AN INTERNATIONAL PERSPECTIVE ON INFORMATION FOR PATIENT SAFETY
WHAT CAN WE LEARN ABOUT MEASURING SAFE CARE?


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## CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Foreword</td>
</tr>
<tr>
<td>04</td>
<td>Executive summary</td>
</tr>
<tr>
<td>06</td>
<td>Introduction</td>
</tr>
<tr>
<td>10</td>
<td>Section 1: Patient Safety Information Scorecard – overview and methods</td>
</tr>
<tr>
<td>17</td>
<td>Section 2: How do health systems organize patient safety?</td>
</tr>
<tr>
<td>18</td>
<td>Section 3: Which data sources do health systems use to assess patient safety across care settings?</td>
</tr>
<tr>
<td>29</td>
<td>Section 4: How do health systems assess patient safety in acute care settings?</td>
</tr>
<tr>
<td>41</td>
<td>Section 5: How is staff-reported information recorded and used? An in-depth look at incident reporting systems</td>
</tr>
<tr>
<td>57</td>
<td>Appendix: Methodology</td>
</tr>
<tr>
<td>65</td>
<td>Acknowledgments</td>
</tr>
<tr>
<td>67</td>
<td>References</td>
</tr>
</tbody>
</table>
FOREWORD

Since the publication of *To Err Is Human: Building a Safer Health System*, patient safety has been a priority for health systems across the globe. However, as a clinician, former health minister and academic, I have seen firsthand that measuring patient safety remains challenging; the information we use to assess patient safety is imperfect and less readily available than it is in other areas.

To improve patient safety, we need to know what is going wrong. We need a full picture view, with accurate, comprehensive and accessible information. We also need reliable measures to track progress and improvement, to answer the question: are we providing safer care?

As part of the Leading Health Systems Network (LHSN) – an international group of health systems, hosted at Imperial College’s Institute of Global Health Innovation, that shares knowledge and compares performance – we came together to review the sources that healthcare providers use to measure patient safety and how they act on this information. This report summarizes the results of this effort and incorporates insights from the literature on measuring patient safety.

I hope that this publication will serve as a starting point for health systems to assess, and ultimately improve, the use of information for patient safety.

Professor the Lord Darzi of Denham,
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Chairman, Leading Health Systems Network
Executive Chair, WISH, Qatar Foundation
Director, Institute of Global Health Innovation, Imperial College London
EXECUTIVE SUMMARY

The fact that patient safety is an important issue in healthcare is not up for debate. We can all agree that it is unacceptable that almost one in 10 patients are harmed while receiving care in the hospital. However, it is also worrying that we rely on estimates of safety levels because of the lack of comprehensive information.

Through a combination of a review of the literature and a qualitative survey of eight organizations, this report compares how health systems measure patient safety. We review which information sources are used and to what end. However, this exercise is not meant to rank one system over another in terms of performance, but aims to highlight ways for all care providers to improve the measurement of patient safety.

Information is typically less readily available for patient safety than other areas of healthcare. While administrative systems are geared to capture information for areas such as clinical outcomes or billing, they contain little information on patient safety. Rather, much patient safety information is recorded in parallel systems (for example, incident reporting). Yet, even these systems do not capture the full picture, with organizations relying on several data sources to cobble together a picture of safety.

Acute care has the most comprehensive patient safety information. Organizations use case reviews and audits – such as mortality/morbidity reviews – as well as administrative data and incident reporting systems to measure patient safety. Incident reporting systems, in particular, are used for identifying local hazards, sharing lessons and supporting a culture of patient safety. Their usefulness, however, depends on a variety of factors.

Although patient experience and outcomes information provide a partial picture of quality, settings outside acute care appear to have minimal patient safety data. The literature and information provided by our survey participants seem to show that organizations struggle to define a best practice set of indicators in settings such as mental health or primary care.

This report proposes the following recommendations for healthcare providers to improve the use of information for patient safety:

1. **Generate more evidence** on the most effective indicators for driving improvement – particularly for care settings outside acute care, including mental health and primary care.
2. **Monitor a standard set of indicators** – including deaths resulting from poor care – within health systems to track internal progress.
3. **Triangulate data from multiple sources** to identify common themes, improve data accuracy and compensate for imperfect methodologies of specific information sources.
4. **Implement an effective incident reporting system**, ensuring that reporting is embedded at both the organizational and system-wide policy levels.

   a) Increase reporting levels by: systematically training and educating staff; implementing a user-friendly, simple interface; ensuring that reporting is non-punitive, with the option for anonymous reporting; and creating effective feedback mechanisms between reporters and investigators.

   b) Improve reporting quality by: clearly articulating the objectives of reporting systems; defining procedures for what to report; and limiting the number of required fields, while including the option for text comments.

5. **Ensure that appropriately trained analysts are available** to properly analyze patient safety data and identify potentially troubling patterns.

6. **Establish a system to share lessons** quickly and with the appropriate audiences at local, regional and national levels.

7. **Foster a culture of openness** rather than blame and empower all staff to ‘own’ the responsibility of patient safety without fear of punishment.

Implementing these recommendations will require significant effort and collaboration across frontline providers, administrators and academia, but we believe that it will lead to more accurate measurement of patient safety.
INTRODUCTION

Defining patient safety

Patient safety in healthcare has become a priority area for improvement and research in the past two decades. It has been the subject of several high-profile publications and inquiries, yet the concept of patient safety is rarely viewed in isolation.\(^1\)\(^2\) Rather, patient safety is inevitably intertwined with the larger realm of care quality, as shown in Figure 1.

Figure 1: A framework for quality and patient safety

While we recognize that patient safety, clinical effectiveness and patient experience are all essential elements that contribute to quality, we focus the scope of this report on patient safety specifically, using the World Health Organization (WHO) definition:\(^4\)

“Patient safety is the absence of preventable harm to a patient during the process of health care.”

Therefore, the following analysis focuses only on information sources directly linked to this definition of patient safety. For instance, all systems that submitted data for the Patient Safety Information Scorecard exercise – explained in further detail in Section 1 – rely heavily on patient-reported information to assess patient experience. While patient experience is an important element of quality, it is distinct from patient safety, and therefore does not fall directly within the remit of this report.
The scale of the problem and importance of measurement

Despite receiving significant attention and investment, patient safety remains a considerable challenge worldwide. Estimates state that:

- almost one in 10 patients are harmed while receiving hospital care;
- 7 to 10 percent of patients acquire healthcare associated infections; and
- in the United States (US) alone, 400,000 deaths occur annually from potentially preventable errors.5,6

This high level of patient harm causes significant pain and suffering for patients and their families. In addition, there are substantial financial consequences for health systems. Additional medical expenses, litigation costs and lost productivity due to poor quality of care result in an annual expenditure of $19 billion in some countries.7

Harrowing as these statistics are, inaccurate measurement masks the true extent of the problem, leaving us to grapple with estimates. Patient safety measurement unfortunately remains a problem globally; assessing whether an organization provides safe care is not a simple task.8 Some components of patient safety (such as resilience or preventability) are challenging to define and measure, and patient harm is not necessarily captured in routinely collected administrative data. As a result, healthcare providers rely on a patchwork of data sources and audits to assess safety.9

Most healthcare providers rely heavily on incident reporting systems where staff voluntarily report on patient safety incidents.10 These systems, while a valuable tool for identifying patterns and learning from past mistakes, are not necessarily reflective of true rates of adverse events. Underreporting of incidents by staff is a problem around the globe.11 A sampling of 34 hospitals in the US, for example, found that only 14 percent of incidents were captured through incident reporting systems.12 Meanwhile, a review in a hospital in the United Kingdom (UK) found that only 5 percent of adverse events were reported.13 Fear of consequences, ambiguity around impact and time constraints all contribute to low rates of reporting by staff, and these challenges are not easily overcome.14

Working from only a partial picture leaves policymakers ill-equipped to create appropriate and effective initiatives, potentially leading to a misdirection of resources. Monitoring the success of improvement initiatives is complicated by inaccurate reporting; if either the ‘before’ or ‘after’ evidential basis is not genuine, then there is no way to reliably evaluate success. Therefore, it is imperative that we continue to improve the accuracy and robustness of patient safety measurement.
Overview of LHSN and Safer Care Accelerator Programme

Based at Imperial College’s Centre for Health Policy, with support from the National Institute for Health Research (NIHR) Imperial Patient Safety Translational Research Centre (PSTRC) and in partnership with the World Innovation Summit for Health (WISH), LHSN is a collaborative network of healthcare leaders and organizations – outlined in Figure 2 – dedicated to improving healthcare delivery by effectively and efficiently using available resources. Our network brings together the best ideas, models of care and strategies to drive sustained improvement and connects healthcare leaders to a like-minded community of peers that share the same goals and challenges.

Figure 2: LHSN membership overview

<table>
<thead>
<tr>
<th>CANADA</th>
<th>SPAIN</th>
<th>ENGLAND</th>
<th>SCOTLAND</th>
<th>ITALY</th>
<th>INDIA</th>
<th>HONG KONG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancouver</td>
<td>BIOEF (Basque</td>
<td>NHS Arden</td>
<td>Friuli Venezia</td>
<td>Apollo Hospitals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal</td>
<td>Health System)</td>
<td>and Greater</td>
<td>Health (Italy)</td>
<td></td>
<td></td>
<td>Hong Kong</td>
</tr>
<tr>
<td>Health</td>
<td>East Midlands</td>
<td>Glasgow and</td>
<td></td>
<td></td>
<td></td>
<td>Hospital Authority</td>
</tr>
<tr>
<td>INESSS</td>
<td>NHS England</td>
<td>Clyde</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Québec)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>COLOMBIA</th>
<th>QATAR</th>
<th>UGANDA</th>
<th>SINGAPORE</th>
<th>BRUNEI DARUSSALAM</th>
<th>AUSTRALIA</th>
<th>NEW ZEALAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundación</td>
<td>Hamad Medical</td>
<td>Sidra Medical</td>
<td>Changi General</td>
<td>Department of</td>
<td>Ko Awatea</td>
<td></td>
</tr>
<tr>
<td>Santa Fe de</td>
<td>Corporation</td>
<td>and Research</td>
<td>Hospital</td>
<td>Health and Human</td>
<td>(Counties</td>
<td></td>
</tr>
<tr>
<td>Bogotá</td>
<td></td>
<td>Center</td>
<td></td>
<td>Services</td>
<td>Manukau Health)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Victoria)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

08 LEADING HEALTH SYSTEMS NETWORK
In April 2015, we began a program focusing on safer care. The Safer Care Accelerator brings together healthcare leaders and organizations to exchange insights, experiences and data around patient safety. Network activity has included three main components:

- **Patient Safety Information Scorecard**: This work provides a comparative view of what information is used for patient safety and how effectively this information is used across healthcare systems.

- **Patient Safety in Maternity**: This analytical module compares system performance of patient safety in maternity care. The module – currently underway – has three components assessing: context and model of care; patient safety culture; and outcomes. Similar to the Patient Safety Information Scorecard work, this information will be compiled in a report that combines systems’ data with a review of literature and selected case studies.

- **Webinar series**: This component is meant to complement the analytical modules where participants contribute comparative data. These web-hosted sessions range from high-level perspectives on patient safety to examples of specific patient safety initiatives. The series is hosted by frontline change leaders. Featured speakers have included: Margaret Murphy, External Lead Advisor for WHO’s Patients for Patient Safety; Sir Liam Donaldson, WHO Envoy for Patient Safety; and Dr Peter Pronovost, Director of the Armstrong Institute for Patient Safety and Quality at Johns Hopkins University.

