

WORKSHOP 9

THE ECONOMICS OF PATIENT SAFETY

HANS RUTBERG AND ANE AURAAEN

The Nordic Conference on Health Care Quality and Safety



What are we going to do today?

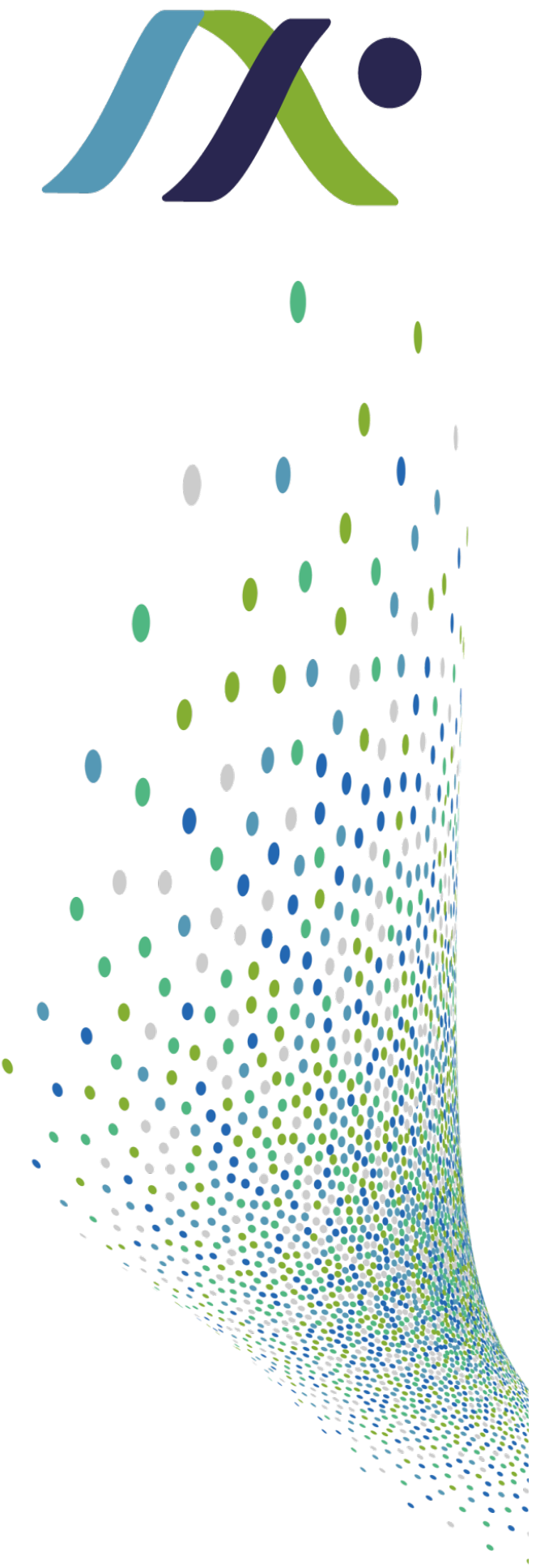
Introduction

What do you understand by the term *economics of patient safety*?

Is there an ongoing discussion on the economics of patient safety in your country?

During this workshop you will learn more about:

- The economic consequences of adverse events
- Strategies that can minimise harm effectively and efficiently
- Patient safety in primary and ambulatory care settings



AN OECD PERSPECTIVE ON

THE ECONOMICS OF PATIENT SAFETY

ANE AURAAEN, LUKE SLAWOMIRSKI, NIEK KLAZINGA



Adopting a health system perspective on patient safety economics





How is the economic and financial burden of harm estimated at the OECD level?

Burden of disease

- Incidence/prevalence of adverse events
- Consequences/severity
- Understand nature, causes and drivers of harm

Economic and financial burden

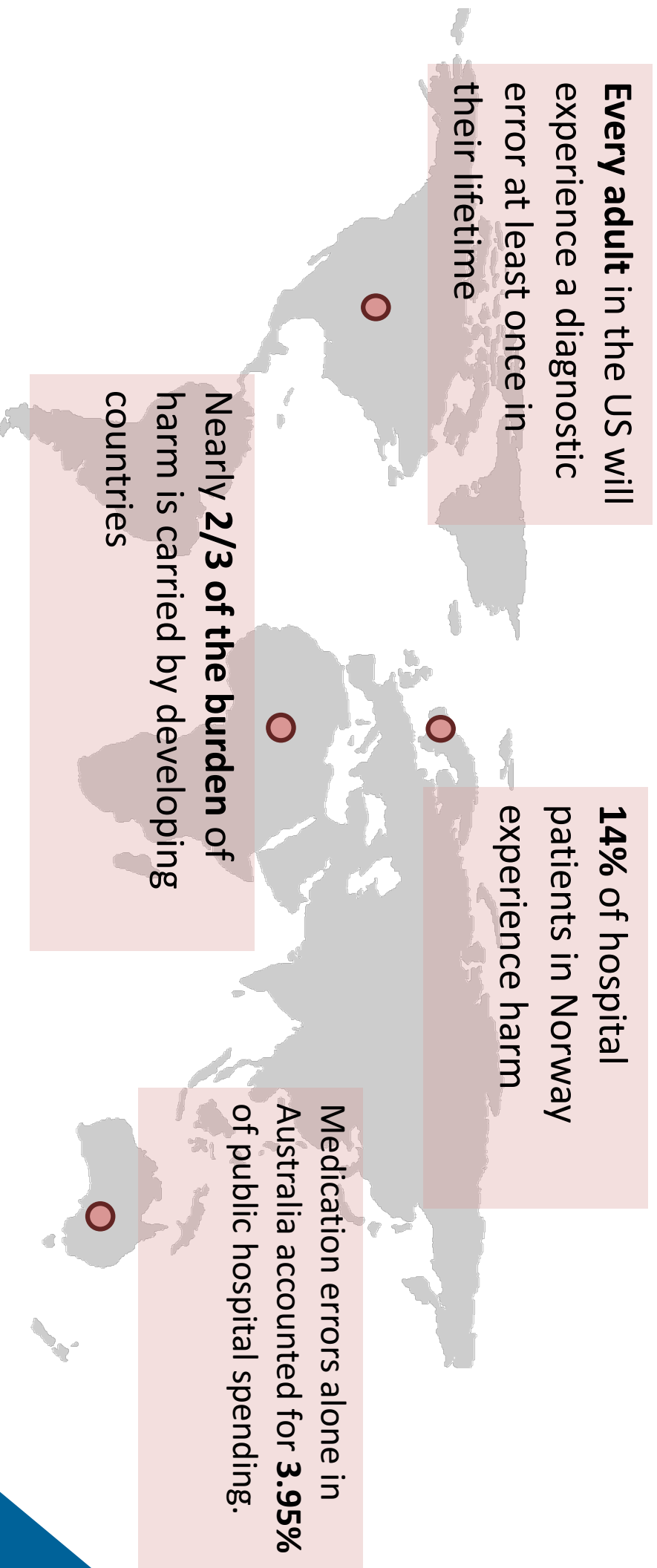
- Direct costs
 - Consumption of healthcare resources
- Indirect costs
 - Productivity loss, premature deaths, loss of trust in the health system

Data sources (and their limitations)

- Published scientific literature, national data registries, Institute of Health Metrics and Evaluation (IHME) and OECD Health Statistics
 - Accessibility and availability
- Substantial variety in methodologies and definitions
 - Quality and comparability
- Expert panels – academia and policy

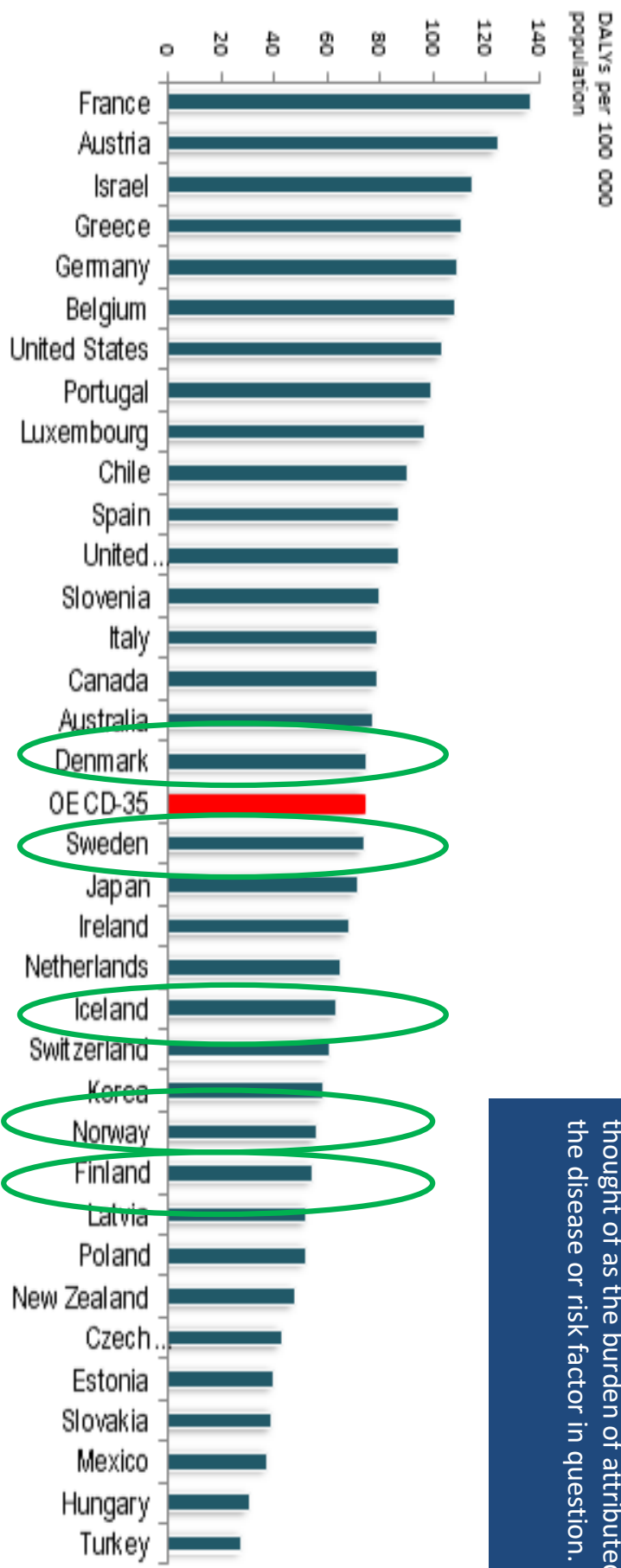


Patient harm is the 14th leading cause of disease burden





DALY's attributable to patient harm in OECD countries



One DALY can be thought of as one lost year of "healthy" life. The sum of these DALYs across the population can be thought of as the burden of attributed to the disease or risk factor in question.

