined excess was 4,045 more inpatient falls requiring intervention.

**CI 4.3: Inpatient falls resulting in fracture or closed head injury (L)** In 2011, there were 8,713,428 bed days reported from 257 HCOs. The annual rate of falls during an admission was 0.009 per 100 bed days. The fitted rate deteriorated from 0.007 to 0.009, a change of 0.002 per 100 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.002 per 100 bed days. In 2011, there were six outlier submissions from six HCOs whose combined excess was 84 more fractures or closed head injuries resulting from an inpatient fall.

**CI 4.4: Inpatient falls – patients ≥65 years (L)** In 2011, there were 4,290,767 bed days reported from 248 HCOs. The annual rate of falls during an admission was 0.53 per 100 patients. The fitted rate deteriorated from 0.46 to 0.53, a change of 0.071 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.071 per 100 patients. In 2011, there were 71 outlier submissions from 59 HCOs whose combined excess was 2,449 more falls in inpatients aged 65 years and older.
Patient deaths
CI 5.1: Patient deaths addressed within a clinical audit process (H) In 2011, there were 20,306 deaths reported from 200 HCOs. The annual rate was 94.8 per 100 deaths. The fitted rate improved from 76.9 to 95.8, a change of 18.9 per 100 deaths. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 17.3 per 100 deaths. In 2011, there were 26 outlier submissions from 21 HCOs whose combined excess was 683 fewer patient deaths addressed within a clinical audit process.

Blood transfusion
CI 6.1: Significant adverse blood transfusion events (L) In 2011, there were 81,128 transfusions reported from 145 HCOs. The annual rate was 0.23 per 100 transfusions. There was no significant trend in the fitted rate. In 2011, there were seven outlier submissions from five HCOs whose combined excess was 47 more significant adverse transfusion events.

CI 6.2: Transfusion – informed patient consent not documented (L) In 2011, there were 13,172 transfusions reported from 64 HCOs. The annual rate was 3.9 per 100 transfusions. The fitted rate improved from 7.7 to 4.8, a change of 2.9 per 100 transfusions. In 2011, there were 19 outlier submissions from 16 HCOs whose combined excess was 242 more transfusion episodes where informed patient consent was not documented.

CI 6.3: RBC transfusion – Hb reading ≥100 g/L (L) In 2011, there were 13,463 transfusions reported from 53 HCOs. The annual rate was two haemoglobin (Hb) readings above 100g/L per 100 transfusions. The fitted rate improved from 3.1 to 1.8, a change of 1.3 per 100 transfusions. There were 11 outlier submissions from ten HCOs whose combined excess was 74 more transfusions where Hb exceeded 100 g/L.

Day of surgery admissions
CI 7.1: Elective surgery patients admitted on day of surgery (H) In 2011, 56,444 patients were reported from 30 HCOs. The annual rate was 91.0 per 100 patients. The fitted rate improved from 85.6 to 87.1, a change of 1.5 per 100 patients. In 2011, there were 13 outlier submissions from ten HCOs whose combined excess was 1,903 fewer elective surgery patients admitted on the day of surgery.

Thromboprophylaxis
CI 8.1: VTE prophylaxis for high risk medical patients (H) In 2011, there were 2,011 patients reported from 11 HCOs. The annual rate was 86.7 per 100 patients. The fitted rate improved from 73.2 to 84.4, a change of 11.2 per 100 patients. In 2011, there were four outlier submissions from three HCOs whose combined excess was 127 fewer high risk medical patients receiving VTE prophylaxis.

Expert commentary
Royal Australasian College of Medical Administrators (RACMA)

Hospital readmissions
The rate for CI 1.1: Unplanned and unexpected readmissions within 28 days remains low and has reached its lowest level in the past eight years (1.13%), however 81 outlier HCOs have produced an outlier HCO rate of 3.2 per 100 separations.

The trend is favourable and would indicate continuing overall improvement in care and in discharge planning in particular. This is notwithstanding that this indicator is difficult to accurately collect because determining whether a readmission is ‘unexpected’ can be difficult; this would particularly apply in the private sector where less complexity compared to the public sector may be a factor in the higher public rate (2.75% vs 0.53%). Outlier HCOs should review their data and undertake case review to determine whether the outlier status relates to the measurement of ‘readmission was unexpected,’ or whether deficiencies in care or discharge planning may be causing the outlier status.

The rate for CI 1.2: Unplanned and unexpected readmission within 14 days has decreased from 1.14 in 2010 to 0.90% in 2011, with the public HCO rate higher than the private HCO rate (1.76% vs 0.45%). The Qld rate remains the highest of the states and territories at 1.19%. Additionally, 28 outlier HCOs have led to an outlier HCO rate of 2.4 per 100 separations. If HCOs had been able to achieve the best performing 20% HCO rate of 0.16%, 9,146 patients would not have been readmitted within 14 days of discharge.

This is as for CI 1.1: Unplanned and unexpected readmissions within 28 days, albeit early readmissions tend more to reflect complications arising from the admission than from a failure of discharge planning. Outlier HCOs should review their data and undertake case review to determine whether their outlier status relates...
Expert commentary continued: Royal Australasian College of Medical Administrators (RACMA)

to the classification of a readmission as ‘unexpected’, or whether there are deficiencies in care, in particular, or discharge planning, causing the outlier status.

Return to operating room

The rate for CI 2.1: Unplanned return to the operating room during same admission is 0.32%, and although low, has produced centile gains of 4,036 patients and outlier gains of 1,370 patients. There were 37 outlier HCOs responsible for an outlier HCO rate of 0.83 per 100 patients.

The trend is favourable and would indicate continuing improvement in surgical care and in post-operative care in particular. This is notwithstanding that this indicator is difficult to accurately collect because of the challenges in determining whether a return to the operating theatre was ‘unplanned’; and this would particularly apply in the private sector where there is less surgical complexity compared to the public sector. Outlier HCOs should examine their data and undertake case review to determine whether their outlier status relates to the measures or whether there are themes relating to surgeon, specialty, patient characteristics, or any other relevant factor that might be addressed.

Pressure ulcers

The rate for CI 3.1: Inpatients who develop ≥1 pressure ulcers has remained consistent since its introduction in 2007, currently at 0.074%, with the public HCO rate higher than the private HCO rate (0.094% vs 0.052%). The best performing 20% HCO rate is 0.017% and the poorest performing 20% HCO rate is 0.10%, with centile gains of 6,603 patients, stratum gains of 2,560 patients, and outlier gains of 2,363 patients.

The overall failure to achieve significant improvement is disappointing given the effort in several jurisdictions and organisations to develop care bundles to minimise the risk of pressure ulcer. Introduction of best practice care bundles has often led to a significant reduction in the incidence and prevalence of pressure ulcers in the jurisdiction or organisation.

It is considered that a strengthened jurisdictional approach may be necessary to reduce outliers. Outlier organisations should review their approach based on ACHS EQuiP5 Criterion 1.5.3 and the new National Safety and Quality Health Service (NSQHS) Standard 8.

The rate for CI 3.2: Inpatients admitted with ≥1 pressure ulcers has increased in 2011 to 0.40%, with the best performing 20% HCO rate at 0.079% and the poorest performing 20% HCO rate at 0.88%. This has produced centile gains of 7,977 patients, and outlier gains of 3,935 patients. There were 70 outlier HCOs responsible for an outlier HCO rate of 1.2 per 100 patients.

This CI relates to admission to an HCO with a pre-existing pressure ulcer; most likely sustained at home, in a residential care facility, or in another HCO. The reason for, and significance of, the increase from 2010 to 2011 is unclear. If sustained beyond one year, it is considered that a broader jurisdictional approach on public and healthcare provider education might be required.

Inpatient falls

The rate for CI 4.1: Inpatient falls has remained reasonably stable since 2007 (currently 0.37%), with no stratum differences. In 2011, 34 more HCOs reported on this indicator than in 2010. There were 118 outlier HCOs responsible for an outlier HCO rate of 0.66 per 100 bed days.

Whilst it is possible that the introduction of new HCOs to the data collection may have masked an improvement in HCOs previously participating, the overall failure to achieve significant improvement is disappointing given the effort in many jurisdictions and organisations to develop care bundles to minimise the risk of falls, and the development of ACHS EQuiP5 Criterion 1.5.4. Where best practice care bundles have been introduced, there has been a reduction in the incidence and prevalence of falls in the jurisdiction or organisation. It is considered that a strengthened jurisdictional approach may be necessary to reduce outliers. Outlier organisations should review their approach based on ACHS EQuiP5 Criterion 1.5.4 and the new NSQHS Standard 10.

The rate for CI 4.2: Inpatient falls requiring intervention has also remained reasonably stable since 2007 (currently 0.11%), however the public HCO rate is much higher than the private HCO rate (0.16% vs 0.069%). There were 60 outlier HCOs responsible for an outlier HCO rate of 0.32 per 100 bed days. The centile gains are large at 9,340 patients. This indicator tends to follow the trend of CI 4.1: Inpatient falls.

The rate for CI 4.3: Inpatient falls resulting in fracture or closed head injury has also remained stable since 2007 (currently 0.009%). Although the results are extremely low, there were six outlier HCOs producing an outlier HCO rate of 0.060 per 100 bed days. If all HCOs could achieve the best performing 20% HCO rate, 362 less patients would sustain a fracture or closed head injury following a fall.

This indicator tends to follow the trend of CI 4.1: Inpatient falls, although it also incorporates protective mechanisms following a fall (low lying beds, hip protectors etc). Outlier organisations should review their falls care bundle to ensure such protective mechanisms are included.

The rate for CI 4.4: Inpatient falls – patients ≥65 years has also remained reasonably stable since 2005 (currently 0.53%), with the best performing 20% HCO rate at 0.34% and the poorest performing 20% HCO rate at 0.79%. The centile gains are large at 8,211 patients, and the outlier gains are 2,449 patients. Again, this indicator tends to follow the trend of CI 4.1: Inpatient falls.

Patient deaths

The rate for CI 5.1: Patient deaths addressed within a clinical audit process has continued to increase since 2005, reaching its highest level in 2011 of 94.8%. Four more
Expert commentary continued: Royal Australasian College of Medical Administrators (RACMA)

HCOs reported on this indicator in 2011 compared with 2010, and the denominator is the largest it has been at 20,306 deaths.

Review of deaths using a clinical audit process within a clinical unit is critical, as it allows short term feedback and has the best chance of achieving provider-driven improvement in care and safety. Therefore the steady improvement in HCOs participating, number of deaths reviewed, and percentage of deaths reviewed is a very positive trend. Clinicians tend to be receptive to death review within their unit with short loop feedback, and it is noteworthy that one jurisdiction (Vic) is trialling an online approach to recording death audit and audit outcomes.

Blood transfusion

The rate for CI 6.1: Significant adverse blood transfusion events has reached its lowest level in 2011 at 0.23%, with centile gains of 117 patients. There were five outlier HCOs responsible for an outlier HCO rate of 2.3 per 100 transfusions.

Jurisdictions have significantly improved their approach to transfusion safety in recent years and the ACHS has introduced an EQuIP criterion to address this issue specifically. The significant and persistent improvements in adverse transfusion event rate, and the increased involvement of HCOs in this clinical indicator, reflects this approach. Outlier HCOs would benefit from a review of their transfusion safety program in conjunction with the relevant jurisdiction, and against EQuIP Criterion 1.5.51 and the new NSQHS Standard 7.

The rate for CI 6.2: Transfusion — informed patient consent not documented has also reached its lowest level in 2011 at 3.94%. The best performing centile rate is 0.71% and the poorest performing centile rate is 12.7%, resulting in centile gains of 425 patients, stratum gains of 259 patients, and outlier gains of 242 patients. Qld HCOs had the lowest rate of 1.47%, while SA and NSW had the highest rates (6.29% and 6.41% respectively). Lastly, there were 16 outlier HCOs producing an outlier HCO rate of 21.7 per 100 transfusions.

Blood transfusion is an invasive procedure and not without risk. Informed consent is mandatory under ACHS EQuIP Criterion 1.5.51 and the new NSQHS Standard 7, and also by common law and other national and state standards and policies. The trend is satisfactory but the goal should be 100%. Outlier jurisdictions and organisations should consider their policy position in this regard and audit compliance.

The rate for CI 6.3: RBC transfusion – Hb reading ≥100 g/L was 1.96% in 2011, with centile gains of 162 patients. There were ten outlier HCOs responsible for an outlier HCO rate of 13.7 per 100 transfusions.

Appropriateness of blood transfusion is an important issue given the nature of the resource. This indicator shows an improved trend in this regard. Outlier organisations should review their ‘Guidelines’ in accordance with NSQHS Standard 7.

Day of surgery admissions

The rate for CI 7.1: Elective surgery patients admitted on day of surgery has increased to its highest level in 2011 at 91.0%, with the best performing 20% HCO rate at 99.4% and the poorest performing 20% HCO rate at 86.8%. There were ten outlier HCOs responsible for an outlier HCO rate of 80.4 per 100 patients.

This approach to admission for elective surgery is now well entrenched for efficiency, and patient safety and preference; the improved outcome reflects this. Appropriate procedure development is required and outlier organisations should give consideration to clinical pathway development to this end, noting that a small percentage of patients will require earlier admission for justifiable clinical reasons.

Thromboprophylaxis

The rate for CI 8.1: VTE prophylaxis for high risk medical patients has increased from 77.4% in 2010 to 86.7% in 2011, however only 11 HCOs reported on this indicator (three more HCOs than in 2010). The best performing 20% HCOs rate is at its highest (98.1%) and the poorest performing 20% HCO rate is 69.4%, resulting in centile gains of 230 patients, stratum gains of 206 patients, and outlier gains of 127 patients. The metropolitan HCO rate is much higher than the non-metropolitan HCO rate (96.9% vs 72.8%) and the WA HCO rate is much higher than the other states (96.4% vs 77.2%).

This evidence-based approach still remains the subject of some individual and unit differences of view within the hospitals; the approach needs to be multidisciplinary and multi-specialty in nature. The low uptake of the indicator by HCOs probably reflects this complexity, as well as the difficulty in data collection. Audit of this indicator requires time-consuming medical record review. Consideration should be given to surveying the 11 HCOs participating in the CI to determine best practice in collecting the data. Approaches using coding of data have not been found to be very successful. Jurisdictions, including the Colleges and HCOs, need to be more active in guideline development and monitoring.

References

Expert commentary

Royal College of Nursing, Australia (RCNA)*

Hospital readmissions

The rate for all hospitals submitting CI 1.1: Unplanned and unexpected readmissions within 28 days is trending well compared to 2010 and the previous eight years, reflecting maturing and consistent discharge planning practices for the majority of the contributing HCOs. The rates of the high outlier HCOs and the number of patients that were required to return unexpectedly to inpatient beds (almost 27,000) are important flags for all readers of this report. This demonstrates the major significance of this indicator as a measure to assist HCOs to reassess their care processes. It is noted that there were ten more outliers than in 2010 (71) and these data are not trending in a positive direction.

Factors contributing to the much higher public HCO rate may include population factors such as higher rates of chronic illness, comorbidities, socioeconomic distress, mental health, critical care, complex care, dual diagnoses and difficulties gaining out-of-hours care.

HCOs have strategies in various stages of development to address these challenges. Additional work needs to be done on decreasing readmission rates, and this is occurring in many hospitals around Australia. More funding and research into unplanned readmission rates would assist hospitals to achieve the best performing 20% HCO rate of 0.23%. This is especially relevant for hospital avoidance packages and short term community support to assist patients’ transition back to their home environments.

The differing rates between public and private hospitals could be explained by their patient populations, as well as the different financial responsibilities and processes (such as discharge planning and follow up) for the HCOs. Further research investigating these is recommended. Private hospitals often achieve a lower readmission rate through transferring and referring patients to public hospitals, rather than private. Patients themselves often self-refer to a larger hospital for unplanned readmission which is typically public, but not always. The cost involved in admission and treatment in a private hospital would also be a deterrent for patients being readmitted. Private hospitals may have dedicated discharge planners to assist with planning of the appropriate discharge supports, and also have follow up appointments available in the doctors’ private clinics, which may avoid a potential readmission. Private patients may also have more ready access to allied health assessment and services, assisting to prevent decline and subsequent readmission.

Public hospitals do not automatically organise follow up with the treating team, and so patients that re-present with similar symptoms may automatically be readmitted, rather than offered outpatient follow up.

The rate for CI 1.2: Unplanned and unexpected readmission within 14 days has decreased from 2010 to 0.90%, with the public HCO rate higher than the private HCO rate (1.76% vs 0.45%). Qld’s rate remains the highest of the states and territories at 1.19%. Additionally, 28 outlier HCOs have led to an outlier HCO rate of 2.4 per 100 separations. If HCOs had been able to achieve the best performing 20% HCO rate of 0.16%, 9,146 patients would not have been readmitted within 14 days. CI 1.2 is more likely to be related to premature discharge than the previous indicator and it is concerning that contributing outlier HCOs had a rate 2.66 times the average HCO.

Once again, this is significant with respect to the >9,000 beds that needed to be found, the wages, and other costs associated with the unplanned readmission and, most importantly discomfort / pain / inconvenience or other deterioration in the patient’s condition. HCOs need to comprehend the major significance of this indicator as a measure of their discharge care processes.

The Qld rate is likely to be inclusive of the NT data which is impacted by the cultural practices of Aboriginal and Torres Strait Islander communities. It would however aid analysis if more detail was available. Any additional differentiation in the data and information (such as the diagnosis-related groups associated with the admissions) would assist in the appropriate allocation of resources. Individual HCOs could undertake this type of analysis at a local level.

Return to operating room

The rate for CI 2.1: Unplanned return to the operating room during same admission is 0.32%, and has produced centile gains of 4,036 patients and outlier gains of 1,370 patients. There were 37 outlier HCOs responsible for an outlier HCO rate of 0.83 per 100 patients.

A continued trend downwards in this CI is desirable. It is noted that the number of contributing HCOs has fallen by 10.5% since 2004. It appears that reliable data from the OR needs to be promoted among health service managers.

Any unplanned activity warrants reporting to the monitoring and quality organisation and investigation at stakeholder level. As in the report, the relevant professional college may assist with determination of the reasons for return to the OR.

* Organisation’s name changed to Australian College of Nursing in 2012.
The rate for CI 3.1: Inpatients who develop ≥1 pressure ulcers has remained consistent since its introduction in 2007, currently at 0.074%, with the public HCO rate higher than the private HCO rate (0.094% vs 0.052%). The best performing centile rate is 0.017% and the poorest performing centile rate is 0.10%, with high centile, stratum and outlier gains. There were more contributing HCOs (373) than in previous years, amounting to over 100 more than when data were first captured for this indicator in 2007. This demonstrates that nurses are increasing their commitment to the reporting of data that relate to a hospital-acquired skin lesion that is largely preventable through nursing care.

The ACHS EQuIP framework of criteria for improvement may be contributing to the rates and the willingness to provide data. The outliers may be the new participants. The difference between the public and private HCOs could be explained by the different patient types that are treated in the separate sectors. Public hospitals are more likely to treat patients at risk of developing pressure ulcers despite nursing care prevention strategies, for example, those with longer stays (increased length of stay), immobility, malnourishment and who are immunocompromised.

It is suggested that those outlier HCOs should increase their focus on pressure ulcer prevention. Once again, this is an area that would benefit from greater support from specialised nursing staff.

The rate for CI 3.2: Inpatients admitted with ≥1 pressure ulcers has increased in 2011 to 0.40%, with the best performing 20% HCO rate at 0.079% and the poorest performing 20% HCO rate at 0.88%. This has produced centile gains of 7,977 patients, and outlier gains of 3,935 patients.

Interestingly, there were a similar number of HCOs reporting in 2010 and 2011, with a small increase since 2009 when data were first captured for this indicator. There were 70 outlier HCOs.

The role played by nurses in reporting data on these hospital-acquired skin lesions that are largely preventable by nursing care, should be acknowledged, as should the contribution of all participants who have contributed to this decline. This indicator would capture data from those patients with complex medical conditions affecting the condition of their skin, as well as those where quality of nursing care is significantly compromised, without discriminating between them.

Inpatient falls

The rate for CI 4.1: Inpatient falls has remained reasonably stable since 2007 (currently 0.37 per 100 bed days), with no stratum differences. An additional 34 HCOs reported on this indicator in 2011. There were 118 outlier HCOs responsible for an outlier HCO rate of 0.66 per 100 bed days.

With large numbers of patients vulnerable, improvements would lead to significant gains. If the mean rate could be lifted to that of the best performing 20% of HCOs, among this selection of patients, there would be 19,246 fewer inpatient falls. These may result not only in bone fractures and soft tissue injury, but also in fear of falling again.

Nursing, medical and allied health teams have been proactive in anticipating patient needs and intervening appropriately, resulting in these gains. While the rate has remained stable over the past five years, it is encouraging to see the 22% growth in the number of contributing HCOs since 2007. The stable rate of this indicator should also be viewed as positive, given the ageing population and increasing average age of hospital presentations.

This result is not unexpected; in fact, a similar trend in stable fall rates has been seen internationally. It does suggest, however, that a different approach may be required. Recent falls prevention research suggests targeting patients’ behaviour, particularly through risk reduction, using a multidisciplinary approach and using multimedia (i.e. visual and verbal). More research investigating these possibilities should be undertaken to reduce the current figure.

The rate for CI 4.2: Inpatient falls requiring intervention has also remained reasonably stable since 2007 (currently 0.11%), however the public HCO rate is much higher than the private HCO rate (0.16% vs 0.069%). There were 60 outlier HCOs responsible for an outlier HCO rate of 0.32 per 100 bed days. The centile gains were large at 9,340 patients.

Public hospitals are more likely to treat patients at risk of complications of chronic illness, in socioeconomic distress, with mental health vulnerability, and admissions to critical care, complex care, dual diagnosis and those who have multiple comorbidities. They are also more likely to care for those who are aged and dependent on public health services. On the background of this population profile, public hospital inpatients are at higher risk of falls and falls requiring intervention.

This is in comparison to private hospitals whose population may be skewed towards planned admissions for elective surgery, a population with a lower risk of injurious falls.

The stable results for this CI suggest that strategies by the clinical teams have been successful in minimising falls for this high risk group.

It also should be noted that many patients in this high risk group may have delayed care that lacks continuity in an acute care setting. Another environment and care team may be more appropriate for their needs, such as subacute, rehabilitation, low level care, or even high level residential care, including dementia-specific care. Patients may be awaiting transfer to more appropriate care environments for weeks or months, a time during which such falls occur.
**Expert commentary continued:** Royal College of Nursing, Australia (RCNA)

All injurious falls need to be thoroughly investigated, regardless of where they occur.

**CI 4.3: Inpatient falls resulting in fracture or closed head injury** has also remained reasonably stable since 2005 (currently 0.53%), with the best performing 20% HCO rate at 0.34% and the poorest performing 20% HCO rate at 0.79%. The centile gains are large at 8,211 patients, and the outlier gains at 2,449 patients. There were 59 outlier HCOs responsible for an outlier HCO rate of 0.88 per 100 patients.

In 2011, there was a significant rise in the number of contributors to the data set, to 248 HCOs. It is reported that there has been a significant change in the composition of HCOs contributing, but no details were provided. HCOs will need to remain vigilant with respect to prevention strategies in view of the ageing population since fall-related injuries are the single greatest reason for hospital admission and emergency department presentation.

**Patient deaths**

**CI 5.1: Patient deaths addressed within a clinical audit process** examines outcomes of care; clinical audit is an important process for health service organisations to incorporate into their routine quality program. The rate has continued to increase since 2005, reaching its highest level in 2011 of 94.8%. The denominator is the largest it has been at 20,306 deaths. Importantly, the number of HCOs contributing has risen from 91 in 2005 to 200 in 2011.

Whilst this is a pleasing result, there are still 1,034 patients whose death could have been addressed within a clinical audit process, as the best performing 20% of HCOs audited 99.9% of their deaths. There were 21 outlier HCOs responsible for an outlier HCO rate of 67.1 per 100 deaths.

It is suggested that a review be undertaken of those HCOs that are under-performing and those that have the best rates to determine how each manages a clinical audit process after a patient death. The development of policies and procedures that address this criterion is recommended for those HCOs that have a poor result. Strict adherence to these policies is also required, and this would be the responsibility of a strong clinical governance system. A clinical advisory committee of some form is essential to monitor these data and ensure that the clinical audit and investigation is undertaken.

**Blood transfusion**

**CI 6.1: Significant adverse blood transfusion events** reached its lowest level at 0.23 per 100 transfusions, with centile gains of 117 fewer patients who would experience a significant adverse transfusion event if the mean rate for adverse blood transfusion events could be shifted to the rate achieved by the better performing 20% of HCOs.

While the administration of blood component therapy can save lives, and the limitations are acknowledged, it is also recognised that alternative therapies and strategies form part of the future for the management of patients who currently require human blood. Several statewide improvement projects in transfusion safety are also reflected in ACHS EQuIP5 criterion 1.5.5 which provides a strong framework for improvement.

The HCOs with a high result should review their processes to ensure compliance and to reduce the rates of adverse reactions. In 2011, the rate for **CI 6.2: Transfusion – informed patient consent not documented** reached its lowest level at 3.94%.

The decision to transfuse must be made with great care, and in some circumstances that decision is made in an emergency, where informed patient consent is not always documented. Absence of documentation does not necessarily mean that consent was not obtained, and this is not clear from the indicator data. Informed patient consent in this report also needs to be clarified to include verbal consent by both the patient and/or their next of kin.*

Improvement in this indicator suggests that clinicians are obtaining consent, even in emergencies, and this may be in response to the transfusion safety projects, being mindful that most incidents and accidents occur during emergencies.

Those states that have the highest rates for these indicators – SA (6.29%) and NSW (6.41%) – should be reviewing their processes to determine whether there are identifiable reasons for the difference.

Due to the often time-critical need for blood transfusions, there is likely to always be a number of events where documented consent is absent. Education for staff and robust, relevant policies and procedures must be in place.

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* The CI User Manual requires that informed consent be noted either on a consent form or by documenting the discussed information in the consumer / patient’s health record. Where a consumer / patient gives verbal consent, this should be documented by the treating physician.
Expert commentary continued: Royal College of Nursing, Australia (RCNA)

The rate for CI 6.3: RBC transfusion – Hb reading ≥100 g/L was 1.96% in 2011, with centile gains of 162 patients. Ten outlier HCOs were responsible for an outlier HCO rate of 13.7 per 100 transfusions. Red blood cell transfusions are a highly rationalised course of treatment for several reasons related to supply and to unwanted effects on the patient. However, there are alternatives that can, and should, be used in some situations. It is important that healthcare professionals are aware of all alternatives, and that they have access to them. The nationally funded education program would be an ideal way to address these issues.*

It is important to identify the steps and processes that are involved in actions related to this indicator to check whether there are any errors in reporting lines or delays in obtaining results.

Day of surgery admissions

The rate for CI 7.1: Elective surgery patients admitted on day of surgery has increased to its highest level in 2011 at 91.0%, with the best performing centile rate at 99.4% and the poorest performing centile rate at 86.8%.

Admissions of elective surgery patients on the day of surgery rationalises bed occupancy to only those requiring immediate preoperative and post-operative care. This facilitates better bed management and overnight bed use. In 2011, 51,355 patients were admitted on the day of surgery, allowing for reallocation of their beds / chairs / trolleys and the associated staff.

This is a pleasing result, particularly since it is now more than 25 years since day surgery was introduced in Australia for this purpose, and gains are still being made.

These results may also indicate increasing age and decreasing baseline health of those patients admitted for elective surgery. This suggests a change in the way HCOs are approaching day surgery; it is now viewed as the ‘everyday’ rather than the ‘special’ surgical model. The majority of reporting HCOs are likely to be small, private, free-standing HCOs.

Thromboprophylaxis

The rate for CI 8.1: VTE prophylaxis for high risk medical patients has increased from 77.4% in 2010 to 86.7% in 2011, however only 11 HCOs reported on this indicator (three more HCOs than in 2010). Among the best performing 20% of HCOs almost every high risk patient (98.1%) received prophylaxis to combat venous thromboembolism (VTE). The poorest performing 20% HCO rate is 69.4%, resulting in the potential for significant gains. The metropolitan HCO rate is much higher than the non-metropolitan HCO rate (96.9% vs 72.8%) and the WA HCO rate is much higher than the other states (96.4% vs 77.2%).

This is considered a controversial indicator despite the evidence base, and it is encouraging to see there were 15 submissions from 11 HCOs. Some clinicians may have remnant concerns about bleeding as a result of use of VTE prophylaxis. Given that the risk factors for VTE are increasing in the general medical population, greater participation from HCOs would not only be of interest, but would allow a more in-depth analysis of the indicator results.

It is anticipated that the development and distribution of standard evidence-based guidelines will support the development of local HCO guidelines, and encourage the reporting of such results.

It is recommended that the differing rates between metropolitan and non-metropolitan HCOs be further investigated, to improve reporting and implementation.