Full results from the Safer Care Accelerator Programme will be summarized at the WISH event in Doha, Qatar in November 2016.
SECTION 1: PATIENT SAFETY INFORMATION SCORECARD – OVERVIEW AND METHODS

To assess how participants use information to measure patient safety, we developed two questionnaires which were emailed to all LHSN program leads. The program leads liaised with internal stakeholders to gather relevant information to complete the questionnaires for their respective organizations (full questionnaires are included in the Appendix).

Patient Safety Information Scorecard questionnaire

The Patient Safety Information Scorecard questionnaire, distributed as an Excel file, comprises two main sections: organizational context and sources of patient safety information. Context questions provide information on how participants organize patient safety – centrally and by care setting – as well as general organizational characteristics, such as population served, staffing levels and number of admissions.

The ‘sources of information’ section covers multiple care settings – from primary care, acute care and mental health to non-medical care settings such as social care – and groups information sources into the following categories:

- **Administrative data**: Health data generated through the routine administration of health programs (for example, delivering care, enrolling members into health insurance plans and reimbursing for services). Examples include episode-level data sets and patient safety indicator sets.
- **Staff-reported data**: Any information provided – voluntarily or mandatorily – by frontline staff (for example, via patient safety event reporting or incident reporting systems).
- **Patient-reported data**: Any information provided by patients about the safety of their care (for example, ‘mystery patient’ feedback or patient-reported feedback).
- **Case review and audit data**: Information reviewed for specific cases where adverse events or harm to patients is suspected (for example, mortality/morbidity rounds, peer reviews, case note reviews, focused record reviews, critical incident reviews and externally led audits).
- **Liability claims data**: Data compiled for the purposes of a medical liability claim when an incident occurs, even if no litigation ensues (for example, liability claims records).
For each data source, participants provided answers to the following questions:

- How is this data analyzed and formatted for presentation/use?
- At what level is this data reviewed (provider, regional, national)?
- Who receives this information, and how is it made available to them?
- What systems/processes (if any) are in place to ensure that this information is acted on?

These questions are designed to provide a fuller picture of how information sources are used to assess patient safety and drive improvement.

**Incident Reporting System questionnaire**

Given that staff-reported information is typically the most common source of information for assessing patient safety, we also administered a questionnaire on incident reporting systems to assess the commonalities and differences in the structure of these systems and how organizations use them to assess patient safety. The questionnaire is based on an academic framework detailing the characteristics of successful incident reporting systems.\(^{15}\) It contains 30 questions covering a variety of areas – from uptake and usage, to information capture, to learning and improvement. The full questionnaire can be found in the Appendix.

After collating and analyzing data from responses submitted by participants, we undertook a review of the literature on patient safety measurement to supplement the insights from the Scorecard.
Participants

Seven healthcare providers and one national commissioning body submitted data for this exercise, though not all organizations provided information for both questionnaires. Figure 4 provides an overview of participants.

Figure 4: Participating organization characteristics

Apollo Hospitals (Apollo)

Based in India, Apollo Hospitals is a private healthcare provider that provides primary and acute care throughout the country and in select international locations.

<table>
<thead>
<tr>
<th>100 million population served</th>
<th>64 multispecialty hospitals</th>
<th>7,619 acute care beds</th>
<th>7,000 consulting physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.26 million acute admissions*</td>
<td></td>
<td>1,786 critical care beds</td>
<td></td>
</tr>
</tbody>
</table>

QUESTIONNAIRE DATA SUBMITTED

- Primary care
- Acute care
- Mental health
- Additional care settings
- Incident reporting system

*Acute inpatient admissions annual average over last 5 years
## Basque Health System (Osakidetza)

Osakidetza, the publicly funded Basque Health Service, provides universal health services to the population in the Basque Country. The Basque Foundation of Health Innovation and Research (BIOEF) was created to support research, innovation and performance improvement of the service.

<table>
<thead>
<tr>
<th>2.29 million population served</th>
<th>13 hospitals</th>
<th>4,159 acute care beds</th>
<th>13,386 acute care clinical staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>254,559 acute admissions*</td>
<td></td>
<td>458 medium/long-stay beds</td>
<td>1,355 primary care physicians</td>
</tr>
</tbody>
</table>

*Acute admissions July 2014 to June 2015

## Counties Manukau Health (CMH)

Counties Manukau Health is one of 20 publicly funded District Health Boards in New Zealand, responsible for providing health and disability services for its residents. Ko Awatea, based at CMH, works to support innovation, education and improvement within CMH and beyond.

<table>
<thead>
<tr>
<th>520,000 population served</th>
<th>3 hospitals</th>
<th>1,050 beds</th>
<th>824 medical staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,205 acute admissions*</td>
<td></td>
<td>67 mental health beds</td>
<td>2,201 nursing staff</td>
</tr>
</tbody>
</table>

*Acute admissions 2014

**QUESTIONNAIRE DATA SUBMITTED**

- Primary care
- Acute care
- Mental health
- Additional care settings
- Incident reporting system
**Hong Kong Hospital Authority (HKHA)**

Hong Kong Hospital Authority manages Hong Kong’s public hospitals and is responsible for providing people-centered preventative, curative and rehabilitative healthcare services.

- **7.2 million population served**
- **1.63 million patient discharges***
- **42 hospitals and institutions**
- **27,440 beds**
- **5,500+ physicians**
- **21,800+ nurses**

**QUESTIONNAIRE DATA SUBMITTED**

- Primary care
- Acute care
- Mental health
- Additional care settings
- Incident reporting system

*Inpatient and day patient discharges 2014 to 2015

Source: Hong Kong Hospital Authority; www.ha.org.hk/

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**NHS Greater Glasgow and Clyde (GG&C)**

NHS Greater Glasgow and Clyde is a publicly funded health board – the largest in the UK – responsible for providing a full range of health services to its population, spanning primary care, pharmacy, to hospital care.

- **1.2 million population served**
- **35 hospitals**
- **4,150 acute care beds**
- **1,205 mental health beds**
- **794 primary care physicians**
- **18,749 acute care staff**
- **426,168 acute admissions***

**QUESTIONNAIRE DATA SUBMITTED**

- Primary care
- Acute care
- Mental health
- Additional care settings
- Incident reporting system

*Acute admissions 2014 to 2015*
Vancouver Coastal Health

Vancouver Coastal Health is a publicly funded regional health authority in British Columbia that provides care across the spectrum, from primary care and secondary care to home and community care.

- 1 million+ population served
- 92,590 acute care discharges*
- 13 hospitals
- 702 acute care beds
- 2,100 physicians
- 480 mental health beds
- 4,400 nurses

*Acute inpatient discharges 2013 to 2014

Victorian Department of Health and Human Services

The Victorian Department of Health and Human Services is a publicly funded department that develops and delivers policies, programs and services to support the health and wellbeing of residents in the state of Victoria, Australia.

- 5.7 million population served
- 1.5 million+ patient admissions*
- 149 public hospitals
- 13,981 acute care beds
- 8,726 acute care physicians
- 48,251 nurses and midwives

NHS England

NHS England is a national commissioning body that oversees the priorities and direction of health services across England, but does not directly provide care services.

53+ million population served
155 acute trusts
106,250 acute care beds
150,273 physicians
15.5 million acute admissions**
21,374 mental health beds
377,191 nurses

QUESTIONNAIRE DATA SUBMITTED

Primary care
Acute care
Mental health
Additional care settings
Incident reporting system

*The patient safety functions described under NHS England have since April 2016 been taken over by NHS Improvement
**Acute admissions 2013 to 2014

Source: Data submitted by participating organizations

It is important to note, however, that the goal of this exercise was not to provide a performance ranking, with one health system performing better than another in providing safe care. Rather, our aim was to provide a comparative view of how health systems use information to assess patient safety and to identify actionable recommendations for all.

Also, we acknowledge that – as in any international comparison – local context and regulations, as well as structural differences, influence how organizations address issues. It is important to keep this in mind when viewing our results, particularly as the level of detail and focus of patient safety efforts can vary significantly depending on the responsibilities and goals of organizations.

With this in mind, we have isolated the responses for NHS England, given that it is not a service provider like the other participating organizations.
SECTION 2: HOW DO HEALTH SYSTEMS ORGANIZE PATIENT SAFETY?

Before evaluating how health systems measure patient safety, we reviewed who is responsible for evaluating and improving patient safety across organizations. Patient safety in healthcare is rarely viewed in isolation, but is usually included in the larger realm of care quality. This is supported by the fact that most service providers surveyed view patient safety as a broader part of quality within their organizational structure, as shown in Table 1.

Table 1: Participating organization characteristics

<table>
<thead>
<tr>
<th>Organization</th>
<th>Under which department is patient safety?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apollo</td>
<td>Quality</td>
</tr>
<tr>
<td>Osakidetza</td>
<td>Co-ordination of public health and patient safety programs</td>
</tr>
<tr>
<td>CMH</td>
<td>Spread across three clinical directorates: infection services; medication safety; and patient safety and quality assurance</td>
</tr>
<tr>
<td>GG&amp;C</td>
<td>Patient safety falls under both Clinical Governance and Health and Safety</td>
</tr>
<tr>
<td>VCH</td>
<td>Quality and patient safety</td>
</tr>
<tr>
<td>DHHS</td>
<td>Quality and Safety Branch monitors and supports health services quality and safety, though mental health and aged care programs provide specialist management for patient quality and safety relating to those areas</td>
</tr>
</tbody>
</table>

For non-national level respondents, the remit of patient safety is not typically a distinct department but is often linked with other areas such as quality or public health. The ultimate responsibility for patient safety often does not fall on a specific ‘patient safety officer’ but instead under the broader realm of ‘quality’. In the case of Apollo Hospitals, it is seen as a collective responsibility wherein “all staff members in each unit are responsible for ensuring patient safety.” It is also worth noting, however, that most surveyed organizations operate as regional health systems. Therefore, responses correspond to this level only; it is possible, for instance, that a single acute-care hospital within one of these organizations maintains a distinct patient safety officer or department.

Looking at the national level, NHS England has a dedicated patient safety team. The team is responsible for identifying under-recognized risks and offering improvement support for all care provided in the country. They do this through activities such as reviewing patient safety incident reports, issuing safety alerts and leading national patient safety initiatives. Similarly, Scotland has a national organization, Health Improvement Scotland (HIS), to which GG&C and other health boards submit data. This organization is dedicated to improvement and patient safety assurance.
SECTION 3: WHICH DATA SOURCES DO HEALTH SYSTEMS USE TO ASSESS PATIENT SAFETY ACROSS CARE SETTINGS?

Overview of data sources

Measuring patient safety is not straightforward. While administrative data, for instance, provides a detailed account of procedures for billing purposes, it is not designed to capture a holistic view of patient safety incidents. Rather, much patient safety information is recorded in parallel systems (for example, incident reporting), derived through resource-intensive retrospective record reviews, or estimated via sampling. Organizations typically rely on several data sources to aggregate a view of safety, making data triangulation integral for accurate measurement.

Based on our review, we grouped data sources in our survey results into five main categories: administrative; staff-reported; audits and case reviews; patient-reported; and liability claims.

The subsections that follow combine a brief overview of the literature with survey responses about data used for patient safety in primary care, mental health and other care settings. As the acute care setting has the most data available, it is discussed in a separate section.

Primary care

Despite the fact that most care is provided in a primary care setting, little is known about the day-to-day risks faced by patients in this environment, particularly in low-to middle-income countries. This lack of knowledge may be because early patient safety studies centered on medical errors within hospital settings, and so subsequent research and policy initiatives also focused on this setting. Also, primary care may be perceived as being a less risky environment than secondary care, with this perception shifting the research focus to other areas. However, the result is a deficiency in patient harm data within this setting. This dearth of data, coupled with the lack of understanding and consensus around the definition and types of incidents occurring within primary care, means that measurement of patient safety in primary care is complex.