Source: IHME 2015

THE COST OF FAILURE HOSPITAL CARE



80% of burden of harm in acute care attributable to six types of adverse events

Table 3. Disease burden of 6 adverse event types compared to chronic conditions in England

Disease	Annual burden per 100,000 pop/n	Total annual burden across England
All adverse events*	86 DALYs	46,491 DALYs
Multiple sclerosis	80 DALYs	42,400 DALYs
6 adverse event types	68 DALYs	36,000 DALYs
HIV/AIDS and Tuberculosis	63 DALYs	33,400 DALYs
Cervical cancer	58 DALYs	30,740 DALYs
Interpersonal violence	57 DALYs	30,200 DALYs

Source: Hauck et al (2017); *IHME (2015)

Table 5. Annual impact of 6 adverse events in a typical English Hospital

	Bed days lost	Cost of bed days lost	Admissions foregone	Salaried GPs	Hospital nurses
Across England	495,020	GBP151 million	69,721	2,218	3,574
Avg English Hospital	2,024	GBP 617,000	285	9	15

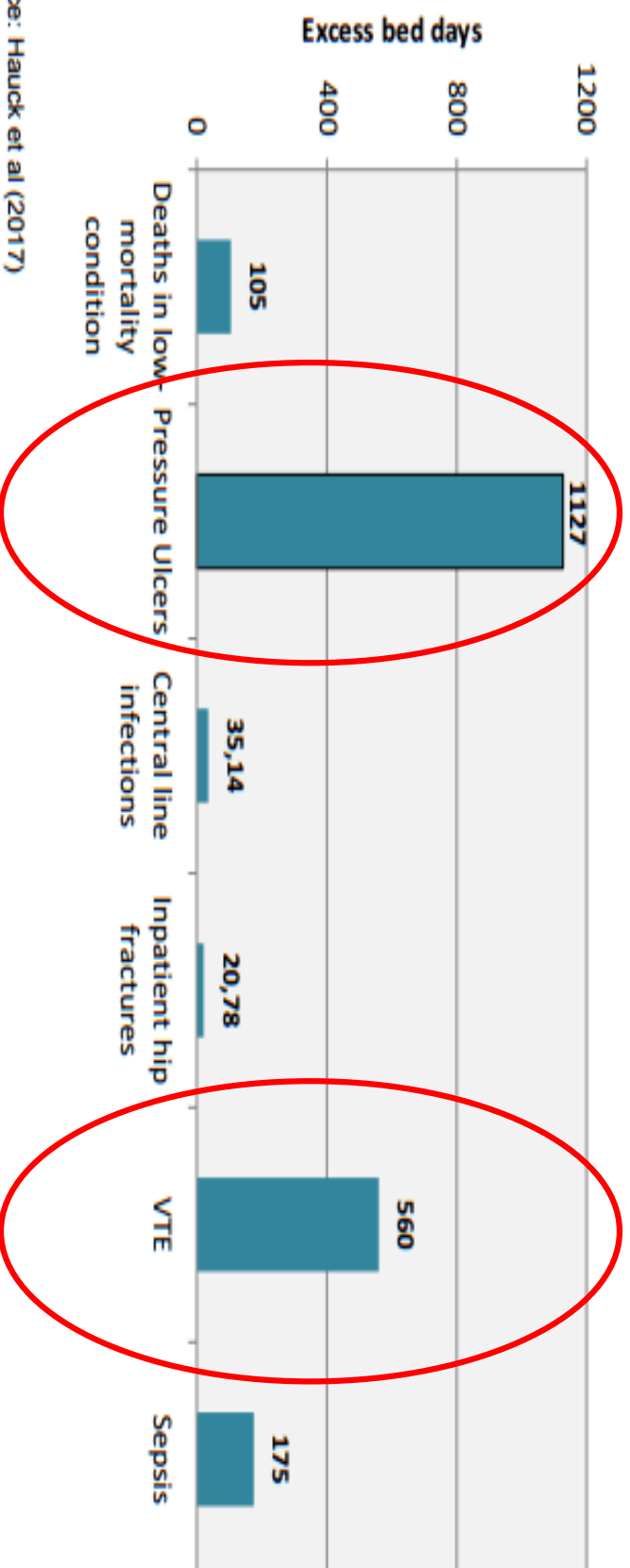
Source: Hauck et al (2017); OECD stat

sepsis; pressure ulcers; inpatient hip fractures due to falls; VTE; central line infections; deaths in low-mortality conditions



Bed days consumed by AE sequelae – England

Figure 4. Bed days lost due to six adverse events, annual totals for a typical English hospital



Source: Hauck et al (2017)





15% of total hospital activity and expenditure is a direct result of patient harm – VTE, pressure ulcers the most burdensome

Table 6. Economic burden due to adverse events in acute care or hospital care (as share of public hospital spending)

	Adverse events in hospitals	Share of public hospital spending
Brown, P. (2002)	New Zealand The results suggest that treating adverse events costs hospitals over \$870 million.	32%
Rafter et al., (2016)	Ireland Adverse events relate to adult inpatient amounted to 194 million€ in 2009	4%
Ethells et al (2012)	Canada Financial burden of adverse events in Canada in 2009–2010 was \$CAN 1,071,983,610	4.2%
Jackson (2009)	Canada Administrative data.	14%
Health Policy Analysis, Australia (2013)	Australia Hospital-associated conditions modelled to range between AUD 634 million and AUD 896 million	12 % – 16.5%
Ehsani et al (2006)	Australia (Victoria) Impact of adverse events modelled from hospital administrative data was AUD 6,800 per episode or AUD 460 Million in aggregate.	15.7%
Zsifkovits et al (2016)	Europe Direct costs for the public care sector ranged from 2.8 billion euros to 84.6 billion euros	0.2%-6% *
Hoonhout L. et al (2009)	Netherlands Costs estimated at a total of €355 million for all adverse events in hospitals	1.8%
Adverse events in long term care		
Levinson, D. (2014)	United States Long-term care 2% of all Medicare spending is associated with treatment of adverse events.	2%



Table 7. Studies of adverse event rates in various countries, extrapolated to determine their impact on hospital

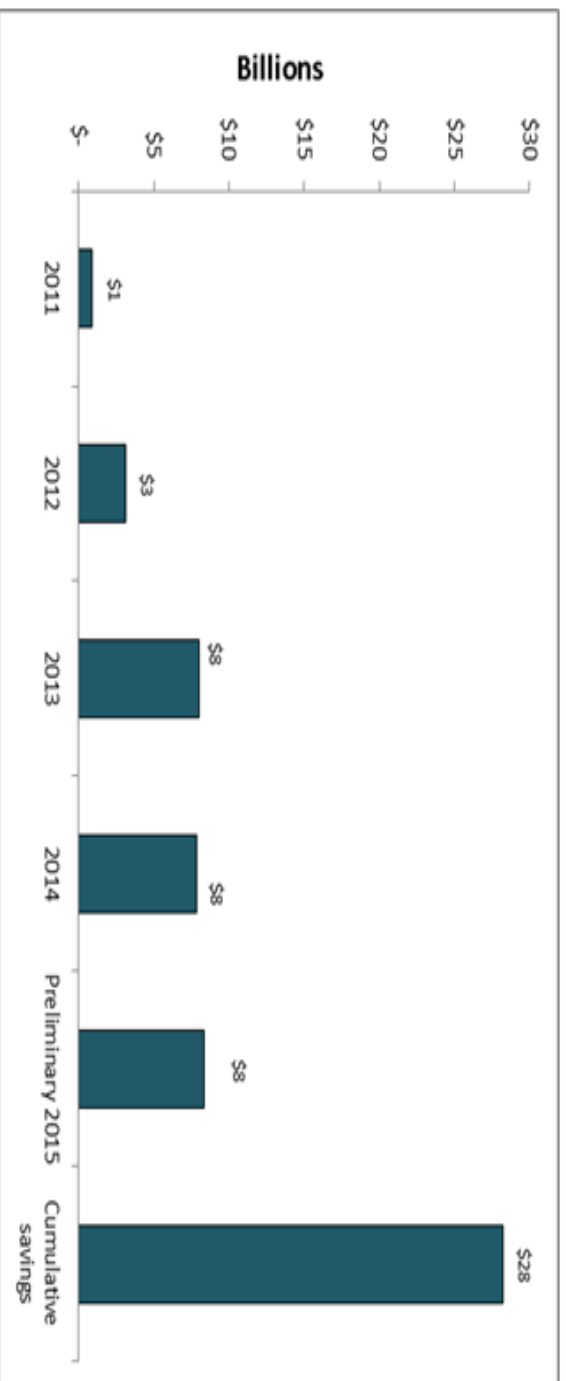
Study	Adverse event rate	% of events considered preventable	% of events resulting in death or contributing to death	Average additional hospital days per patient	% of all hospital days in the country investigated in the study attributable to adverse events
Harvard Medical Practice Study, United States (Brennan et al., 1991)	3.7%	27.6% of events due to negligence (preventable not specified)	13.6%	Not specified	N.A.
Quality in Australian Health Care Study (Wilson et al., 1995)	16.6%	51.0% of events	4.9%	7.1	21.4%
Adverse Events in British Hospitals (Vincent et al., 2001)	10.8%, and 11.7% when including multiple events.	48.0% of events	8.0% of patients with adverse events died	8.5	14.1%
Danish adverse events study (Schlieler et al., 2001)	9.0%	40.4% of events	6.1% of admissions with adverse events	7.0	14.7%
Canadian Adverse Events Study (Baker et al., 2004)	7.5%	36.9% of patients with adverse events	15.9%	7.7 in small hospitals, 3.6 in large hospitals, 6.2 in teaching hospitals	6.0%
Spanish National Study of Adverse Events (Aranaz-Andrés et al., 2008)	8.4%	42.6% of events	4.4% of patients with adverse events died	6.1	6.9%
Systematic review of eight studies in Australia, Canada, New Zealand, United Kingdom, United States (de Vries et al., 2008)	Median incidence 9.2%	Median percentage preventable 43.5%	7.4%	Not specified	N.A.
Incidence of Adverse Events in Swedish Hospitals (Soop et al., 2009)	12.3%	70.0% of events	3.0%	6.0	13.0%
Adverse events and potentially preventable deaths in Dutch hospitals (Zegers et al., 2009)	5.7%	39.6% of events	7.8%	Not specified	N.A.
Costs of adverse drug events in German hospitals (Rottenkobler et al., 2009)	1.14% of all hospitalisations	Not specified	Not specified	2.9 days	3.3%
Nosocomial Infections in Belgium, part 2: Impact on Mortality and Costs (Vrijens et al., 2009)	6.2% of all hospitalisations	Not specified	2.1%	6.7 days	5.3%
Irish National Adverse Events Study (Rafter et al., 2016)	10.3%	72.5% of events	6.7%	6.1	10.5%