References

1 Haines T. Workshop: Falls prevention in the acute setting. SA Fall and Fall Injury Prevention and Management Program. SA Health; 30 April 2012.


* Bloodsafe eLearning Australia. For more information see http://www.nba.gov.au/appropriate/
Infection surveillance

Of the 18 surgical site infection indicators, four showed an improvement and one deteriorated over the period 2004 to 2011. The trends were statistically significant after allowing for the changing mix of contributing HCOs.

The four orthopaedic indicators for hip and knee replacement, CIs 1.1–1.4 had rates less than 0.7% in 2011.

The three CABG indicators, CIs 1.5, 1.6 and 1.8 had rates less than 0.9% in 2011.

The rate for CI 1.7: CABG – superficial incisional SSI (donor incision site) was 1.36%, lower than in previous years.

In colectomy, CIs 1.9 and 1.10 the highest rate was 2.6% in 2011.

In femoro-popliteal bypass, CIs 1.11 and 1.12 the rate for superficial infection was 2.5% and there were no deep infections in 2011. The number of HCOs reporting has approximately halved since 2004.

A single infection was reported in 105 open AAA repair procedures, CIs 1.13 and 1.14 in 2010, and one infection in 74 procedures in 2011.

For caesarean section, CIs 1.15 and 1.16, the infection rate was 0.65% for superficial infections and 0.21% for deep infections in 2011.

The hysterectomy infection rate, CIs 1.17 and 1.18, was 0.64% for superficial infections and 0.16% for deep infections in 2011.

For all but two of the 18 indicators evaluating infection of surgical incisions, the combined rates over the years 2004–2011 for non-metropolitan HCOs were higher than the metropolitan rates. Public rates were higher than private rates for all 18 indicators. For those indicators where there were outlier HCOs, the number of excess infections was small, except for CI 1.15, with no superficial infections reported.

Surgical site infections (SSIs)

Hip and knee procedures

CI 1.1: Superficial incisional SSI – hip prosthesis procedure (L) In 2011, there were 22,333 procedures reported from 158 HCOs. The annual rate was 0.59 per 100 procedures. The fitted rate improved from 1.2 to 0.65, a change of 0.55 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.54 per 100 procedures.

CI 1.2: Deep incisional SSI – hip prosthesis procedure (L) In 2011, there were 21,995 procedures reported from 156 HCOs. The annual rate was 0.66 per 100 procedures. The potential gains totalled 43 fewer deep incisional SSIs in hip prosthesis procedures.

CI 1.3: Superficial incisional SSI – knee prosthesis procedure (L) In 2011, there were 8,866 procedures reported from 159 HCOs. The annual rate was 0.58 per 100 procedures. The fitted rate improved from 0.89 to 0.58, a change of 0.30 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.30 per 100 procedures. In 2011, the potential gains totalled 61 fewer superficial incisional SSIs in knee prosthesis procedures.

Coronary artery bypass graft (CABG)

CI 1.5: CABG – superficial incisional SSI (chest incision site) (L) In 2011, there were 8,866 coronary artery bypass graft (CABG) procedures reported from 37 HCOs. The annual rate was 0.86 per 100 procedures. In 2011, the potential gains totalled 33 fewer superficial incisional SSIs in the chest incision site.

CI 1.6: CABG – deep incisional / organ space SSI (chest incision site) (L) In 2011, there were 8,866 CABG procedures reported from 37 HCOs. The annual rate was 0.79 per 100 procedures. In 2011, the potential gains totalled nine fewer deep incisional / organ space SSIs in the chest incision site.

CI 1.7: CABG – superficial incisional SSI (donor incision site) (L) In 2011, there were 4,555 CABG procedures reported from 23 HCOs. The annual rate was 1.4 per 100 procedures. In 2011, the potential gains totalled 36 fewer superficial incisional SSIs in the donor incision site.

Coelectomy

CI 1.9: Colectomy – superficial incisional SSI (elective, no stoma) (L) In 2011, there were 1,416 procedures reported from 29 HCOs. The annual rate was 2.6 per 100 procedures. There was relatively little variation between HCOs in 2011.
Infection Control (continued)

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CI 1.10: Colectomy – deep incisional / organ space SSI (elective, no stoma) (L) In 2011, there were 1,425 procedures reported from 28 HCOs. The annual rate was 1.4 per 100 procedures. There was relatively little variation between HCOs in 2011.

Femoro-popliteal bypass
CI 1.11: Femoro-popliteal bypass – superficial incisional SSI (L) In 2011, there were 120 procedures reported from seven HCOs. The annual rate was 2.5 per 100 procedures. There were no potential gains in 2011.

CI 1.12: Femoro-popliteal bypass – deep incisional SSI (L) In 2011, there were 93 procedures reported from six HCOs. No SSIs were reported.

Open AAA repair
CI 1.13: Open AAA – superficial incisional SSI (L) In 2011, there were 74 abdominal aortic aneurysm (AAA) procedures reported from four HCOs. The annual rate was 1.4 per 100 procedures.

CI 1.14: Open AAA – deep incisional / organ space SSI (L) In 2011, there were 74 procedures reported from four HCOs. No SSIs were reported.

Lower segment caesarean section (LSCS)
CI 1.15 LSCS – superficial incisional SSI (L) In 2011, there were 37,311 lower segment caesarean section (LSCS) procedures reported from 97 HCOs. The annual rate was 0.65 per 100 procedures. The fitted rate improved from 0.98 to 0.74, a change of 0.25 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.22 per 100 procedures. In 2011, the potential gains totalled 112 fewer superficial incisional SSIs.

CI 1.16: LSCS – deep incisional / organ space SSI (L) In 2011, there were 38,956 LSCS procedures reported from 98 HCOs. The annual rate was 0.21 per 100 procedures. In 2011, the potential gains totalled 52 fewer deep incisional / organ space SSIs, corresponding to a reduction by approximately one-half. There were seven outlier submissions from six HCOs whose combined excess was 22 more deep incisional / organ space SSIs. The outlier HCO rate was 1.7 per 100 procedures.

Abdominal hysterectomy
CI 1.17: Abdominal hysterectomy – superficial incisional SSI (L) In 2011, there were 2,654 procedures reported from 44 HCOs. The annual rate was 0.64 per 100 procedures. The fitted rate improved from 1.3 to 0.73, a change of 0.61 per 100 procedures. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.60 per 100 procedures.

CI 1.18 Abdominal hysterectomy – deep incisional / organ space SSI (L) In 2011, there were 2,566 procedures reported from 43 HCOs. The annual rate was 0.16 per 100 procedures.

Central line-associated bloodstream infections (CLABSI)

These indicators have been collected since 2004. Two indicators relating to central line infections in ICU have been moved to the Intensive Care indicator set.

Central line infection rates are highest in haematology units and outpatient intravenous therapy (OPIV) units in this data collection. Other units all report rates that average less than one episode of bacteraemia per 1,000 central line-days.

There was an improvement in the rates of central-line associated bacteraemia (bloodstream infections) in both centrally and peripherally inserted central lines, CIs 2.1 and 2.3. The latter trend to be lower and more variable (due to relatively small numerators) than the central line indicator equivalent. There was a decrease in the utilisation rates for centrally inserted lines (CI 2.1) and an increase in the utilisation rate of peripherally inserted central lines, (CI 2.2).

In 2011, two public HCOs reported CI 2.3 and one reported CIs 2.4 and 2.5, which relate to paediatric central lines. Three HCOs reported CIs 2.11 and 2.12 which relate to units providing outpatient intravenous therapy. OPIV units often provide chemotherapy for cancer patients.

CI 2.1: CI central line-days in Adult ICU (N) In 2011, there were 88,708 patient days reported from 39 HCOs. The annual rate for bloodstream infections (BSI) in centrally inserted (CI) lines was 46.7 per 100 patient days. The fitted rate decreased from 70.3 to 51.3, a change of 19.0 per 100 patient days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 17.4 per 100 patient days.

CI 2.2: PI central line-days in Adult ICU (N) In 2011, there were 66,188 patient days reported from 30 HCOs. The annual rate for bloodstream infections (BSI) in peripherally inserted (PI) central lines was 10.9 per 100 patient days. The fitted rate increased from 3.7 to 10.7, a change of 7.0 per 100 patient days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 8.1 per 100 patient days.

CI 2.3: Paediatric ICU-associated CI-CLABSI (L) In 2011, there were 2,010 line-days reported from two HCOs. Both had an annual rate of zero per 1,000 line-days, so there were no potential gains.
CI 2.4: CI central line-days in Paediatric ICU (N)
In 2011, there were 4,358 patient days reported from one HCO. The annual rate was 45.6 per 100 patient days.

CI 2.5: Paediatric ICU associated PI-CLABSI (L)
In 2011, there were 1,073 line-days reported from one HCO, with zero infections.

CI 2.6: PI central line-days in Paediatric ICU (N)
In 2011, there were 2,271 patient days reported from a single HCO. The annual rate was 47.2 per 100 patient days.

CI 2.7: Haematology Unit-related CI-CLABSI (L)
In 2011, there were 21,350 line-days reported from five HCOs. The annual rate was 1.6 per 1,000 line-days. The fitted rate improved from 5.4 to 1.6, a change of 3.8 per 1,000 line-days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.5 per 1,000 line-days. In 2011, the potential gains totalled 27 fewer bloodstream infections, corresponding to a reduction by approximately four-fifths. In 2011, there was one outlier submission from one HCO whose combined excess was 11 more bloodstream infections. The outlier HCO rate was 6.1 per 1,000 line-days.

CI 2.8: Haematology Unit-related PI-CLABSI (L)
In 2011, there were 11,781 line-days reported from four HCOs. The annual rate was 1.4 per 1,000 line-days. The potential gains totalled seven fewer bloodstream infections, corresponding to a reduction by approximately one-third.

CI 2.9: Oncology Unit-related CI-CLABSI (L)
In 2011, there were 109,330 line-days reported from 11 HCOs. The annual rate was 0.31 per 1,000 line-days. The fitted rate improved from 0.99 to 0.20, a change of 0.78 per 1,000 line-days. In 2011, the potential gains totalled 32 fewer bloodstream infections, corresponding to a reduction by approximately four-fifths. In 2011, there were three outlier submissions from two HCOs whose combined excess was 24 more bloodstream infections. The outlier HCO rate was 2.7 per 1,000 line-days.

CI 2.10: CI central line-days in Adult ICU (L)
In 2011, there were 29,511 patient days reported from eight HCOs. The annual rate was 0.020 per 100 patient days. The fitted rate improved from 0.044 to 0.015, a change of 0.029 per 100 patient days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.031 per 100 patient days. There was relatively little variation between HCOs in 2011.

CI 2.11: OPIV* Unit-related CI-CLABSI (L)
In 2011, there were 1,690 centrally inserted line-days reported from three HCOs. The annual rate was 2.4 per 1,000 line-days and there were no potential gains.

CI 2.12: OPIV* Unit-related PI-CLABSI (L)
In 2011, there were 1,914 peripherally inserted line-days reported from three HCOs. The annual rate was zero per 1,000 line-days and there were no potential gains.

Haemodialysis-associated bloodstream infection surveillance
These indicators have been collected since 2004. Averaged over all years, the lowest rate of access-associated bloodstream infections was in CI 3.1 (AV-fistula access). A preferred method to access the bloodstream for dialysis is via a surgically created AV-fistula. The highest rates were in CIs 3.4 and 3.5 which relate to central line access for dialysis.

CI 3.1: Haemodialysis – AV-fistula access-associated BSI (L)
In 2011, there were 40 submissions from 23 HCOs. The annual rate was 0.17 BSIs per 100 patient months. The fitted rate deteriorated from 0.063 to 0.22, a change of 0.15 per 100 patient months. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.17 per 100 patient months. In 2011, the potential gains totalled 11 fewer bloodstream infections, corresponding to a reduction by approximately one-half. In 2011, there was one outlier submission whose combined excess was eight more bloodstream infections. The outlier HCO rate was 1.1 per 100 patient months.

CI 3.2: Haemodialysis – synthetic graft access-associated BSI (L)
In 2011, there were 30 submissions from 18 HCOs. The annual rate was 0.34 per 100 patient months. There was one outlier submission with an outlier rate of eight BSIs per 100 patient months.

CI 3.3: Haemodialysis – native vessel graft access-associated BSI (L)
In 2011, there were 15 submissions from ten HCOs. The annual rate was zero infections per 100 patient months.

CI 3.4: Haemodialysis – CI non-cuffed line access-associated BSI (L)
In 2011, there were 22 submissions from 12 HCOs. The annual rate was 5.6 per 100 patient months. The fitted rate for centrally inserted non-cuffed line BSIs improved from 12.2 to 1.1, a change of 11.1 per 100 patient months. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The potential gains totalled seven fewer bloodstream infections, corresponding to a reduction by approximately two-thirds. There were no outlier HCOs in 2011.

* OPIV Units are outpatient intravenous therapy units.
Infection Control

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Ci 3.5: Haemodialysis – CI cuffed line access-associated BSI (L) In 2011, there were 40 submissions from 24 HCOs. The annual rate was 1.1 per 100 patient months. The fitted rate for centrally-inserted cuffed line BSIs improved from 4.3 to 1.4, a change of 2.8 per 100 patient months. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.5 per 100 patient months. There was relatively little variation between HCOs and so the potential gains were small in 2011. There were no outlier HCOs in 2011.

Neonatal infections

CIs 4.1 and 4.2, relating to full term neonates, were first collected in 2005. The number of HCOs contributing to these indicators was one in 2003, 17 in 2011, the peak being 23 HCOs in 2009. They have low rates that vary from year to year because of small numbers of infections. There were 67 infections reported in 92,858 neonates, a rate of 0.072% over the period from 2004 to 2011 (CI 4.1 – all neonates). For term neonates there were 13 infections reported in 85,108 neonates, a rate of 0.02%.

The four indicators that relate to infection rates of neonates in NICU were reported by three HCOs in 2008–2011. Since 2004, none of the six indicators had significant stratum gains or centile gains.

4.1: Neonates – blood / CSF infection within 48 hours of birth (L) In 2011, there were 14,083 patient days reported from NICUs at two HCOs. The annual rate was 0.59 per 100 bed days.

CI 4.2: Neonates ≤37 weeks GA – blood / CSF infection within 48 hours of birth (L) In 2011, there were 153 for a combined denominator of 25,295 bed days, an incidence of 0.24 per 100,000 bed days.

CI 4.3: NICU Neonates birth weight <1,000 g – significant BSI within 48 hours of birth (L) In 2011, there were 5.4 per 10,000 bed days. The incidence improved from 5.4 to 1.6, a change of 3.8 per 10,000 bed days.

CI 4.4: NICU neonates ≥1,000 g birth weight – significant BSI within 48 hours of birth (L) In 2011, there were 14,003 babies reported from 17 HCOs. The annual rate was 0.019 per 100 patient days. The number of infections reported after 48 hours for neonates whose birth weight was <1,000 g, was 119 for a combined denominator of 103,865 bed days, a rate of 0.11 per 100 bed days.

Healthcare-associated MRSA morbidity

Area 5 indicators measure methicillin-resistant Staphylococcus aureus infections acquired within a healthcare setting (HAIs). These indicators have been collected since 2005.

There were improvements in CIs 5.1 and 5.2 which relate to ICU-associated infection in sterile and non-sterile sites respectively. There were less prominent improvements in the non-ICU counterparts for the two indicators, CIs 5.3 and 5.4.

CI 5.1: ICU-associated new MRSA HAIs in a sterile site (L) In 2011, there were 180,302 bed days reported from 62 HCOs. The annual rate was 1.4 per 10,000 bed days. The fitted rate improved from 5.4 to 1.6, a change of 3.8 per 10,000 bed days.

CI 5.2: ICU-associated new MRSA HAIs in a non-sterile site (L) In 2011, there were 173,211 bed days reported from 61 HCOs. The annual rate was 5.3 per 10,000 bed days. The fitted rate improved from 21.1 to 5.9, a change of 15.3 per 10,000 bed days.

CI 5.3: Healthcare-associated MRSA morbidity

In 2011, there were 14,083 patient days reported from NICUs at two HCOs. The annual rate was 0.24 per 100,000 bed days. The number of infections reported after 48 hours for neonates whose birth weight was <1,000 g, was 119 for a combined denominator of 103,865 bed days, a rate of 0.11 per 100 bed days.

CI 5.4: NICU Neonates ≤1,000 g birth weight – significant BSI >48 hours of birth (L) In 2011, there were 14,083 patient days reported from NICUs at two HCOs. The annual rate was 0.028 per 100 patient days. The number of infections reported after 48 hours for neonates whose birth weight was ≥1,000 g, was 119 for a combined denominator of 103,865 bed days, a rate of 0.11 per 100 bed days.
CI 5.3: Non ICU-associated new MRSA inpatient HAIs in a sterile site (L) In 2011, there were 6,564,482 bed days reported from 150 HCOs. The annual rate was 0.26 per 10,000 bed days. The fitted rate improved from 0.56 to 0.34, a change of 0.22 per 10,000 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.22 per 10,000 bed days. The potential gains totalled 65 fewer new MRSA inpatient healthcare-associated infections in a sterile site, corresponding to a reduction by approximately one-third.

CI 5.4: Non ICU-associated new MRSA HAIs in a non-sterile site (L) In 2011, there were 6,182,625 bed days reported from 148 HCOs. The annual rate was 1.3 per 10,000 bed days. The fitted rate improved from 2.9 to 1.3, a change of 1.6 per 10,000 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.6 per 10,000 bed days. In 2011, the potential gains totalled 616 fewer new MRSA healthcare-associated infections in a non-sterile site, corresponding to a reduction by approximately three-quarters.

Occupational exposures to blood and/or body fluids

These indicators have been collected since 2005. For the purposes of CIs 6.1 and 6.2, occupational exposure means skin, eye, mucous membrane or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee’s duties.

The rates of reported parenteral exposures sustained by staff, CI 6.1, are of the order of one in 2,500 bed days. The rate of reporting non-parenteral exposures, CI 6.2, is one-third of the rate of parenteral exposures.

CI 6.1: Reported parenteral exposures sustained by staff (L) In 2011, there were 9,362,662 bed days reported from 245 HCOs. The annual rate was 0.037 per 100 bed days. The fitted rate improved from 0.041 to 0.037, a change of 0.004 per 100 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.003 per 100 bed days. In 2011, the potential gains totalled 1,226 fewer reported parenteral exposures, corresponding to a reduction by approximately one-third.

CI 6.2: Reported non-parenteral exposures sustained by staff (L) In 2011, there were 9,199,894 bed days reported from 238 HCOs. The annual rate was 0.016 per 100 bed days. In 2011, the potential gains totalled 744 fewer non-parenteral exposures, corresponding to a reduction by approximately one-half.
In this indicator set approximately two-thirds of the patients covered are from public HCOs.

Of the 13 indicators that had the desirable level specified as high (H) or low (L), eight CIs showed improvement and in five of these, the trend was significant after allowing for the changing composition of HCOs contributing over the period.

### Access and exit block – Intensive Care Unit (ICU)

**CI 1.1: ICU adult non-admission due to inadequate resources (L)**

In 2011, there were 50,689 patients reported from 63 HCOs. The annual rate was 2.0 per 100 patients failing to be admitted into an intensive care unit (ICU). The fitted rate improved from 7.7 to 2.3, a change of 5.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 5.1 per 100 patients. In 2011, there were 20 outlier submissions from 14 HCOs whose combined excess was 485 more patients who could not be admitted to the ICU due to access block.

**CI 1.2: ICU – elective adult surgical cases deferred or cancelled due to unavailability of bed (L)**

In 2011, there were 50,866 admissions reported from 59 HCOs. The annual rate was 0.96 per 100 admissions. The fitted rate improved from 3.2 to 0.87, a change of 2.3 per 100 admissions. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.2 per 100 admissions. In 2011, there were ten outlier submissions from eight HCOs whose combined excess was 197 more elective surgical cases deferred or cancelled.

**CI 1.3: ICU – adult transfer to another facility / area due to unavailability of bed (L)**

In 2011, there were 43,860 patients reported from 56 HCOs. The annual rate was 0.92 per 100 patients. The fitted rate improved from 3.2 to 0.87, a change of 2.3 per 100 patients. In 2011, there were 14 outlier submissions from ten HCOs whose combined excess was 184 more patients transferred to another facility / ICU.

**CI 1.4: ICU – adult discharge delay >6 hours (L)**

In 2011, there were 45,513 patients reported from 63 HCOs. The annual rate was 23.3 per 100 patients. In 2011, there were 29 outlier submissions from 22 HCOs whose combined excess was 3,836 more patients whose discharge from ICU was delayed more than six hours.

**CI 1.5: ICU – adult discharge between 6pm and 6am (L)**

In 2011, there were 56,213 patients reported from 73 HCOs. The annual rate was 16.2 per 100 patients. The fitted rate improved from 16.9 to 15.7, a change of 1.2 per 100 patients. In 2011, there were 43 outlier submissions from 27 HCOs whose combined excess was 2,570 more patients discharged from the ICU between 6pm and 6am.

### Intensive care patient management

**CI 2.1: Rapid response calls to adult ICU patients within 72 hours of discharge from ICU (L)**

In 2011, there were 30,493 patients reported from 45 HCOs. The annual rate was 24.1 per 1,000 patients. In 2011, there were five outlier submissions from four HCOs whose combined excess was 176 more rapid response calls within 72 hours of discharge from an ICU.

### Intensive care patient treatment

**CI 3.1: VTE prophylaxis in adults within 24 hours of admission to ICU (H)**

In 2011, there were 45,912 patients reported from 58 HCOs. The annual rate was 91.0 per 100 patients. The fitted rate improved from 74.8 to 89.6, a change of 14.8 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 14.0 per 100 patients. In 2011, there were 27 outlier submissions from 20 HCOs whose combined excess was 1,714 fewer patients given VTE prophylaxis.

### ICU central line-associated bloodstream infection (CLABSI)

**CI 4.1: Adult ICU-associated CI-CLABSI (L)**

In 2011, there were 56,171 centrally inserted (CI) line-days reported from 35 HCOs. The annual rate was one per 1,000 line-days. The fitted rate improved from 3.7 to 0.95, a change of 2.8 per 1,000 line-days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.6 per 1,000 line-days. In 2011, there was one outlier submission whose combined excess was six more Adult ICU-associated CI-CLABSI.

**CI 4.2: Adult ICU-associated PI-CLABSI (L)**

In 2011, there were 5,404 peripherally inserted (PI) line-days reported from 23 HCOs. The annual rate was 0.56 per 1,000 line-days. The fitted rate improved from 2.6 to 0.40, a change of 2.2 per 1,000 line-days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.2 per 1,000 line-days.
Utilisation of patient assessment systems

Cl 5.1: Participation in the ANZICS CORE Adult Patient Database (APD) (H) In 2011, there were 59,734 admissions reported from 72 HCOs. The annual rate was 92.2 per 100 admissions. The fitted rate improved from 89.8 to 91.3, a change of 1.6 per 100 admissions. In 2011, there were 22 outlier submissions from 17 HCOs whose combined excess was 3,202 fewer complete submissions to the ANZICS CORE APD.*

Cl 5.2: Participation in the ANZICS CORE Critical Care Resources survey (N) In 2011, there were 70 submissions from 42 HCOs. Half of the submissions answered yes to having responded to the most recent ANZICS CORE Critical Care Resources survey.† The plot indicates that there is a trend of decreasing response rates among HCOs submitting to this indicator.

Minimum standards for a rapid response system

CI 6.1: Rapid response system calls to adult patients (N) In 2011, there were 952,395 patients reported from 46 HCOs. The annual rate was 23.6 per 1,000 patients.

CI 6.2: Rapid response system calls to adult patients within 24 hours of admission (N) In 2011, there were 551,028 patients reported from 26 HCOs. The annual rate was 5.0 per 1,000 patients.

CI 6.3: Adult patients experiencing cardiopulmonary arrest (L) In 2011, there were 869,269 patients reported from 43 HCOs. The annual rate was 1.2 per 1,000 patients. In 2011, there were ten outlier submissions from nine HCOs whose combined excess was 134 more patients who have cardiopulmonary arrest.

CI 6.4: Deaths in adult patients – no NFR order (L) In 2011, there were 365,401 patients reported from 23 HCOs. The annual rate was 1.5 per 1,000 patients. In 2011, there were five outlier submissions from five HCOs whose combined excess was 236 more deaths in adult patients who do not have an NFR (not for resuscitation) order.

CI 6.5: Adult deaths (L) In 2011, there were 736,784 patients reported from 39 HCOs. The annual rate was 12.8 per 1,000 patients. In 2011, there were 21 outlier submissions from 16 HCOs whose combined excess was 2,792 more deaths.

Expert commentary

ANZICS – The Australian and New Zealand Intensive Care Society

General Comments

The ACHS clinical indicator set for Intensive Care provides valuable information about the performance of intensive care units (ICUs) in a number of domains. Public and private hospitals, predominantly from Australia (and in both rural and metropolitan areas), have contributed data. The findings are likely to be representative of current practice, and thus provide an important resource to assess the state of Intensive Care Medicine.

The importance for ICUs to monitor their own performance and to benchmark against their peers cannot be underestimated. Contribution to the ACHS indicator set is an ideal way to do this, and ANZICS strongly recommends all hospitals with ICUs in Australia and New Zealand submit data. Indeed, it has been suggested that failure to submit information and participate in a peer review process may in itself be an indicator of poor performance.¹

It is reassuring to see that overall there have been improvements in the clinical indicators reported. However there are outliers in every indicator measured, where improvements in performance could be targeted. These might in turn lead to better outcomes for patients admitted to intensive care in Australia and New Zealand. It is also worth highlighting that contribution of data for some indicators (e.g. CI 5.1: Participation in the ANZICS CORE Adult Patient Database) is much better than for others (e.g. CI 3.1: VTE prophylaxis in adults within 24 hours of admission to ICU). It is recognised that many units have difficulty in providing resources to record ICU data and this can be particularly difficult when data on patients who were not admitted to ICU are also required (e.g. CI 1.1: ICU adult non-admission due to inadequate resources).

There should be caution before generalising the trends seen in this report to every hospital. At present, 167 ICUs (142 in Australia and 25 in New Zealand) contribute data to at least one of the registries run by ANZICS CORE. There are estimated to be another 20 units (predominantly small rural units) who do not submit any data to ANZICS CORE. Thus contribution to the ACHS clinical indicator set by these hospitals

* Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) Adult Patient Database
† Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) Critical Care Resources Survey
Expert commentary continued: ANZICS – The Australian and New Zealand Intensive Care Society

**Access and exit block**

It is hoped that the observed decrease in non-admissions to adult ICUs due to inadequate resources (CI 1.1) between 2004 (7.13%) and 2011 (1.95%) does indeed represent better access to ICU beds over this time period, and may reflect increasing awareness of this important issue. ICU bed numbers have increased over the past five years, but this is in line with increases in population. Reasons for the decrease are multifactorial, including changing referral practices. If an ICU is known to be full, referring teams may not request assessment, but instead Rapid Response Teams may stabilise patients on the ward, or may facilitate ‘do not resuscitate’ (DNR) orders or similar that decrease the likelihood of ICU admission.

The number of HCOs reporting CI 1.1: ICU adult non-admission due to inadequate resources has remained fairly constant, but may represent different HCOs with less ICU ‘bed pressure’. These findings should also be taken in the context of after-hours discharges from ICU remaining constant over this time period (See CI 1.5).

It is good to see a reduction in CI 1.2: ICU – elective adult surgical cases deferred or cancelled due to unavailability of bed.

Private ICUs have tended to cancel cases less often than public hospitals, and it is potentially reassuring to see that in 2011, there are no differences across hospital types, unlike in previous years. This may represent a general improvement in access to ICU with less cancellation of elective surgical cases.

It should be noted that the number of HCOs reporting this indicator has risen over the years to its highest level in 2011. Increasing numbers of hospitals with good access to ICU contributing data for this indicator may have resulted in a change in mean ‘bed pressure’. This can only partly explain the change, as the raw numerator has fallen significantly in concert with a rise in the denominator.

CI 1.4: ICU – adult discharge delay >6 hours was changed in 2011 from ‘greater than 12 hours’ to ‘greater than six hours’.

The rate in a hospital for CI 1.4 is very dependent on patient flow systems, staff culture, management culture, as well as occupancy on the wards. Clearly, changing from 12 hours to six hours for the 2011 collection period alters the value and a new baseline will need to be established. The relative performance under the old and new criterion for individual hospitals would be an interesting metric, but is not available. At present, there are no published standards by which to evaluate performance against this indicator.

It is also possible that a desire to minimise exit block to comply with the new ‘six hour’ indicator may potentially adversely affect after-hours discharges. Accepting discharge delay of up to 12 hours did previously allow for ICUs to hold patients overnight to avoid an after-hours discharge.