For instance, a UK study showed that many general practitioners (GPs) were: unclear on the definition of ‘patient safety’ in primary care; unsure of what constituted a serious incident; unaware of whether reporting was mandatory and not sure how to report; and had little consensus on who was responsible for measuring patient safety in primary care. Also, the use of routinely collected data to identify adverse events in primary care appears to be limited and not standardized.
Six organizations provided information on the primary care setting for our survey: five care providers and NHS England. The results for care providers are shown in Figure 5; NHS England responses are outlined in the text below; and information for DHHS is included as a case study because the majority of GP care is provided privately and subsidized through a different level of government, rather than by DHHS (see Case study 1). As expected, the breadth of sources used to assess patient safety in primary care in these organizations were more limited than in acute care.

**Figure 5: Sources of patient safety data in primary care**

<table>
<thead>
<tr>
<th>Source</th>
<th>APOLLO</th>
<th>OSAKIDETZA</th>
<th>GG&amp;C</th>
<th>VCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative data</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>Staff-reported information</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Patient voice/patient-reported</td>
<td>×</td>
<td>✓</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Audits and case reviews</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>Liability claims</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>✓</td>
</tr>
</tbody>
</table>

Source: Data submitted by participating organizations

In our survey sample, staff-reported data appears to be the most important source of patient safety information. All four organizations rely on incident reporting systems to record patient harm in this setting. GG&C also undertakes standardized evaluations for all significant events. This data is collated and submitted to the NHS Education for Scotland (NES), which then distributes this information across Scotland to share lessons about significant event analysis. Data is also collected through the GP contract, Local Enhanced Service (LES) and Quality Outcomes Framework (QOF), which are monitored through the Primary Care Development Support Team. This information is collated and returned to each Community Health and Care Practice (CHCP),
or now Health and Social Care Practice (HSCP), highlighting areas for improvement of patient safety.

Most organizations also employ audits and case reviews to assess specific aspects of patient safety. In GG&C, this is driven by participation in the Scottish Patient Safety Programme, which collects data from participating organizations across multiple areas, including primary care. Similarly, Apollo maintains an organization-wide dashboard to assess quality and safety across its primary clinics, and organizations submit this data on a monthly basis.

Though liability claims in primary care are rare, VCH uses this information to supplement their view of patient safety in this setting. At VCH, for example, specific case summaries are presented – at the provider level as well as at the organizational and regional levels – to operational leadership, quality councils, executive and medical executive groups for information and consideration of actions to improve care.

All organizations review patient complaints or use surveys to assess patient satisfaction, but, during follow-up interviews, agreed that this information is used primarily to assess patient experience or quality more broadly. Therefore, we did not include these sources in the table above – with the exception of Osakidetza, where patient feedback related to safety is requested. However, this does not mean that participants do not respond to patient complaints about safety. In GG&C, for instance, there is a process in place with respect to ombudsmen’s reports on complaints. When safety issues are identified, they are formally reported and acted upon.

Looking to the national context, NHS England uses similar methods to assess safety, using staff-reported information and case review or audit data. For this setting, they review incident reports collated at national level and also collect organizational audit data on specific national priorities, such as medication reconciliation.

In terms of specific metrics, NHS England is not typically the main source of information on primary care. Rather, other organizations such as the Health and Social Care Information Centre (HSCIC) serve in this capacity. However, NHS England reports select metrics, including: the proportion of GP practices that have access to software that supports safety audits; the proportion of GP practices using the Summary Care Record and therefore able to upload patient records onto the system; and information on medication optimization, grouped by clinical commissioning group. They also track more than 80 quality indicators in primary care in the Quality Outcomes Framework. These focus more broadly on clinical quality and public health measures and were therefore not included here.

When reviewing specific indicators of patient safety, we have categorized metrics into three groups:

- **Structure**, which measures whether organizations have the right things in place (such as appropriate staffing, training and so on).
- **Process**, which measures whether things are done correctly (for example, teamwork and following protocols).
• **Outcome**, which measures whether the right – or wrong – things happen (for example, preventing falls and infections).\(^{30}\)

It is important to consider all of these aspects when assessing the safety of an organization in order to obtain a full picture of the safety environment.

For provider organizations in our survey, the number of routinely reported metrics – those reported at regular intervals and tracked over time – was low, with VCH maintaining no metrics for patient safety in primary care. However, this is more likely reflective of the system set-up for VCH, in that primary care providers operate fairly independently within their catchment area. Routinely reported metrics for other participants are listed in Figure 6.

**Figure 6: Routinely reported patient safety metrics in primary care**

<table>
<thead>
<tr>
<th></th>
<th>APOLLO</th>
<th>OSAKIDETZA</th>
<th>GG&amp;C*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total metrics</strong></td>
<td>11</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defibrillator available</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency medications available</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire extinguishers available in critical areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation signage up near X-ray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of radiology reporting errors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomedical equipment preventative maintenance done</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defibrillator check done daily and recorded</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medications labeled/ not expired</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality for Excellence (Q4E) chart displayed/filled daily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerator temp monitored</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of incidents reported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notifications made through incident reporting system [PSNLS]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of PSNLS notifications associated with improvement actions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adverse drug reactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood sample identification errors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure ulcer prevalence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff climate survey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of primary care centers with alcohol-based handrub pocket containers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existence of Patient Safety Commission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existence of patient safety plan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication reconciliation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger tool completion</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Note that this list does not account for monitoring through contract arrangements for independent primary care contractors

Source: Data submitted by participating organizations\(^{30}\)
Interestingly, the metrics reviewed at the central level for primary care are mostly structure or process metrics, rather than outcome measures – of which there are many in acute care. This likely reflects the lack of established measures in this space, but may also reflect the difficulty in comparing outcomes across GP practices with small sample sizes, which can make comparisons and trends statistically insignificant.

However, it is important to note that the indicators listed above reflect only patient safety metrics (rather than broader quality or patient experience measures) and only those routinely reported centrally, since these are important for system-level learning and improvement. We cannot say with certainty that individual primary care practices, for example, do not track patient safety metrics internally.

Further, and perhaps more importantly, this points to a lack of standard patient safety metrics for primary care across the healthcare industry more broadly and a need to invest further and build on the work of Professor Paul Aylin of Imperial College and others in this area.32, 33

Case study 1: Primary care in Victoria

The majority of primary care in the state of Victoria is provided by around 6,500 independent GPs, primarily funded by the Commonwealth Government, and outside of the purview of DHHS. However, a number of Community Health Centres, run by DHHS, have co-located GP services and deliver a range of primary health, human services and community-based support to meet local community needs. Community Health Centres fall into two categories:

- 31 independent Registered Community Health Centres (approximately 55 percent have co-located GPs); and
- 56 Integrated Community Health Centres that are part of rural or metropolitan health services (approximately 27 percent have co-located GPs).

These facilities provide universal access to services as well as targeted services for vulnerable population groups and sit alongside private general practices (whose patient fees are subsidized by the Commonwealth Government) to make up the primary health sector in Victoria. Other health and human services which are provided include drug and alcohol services, disability care, dental services, post-acute care, home and community care, mental health services and community rehabilitation.

The Australian Commission on Safety and Quality in Health Care (ACSQHC) sets national standards for quality and safety in community care, with 10 guiding principles, ranging from infection control to partnering with consumers.34 DHHS assesses patient safety through administrative data sources – including the Victorian Community Health Practice Indicators – and staff-reported data through the Victorian Health Incident Management System (VHIMS).
Mental health

Within the realm of mental health, there are two distinct areas of patient safety: measuring mental health harm across all settings; and measuring physical harm within the mental healthcare setting. The former is an emerging area within the patient safety arena, currently with limited methods to accurately record this type of harm. Therefore, for this report we chose to focus on the latter for the scorecard exercise.

Even when focusing on physical harm that occurs in the mental health setting, the picture is limited. One problem is the inconsistency that exists around the definition of basic patient safety concepts within mental health. Similar to primary care, the measurement of patient safety is problematic when there is no consensus on what patient safety actually entails. Also, the nature of mental health means that there are unique patient safety issues within the provision of care, concerning the use of physical or mechanical restraints, suicide and absconding, for example. However, little effort has been made to understand such distinctive features, leaving providers to apply patient safety principles from other areas. This in itself may confuse the approach of patient safety measurement in mental health, as results generated from such measurements may not account for the specialized context that accompanies mental healthcare.

Six organizations provided information for our survey on the mental health setting: five care providers and NHS England. Similar to primary care, these organizations had more limited patient safety information available regarding mental health than acute care, as displayed in Figure 7.

[Case study 1 continued]

Further, DHHS is currently developing two additional data sources: a Client Experience Survey that is scheduled to be implemented in 2016/17; and the Cultural Safety in Community Care guidelines, which are being developed with a focus on vulnerable children, indigenous Australians, people with disabilities and culturally diverse populations. Different to ‘clinical safety’, this will encompass provision of structures to ensure safe care and non-violation of client rights.
Within our survey sample, all organizations rely on staff-reported information through incident reporting systems to assess patient safety in the mental health setting. Case reviews, audits and administrative data are also commonly used. Osakidetza, for example, conducts periodic reviews and audits of patient safety to supplement staff-reported data and create patient safety reports with recommended improvement actions. DHHS uses the Client Management Interface/Operational Data Store (CMI/ODS), the information management database for public mental health services, to generate key patient safety indicators including seclusions and restraint use. Similar to primary care, GG&C provides data for audits by the Scottish Patient Safety Programme, which collects data from mental health settings across Scotland.
Patient satisfaction surveys are common across organizations, with CMH and GG&C asking patients whether they feel safe receiving care – incorporating the patient voice into the assessment of patient safety, an emerging goal in patient safety.\(^4\) Similarly, Osakidetza monitors the number of safety-related complaints and suggestions submitted by patients to incorporate the patient perspective. VCH was also unique in using liability claims to inform patient safety. In the same way as primary care, specific case summaries are presented – at the provider level as well as at the organizational and regional levels – for learning and to develop actions to improve care.

As discussed, there is a lack of clear or recommended indicators for patient safety in the mental health setting, though many focus on self-harm, restraint use and seclusions.\(^4\) DHHS, for example, publicly reports on seclusions and restraint use through multiple sources, including the Victoria Chief Psychiatrist Annual Report and the Australian Institute of Health and Welfare.

GG&C must notify Healthcare Improvement Scotland when a person has committed suicide (or when suicide is the probable cause of death), and that person has had contact with mental health services in the 12 months before their death. A significant clinical incident review is undertaken, with input from the patient’s relatives, and submitted nationally. Healthcare Improvement Scotland maintains a community of practice website to share lessons from these reviews; GG&C has used themes from these significant clinical incident reviews to improve the national safety program.

At the national level, NHS England tracks three routinely reported mental health patient safety indicators, which focus on self-harm and death after contact with health services:

1. Patients who die following injury or self-harm within three days of being admitted to acute care hospital beds.
2. People who take their own lives within three days of discharge from hospital.
3. A composite indicator indicating risk in relation to the number of deaths of patients while detained under the Mental Health Act 2007.

However, it is important to note, again, that NHS England does not purport to serve as a ‘metric publisher’ and other organizations, such as the HSCIC, report additional metrics in this area.