Note: The calculations behind the numbers in the table were based on the latest year available. If adverse events were avoided were based on the average length of stay reported to OECD Health Statistics the latest year available.



Improving patient safety in US Medicare hospitals is estimated to have saved USD 28 Billion

Figure 7. Total Annual and Cumulative Cost Savings (2010 Baseline) in USD Billions



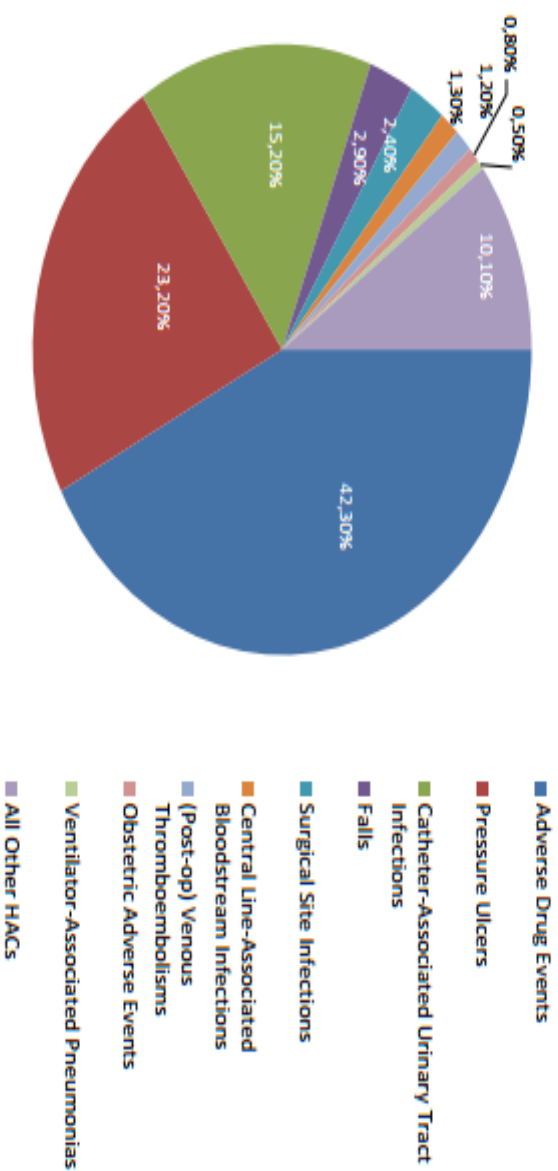
Source: AHRQ 2016





The US has seen a 21% decline in hospital-acquired conditions since 2011

Figure 8. Decrease in healthcare-acquired conditions, 2011-2015 (Total = 3,097,400)



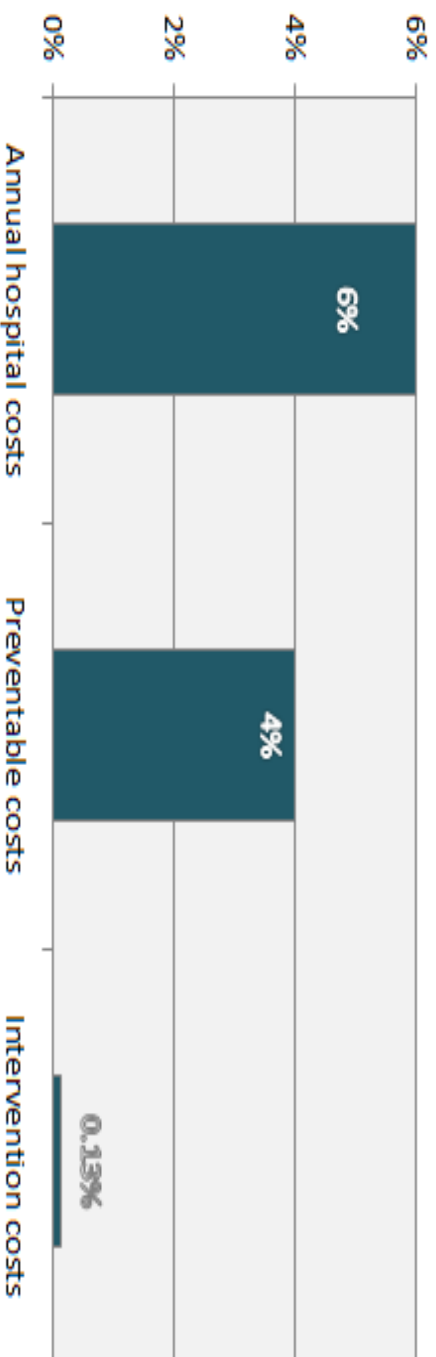
Source: AHRQ 2016





Failure costs of VTE and pressure ulcers dwarf the cost of prevention

Figure 6. Annual hospital costs of venous thromboembolism dwarf the costs of prevention



Source: Mahan et al. 2011

Table 9. Prevention costs for pressure ulcers are lower than treatment costs

	Failure cost (national, annual cost)	Prevention cost (national, annual cost)
Across all levels of care	121.44 million – 2.59 billion EUR	195,27 – 291,33 million EUR
Hospital care	140.47 million EUR- 210.70 million EUR	33.2 million EUR (technical approach) 76.79 million EUR (human approach)
Long-term care	N.A.	12.58-16.27 million EURO

Source: Bayoumi et al 2008, Schuurman, JP et al 2009



Related costs outside the hospitals

Indirect costs potentially enormous

The flow-on costs of harm include loss of productivity and diminished trust in the healthcare system.

In 2008, the economic cost of medical error in the US was estimated to be almost USD 1 trillion.

-> GDP of Mexico or Indonesia

Primary care remains somewhat a black box

Most patient safety research focusses on inpatient care.

Less is known about harm in primary and ambulatory care. Research indicates that wrong or delayed diagnosis is a considerable problem.

The topic of our latest Economics of Patient Safety report



Key messages

- Patient safety is a **critical policy issue**
- The cost to patients, healthcare systems and societies is **considerable**
- Most of the burden in hospital care is associated with a few **common adverse events**
- Greater investment in prevention is justified
- Solid foundations for patient safety need to be in place



Question for discussion

Is quantifying the cost an adequate and appropriate way to addressing patient safety?



THE ECONOMICS OF PATIENT SAFETY

- the situation in Sweden

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Adverse events are underreported

For the full versions of these articles see bmj.com

EDITORIALS

Incident reporting and patient safety

Emphasis is needed on measurement and safety improvement programmes

RESEARCH P 79

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BMJ 2007;335:A51

doi: 10.1136/bmj.39071.446092.00

Incident reporting should ideally communicate all information relevant to patient safety. Local incident reporting systems in hospitals typically use an incident form that comprises basic clinical details and a brief description of the incident. Such systems are ideally used as part of an overall safety and quality improvement strategy,¹ but in practice they may be dominated by managing claims and complaints.¹ Specially reporting systems² and large scale systems, such as that of the UK National Patient Safety Agency (www.npsa.nhs.uk/), allow wider dissemination of lessons learnt and emphasise the need for parallel analysis and development of solutions. In this week's *BMJ* a case note review by Sari and colleagues finds that local reporting systems are poor at identifying patient safety incidents, particularly those involving harm,³ echoing the findings of similar studies.⁴ Does this mean that these reporting systems

who can tease out the human factors and organisation issues. Analysing a small number of incidents thoroughly is probably more valuable than a cursory overview of a large number of incidents.⁵ In health care we are learning slowly and painfully that safety is a tough intractable problem that will take much more than reporting to resolve.¹

It is hard to see why it may be thought that reporting could be a substitute for systematic data collection. One reason, perhaps, is that it seemed as if aviation and other industries were using reporting to establish rates of serious incidents. In fact, aviation already had established the epidemiology of harm in the form of comprehensive databases of accidents and other systematically collected information. Reporting was always complementary to systematic data collection, providing warnings and additional safety information.

Cite this article as: [BMJ, doi:10.1136/bmj.39031.507153.AE](http://doi.org/10.1136/bmj.39031.507153.AE) (published 15 December 2006)

Research

BMJ

Sensitivity of routine system for reporting patient safety incidents in an NHS hospital: retrospective patient case note review

Ali Babae-Akbari Sari, Trevor A Sheldon, Alison Cracknell, Alastair Turnbull

Abstract

Objective To evaluate the performance of a routine incident reporting system in identifying patient safety incidents.

Design Two stage retrospective review of patients' case notes and analysis of data submitted to the routine incident reporting system on the same patients.

Setting A large NHS hospital in England.