The mean rate for CI 1.5: ICU – adult discharge between 6pm and 6am has remained reasonably constant since 2007 (between 15.7% and 17.5%), and is currently 16.2%. The best 20% HCO rate is 4.97% and the poorest 20% HCO rate is 27.9%, with centile gains exceeding 6,000.

After-hours discharge from ICU has consistently been shown to be associated with increased risk of death. SA has the highest number of ICU beds per 100,000 population (approx. 10) in Australia and New Zealand. The low after-hours discharge rate in SA therefore may reflect better access to ICU in this state.

While Vic, NSW and Qld all have similar ICU bed numbers per 100,000 population (approx. 8), a much higher proportion of these beds are in the private sector in Qld. The lower after-hours discharge rate in Qld compared to the two more populous states may reflect this difference.

Private ICUs tend to have a greater proportion of elective ICU admissions.
Expert commentary continued: ANZICS – The Australian and New Zealand Intensive Care Society

This may facilitate the planning of admissions and discharges, hence the lower after-hours discharge rate in private hospitals. The constancy of this metric suggests that the reduction in non-admissions (CI 1.1: ICU adult non-admission due to inadequate resources) may not be explained simply by increased bed availability and improved access to ICU services.

Intensive care patient management

CI 2.1: Rapid response calls to adult ICU patients within 72 hours of discharge from ICU was introduced into the collection in 2011, and the rate for that year was 24.1 per 1,000 patients. The best 20% HCO rate was 8.4 and the poorest 20% HCO rate was 29.4, with centile gains of 477 patients, stratum gains of 344 patients, and outlier gains of 177 patients. The metropolitan HCO rate was twice the non-metropolitan HCO rate (28.2 vs 12.8), the public HCO rate was much higher than the private HCO rate (31.1 vs 13.0), and the Vic HCO rate was higher than the other states at 35.4. There were four outlier HCOs responsible for an outlier HCO rate of 64 per 1,000 patients.

There are many contributing factors to this metric, including:

- ward staff reliance on ‘ad hoc ICU outreach’
- premature discharge from ICU
- lack of competence and/or confidence of ward staff to manage patients following ICU discharge
- a culture of ‘ownership’ by ICU even after discharge
- lack of training, seniority or supervision of ward staff
- reticence of ICU staff to review patients post-ICU discharge (reducing the rate)
- medicolegal history or culture of a particular institution, HCO or jurisdiction.

It is also uncertain whether a high rate is necessarily good or bad. Failure to activate a rapid response call in a patient who needs attention would contribute to a low rate here, but is plainly detrimental to the patient.

Intensive care patient treatment

The rate for CI 3.1: VTE prophylaxis in adults within 24 hours of admission to ICU has reached its highest level at 91.0%, however the centile gains are still large at 4,068 patients and outlier gains at 1,714 patients. There were 20 outlier HCOs responsible for an outlier HCO rate of 76.4 per 100 patients.

One of the problems with this type of measure is the ‘data-cleanliness’ when there may be lack of specificity in the definitions. This measure is of ‘patients being treated appropriately for VTE prophylaxis, according to local protocol, within 24 hours of admission to the ICU’ – local protocols may vary. Varied interpretation may limit the conclusions that can be drawn.

It is recognised, however, by ANZICS that the failure to provide venous thromboembolism (VTE) prophylaxis for an ICU patient when indicated is associated with approximately a 20% increase in risk of death.3 It is good to see the rate rising, but even if accurate, may still indicate many patients are not receiving VTE prophylaxis when they should.

Central line-associated bloodstream infection (CLABSI)

The rate for CI 4.1: Adult ICU-associated CI-CLABSI has remained stable for the last two years at 1.00%, with small centile gains of 26 patients.

The rate of central line-associated bloodstream infection (CLABSI) in Australia is at a level that overseas jurisdictions aim for as ‘reach targets’. It is important to note that the casemix and the actual number of admissions to ICU requiring central lines at some institutions may have a large effect on the CLABSI rate. Higher rates may be seen in ICUs admitting major burns, multiple immunocompromised patients and transplant patients.

The outlier gain of six CI-CLABSI with a rate of 28 per 1,000 line-days implies a denominator of only about 214 line-days. CLABSI in an ICU with a very low number of central line-days may manifest as a high rate. Without knowing more about outlier hospitals, very high numbers such as 28 should be treated with caution and the implications of this figure cannot confidently be commented on.

The rate for CI 4.2: Adult ICU associated PI-CLABSI has remained very low since 2007 and is currently at 0.56%. There were no outliers and no centile gains.

It is hard to compare data on centrally inserted lines to measures on peripherally inserted lines in ICU since these may be different patient populations and the numerators are very low. ANZICS would question the benefit in continuing to record this measure.

The number of HCOs reporting on Area 4 is very low. There are multiple groups collecting the same data: hospitals, Australian states, ANZICS and ACHS, to name four. CLABSI definitions vary, are now only starting to become standardised throughout the country, and control of data collection may be outside the normal ICU processes, for instance when performed by external infection control bodies within the hospital. All these factors may limit the number of contributing ICUs who are either willing or able to submit this data.

Utilisation of patient assessment systems

The rate for CI 5.1: Participation in the ANZICS CORE Adult Patient Database (APD)* has reached its highest level since 2004 – currently at 92.2%. The poorest 20% HCO rate is 90.0% and the highest 20% HCO rate is 100%, producing significant opportunities for gains.

* Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) Adult Patient Database.
Expert commentary continued: ANZICS – The Australian and New Zealand Intensive Care Society

The public HCO rate was much higher than the private HCO rate (96.3% vs 81.1%) and the SA rate was the lowest (74.9%) while Qld was the highest (98.3%). There were 17 outlier HCOs responsible for an outlier rate of 58.9 per 100 admissions.

ANZICS would like to see 100% participation of hospitals in collecting for ANZICS CORE databases. Whilst in 2011, the rate is the highest since 2004, the increase has been modest and the trend line is sloping upwards very gently. It is possible that ICUs not reporting at all may conceal safety, quality or performance issues. Variation in risk-adjusted mortality outcomes amongst private ICUs is greater than other hospital types. Without increased contribution from this sector, it is not possible to determine whether this really represents significant variation in patient outcomes.

It is notable that the 72 hospitals reporting this indicator to the ACHS is approximately half the number that contributes data to ANZICS CORE. There are presently about 140 hospitals contributing to the Adult Patient Database (CI 5.1) and over 160 contributing to the Critical Care Resource Registry (CI 5.2). ANZICS considers there can be little comment about regional differences as these numbers under-represent true contribution rates.

Minimum standards for a rapid response system

These rates for CI 6.1: Rapid response system calls to adult patients and CI 6.2: Rapid response system calls to adult patients within 24 hours of admission are cited per 1,000 patients. The wording and definitions for these indicators make their interpretation difficult and this probably impacts on the ability of hospitals to collect and submit these data to the ACHS.

These are new indicators in 2011. Approximately one in four Rapid Response Teams are not coordinated or run by the ICU, so in the long term this indicator may be placed within the general Hospital-Wide set of indicators rather than with the ICU indicators.

Many patients receive more than one Rapid Response call. Perhaps the numerator should be ‘number of patients triggering at least one Rapid Response Team call’ rather than ‘number of Rapid Response Team calls’.

With cardiopulmonary arrest being an inevitable consequence of death, presumably this clinical indicator is measuring number of cardiopulmonary arrests that are unexpected or occur without a ‘not for resuscitation’ (NFR) order and that trigger an ‘arrest call’.* In addition, cardiac arrests within an ICU are unlikely to involve or need the involvement of a Rapid Response Team. However, if better worded and collectable, CI 6.3: Adult patients experiencing cardiopulmonary arrest might be the most useful marker of the impact of a Rapid Response Team within a hospital.

CI 6.4: Deaths in adult patients – no NFR order might be a more useful indicator if total number of deaths in the hospital, rather than total number of hospital admissions, were used as the denominator.

ANZICS recommends taking further advice but cannot comment further about these figures. It appears (by extrapolation) that most patients dying in hospital have an NFR order – this raises questions about these data. The variation in systems design between HCOs makes these data hard to interpret.

No comment or inference about CI 6.5: Adult deaths can be drawn without knowing the severity of illness of patients admitted to these hospitals.† The lower rate in private hospitals probably represents a population of patients who are of lower severity illness (predominantly elective surgical cases) and so would be expected.

In conclusion

Hospital-wide safety, quality and performance is a responsibility for many organisations, as well as for ANZICS. The ANZICS CORE Adult Patient Database does not gather these data, and ANZICS cannot comment on the robustness of these data, and is not in a position to comment on the HCOs that choose to contribute, or not contribute, to it. The low numbers of contributing hospitals may reflect difficulty in collecting these data, inconsistent and ‘non-standardised’ definitions and uncertainty about their relevance specifically to intensive care practice.

ANZICS does recognise, however, that the provision of appropriate care to critically ill patients throughout the hospital, and not just within the ICU, is an important issue with direct relevance for all intensive care practitioners. ANZICS fully supports further work being done to develop these indicators into a robust set which are more clinically useful.

References

* The definitions for cardiac arrest and for pulmonary arrest in the User Manual include: ‘necessitating the commencement of resuscitation’.
† Peer comparison is likely to provide more insight. Hospitals submitting data are stratified as public or private facilities, and as Level I, II or III Adult ICUs according to the College of Intensive Care Medicine’s Minimum standards for Intensive Care Units (2010) (See ACHS Intensive Care CI User Guide.) These minimum standards cover work practice/caseload, staffing and operational requirements, design, equipment and monitoring.
‡ To support individual HCOs, the Australian Commission for Safety and Quality in Health Care (ACSQHC) and the Australian Health Performance Authority promote and monitor safety, quality and performance. Many state health departments also have divisions that work to improve safety and quality.
**Expert commentary**

**College of Intensive Care Medicine (CICM)**

### General comments

Overall, there has been a pleasing improvement in many of the clinical indicators reported.

However, there are outliers for every indicator measured, which suggests there is potential for improvements in performance that would lead to better outcomes for patients admitted to intensive care units (ICUs) in Australia. Indicators C1.1: ICU – adult non-admission due to inadequate resources, C1.2: ICU – elective adult surgical cases deferred or cancelled due to unavailability of bed, C1.3: ICU – adult transfer to another facility / area due to unavailability of bed and C1.5 ICU – adult discharge between 6pm and 6am reflect the adequacy of ICU resources (beds, nursing staff, other staff, equipment), whereas C1.4: ICU – adult discharge delay >6 hours reflects resources within the hospital in general, particularly bed pressure. Low levels are desirable, but it is difficult to conceive that these rates will ever reach zero because of the finite nature of health resources.

Where differences between public and private healthcare organisations are reported, rates are lower for private hospitals, reflecting a more elective and predictable patient population, for whom admissions and discharges can be better planned.

**CI 1.1: ICU adult non-admission due to inadequate resources** showed a significant improvement from 2.33 per 100 patients admitted to ICU in 2010 to 1.95 per 100 patients in 2011 (compare with 7.13 per 100 patients in 2004). This improved trend is probably the result of an increase in the numbers of staffed and equipped ICU beds but could also arise from improved management of ward-based acute problems through the rapid response team (RRT) or intensive care outreach systems. These systems may also identify patients for whom ICU care is inappropriate and so their admission to ICU will not be requested.

Reduction in discharge delay could also contribute, although the overall rate for new indicator C1.4: ICU – adult discharge delay >6 hours does not appear to be substantially improved. The rate is approximately five times higher in public hospitals than in private. The lower rate in private hospital ICUs probably reflects the predominantly elective surgical nature of patients as described above.

Sixty-three (63) HCOs supplied data for this indicator. As this indicator requires documented evidence from an intensivist that an ICU bed is unavailable, with inadequate resources, it is possible the true number is under-reported. The outlier rate of 7.3 per 100 patients is similar to the overall rate in 2004. These ICUs are likely to be particularly under-resourced in terms of beds and/or staff.

**CI 1.2: ICU – elective adult surgical cases deferred or cancelled due to unavailability of bed** also showed a significant improvement from 1.15 to 0.96 per 100 ICU admissions between 2010 and 2011. As with CI 1.1, this improvement is likely to reflect an increase in the number of staffed ICU beds over this period. Other contributing factors may be a reduction in discharge delay, better ICU bed management (such as staged admission times) and advances in surgical techniques (such as laparoscopic surgery) that allow safe patient management outside of ICU.

Fifty-nine (59) ICUs supplied data for this indicator. As with the previous indicator, data collection is more difficult as patients not admitted are not entered into the ICU database.

The outlier rate was approximately four times the overall rate and similar to the rate in 2007 when CI 1.2 was first introduced. This suggests that these ICUs have not had the same improvement in ICU resources that is suggested by the pooled data.

There was a slight increase in the rate of **CI 1.3: ICU – adult transfer to another facility / area due to unavailability of bed**, compared with a significant reduction in that for CI 1.1: ICU adult non-admission due to inadequate resources, to which it is closely linked. CI 1.3 refers to critically ill patients who cannot be admitted to ICU because of resource limitations and who cannot be managed on a general ward, usually because of...
a requirement for ventilation or vasoactive medications. These patients are often transferred directly from emergency departments. Like CI 1.1, this indicator reflects ICU resources but is less likely to be influenced by rapid response teams and ICU outreach.

CI 1.4: ICU – adult discharge delay >6 hours is a new indicator – the previous version measured delays of more than 12 hours. The baseline rate is 23.3 per 100 patients admitted to ICU – close to one in four, compared with 2010 when approximately one in eight were delayed for more than 12 hours.

This indicator reflects resource issues in the general wards rather than in the ICU. High rates are not necessarily a problem for the quality of patient care within ICUs, unless discharge delay is combined with access block. The rate in public ICUs was almost eight times the private rate. This is likely to reflect the more predictable, elective nature of many patients in the private sector and perhaps less pressure from emergency departments. There is an extremely wide range of rates between different HCOs and a large outlier population where 27.6% of contributing hospitals (29 of 105) had a rate of 47.5 discharge delays per 100 patients. This is likely to have major cost implications for ICUs and potentially redirects funds away from critically ill patients who need the service.

The overall rate for 2011 was 16.2 per 100 patients admitted to ICU, but there was a wide range between the best and poorest performing 20% of HCOs (4.97 vs 27.9 per 100 patients). Rates were higher in NSW and Vic (19.8 and 17.4 per 100 patients respectively) than in SA and Qld. The rate in public hospitals was almost four times that of private ICUs. The number of patients involved is large, and given the increased risk of death associated with after-hours discharge, the potential for saving lives is substantial if changes to this practice can be achieved.

Unfortunately, the issues are complex. After-hours discharge almost invariably occurs because a new patient requires admission to the ICU and there is no other way for the necessary resources (bed, staff, equipment) to be found. It is consequently unpredictable and related to access block in that if a patient is not discharged, access to the new patient is denied.

After-hours discharge might be reduced by increasing ICU resources during the hours of 6pm to 6am but this would have major organisational and cost implications. Other approaches could involve accepting that some level of after-hours discharge is inevitable, and increasing the resources for the patient following their discharge from the ICU.

Intensive care patient management

CI 2.1: Rapid response calls to adult ICU patients within 72 hours of discharge from ICU is a new indicator in 2011. It is a welcome addition since it should go some way toward monitoring any morbidity resulting from after-hours or other early discharge from intensive care (ICU). The annual rate from 45 HCOs was 24.1 per 1,000 patients discharged from ICU and was highest in Victoria (35.4 per 1,000 patients). Two outlier Vic hospitals were responsible for much of this increase. The rate was higher in metropolitan than non-metropolitan HCOs (28.2 vs 12.8 per 1,000 patients) and higher in public than private hospitals (31.1 vs 13.0 per 1,000 patients).

It is difficult to comment on these results at this early stage, and in the absence of any data regarding the indications for, and the outcome from, these rapid response calls. The higher rates in metropolitan and public hospitals could reflect more after-hours / early / unplanned discharges because of increased bed pressure in these ICUs. They could also reflect a better established, and more available, rapid response system in these hospitals, or differing triggers for calls.

Intensive care patient treatment

The role of VTE prophylaxis in reducing morbidity and mortality in patients admitted to the ICU is well established. It can also be seen as a surrogate marker of ‘total patient care’ and attention to detail in ICU patient management.

This rate for CI 3.1: VTE prophylaxis in adults within 24 hours of admission to ICU requires that VTE prophylaxis* be administered according to local protocols. From a rate of 76.2% in 2008, it has increased each year to its highest ever rate of 91%. In 2011 however, 20 of 58 reporting HCOs were outliers with a rate of only 76.4%. Clearly, practice in these outlier organisations will need to be addressed before the overall rate can be improved further. This indicator requires appropriate treatment within 24 hours of admission to ICU, so it is not clear whether any appropriate treatments were not recorded because of a short (less than 24 hours) stay in ICU.†

Central line-associated bloodstream infection (CLABSI)

The number of ICU-associated central line-associated bloodstream infections has decreased progressively since CI 4.1: Adult ICU-associated CLABSI was introduced in 2004 and has been one per 1,000 line-days in 2010 and 2011. These excellent results are likely to have followed from findings published in US literature that checklists for central line insertion resulted in better compliance with sterile procedure, fewer infections and less management.¹ ² and as a result, they have been widely adopted in HCOs
Expert commentary continued: College of Intensive Care Medicine (CICM)

in Australia. The single outlier with a rate of 28 central line-associated bloodstream infections (CI-CLABSI) per 1,000 line-days clearly needs to modify its protocols in accordance with these checklists.

Collection of data for this indicator and for CI 4.2: Adult ICU-associated PI-CLABSI is extremely time consuming – data for each day that a central line is present for each patient need to be collated. This is beyond the means of many ICUs who do not employ data collectors for this purpose and is the probable reason that a relatively small number of HCOs have reported these indicators.

The number of bloodstream infections associated with peripherally inserted central lines has also decreased since 2004. In 2011, the rate for CI 4.2: Adult ICU-associated PI-CLABSI is 0.56%, and there were no outliers and no centile gains. Although these lines are often inserted in the radiology department, compliance with protocols for central line management is the likely cause of these excellent results.

Utilisation of patient assessment systems

CI 5.1 assesses compliance with submitting completed patient data to and review of results from the ANZICS CORE Adult Patient Database. CORE allows benchmarking with other ICUs and review of standardised mortality data. The overall data submission rate of 92.2% is pleasing and is the highest since this indicator was introduced in 2004. The rate was lower in private than in public ICUs (81.1 vs 96.3) likely reflecting more limited resources for data collection in these units. It is not clear why the rate should be lower in SA (74.9%) and to a lesser extent in Vic (68.8%). Almost one-third of HCOs were outliers. The indicator does not address whether these outliers might collect and review data on casemix and standardised mortality ratios using systems other than the ANZICS CORE Adult Patient Database.

Participation in the ANZICS CORE Critical Care Resources survey (CI 5.2) allows valuable data to be collected and analysed regarding the intensive care resources available in Australia, particularly with respect to available beds and staffing levels. It is therefore disappointing that only the responding HCOs answered yes to having responded to the most recent ANZICS CORE Critical Care Resources Survey.

Minimum standards for a rapid response system

Area 6 indicators were first introduced in 2011. The number of HCOs providing data ranged from 23 to 46, less than for many of the other indicators. This may reflect the absence of, or less well established, rapid response systems in some hospitals, and difficulties in collection of hospital-wide data, particularly with respect to the incidence of ‘not for CPR’ orders.

The rate for CI 6.1: Rapid response system calls to adult patients was 23.6 per 1,000 adult hospital admissions. It is not clear at this stage what rate is desirable. The results need to be assessed in the context of other rates in this indicator set. For example, if the rate for this indicator is high and the number of patients experiencing cardiopulmonary arrest or death without a ‘not for CPR’ order is low, then the rapid response system has been successful for the quality of patient care. There will be resource implications, however, if the number of rapid response calls is high. On the other hand, if the number of rapid response calls is low and cardiopulmonary arrest numbers are high, then improvements can be made to patient care.

The rate of CI 6.2: Rapid response system calls to adult patients within 24 hours of admission was 5.0 per 1,000 hospital admissions. As above, it is not clear whether high or low rates are desirable. To some extent this indicator assesses the quality of triage at hospital admission.

The annual rate for CI 6.3: Adult patients experiencing cardiopulmonary arrest was 1.19 per 1,000 hospital admissions. Clearly a low rate is desirable. The rate was higher in non-metropolitan than in metropolitan hospitals (1.72 vs 1.09 per 1,000), and higher in public than in private hospitals (1.38 vs 0.63 per 1,000). The lower rate in private hospitals is likely to reflect a more elective, less acutely ill patient population in these institutions. These patients are more stable and less likely to suffer a cardiac arrest. The higher rate in non-metropolitan HCOs may indicate less resources, such as specialty trained staff, or newly established rapid response teams (RRTs). The reasons for the high outlier rate of 2.5 per 1,000 patients in ten hospitals are unclear.

The rate for CI 6.4: Deaths in adult patients – no NFR order was 1.54 per 1,000 hospital admissions and higher than the rate for the previous indicator (CI 6.3), although the number of contributing HCOs was smaller (23 vs 43) and the results may not be directly comparable. If they are comparable, the findings would suggest that a number of not for resuscitation (NFR) deaths occur without cardiopulmonary resuscitation. The stipulation that no NFR orders are in place suggests that these deaths are unexpected.

Rates were higher in public than in private HCOs (2.44 vs 0.52) again reflecting the more acute, unstable patient population. The overall rate was lowest in NSW, but there were outliers in NSW and the ‘other’ category suggesting more consistent practice in Vic.

* ACHS recommends that outlier organisations should review their data to ensure their data collection processes are in accordance with the User Manual.
† Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) Adult Patient Database
‡ CPR = cardiopulmonary resuscitation. Acronyms vary between locations e.g. NFR (not for resuscitation), DNR (do not resuscitate), DNAR (do not attempt resuscitation).
Expert commentary continued: College of Intensive Care Medicine (CICM)

Clearly, in some institutions a high rate may reflect deficiencies in NFR policies or lack of compliance with NFR policies rather than an elevated number of unexpected deaths.

The annual rate for adult deaths (CI 6.5) was 12.8 per 1,000 adult hospital admissions. This was over five times higher in public than in private hospitals for reasons discussed above. This indicator does not necessarily assess quality of care, and may simply reflect the number of terminally ill patients in Australian hospitals.

References

Expert commentary

Australian College of Critical Care Nurses (ACCCN)

Access and exit block

The rate for CI 1.1: ICU adult non-admission due to inadequate resources has decreased significantly since its highest level in 2004 (7.13%) and is currently at its lowest level of 1.95%.

The rate for CI 1.2: ICU – elective adult surgical cases deferred or cancelled due to unavailability of bed has decreased significantly since 2007 (3.12%). It is currently at its lowest rate of 0.96%, with three more HCOs reporting in 2011 than in 2010. There were eight outlier HCOs responsible for an outlier HCO rate of 4.0 per 100 admissions.

There are multiple factors now influencing access within an HCO or healthcare system, the outcomes of which may flow on to the ICU, e.g.

- increasing use by retrieval services
- smaller ICUs
- use of online reports that provide real-time ICU bed status (in the past, telephone referrals may have resulted in the same patient being refused by several ICUs).

The focus on hospital length of stay may have produced:

- earlier discharges, making hospital beds available, thereby reducing exit block from ICU
- incentives to reduce patient time in emergency departments
- better systems for matching elective admissions to available resources

- increases in the number of ICU beds within the reporting HCOs or a change in configuration of beds to provide greater flexibility; this can sometimes include use of beds physically outside the ICU that may not be ideal for ICU care e.g. the recovery room.

There may also be some occurrences of access block not reported as they do not meet the criteria requiring documented evidence by an intensivist.

The rate for CI 1.3: ICU – adult transfer to another facility / area due to unavailability of bed has increased slightly since 2010 to 0.92%, with the best 20% HCO rate of 0.078% and the poorest 20% HCO rate of 1.32%. This has produced centile gains of 370 patients and outlier gains of 184 patients. There were ten outlier HCOs responsible for an outlier HCO rate of 4.9 per 100 patients.

In spite of the improvements in CIs 1.1 and 1.2, the result for CI 1.3 is not entirely surprising. It would seem that any improvements in bed availability and increased flexibility have been used to accommodate elective surgery, rather than for emergency cases.

Inter-hospital transfer is seen as a last resort, especially where a long period in transit is required and a senior medical officer will be away from the ICU. Given the general reluctance to transfer, an increase would likely indicate that the flexibility described above for CIs 1.1 and 1.2 has been maximised, and there are no other options.

Staffing resources also impact on the availability of ICU beds and models that reduce nurse staffing over weekends may contribute to the need to transfer patients.

CI 1.4: ICU – adult discharge delay >6 hours was changed in 2011 from greater than 12 hours to greater than six hours. Previously, the rate for this indicator was between 11.4% (2009) and 16.6% in 2007. The rate for 2011 using the new time frame of six hours is 23.3%.

The rate for CI 1.5: ICU – adult discharge between 6pm and 6am has remained reasonably constant since 2007 (15.7–17.5%), and is currently 16.2%. There is a large difference between the rates of the best and poorest centiles (4.97% and 27.9%) with centile gains of 6,290 patients, stratum gains of 6,074 patients, and outlier gains of 2,570 patients. These gains are quite large, and are significant when placed in the context of the literature around the consequences of after-hours discharge. The public HCO rate (20.3%) is much higher than the private HCO rate (5.35%). The SA HCO rate is the lowest (7.90%) and the NSW HCO rate is the highest (19.8%). There were 27 outlier HCOs responsible for an outlier HCO rate of 30.6 per 100 patients.
Delays in discharging patients from ICU indicate insufficient ward beds are available. There are several reasons for this:

- Insufficient beds: any increase in beds has been accompanied by an increase in activity with waiting lists and the emergency department being given preference.
- Delays in patient discharge: reasons are multifactorial, and there have been many attempts to rectify them with improved discharge planning, but any further gains are probably reliant on changes in medical and ancillary staff processes.
- An increase in day of surgery admissions; cardiac surgery patients in particular are admitted and go straight to theatre rather than being admitted to the ward the previous day. This used to create an available ward bed for an ICU patient when they went to theatre and then ICU.

Overnight discharges can indicate either a delay, or a premature discharge; in either case they are likely to be done to accommodate another patient. Strategies to avoid delays will need to address ward bed availability, and the local policies and incentives that are in place.

The differences in rates between HCOs in SA and NSW would need to be considered in relation to the number of ICU beds available and the number of admissions per ICU bed.

Assuming there is little difference in the mix or profile of the contributing HCOs over time, these factors have contributed to a situation where a sustained decrease in inter-hospital transfer, delayed discharge, and overnight discharge has not been possible, and reflect a system working beyond capacity.

The differences between the public and private sector ICUs in CI 1.1: ICU adult non-admission due to inadequate resources, CI 1.2: ICU – elective adult surgical cases deferred or cancelled due to unavailability of bed, CI 1.3: ICU – adult transfer to another facility / area due to unavailability of bed, CI 1.4: ICU – adult discharge delay >6 hours and CI 1.5: ICU – adult discharge between 6pm and 6am reflect the predictability of the private system, which predominantly caters for elective admissions.

### Intensive care patient management

CI 2.1: Rapid response calls to adult ICU patients within 72 hours of discharge from ICU was introduced into the collection in 2011, and the rate for that year was 24.1 per 1,000 patients. Only 45 ICUs submitted data for this CI. Being a new indicator, some HCOs may not have had processes in place to provide this particular data; in addition, not all HCOs have a formal rapid response system.

Individual HCO data for this indicator may therefore be more relevant than collective data at this time, as the rates will be influenced by the various approaches to responding to deteriorating patients, including the broad scope of call criteria.

There were four outlier HCOs responsible for an outlier HCO rate of 6.4 per 100 patients.

The metropolitan HCO rate is higher than the non-metropolitan HCO rate (28.2 vs 12.8), the public HCO rate is much higher than the private HCO rate (31.1 vs 13.9), and the Vic HCO rate is much higher than the other states at 35.4 per 1,000 patients.

Differences between metropolitan and non-metropolitan, and public and private ICUs may reflect the variations in rapid response team call-out criteria, but most likely reflect differences in casemix and emergency admissions.

The high rate for Vic may be due to a high number of premature discharges, and interestingly, this correlates with a high rate of discharges between 6pm and 6am. This is likely to be a result of inadequate ICU beds, however with only 11 Vic ICUs submitting data for this CI, it is difficult to know the broader implications.

### Intensive care patient treatment

The rate for CI 3.1: VTE prophylaxis in adults within 24 hours of admission to ICU has reached its highest rate of compliance at 91.0%, however the centile gains are still large at 4,068 patients and outlier gains at 1,714 patients. There were 20 outlier HCOs responsible for an outlier HCO rate of 76.4 per 100 patients.

This can be a difficult CI to collect retrospectively due to inadequate patient notes regarding:

- use of mechanical devices
- contraindications to either chemical or mechanical VTE prophylaxis
- misinterpretation of the definition.

The definition has become clearer, and use of mechanical devices more common, the rate of VTE prophylaxis has improved.