Indicators routinely reported in mental health for provider organizations are found in Figure 8, though VCH is excluded from this analysis as it does not regularly review a set of routinely reported patient safety metrics.
Figure 8: Routinely reported patient safety metrics in mental health

<table>
<thead>
<tr>
<th>OSAKIDETZA</th>
<th>CMH</th>
<th>GG&amp;CCMH</th>
<th>DHHS</th>
</tr>
</thead>
<tbody>
<tr>
<td># (Total metrics)</td>
<td>23</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>% of units that effectively use the incident reporting system</td>
<td></td>
<td></td>
<td>Staff climate survey</td>
</tr>
<tr>
<td>Structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Best practices diffused via news bulletin/internet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implemented best practices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of analyzed and closed incidents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient safety training (# of sessions, # of participants, % of professionals completed online training, % of professionals completed hand hygiene online training)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of command-level staff trained in event analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of incident reports with improvement actions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of analyzed reports with improvement actions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implemented improvements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of patient safety committee (PSC) meetings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of PSC improvement projects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of staff involved in improvement issues</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of auditing plan enforcement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of incident reports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of incidents that did not reach the patient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of incidents that reached the patient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of incidents by the community level, hospital setting and contributing events</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of patient-related complaints and suggestions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assaulsts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harm incident incurred during use of restraint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidence of self-harm after admission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidence of violence or aggression after admission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health serious and sentinel events (SSEs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never events (avoidable serious event monitoring)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant clinical incidents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reportable deaths</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Data submitted by participating organizations42
It is again worth noting that Figure 8 reflects what is routinely reported at central level and what directly reflects patient safety, which is not always perfectly clear cut. For example, VCH does not track centrally – by our definition – any patient safety metrics for mental health. However, they monitor a number of quality indicators, as do other survey participants, including 30-day readmissions and repeat hospitalizations. Nonetheless, this points to a need for additional research on how systems should tackle the lack of available information for patient safety in the mental health setting.

Other care settings

When looking at other care settings – ranging from social care to residential aged care – the situation is similar to that of mental health and primary care: there exists, on average, limited data on patient safety.\textsuperscript{43} Again, this points not necessarily to a lack of rigor on the part of health systems, but to a lack of consensus around what constitutes patient safety in these settings and which indicators accurately assess safety.

Also, given the varied organizational structures of survey participants, direct comparisons of practice outside of mental health, primary care and acute care settings proved to be of limited use. Therefore, we’ve highlighted select examples of information for patient safety in alternative care settings to provide additional context.

VCH, along with other organizations across Canada, submits data to the Canadian Institute for Health Information (CIHI) for a variety of quality and safety indicators. Drawing on administrative data, they calculate nine indicators for residential or long-term care facilities. Of these performance indicators, two fall within patient safety: falls in the last 30 days and worsened pressure ulcers. This data is publicly available and can be searched at the provincial, regional and facility levels.\textsuperscript{44} Staff-reported information, via an incident reporting system, is also used to assess patient safety in this setting, and serious incidents are reviewed centrally by the licensing team to identify safety issues.\textsuperscript{45}

Similarly, DHHS uses staff and organizational reported data in combination with applied research to calculate a number of performance measures for long-term residential aged care, including falls, fall-related fractures, pressure injuries and physical restraint use. State- and regional-level data, health service or provider data, and individual service data are all reviewed quarterly. Sector-level trends are analyzed twice a year to drive strategic improvement initiatives and responses, with service-level trends used to drive local improvements. All health services are required to publish their results in their annual quality of care reports.\textsuperscript{44} Further, aged care is integrated at DHHS within health services; long-term residential aged care services are therefore included within the sentinel event program, the incident reporting system, liability claims and the health service performance monitoring framework.

Looking to other care settings at a national level, NHS England monitors and makes publicly available a wealth of performance data for ambulance services. Each Ambulance Trust submits Ambulance Quality Indicators (AQI) data on a monthly basis, which NHS England then analyzes and publishes for performance monitoring.
and comparisons. Though AQIs cover a broad range of quality metrics, specific patient safety indicators include: proportion of Category A Red 1 and 2 emergency calls responded to within eight minutes* and proportion of Category A calls responded to within 19 minutes. Similarly, staff-reported and administrative data sources are relied on to assess patient safety measures.

* Red 1 calls refer to life-threatening cases where the patient is not breathing or does not have a pulse; Red 2 calls refer to life-threatening cases that are less immediately time critical, such as strokes or fits.
SECTION 4: HOW DO HEALTH SYSTEMS ASSESS PATIENT SAFETY IN ACUTE CARE SETTINGS?

Patient safety information in acute care

As mentioned throughout this report, information for patient safety is not always readily available in healthcare. However, the acute setting typically has the most comprehensive information of all care settings. This is due in part to the historical focus on this setting, as well as the fact that patients in acute care often undergo more intensive treatment, increasing the potential for error. Yet, despite there being more information in this setting, there is still a dearth of industry standards on what information we should collect, how we should collect it and which analytical methods we should use to make the data most useful.

For our survey, seven organizations submitted data for the acute care setting: six care providers and NHS England. Figure 9 outlines results submitted by care providers, and NHS England’s results are summarized in the text. Most systems use multiple data sources, though there is variation in the number and type of indicators derived from the data.
While most systems use a variety of information sources, administrative data, staff-reported data and case review and audit information are typically relied on most heavily – particularly to calculate specific indicators.\(^{51}\)

**Administrative data**

All participants in our sample rely on administrative data to assess patient safety. Most organizations collect a wealth of information on patient care, which can be analyzed to yield measures of patient safety – though this data is rarely relied on as the sole source of information, given various coding practices and limitations.\(^{52}\)

Across our sample, organizations use administrative data to calculate specific indicators or key performance indicators for various reports, such as a monthly quality plan (Apollo), balanced scorecard (VCH), safety information scorecard (Osakidetza) and clinical indicators (CMH).
DHHS, for example, houses data for public and private hospital episodes in a database called the Victoria Admitted Episodes Dataset. Analysts use this database to calculate a variety of patient safety indicators and broader quality measures. Reports on hospital performance are reviewed by the DHHS as part of the Victorian Health Services Performance Monitoring Framework. This framework includes regular meetings with health service chief executives and senior management, where they review performance and discuss potential improvements.

Specific indicators, including those calculated through other data sources, are presented in the next subsection.

### Staff-reported information

Staff-reported information, most often submitted via incident reporting systems, plays a critical role across all surveyed organizations. All respondents maintain an electronic, web-based incident reporting system, which staff members use to report patient safety information.

In addition to general incident reporting systems, Osakidetza staff report incidents on separate databases for transfusion-related incidents; hospital-acquired infections; adverse drug reactions; and medication errors – all of which are collated at either the regional or national level, or both.

Given the importance of staff-reported information, we performed an in-depth review of incident reporting systems, which is summarized in the following section.

### Patient-reported information

While patient input plays a large role in patient experience and broad quality initiatives, it does not appear that patient-reported data are typically used to assess patient safety. Within our survey, organizations that use patient-reported data do so with a link to a specific indicator or initiative. For example, DHHS asks patients via their patient experience survey about hand hygiene and cleanliness, using the following questions:

- **Did you see hospital staff wash their hands, use hand gel to clean their hands, or put on clean gloves before examining you?**
- **Were hand washing gels available for patients and visitors to use?**
- **In your opinion, how clean was the hospital room or ward that you were in?**

Patients do not, however, routinely provide feedback on other areas of safety across our sample.

Patient involvement within patient safety is almost universally encouraged, yet such conversations tend to look at direct patient involvement within safety work, such as WHO’s Patients for Patient Safety initiative, rather than using patient feedback to
inform safety initiatives or measure levels of safety. While there are concerns about involving patients directly in this way – such as patients having too much responsibility placed on them and a fear that a tension will develop between patients and healthcare workers – this is an area worthy of further research and development.

**Case review and audit data**

Data from record reviews and audits are a common source of information to assess patient safety. As incident reporting levels are typically low and administrative data does not always contain sufficient detail to detect events, audit or case review information can provide reliable measures of safety.

Many organizations in our study use this source of information to inform monthly performance reports. GG&C uses surveillance and audit data to create monthly infection control reports at levels from the individual ward to the entire board. These reports include a summary of all reportable infections as well as a summary of any investigations, outcomes and action plans. Similarly, VCH uses this source for infection control surveillance. These data, in addition to a variety of other safety measures, are stored on the Quality and Patient Safety Portal. Staff can log in to the portal to track and trend data down to the unit level on a variety of metrics, from specific infections to Ministry of Health performance targets.

CMH uses case reviews to populate a monthly patient safety dashboard with six measures of patient safety at its largest hospital. It also audits all ‘serious and sentinel’ and ‘serious untoward’ events on a monthly basis.

Apollo Hospitals uses a combination of administrative data and case reviews and audits to inform the Apollo Quality Plan. This online dashboard has 20 indicators across five areas: clinical handovers; international patient safety goal performance; surgical care improvement; medication safety; and standardization of medical records. This data is reviewed at the provider level as well as collated and reviewed for the entire organization at the national level. Medical directors and chief executive officers (CEOs) of each location regularly review this information and draft action plans to improve, when appropriate.

While case reviews are commonly undertaken at the local health service level in Victoria, DHHS also undertakes select statewide case reviews for surgical mortality as well as perinatal and maternal morbidity and mortality. This information contributes to the department’s performance monitoring framework.
Liability claims

All but one participant, Apollo Hospitals, use liability claims data to review patient safety. Common across systems, specific cases are reviewed for learning and improvement opportunities – at the local and central levels – though this information is not used to calculate standard indicators tracked over time.

DHHS have a corporate management area in the department for liability claims. The department receives cost and administrative data (without claims data) directly from the statewide insurer, the Victorian Managed Insurance Authority. The statewide cost information is reviewed by the department. The insurer supplies claim detail reports directly to healthcare providers, who review the information to identify areas for improvement.

Patient safety indicators in acute care

In addition to qualitative information gained through more in-depth investigations of patient safety incidents, organizations typically maintain a series of quantitative indicators to measure levels of harm and track progress over time. Figures 10 and 11 provide an overview of the routinely reported patient safety metrics for provider organizations in our cohort. Again, these metrics reflect only what is routinely reported and monitored at the central organization level and do not take into account specific metrics that may be monitored at individual acute care hospitals. GG&C, for instance, has streamlined metrics in recent years: while central line infections used to be a core indicator at the central level, these infections have decreased to such low levels that they are no longer reviewed regularly at the board level.