Population 1006 hospital admissions between January and May 2004: surgery (n = 311), general medicine (n = 251), elderly care (n = 184), orthopaedics (n = 131), urology (n = 61), and three other specialties (n = 68).

Main outcome measures Proportion of admissions with at least one patient safety incident; proportion and type of patient safety incidents missed by routine incident reporting and case note review methods.

Results 324 patient safety incidents were identified in 290/1006 admissions (92.9%; 95% confidence interval 90.3% to 95.5%); 270 (83%) patient safety incidents were identified by case note review only; 21 (7%) by the routine reporting system only; and 33 (10%) by both methods. 110 admissions (10.9%; 9.6% to 12.8%) had at least one patient safety incident resulting in patient harm, all of which were detected by the case note review and six (5%) by the reporting system.

Conclusion The routine incident reporting system may be poor at identifying patient safety incidents, particularly those resulting in harm. Structured case note review may have a useful role in surveillance of routine incident reporting and associated quality improvement programmes.

about the cause, contributory factors, preventability, and impact of these incidents.⁶⁻⁸ In this paper we evaluate the relative performance of a local routine incident reporting system that feeds into the national reporting and learning system, by comparing it with a well validated method of systematically reviewing case notes.^{1,3}

Methods

We did the study in a large NHS hospital trust in England in 2005. We selected a stratified random sample of 1006 admissions (>24 hours' stay) between January and May 2004 from eight specialties: surgery; urology; orthopaedics; general medicine; medicine for the elderly; oncology; ear, nose, and throat; and ophthalmology. All data extracted were anonymised and kept confidential. The study consisted of using structured data extraction tools to do a two stage retrospective case note review of the sample admissions and reviewing the patient safety incidents reported by the routine hospital reporting system for the same admissions.

Review of medical records

We used previously described methods to do the case note review.^{1,3} Five trained nurses screened patients' records by using 18 explicit criteria (box). We used one (or more) positive criterion as an indicator of a patient safety incident and scrutinised these medical records in stage two. One of the other nurses independently reviewed a 10% sample to assess inter-rater reliability. In addition, medical staff fully reviewed 10% of admissions for which no positive criteria were identified to identify false

Nordic Council of Ministers 2007- 2010

Project to strengthen
Nordic monitoring of
quality and safety in healthcare



Recommendation in 2010

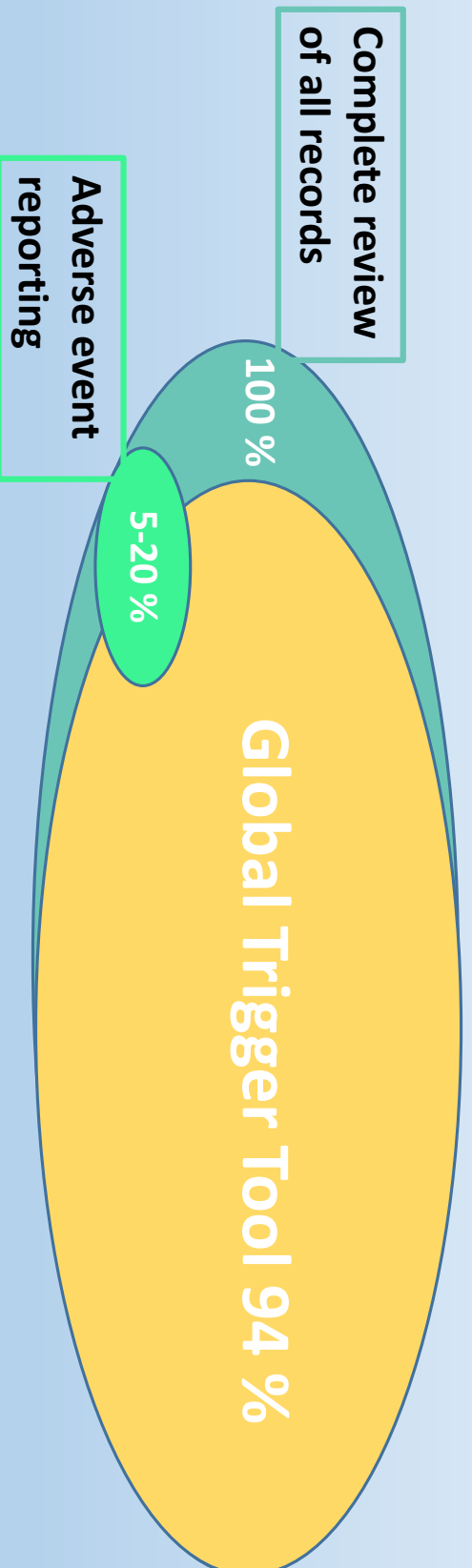
A National Quality Indicator:

Percentage of hospitals

that have applied medical record review
according to the **Global Trigger Tool**



Adverse event rate identified according to the Global Trigger Tool method



EMERGENT ADVERSE EVENTS

By David C. Clark, Roger Maje, Frances Griffin, Frank Reddy, Scott Frankel, Nancy Conrad, Bill E. Rothstein, Adam Finkel, Andrew Singer, and David A. Asch

'Global Trigger Tool' Shows That Adverse Events In Hospitals May Be Ten Times Greater Than Previously Measured

OBJECTIVE: Identification and measurement of adverse medical events is central to patient safety, forming a foundation for accountability, prioritizing problems to work on, generating ideas for safer care, and testing which interventions work. We compared three methods to detect adverse events in hospitalized patients, using the same patient sample and methods: comprehensive need for track patient safety in the United States today—voluntary reporting and the Agency for Healthcare Research and Quality's Patient Safety Indicators—fared very poorly compared to other methods. The Global Trigger Tool (GTTT) identified 10 times more confirmed serious events than other methods. Overall, adverse events occurred in one-third of hospital admissions. Relying on voluntary reporting and the Patient Safety Indicators could produce misleading conclusions about the current safety of care in the US health care system and misdirect efforts to improve patient safety.

DOI: 10.1093/jama.2011.10.1683
 Published online first
 October 16, 2011

Author Disclosures of Potential Conflicts of Interest and Author Contributions: Disclosures of potential conflicts of interest and author contributions are found at the end of this article.

Address correspondence to: David C. Clark, MD, MSc, Department of Health Policy and Management, Harvard School of Public Health, 665 Huntington Ave, Boston, MA 02115 (e-mail: dclark@hsph.harvard.edu).

GTT definition of adverse event

‘Unintended physical injury

resulting from, or contributed to, by medical care
that requires additional monitoring, treatment
or hospitalization or that results in death’

Medical record review by GTT

- Internationally acknowledged method initially described by IHI
- Medical records from somatic care of adults reviewed retrospectively
- Performed as team work by two nurses and one MD
- Randomly selected records reviewed at hospital level
- Adverse events causing harm to patients are identified
- Method in Sweden is adjusted to include assessment of preventability

GTT in practice

- Randomly selected medical records
 - University hospitals review 20 (40), medium sized hospitals 15 (30), and small hospitals 10 (20) records per month
- Team of nurse/-s and MD/-s make a final judgement of AEs and harm
- Each team reports directly to national database
- Each team has direct access to own reported data and the national mean as a reference

Adverse events are categorized according to severity and 19 types

Severity is categorized according to

‘National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) index’

- E: Temporary harm requiring intervention
- F: Temporary harm requiring initial or prolonged hospitalization
- G: Permanent harm
- H: Intervention required to sustain life
- I: Harm contributing to death

Compounded categories

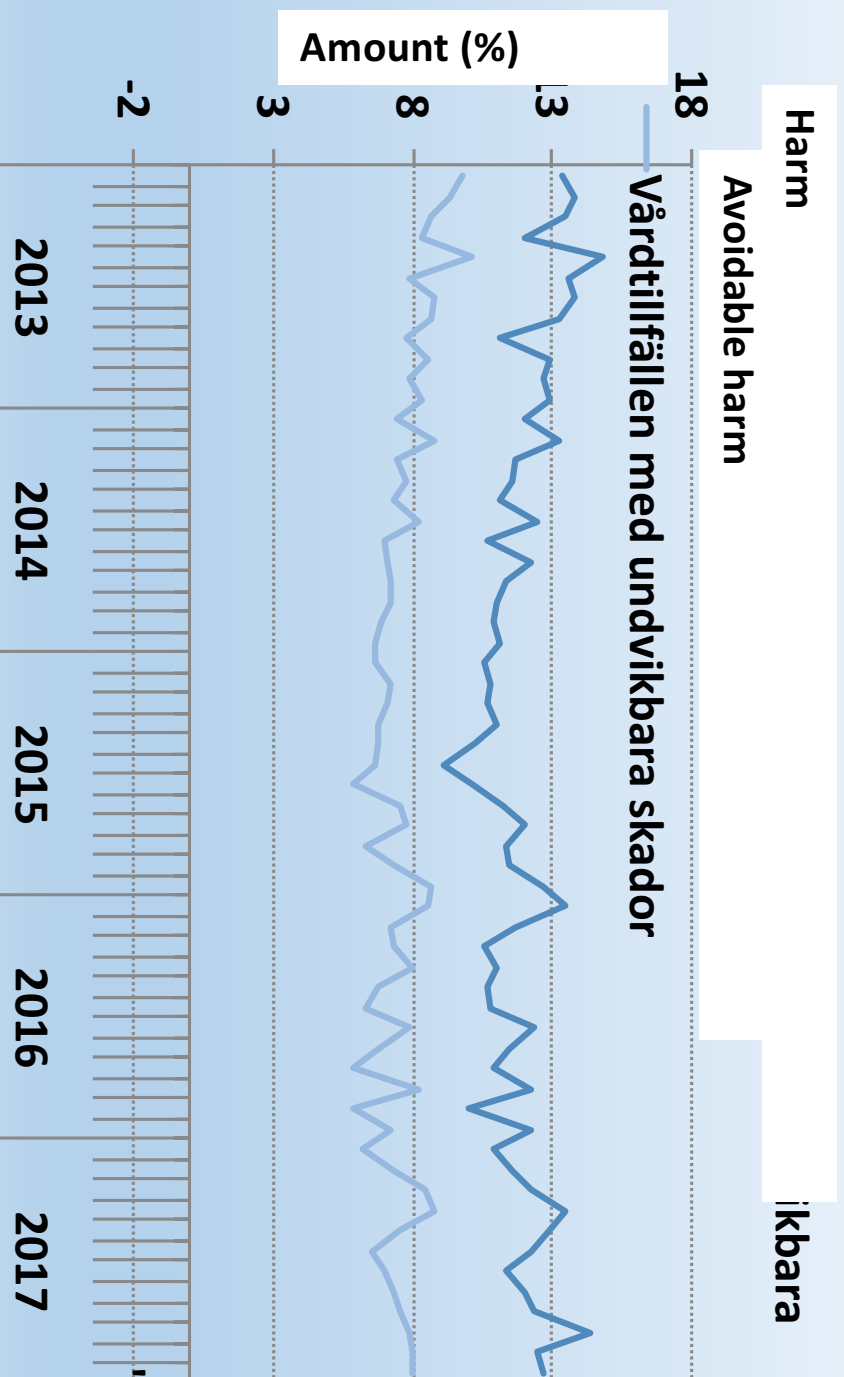
E-I

F-I

Medical records reviewed in Sweden 2013-2017

- 1 % of hospital admissions randomly selected for review
- Results from 77 188 records in national database after 5 years
- Workload per hospital at present:
 - nurses 1-2 days / month
 - MD:s ½ day / month