Improved documentation on the use of mechanical devices may have increased the rate in this indicator, as tracking pharmacological prophylaxis is generally easier from patient charts than the use of mechanical devices. Access to mechanical devices for prophylaxis, especially when hired, was identified as a potential problem for non-metropolitan units and this may have improved.

### Central line-associated bloodstream infection (CLABSIs)

The rate for CI 4.1: Adult ICU-associated CI-CLABSIS has remained stable for the last two years at one per 1,000 line-days with small centile gains of 26 patients. One outlier HCO was responsible for an outlier HCO rate of 28.0 per 1,000 line-days.

The rate for CI 4.2: Adult ICU-associated PI-CLABSIS has remained very low since 2007 and is currently at 0.56 per 1,000 line-days. There were no outliers and no centile gains.

### Summary of results: Intensive Care

Expert commentary continued: Australian College of Critical Care Nurses (ACCCN)
Expert commentary continued: Australian College of Critical Care Nurses (ACCCN)

There are several factors that will have contributed to a steady decline in CLABSI over the last few years:

- since 2006, several jurisdictions have implemented CLABSI reduction policies
- The NSW, Vic and WA surveillance bodies adopted a new microbiological definition in mid-2008 that decreased the number of false positive results.

A high number of HCOs submitting from these jurisdictions would obviously improve the rate. An outlier rate of 28 per 1,000 line-days for CI 4.1 warrants further investigation, but may be from an ICU with a small number of central lines, so that each CLASBI event has a heightened impact on the overall rate.

The number of HCOs reporting on Area 4 is very low. Although these central-line associated bloodstream infection indicators are important to clinical management, they have not previously been easy to collect in a consistent fashion across the country, nor easily accessible to ICU clinicians; and where there are no data proving otherwise, the assumption has been that the rate is low.

In addition, this CI was moved to the Intensive Care indicator set from Infection Control in 2011.

As a result of the Australian Commission on Safety and Quality and ANZICS CLABSI Prevention Project¹, all jurisdictions are moving towards a consistent definition, with simpler line-day calculations, so reporting on this indicator should continue to improve.

Utilisation of patient assessment systems

The rate for CI 5.1: Participation in the ANZICS CORE Adult Patient Database (APD) has reached its highest level since 2004 – currently at 92.2%.

The total numbers are impressive. Rate differences may be attributed to variations in resources and methods for data collection, which may be manual and paper-based or electronic, with diverse personnel, from clinicians to dedicated data managers, responsible for data collection.

Minimum standards for a rapid response system

As for the response to CI 2.1: Rapid response calls to adult ICU patients within 72 hours of discharge from ICU, these new Area 6 indicators may have needed new data collection systems to be developed, requiring additional resources.

CI 6.5: Adult deaths is impossible to interpret without risk / casemix adjustment. As an example, the higher public HCO rate is expected due to a high emergency admission rate and, in general, a more complex casemix.

General comments

Given these are ICU CIs, they are likely to only be collected in those HCOs where there are ICUs, whereas they are probably relevant to all HCOs.

It is interesting to note the varying number of HCOs that contribute to each CI; this ranges from 23 to 73, with the proportion from each jurisdiction not necessarily reflecting the actual distribution of ICUs. This is also important in the context of there being a total of approximately 180 ICUs across Australia and New Zealand.

Some of the results therefore need to be interpreted with caution, especially the CIs with particularly low submission rates, as these may not be an accurate reflection of the intensive care system as a whole.

References

In 19 of the 32 indicators in this set, only public HCOs contributed. Approximately 60% of contributions to the PTCA indicators, Cls 1.6 and 1.7, came from private HCOs. Twenty-seven (27) of the indicators had fewer than 1,000 patients or procedures reported.

**Cardiovascular disease**

**Prescription of ACE Inhibitor / Angiotensin II Receptor Antagonist in coronary heart failure (CHF)**

Cl 1.1: CHF – prescribed ACEI / A2RA (H) In 2011, there were 41 patients reported from three HCOs. The annual rate was 70.7 per 100 patients.

**Prescription of beta blocker in CHF**

Cl 1.2: CHF – prescribed beta blocker (H) In 2011, there were 14 patients reported by a single HCO. The annual rate was 85.7 per 100 patients.

**Prescription of warfarin in CHF with AF**

Cl 1.3: CHF and AF – prescribed warfarin (H) In 2011, there were ten patients with coronary heart failure (CHF) and atrial fibrillation (AF) reported from one HCO – all were prescribed warfarin (annual rate 100%).

**Referral to a chronic disease management service – patients discharged with CHF**

Cl 1.4: CHF – Chronic disease management that includes physical rehabilitation (H) In 2011, there were only 12 patients reported – all were referred to a disease management service (annual rate 100%).

**Receipt of thrombolytic therapy for acute myocardial infarction (AMI)**

Cl 1.5: AMI – thrombolysis within 1 hour of presentation (H) In 2011, there were 77 patients reported from seven HCOs. The annual rate for receipt of thrombolytic therapy for acute myocardial infarction (AMI) was 63.6 per 100 patients. There was no significant trend in the fitted rate.

**Clinical outcome of percutaneous transluminal coronary angioplasty (PTCA)**

Cl 1.6: PTCA – vessels where primary success achieved (H) In 2011, there were 7,627 vessels reported from 18 HCOs. The annual rate was 96.7 per 100 vessels. There was no significant trend in the fitted rate. In 2011, there was one outlier submission whose combined excess was nine fewer vessels in which primary success is achieved.

Cl 1.7: PTCA – CABG within 24 hours (L) In 2011, there were 7,406 patients reported from 19 HCOs. The annual rate was 0.095 per 100 patients. The fitted rate improved from 0.39 to 0.18, a change of 0.22 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.24 per 100 patients.

**Endocrine disease**

**Monitoring and prevention of symptomatic hypoglycaemia**

Cl 2.2: Elective surgery – insulin treated diabetes – ≥4 BSLs during first post-op day (H) In 2011, there were 263 patients reported from three HCOs. The annual rate was 97.7 per 100 patients.

Cl 2.3: Elective surgery – insulin treated diabetes – post-operative hypoglycaemia (L) In 2011, there were 258 patients reported from two HCOs. The annual rate was 19.0 per 100 patients.

**Acute stroke management**

**Assessment of swallowing function in patients admitted with stroke**

Cl 3.1: Acute stroke – documented evidence of a swallowing screen prior to food or fluid intake (H) In 2011, there were 494 patients reported from 11 HCOs. The annual rate was 83.6 per 100 patients. In 2011, there was one outlier submission whose combined excess was five fewer inpatients having documented evidence of a swallowing screen.

**Stroke investigation**

Cl 3.2: Acute stroke – documented brain scan within 24 hours of presentation (H) In 2011, there were 1,283 patients reported from 19 HCOs. The annual rate was 92.1 per 100 patients. In 2011, there were two outlier submissions from different HCOs whose combined excess was 15 fewer patients having a documented scan within 24 hours.

**Allied health assessment in patients admitted with a diagnosis of stroke**

Cl 3.3: Acute stroke – documented physiotherapy assessment within 48 hours of presentation (H) In 2011, there were 557 patients reported from a single HCO. The annual rate was 79.2 per 100 patients.

**Receipt of hyperacute pharmacological therapy for ischaemic stroke**

Cl 3.4: Ischaemic stroke – receipt of aspirin within 48 hours of presentation (H) In 2011, there were 305 patients reported from nine HCOs. The annual rate was 72.1 per 100 patients. In 2011, there were two outlier submissions from one HCO whose combined excess was 30 fewer patients receiving aspirin within 48 hours.

Cl 3.5: Ischaemic stroke presenting to the hospital within 4.5 hours of stroke onset – documented evidence of intravenous thrombolysis (H) In 2011, there were 32 patients reported from six HCOs. The annual rate was 71.9 per 100 patients.
Internal Medicine (continued)

Appropriate discharge planning for stroke
CI 3.6: Acute stroke – documented plan for ongoing care developed and provided to patient / family prior to discharge (H) In 2011, there were 522 patients reported from seven HCOs. The annual rate was 70.3 per 100 patients.

CI 3.7: Acute stroke – prescribed and administered antihypertensive medication prior to discharge (H) In 2011, there were 358 patients reported from nine HCOs. The annual rate was 87.2 per 100 patients. In 2011, there was one outlier submission whose combined excess was four fewer patients who are prescribed and administered antihypertensive medication prior to discharge.

Stroke unit care
CI 3.8: Acute stroke – documented treatment in a stroke unit at any time during hospital stay (H) In 2011, there were 862 patients reported from nine HCOs. The annual rate was 68.8 per 100 patients. In 2011, there were two outlier submissions from two HCOs whose combined excess was 38 fewer patients that have documented treatment in a stroke unit at any time during their hospital stay.

Aged care
Assessment of cognitive function – general medical patients ≥65 years at admission
CI 4.1: Medical patients ≥65 years – cognition assessment (H) In 2011, there were 6,081 patients reported from 14 HCOs. The annual rate was 75.0 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were six outlier submissions from six HCOs whose combined excess was 357 fewer patients who have had their cognition assessed.

Assessment of physical function
CI 4.2: Geriatric patients – assessment of physical function documented (H) In 2011, there were 7,922 patients reported from 15 HCOs. The annual rate was 95.1 per 100 patients. The fitted rate improved from 81.5 to 94.4, a change of 13.0 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 12.5 per 100 patients. In 2011, there were five outlier submissions from four HCOs whose combined excess was 143 fewer patients having documented objective assessment of physical function.

Vitamin D therapy for vitamin D deficiency – patients ≥65 years
CI 4.3: Medical patients ≥65 years with vitamin D deficiency prescribed vitamin D (H) In 2011, there were 169 patients reported from two HCOs. The annual rate was 100%.

Respiratory disease
Referral to a chronic disease management service for patients with COPD
CI 5.1: COPD – chronic disease management service referral (H) In 2011, there were 16 patients with chronic obstructive pulmonary disease (COPD) reported from one HCO. The annual rate was 68.8 per 100 patients.

Assessment of asthma severity and asthma management plans
CI 5.2: Acute asthma – initial severity assessment documented (H) In 2011, there were 255 patients reported from ten HCOs. The annual rate was 95.3 per 100 patients. There was no significant trend in the fitted rate. In 2011, there was one outlier submission.

CI 5.3: Acute asthma – ongoing severity assessment documented (H) In 2011, there were 237 patients reported from nine HCOs. The annual rate was 95.3 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were three outlier submissions from three HCOs whose combined excess was nine fewer patients with objective assessment of severity, in addition to their initial assessment.

CI 5.4: Acute asthma – appropriate discharge plan documented (H) In 2011, there were 412 patients reported from 12 HCOs. The annual rate was 68.7 per 100 patients. The fitted rate improved from 44.6 to 77.4, a change of 32.9 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 30.5 per 100 patients.

Gastrointestinal disease
Management of haematemesis and/or melaena patients given blood transfusion
CI 6.1: Haematemesis / melaena, blood transfusion – gastroscopy within 24 hours (H) In 2011, there were 475 patients reported from seven HCOs. The annual rate was 74.1 per 100 patients. The fitted rate improved from 61.0 to 77.5, a change of 16.5 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 12.7 per 100 patients.
Summary of results:

Internal Medicine

CI 6.2: Haematemesis / melaena, blood transfusion – cause of bleeding diagnosis (H) In 2011, there were 549 patients reported from six HCOs. The annual rate was 79.6 per 100 patients. The fitted rate improved from 67.5 to 80.7, a change of 13.2 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 13.8 per 100 patients. In 2011, one outlier submission represented a combined excess of two fewer patients discharged with a specific diagnosis that explains the cause of bleeding.

CI 6.3: Haematemesis / melaena, blood transfusion – surgical staff notification (H) In 2011, there were 304 patients reported from two HCOs. The annual rate was 31.3 per 100 patients.

CI 6.4: Haematemesis / melaena, blood transfusion – operation during the same admission (N) In 2011, there were 539 patients reported from five HCOs. The annual rate was 5.6 per 100 patients. The fitted rate decreased from 11.4 to 5.4, a change of six per 100 patients.

CI 6.5: Haematemesis / melaena, blood transfusion and endoscopic therapy – operation during the same admission (N) In 2011, there were 539 patients reported from five HCOs. The annual rate was 3.5 per 100 patients. There was no significant trend in the fitted rate.

CI 6.6: Haematemesis / melaena with blood transfusion – death (L) In 2011, there were 558 patients reported from six HCOs. The annual rate was 6.5 per 100 patients. There was no significant trend in the fitted rate.

Renal disease

Adequacy and safety of renal biopsy
CI 7.1: Renal biopsy – macroscopic haematuria within 24 hours of procedure (L) In 2011, there were 722 patients reported from eight HCOs. The annual rate was 2.9 per 100 patients. There was no significant trend in the fitted rate.

Oncology

Use of systemic adjuvant treatment for Stage II breast cancer
CI 8.1: Pre-menopausal patients with Stage II carcinoma of breast – poly-chemotherapy (H) In 2011, there were 77 patients reported from five HCOs. The annual rate was 88.3 per 100 patients. There was no significant trend in the fitted rate.
Of the six indicators that were suitable for trending, two improved and two deteriorated. There was a significant contribution from private HCOs to these indicators, in excess of 50% of patients covered in several indicators.

**Reporting of adverse drug reactions to the TGA**

**CI 1.1: Adverse drug reactions reported to OPC, TGA (N)**

In 2011, there were 893,193 separations reported to the Therapeutic Goods Administration (TGA) from 97 HCOs. The annual rate was 0.12 per 100 separations. The fitted rate decreased from 0.17 to 0.093, a change of 0.074 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period.

**Medication errors resulting in an adverse event**

**CI 2.1: Medication errors – adverse event requiring intervention (L)**

In 2011, there were 7,132,050 bed days reported from 247 HCOs. The annual rate was 0.013 per 100 bed days. The fitted rate improved from 0.051 to 0.030, a change of 0.021 per 100 bed days. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.020 per 100 bed days. In 2011, there were 21 outlier submissions from 17 HCOs whose combined excess was 330 more medication errors resulting in an adverse event requiring intervention.

**Documentation of adverse drug reactions (ADR)s**

**CI 3.1: Known ADRs documented in current medication chart (H)**

In 2011, there were 15,674 patients reported from 57 HCOs. The annual rate was 93.0 per 100 patients. The fitted rate deteriorated from 86.0 to 82.6, a change of 3.4 per 100 patients. In 2011, there were seven outlier submissions from seven HCOs whose combined excess was 128 fewer patients discharged on warfarin who received written drug information upon discharge.

**Error-prone abbreviations**

**CI 4.1: Medication orders with error-prone abbreviations (L)**

In 2011, 58,827 medication orders were reported from 97 HCOs. The annual rate was 4.7 per 100 medication orders. There were 12 outlier submissions from nine HCOs whose combined excess was 1,072 more medication orders that include error-prone abbreviations.

**Warfarin management**

**CI 5.1: Warfarin – abnormal bleeding (L)**

In 2011, there were 35 submissions reported from 24 HCOs. The annual rate was 1.4 per 100 separations. The fitted rate deteriorated from 0.45 to 0.77, a change of 0.32 per 100 separations. In 2011, there were three outlier submissions from two HCOs whose combined excess was nine more separations of inpatients receiving warfarin who experience abnormal bleeding. The outlier HCO rate was 11.8 per 100 separations.

**CI 5.2: Warfarin – INR / prothrombin reading >5 (L)**

In 2011, there were 7,296 separations reported from 26 HCOs. The annual rate was 2.2 per 100 separations. The fitted rate improved from 4.2 to 2.8, a change of 1.3 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.4 per 100 separations. In 2011, there were two outlier submissions from a single HCO whose combined excess was 35 more separations receiving warfarin as an inpatient with an INR* reading greater than 5.

**CI 5.3: Warfarin – written drug information upon discharge (H)**

In 2011, there were 2,728 patients reported from 20 HCOs. The annual rate was 84.2 per 100 patients. In 2011, there were seven outlier submissions from seven HCOs whose combined excess was 128 fewer patients discharged on warfarin who received written drug information upon discharge.

**CI 5.4: Warfarin – dosage review following high INR result (H)**

In 2011, there were 280 patients reported from 23 HCOs. The annual rate was 96.8 per 100 patients. In 2011, there were two outlier submissions from two HCOs whose combined excess was six fewer patients whose dosage has been adjusted or reviewed prior to the next warfarin dose.

**CI 5.5: Warfarin – starting doses consistent with hospital approved protocol (H)**

In 2011, there were 85 patients reported from seven HCOs. The annual rate was 67.1 per 100 patients.

**Timely and appropriate monitoring of aminoglycoside antibiotics**

**CI 6.1: Aminoglycoside toxicity – dosage adjustment prior to next dose (H)**

In 2011, there were 46 patients reported from three HCOs. The annual rate was 97.8 per 100 patients.

*The International Normalised Ratio is a test for blood clotting.*
Expert commentary

Therapeutic Goods Administration (TGA)

Reporting of adverse drug reactions to the TGA

Although the number of adverse drug reaction reports submitted to the TGA increased from almost 11,000 in 2004 to 14,500 in 2011, there has been a drop in reporting of CI 1.1 by HCOs from a peak of 3,010 in 2004 to 1,660 in 2011. This is contrary to international trends, where the number of hospital admissions, and hospital admissions extended by adverse drug reactions, is increasing. Australia shares an ageing population and the tendency to increasing polypharmacy, suggesting a likely increase in the total number of adverse drug reactions (ADRs) experienced by consumers. While the rate of reporting increased in 2011 to a rate of 0.12 reports per 100 separations, it is not clear why the number of reports and the number of reporting HCOs has dropped, particularly since there is a requirement for the clinical workforce in public hospitals to document patients’ previously known ADRs and report them to the TGA.

The TGA seeks information from a variety of sources when monitoring the safety of medicines and vaccines on the market. One source of information is spontaneous adverse event reporting. The TGA encourages all hospitals to ensure that they have systems in place for reporting adverse events related to medicines.

Adverse event reports from hospitals are particularly important to the TGA for a number of reasons:

• hospitals have early experience with new medicines and/or their use in people with co-morbidities who would be excluded from clinical trials, and therefore may detect new signals;
• hospitals are encouraged to have in place systems to ensure that ADRs are identified and reported internally and to the TGA and
• patients may present to a hospital following a serious ADR.

The TGA encourages all health professionals to report adverse events associated with medicines and thus contribute to the post-market detection and understanding of adverse drug reactions. The TGA supports the use of e-prescription forms to increase ADR reporting, and looks forward to the update of the software functionality.

Warfarin management

The TGA encourages the collection of data on reporting rates of warfarin, however has no specific comment on these indicators (CIs 5.1–5.5). As other anticoagulants gain market prominence, their potential for exacerbating morbidity and mortality may need to be monitored. The TGA suggests that consideration be given to collecting data on the use of other anticoagulants as they become available.

References

Mental Health Community Based

Twenty-one (21) HCOs submitted data to this indicator set in 2010 and 2011. Almost all clients were reported by public HCOs (98% overall). All indicators in this set show large variation between HCOs as measured by differences in the centiles.

Community

CI 1.1: Consumers seen face-to-face by community service (N) In 2011, there were 70,254 consumers reported from 19 HCOs. The annual rate was 79.1 per 100 consumers. The fitted rate increased from 76.0 to 81.0, a change of 5.0 per 100 consumers.

CI 1.2: Consumers / carers – >24 treatment days over 3 month period (N) In 2011, there were 58,713 consumers reported from 16 HCOs. The annual rate was 15.1 per 100 consumers. The fitted rate increased from 2.6 to 14.9, a change of 12.3 per 100 consumers.

CI 1.3: Consumers / carers – ≥3 face-to-face contacts within 7 day period (N) In 2011, there were 40,278 consumers reported from 12 HCOs. The annual rate was 20.3 per 100 consumers. The fitted rate decreased from 22.4 to 15.9, a change of 6.5 per 100 consumers.

CI 1.4: Consumers – admitted for psychiatric reasons in first year of treatment (L) In 2011, there were 26,912 consumers reported from ten HCOs. The annual rate was 12.3 per 100 consumers. The fitted rate improved from 13.6 to 10.9, a change of 2.7 per 100 consumers. In 2011, there were four outlier submissions from four HCOs whose combined excess was 820 more consumers who were admitted to hospital for psychiatric reasons in the first year of treatment.

Care planning

CI 2.1: Consumers – current completed care plans (H) In 2011, there were 13,955 consumers reported from six HCOs. The annual rate was 18.5 per 100 consumers. In 2011, there were three outlier submissions from three HCOs whose combined excess was 792 fewer consumers with current completed care plans.

CI 2.2: Carers involved in care plan development (H) In 2011, there were 13,572 consumers reported from five HCOs. The annual rate was 9.6 per 100 consumers. In 2011, there were three outlier submissions from three HCOs whose combined excess was 559 fewer carers involved in developing care plans.

Expert commentary

Royal Australian and New Zealand College of Psychiatrists (RANZCP)

Community

Since 2007, the rates for CI 1.1: Consumers seen face-to-face by community service have remained reasonably constant at 75.7% to 81.7%. In this time, the number of reporting HCOs has decreased to 19. Monitoring this indicator appears to have limited utility.

CI 1.2: Consumers / nominated carers – >24 treatment days over 3 month period appears to be reasonably volatile, changing with different reporting HCOs. Only 16 HCOs reported on this indicator in 2011. This is probably a good measure of high quality community services. It is interesting that it has not been reported consistently.

The rate for CI 1.4: Consumers – admitted to hospital for psychiatric reasons in first year of treatment is 12.3%, with the best 20% HCO rate of 3.04% and the poorest 20% HCO rate at 17.0%. Centile gains are reasonably large at 2,486 patients. Additionally, there were four outlier HCOs responsible for an outlier HCO rate of 17.8 per 100 consumers.

RANZCP notes the pleasing overall movement. It is likely that the outlier HCOs differ in scope and type from others.

Care planning

CI 2.1: Consumers – current completed care plans appears to be reasonably volatile, changing with different reporting HCOs. Only six HCOs have reported on this indicator in 2011.

The completion of care plans may be an emerging practice for the reporting HCOs, not embedded practice. This may also apply to CI 2.2: Carers involved in care plan development, where the reported rate is very low. In 2011, only five HCOs reported on this indicator. The rate has changed with different reporting HCOs.
Since 2004, approximately 120 HCOs have contributed to these indicators. Of the 28 indicators in this set, 26 were tested for trend. Of these, 18 showed statistically significant improvement, 12 of which were also statistically significant after allowing for variation due to changes in the HCOs that contribute. Five indicators showed a statistically significant deterioration, two of which were significant after adjusting for variation due to changes in the composition of contributing HCOs.

In areas 1, 2, and 3 (diagnosis and care plan, physical examination and medication on discharge), the rates for these six process indicators differ little between public and private HCOs. The same is true for the process indicators in areas 9 and 10 (discharge summary and regular review).

In most of the years of collection, in the areas of electroconvulsive therapy (ECT), seclusion and physical restraint, injury and assault, readmission and death (CIs 4.1, 5.1, 6.2, 7.1, 8.1), public rates have been at least twice the private rates.

The private rate of voluntary admission has been twice that of the public rate, 90% compared to 43% (CI 12.1). Across all the indicators in this set, state differences and metropolitan / non-metropolitan differences have not been consistent over time.

**Diagnosis and care planning**

**CI 1.1: Diagnosis allocated within 24 hours of admission (H)** In 2011, there were 43,198 patients reported from 73 HCOs. The annual rate was 92.3 per 100 patients. The fitted rate deteriorated from 94.4 to 93.0, a change of 1.4 per 100 patients. In 2011, there were 27 outlier submissions from 21 HCOs whose combined excess was 1,752 fewer inpatients allocated a diagnosis within 24 hours of admission.

**CI 1.2: Documented diagnosis upon discharge (H)** In 2011, there were 45,857 patients reported from 74 HCOs. The annual rate was 88.3 per 100 patients. The fitted rate improved from 87.3 to 89.1, a change of 1.8 per 100 patients. In 2011, there were 33 outlier submissions from 25 HCOs whose combined excess was 2,531 fewer inpatients with a diagnosis recorded on hospital discharge.

**CI 1.3 Individual care plan – regularly reviewed with consumer (H)** In 2011, there were 32,126 patients reported from 54 HCOs. The annual rate was 83.4 per 100 patients. The fitted rate improved from 80.6 to 83.0, a change of 2.4 per 100 patients. In 2011, there were 21 outlier submissions from 16 HCOs whose combined excess was 2,312 fewer inpatients with an individual care plan which is regularly reviewed with the consumer.

**Physical examination of patients**

**CI 2.1: Physical examination documented within 48 hours of admission (H)** In 2011, there were 39,248 patients reported from 77 HCOs. The annual rate was 85.9 per 100 patients. The fitted rate deteriorated from 87.0 to 84.3, a change of 2.7 per 100 patients. In 2011, there were 33 outlier submissions from 24 HCOs whose combined excess was 2,228 fewer inpatients with a complete physical examination within 48 hours of admission.

**Prescribing patterns**

**CI 3.1: Discharged on ≥3 psychotropic medications from 1 sub-group category (L)** In 2011, there were 20,820 patients reported from 46 HCOs. The annual rate was 5.5 per 100 patients. The fitted rate improved from 12.7 to 4.1, a change of 8.6 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 7.9 per 100 patients. In 2011, there were 16 outlier submissions from 12 HCOs whose combined excess was 576 more patients on three or more psychotropic medications, from one sub-group category, at the time of discharge.

**Electroconvulsive therapy (ECT)**

**CI 4.1: Acute inpatients undergoing >12 treatments of ECT (L)** In 2011, there were 5,520 patients reported from 68 HCOs. The annual rate of inpatients receiving more than 12 electroconvulsive therapy (ECT) treatments was 7.5 per 100 patients. The fitted rate improved from 10.3 to 9.1, a change of 1.1 per 100 patients. In 2011, there were 14 outlier submissions from nine HCOs whose combined excess was 117 more patients undergoing more than 12 treatments of ECT.

**CI 4.2: Major medical complications while undergoing ECT (L)** In 2011, there were 4,876 patients reported from 63 HCOs. The annual rate was 0.49 per 100 patients. There was no significant trend in the fitted rate. In 2011, there was one outlier submission with a combined excess of one more patient experiencing major medical complications while undergoing ECT.

**Use of seclusion and restraint**

**CI 5.1: Seclusion – ≥1 episode during admission (L)** In 2011, there were 26,734 patients reported from 51 HCOs. The annual rate was 8.2 per 100 patients. The fitted rate improved from 10.7 to 8.0, a change of 2.7 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.8 per 100 patients. In 2011, there were 19 outlier submissions from 13 HCOs whose combined excess was 485 more inpatients having at least one episode of seclusion.
Mental Health Inpatient (continued)

CI 5.2: Seclusion – ≥2 episodes of seclusion (L)
In 2011, there were 2,013 patients reported from 44 HCOs. The annual rate was 33.7 per 100 patients. The fitted rate improved from 42.1 to 35.6, a change of 6.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 6.5 per 100 patients.

CI 5.3: Seclusion – ≥4 hours in 1 episode (L)
In 2011, there were 2,019 patients reported from 45 HCOs. The annual rate was 53.1 per 100 patients. The fitted rate deteriorated from 33.5 to 52.9, a change of 19.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 20.6 per 100 patients. In 2011, there were seven outlier submissions from four HCOs whose combined excess was 161 more inpatients having a seclusion episode lasting more than four hours.

CI 5.4: Seclusion – not reviewed by sight at least half-hourly (L)
In 2011, there were 1,567 patients reported from 35 HCOs. The annual rate was 0.13 per 100 patients. The fitted rate improved from 0.98 to 0.39, a change of 0.59 per 100 patients.

CI 5.5: Seclusion – major complications (L)
In 2011, there were 1,476 patients reported from 35 HCOs. The annual rate was 0.68 per 100 patients. There was no significant trend in the fitted rate.

CI 5.6: Total seclusion episodes (L)
In 2011, there were 1,431 patients reported from 35 HCOs. For those patients managed with seclusion, the average number of seclusions was 3.3.

CI 5.7: Physical restraint – ≥1 episode (L)
In 2011, there were 17,913 patients reported from 37 HCOs. The annual rate was 1.2 per 100 patients. The fitted rate improved from 2.9 to 0.97, a change of 1.9 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.1 per 100 patients. In 2011, there were eight outlier submissions from six HCOs whose combined excess was 107 more inpatients having at least one episode of physical restraint.

CI 5.8: Physical restraint – major complications (L)
In 2011, there were 778 separations reported from 15 HCOs. The annual rate was 0.13 per 100 separations.

Major critical incidents
CI 6.1: Attempted or actual suicide (L)
In 2011, 82,368 patients were reported from 89 HCOs. The annual rate was 0.29 per 100 patients. The fitted rate improved from 0.60 to 0.40, a change of 0.20 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.19 per 100 patients. In 2011, there were 11 outlier submissions from ten HCOs whose combined excess was 43 more inpatients with an attempted or actual suicide.