Figure 10: Routinely reported patient safety metrics in acute care – structure and process

<table>
<thead>
<tr>
<th></th>
<th>APOLLO</th>
<th>OSAKIDETZA</th>
<th>CMH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total metrics</td>
<td>10</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>Patient Safety Commission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient safety plan/improvement project existence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan for drug-resistant infections</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% of hospitals with system for physical identification of patients
% of hospitals with system for physical identification of patients
% of hospitals with system for physical identification of patients
Prior to patient transfer or handover

<table>
<thead>
<tr>
<th>Process</th>
<th>Total metrics</th>
<th>LEADING HEALTH SYSTEMS NETWORK (total and per 100 discharges)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of compliance – in-house transfer form*</td>
<td>% of patients correctly identified</td>
<td>High-risk patients with EMR completed within 48 hours of admission</td>
</tr>
<tr>
<td>% of compliance – nursing handover form*</td>
<td>% of scheduled surgeries with surgical checklist</td>
<td>Pharmacy dispensing errors</td>
</tr>
<tr>
<td>% of compliance – physician handover form*</td>
<td>% of emergency surgeries with surgical checklist</td>
<td></td>
</tr>
<tr>
<td>% of compliance to minimum content of medical records</td>
<td>% of surgical services that perform self-assessment on checklist use</td>
<td></td>
</tr>
<tr>
<td>% of patients excluded from surgical site infection (SSI) calculation due to lack of follow-up within timeframe</td>
<td>% of incident reports associated with improvement actions</td>
<td></td>
</tr>
<tr>
<td>% of patients given antimicrobial prophylaxis 1 hour before surgery</td>
<td>Staff participation in hand hygiene training</td>
<td></td>
</tr>
<tr>
<td>Compliance – communicating sponge/instrument count to surgeon before skin closure</td>
<td>% of beds with alcohol-based handrub</td>
<td></td>
</tr>
<tr>
<td>Instances per month where clinical handovers were a proximate cause for adverse events or outcomes</td>
<td>% of patients evaluated for pressure ulcer risk</td>
<td></td>
</tr>
<tr>
<td>International Patient Safety Goals (IPSG) tracker scores (Goals 1–6)</td>
<td>% of unjustified discrepancies in medication reconciliation</td>
<td></td>
</tr>
<tr>
<td>Missing patient records (total and per 100 discharges)</td>
<td>% of safety incidents reported to safety references (from total incidents collected via complaints/claims)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of hospitals making direct observation of any of the 5 times for hand hygiene (WHO criteria)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of hospitals that have made self-assessment according to WHO criteria</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of surgical patients not receiving indicated antibiotic prophylaxis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of surgical patients beginning with adequate antibiotic prophylaxis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of surgical patients with appropriate duration of antibiotic prophylaxis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumption of alcohol-based handrub</td>
<td></td>
</tr>
<tr>
<td></td>
<td># of organizations that have adhered to the line of action for preventing errors in management of high-risk medications (insulins, oral anticoagulants, cytostatic and intravenous potassium)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medication reconciliation at discharge</td>
<td></td>
</tr>
</tbody>
</table>

*Prior to patient transfer or handover
Although DHHS tracks organizational culture through staff surveys and Osakidetza looks at a number of indicators relating to patient safety plans and the presence of patient safety commissions, metrics that measure how structural characteristics affect safety are the least common across organizations. It is not surprising that this aspect has the lowest number of regularly monitored indicators, particularly as some structural aspects – such as staffing ratios or training procedures – are fairly static and therefore do not lend themselves to regular monitoring. However, organizational culture is an important consideration and necessary for any intervention to succeed.

Process metrics are more common across our sample, with organizations routinely tracking between two and 10 indicators in this area. The majority of metrics track compliance with guidelines, such as procedural checklists, prophylactic treatment and appropriate recording of information.
### Figure 11: Routinely reported patient safety metrics in acute care outcome

<table>
<thead>
<tr>
<th>APOLLO</th>
<th>OSAKIDETZA</th>
<th>CMH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total metrics</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Catheter-related bloodstream infections (CR-BSIs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catheter-related urinary tract infections (CR-UTIs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidents of retained foreign body during surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication errors due to sound-alike/look-alike drugs (as % of total errors)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication errors per 100 discharges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needle stick injuries (total and per 100 beds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient falls (total and per 1,000 adjusted bed days)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure ulcers (total and per 1,000 adjusted bed days)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentinel events (SEs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical site infections (SSIs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventilator-associated pneumonia (VAP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrong patient/wrong side/wrong procedure surgeries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of patients with community-acquired pressure ulcers at the time of discharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of patients with nosocomial pressure ulcers at the time of discharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of patients with Grade II, III or IV pressure ulcers at discharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of ulcers detected through the study of annual prevalence and undeclared through software application</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of eutocic deliveries with episiotomy</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of total adverse transfusion reactions gravely II, III or IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of allergic, febrile, hemolytic or TRALI transfusion reactions gravely II, III or IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of adverse reactions associated with red cells, platelets and plasma units transfusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average rate of VAP in intensive care unit (ICU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average rate of bacteremia associated with central venous catheter in ICU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falls during hospitalization (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidence of surgical wound infection in elective colon surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidence of surgical wound infection in prosthetic hip surgery</td>
<td></td>
<td></td>
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<tr>
<td>Incidence of surgical wound infection in prosthetic knee surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidence of nosocomial infection in high-risk units</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of incident reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence of urinary infection in patients with urinary catheter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate of intrapartum fetal distress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate of puerperal women who have puerperal infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate of bleeding complications in puerperal women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate of puerperal women with complications from epidural anesthesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd and 4th degree perineal tears</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adverse events per 1,000 bed days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacteremia in dialysis patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falls in assessment, treatment and rehabilitation (AT&amp;R) wards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falls with major harm per 1,000 bed days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital-acquired extended-spectrum beta-lactamases (ESBL) rate per 1,000 bed days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital-acquired Methicillin-resistant Staphylococcus aureus (MRSA) rate per 1,000 bed days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidents (% of unique patient identifiers, average working days from incident to closing date)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient central line-associated bloodstream infections (CLABSIs) (time between events)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-op deep wound infection or joint prosthesis infection within 6 weeks (hemiarthroplasty for subcapital fracture of femur)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure areas in AT&amp;R wards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate of staphylococcus aureus bacteremia (SAB) per 1,000 bed days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe pressure injuries per 100 patients</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Total metrics

<table>
<thead>
<tr>
<th>CR-UTI</th>
<th>Bloodstream infection incidence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never events (avoidable serious event monitoring)</td>
<td>Care-sensitive adverse event rate per 1,000 discharges</td>
</tr>
<tr>
<td><strong># of significant incidents</strong></td>
<td><strong>C. diff infection rate</strong></td>
</tr>
<tr>
<td><strong># of hospital-acquired infections</strong></td>
<td><strong>CLABSI</strong></td>
</tr>
<tr>
<td>Patient falls</td>
<td><strong>CR-UTI</strong></td>
</tr>
<tr>
<td>Pressure ulcers</td>
<td><strong>MRSA incidence rate</strong></td>
</tr>
<tr>
<td>Rate of Clostridium difficile (C. diff) infections</td>
<td><strong>Norovirus incidence rate</strong></td>
</tr>
<tr>
<td>Rate of SAB infections</td>
<td><strong>Patient falls</strong></td>
</tr>
<tr>
<td>Sepsis</td>
<td><strong>Patients identified as having mycobacterium tuberculosis</strong></td>
</tr>
<tr>
<td>SSI</td>
<td><strong>Pressure ulcers</strong></td>
</tr>
<tr>
<td>VTE</td>
<td><strong>Sepsis mortality</strong></td>
</tr>
<tr>
<td></td>
<td><strong>SSI odds ratio</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Surgical adverse events</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Urosepsis</strong></td>
</tr>
<tr>
<td></td>
<td><strong>VAP</strong></td>
</tr>
<tr>
<td></td>
<td><strong>VTE incidence rate</strong></td>
</tr>
</tbody>
</table>

**Source:** Data submitted by participating organizations

<table>
<thead>
<tr>
<th>Outcome</th>
<th>GG&amp;C</th>
<th>VCH</th>
<th>DHHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR-UTI</td>
<td>11</td>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>MRSA incidence rate</td>
<td><strong>C. diff infections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norovirus incidence rate</td>
<td><strong>ICU CLABSI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient falls</td>
<td><strong>Infections for same-day admission hemodialysis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients identified as having mycobacterium tuberculosis</td>
<td><strong>MRSA infections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure ulcers</td>
<td><strong>NICU CLABSI and PLABSI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sepsis mortality</td>
<td><strong>SAB infections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSI odds ratio</td>
<td><strong>SE: wrong patient or body part resulting in death/major permanent loss of function</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical adverse events</td>
<td><strong>SE: hemolytic blood transfusion reaction resulting from ABO incompatibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urosepsis</td>
<td><strong>SE: infant discharged to wrong family</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAP</td>
<td><strong>SE: intravascular gas embolism resulting in death or neurological damage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VTE incidence rate</td>
<td><strong>SE: maternal death/serious morbidity association with labor or delivery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SE: medication error leading to death</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SE: other catastrophic SE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SE: retained instrument or other material</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SE: suicide in inpatient unit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SSI: abdominal hysterectomy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SSI: Coronary artery bypass grafting (CABG)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SSI: C-section</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SSI: colorectal surgery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SSI: orthopedic surgery</strong></td>
<td></td>
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</tbody>
</table>
Though the number and types of metrics vary by organization, outcome metrics are the most common measures of patient safety – likely because they are often more objective and associated with patient harm. As discussed, metrics are typically driven by local priorities and past problem areas as well as local and national regulations. For instance, DHHS is required to report on a specific set of sentinel events established at the national level. Similarly, VCH reports on a set of surgical safety indicators as a part of the National Surgical Quality Improvement Program.

Figure 12: Sample routinely reported patient safety metrics (NHS England)

<table>
<thead>
<tr>
<th>Structure</th>
<th>Process</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of staff reporting they would feel secure raising concerns about unsafe clinical practice</td>
<td>% of patients receiving medicines reconciliation within 24 hours of admission</td>
<td>% of harmful medication events</td>
</tr>
<tr>
<td>Composite risk rating of Electronic Staff Record (ESR) items relating to ratio: staff versus bed occupancy</td>
<td>Ambulance handover delays</td>
<td>Admission of full-term babies to neonatal care</td>
</tr>
<tr>
<td>Composite risk rating of ESR items relating to staff support/supervision</td>
<td>Children and young people’s experience of inpatient services*</td>
<td>Deaths attributable to problems in healthcare</td>
</tr>
<tr>
<td>Fairness and effectiveness of incident reporting procedures</td>
<td>Composite of Central Alerting System: dealing with safety alerts in a timely way</td>
<td>Deaths from VTE-related events</td>
</tr>
<tr>
<td>Staff-reported fairness and effectiveness of procedures for incident reporting</td>
<td>Consistency of safety incident reporting</td>
<td>Deaths in low-risk groups</td>
</tr>
<tr>
<td></td>
<td>CQC’s National Customer Service Centre (NCSC) safeguarding concerns</td>
<td>Hip fractures from falls during hospital care</td>
</tr>
<tr>
<td></td>
<td>National Reporting and Learning System (NRLS) medicines event reporting rate (per 100,000 admissions)</td>
<td>Incidence of HCAI – C. diff</td>
</tr>
<tr>
<td></td>
<td>Patient experience characterised as poor or worse – hospital care*</td>
<td>Incidence of HCAI – MRSA</td>
</tr>
<tr>
<td></td>
<td>Patient experience of hospital care*</td>
<td>Incidence of sepsis</td>
</tr>
<tr>
<td></td>
<td>Patient safety alert compliance</td>
<td>Incidence of VTE</td>
</tr>
<tr>
<td></td>
<td>Potential underreporting of patient safety incidents</td>
<td>Never events (wrong site surgery, retained foreign object post-procedure, wrong implant/prosthesis, misplaced naso/oro-gastric tubes, wrong route administration of medication)</td>
</tr>
<tr>
<td></td>
<td>Proportion of admitted patients assessed for VTE</td>
<td>PLACE (patient-led assessments of the care environment) score for cleanliness of environment</td>
</tr>
<tr>
<td></td>
<td>Proportion of staff receiving health and safety training in last 12 months</td>
<td>Proportion of patients with category 2, 3 and 4 pressure ulcers</td>
</tr>
<tr>
<td></td>
<td>Responsiveness to inpatients’ personal needs*</td>
<td>Proportion of safety incidents that are harmful</td>
</tr>
<tr>
<td></td>
<td>Summary Care Record utilization for non-elective admissions</td>
<td>Safety thermometer: number of harms, type of harm, pressure ulcers, falls with harm, UTIs in patients with a catheter, VTEs (dementia units)</td>
</tr>
<tr>
<td></td>
<td>Women’s experience of maternity services*</td>
<td>Severe harm attributable to problems in healthcare</td>
</tr>
</tbody>
</table>

*Calculation includes specific questions on safe care, cleanliness, feeling safe, or communication of medication side effects

Source: Data submitted by participating organizations
At the national level, NHS England looks at a wide array of metrics for acute care. We have listed 38 in total in the Figure 12, but note that this reflects only the main metrics published regularly. As NHS England serves as a commissioner for care across all of England, it is not surprising that it has a broad set of indicators, reflecting structure, culture and outcomes. Also, while incident reports through the NRLS are used to assess patient safety, it is important to note that they are not used as an outcome measure. Rather, extremely low reporting is seen as an indicator of a potentially poor reporting culture.