Amount of hospital admissions with identified harm and avoidable harm per month 2013 - 2017

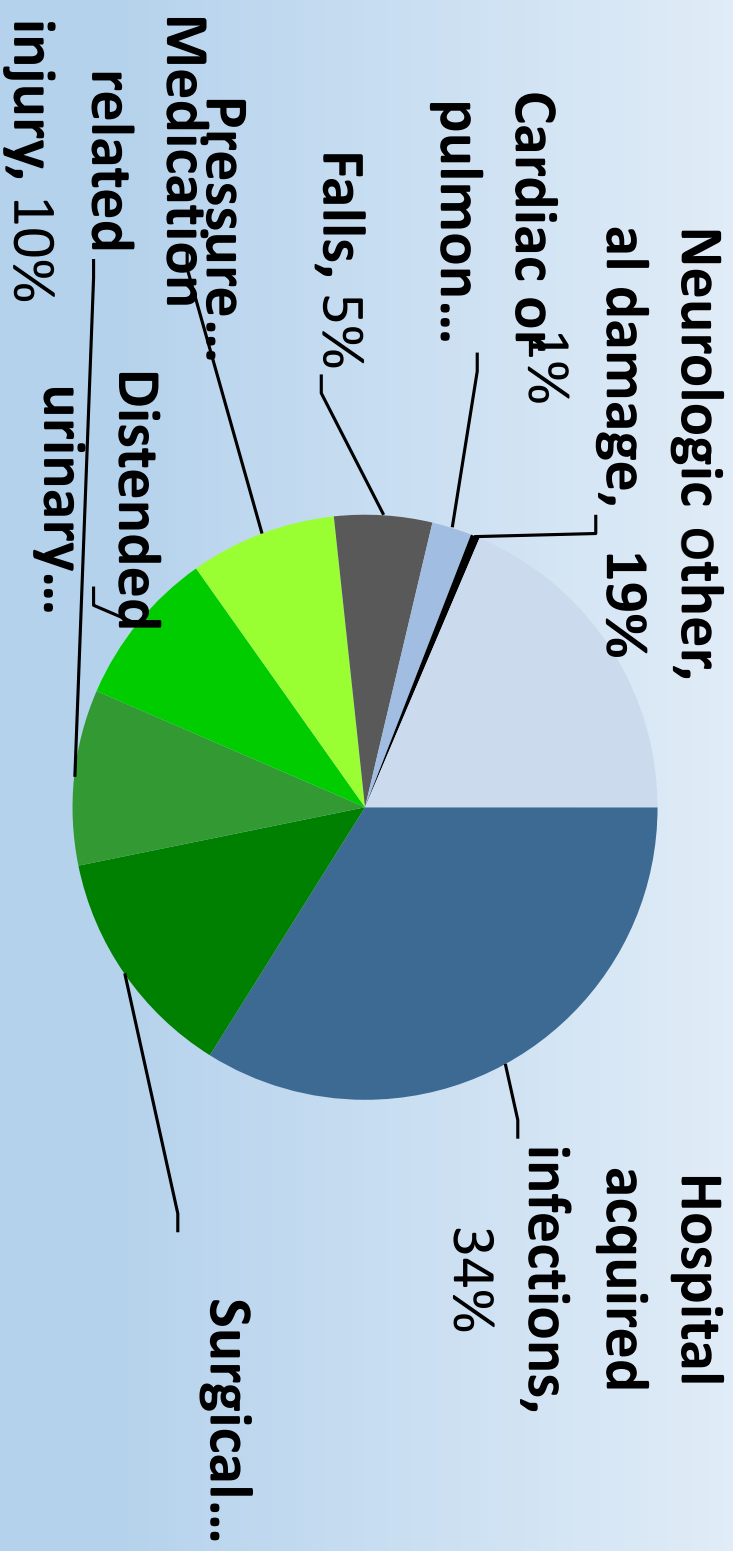


Admissions with avoidable harm.

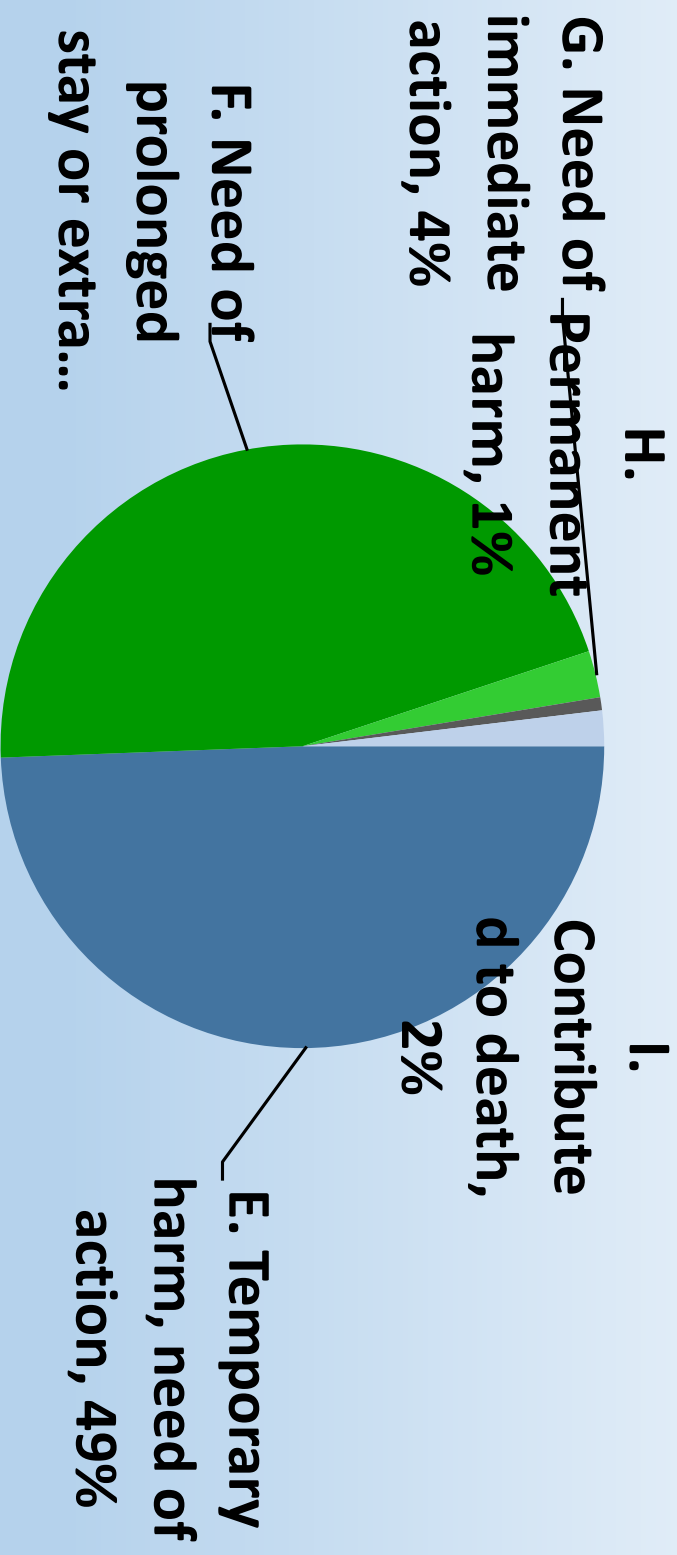
Change over time 2013-2015

- 2013-2015 avoidable harm from 8,7 to 7,0 %
- 2015-2017 avoidable harm from 7,0 to 7,5 %
- Increase in less severe harm
- Ongoing decrease in HAI and circulatory failure