CI 6.2: Assault (L)
In 2011, there were 56,919 patients reported from 84 HCOs. The annual rate was 1.6 per 100 patients. The fitted rate improved from 3.0 to 1.8, a change of 1.3 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.3 per 100 patients. In 2011, there were 31 outlier submissions from 21 HCOs whose combined excess was 440 more inpatients who assault.

CI 6.3: Assault – ≥2 occasions (L)
In 2011, there were 775 patients reported from 48 HCOs. The annual rate was 27.2 per 100 patients. There was no significant trend in the fitted rate.

CI 6.4: Significant self-mutilation (L)
In 2011, there were 79,783 patients reported from 82 HCOs. The annual rate was 0.33 per 100 patients. The fitted rate improved from 0.84 to 0.35, a change of 0.50 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.48 per 100 patients. In 2011, there were 16 outlier submissions from 13 HCOs whose combined excess was 94 more inpatients who undertake significant self-mutilation.*

CI 6.5: Significant other injuries (L)
In 2011, there were 41,934 patients reported from 68 HCOs. The annual rate was 0.26 per 100 patients. The fitted rate improved from 0.65 to 0.26, a change of 0.38 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.38 per 100 patients. In 2011, there were eight outlier submissions from seven HCOs whose combined excess was 30 more inpatients suffering significant other injuries.*

CI 6.6: Assaults by staff / visitors / other inpatients (L)
In 2011, there were 38,392 patients reported from 61 HCOs. The annual rate was 0.77 per 100 patients. The fitted rate improved from 1.2 to 0.75, a change of 0.48 per 100 patients. There were 11 outlier submissions from nine HCOs whose combined excess was 133 more inpatients assaulted by staff, visitors or other inpatients.

* In the context of CIs 6.4 and 6.5, injuries or self-mutilation that meet the definition of ‘significant’ are those requiring medical intervention.
Readmissions to hospital

CI 7.1: Unplanned readmissions within 28 days (L)
In 2011, there were 59,500 separations reported from 89 HCOs. The annual rate was 6.8 per 100 separations. The fitted rate improved from 8.7 to 6.9, a change of 1.7 per 100 separations. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.8 per 100 separations. In 2011, there were 29 outlier submissions from 23 HCOs whose combined excess was 1,061 more unplanned readmissions within 28 days.

Mortality

CI 8.1: Deaths (L) In 2011, there were 51,747 inpatients reported from 78 HCOs. The annual rate was 0.052 per 100 inpatients. The fitted rate improved from 0.096 to 0.066, a change of 0.030 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.031 per 100 inpatients.

Continuity of care

CI 9.1: Discharge summary / letter upon discharge (H)
In 2011, there were 41,641 patients reported from 75 HCOs. The annual rate was 74.1 per 100 patients. The fitted rate deteriorated from 77.3 to 71.4, a change of 5.9 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 6.1 per 100 patients. In 2011, there were 32 outlier submissions from 23 HCOs whose combined excess was 3,618 fewer inpatients who have a discharge summary or letter at the time of discharge.

CI 9.2: Final discharge summary recorded within 2 weeks of discharge (H)
In 2011, there were 44,877 patients reported from 74 HCOs. The annual rate was 78.4 per 100 patients. The fitted rate deteriorated from 80.5 to 76.2, a change of 4.3 per 100 patients. In 2011, there were 33 outlier submissions from 23 HCOs whose combined excess was 3,832 fewer inpatients who have a final discharge summary recorded in the medical record within two weeks of discharge.

Long term care

CI 10.1: Three-monthly multidisciplinary review (H)
In 2011, there were 725 long term mental health inpatients reported from 31 HCOs. The annual rate was 92.0 per 100 inpatients. The fitted rate improved from 76.7 to 93.8, a change of 17.1 per 100 inpatients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 17.0 per 100 inpatients. In 2011, there was one outlier submission whose combined excess was 43 fewer inpatients who have a multidisciplinary review recorded every three months.

Average length of stay (LOS)

CI 11.1: Acute unit – LOS >30 days (L)
In 2011, there were 38,583 inpatient episodes reported from 68 HCOs. The annual rate was 15.3 per 100 inpatient episodes. The fitted rate improved from 19.1 to 14.9, a change of 4.2 per 100 inpatient episodes. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 4.1 per 100 inpatient episodes. In 2011, there were 19 outlier submissions from 13 HCOs whose combined excess was 894 more inpatients in an acute unit with a length of stay greater than 30 days.

Admission

CI 12.1: Voluntary inpatient admissions (N)
In 2011, there were 27,264 admissions reported from 49 HCOs. The annual rate was 57.0 per 100 admissions. The fitted rate increased from 51.0 to 57.4, a change of 6.4 per 100 admissions.
Expert commentary

Royal Australian and New Zealand College of Psychiatrists (RANZCP)

**Diagnosis and care planning**

The rate for CI 1.1: Diagnosis allocated within 24 hours of admission has been stable since 2004 (currently 92.3%), however 21 outlier HCOs have produced an outlier HCO rate of 74.7 per 100 patients. Outlier HCOs are worth further examination. Their results may indicate some problem; they are possibly provincial units with limited medical staffing after-hours.

The rate for CI 1.2: Documented diagnosis upon discharge has remained stable since 2004 (currently 88.3%), however 25 outlier HCOs have produced an outlier HCO rate of 68.8 per 100 patients. Outlier HCOs are worth further examination – they are possibly provincial units with limited medical staffing after-hours.

The rate for CI 1.3: Individual care plan – regularly reviewed with consumer has remained stable since 2004 (currently 83.4%), with 16 outlier HCOs producing an outlier HCO rate of 56.8 per 100 separations. The rate of 99.7%, achieved by the better performing 20% of reporting HCOs, is impressive.

**Physical examination of patients**

The rate for CI 2.1: Physical examination documented within 48 hours of admission is 85.9%, but 24 outlier HCOs have an outlier HCO rate of 66.9 per 100 patients. The RANZCP examination has increased the emphasis on this issue in recent times.

**Prescribing patterns**

The rate for CI 3.1: Discharged on ≥3 psychotropic medications from 1 sub-group category is 5.46%, and 12 outlier HCOs have led to an outlier HCO rate of 19.2 per 100 patients.

RANZCP is pleased to note the persistent decline in all cohorts and expects ongoing falls in this indicator, although with a slower phase for the outlier group.

**Electroconvulsive therapy (ECT)**

The rate for CI 4.1: Acute inpatients undergoing ≥12 treatments of ECT increased to a peak in 2008 (12.5%) but has now reduced to its lowest rate of 7.52%. WA has the lowest rate of 3.26% and NSW the highest rate of 18.1%, with nine outlier HCOs with an outlier HCO rate of 27.9 per 100 separations.

The outliers are likely to be quaternary treatment centres*. The outliers are likely to be quaternary treatment centres*. The outliers are likely to be quaternary treatment centres*. The outliers are likely to be quaternary treatment centres*.

**Use of seclusion and restraint**

The rate for CI 5.1: Seclusion – ≥1 episode during admission has remained constant since 2007 at 8.24–9.46%, however there are notable differences between the rates achieved by the best centile of reporting HCOs (3.14–5.17%) and the poorest centile of HCOs (13.2–14.1%). In 2011, centile gains were 1,365 patients. There were 13 outlier HCOs with an outlier HCO rate of 16.5%.

The overall decline over time is pleasing. It is likely that this measure reflects other care elements.

It is pleasing to see the rate for CI 5.2: Seclusion – ≥2 episodes of seclusion has reduced to its lowest level since 2004 (currently 33.7%). Qld had a higher stratum rate of 40.3%, however these data came from only six HCOs.

The rate for CI 5.3: Seclusion – >4 hours in 1 episode has increased to its highest level since 2003 (currently 53.1%), with WA having the lowest rate (28.8%) and Vic the highest rate (66.9%). The best 20% HCO rate is 24.6% and the poorest 20% HCO rate is 66.8%, with centile gains of 577 patients. Additionally, four outlier HCOs have produced an outlier HCO rate of 83.8 per 100 separations.

These findings are worthy of further examination; this may be a reporting artefact.

With the rate for CI 5.4: Seclusion – not reviewed by sight at least half-hourly consistently remaining less than 1.0% since 2004, it seems unlikely that further improvement will be achieved. Thirty-five (35) HCOs submitted data in 2011.

The rate for CI 5.5: Seclusion – major complications has increased since 2008 to its highest rate of 0.68%. This increase is likely due to better reporting and identification of these complications.

The mean rate for CI 5.6: Total seclusion episodes has been gradually increasing since 2009, reaching its highest mean rate of 3.3 episodes despite the number of reporting HCOs decreasing. This possibly reflects changing population issues.

The rate for CI 5.7: Physical restraint – ≥1 episode is 1.16%, but the best 20% HCO rate is 0.042% and the poorest 20% HCO rate is 1.89%, with centile gains of 199 patients. Additionally, six outlier HCOs were responsible for an outlier HCO rate of 6.4%. This is likely to be a result of ongoing improvement; HCOs with higher rates can continue to improve.

**Major critical incidents**

The rate for CI 6.1: Attempted or actual suicide has reached its lowest level since 2004 (0.29%), with the best 20% HCO rate at 0.19% and the poorest HCO rate at 0.62%, with centile gains of 83 patients. SA has the lowest rate (0.036%) and Vic has the highest rate (0.51%). These are very low rates overall; a change in acuity may account for the difference in rates.

* Quarternary treatment centres are HCOs or units providing highly specialised care to which tertiary care patients are referred.
Expert commentary continued: Royal Australian and New Zealand College of Psychiatrists (RANZCP)

CI 6.2: Assault is at its lowest level since 2004 (currently 1.57%), however, as expected, the private rate is lower than the public rate. Additionally, 21 outlier HCOs have produced an outlier HCO rate of 6.8 per 100 patients. Differences in HCO catchment may account for differences seen between the best centile rate (0.11%) and the poorest centile rate (3.47%).

CI 6.3: Assault – ≥2 occasions has remained reasonably constant since 2009 (26.4–27.2%), however the best 20% HCO rate is 23.1% and the poorest 20% HCO rate is 31.0%. These variations are likely to reflect differences in population groups between HCOs.

CI 6.4: Significant self-mutilation is at its lowest level since 2004 (currently 0.33%), with SA’s five reporting HCOs having the lowest rate. The best 20% HCO rate is 0.11% and the poorest 20% HCO rate is 0.73%. This pleasing result may be related to improved physical environment.

It is very pleasing to see that the rate for significant other injuries (CI 6.5) remains low at 0.26%, however the best centile rate is 0.085% and the poorest centile rate is 0.35%, with centile gains of 72 patients. Seven outlier HCOs are responsible for an outlier HCO rate of 1.7 per 100 patients.

CI 6.6: Assaults by staff / visitors / other inpatients is at its lowest level since 2006 (currently 0.77%), and the private rate (0.15%) is much lower than the public rate (1.66%), which is as expected. Nine outlier HCOs have produced an outlier HCO rate of 4.2 per 100 patients. The best 20% HCO rate is 0.062% and the poorest 20% HCO rate is 1.29% – the differences between organisations with higher and lower rates are likely to be predictable and relate to the casemix or type of facility.

Readmissions to hospital

The rate for CI 7.1: Unplanned readmissions within 28 days has fallen to its lowest level since 2004 (currently 6.84%), and the public rate (9.88%) is over twice as high as the private rate (4.73%). This lower rate would be expected from the private sector and is likely to be a function of the quality of out-of-hospital care.

Mortality

CI 8.1: Deaths remained constant between 2004 and 2010 (0.058–0.097%), but reached their lowest level in 2011 (0.052%) – representing six fewer inpatient deaths or a reduction by approximately one-fifth. In 2011, 78 HCOs submitted data and it is likely that these figures are near to the lowest achievable rate.

Continuity of care

The rate for CI 9.1: Discharge summary / letter upon discharge has increased to 74.1% since 2010, when the rate fell to 69.4%, its lowest level since 2004. In 2011, the poorest 20% HCO rate was 55.8%, while the best centile rate was 97.5%, with centile gains of 9,745 patients. This fall in performance is likely to be related to reduced administrative support for doctors.

Differences in rates for CI 9.2: Final discharge summary recorded within 2 weeks of discharge between the poorest 20% HCO rate at 56.4% and the best 20% HCO rate at 94.6% may also reflect reduced administrative support for doctors. In 2011, centile gains comprise 7,277 patients and outlier gains comprise 3,832 patients.

Long term care

The rate for CI 10.1: Three-monthly multidisciplinary review tends to improve with multidisciplinary contact with a psychiatrist. The rate has reduced since 2010, and is now 92.0%. Overall, RANZCP believes these rates are relatively high overall. The poorest 20% HCO rate, however, has increased from 90.0% to 96.5%, and the best 20% HCO rate has increased from 98.5% to 99.6%. The private HCO rate is much lower than the public HCO rate (76.6% vs 98.9%) – possibly reflecting funding issues within the private sector. Despite this increase, there are still centile gains of 55 patients, stratum gains of 51 patients, and outlier gains of 44 patients. One outlier HCO is responsible for an outlier HCO rate of 29.6%.

Average length of stay (LOS)

The rate for CI 11.1: Acute unit – LOS >30 days reflects the appropriateness of length of stay in an acute inpatient unit, and is likely reflective of effective community-based care. In 2011, the indicator is at its lowest level since 2006 (currently 15.3%). The best 20% HCO rate is 8.16% and the poorest 20% HCO rate is 21.4%, with centile gains of 2,756 patients.
In 2011, 186 HCOs submitted data to this set. Across most of the indicators, about 60% of births were reported by public HCOs.

Three of the 19 CIs in this set improved and nine deteriorated, however in the latter case only three deteriorating trends were significant after adjusting for differences over the years in the HCOs contributing.

**Outcome of selected primipara**

These four indicators have been collected since 2008. The rates for these indicators have varied little since then. In CIs 1.1 and 1.4, there are public / private differences. The private rates of intervention are higher than those from the public sector when the data are combined over the last two years. That is:

- for spontaneous vaginal birth (CI 1.1), the private rate was 35.2% and the public rate was 52.7%
- for caesarean section (CI 1.4), the private rate was 36.3% and the public rate was 23.0%.

**CI 1.1: Selected primipara – spontaneous vaginal birth (H)**

In 2011, there were 50,507 primipara reported from 165 HCOs. The annual rate was 45.0 per 100 primipara. The fitted rate deteriorated from 46.0 to 45.1, a change of 0.95 per 100 primipara. In 2011, there were 27 outlier submissions from 20 HCOs whose combined excess was 1,374 fewer primipara who have a spontaneous vaginal birth.

**CI 1.2: Selected primipara – induction of labour (L)**

In 2011, 50,141 primipara were reported from 160 HCOs. The annual rate was 30.7 per 100 primipara. The fitted rate deteriorated from 27.4 to 30.5. This trend was also significant after allowing for the changes in the HCOs contributing over the period. The rate change was 3.1 per 100 primipara. In 2011, there were 14 outlier submissions from ten HCOs.

**CI 1.3: Selected primipara – instrumental vaginal birth (L)**

In 2011, there were 49,988 primipara reported from 158 HCOs. The annual rate was 24.8 per 100 primipara. The fitted rate deteriorated from 24.0 to 24.6, a change of 0.59 per 100 primipara. In 2011, there were 13 outlier submissions from ten HCOs whose combined excess was 489 more primipara who undergo an instrumental vaginal birth.

**CI 1.4: Selected primipara – caesarean section (L)**

In 2011, there were 50,431 primipara reported from 158 HCOs. The annual rate was 29.2 per 100 primipara. The fitted rate deteriorated from 27.9 to 28.7, a change of 0.81 per 100 primipara. In 2011, there were 24 outlier submissions from 18 HCOs whose combined excess was 1,002 more primipara undergoing caesarean section.

**Vaginal birth after caesarean section (VBAC)**

**CI 2.1: Vaginal delivery following a previous primary caesarean section (N)**

This CI has been collected since 2003. The apparent trend is small and the 20th and 80th centile rates have remained close to 7.5% and 20% respectively, indicating that there is considerable variation between HCOs. Since 2004, the private rate has been approximately half the public rate.

In 2011, there were 20,651 deliveries reported from 139 HCOs. The annual rate was 13.1 per 100 deliveries. There was no significant trend in the fitted rate.

**Major perineal tears and surgical repair of the perineum**

These six indicators that measure perineal injury in primiparous women delivering vaginally have been collected since 2008.

There are public / private differences in CI 3.2 and CI 3.5. When the last two years of data are combined, the private rate of episiotomy and no perineal tear was 38.1% and the public rate was 25.6%, and the private rate of surgical repair of perineum for fourth degree tear was 2.6% and the public rate was 5.7%.

**CI 3.1: Selected primipara – intact perineum (H)**

In 2011, there were 32,775 primipara reported from 150 HCOs. The annual rate was 17.9 per 100 primipara. In 2011, there were 26 outlier submissions from 16 HCOs whose combined excess was 687 fewer primipara with an intact perineum or unsutured perineal tear.

**CI 3.2: Selected primipara – episiotomy and no perineal tear (L)**

In 2011, there were 32,452 primipara reported from 149 HCOs. The annual rate was 30.3 per 100 primipara. The fitted rate deteriorated from 27.4 to 30.1, a change of 2.6 per 100 primipara. In 2011, there were 25 outlier submissions from 16 HCOs whose combined excess was 687 more selected primipara undergoing episiotomy and no perineal tear.

**CI 3.3: Selected primipara – perineal tear and NO episiotomy (L)**

In 2011, there were 32,202 primipara reported from 150 HCOs. The annual rate was 45.5 per 100 primipara. There was no significant trend in the fitted rate. In 2011, there were 12 outlier submissions from nine HCOs whose combined excess was 578 more selected primipara sustaining a perineal tear and having no episiotomy.

* Selected primipara represent an uncomplicated pregnancy whereby intervention and complication rates should be low and consistent across hospitals.
Summary of results: Obstetrics

CI 3.4: Selected primipara – episiotomy and perineal tear (L) In 2011, there were 31,500 primipara reported from 144 HCOs. The annual rate was 5.9 per 100 primipara. The fitted rate deteriorated from 5.5 to 6.1, a change of 0.59 per 100 primipara. In 2011, there were 16 outlier submissions from 12 HCOs whose combined excess was 333 more selected primipara undergoing episiotomy and still sustaining a perineal tear.

CI 3.5: Selected primipara – surgical repair of perineum for third degree tear (L) In 2011, there were 34,999 primipara reported from 161 HCOs. The annual rate was 4.8 per 100 primipara. The fitted rate deteriorated from 4.0 to 4.7, a change of 0.7 per 100 primipara. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.69 per 100 primipara. In 2011, there were 11 outlier submissions from nine HCOs whose combined excess was 173 more selected primipara undergoing surgical repair of the perineum for third degree tears.

CI 3.6: Selected primipara – surgical repair of perineum for fourth degree tear (L) In 2011, there were 35,002 primipara reported from 162 HCOs. The annual rate was 0.37 per 100 primipara. There was no significant trend in the fitted rate.

General anaesthesia for caesarean section
The public rate for a general anaesthetic in caesarean section is more than twice the private rate, 8.5% and 3.1% respectively, over the last two years.

CI 4.1: General anaesthetic for caesarean section (L) In 2011, there were 61,600 caesareans reported from 151 HCOs. The annual rate was 6.5 per 100 caesareans. There was no significant trend in the fitted rate. In 2011, there were 32 outlier submissions from 22 HCOs whose combined excess was 600 more women having a general anaesthetic for a caesarean section.

Antibiotic prophylaxis and caesarean section
More than one-fifth of submitting HCOs have compliance rates in excess of 97%, however one in five HCOs have rates less than 82%.

CI 5.1: Appropriate prophylactic antibiotic at time of caesarean section (H) In 2011, there were 37,589 caesareans reported from 95 HCOs. This rate includes both elective and emergency caesareans. The annual rate was 89.0 per 100 caesareans. The fitted rate improved from 67.4 to 90.2, a change of 22.8 per 100 caesareans. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 22.2 per 100 caesareans. In 2011, there were 28 outlier submissions from 20 HCOs whose combined excess was 1,643 fewer women who receive an appropriate prophylactic antibiotic.

Pharmacological thromboprophylaxis and caesarean section
More than one-fifth of submitting HCOs have compliance rates with guidelines for thromboprophylaxis exceeding 90%, however one in five HCOs have rates less than 50%.

CI 6.1: High risk caesarean section – pharmacological thromboprophylaxis (H) In 2011, there were 4,341 caesareans reported from 70 HCOs. The annual rate was 73.0 per 100 caesareans. The fitted rate improved from 52.6 to 70.6, a change of 18.0 per 100 caesareans. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 16.6 per 100 caesareans. In 2011, there were 13 outlier submissions from ten HCOs whose combined excess was 291 fewer women undergoing caesarean section who receive thromboprophylaxis.

Postpartum haemorrhage / blood transfusion
In both of these indicators, the public rate was more than twice the private rate, when data from 2010 and 2011 are combined.

CI 7.1: Vaginal birth – blood transfusion (L) In 2011, there were 124,122 vaginal births reported from 155 HCOs. The annual rate equates to 12 blood transfusions per 1,000 vaginal births. There was no significant trend in the fitted rate. In 2011, there were five outlier submissions from five HCOs whose combined excess was 40 more women who give birth vaginally who receive a blood transfusion.

CI 7.2: Caesarean section – blood transfusion (L) In 2011, there were 61,620 caesareans reported from 146 HCOs. The annual rate represents 16 per 1,000 caesareans. There was no significant trend in the fitted rate. In 2011, there were 11 outlier submissions from six HCOs whose combined excess was 40 more women who give birth vaginally who receive a blood transfusion.

Intrauterine growth restriction (IUGR)

CI 8.1: Deliveries – birth weight <2,750 g at 40 weeks gestation or beyond (L) In 2011, there were 67,755 deliveries reported from 146 HCOs. The annual rate was 1.7 per 100 deliveries. There was no significant trend in the fitted rate. In 2011, there were four outlier submissions from four different HCOs whose combined excess was 15 more deliveries with IUGR.
Apgar score*

CI 9.1: Term babies – Apgar score of <7 at 5 minutes post-delivery (L) In 2011, there were 182,435 babies reported from 164 HCOs. The annual rate was 1.2 per 100 babies. The fitted rate deteriorated from 1.0 to 1.2, a change of 0.14 per 100 babies. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. In 2011, there were eight outlier submissions from seven HCOs whose combined excess was 119 more term babies born with an Apgar score of less than 7 at five minutes post-delivery.

Admission of term babies to SCN or NICN

CI 10.1: Term babies – transferred / admitted to neonatal intensive care nursery or special care nursery (except congenital abnormality) (L) In 2011, there were 166,859 babies reported from 156 HCOs. The annual rate was 10.3 per 100 babies. The fitted rate deteriorated from 9.1 to 10.3, a change of 1.2 per 100 babies. In 2011, there were 60 outlier submissions from 37 HCOs whose combined excess was 3,913 more term babies transferred or admitted to a neonatal intensive care nursery (NICN) or special care nursery (SCN).

Peer review of serious adverse events

CI 11.1: Serious adverse events addressed within peer review process (H) In 2011, there were 2,428 serious adverse events reported from 42 HCOs. The annual rate was 94.5 per 100 serious adverse events. The fitted rate improved from 40.4 to 92.8, a change of 52.4 per 100 serious adverse events. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 47.0 per 100 serious adverse events. In 2011, there were nine outlier submissions from seven HCOs whose combined excess was 116 serious adverse events that were not addressed within a peer review process.

Expert commentary

Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)

Outcome of selected primipara

Even though spontaneous vaginal births in the selected primipara (CI 1.1) is expected to be high, it remains at around 45.0%. Stratum differences were demonstrated in relation to private and public HCOs (35.8% vs 51.4% respectively).

Outcomes for this group might be expected to be low, but there are several confounding factors. These include:

- the increased age of mothers at first birth (now over 30 years)
- the obesity epidemic
- enormous variation in induction rates for different obstetric conditions
- increasing social requests for induction of labour or elective caesarean section
- less risk tolerance for prolonged pregnancy.

These factors will have an impact on the rate of interventions around birth in primigravidae. Women in the private sector have historically had a higher rate of intervention and this is reflected in these data.

Rates for CI 1.2: Selected primipara – induction of labour have continued to deteriorate, reaching their highest rate of 30.7%. Rates remain higher for SA and WA, and in 2011, the lowest rates were in Vic and Qld.

Induction rates for different conditions, such as post-dates pregnancy, pre-eclampsia, and intrauterine growth restriction, do vary. Despite the proliferation of clinical practice guidelines in this area, this shows no sign of changing. The reasons for this are likely to be complex, and will include practitioner, patient, institutional, social, geographic and other influences.

Rates for CI 1.3 Selected primipara – instrumental vaginal birth remain constant around 24.0%, with rates higher for WA and Vic, and lower for Qld.

Individual variations between states and territories may reflect the use of different guidelines, different variations in risk tolerance, or in casemix. Given the increasing age of first pregnancy, it is surprising that this result has not increased slightly.

In 2011, results for CI 1.4: Selected primipara – caesarean section have reached their highest rate at 29.2%. The stratum rate for private HCOs is much higher than for public HCOs. There are 18 outlier HCOs with an outlier rate of 44.2 per 100 selected primipara. This outlier rate is higher than seen in the 2010 data and...
**Expert commentary continued:** Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)

reflects what is happening in every developed country – the seemingly inexorable rise in caesarean section rates. This may be related to higher rates of induction, to higher rates of dystocia, a lower threshold for intervention when foetal monitoring in labour is concerning, or maternal request for caesarean section. The latter is more likely to happen in the private system.

**Vaginal birth after caesarean section (VBAC)**

CI 2.1: Vaginal delivery following a previous primary caesarean section has remained between 12% and 15% for the last eight years. VBAC rates have been in decline for years, and seem to have stabilised in the past few years at around 15–18%. This is also reflected in similar developed countries. The success rates for women attempting VBAC is quoted to be around 60%, but no Australian data in the past years have come close to that figure.*1 This may represent a low threshold for intervening if labour progress is poor, or if foetal status is concerning. Rates will vary between HCOs depending on patients, and their carers’ risk tolerance.

**Major perineal tears and surgical repair of the perineum**

The numerator for CI 3.1 was modified to include unsutured perineal tear, so results for this indicator cannot be compared with previous results. The data do indicate that metropolitan rates are much lower than non-metropolitan rates (16.1% vs 26.6%), and there is significant variation between states and territories.

**Selected primipara – intact perineum.** There has been debate in the obstetric and midwifery literature about a ‘hands on’, ‘hands off’, and ‘hands shaded’ technique for delivery of the foetal head.2 The method used may have an impact on the rate of ‘intact’ perineum. Care should be provided according to agreed best practice guidelines in each HCO. Despite Cl 3.2: Selected primipara – episiotomy and no perineal tear having a desired rate specified as ‘low’, the highest rate achieved has been 30.3% in 2011. Vic continues to have very high results (38.4%) and Qld has the lowest rates (21.1%). Sixteen outlier HCOs are responsible for an outlier HCO rate of 50.2 per 100 selected primipara.

The optimal rate of episiotomy is unknown. There is no doubt that, properly done, mediolateral episiotomy will reduce the incidence of obstetric anal sphincter injuries (OASIS). These injuries are the worst outcome for a woman delivering vaginally. A reasonable rate would be about 25%.

There is also some evidence that an intact perineum may hide other injuries sustained by the woman that are of significance. It would be wrong to say that ‘there is never an indication for episiotomy’ and equally wrong to say that ‘they should be mandated for all’. Episiotomy rates should be the subject of practice audit.

The desired rate for CI 3.3: Selected primipara – perineal tear and NO episiotomy has been specified as ‘low’, however, rates remain between 45% and 47%. SA and Qld have higher rates, and Vic has the lowest rate. There were nine outlier HCOs with an outlier HCO rate of 60.8 per 100 selected primipara.

The different rates of episiotomy and perineal tears are often influenced by the training and philosophies of the birth attendants, and should be the subject of audit. Given Vic has the highest episiotomy rate, it might be assumed that this state would therefore have a low perineal tear rate.

The rate for CI 3.4: Selected primipara – episiotomy and perineal tear remains around 5% or 6%, but the best performing centile rate is 2.35–2.91%. The poorest centile rate is 5.94–6.75%, with centile gains of 953 selected primipara.

These differences are likely to be influenced by the practice of the birth attendants and the accuracy of the diagnosis.

For CI 3.5: Selected primipara – surgical repair of perineum for third degree tear, the public HCO rate is nearly twice that of the private HCOs (5.65 vs 3.06). There may be several reasons for this. One reason may be the diagnosis and reporting of third degree tears in private hospitals. Some of the less severe tears may be repaired in a labour ward setting in private HCOs, whereas in the public system they would be managed in an operating theatre. These differences should be the subject of audit.

RANZCOG trainees are taught to be particularly diligent in looking for third degree tears.