Similar to provider organizations, however, outcome metrics reflect certain regulatory requirements – such as reporting of never events (avoidable serious events) – as well as specific focus areas or initiatives, including compliance with patient safety alerts.

What should health systems measure?

There is little consensus around what specific metrics health systems should track. There is no ‘gold standard’ list of indicators, and many variations across systems are driven by legal requirements to report specific incidents (such as never events). While multiple organizations have put forward lists of indicators or ways to measure harm, there is not yet a universally adopted methodology. The Agency for Healthcare Research & Quality in the US, for instance, maintains a list of 18 patient safety indicators that can be calculated from administrative data using International Classification of Diseases (ICD) codes. Even this well-researched and evidence-based set of metrics does not purport to provide a full picture of patient safety.

Similarly, the Organisation for Economic Co-operation and Development (OECD) tracks five country-level patient safety indicators, while the Institute for Healthcare Improvement has developed the ‘global trigger tool’ – a method to measure adverse events using a retrospective record review – which can be adopted by any care provider.

Looking beyond internal assessment, performance comparisons across countries can also be challenging – it is difficult to account for case-mix adjustment and to standardize definitions of incidents (and near misses). The reliance on self-reporting also presents comparison challenges.

While the evidence does not point to a ‘one-size-fits-all’ approach to assessing patient safety within an organization, tracking a core set of indicators from year to year helps systems to identify problem areas and improvements. While measuring preventable deaths should be a priority for all organizations (see Case study 2), organizations should assess their own care environments to identify the most common harms and problem areas, thereby enabling them to prioritize and develop the most meaningful indicators for their particular organizations. Providers should use a range of information sources – from administrative data to more qualitative information recorded in incident reporting systems – to detect negative outcomes and also processes and structural components that contribute to unsafe care.
Case study 2: Measuring preventable deaths

Though comprising only a small percentage of adverse events, a significant number of patients die unnecessarily due to medical errors. In the US alone, it is estimated that nearly 400,000 deaths occur annually due to poor care. Accurately measuring and tracking these incidents is essential in identifying unsafe practices and can have significant policy implications. For instance, work by Professor Aylin and colleagues revealed a higher mortality rate for patients undergoing elective procedures towards the end of the week and at the weekend, leading to an investigation into staffing and service availability.

While many countries and organizations track standardized mortality ratios, which are fairly straightforward to calculate from administrative data, these metrics are not necessarily a reliable indicator of safety and quality. Standardized mortality ratios appear to be most useful for specific patient groups where death is a likely outcome and where detailed clinical quality data is available for robust risk adjustment. Instead, calculating avoidable deaths via case record review appears to provide a slightly more accurate view of patient safety and also yields an opportunity to pinpoint problems and identify improvement opportunities at the local level. However, both metrics have obvious limitations and should not be taken as a composite indicator of safety.

Select health systems and providers across several countries calculate preventable deaths, typically through a retrospective case record review. Physician experts determine whether reported adverse events can be avoided using available case notes and assigning a score, such as an adapted Likert scale (1–6, where 6 is a highly preventable adverse event). However, health systems may have different definitions of adverse events or avoidable harm, as well as variations in reporting methods. The care settings of these studies also vary, from particular specialties within a hospital, to specific populations, to national level estimates across all hospitals. There is also no established, robust method of extrapolation to the international level, meaning cross-country comparisons should be viewed critically.

While there is a lack of consensus on the methods for calculating preventable deaths, the magnitude of the issue makes it too important to overlook. Health systems, academics and regulators must continue to refine the methodology to accurately assess mortality attributable to poor care.
SECTION 5: HOW IS STAFF-REPORTED INFORMATION RECORDED AND USED? AN IN-DEPTH LOOK AT INCIDENT REPORTING SYSTEMS

Incident reporting systems – wherein staff voluntarily submit reports of errors, adverse events and ‘near misses’ – are a commonly used source of patient safety information in healthcare. These systems vary across multiple dimensions, including:

- their structure (web-based or mixed input);
- who is responsible for reporting (clinical staff or all staff);
- whether anonymous reporting is available;
- what should be reported (all errors, near misses or a predefined set of sentinel events);
- classification or taxonomy of incidents (such as severity assessment indexes);
- who is responsible for investigation or follow-up; and
- what information, if any, is made publicly available.

Despite these differences, they typically share the same goals, to: improve accountability, learn from mistakes, identify areas for improvement, and promote a safe culture.

To maximize the benefits of incident reporting systems, however, staff need to actively submit reports. Unfortunately, there are several barriers to reporting that contribute to low reporting rates. An unpublished systematic review of the barriers to incident reporting found that fear of adverse consequences is the most commonly cited factor preventing staff from submitting a report. Other common barriers include: the time required to complete a report; complexity of reporting forms; uncertainty on what to report; and ambiguity on the impact of reporting. To encourage greater reporting levels, incident reporting systems and the policies around them should mitigate these barriers.
Incident reporting system framework and survey results

Building on the literature on indicators of successful and impactful incident reporting systems, Flott et al. are developing a framework for evaluating incident reporting systems that improves learning, accountability and patient safety culture. The framework has five indicator categories, with each level increasing in maturity:

- Resources and readiness
- Uptake and usage
- Information capture
- Analysis and publication
- Generates learning and improvement

Organizations in the early stages of implementing an incident reporting system may wish to focus efforts on the ‘resources and readiness’ indicators, while organizations with established incident reporting systems may wish to evaluate how their system compares in the ‘generates learning and improvement’ category.

As we outlined in Section 1, we used this framework as the basis for a survey to compare the characteristics of incident reporting systems used by various health systems and providers. The survey results and overarching framework for evaluating incident reporting systems are described below.

Resources and readiness

At the most basic level, organizations should establish an underlying level of resources and readiness for incident reporting systems. To allocate sufficient resources, providers must anticipate the upfront investment of implementing an incident reporting system, but also the ongoing costs of monitoring and investigation. Also, staff engagement is crucial to ensure that the system meets people’s needs and is actually used – ideally by including staff from the design phase through to training and ongoing support of a safe culture. Indicators for success include:

- allotting sufficient financial and staff resources;
- clearly articulating system objectives to users;
- defining what staff should report; and
- encouraging a positive safety culture.

As our LHSN survey cohort have well-established incident reporting systems, we focused our survey questions for this section on whether systems have clear objectives that are clearly articulated to users (see Figure 13).
In line with the characteristics of effective incident reporting systems, all participating organizations have clear and defined objectives for their systems. Although they vary slightly, the incident reporting systems primarily align with learning from incidents and identifying issues or hazards. Osakidetza, the public health system in Basque, uses the incident reporting system to track only incidents that do not result in patient harm. Therefore, the purpose of this system differs slightly from others usually discussed in the literature.

**Uptake and usage**

After ensuring that the appropriate infrastructure and resources are in place, organizations should evaluate to what extent their incident reporting systems and policies encourage staff reporting. As discussed, low reporting rates can lead to an inaccurate picture of safety and, more importantly, prevent widespread learning. Studies show that ensuring that staff receive sufficient training, on the use and importance of reporting, is a crucial first step. The structural design of web-based incident reporting systems, particularly to make them more user-friendly, can encourage use. In general, effective systems that promote take-up and use have characteristics such as:

- web-based platforms;
- straightforward, simple platforms;
- availability of training for staff;
- non-punitive reporting; and
- effective feedback between reporters and investigators.
As shown in Figure 14, all participants maintain fully electronic or web-based systems, which is associated with ease of reporting. However, the availability of anonymous reporting was not universal.

Studies have shown that anonymous reporting further promotes a safe and blame-free culture. Organizations may wish to consider making the option to report anonymously available. However, in organizations with a well-established culture of safety and reporting, this function may be less important – particularly if involving reporters in incident investigations encourages active engagement and is an organizational priority. At Apollo Hospitals, for example, the reporter is always involved in the investigation of the incident, making anonymous reporting potentially problematic.

*Only in certain circumstances

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**Figure 14: Structural characteristics**

<table>
<thead>
<tr>
<th></th>
<th>APOLLO</th>
<th>OSAKIDETZA</th>
<th>CMH</th>
<th>GG&amp;C</th>
<th>HKHA</th>
<th>VCH</th>
<th>DHHS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fully electronic/web-based?</strong></td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td><strong>Anonymous reporting available?</strong></td>
<td>✗</td>
<td>✔️</td>
<td>✔️</td>
<td>✗</td>
<td>✗</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

Source: Data submitted by participating organizations

---

44 LEADING HEALTH SYSTEMS NETWORK
As shown in Figure 15, all organizations surveyed have universal or near universal staff access to reporting systems, though not all staff are offered formal training. This could be an area for improvement for select systems, because training provides an opportunity to promote engagement and explain to staff why reporting is important.99 This engagement is critical, particularly as submitting a single report can take up to 20 minutes in three of the organizations surveyed and up to 30 minutes for Victoria health services staff (DHHS).

### Figure 15: Characteristics of use

<table>
<thead>
<tr>
<th></th>
<th>APOLLO</th>
<th>OSAKIDETZA</th>
<th>CMH</th>
<th>GG&amp;C</th>
<th>HKHA</th>
<th>VCH</th>
<th>DHHS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Who can report?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent staff</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All staff</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Are eligible staff offered training?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All staff</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All staff</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All staff</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frontline staff</td>
<td></td>
<td></td>
<td></td>
<td>Some staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All staff</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All staff</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Time to submit a report?</strong></td>
<td>10–20 min</td>
<td>Varies by provider</td>
<td>0–10 min</td>
<td>0–10 min</td>
<td>10–20 min</td>
<td>10–20 min</td>
<td>20–30 min</td>
</tr>
</tbody>
</table>

Source: Data submitted by participating organizations98
Confidence that reporting leads to action drives staff engagement and reporting levels, so it is important that organizations have clear protocols in place for investigation. While follow-up for no harm or minor events tends to be less structured or handled by charge nurses on units, five of the organizations surveyed have structured investigation protocols – typically time-bound – for more serious incidents (see Figure 16). At CMH, for example, incidents that are categorized in the top two severity assessment codes must have initial assessments completed within 15 days and full investigations submitted within 70 days. This ensures that all serious incidents are investigated in a timely manner. However, not all surveyed organizations do so consistently. Routinely notifying reporters of investigations and involving them – if appropriate – could improve staff engagement.

**Information capture**

Moving to the next level, after tactics for increased uptake and use, it is imperative that incident reporting systems capture the most useful data that accurately reflects the safety of the environment. Also, prompt follow-up and investigation appears to result in better accountability and more accurate reporting.
Characteristics of systems with effective information capture include:

- accurate reflection of the number of incidents;
- minimal lag time between incidents and reporting;
- collaborative reporting capabilities; and
- simple, user-friendly interfaces.\textsuperscript{103}

Figure 17: Information recording

<table>
<thead>
<tr>
<th>Number of required fields?</th>
<th>APOLLO</th>
<th>OSAKIDETZA</th>
<th>CMH</th>
<th>GG&amp;C</th>
<th>HKHA</th>
<th>VCH</th>
<th>DHHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1–10</td>
<td>1–10</td>
<td>10–20</td>
<td>20–30</td>
<td>1–10</td>
<td>20–30</td>
<td>30+</td>
</tr>
</tbody>
</table>

| Do staff report as a team? | Never | Never | Sometimes | Rarely | Sometimes | Sometimes | Rarely |

| Potential degree of harm captured? | Sometimes | Never | Always | Sometimes | Sometimes | Always | Sometimes |

Source: Data submitted by participating organizations\textsuperscript{104}

In terms of accurate and useful information recording, there is a trade-off between requiring multiple fields – which allows for easier and more comprehensive data analysis – and simplifying reporting platforms to make them less time-consuming and more user-friendly.\textsuperscript{105} For example, having multiple drop-down boxes to categorize an incident can allow analysts to segment reports by specific incident type (such as medication errors). Yet, some users may find the classifications confusing if they are not familiar with them. Therefore, organizations should consider the end users and the goals of their incident reporting system when designing these features.