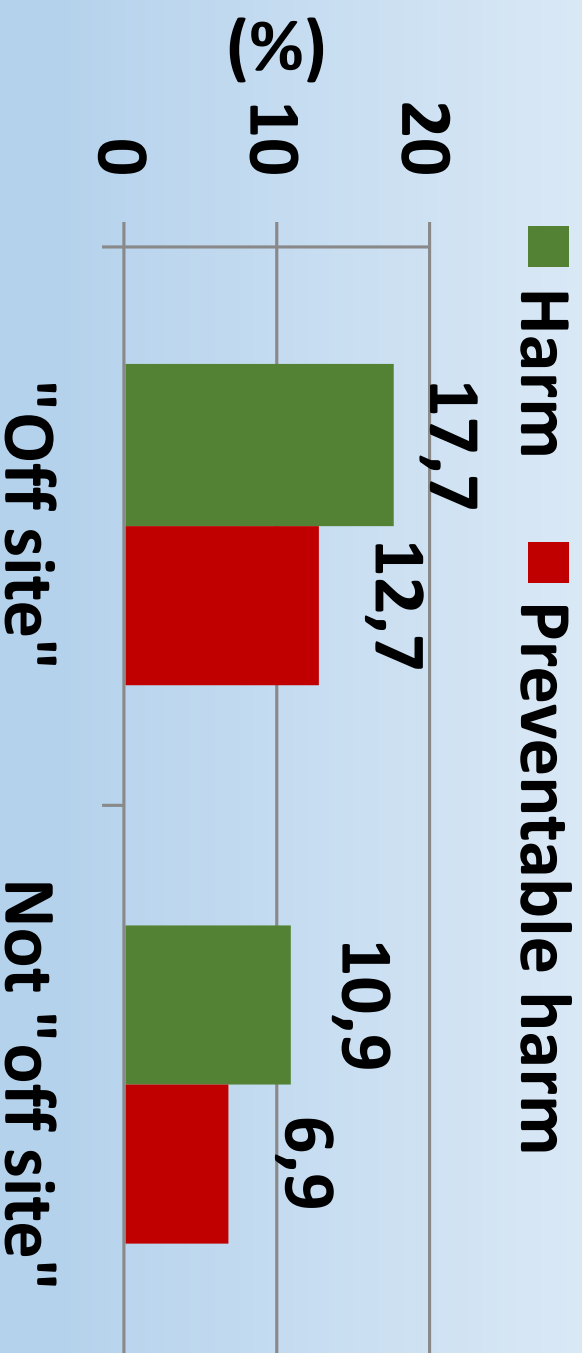
Harm categories



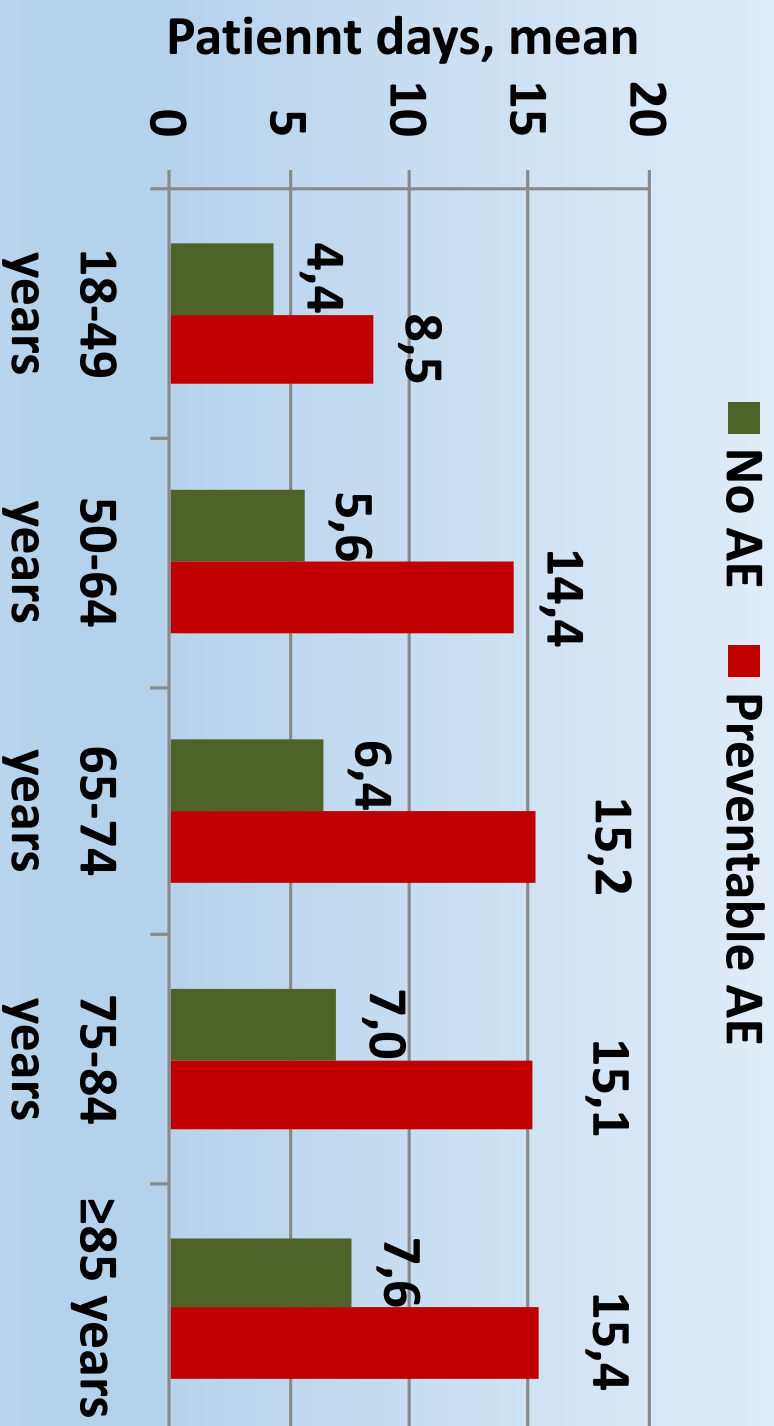
Severity level of identified harm



Level of harm for patients treated in another ward than that specialised for their medical needs (“off site”)



Hospital stay for patients with or without avoidable harm



Prolonged hospital stay and cost

- A total of almost 1,4 million adult somatic patients are hospitalized in Sweden every year
- The frequency of preventable AEs is around 8%
- Approximately 110 000 patients are harmed every year
- In average a preventable AE prolonged the hospital stay with 8 additional days
- Almost 900 000 extra hospital days are used for patients with preventable AEs

Prolonged hospital stay and cost in Sweden

- The average national per diem cost calculated by Activity Based Costing is approximately 10 000 SEK
- The annual cost for preventable AEs is estimated to be around 9 billion SEK
- This amounts to 13-14% of public hospital budgets



Our finding that 13-14 % of total hospital cost is a direct result of patient harm is comparable with the OECD conclusions



Key messages

- Retrospective record review can be used to monitor patient safety over time on regional and national level
- Retrospective record review can detect safety risks connected to trends in healthcare, i.e. increasing 'off-site' care
- The economic burden of preventable AEs is high
- OECD emphasises that the costs for preventive actions are substantially lower than the costs of AEs

Publications

Open Tech Week (2015) 17:45-54
DOI 10.1007/s10111-014-0302-2

ORIGINAL ARTICLE

Use of the Global Trigger Tool in patient safety improvement efforts: Nordic experiences

Persphone Dougi · Helge Svær · Brian Björn · Ellen Deikås · Urban Nylen · Hans Rutberg

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Abstract The Global Trigger Tool (GTT) developed by the Institute for Healthcare Improvement is a method for retrospective patient record review based on the use of triggers—signals of potential adverse events that have caused patient harm. The method has the purpose of patient

reliability observed in many studies. Strengths of the GTT are its ability to detect larger numbers, as well as different types of adverse events when compared to other incident detection methods, hence it is a good addition to the patient of means for organizational patient safety monitoring.

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Open Access

Research

BMJ Open Incidence of adverse events in Sweden during 2013–2016: a cohort study describing the implementation of a national trigger tool

Lena Nilsson,^{1,2} Madeleine Borgstedt-Risberg,³ Michael Soop,⁴ Urban Nylen,⁴ Carina Alenius,⁵ Hans Rutberg⁵

To cite: Nilsson L, Borgstedt-Risberg M, Soop M, et al. Incidence of adverse events in Sweden during 2013–2016: a cohort study describing the implementation of a national trigger tool. *BMJ Open* 2018;8:e020833. doi:10.1136/bmjopen-2017-020833

ABSTRACT
Objectives To describe the implementation of a trigger tool in Sweden and present the national incidence of adverse events (AEs) over a 4-year period during which an ongoing national patient safety initiative was terminated. **Design** Cohort study using retrospective record review based on a trigger tool methodology. **Setting and participants** Patients ≥18 years admitted to all somatic acute care hospitals in Sweden from 2013 to 2016 were randomised into the study.

Strengths and limitations of this study
▶ The study includes all somatic acute care hospitals in Sweden, except for paediatric units.
▶ This is a longitudinal study over a 4-year period during which an ongoing national patient safety initiative was terminated.
▶ An estimation of the economic cost for prolonged hospital stay due to preventable AEs was undertaken.

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Open Access

Research

BMJ Open Characterisations of adverse events detected in a university hospital: a 4-year study using the Global Trigger Tool method

Hans Rutberg,¹ Madeleine Borgstedt-Risberg,² Rune Sjödah,^{1,3,4} Pernilla Nordqvist,⁴ Lars Valter,² Lena Nilsson⁵

To cite: Rutberg H, Borgstedt-Risberg M, Sjödah R, et al. Characterisations of adverse events detected in a university hospital: a 4-year study using the Global Trigger Tool method. *BMJ Open* 2014;4:e004879. doi:10.1136/bmjopen-2014-004879

ABSTRACT
Objectives To describe the level, preventability and categories of adverse events (AEs) identified by medical record review using the Global Trigger Tool (GTT). To estimate when the AE occurred in the course of the hospital stay and to compare voluntary AE reporting with medical record reviewing. **Design** Two-stage retrospective record review. **Setting** 650-bed university hospital. **Participants** 201 randomly selected medical records.

Strengths and limitations of this study
▶ The sample is representative of the care given at the university hospital.
▶ The review team was experienced and remained the same throughout the study.
▶ This study was conducted in a single hospital which may restrict the generalisability of the findings.