**General anaesthesia for caesarean section**

The rates for CI 4.1: General anaesthetic for caesarean section have remained constant at 6.05–6.52%, however the private HCO rate is much lower than the public HCO rate (3.57 vs 8.48 per 100 caesareans).

A number of jurisdictions have policies on the performance of Category 1 caesarean sections† which are the most urgent ones. Policy can dictate the use of general anaesthesia for these. Private sector anaesthetists, being consultants, may not have to resort to this approach as often.

* Crowther et al. (2012) reported that 83% of primiparous Australian women who had a caesarean, subsequently had a caesarean at their second parturition. Of 1225 women who sought a vaginal birth following a caesarean at their first parturition, only 535 (43.2%) women who chose to have a vaginal birth were able to deliver this way because of failure to progress in labour or foetal distress: 334 of these women (27.0%) had to have an elective caesarean section and 368 women had to have an emergency caesarean section.

† RANZCOG’s four categories relate to the urgency of a caesarean. In Category 1, there is an immediate threat to the life of the woman or the foetus.
Expert commentary continued: Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)

Antibiotic prophylaxis and caesarean section
The rate for CI 5.1: Appropriate prophylactic antibiotic at time of caesarean section has been improving significantly since 2008 to its highest rate of 89.0%, and the rate of the poorest 20% of HCOs has increased in this time from 36.1% to 82.6%.

RANZCOG is pleased that this indicator is rising. There are different reasons for this:

- increased awareness amongst clinicians, as this topic is highlighted at meetings
- state network guidelines calling for this practice to be adopted
- better hospital audit systems to ensure compliance with best practice guidelines
- increased numbers of RANZCOG trainees, as it is often trainees who drive changes in practice in hospitals, by questioning previously established treatment protocols, or initiating them where none exist.

Pharmacological thromboprophylaxis and caesarean section
The rate for CI 6.1: High risk caesarean section – pharmacological thromboprophylaxis has improved to its highest rate of 73.0 per 100 caesareans, however only 70 HCOs report on this indicator (13 more than in 2010). The poorest 20% HCO rate has increased significantly from 19.1% to 50.1%, but the best 20% HCO rate has only increased from 85.6% to 92.9%. Lastly, ten HCOs are responsible for an outlier HCO rate of 19.5 per 100 caesareans.

There is ample evidence in the literature attesting to the efficacy of venous thromboembolism (VTE) prophylaxis. RANZCOG has highlighted this in their ‘in house’ publications, and it has been the subject of presentations at RANZCOG meetings. State network guidelines have helped to promote this issue.

The provision of VTE prophylaxis at caesarean section should be the subject of regular clinical audit, and RANZCOG Fellows can earn continuing professional development (CPD) points for the performance of such audits.

One of the reasons for low reporting rates may be that hospitals are already reporting these data to other regulators.

Intrauterine growth restriction (IUGR)
While the rates for CI 8.1: Deliveries – birth weight <2,750 g at 40 weeks gestation or beyond have been consistently low, there are centile gains of 202 patients.

This may be due to the increased use of ultrasound in the assessment of foetal growth in the third trimester. Historically, foetal growth has been assessed clinically and managed according to symphysis-fundal height, but there is some evidence that this approach is flawed and potentially misses some babies who have intrauterine growth restriction (IUGR).

RANZCOG trainees are taught about, and have to get experience in the use of, pelvic ultrasound, and they frequently use this modality to assess foetal growth if they have a clinical suspicion that it is inadequate. This may result in better detection of IUGR, and to appropriate interventions.

Apgar score
The difference between the public and private rates for CI 9.1: Term babies – Apgar score of <7 at 5 minutes post-delivery highlights the differences between public and private obstetric care, reflecting the experience of care providers, casemix and other factors.

Admission of term babies to SCN or NICN
The rates for CI 10.1: Term babies – transferred / admitted to neonatal intensive care nursery or special care nursery (except congenital abnormality) have continued to increase since 2008 to the highest rate of 10.3%. Rates for the best performing 20% of HCOs are 2.29% while the poorest performing 20% of HCOs achieve 14.7%. Additionally, the centile gains are extremely large at 13,303 babies.
This may reflect differences in practice between hospitals. Some hospitals have a practice where all babies who have meconium stained liquor* in labour (about 10%) are admitted to the nursery for post-natal observations. There has also been an increase in diabetes in pregnancy, and, again, some hospitals will have a policy that the babies of diabetic mothers are admitted to the nursery for monitoring of blood sugars. These differences may be reflected in staffing levels within those hospitals that have varying levels of neonatal-trained nurses and midwives.

Levels of operative births have also increased, and although most elective caesarean sections are done after 39 completed weeks of gestation, a small number of those babies may have transient respiratory morbidity, requiring nursery admission.

**Peer review of serious adverse events**

The rate of peer review of serious adverse events (CI 11.1) has increased to its highest level at 94.5%, with the poorest centile rate increasing from 60.2% to 95.8% and the best centile rate from 95.1% to 99.7%. The rate for SA remains lower than for all other states.

Most hospitals now have well developed systems for critical (sentinel) event monitoring that goes hand in hand with an evaluation process. As institutions have jurisdictional reporting requirements, and the hospital has processes around these incidents, it is not surprising that this rate is high.

Many lessons are learnt from ‘near miss’ audit by teams providing maternity care, and RANZCOG has been a strong advocate for the multidisciplinary review of such incidents.

**References**


**General comments**

The use of ‘obstetrics’ as a descriptor for these data is not contemporary. The use of ‘maternity’ or ‘maternity care’ is inclusive and reflects the diversity of healthcare providers involved in maternity care.

The ACM supports the demonstration of variation between public and private facilities through indicators. This set of indicators should be aligned with the Core Maternity Indicators being developed through the Australian Health Ministers Advisory Council as part of the National Maternity Services Plan.¹

The focus on women having their first labour and first birth should be continued. This is critical for the future to challenge rising intervention rates.

These indicators do not take obesity into account.

**Outcome of selected primipara**

The ACM notes the public and private stratification for CI 1.1:

**Selected primipara – spontaneous vaginal birth.**

Rates for induction of labour in the selected primipara (CI 1.2) have continued to deteriorate, reaching its highest level at 30.7%. In 2011, rates remain higher for SA and WA in 2011. It would be interesting to know the quality processes that are being put in place in Vic and Qld where rates are low. Characteristics of these successful organisations should be identified, investigated further and promoted.

Rates for instrumental vaginal birth in the selected primipara (CI 1.3) remain constant around 24.0%, with rates higher for WA and Vic, and lower for Qld. With the efforts to increase the commencement of labour and vaginal birth, it is disappointing that there has not been an increase in instrumental births. It may be worth reviewing the validity of maintaining a low rate as ‘desirable’ for this indicator.

Rates of caesarean section among the selected primipara (CI 1.4) have reached 29.2% with the stratum rate for private HCOs much higher than for public HCOs. The 18 outlier HCOs have an outlier rate of 44.2 per 100 selected primipara, which is higher than the 2010 outlier data. Given the importance of the selected primipara, it would be useful to establish indicators to monitor the contribution of selected primipara to the overall rate of caesarean section. Distinct practices of organisations that achieve low caesarean section rates for selected primipara may offer insights into useful behaviours for quality improvement programs.

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*Amniotic fluid stained green or brown because the baby has opened its bowels before / during birth.*
Major perineal tears and surgical repair of the perineum

In 2011, the numerator for CI 3.1: Selected primipara – intact perineum was modified to include unsutured perineal tear. The 2011 rates do indicate that metropolitan rates are much lower than non-metropolitan rates (16.1% vs 26.6%), and that there is variation between the states (12.8% in WA vs 22.2% in NSW). This indicator should be brought into line with the Core Maternity Indicators and specifically examine 3rd and 4th degree tears.

Despite CI 3.3: Selected primipara – perineal tear and NO episiotomy having a desired rate that is ‘low’, rates remain at 45 – 47%. Nine outlier HCOs are responsible for an outlier HCO rate of 60.8 per 100 selected primipara. It would be interesting to know what these outlier organisations have done to investigate these results for accreditation.

The public HCO rate for CI 3.5: Selected primipara – surgical repair of perineum for third degree tear is nearly twice the private HCO rate. This is likely to be an ascertainment issue where larger numbers of public hospitals are reporting data (106 public vs 55 private HCOs).

General anaesthesia for caesarean section

The rates for CI 4.1: General anaesthetic for caesarean section have remained very low at 6.05% – 6.52%. A higher rate of general anaesthesia is to be expected in the public sector, as the most complex cases are cared for in public HCOs.

Pharmacological thromboprophylaxis and caesarean section

The rate for CI 6.1: High risk caesarean section – pharmacological thromboprophylaxis has improved to its highest rate of 73.0%, however only 70 HCOs reported this indicator (13 more than in 2010). The Australian College of Midwives agrees there is a need for ascertainment.

Postpartum haemorrhage / blood transfusion

The rate for blood transfusion at caesarean section (CI 7.2) was almost twice as high in public HCOs as in the private sector. This outcome is not surprising as the most complex cases tend to be seen in the public sector.

Intrauterine growth restriction (IUGR)

It remains important to monitor rates of intrauterine growth restriction through monitoring birth weight at 40 weeks gestation and beyond (CI 8.1). The indicator, however, should not become a driver for increasing numbers of scans and intrauterine investigation.

Apgar score

While the rates for term babies with an Apgar score of less than 7 at five minutes post-delivery (CI 9.1) remain low at 1.16%, the public HCO rate is twice as high as the private HCO rate. The difference reflects the greater complexity in the public sector, even at term.

Admission of term babies to SCN or NICN*

The rates for CI 10.1: Term babies – transferred / admitted to NICN / SCN (except congenital abnormality) have continued to increase since 2008 to 10.3%. HCOs in the best performing centile are achieving 2.29%, while the poorest performing centile can only achieve 14.7%. The centile gains are extremely large at 13,303 babies.

Poor performing organisations could do a lot more work in this area. A good starting point would be to separate neonatal intensive care cases from those admitted to the special care nursery (SCN) for term babies. Many HCOs admit ‘borderline wellness’ babies into the SCN. Many of these could be cared for on the postnatal ward. Organisations should seek to understand why term babies are being admitted to a neonatal intensive care nursery (NICN) and/or SCN.

Peer review of serious adverse events

All HCOs should have a robust peer review process (CI 11.1). In 2011, the rate for the 71 submissions was 94.5%. The process for peer review of serious adverse events needs to be embedded in a structured, systematic way. This rate should be the same in the public and private sectors, and it should be high.

References

In 2011, 86 HCOs reported at least one of the Ophthalmology clinical indicators. For all indicators combined, more than 80% of patients or procedures reported were from metropolitan HCOs. Two-thirds were from private HCOs.

Of the 11 indicators suitable for trend analysis,* eight showed improvement and two deteriorated.

The greatest variation between HCOs was observed in CI 1.3: Cataract surgery – unplanned overnight admission, however the fitted rate for this CI has improved since 2004.

**Cataract surgery**

CI 1.1: Cataract surgery – readmission within 28 days (L)

In 2011, there were 51,477 patients reported from 66 HCOs. The annual rate was 0.23 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were two outlier submissions from a single HCO whose combined excess was 25 more readmissions within 28 days.

CI 1.2: Cataract surgery – readmission within 28 days due to endophthalmitis (L)

In 2011, there were 48,064 patients reported from 64 HCOs. The annual rate was 0.027 per 100 patients. The fitted rate improved from 0.080 to 0.031, a change of 0.048 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.048 per 100 patients.

CI 1.3: Cataract surgery – unplanned overnight admission (L)

In 2011, there were 49,675 patients reported from 66 HCOs. The annual rate was 0.74 per 100 patients. The fitted rate improved from 0.80 to 0.031, a change of 0.048 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.048 per 100 patients.

CI 1.4: Cataract surgery – anterior vitrectomy (L)

In 2011, there were 56,647 patients reported from 63 HCOs. The annual rate was 0.62 per 100 patients. The fitted rate improved from 0.70 to 0.61, a change of 0.089 per 100 patients. In 2011, there were four outlier submissions from three HCOs whose combined excess was 72 more patients having an anterior vitrectomy.†

**Glaucoma surgery**

CI 2.1: Glaucoma surgery – readmission within 28 days (L)

In 2011, there were 1,300 patients reported from 19 HCOs. The annual rate was 3.3 per 100 patients. The fitted rate deteriorated from 0.70 to 4.8, a change of 4.1 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.5 per 100 patients.

CI 2.2: Glaucoma surgery – readmission within 28 days due to endophthalmitis (L)

In 2011, there were 1,286 patients reported from 18 HCOs. The annual rate was 0.16 per 100 patients. The fitted rate deteriorated from 0.010 to 0.17, a change of 0.15 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.13 per 100 patients.

CI 2.3: Glaucoma surgery – LOS >3 days (L)

In 2011, there were 1,078 patients reported from 15 HCOs. The annual rate was 1.4 per 100 patients. The fitted rate improved from 4.6 to 1.8, a change of 2.8 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.9 per 100 patients. In 2011, there was one outlier submission whose combined excess was seven more patients with a length of stay greater than three days following glaucoma surgery.

**Retinal detachment surgery**

CI 3.1: Retinal detachment surgery – readmissions within 28 days (L)

In 2011, there were 4,112 patients reported from 11 HCOs. The annual rate was 3.0 per 100 patients. The fitted rate improved from 4.3 to 2.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.9 per 100 patients. In 2011, there were two outlier submissions from a single HCO whose combined excess was 24 more readmissions within 28 days.

CI 3.2: Retinal detachment surgery – unplanned readmission within 28 days due to endophthalmitis (L)

In 2011, there were 3,324 patients reported from ten HCOs. The annual rate was 0.060 per 100 patients. The fitted rate improved from 0.19 to 0.043, a change of 0.15 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.13 per 100 patients.

* Trends are determined when an indicator has a preferred direction (H or L) and has been collected over at least four years, with at least four HCOs contributing data.

† An anterior vitrectomy may be performed for traumatic cataract removal or secondary intraocular lens placement. Unplanned anterior vitrectomies are performed following cataract surgery when vitreous inadvertently prolapses into the anterior segment of the eye. This complication occurs more commonly for inexperienced surgeons. It may, but does not necessarily, impact visual acuity.
CI 3.3: Retinal detachment surgery – LOS >4 days (L)
In 2011, there were 3,100 patients reported from ten HCOs. The annual rate was 0.39 per 100 patients. The fitted rate improved from 1.5 to 0.91, a change of 0.57 per 100 patients. In 2011, there was one outlier submission whose combined excess was two more patients with a length of stay (LOS) exceeding four days.

CI 3.4: Retinal detachment surgery – unplanned re-operation within 28 days (L)
In 2011, there were 3,317 patients reported from nine HCOs. The annual rate was 2.7 per 100 patients. The fitted rate improved from 4.5 to 2.2, a change of 2.3 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.0 per 100 patients. In 2011, there were two outlier submissions from a single HCO whose combined excess was 25 more patients having an unplanned re-operation within 28 days.

Refractive surgery*
CI 4.1: Refractive surgery – readmission within 28 days (L)
In 2011, there were 932 patients reported from five HCOs, with no instances of readmission reported. The annual rate was zero per 100 patients.

CI 4.2: Refractive surgery – readmission within 28 days due to endophthalmitis (L)
As no patients were readmitted under CI 4.1, the rate of CI 4.2 is also zero (five HCOs with 932 patients).

CI 4.3: Refractive surgery – unplanned overnight admission (L)
In 2011, there were 932 patients reported from five HCOs. There were no unplanned overnight admissions.

CI 4.4: Refractive surgery – anterior vitrectomy (L)
In 2011, there were 932 patients reported from five HCOs. No instances of anterior vitrectomy were reported.

CI 4.5: Excimer laser surgery – complication within 28 days (L)
In 2011, there were 1,200 patients reported from four HCOs. A single complication led to an annual rate of 0.083 per 100 patients.

* Refractive surgery involves reshaping the cornea to change the focusing capability of the eye. Lasik surgery uses a laser to reshape the cornea.
Expert commentary

Royal Australian and New Zealand College of Ophthalmologists (RANZCO)

Cataract surgery
The readmission rate following cataract surgery is low (CI 1.1) at 0.23 per 100 patients. The single outlier HCO, responsible for a rate of 0.71 per 100 patients, is a concern. This organisation should explore the reasons behind the higher rate of readmission.

In 2011, the rate for CI 1.2: Cataract surgery – readmission within 28 days due to endophthalmitis reached its lowest level of 0.027%, as it was in 2008, with 64 HCOs reporting. This reduction in the endophthalmitis rate probably reflects the use of intracameral antibiotics.†

Although the rate for unplanned overnight admission following cataract surgery (CI 1.3) has increased to the highest level in eight years, the long term trend remains down. These indicators do not identify the reasons for readmission, nor whether the readmissions are linked to results demonstrated in other indicators.

Glaucoma surgery
The rate for CI 2.1: Glaucoma surgery – readmission within 28 days has increased to 3.31%, with only 19 HCOs reporting on this indicator in 2011. The overall trend is also up, and may be a reflection of a change in the type of glaucoma surgery being performed.

It is pleasing to see that the ongoing rates of readmission due to endophthalmitis following glaucoma surgery (CI 2.2) remain low in 2011.

The rate for CI 2.3: Glaucoma surgery – LOS >3 days is down from 4.14% in 2010 to 1.39% in 2011. This is a good outcome.

Retinal detachment surgery
Despite an increase in the rate of readmissions within 28 days of retinal detachment surgery (CI 3.1) to 2.97% in 2011, the overall trend is down. Although only 11 HCOs are reporting on this indicator, it will be interesting to see the 2012 data.

The rate for unplanned repeat surgery within 28 days of retinal detachment surgery (CI 3.4) has increased to 2.65%, however only nine HCOs reported on this indicator. The outlier HCO with an outlier HCO rate of 12.3 per 100 patients should closely consider their high rate for readmissions. It would be of major concern if the same HCO is an outlier for both CI 3.3 and CI 3.4.

Refractive surgery
With only five HCOs reporting on complications of refractive surgery (CIs 4.1–4.4), RANZCO does question their usefulness.

Expert commentary

Australian Ophthalmic Nurses’ Association (AONA)

A decrease in rates across almost all clinical indicators could suggest surgeon expertise, improved technology available, experienced staff with high clinical practice standards and improved patient process.

Cataract surgery
The most likely reason that CI 1.2: Cataract surgery – readmission within 28 days due to endophthalmitis has been decreasing is that data are not being captured at the surgery centre or tertiary referral centre where treatment takes place.

AONA would strongly recommend that all major ophthalmic referral centres should be gathering endophthalmitis data, especially where it may be identified as being preventable.

International reports also suggest a similar rate for endophthalmitis after cataract surgery as noted in these data (0.027 per 100 patients).

† Intracameral antibiotics are injected into the anterior chamber of the eye, providing higher concentrations than those achieved using topical eyedrops.
Summary of results:

Oral Health

In 2011, 15 organisations, some consisting of a number of separate facilities, provided data for this indicator set. Most of the data comes from public HCOs. Of the four indicators that were suitable for trend analysis, two showed improvement. Six indicators showed large variation between data providers (CI 1.2, 3.1, 3.2, 5.2, 5.5 and 5.6).

Please note that estimates of the centiles were obtained from small numbers of data submissions.

Unplanned returns to the dental centre

CI 1.1: Restorative treatment – teeth retreated within 6 months (L) In 2011, there were 194,153 restored teeth reported from 12 HCOs. The annual rate was 5.1 per 100 teeth restored. The fitted rate improved from 6.3 to 5.1, a change of 1.2 per 100 teeth restored. In 2011, there were six outlier submissions from three HCOs whose combined excess was 1,312 more teeth retreated within six months.

CI 1.2: Routine extraction – complications within 7 days (L) In 2011, there were 49,353 simple extractions reported from 12 HCOs. The annual rate was 1.3 complications per 100 simple extractions. There was no significant trend in the fitted rate. In 2011, there were two outlier submissions from a single HCO whose combined excess was 148 more attendances for complications within seven days.

CI 1.3: Surgical extraction – complications within 7 days (L) In 2011, there were 10,519 surgical extractions reported from nine HCOs. The annual rate was 0.78 complications per 100 surgical extractions. In 2011, there was one outlier submission from one HCO whose combined excess was 20 more attendances for complications within seven days.

CI 1.4: Denture remade within 12 months (L) In 2011, 4,242 dentures were reported from 11 HCOs. The annual rate was 2.1 per 100 dentures. The fitted rate improved from 2.2 to 1.6, a change of 0.53 per 100 dentures.

Endodontic treatment

CI 2.1: Endodontic treatment – same tooth within 6 months (H) In 2011, there were 4,260 treatments reported from seven HCOs. The annual rate was 40.2 per 100 treatments. In 2011, there was one outlier submission whose combined excess was 91 fewer completed courses of endodontic treatment.

CI 2.2: Endodontic treatment – teeth retreated between 1 and 6 months (L) In 2011, there were 1,145 teeth reported from six HCOs. The annual rate was 0.79 per 100 teeth.

CI 2.3: Teeth extracted within 12 months (L) In 2011, there were 1,756 teeth reported from nine HCOs. The annual rate was 1.3 extractions per 100 treated teeth. There was no significant trend in the fitted rate.

Patient record audits

CI 3.1: Medical history – complete and updated (H) In 2011, there were 4,502 patients reported from seven HCOs. The annual rate was 99.2 per 100 patients. In 2011, there were four outlier submissions from three HCOs whose combined excess was 32 fewer patients with completed and updated medical history.

CI 3.2: Charting completed at initial assessment (H) In 2011, there were 2,101 patients reported from four HCOs. The annual rate was 95.2 per 100 patients. In 2011, there were three outlier submissions from three HCOs whose combined excess was 83 fewer patients with completed charting at initial assessment.

Children’s dental care

CI 4.1: Pulpotomy – deciduous teeth extracted within 6 months (L) In 2011, there were 3,114 teeth reported from five HCOs. The annual rate was 3.3 per 100 teeth treated by pulpotomy. In 2011, there were two outlier submissions from one HCO whose combined excess was 17 more deciduous teeth extracted (for pathological reasons) within six months following pulpotomy treatment.

CI 4.2: Fissure sealant treatment – retreatment within 24 months (L) In 2011, there were 92,025 teeth reported from five HCOs. The annual rate was 6.6 per 100 teeth. In 2011, there was one outlier submission from one HCO whose combined excess was 230 more teeth requiring repeat fissure sealant treatment within 24 months of the initial treatment.

CI 4.3: Fissure sealant treatment – retreatment within 24 months (L) In 2011, there were 92,025 teeth reported from five HCOs. The annual rate was 2.4 retreatments per 100 teeth. In 2011, there were two outlier records from one HCO whose combined excess was 72 more teeth requiring retreatment (restoration, endodontic or extraction, but not including pit and fissure sealants) within 24 months of the initial treatment.
## Summary of results:

### Oral Health

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<th>Indicator</th>
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<th>Annual Rate</th>
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<td>CI 5.2</td>
<td>OPG* – new patients 18–24 years (N)</td>
<td>2011</td>
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<td>3.9 per 100 patients</td>
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<td>CI 5.3</td>
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<td>CI 5.6</td>
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<td>CI 5.9</td>
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<td>2011</td>
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<td>62.6 per 100 radiographs</td>
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</tbody>
</table>

*An orthopantomogram (OPG) is a panoramic scanning x-ray of the upper and lower jaw.*

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### Radiographs

**CI 5.6: Intraoral films – new patients 18–24 years (N)**
In 2011, there were 1,807 patients reported from two HCOs. The annual rate was 9.2 per 100 patients.

**CI 5.7: Intraoral films – new patients 25–64 years (N)**
In 2011, there were 4,939 patients reported from two HCOs. The annual rate was 27.7 per 100 patients.

**CI 5.8: Intraoral films – new patients 65+ (N)**
In 2011, there were 3,299 patients reported from two HCOs. The annual rate was 29.8 per 100 patients.

**CI 5.9: Radiographs (bite-wing) quality (H)**
In 2011, there were 163 radiographs reported from three HCOs. The annual rate of bite-wing radiographs that met all six of the stated quality criteria was 62.6 per 100 radiographs.

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### Expert commentary

**South Australia Dental Service (SADS)**

**General comments**

The usefulness of the Oral Health Clinical Indicators (OH CIs) is evident over the time series, but especially relevant for use within an organisation, and for clinicians comparing their own performance over time to demonstrate quality of care improvements for the benefit of their dental clients.

One of the main reasons for establishing indicator programs is to enable clinicians in individual practice, in small groups and in larger organisational service delivery systems, to become aware of their clinical practice, to be open to self-assessment, reflecting on the evidence and feedback.

The ACHS has been a wonderful vehicle for fostering this structured process and as the concept gains better currency within wider dental practice, with accreditation and national quality healthcare frameworks, more relevance will be attached to self-measurement. SADS looks forward to fostering greater consensus and further refinement of the oral health sector indicator set in future years, as dental clinicians mature in their practical understanding and self-assessment in measuring quality of care.

The introduction to each indicator in the long report identifies the broad clinical intention of the CI, guiding and supporting best clinical practice.

The relatively small number of HCOs participating in the Oral Health CI Program is not reflective of the commitment of dental care providers in Australia, and in particular the public dental services, to maintaining high quality standards of clinical care and to striving for continuous improvements in patient care and service delivery. A couple of the individual HCOs submitting oral health data represent a very large number of individual public dental clinic sites as a single organisation – state-wide submission. The size of the HCOs submitting data varies widely.

It is noted that all but one of the HCOs submitting data in 2011 are from the public sector.

The aggregate submissions from these public dental organisations may include a mix of service types, including dental schools, dental hospitals, adult community-based public dental services for eligible cardholders only, and school dental services in some states to varying degrees.

It is pleasing to see that the number of HCOs submitting has been maintained or increased over the past two years. The reported denominators (number of clients provided with dental services) increased substantially in 2010 and has been maintained in 2011, when compared with the previous few years for most indicators.
Expert commentary continued: South Australia Dental Service (SADS)

Unplanned returns to the dental centre

The average rate for teeth retreated within six months of dental restorations (fillings) (CI 1.1) has been maintained at about 5%. The rate improved over the past three years and compares most favourably with the higher rates of almost 6% in 2006 and 2007 and up to 6.9% in 2008.

The mix of services provided at emergency and/or general care visits in the public sector, and the proportion of services provided for eligible adults (e.g., card holders) or children's dental services may influence these results.

It is pleasing that the data from submitting HCOs have returned more than 190,000 teeth restored for both of the past two years.

From 2012, this CI is to be split into two indicators, separately reporting data for adults’ and children’s dental care, as a refinement to the context of setting and appropriate measurement of this foundation quality measure of dental services.

Except for one of the half-yearly submissions in 2010, the rate of return following routine extraction of CI 1.2 has always been below 1.4% of extracted teeth. In 2011, this rate has returned to the lower levels experienced in most previous years.

For CI 1.3 the recent rate of return following surgical extractions improved from between 2% and 5% during 2004–2007, on a relatively low number of cases. The rate for this indicator has been maintained below 1.2% of surgically extracted teeth returning to the dental centre within seven days for the past four years.

From 2012, these two indicators (CI 1.2: Routine extraction – complications within 7 days and CI 1.3: Surgical extraction – complications within 7 days) are to be modified. The denominator will change and will record the number of visits, or attendances, in which one or more extractions takes place.

These sets of results will therefore not be comparable in the future. However, counting visits in both parts of the rate equation will give a better measure of clinical care. When the new CI definitions are adopted in 2012, there will be an increase in the results rate where more than one tooth is extracted at the one appointment.

Return following complications of dental extractions such as dry-socket are sometimes unavoidable, and often related to patient factors, such as post-operative wound care and smoking. The current rates described by these 2011 results are excellent.

The overall rate for CI 1.4: Denture remade within 12 months has historically remained below 3%. The 2011 rate of 2.05% is the second lowest result for this indicator over the past eight years.

The analysis of AIHW data in the National Surveys of Adult Oral Health indicates that denture wearing is now quite uncommon in patients under age 55, and proportionally more so in an ever-ageing sub-group of the population, and edentulousness* is not particularly prevalent in patients under 65 years of age.

The rapid ageing of denture wearers will increase the complexity of cases. This will impact on the required skills of dental practitioners, dentists and prosthетists, for quality denture services over time, especially for the least affluent of the community, and particularly for those eligible for public dental services and with complex chronic disease conditions with oral manifestations.

Endodontic treatment

The rate of endodontic (root canal therapy) treatment completed within six months of initial treatment (CI 2.1) has reduced to 40%, the lowest rate since 2006. A high rate is desirable for this indicator. This is an adverse outcome, as good clinical practice guidelines suggest the highest rates of success for endodontic treatments are achieved where the procedure is completed within a relatively short period of time (e.g. within 3-6 months).

The number of submitting HCOs has increased, and the number of endodontically treated teeth reported (the denominator) has tripled compared with 2009.