Also, evidence suggests that collaborative reporting can help to encourage an inclusive learning culture by shifting the perception of incident reporting as ‘individual complaints’. However, organizations we surveyed do not regularly receive team reports [see Figure 17]. Many cited the inability of their incident reporting systems – often externally procured rather than developed in-house – to assign more than one ‘owner’ to a report. This could be a useful feature to include for those developing new or customized systems.
As shown in Figure 18, while not all participating organizations uniformly record the potential degree of harm for incidents or near misses, all but one track the degree of harm for actual patient safety events (Osakidetza, as mentioned above, do not use their incident reporting systems for incidents resulting in harm). This is an important feature for tracking hazardous trends and also to ensure that the most serious events undergo rigorous analysis. As such, most organizations use these levels of harm to determine which incidents are investigated.

As we have highlighted, incident reporting systems are only useful if staff actively report incidents. Therefore, we asked organizations to provide us with an estimate of the annual volume of reports (including no harm events and near misses) that they receive. We then divided this figure by the number of inpatient beds in each organization (including mental health and critical care beds, but excluding nursing home beds) to obtain a roughly comparable ratio of reporting levels (see Figure 19).
Figure 19: Number of incident reports per inpatient hospital bed per annum*

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Number of Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCH</td>
<td>38.4</td>
</tr>
<tr>
<td>DHHS</td>
<td>7.2</td>
</tr>
<tr>
<td>CMH</td>
<td>6.6</td>
</tr>
<tr>
<td>GG&amp;C</td>
<td>3.3</td>
</tr>
<tr>
<td>APOLLO</td>
<td>1.4</td>
</tr>
<tr>
<td>HKHA</td>
<td>0.4</td>
</tr>
</tbody>
</table>

*Includes all reports, including near misses and no harm incidents; values are approximate; Osakidetza data is excluded from comparison as harms are not reported via the system.

Source: Data submitted by participating organizations

For Figure 19, it is worth noting that measuring the number of reports per inpatient bed per annum is a rough, imperfect method to measure reporting rates. The guidance and standards for which incidents and near misses should be reported vary by system, making direct comparisons of reporting rates problematic. Also, these figures do not take into account occupancy, average length of stay, case mix, percent of activity outside the inpatient setting, or other factors that could affect patient safety incidents. Finally, the estimates include both incidents and near misses, and therefore do not reflect levels of patient harm but rather levels of reporting.

As such, this is not meant to be a ranking of the safety of these institutions. However, low reporting rates do not necessarily reflect a safe organization. High reporting rates may reflect a positive patient safety culture where staff feel comfortable reporting incidents and near misses without fear of reprisal.

Analysis and publication

Moving beyond the data collected by incident reporting systems, the next level of evaluation relates to how the information is used and shared. Importantly, systems appear to be most successful when they produce early warnings and timely results, rather than delayed complaints. When feedback, investigation and follow-up procedures are open and transparent, staff tend to have more confidence in the reporting process.

Systems designed for effective analysis have characteristics such as:

- analyzable data (such as data recorded in drop-down boxes);
- data that is easily understood by staff;
- immediate access to data; and
- staff involvement in analysis and discussion.
Overall, participating organizations have incident reporting systems that are well designed for analysis and publication. Common characteristics are displayed in Figure 20.

Figure 20: Common characteristics of analysis

- Data regularly available to staff but not directly shared with the public
- Immediate, automated email notification to person responsible for report investigation
- Majority of information in drop-down fields

Source: Data submitted by participating organizations

Also, all organizations regularly disseminate information from reporting systems to staff through a variety of media, including newsletters, bulletins, annual reports and departmental meetings. No participants release incident reporting system data directly to the public, as many cited confidentiality and data privacy issues. However, DHHS and HKHA regularly release information to the public on sentinel and serious untoward events from incident reporting data. This is in line with other organizations and countries that publicly report select patient safety incidents – often a list of ‘never events’ – though this information can come from separate reporting channels.

 Generates learning and improvement

Finally, well-established and effective incident reporting systems should lead to improved and safer care. Systems that facilitate learning and improvement appear to:

- prioritize efforts prior to designing improvements;
- have existing, prioritized categories;
- maintain a system for monitoring improvements; and
- use innovative approaches to engage staff in improvements.

All participating organizations have a strong basis for generating learning and improvements. They maintain set taxonomies of incidents in their systems and have personnel – typically in the quality department – responsible for acting on patient safety issues. All organizations in our sample have also employed campaigns to improve reporting rates, using techniques such as linking reporting to specific quality improvement initiatives or providing an award for the most incidents reported. Staff at NHS GG&C also used a targeted campaign to increase reporting of venous thromboembolism (VTE), as many physicians saw this as a routine or unavoidable complication. This resulted in higher reporting levels and also changed physicians’ attitudes toward VTE incidents.
As we highlighted, identifying hazards and generating lessons from past mistakes is a key benefit of incident reporting systems. Figure 21 briefly outlines select improvements that have resulted from incident reporting systems by participating organizations.

**Figure 21: Improvements resulting from incident reporting systems**

**APOLLO**
Based on data collated from patient fall incidents, staff created a comprehensive falls prevention program.

**CMH**
Within critical care, staff identified an increase in the reporting of pressure injuries. Investigation led to a change in the type of tubes used, resulting in a decrease in pressure injury incidents.

**GG&C**
Certain physicians viewed VTE incidents as unavoidable complications. GG&C implemented an educational campaign – at the same time they moved from a paper to an electronic incident reporting system – to raise awareness, increase reporting and also decrease incidents.

**HKHA**
In response to an incident of unintended prolonged use of a high dose steroid, an automatic reminder was established in the medication ordering system to reduce the risk of a similar incident happening again.

**VCH**
Staff reported that normal saline (NS) multi-use vials were similar in appearance and located next to Vitamin K vials, resulting in a near miss medication error. Staff then worked in partnership with the vendor to change the appearance of the vials and with pharmacy to move the NS to another part of the medication room.

**DHHS**
Following two significant clinical incidents, a massive transfusion and critical bleeding procedure was developed and rolled out to clinical staff to ensure the safe, timely and appropriate provision of blood and blood products to a critically bleeding child.

Source: Data submitted by participating organizations

As discussed, current incident reporting systems do not provide a full picture of patient safety, nor can they capture all adverse events. However, if designed to encourage staff engagement and an open culture, they are an important tool for measuring and improving patient safety by:

- tracking trends and producing alerts;
- disseminating knowledge gained from investigation of serious events; and
- generating best practice insights, locally and across countries.

Case study 3 describes the national-level incident reporting system in the UK.
Case study 3: National Reporting and Learning System (NRLS) – UK

Overview
Set up in 2003 by the National Patient Safety Agency (NPSA), the NRLS is an incident reporting system that spans the whole of the NHS in England and Wales. It holds more than 12 million patient safety incident reports, with a new report created approximately every 35 seconds.

Based on similar systems in industries such as nuclear power and aviation, the NRLS has the following basic principles:

- A voluntary system for NHS staff to report safety incidents and near misses.
- Collects data mainly through local risk management systems in hospitals.
- Reporters are usually identifiable at the local level and always anonymised at the national level.
- Reports composed of a combination of structured data fields and free text narrative.
- Risk managers at hospitals report into a central database hosted by Imperial College Healthcare NHS Trust on behalf of NHS England.
- Reports form the basis of Patient Safety Alerts and advice from NHS England (formerly from the NPSA).

The NRLS collects most of its data through secondary and anonymized incidents primarily reported for local purposes. Although, direct reporting is also possible and primarily used by smaller organizations or individual practitioners without their own incident database.

Over and above local objectives, NRLS aims to identify trends and patterns that allow it to fulfill its statutory duties of identifying risks to patient safety and issuing advice and guidance to the NHS to improve patient safety, including through the National Patient Safety Alerting System (NPSAS) – described in further detail below.

Learning and improvement
Rather than investigating single incidents at the local level, the NRLS focuses on identifying trends and risks to patient safety as a whole, particularly new or under-recognized risks. Data is made publicly available via quarterly and biannual statistical reports at national level and per organization. NRLS reports are also used as the basis for a range of publications to support learning, including newsletters, conference presentations and journal articles on specific in-depth reviews of multiple incidents.
Importantly, data from the NRLS is used to issue Patient Safety Alerts through a web-based Central Alerting System.* Based on a clinical review of NRLS data, staff identify emerging risks and disseminate guidance to address these issues and prevent patient harm. Alerts typically fall into three categories:

- New or under-recognized patient safety issues.
- Widespread, common and challenging patient safety issues, not solved by alerts in isolation.
- Alerts aimed at improving systems for clinical governance, reporting and learning.

Alerts are also divided into three stages:

- Stage One alerts warn of emerging risks and are issued rapidly once the risk is identified.
- Stage Two alerts are issued weeks or months after the initial alert and typically contain additional information to address and mitigate the previously identified risk.
- Stage Three alerts, if issued, require organizations to prove that they have completed a recommended set of actions to appropriately respond to the risk.

Despite its successes, it is well established that NRLS data has been underused. Over the past few years, researchers have spent considerable time researching how to make the data more useful. This includes applying novel analytical techniques, such as natural language processing to the free text comments to investigate whether people’s descriptions provide useful details of what happened during incidents that might not be recorded by the set questions. This research will help to build better reporting platforms in the future.

**Future direction**

Over the past few years, the Imperial College Centre for Health Policy and the Patient Safety Translational Research Centre have undertaken a portfolio of work directly related to understanding and improving the NRLS. This work has focused on four areas that are particularly salient for reconstructing and modernizing the system:

- **Purpose of incident reporting:** Reporting systems should capture data about adverse events in a way that is conducive to using data at a local level while also contributing to a national data repository. It should not try to function as a learning system itself, but instead contribute effectively to a learning process.

* More information can be found here: [https://improvement.nhs.uk/resources/patient-safety-alerts/](https://improvement.nhs.uk/resources/patient-safety-alerts/)
• **User experience with reporting systems:** Systems should be quick and easy to use, with a visually pleasing and intuitive reporting interface design based on behavioral insights. It should also have options for anonymous reporting to reduce the fear of a ‘blame culture’.

• **Data quality and analysis:** Simple incident categories should be used, based on evidence of how clinicians classify incidents in practice. Systems should include all necessary details in a limited number of mandatory fields, as well as an option for free text comments.

• **Effective feedback and learning:** Regardless of the structure of the system, the culture has to nurture learning, and the reporting system has to include appropriate feedback to encourage this. Systems should have a mechanism for the designated member of staff to provide feedback to the reporter, so the reporter knows what has happened to the incident they’ve reported. The incident reporting system should be coupled with a learning system, which might include virtual communities who discuss how to avoid specific incidents in the future, or learning material for quick reference. This system could also comprise review meetings to understand where the highest volume of incidents occur and how to focus resources to reduce incidents. Data collated at national level should allow for a more tailored inquiry into high-severity events and be used to guide policy.