Open Access

Research

BMJ Open Exploring similarities and differences in hospital adverse event rates between Norway and Sweden using Global Trigger Tool

Elen Tvetter Deikås,^{1,2} Madeleine Borgstedt-Risberg,³ Marlon Haugen,⁴ Jonas Christoffer Lindström,² Urban Nylen,⁵ Hans Rutberg^{6,7} Soop Michael⁵

To cite: Deikås ET, Haugen M, Lindström J, et al. Exploring similarities and differences in hospital adverse event rates between Norway and Sweden using Global Trigger Tool. *BMJ Open* 2017;7:e012492. doi:10.1136/bmjopen-2016-012492

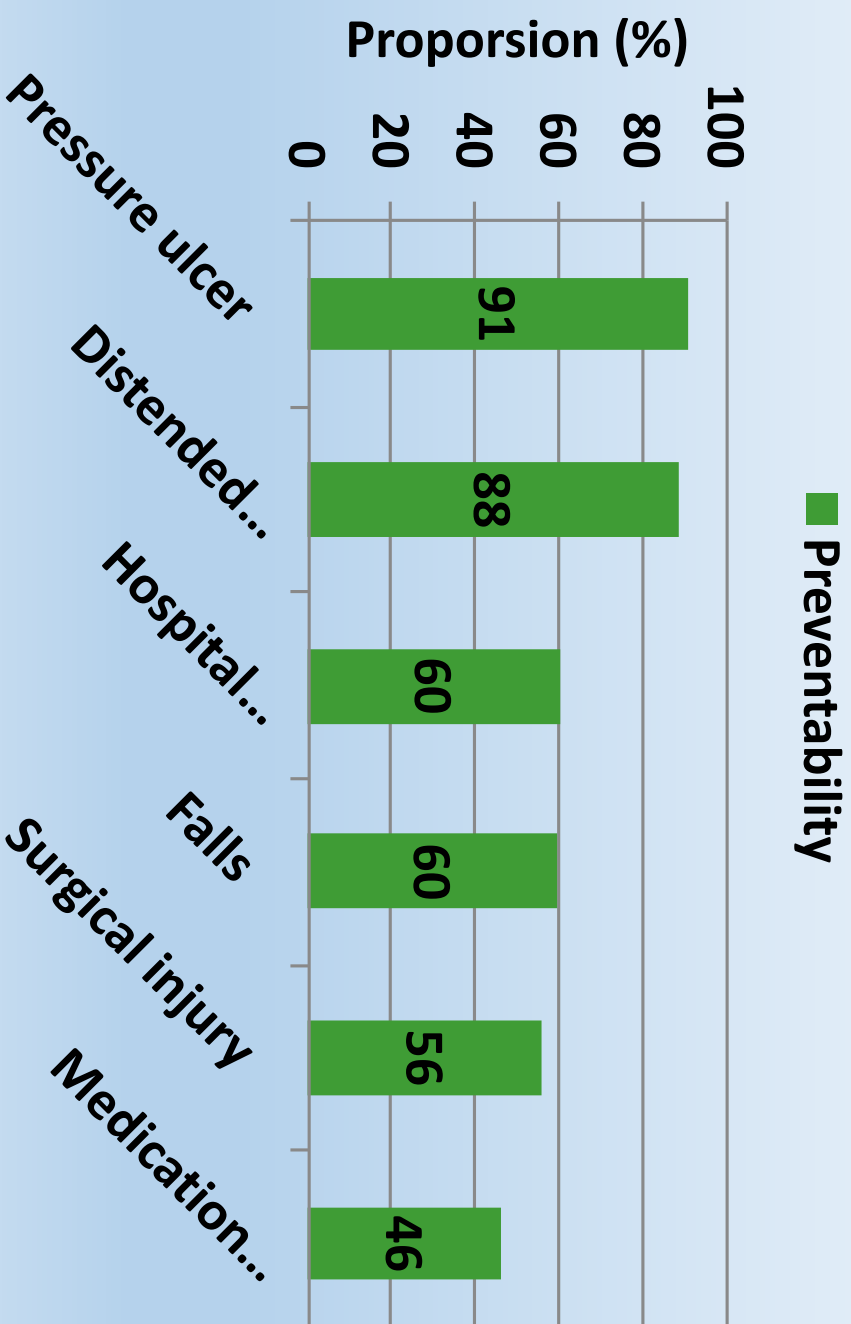
ABSTRACT
Objectives In this paper, we explore similarities and differences in hospital adverse event (AE) rates between Norway and Sweden by reviewing medical records with the Global Trigger Tool (GTT). **Design** All acute care hospitals in both countries performed medical record reviews, except one in Norway. Records were randomly selected from all eligible admissions in 2013. Eligible admissions were patients 18 years of age or older, undergoing care with

Strengths and limitations of this study
▶ The samples are drawn from all eligible hospital admissions in both countries in 2013.
▶ The samples represent 1.9% of all eligible hospital admissions in Norway and 1.4% in Sweden.
▶ This is the first explorative cross-country comparison of adverse event rates and types based on Global Trigger Tool.
▶ The study does not include demographic data or

Question to discuss

Do you believe that the situation is the same in your country as in Sweden?

Avoidability in different harm categories



GTT in psychiatry

Sweden

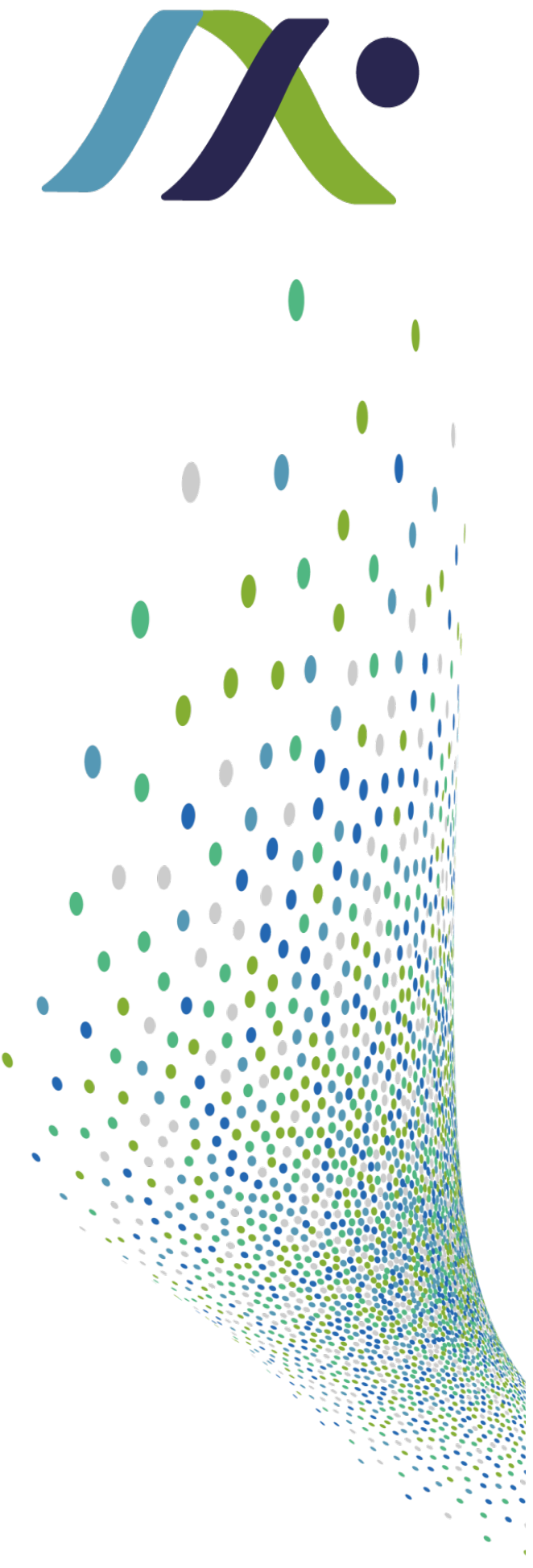
- Adjusted method
- 2 552 records reviewed nationally
- 3 months including in- and outpatient care
- AEs in approx. 17 % of medical records
- Avoidable AEs in approx. 8 % of medical records

Norway

- Translation tested

Conclusion

- GTT results in figures, levels and trends
- Overview and national perspective is possible
- Details on AEs and harm available for local improvement efforts
- **GTT is not only a quantitative method**
- Patients perspective on care and treatment
- Open eye to the unexpected
- Patient safety culture is challenged