As previously noted, most HCO submissions are from the public dental sector. In the current environment in many jurisdictions, with long waiting lists, high demand, emergency (problem-based) presentations, and scarce resources (workforce and funding), and local and state policy may impact on the outcome, in addition to the local clinical situation. Jurisdictional policies about access criteria and eligibility rules vary (e.g., completion of an emergency course of care or via a long waiting list). Access to, and availability of, public providers or external private practitioner schemes to support these patients, also varies across the country. If clients choose to self-fund the completion of their required care, completion will not be noted in the same HCO submission. Support for ongoing care initiated at a problem-based visit will impact adversely on this indicator.

Additional Commonwealth funding from January 2013, announced in the May 2012 federal budget, should redress long public dental waiting lists. The timeline of complex endodontic care measured by this indicator should improve in future years.

Rates of retreatment between one and six months after endodontic treatment (CI 2.2) are excellent and very, very low. Annual results have always been below 1.6% at the 80th centile level and below 0.8% for five of the past six years. The numerators are extremely low with less than ten retreatments annually from all contributing HCOs combined.

The Oral Health CI Working Party resolved in 2010 to delete CI 2.2 from 2012. At the time of writing, this

* Edentulousness is the loss of teeth with age.
**Expert commentary continued:** South Australia Dental Service (SADS)

indicator is no longer collected; the indicator below (CI 2.3) has been revised and numbered as CI 2.2.

Whilst it is noted that the 2010 rate for CI 2.3: Endodontic treatment – teeth extracted within 12 months was the highest since 2003 at 2.2%, the 2011 rate is a very acceptable 1.3%. Rates have been consistently maintained at very low levels and the long term trend is in a positive direction with proportionally fewer extractions noted for this indicator.

Annual results have always been below 3% at the 80th centile level. The numerators (extracted teeth) are very low with no more than 38 extractions after root canal treatment reported from all HCOs combined, in any one year.

In late 2010, the Oral Health CI Working Party adopted a recommended change to the structure and intent of this indicator from 2012.

The recommendation is to update the User Manual for CI 2.3 to measure “extraction following commencement (rather than completion) of a course of endodontic treatment” for both the numerator and denominator. This new indicator will better reflect clinical success in initial clinical case assessment for endodontic care and appropriate clinical decisions to start root canal therapy.

**Patient record audits**

The taking of a medical history was mandated in patient records before the appointment of the Dental Board of Australia. An explanatory note will be included in the 2012 edition of the ACHS Oral Health CI User Manual v3.0. HCOs are strongly encouraged to undertake self-audits of patient records.

**Children’s dental care**

The increasing number of submissions from HCOs providing children’s dental care in 2011 is pleasing. More organisations are evaluating dental services for children using this quality framework.

A relatively large state School Dental Service (SDS) program commenced reporting to ACHS in 2010. This SDS substantially influences the overall rate results by contributing over 70% of all cases under review in both 2010 and 2011.

CI 4.1 measures the total number of deciduous teeth extracted (for pathological reasons) within six months following pulpotomy treatment. This measure is limited to deciduous, or ‘baby’ teeth and, as such, is equivalent in theme and intent to the endodontic indicator CI 2.3: Endodontic treatment – teeth extracted within 12 months, but applies over a shorter time frame.

The 2011 rate for CI 4.1 has decreased to its lowest level since 2006 and is now 3.3% compared with rates between 4.9% and 12.0% across the earlier years.

Rates in the range of 3–6% of treated teeth subsequently failing and requiring extraction are acceptable for this clinical care procedure for pathological baby teeth.

CI 4.2: Fissure sealant treatment – retreatment within 24 months describes ‘maintenance’ of fissure sealants*, by resealing or reapplying the fissure sealant at the subsequent dental recall visit. As such, a rate approaching zero (no resealant maintenance) is not acceptable, as it would indicate no maintenance guidelines. Yet, a very high rate would indicate poor technique, material choice, case selection or clinical quality. A rate of resealant application between 5% and 10% would be acceptable over a long review period up to 24 months.†

The integrity of fissure sealants is most important for their preventive clinical effect, and so some level of maintenance and resealing is desirable.

The 2010 Oral Health CI Working Party recommended deletion of CI 4.2: Fissure sealant treatment – retreatment within 24 months from the Oral Health set. It was not included in the 2012 User Manual. A certain degree of maintenance (repair and/or replacement) of fissure sealants is expected and is normal clinical practice in children’s dentistry to maximise the preventive benefits and minimise tooth decay in the most vulnerable pit and fissure tooth surfaces.

Unlike the previous CI 4.2, CI 4.3: Fissure sealant treatment – retreatment within 24 months is very relevant to children’s dental services, and a low rate is highly desirable. It indicates the success of fissure sealants as a preventive measure in avoiding tooth decay and the subsequent need for fillings or, in a few more extreme cases, root canal therapy or even extractions.

The overall rates of 2.6% in 2010 and 2.4% in 2011 are significantly influenced by the single school dental service that is contributing about 75–80% of cases. It had a lower-than-average rate for this indicator in both reporting periods, and inclusion of these data is the reason for much of the observed improvement.

It is pleasing that five HCOs now contribute to this fissure sealant indicator data compared with none (0) in 2008 and only one HCO in 2007.

The rates reported for fissure sealant retreatment are acceptable and have historically always been below 6% at

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* Fissure sealants are applied as a non-invasive, preventative treatment.
† Personal view of the author.
Expert commentary continued: South Australia Dental Service (SADS)

the 80th centile rate. Fissure sealants are a successful, non-invasive, simple preventive measure for children’s dentistry and their use is strongly encouraged to prevent tooth decay in the pits and fissures of permanent back teeth.

**Radiographs**

The 2010 Oral Health CI Working Party review recommended deletion of the first eight indicators, CIs 5.1–5.8. At most, two HCOs annually submitted data for these indicators during the past six years.

Only CI 5.9: Radiographs (bite-wing) that meet all six criteria, representing a clinical audit review of the diagnostic quality of intra-oral bite-wing radiographs (the most common type of dental x-rays taken) will be maintained in the Oral Health CI set from 2012.

It is noted by the Working Party that CI 5.9 as a case-note audit review, carries a time burden for case selection, competent audit review against the criteria, and subsequent data collection.

Expert commentary

**Australian Dental Association (ADA)**

The Australian Dental Association Inc. (ADA) would like to thank the Australian Council on Healthcare Standards for the opportunity to respond to the questions in regard to the Oral Health version 2.1 clinical indicators for the Australasian Clinical Indicator Report 2004–2011, 13th edn. The ADA notes that the results essentially reflect those in previous years, and hence the ADA continues to have concerns with a number of issues in respect to the indicators and the subsequent results.

In that respect, the ADA believes the survey does not provide sufficient scope of information to predict or represent a cause for the various outcomes, particularly in regard to individual clinic results. The ADA maintains the same reasoning from last year in regard to the current analysis.

The ADA has no objection to the deletion of the CIs 5.1–5.8 as they do not reflect patient outcomes or the standard of the radiographic material.

Response from ACHS

Clinical indicators rarely provide definitive answers. They are designed to indicate potential problems, and flag, screen or draw attention to specific clinical issues that might need addressing.
In 2011, 47 HCOs submitted data to this indicator set, the majority of which were submitted by public HCOs. Of the 12 indicators in this set, only three CIs had data suitable for trend analysis.* Of those three, one improved: Cl 1.2: Planned / catch-up immunisation. There was relatively large variation between HCOs as measured by centile differences in Cl 1.1: Documented immunisation status.

**Paediatric – general**

**Cl 1.1: Documented immunisation status (H)** In 2011, there were 6,586 patients reported from 19 HCOs. The annual rate was 84.2 per 100 patients. There was no significant trend in the fitted rate. There were five outlier submissions from five HCOs whose combined excess was 484 fewer infants admitted without their current immunisation status documented.

**Cl 1.2: Planned / catch-up immunisation (H)** In 2011, there were 637 patients reported from 16 HCOs. The annual rate was 64.7 per 100 patients. The fitted rate improved from 53.9 to 63.7, a change of 9.9 per 100 patients. In 2011, there were three outlier submissions from three HCOs whose combined excess was 41 fewer infants for whom there was documented evidence that they were either given catch-up immunisation or that such immunisation was planned.

**Paediatric – asthma**

**Cl 2.1: Asthma – average LOS (L)** In 2011, there were 60 submissions from 36 HCOs. The average length of stay (LOS) was 1.7 days. The average length of stay for asthma patients has remained between 1.5 and 1.7 days since 2004. There is little variation between HCOs as measured by the difference between the 20th and 80th centiles.

**Cl 2.2: Asthma – average LOS, excluding same day admissions (L)** In 2011, there were 58 submissions from 36 HCOs. The average LOS was 1.8 days. The average LOS for non-same-day admission asthma patients has remained between 1.7 and 1.9 days since 2004. There is little variation between HCOs as measured by the difference between the 20th and 80th centiles.

**Cl 2.3: Asthma – readmission within 28 days (L)** In 2011, there were 5,468 separations reported from 38 HCOs. The annual rate was 3.6 per 100 separations. There was no significant trend in the fitted rate. In 2011, there was one outlier submission whose combined excess was 21 more readmissions to hospital for asthma within 28 days.

**Utilisation of patient assessment systems**

**Cl 3.1: Participation in the ANZICS CORE Paediatric Patient Database (PPD) (H)** In 2011, there were 2,061 admissions reported from three HCOs. The annual rate for submission to the ANZICS CORE PPD† was 99.9 per 100 admissions.

**Access and exit block to the ICU**

**Cl 4.1: Paediatric ICU – non-admission due to inadequate resources (L)** In 2011, there were 2,156 patients reported from two HCOs. The annual rate was 4.4 per 100 patients.

**Cl 4.2: Paediatric ICU – elective surgery deferred or cancelled due to unavailability of bed (L)** In 2011, there were 2,824 admissions reported from four HCOs. The annual rate was 3.8 per 100 admissions. In 2011, there was one outlier submission whose combined excess was 31 more elective surgical cases that were deferred or cancelled.

**Cl 4.3: Paediatric ICU – transfer to another facility / area due to unavailability of bed (L)** In 2011, there were 2,064 patients reported from two HCOs. The annual rate was 0.097 per 100 patients.

**Cl 4.4: Paediatric ICU – discharge delay >12 hours (L)** In 2011, there were 2,544 patients reported from three HCOs. The annual rate was 17.8 per 100 patients. In 2011, there were two outlier submissions from a single HCO whose combined excess was 76 more patients whose discharge from ICU was delayed by more than 12 hours.

**Cl 4.5: Paediatric ICU – discharge between 6pm and 6am (L)** In 2011, there were 2,544 patients reported from three HCOs. The annual rate was 10.2 per 100 patients.

**Intensive care patient management**

**Cl 5.1: Paediatric ICU – unplanned readmission within 72 hours (L)** In 2011, there were 2,621 admissions reported from four HCOs. The annual rate was 1.4 per 100 admissions.

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* Trends are not provided where there is no desirable direction (either high or low), less than four years data or fewer than five HCOs reporting.
† Australia New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) Paediatric Patient Database (PPD)
**Paediatric – general**

The rate for documented immunisation status (CI 1.1) decreased to its lowest level at 84.2%, however only 19 HCOs reported on this indicator in 2011. The NSW HCO rate was the highest at 91.4% and there were five outlier HCOs responsible for an outlier HCO rate of 58.7 per 100 patients.

Submitting data for this indicator requires chart review. NSW may have higher rates due to electronic medical records (eMRs). This will continue to be a difficult indicator to collect as it requires significant resources. It is pleasing there is an increased documentation of immunisation. Feedback should be given to the units who are outliers with low rates.*

The rate for CI 1.2: Planned / catch-up immunisation has increased to 64.7% in 2011. Three outlier HCOs were responsible for an outlier HCO rate of 32.4 per 100 patients. This indicator also requires chart review and therefore significant resources to collect the data. NSW may have higher rates due to eMRs. It is probably the same facilities collecting as for CI 1.1, but CI 1.2 may be harder to collect as three fewer facilities have elected to report this indicator. Again it is pleasing that more children are having catch-up immunisations. The three outliers with low rates should be given this feedback.

**Paediatric – asthma**

The mean for CI 2.1: Asthma – average length of stay (LOS) is 1.7 days. There has been minimal variation for some years which suggests this indicator may not be discriminatory or there is a uniformity of approach across the country.

The mean LOS for asthma when same day admissions are excluded (CI 2.2) is 1.8 days.

Again, there has been minimal variation for some years which suggests this indicator may not be discriminatory or there is a uniform approach across the country.

The rate for CI 2.3: Asthma – readmission within 28 days decreased to 3.55%, with only one outlier HCO responsible for an outlier HCO rate of 10.1 per 100 separations, suggesting that while the length of stay for asthma has not increased, improved preventative measures such as prevention treatment and action plans have had a positive effect across the country. The outliers should review their data – it may be an ascertaining issue or a clinical practice issue.

**Utilisation of patient assessment systems**

The rate for CI 3.1 is 99.9%. This high participation in the ANZICS CORE Paediatric Patient Database (PPD) reflects accreditation which requires participation in the database. As a result, this may no longer be a useful indicator.

**Access and exit block to the ICU**

The rate for CI 4.1: Paediatric ICU – non-admission due to inadequate resources has increased to 4.36%, but only two HCOs reported data in 2011. Low numbers of reporting HCOs make this indicator difficult to interpret. As a result, it may not be a useful indicator.

The rate for CI 4.2: Paediatric ICU – elective surgical cases deferred or cancelled due to unavailability of bed increased to 3.79%, however only four HCOs reported on this indicator in 2011. Although there are only four HCOs contributing, there has been a significant increase in ICU access block. This is of significant concern from a health access point of view.

Given this result, the increase in CI 4.3: Paediatric ICU – transfer to another facility / area due to unavailability of bed to 0.097% is not surprising. With only two HCOs contributing data, this CI currently has very limited value for overall review.

Discharge delay from paediatric ICU (PICU) of more than 12 hours (CI 4.4) increased to 17.8%. Although only three HCOs have contributed, these results, along with those for the previous two indicators, suggest there is a significant increase in problems for paediatric ICU availability due to both access and exit block in the contributing facilities. It is noted that although the number of HCOs is the same, if these are the same HCOs that provided data in 2010, there has been a significant increase in admissions.

The rate for CI 4.5: Paediatric ICU – discharge between 6pm and 6am decreased to 10.2% in 2011. Despite the increase in exit block, most children in the three HCOs that reported, are being discharged between 6am and 6pm. It is interesting that despite one fewer HCO contributing data, the denominator has remained the same.

**Intensive care patient management**

The rate for unplanned readmission to a paediatric ICU within 72 hours (CI 5.1) decreased to 1.37%, however only four HCOs reported on this indicator in 2011. This is a pleasing trend; it may be the result of fewer discharges within 12 hours and increased discharges at safer times, as reflected in Cls 4.4 and 4.5.
Expert commentary

Australian College of Children and Young People’s Nurses (ACCYPN)

**Paediatric – general**

Immunisation status should be recorded as part of a child’s health history regardless of reason for admission or length of stay. The documentation is useful if opportunistic immunisation is then planned or offered where appropriate. A decrease in CI 1.1: Documented immunisation status from 2010 to the lowest rate since data collection began in 2004, is disappointing.

There were five outlier HCOs responsible for an outlier HCO rate of 58.7 per 100 patients. To comment on the decrease in recording immunisation status in the outlier HCOs is difficult without knowing their specific context.

The NSW HCO rate was the highest at 91.4%. The difference between NSW and other areas cannot be explained without further examination. The use of electronic medical records could be an enabling factor in improved documentation. Reduced reporting does not diminish the importance of this indicator.

The documentation rate of opportunistic immunisation (CI 1.2) has increased to 64.7% from 60.2% in 2010. The non-metropolitan HCO rate is 74.7% and the metropolitan HCO rate is 52.4%. It is encouraging to see the higher rate in non-metropolitan HCOs. There is evidence to support the success of dedicated, competent immunisation staff in increasing the opportunistic immunisation rates. As immunisation schedules change frequently, it is difficult for clinicians to maintain current knowledge in this area particularly when ‘catch-up’ schedules are required. It is disappointing that the number of HCOs reporting on this indicator has fallen significantly since 2004.

**Paediatric – asthma**

The average length of stay (LOS) for children admitted with asthma (CI 2.1) is 1.7 days and is unchanged since 2004, despite advances in treatment. There is little variation between HCOs. Only 36 HCOs reported on this indicator, down from 57 HCOs reporting in 2004. As there has been little change over the eight years of data collection, perhaps further reduction in LOS is unlikely unless new models of care are introduced.

In 2011, the mean for CI 2.2 is 1.8 days. Excluding same day admissions from the asthma LOS, there is little difference in LOS over the eight years of data collection. Further reduction in LOS is unlikely unless new models of care are introduced.

Readmission with asthma within 28 days of discharge (CI 2.3) has decreased to 3.55 per 100 separations which is the lowest rate since the CI was first collected. There is also the lowest number of HCOs reporting (n=38), with a reduced numerator and denominator. This reduction in readmission rate may reflect better discharge planning and improved family education on asthma management. It is difficult to comment on the outlier HCO without more information on its context such as its regional location and whether it is a tertiary centre.

**Access and exit block to the ICU**

Only two HCOs reported CI 4.1: Paediatric ICU – non-admission due to inadequate resources, however the rate has increased since the previous year (from 2.14 in 2010 to 4.36 per 100 patients). Although access block to paediatric ICUs is lower than in adult ICUs, this is an important measure to monitor, especially with the introduction of the National Health Reform Strategy’s ‘four-hour rule’ in the emergency department (ED),” the increasing complexity of patient care, and human resources not matching the increased demand. There are limited HCOs that can contribute these data and they are encouraged to do so. The importance of this indicator has not diminished, which makes the reduced reporting rate disappointing.

There has been a marked increase in cancellation of elective surgical cases due to lack of a paediatric ICU bed (CI 4.2) since 2007, and especially between 2010 and 2011 (from 0.81 to 3.79 per 100 admissions). Only four HCOs submitted data with one outlier accounting for 31 cases cancelled (rate 28.3 per 100 admissions). With such small numbers, the one outlier HCO contributed considerably to the increased rate. The reason for the increase could either be greater complexity of cases requiring increased length of stay in ICU, or increased demand for ICU beds from acute cases.

A very small increase was seen in the rate of transfer to another unit / facility related to unavailability of paediatric ICU beds (CI 4.3). Only two HCOs reported on this indicator. Although a very small increase, it could be symptomatic of the lack of resources, as is possibly reflected in CIs 4.1 and 4.2. Some paediatric ICUs do not

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* Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) Paediatric Patient Database (PPD)
† WA Dept of Health introduced the four hour rule, a program of clinical service redesign that aimed to improve patient care and patient flow, in 2008. There are reports online about its implementation.
Summary of results:

Paediatric

Expert commentary continued: Australian College of Children and Young People’s Nurses (ACCYPN)

have any alternative units / facilities to which they can transfer paediatric ICU patients, which may be why only two HCOs reported on this indicator.

The rate for discharge delay from a paediatric ICU exceeding 12 hours (CI 4.4) increased to 17.8%, however only three HCOs reported on this indicator in 2011.

These rates reflect internal exit block within an HCO. This rate has risen steadily since first introduced in 2007 from 13.1 to 17.8 per 100 patients. Only three HCOs reported on this CI in 2011, and one of those provided two outlier submissions. This would have influenced the overall rate (outlier rate = 26.7 per 100 children).

As there is evidence to show that transferring a patient from ICU can be detrimental after-hours, the rate may reflect translation of that knowledge into practice. By not transferring children after-hours, they may remain in paediatric ICU for more than 12 hours. As this measurement is related to resources, holding a child in ICU longer than is necessary increases the costs for the HCO, although the increased monitoring and care the child receives is not likely to be harmful. The delay in discharge potentially causes bed block for entry into the paediatric ICU.

The rate for CI 4.5: Paediatric ICU – discharge between 6pm and 6am decreased to 10.2%, however only three HCOs reported on this indicator in 2011. A decrease in the rate for discharge from paediatric ICU between 6pm and 6am (CI 4.5) is encouraging, and may be congruent with CI 4.4 where the rate for children held in a paediatric ICU for more than 12 hours has increased.

Intensive care patient management

The rate for unplanned readmission to a paediatric ICU within 72 hours (CI 5.1) decreased to 1.37%. This may reflect an improvement in management of paediatric ICU patients or a decrease in demand for paediatric ICU beds, meaning that children are not being transferred to the wards until they are ready.
In 2011, 42 HCOs submitted data to this indicator set; 99% of specimens were from public HCOs. Of the 11 indicators suitable for trend analysis,* six improved and five deteriorated. Most of the indicators in this set exhibited moderate variation between HCOs as measured by centile differences (the differences between the 80th and the 20th centile rates were of the order of 20–30%).

**Pathology**

**VERSION 3**

In 2011, 42 HCOs submitted data to this indicator set; 99% of specimens were from public HCOs. Of the 11 indicators suitable for trend analysis,* six improved and five deteriorated. Most of the indicators in this set exhibited moderate variation between HCOs as measured by centile differences (the differences between the 80th and the 20th centile rates were of the order of 20–30%).

**Chemical pathology**

**Turnaround time – serum / plasma potassium from ED or specified urgent**

CI 1.1: Serum / plasma potassium from ED or urgent – received to validated time <60 minutes (H) In 2011, there were 129,500 requests reported from 36 HCOs. The annual rate was 84.1 per 100 requests. The fitted rate improved from 82.4 to 84.7, a change of 2.3 per 100 requests. In 2011, there were 17 outlier submissions from 16 HCOs whose combined excess was 2,857 fewer serum / plasma potassium validated reports within 60 minutes.

**Haematology**

**Turnaround time – haemoglobin and coagulation tests from ED**

CI 2.1: Haemoglobin from ED – received to validated time <40 minutes (H) In 2011, there were 127,260 requests reported from 39 HCOs. The annual rate was 89.5 per 100 requests. The fitted rate improved from 84.4 to 89.5, a change of 5.1 per 100 requests. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 5.4 per 100 requests. In 2011, there were 25 outlier submissions from 18 HCOs whose combined excess was 2,736 fewer validated report results of haemoglobin within 40 minutes of receipt of the blood sample.

CI 2.2: Haemoglobin from ED – collected to validated time <60 minutes (H) In 2011, there were 162,302 requests reported from 30 HCOs. The annual rate was 80.4 per 100 requests. The fitted rate improved from 79.5 to 80.1, a change of 0.66 per 100 requests. In 2011, there were 22 outlier submissions from 12 HCOs whose combined excess was 9,577 fewer haemoglobin validated report results within 60 minutes of collection.

CI 2.3: Coag from ED – received to validated time <40 minutes (H) In 2011, there were 42,477 requests reported from 34 HCOs. The annual rate was 56.2 per 100 requests. The fitted rate improved from 55.0 to 56.1, a change of 1.1 per 100 requests. In 2011, there were ten outlier submissions from seven HCOs whose combined excess was 4,028 fewer Coag validated report results within 40 minutes of receipt.

CI 2.4: Coag from ED – collected to validated time <60 minutes (H) In 2011, there were 45,903 requests reported from 28 HCOs. The annual rate was 59.9 per 100 requests. The fitted rate deteriorated from 66.2 to 59.9, a change of 6.3 per 100 requests. In 2011, there were 16 outlier submissions from nine HCOs whose combined excess was 3,672 fewer Coag validated report results within 60 minutes of sample collection.

**Anatomical pathology**

**Turnaround time of requests for small and large biopsies**

CI 3.1: Small biopsy – received to validated time <44 hours (H) In 2011, there were 10,289 biopsy requests reported from 19 HCOs. The annual rate was 56.0 per 100 biopsies. The fitted rate deteriorated from 64.7 to 54.8, a change of 9.8 per 100 biopsies. In 2011, there were ten outlier submissions from eight HCOs whose combined excess was 1,187 fewer small biopsy results that were validated within 44 hours.

CI 3.2: Large biopsy – received to validated time <92 hours (H) In 2011, there were 9,661 biopsy requests reported from 17 HCOs. The annual rate was 55.3 per 100 biopsies. The fitted rate deteriorated from 68.6 to 52.1, a change of 16.5 per 100 biopsies. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 17.9 per 100 biopsies. In 2011, there were two outlier submissions from a single HCO whose combined excess was 82 fewer large biopsy results that were validated within 92 hours.

CI 3.3: Small biopsy – collected to validated time <48 hours (H) In 2011, there were 162,302 biopsy requests reported from 15 HCOs. The annual rate was 55.0 per 100 biopsies. The fitted rate deteriorated from 62.0 to 52.4, a change of 9.7 per 100 biopsies. In 2011, there were seven outlier submissions from five HCOs whose combined excess was 1,098 fewer small biopsy results that were validated within 48 hours.

CI 3.4: Large biopsy – collected to validated time <96 hours (H) In 2011, there were 4,218 biopsy requests reported from 16 HCOs. The annual rate was 41.7 per 100 biopsies. The fitted rate deteriorated from 56.3 to 38.6, a change of 17.7 per 100 biopsies. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 17.7 per 100 biopsies. In 2011, there were four outlier submissions from two HCOs whose combined excess was 306 fewer large biopsy results that were validated within 96 hours.

* Trends are not provided where there is no desirable direction (either high or low), less than four years data or fewer than five HCOs reporting.
Pathology

Microbiology

Turnaround time – cerebrospinal fluid (CSF) from emergency department (ED)

CI 4.1: CSF from ED, microscopy (gram +/- stain) – received to validated time <40 mins (H)

In 2011, there were 698 samples reported from 18 HCOs. The annual rate was 78.9 per 100 samples. The fitted rate improved from 68.3 to 78.3, a change of 9.9 per 100 samples. In 2011, there were four outlier submissions from four HCOs whose combined excess was 19 fewer CSF results validated within 40 minutes.

CI 4.2: CSF from ED, microscopy (gram +/- stain) – collected to validated time <60 mins (H)

In 2011, there were 642 samples reported from 15 HCOs. The annual rate was 74.8 per 100 samples. The fitted rate improved from 54.2 to 73.3, a change of 19.1 per 100 samples. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 19.1 per 100 samples. In 2011, there was one outlier submission whose combined excess was three fewer CSF results validated within 60 minutes.

Expert commentary

Royal College of Pathologists of Australasia (RCPA)

Pathology indicator results are much more susceptible to influence by changing technology and patterns of practice than some of the patient-based indicators, and a sudden change in an indicator result may arise from a change in information technology (IT) systems, new uptake of point-of-care testing, the introduction of new testing platforms, and many other factors. It is important that readers appreciate this when reviewing these data. By comparison, other indicator rates such as patient falls or unplanned return to operating theatres, are likely to be more stable.

As mentioned last year, it is difficult to give detailed comment on these data without more specific information about the processes involved at the individual healthcare organisations (HCOs). Likewise, it is difficult to draw conclusions about changes in the aggregated data from year to year without knowing whether the same HCOs are contributing data and whether their individual performance has changed. The real benefit of collecting these data is that feedback can be provided to the individual HCOs* to enable them to compare their performance with similar HCOs and determine whether there are any processes which can be modified to improve their own performance (and hopefully to demonstrate this improvement in the following year).

As mentioned last year, these KPI rates may not fully reflect clinically relevant performance. For example, a laboratory may achieve 80% of haemoglobin results in 60 minutes and 100% in 70 minutes whereas another laboratory may achieve 85% in 60 minutes and have up to a three hour wait for the other 15% of samples (perhaps arriving after-hours). Some measure of the range of times taken for results to be validated would add value to these KPIs.

Anatomical pathology

Regarding the anatomical pathology items CI 3.1: Small biopsy – received to validated time <44 hours, CI 3.2: Large biopsy – received to validated time <92 hours, CI 3.3: Small biopsy – collected to validated time <48 hours and CI 3.4: Large biopsy – collected to validated time <96 hours, the College has made extensive comment on the problems with these measures previously, caused by the fact that laboratories can pick and choose those biopsies that they report on. Revised criteria were devised by the College’s Anatomical Pathology Advisory Committee in early 2012, and if they are adopted by the ACHS, some real comparability of the data may be achievable.

In conclusion

With the above limitations and assumptions, the College notes that the overall performance is acceptable and appears to be improving despite the increasing workload.

The College recommends developing indicators that are clinically relevant to patient care in pathology and not to waste resources by overlapping with existing quality assurance activities in laboratories administered through external quality assurance programs and the NATA/RCPA Accreditation system, and that the ACHS liaises with the College and its discipline advisory committees. For example, the College has previously identified pre-analytical errors in hospitals (e.g. inpatient specimen collection errors) and these would be an important area for future efforts.

* ACHS CI Program members receive performance reports six-monthly.
Radiation Oncology

In 2011, 18 HCOs submitted indicator data to this set. Between 91% and 98% of patients covered between 2004 and 2011 were treated in public HCOs. All indicators had sufficient data to test for trend. Of these, seven showed improvement, four of which remained statistically significant after adjusting for differences over time in HCOs submitting.