The research across these areas yielded substantial academic output and new insight into how the NRLS can be improved. The findings have been used to build a new demonstrator system that applies the primary recommendations from each area. In the first instance, the Imperial College Centre for Health Policy has designed a platform that:

• works on computers, smartphones and other devices;
• is built on user-centered design;
• leverages existing resources;
• limits reporting time without reducing the richness of data; and
• includes a mechanism for ‘feedback and follow’ via a shared loop between reporter and risk manager.

Though in its prototype form, this system has received initially high praise from clinicians, managers and policymakers.
Conclusion and recommendations

Obtaining an accurate picture of patient safety is an essential building block of providing safe care, yet this task is not as simple as it might seem. Patient safety information, unlike other areas, does not sit within a single, centralized source. Rather, organizations must piece together a picture of patient safety from a variety of sources, spanning staff-reported information, case reviews and existing administrative data. There is also little consensus in the literature about what health systems should measure, and much of this is driven by context, including legal requirements to report specific incidents on a ‘never’ list. However, it is important for providers to regularly use multiple information sources to accurately assess patient safety and identify areas for improvement.

Based on results from the Patient Safety Information Scorecard initiative, combined with a review of the literature, we propose the following recommendations for healthcare providers to improve the use of information for patient safety:

1. Generate more evidence on the most effective indicators for driving improvement – particularly for care settings outside acute care, including mental health and primary care. Despite an exhaustive search, we were unable to identify a definitive list of which metrics healthcare providers should measure. While significant progress has been made in the field of safety science, indicators continue to be heavily influenced by either regulatory requirements or ease of calculation.\textsuperscript{124, 125, 126}

2. Monitor a standard set of indicators – including deaths from poor care – within health systems to track internal progress. Many sources cite that differences in data collection techniques make performance comparisons across organizations difficult; yet maintaining a consistent set of indicators within an organization across time is an important step in assessing safety and promoting accountability.\textsuperscript{127}

3. Triangulate data from multiple sources to identify common themes, improve data accuracy and compensate for imperfect methodologies of specific information sources. As we continue to improve current methods of measuring patient safety, using multiple techniques – from indicators derived from administrative data to in-depth case reviews – provides a fuller picture of performance.\textsuperscript{128, 129}

4. Implement an effective incident reporting system, ensuring that reporting is embedded at the organizational and system-wide policy levels.\textsuperscript{130}

   a) Increase reporting levels by: systematically training and educating staff; implementing a user-friendly, simple interface; ensuring that reporting is non-punitive, with the option for anonymous reporting; and creating effective feedback mechanisms between reporters and investigators.

   b) Improve reporting quality by: clearly articulating the objectives of reporting systems; defining procedures for what to report; and limiting the number of required fields, while including the option for free text comments.
5. **Ensure that appropriately trained analysts are available to properly analyze patient safety data and identify potentially troubling patterns.** Due to the wide array of sources and techniques required to assess patient safety performance, a skilled, multidisciplinary team helps to identify risks and areas for improvement, from not only the local level but also at the organizational and national levels.\(^{131, 132}\)

6. **Establish a system to share lessons quickly and with the appropriate audiences at local, regional and national levels.** In order to learn from mistakes and prevent errors stemming from the same root causes, organizations need to implement effective, timely feedback across all levels.\(^{133, 134}\)

7. **Foster a culture of openness rather than blame, and empower all staff to ‘own’ the responsibility of patient safety without fear of punishment.**\(^{135, 136, 137}\)

We acknowledge that improving the measurement of patient safety alone is not sufficient to make care safer. In fact, obtaining a true view of patient safety may likely reveal a darker reality than providers would prefer to see. However, it is a first and important step, for we cannot improve what we cannot measure.
APPENDIX: METHODOLOGY

The appendix provides additional detail on the methodology described in Section 1 of this report.

Patient Safety Information Scorecard questionnaire

The Patient Safety Information Scorecard questionnaire was distributed to participants electronically as a Microsoft Excel file. The file contains nine tabs:

- One tab containing instructions for how to complete the questionnaire.
- One tab containing questions about structural and demographic information about the organization.
- Three tabs (one each) for acute care, primary care and mental health settings with questions about structural and organizational information.
- Four tabs (one each) with questions about specific data sources for the acute care, primary care, mental health and ‘any other’ care settings.

The figures below contain screenshots of tabs from the Patient Safety Information Scorecard for each category.

Figure A1: ‘Instructions’ tab
Figure A2: ‘Your organization’ tab

<table>
<thead>
<tr>
<th>Column</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>ORGANIZATION NAME</td>
</tr>
<tr>
<td>3</td>
<td>Instructions: These questions pertain to your system’s organization.</td>
</tr>
<tr>
<td></td>
<td>Please type your responses in Column B.</td>
</tr>
<tr>
<td>4</td>
<td>Please provide the population covered by your organization (e.g., catchment area), if applicable.</td>
</tr>
<tr>
<td>5</td>
<td>Please indicate which care settings your organization contains by writing &quot;yes&quot; or &quot;no&quot; in the box next to each of the care settings listed below.</td>
</tr>
<tr>
<td>6</td>
<td>Primary care</td>
</tr>
<tr>
<td>7</td>
<td>Acute care</td>
</tr>
<tr>
<td>8</td>
<td>Mental health</td>
</tr>
<tr>
<td>9</td>
<td>Community care</td>
</tr>
<tr>
<td>10</td>
<td>Social care</td>
</tr>
<tr>
<td>11</td>
<td>Does your organization have a dedicated patient safety department or individual lead? If so, please specify (e.g., organization-level, hospital-level, within each care setting).</td>
</tr>
<tr>
<td>12</td>
<td>If not, does patient safety fall within a wider department (e.g., risk management, quality control)? Please specify.</td>
</tr>
</tbody>
</table>
Figure A3: ‘Acute care overview’ tab

Figure A4: ‘Primary care data’ tab
## Incident Reporting System questionnaire

The Incident Reporting System questionnaire was distributed to participants electronically as a Microsoft Word document. Figure A5 contains the questions and potential answers, as distributed to participants.

**Figure A5: Incident Reporting System questionnaire**

### Background

1. We are interested in how you refer to certain aspects of your incident reporting system. Please list the term(s) your organization uses for the following (please include more than one term, if appropriate)

   a. An incident you record in the system (e.g., near miss, good catch, adverse event, patient safety incident, etc.)

   b. The different degrees of actual harm an incident can cause (e.g., no harm, mild harm, serious harm, etc.)

2. Do all specialties and all types of incidents get reported in a single system? If no, please specify the systems used (i.e., specialty-specific systems for maternity, etc.).

   a. Yes

   b. No (please specify)

### Resource and readiness

3. Does your incident reporting system have a clear and defined set of objectives? If so, can you share this with us (either below or via email to lhsn@imperial.ac.uk)?

   a. Yes

   b. No

4. If so, how are these articulated to staff (e.g., during orientation/training, annual meetings, etc.)?

   a. Free text answer

### Uptake and usage

5. Are all staff offered training on how to use the incident reporting system?

   a. Yes, all staff

   b. Yes, all managerial and clinical staff

   c. Yes, some staff

   d. No, staff are not offered training

   e. Don’t know
6. Is there available to staff a set of definitions of the incidents that should and should not be reported? (If so, can you share this with us?)
   a. Yes
   b. No

7. Is there an option for staff to report anonymously?
   a. Yes
   b. No
   c. Only in certain circumstances
   d. Don’t know

8. If so, have staff been made aware of this option?
   a. Yes, all relevant staff have been made aware
   b. Yes, some relevant staff have been made aware
   c. No
   d. Don’t know

9. How is it determined whether an incident requires investigation?
   a. Free text answer

10. Is the reporting member of staff contacted/informed if their report is investigated?
    a. Always
    b. Sometimes
    c. Rarely
    d. Never
    e. Don’t know

11. Is the reporting member of staff involved in the investigation of the incident?
    a. Always
    b. Sometimes
    c. Rarely
    d. Never
    e. Don’t know

12. Are there standard protocols for the investigation process?
    a. Free text answer

13. What format is your incident reporting system?
    a. Fully electronic/web-based (direct entry by frontline staff with no paper or telephone reporting option)
b. Paper-based (incident reports made by paper or phone, then entered by administrators)

c. Mixed (direct and paper options)

14. On average, how long does it take for a staff member to report an incident?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>0–10 minutes</td>
</tr>
<tr>
<td>b.</td>
<td>10–20 minutes</td>
</tr>
<tr>
<td>c.</td>
<td>20–30 minutes</td>
</tr>
<tr>
<td>d.</td>
<td>Over 30 minutes</td>
</tr>
<tr>
<td>e.</td>
<td>Don’t know</td>
</tr>
</tbody>
</table>

15. How many staff members have access to the reporting system (estimates are acceptable)?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Free text answer</td>
</tr>
</tbody>
</table>

---

**Information capture**

16. How many reports are generated annually (approximations are acceptable)?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Free text answer</td>
</tr>
</tbody>
</table>

17. How many mandatory fields are required in each incident reporting form (please specify, if possible)?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>1–10</td>
</tr>
<tr>
<td>b.</td>
<td>10–20</td>
</tr>
<tr>
<td>c.</td>
<td>20–30</td>
</tr>
<tr>
<td>d.</td>
<td>Over 30</td>
</tr>
</tbody>
</table>

18. Do staff report as a team (i.e., more than one individual logged in/’owning’ a report)?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>a.</td>
<td>Always</td>
</tr>
<tr>
<td>b.</td>
<td>Sometimes</td>
</tr>
<tr>
<td>c.</td>
<td>Rarely</td>
</tr>
<tr>
<td>d.</td>
<td>Never</td>
</tr>
<tr>
<td>e.</td>
<td>Don’t know</td>
</tr>
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</table>

19. Does the system capture information on actual degree of harm for patient safety incidents (e.g., serious harm, minor harm, no harm)?

<p>| | |</p>
<table>
<thead>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td>Always</td>
</tr>
<tr>
<td>b.</td>
<td>Sometimes</td>
</tr>
</tbody>
</table>
20. Does your system capture potential degree of harm?
   a. Always
   b. Sometimes
   c. Rarely
   d. Never
   e. Don’t know

Analysis and publication

21. Is the majority of data recorded in drop-down lists (i.e., not in free text form)?
   a. Yes
   b. No
   c. Don’t know

22. Are incident reports immediately available to the person(s) responsible for investigation (if so, please specify how – i.e., automatic email notification, online alert, etc.)?
   a. Always (please specify)
   b. Sometimes (please specify)
   c. Rarely (please specify)
   d. Never
   e. Don’t know

23. What type of information from the incident reporting system is made publicly available (if anything)?
   a. Free text answer

24. How often is this information made publicly available?
   a. Regularly
   b. Sometimes
   c. Rarely
   d. Never
   e. Don’t know
25. How often is information from the incident reporting system disseminated to staff (please specify how – i.e., monthly newsletter, annual report, real-time bulletins, etc.)?
   a. Regularly (please specify)
   b. Sometimes (please specify)
   c. Rarely (please specify)
   d. Never
   e. Don’t know

26. Are staff who report incidents also involved in discussions about the publications?
   a. Always
   b. Sometimes
   c. Rarely
   d. Never
   e. Don’t know

**Generates learning and improvement**

27. Does the incident reporting system use a fixed taxonomy of incidents?
   If yes, can you share (either below or via email to lhsn@imperial.ac.uk)?
   a. Yes
   b. No
   c. Don’t know

28. Is there a named person or group responsible for monitoring improvements coming from reported incidents (if yes, please specify)?
   a. Yes (please specify)
   b. No
   c. Don’t know

29. Please describe any techniques you have used to improve incident reporting rates.
   a. Free text answer

30. Please describe any specific examples where your incident reporting system has led to learning and improvement.
   a. Free text answer
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This is our logo. Its arrow shows the transformational power of our thinking, and is derived from the capital letter 'K'.