Consultation process

CI 1.1: Radiotherapy – waiting time >14 days from the ‘ready for care’ date (L)
In 2011, there were 944 patients reported from 17 HCOs. The annual rate was 32.4 per 100 patients. The fitted rate improved from 36.9 to 29.9%, a change of 7.0 per 100 patients. In 2011, there were three outlier submissions from two HCOs whose combined excess was 42 more patients waiting more than 14 days before commencing radiotherapy.

CI 1.2: Radiotherapy – documented informed consent (H)
In 2011, there were 1,867 patients reported from 15 HCOs. The annual rate was 98.4 per 100 patients. The fitted rate improved from 81.3 to 97.6, a change of 16.2 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 17.1 per 100 patients. In 2011, there were three outlier submissions from three HCOs whose combined excess was 20 fewer patients who have informed consent recorded before receiving radiotherapy.

Clinical trial participation

CI 1.3: MEBR* – prospective clinical trials (H)
In 2011, there were 1,512 patients reported from 13 HCOs. The annual rate was 3.4 per 100 patients. There was no significant trend in the fitted rate.

Treatment process

CI 2.1: SCC† (oral, oropharynx, hypopharynx, larynx) – radiotherapy >6 weeks post-operatively (L)
In 2011, there were 101 patients reported from ten HCOs. The annual rate was 93.5 per 100 patients with glottic cancer. There was no significant trend in the fitted rate for treatment delay.

CI 2.2: SCC† (cervix) – curative chemoradiotherapy (H)
In 2011, there were 92 patients reported from nine HCOs. The annual rate was 81.5 per 100 patients. The fitted rate improved from 61.9 to 78.0, a change of 16.1 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 15.4 per 100 patients.

Multi-leaf collimators (MLC)‡

CI 2.3: Megavoltage radiotherapy – MLC (H)
In 2011, there were 17,918 patients reported from 13 HCOs. The annual rate was 86.3 per 100 patients. The fitted rate improved from 67.9 to 92.3, a change of 24.4 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 23.4 per 100 patients. In 2011, there were four outlier submissions from three HCOs whose combined excess was 613 fewer patients receiving megavoltage radiotherapy using MLC.

CI 2.4: Megavoltage radiotherapy – CT planning (H)
In 2011, there were 11,930 courses reported from 14 HCOs. The annual rate was 98.8 per 100 courses. The fitted rate improved from 68.6 to 97.7, a change of 29.1 per 100 courses. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 26.6 per 100 courses. In 2011, there were four outlier submissions from two HCOs whose combined excess was 105 fewer curative megavoltage radiotherapy courses where CT planning was utilised.

CI 2.5: Radiotherapy – letter on file to referring doctor and/or GP (H)
In 2011, there were 1,348 patients reported from 10 HCOs. The annual rate was 95.9 per 100 patients. The fitted rate improved from 76.1 to 95.7, a change of 19.6 per 100 patients. In 2011, there were two outlier submissions from two HCOs whose combined excess was 11 fewer patients who have a letter on file to the referring doctor and general practitioner.

Outcome process

CI 3.1: Glottic cancer (T1-2 N0 M0) radiotherapy – complete follow up (H)
In 2011, there were 12 submissions from seven HCOs. The annual rate was 93.5 per 100 patients with glottic cancer. There was no significant trend in the fitted rate.

CI 3.2: Breast conservation radiotherapy – complete follow up (H)
In 2011, there were 804 patients reported from seven HCOs. The annual rate was 74.8 per 100 patients. The fitted rate improved from 67.2 to 75.2, a change of 8.0 per 100 patients. In 2011, there were three outlier submissions from two HCOs whose combined excess was 57 fewer patients who had complete follow-up.

* Megavoltage External Beam Radiation – differentiates radiotherapy using radiation delivered by a machine outside the patient’s body from radiation sourced from radioactive isotopes implanted within the body.
† SCC = squamous cell carcinoma
‡ The MLC enables dose adjustment in radiotherapy – the multileaf collimator is attached to the linear accelerator and shapes the radiation beam.
§ Computed tomography (CT) scans can improve the accuracy of radiotherapy.
^ Glottic cancer occurs within the larynx.
Expert commentary
Faculty of Radiation Oncology, Royal Australian and New Zealand College of Radiologists (FACRO, RANZCR)

Consultation process
The rate for CI 1.1: Radiotherapy – waiting time > 14 days from the ‘ready for care’ date has increased from 29.3% in 2010 to 32.4% in 2011, with the best performing HCO rate at 12.8% and the poorest performing HCO rate at 49.7%. Waiting time measurement is notoriously unreliable and unstandardised. It is hard to say how much the variation is due to differences in how practices interpret the ‘ready to care’ date point versus true wait times. True ‘wait times’ can be caused by inadequate resources or inefficient practice, but the indicators cannot discern reasons behind wait times.

The rate for CI 1.2: Radiotherapy – documented informed consent has reached its highest level since 2007, currently at 98.4%. Mandatory written consent is now required by several states and this has probably helped to raise compliance. It should be 100%.

The rate for CI 1.3: MEBR – prospective clinical trials has increased to 3.44%, however two fewer HCOs reported on this indicator in 2011 and the denominator was much lower than in 2010. The best performing HCO rate is 6.04% and the poorest performing HCO rate is 1.21%, with low centile gains of 39 patients. There were no outlier HCOs.

It is difficult to collect these data. Clinical trials do not include all relevant research, such as health services research and quality focused research (which may result in far greater outcome gains than ‘clinical trials’ per se). Thus, this does not really capture everyone. Variations will occur based on the number of trials staff and economies of scale in large academic centres as opposed to smaller rural centres. Not surprisingly, there is variation, as recruitment to trials is directly related to trials support. FACRO expects the figures to worsen in future years as funding for trials staff is pulled across NSW.

Treatment process
The rate for CI 2.1: SCC (oral, oropharynx, hypopharynx, larynx) – radiotherapy > 6 weeks post-operatively has increased to 33.7%, although only ten HCOs report on this indicator. There were no outlier HCOs.

Radiotherapy is increasingly more complex for these HCOs with the increasing use of intensity-modulated radiation therapy (IMRT). This takes a lot of specialist and planning time, and the College expects these rates to look worse in coming years. Some HCOs may refer complex cases to larger centres, but this does not explain why not all sites contribute to the data.

The rate for CI 2.2: SCC (cervix) – curative chemoradiotherapy has reached 81.5%, its highest level since 2007, however only nine HCOs reported on this indicator. There were no outlier HCOs.

It is hard to understand why the proportion was so poor in previous years. I do not know what the figure should be, but it won’t be 100% as some patients will choose not to have chemotherapy or will be ineligible. It may include adjuvant radiation which probably has less data to support concurrent chemo- and radio-therapy. Some sites may refer complex cases to larger centres, but this does not explain why not all sites contribute to the data.

The rate for CI 2.3: Megavoltage radiotherapy – MLC has decreased to 86.3%. All centres should report, however only 13 HCOs reported on this indicator in 2011. The best performing centile rate is 97.3% and the poorest performing centile rate is 83.0%, producing centile gains of 1,966 patients. Three outlier HCOs were responsible for an outlier HCO rate of 60.5 per 100 patients. The rate will never be 100% as not all patients require therapy with an MLC. It is possible that some departments have old machines not fitted with an MLC – if so, funds should be made available to ensure every linear accelerator has an MLC.
The rate for CT planning of a course of megavoltage radiotherapy (CI 2.4) is 98.8%, with centile gains of 145 patients and outlier gains of 105 patients. There were two outlier HCOs responsible for an outlier HCO rate of 94.6 per 100 courses.

This rate will never be 100%, as not all patients require CT planning. Some centres may have different clinical practice; although CT planning is optimal for most patients, some can be treated very well without CT.

The rate for CI 2.5: Radiotherapy – letter on file to referring doctor and/or GP is the highest it has been since 2007, currently at 95.9%, however only ten HCOs reported on this indicator. The rate achieved by the best performing centile of HCOs is 99.5% and the rate for the poorest performing centile is 90.0%. These data are difficult to collect, so not all centres are responding. The absence of electronic oncology records in some departments may mean the letters are not always found. Departments with high inpatient loads may have this information in different systems, and thus not identified.

The rate for CI 3.1: Glottic cancer (T1-2 NO M0) radiotherapy – complete follow up is 93.5%. Seven HCOs reported on this indicator in 2011. Data are difficult to collect without electronic oncology records. FACRO is uncertain as to what ‘complete follow-up’ means, and would assume this term is open to interpretation.* Complete follow-up does not actually require ongoing radiation follow-up. For head and neck, a good ear, nose and throat (ENT) doctor could do the follow-up as effectively as a radiation oncologist.

The rate for complete follow-up following breast conservation radiotherapy (CI 3.2) is 74.8%, however only seven HCOs reported on this indicator in 2011. Data are difficult to collect without electronic oncology records. The term ‘complete follow-up’ may be open to interpretation. Complete follow-up does not actually require ongoing radiation follow-up. In some cancers (e.g. breast), studies show that general practitioners (GPs) do just as good a job at follow-up as specialists.

* The Radiation Oncology CI User Guide defines ‘complete follow-up’ as: the documentation of the status of all those patients treated during the study period who survived four years, and those who died within the four years, whether or not a total laryngectomy was performed.
Summary of results: Radiology

In 2011, 60 HCOs submitted data to this set, 96% of reported procedures being performed in public metropolitan HCOs. Of the five indicators, two improved and one deteriorated. The differences between the 80th and 20th centile rates indicate moderate variation between HCOs.

Report availability
CI 1.1: Radiographic reports – unavailable within 24 hours (L) In 2011, there were 208,664 requests reported from 52 HCOs. The annual rate was 30.9 per 100 requests. The fitted rate improved from 38.8 to 23.2, a change of 15.7 per 100 requests. This trend in the turnaround time for a report requested from the Radiology Department was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 14.9 per 100 requests. In 2011, there were 13 outlier submissions from 11 HCOs whose combined excess was 10,092 more radiographic reports not available within 24 hours.

Morbidity associated with radiological procedures
CI 2.1: Percutaneous trans-pleural biopsy – pneumothorax or haemothorax (L) In 2011, there were 1,462 patients reported from 37 HCOs. The annual rate was 8.7 per 100 patients. The fitted rate deteriorated from 6.8 to 9.4, a change of 2.6 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 3.0 per 100 patients. In 2011, there were three outlier submissions from three HCOs whose combined excess was six more patients experiencing pneumothorax and/or haemothorax requiring intervention.

CI 2.2: Limb angioplasty – peripheral embolic complications (L) In 2011, there were 1,676 angioplasties reported from 15 HCOs. The annual rate was 0.95 per 100 angioplasties. There was no significant trend in the fitted rate. In 2011, there were two outlier submissions from two HCOs whose combined excess was six more peripheral embolic complications of limb arteries.

CI 2.3: CT procedure – iodinated contrast extravasation (L) In 2011, there were 165,390 patients reported from 45 HCOs. The annual rate was 0.26 per 100 patients. There was no significant trend in the fitted rate. In 2011, there was one outlier submission whose combined excess was six more patients experiencing iodinated contrast extravasation requiring medical review.

CI 2.4: Angiography – puncture site complications (L) In 2011, there were 15,418 angiograms reported from 22 HCOs. The annual rate was 0.64 per 100 angiograms. The fitted rate improved from 3.0 to 1.1, a change of 1.9 per 100 angiograms. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.1 per 100 angiograms. In 2011, there were five outlier submissions from four HCOs whose combined excess was 42 more puncture site complications.

Expert commentary
Royal Australian and New Zealand College of Radiologists (RANZCR)

Report availability
In 2011, two more HCOs reported on CI 1.1 than in 2010, however the denominator, which records requests for radiographic reports, is the lowest it has ever been in the past eight years (208,664).

The best performing 20% HCO rate is 5.16% and the poorest performing 20% HCO rate is 32.9%, resulting in large centile gains of 53,709 reports. There were stratum gains of 26,094 reports, and outlier gains of 10,092 reports. The Qld HCO rate is the lowest at 25.7% and the WA HCO rate is the highest at 41.8%. There were 11 outlier HCOs responsible for an outlier HCO rate of 40.1 per 100 requests.

RANZCR notes the increased rate for CI 1.1: Radiographic reports – unavailable within 24 hours from 24.2% in 2010 to 30.9% in 2011, which may reflect slower reporting times due to limited staff or variation in the method used by sites when collecting data. It is quite possible that different sites may be using different definitions for ‘radiographic examination requests’, leading to variations in the rate across time.

To analyse the results, it would be helpful if ACHS provided more specific instructions to HCOs in order to clarify the types of examinations that are being captured (e.g. all ED or all inpatient studies). Without such information, the clinical significance of these results is unclear due to possible disparity between sites with regard to whether these data reflect different proportions of inpatient, ED, and outpatient examinations.

In observing the lowest denominator in the past eight years, the College suggests that this may be attributable to some HCOs leaving the pool and
Expert commentary continued: Royal Australian and New Zealand College of Radiologists (RANZCR)

Morbidity of radiological procedures

The rate for percutaneous transpleural biopsy of lung or mediastinum leading to pneumothorax or haemothorax (CI 2.1) has increased from 8.06% in 2010 to 8.69% in 2011, with two fewer HCOs reporting on this indicator. This reported rate is in the acceptable range.

The best performing centile rate is 4.30% and the poorest performing centile rate is 15.5%. There were three outlier HCOs responsible for an outlier HCO rate of 34.2 per 100 patients.

The College notes that there is limited clarity regarding the User Manual definition of ‘evidence of pneumothorax and/or haemorrhax requiring intervention’. For example, plain x-rays show fewer pneumothorax and/or haemorrhax than CT, which can result in the discovery of incidental pneumothorax and/or haemorrhax following biopsy. Sites using these different methods may therefore make different observations, aside from the criteria for intervention varying. Means of detection of pneumothorax and the nature of intervention need to be defined to provide for consistency of the data and meaningful interpretation.

The rate for CI 2.2: Limb angioplasty – peripheral embolic complications has fluctuated since 2004, and is currently 0.95%. Only 15 HCOs reported on this indicator in 2011, and centile gains were 12 angioplasty patients. The fluctuation in rate may be attributable to issues regarding definition in relation to what each HCO is reporting as a peripheral complication and what the instructions are for participating sites whilst capturing this data.

Two outlier HCOs were responsible for an outlier HCO rate of 6.5 per 100 angioplasties. In observing the outlier HCO rate of 6.5 per 100 angioplasties, the College notes that this may be explained by variation in data from the various HCOs, particularly if the data are captured from a range of different disciplines which may be performing these procedures across HCOs. A further explanation may be that casemix varies across the reporting HCOs, e.g. older patient cohorts with existing comorbidities can account for the differences in complication rates, as they are at a higher risk.

It is observed that whilst it has fluctuated across time, the rate has remained relatively low, and is within the acceptable range.

The rate for CI 2.3: CT procedure – iodinated contrast extravasation has remained constant across the last eight years (0.25–0.31%) and is currently 0.26%. The College notes that the rates have remained stable, and lie within expected values.

The reason for the difference between the best performing centile rate of 0.20% and the poorest performing centile rate of 0.35% is difficult to confidently identify. It is possible that some HCO sites may perform a higher proportion of CT angiography examinations contributing to higher pressures and higher complication rates. HCOs may also migrate in and out of the data collection.

It is observed that the rate for puncture site complications following angiography (CI 2.4) has reached its lowest level since 2004 (0.64%). The outlier HCO rate in 2011 (4.4 per 100 angiograms) is considerably lower compared to 2010 (8.3 per 100 angiograms). This variation may be accounted for by the increased use of coagulants and inclusion of services provided by cardiologists or vascular surgeon in radiology departments or elsewhere within HCOs. These results may reflect the different techniques used by different craft groups, including use of closure devices versus manual compression etc. The variations may also reflect the different casemixes across various HCOs.

General comments

The College is pleased to be able to provide comment on the Australasian Clinical Indicator Report 2004–2011. The College strongly recommends that further work be conducted to define data collection parameters to improve consistency of data gathering and capacity to interpret and act upon future reports. The College remains available to review and provide input and recommendations into a more balanced suite of indicators that it is hoped will over time reflect all dimensions of quality in a manner appropriate to radiology.
Expert commentary

Medical Imaging Nurses Association (MINA)

Report availability

The trend for C1 1.1: Radiographic reports – unavailable within 24 hours continues to improve, based on the statistical information provided.

The data only provide the number of HCOs by state. There is no indication of the breakdown between tertiary and regional hospitals, private and public hospitals. Specific areas would carry greater need for reporting, such as intensive care units (ICUs) and emergency departments, while non-acute areas, such as outpatient departments, would not have the same need for urgent reporting within the 24-hour timeframe.

The accuracy of these statistics is dependent on the data collection. In a large number of extravasations, the term ‘requiring medical review’ is open to interpretation. Are extravasations that are reported and managed by a medical officer the only statistics captured? A number of small extravasations not requiring medical review may be significant, but not captured. The capture and medical review protocol may vary between HCOs.

The clinical indicators can only include morbidity and complication data submitted to the reporting radiologist.

The variation between HCOs in relation to the data collection criteria is not known. All images taken within the facility would be unlikely to be included in the data collection.†

Morbidity associated with radiological procedures

For C1 2.1: Percutaneous trans-pleural biopsy of lung or mediastinum – pneumothorax or haemothorax, there has been a significant increase in the rate of patients over a smaller number of HCOs. These figures do not define the level of intervention required post biopsy / drainage.

A number of variables would include the patient status and difficulty level for performing the procedure, post-procedure screening rate, the device used to perform the procedure, level of experience of the medical officer performing the procedure. There do not appear to have been any significant changes in the trends for C1 2.2: Limb angioplasty – peripheral embolic complications. The definition of complication may need to be more specific as to what complications are reported.‡

The age and underlying pathology will have significant effect on the rate of morbidity related to angioplastic procedures.

The trend in C1 2.3: CT procedure – iodinated contrast extravasation indicates no significant change.

The development of more sophisticated computed tomography (CT) units has led to an increasing number of diagnostic angiographic examinations. The use of larger gauge cannulae with higher contrast media flow rates does not appear to have increased the extravasation rates.

The accuracy of these statistics is dependent on the data collection. In a large number of extravasations, the term ‘requiring medical review’ is open to interpretation. Are extravasations that are reported and managed by a medical officer the only statistics captured? A number of small extravasations not requiring medical review may be significant, but not captured. The capture and medical review protocol may vary between HCOs.

It is pleasing that the rate and trend for angiographic puncture site complications (C1 2.4) continue to fall. As new stasis products become available and more widely used, there appears to be a reduction in the complication rate. The outlier figures are significant, although improved on the 2010 data.

With improving communication between medical imaging nurses and the development of national guidelines, outlier units may have greater access to evidence and ideas for developing their protocols related to puncture site management.

In conclusion

The clinical indicators can only reflect the data submitted by the participating HCOs. Although the trend appears to be improving in four of the five CIs, the methodology of data collection within the definitions is open to interpretation. For CIs to be accurate, the definitions need to be specific and uniform for all reporting HCOs.

There remains a large variation in the HCOs performing interventional radiology. The submission of data varies by CI, with some HCOs reporting on all CIs and others reporting only specific CIs. As the data submission is voluntary and subject to interpretation of the definition of each CI, these results may not reflect the true picture either nationally or at state level.

The review of clinical indicators may require more specific definition of the numerators to promote a uniform data collection.

HCO outliers are encouraged to access national guidelines through their organisations as it may lead to improvements in complication rates. As technology is introducing new procedures or advancing current procedures, the CIs need to be reviewed to reflect the current trends in medical imaging.

MINA thanks ACHS for the opportunity to review and make comment on the Radiology set of CIs.

* HCOs contributing data are stratified as public or private, and then by the number and range of their imaging.
† The timeframe for study is “all investigations conducted in a 24-hour period over 7 consecutive days.”
‡ The User Manual defines embolic complications as “complications caused by the passage of emboli such as thrombus, air, atheromatous material or other particle or device or part thereof along an artery or vein. The complications may result from either attempts to remove the embolus or from the resulting occlusion of the artery or vein.”
In 2011, 126 HCOs submitted data to this set. In each indicator approximately two-thirds of rehabilitation episodes reported were from private HCOs. Of the six indicators suitable for trend analysis, five improved. In all indicators, 20% of HCOs reported rates close to 100%. With the exception of CI 6.1: Return to accommodation facilitating independence, 80% of HCOs reported rates in excess of 92%.

### Timely assessment of function on admission

**CI 1.1: Functional assessment within 72 hours of admission (H)**
In 2011, there were 59,105 patients reported from 120 HCOs. The annual rate was 96.5 per 100 patients. The fitted rate improved from 94.6 to 96.7, a change of 2.1 per 100 patients. In 2011, there were 44 outlier submissions from 31 HCOs whose combined excess was 1,128 fewer patients for whom there is documented evidence of a functional assessment within 72 hours.

### Assessment of function prior to episode end

**CI 2.1: Functional assessment within 72 hours before end of rehabilitation (H)**
In 2011, there were 53,704 patients reported from 116 HCOs. The annual rate was 96.8 per 100 patients. The fitted rate improved from 94.3 to 97.1, a change of 2.8 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 2.8 per 100 patients. In 2011, there were 39 outlier submissions from 30 HCOs whose combined excess was 985 fewer patients with documented evidence of a functional assessment within 72 hours of ceasing a rehabilitation program.

### Timely establishment of a multidisciplinary team rehabilitation plan

**CI 3.1: Multidisciplinary team plan within 7 days (H)**
In 2011, there were 53,405 patients reported from 120 HCOs. The annual rate was 97.5 per 100 patients. The fitted rate improved from 97.3 to 97.6, a change of 0.21 per 100 patients. In 2011, there were 41 outlier submissions from 31 HCOs whose combined excess was 733 fewer patients for whom there is a documented multi-disciplinary rehabilitation plan within seven days of patient admission.

### Discharge plan prior to patient separation

**CI 4.1: Discharge plan on separation (H)**
In 2011, there were 50,344 separations reported from 118 HCOs. The annual rate was 98.1 per 100 separations. The fitted rate improved from 97.4 to 98.5, a change of 1.1 per 100 separations. In 2011, there were 26 outlier submissions from 20 HCOs whose combined excess was 603 fewer separations for which there is an appropriate discharge plan.

### Functional gain achieved by rehabilitation program

**CI 5.1: Functional gain following completed rehabilitation program (H)**
In 2011, there were 49,424 patients reported from 117 HCOs. The annual rate was 95.0 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were 35 outlier submissions from 26 HCOs whose combined excess was 736 fewer patients discharged where there is documented evidence of functional gain.

### Discharge destination

**CI 6.1: Return to pre-episode accommodation facilitating independence (H)**
In 2011, there were 48,014 patients reported from 116 HCOs. The annual rate was 88.8 per 100 patients. The fitted rate improved from 88.2 to 88.9, a change of 0.68 per 100 patients. In 2011, there were 44 outlier submissions from 33 HCOs whose combined excess was 1,145 fewer patients discharged to their pre-episode form of accommodation, or a form of accommodation that allows for greater independence.

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**Expert commentary**

**Australasian Faculty of Rehabilitation Medicine (AFRM)**

The Australasian Faculty of Rehabilitation Medicine notes a continuing high rate of compliance with the ACHS Rehabilitation Medicine CIs. This should be seen in the context of very high compliance in provision of detailed outcome data to the Australasian Rehabilitation Outcomes Centre (AROC), and a culture of continuous improvement within the Rehabilitation Medicine community resulting, not only in the good process and outcome measures demonstrated by these clinical indicators, but also in shorter lengths of stay and more functional improvement for similar diagnostic groups, demonstrated by the AROC data.

Where differences in indicator outcomes are evident between sectors (public compared with private facilities) or jurisdictions, they should be interpreted very cautiously because these data are not casemix adjusted.*

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* Contributing HCOs are stratified into three categories based on their service provision.
In 2011, 168 HCOs submitted data to this set. Overall, approximately half of all procedures were from public HCOs.

Of the 19 indicators in this set, 16 were tested for trend. Four indicators demonstrated improvement, three of which were statistically significant after allowing for the changing composition of contributing HCOs over time. Four indicators deteriorated, three of which were statistically significant after allowing for the changing composition of contributing HCOs.

Stratum differences were not consistent over time.

**Paediatric surgery**

**Pyloromyotomy for pyloric stenosis**

CI 1.1: Pyloromyotomy – mucosal perforation (L)

In 2011, there were 108 patients reported from five HCOs. The annual rate was 3.7 per 100 patients. The fitted rate deteriorated from 0.81 to 3.0, a change of 2.2 per 100 patients.

**Surgery for suspected appendicitis in childhood**

CI 1.2: Acute appendicitis (children) – normal histology (L)

In 2011, there were 1,443 appendicectomies reported from 30 HCOs. The annual rate was 16.4 per 100 appendicectomies. There was no significant trend in the fitted rate.

CI 1.3: Preoperative acute appendicitis (children) – normal histology but significant other intra-abdominal pathology (L)

In 2011, there were 1,216 appendicectomies reported from 26 HCOs. The annual rate was 4.2 per 100 appendicectomies. The fitted rate deteriorated from 3.4 to 4.8, a change of 1.3 per 100 appendicectomies. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.4 per 100 appendicectomies.

**Orthopaedic surgery**

**Post-operative infection following total hip joint replacement (THJR)**

CI 3.1: THJR – post-operative in-hospital infection (L)

In 2011, there were 4,443 patients reported from 49 HCOs. The annual rate was 0.86 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were two outlier submissions from two HCOs whose combined excess was 11 more patients undergoing primary THJR having a post-operative in-hospital infection.

**Plastic surgery**

CI 4.1: Completely excised malignant skin tumours (H)

In 2011, there were 7,251 excisions reported from 26 HCOs. The annual rate was 88.3 per 100 excisions. The fitted rate improved from 88.1 to 90.0, a change of two per 100 excisions. In 2011, there were five outlier submissions from four HCOs whose combined excess was 177 fewer completely excised malignant skin tumours.

**Cardiothoracic surgery**

**Mortality in coronary artery graft surgery (CAGS)**

CI 5.1: CAGS – death (L)

In 2011, there were 6,603 patients reported from 34 HCOs. The annual rate was 1.4 per 100 patients. The fitted rate improved from 1.8 to 1.2, a change of 0.6 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.25 per 100 patients.
Summary of results: Surgical

**Cl 5.2: Elective CAGS – death (L)** In 2011, there were 3,128 patients reported from 22 HCOs. The annual rate was 1.2 per 100 patients. There was no significant trend in the fitted rate.

**Cl 5.3: CAGS ≥71 years – death (L)** In 2011, there were 2,187 patients reported from 26 HCOs. The annual rate was 1.9 per 100 patients. The fitted rate improved from 3.2 to 2.2, a change of 1.0 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.96 per 100 patients.

**Neurosurgery**

**Cl 6.1: Neurosurgery – neurosurgical infection (L)** In 2011, there were 10,044 patients reported from 16 HCOs. The annual rate was 1.1 per 100 patients. There was no significant trend in the fitted rate. In 2011, there was one outlier submission whose combined excess was ten more patients with a neurosurgical infection in hospital.

**Cl 6.2: Neurosurgery – new neurological deficit (L)** In 2011, there were 8,222 patients reported from 12 HCOs. The annual rate was 1.1 per 100 patients. The fitted rate improved from 1.6 to 1.0, a change of 0.62 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 0.54 per 100 patients.

**General surgery**

**Cl 7.1: Laparoscopic cholecystectomy* – bile duct injury requiring operative intervention (L)** In 2011, there were 14,225 patients reported from 100 HCOs. The annual rate was 0.55 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were two outlier submissions from two HCOs whose combined excess was 15 more patients having a bile duct injury requiring operative intervention.

**Vascular surgery**

**Mortality following elective abdominal aortic aneurysm (AAA) repair**

**Cl 8.1: Elective AAA – death (L)** In 2011, there were 452 patients reported from 24 HCOs. The annual rate was 2.0 per 100 patients. There was no significant trend in the fitted rate.

**Cl 8.2: Carotid endarterectomy – stroke (L)** In 2011, there were 647 patients reported from 25 HCOs. The annual rate was 2.2 per 100 patients. The fitted rate deteriorated from 1.3 to 2.6, a change of 1.3 per 100 patients. This trend was also significant after allowing for the changing composition of HCOs contributing over the period. The rate change was 1.2 per 100 patients. In 2011, there were two outlier submissions from two HCOs whose combined excess was five more patients having a carotid endarterectomy who have a stroke within the same admission.

**Otolaryngology†**

**Cl 9.1: Tonsillectomy – significant reactionary haemorrhage (L)** In 2011, there were 14,816 patients reported from 84 HCOs. The annual rate was 0.65 per 100 patients. There was no significant trend in the fitted rate. In 2011, there were two outlier submissions from two HCOs whose combined excess was 13 more patients who have a significant reactionary haemorrhage following tonsillectomy.

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* Removal of the gall bladder using a laparoscope.
† Ear, nose and throat (ENT) surgery
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