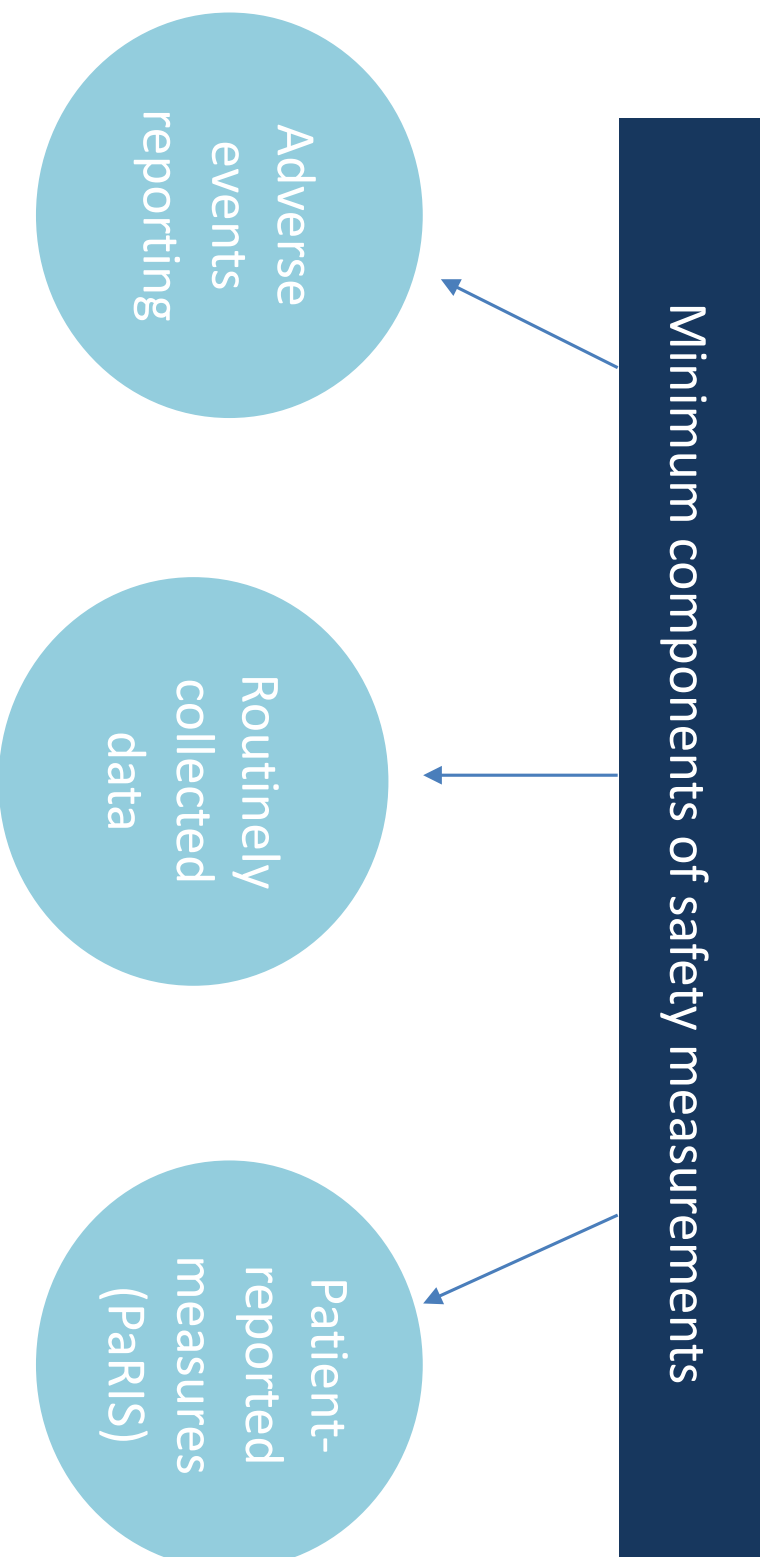
IMPROVING PATIENT SAFETY

ANE AURAAEN

HEALTH POLICY ANALYST, OECD

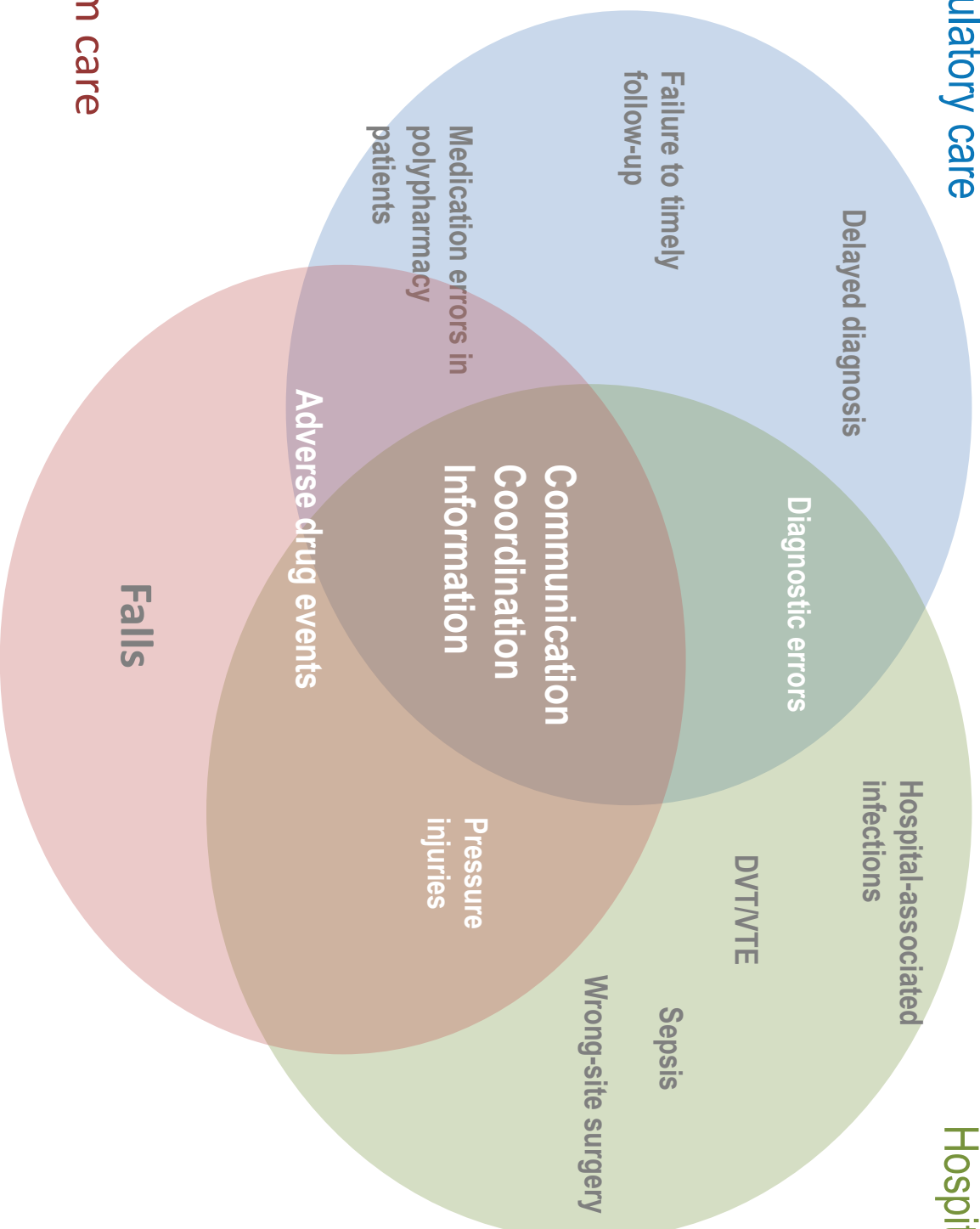


Patient safety as a measure of quality



Primary and ambulatory care

Hospital care



Long-term care

PATIENT SAFETY IN PRIMARY AND AMBULATORY CARE





Primary care is the cornerstone of healthcare provision

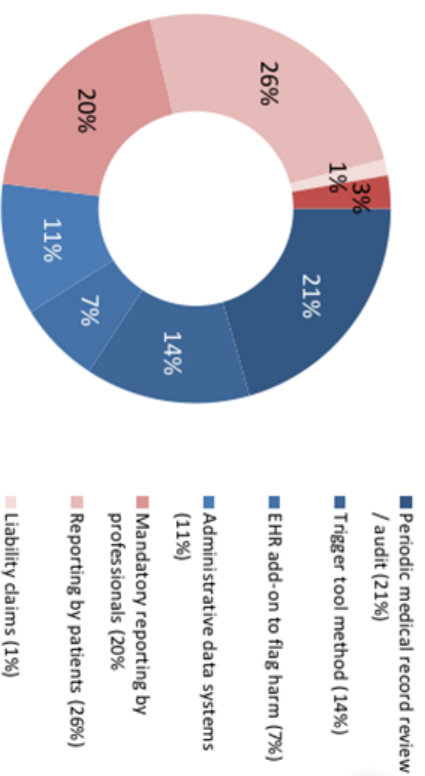
- 8 billion encounters in the OECD countries each year
- Half of the global burden of harm originates in primary care
- As many as 4/10 patients have experienced safety mishap, but generally less severe than hospitalised patients
- Fragmentation of care provision and delivery the core driver of safety mishaps
 - Integrated information infrastructure to capture occurrence of harm and ensure clinical information flow
 - The patient voice is the key to unveiling the true nature, burden and ways of how to prevent harm in primary and ambulatory care





A flurry of measurement methods exist, compromising data comparability

Figure 2.1. Complementary measuring methods favoured by survey respondents (developed countries)



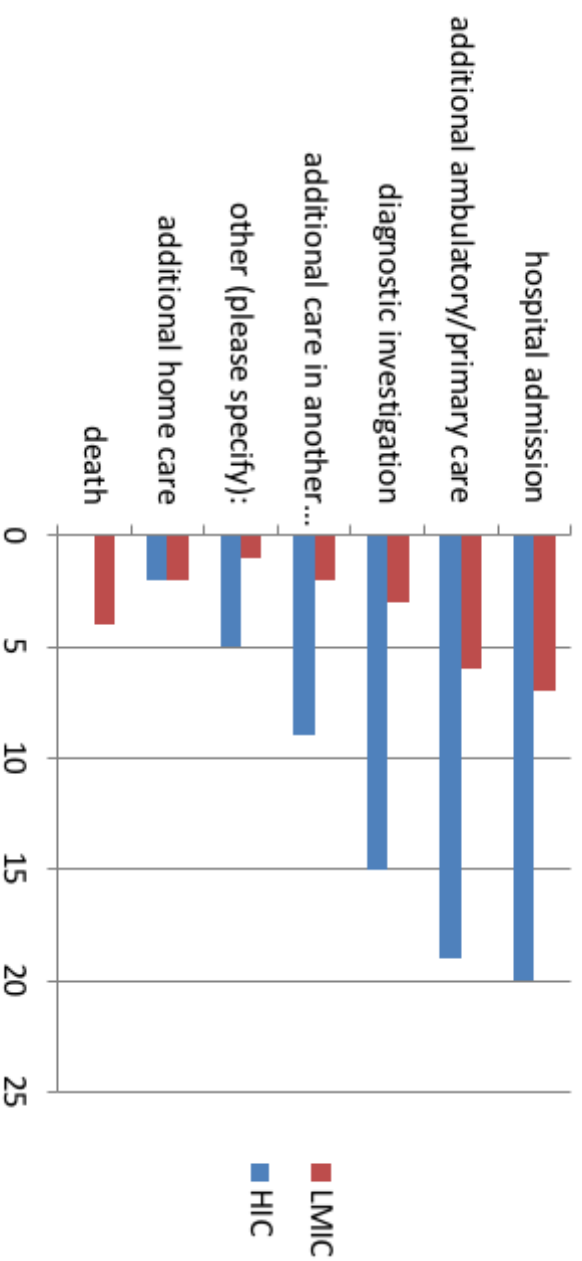
Note: Based on responses to the question: What should be done to systematically measure the incidence, nature and impact of patient harm across the ambulatory/primary sector? Please choose three from the options provided. (73 selections)

Source: OECD Patient Safety Snapshot survey, 2018 (n=26)



Adverse drug events and diagnostic errors contribute to the majority of harmful events in primary care settings

Figure 2.5. Typical sequelae of harm in primary/ambulatory care



Note: Response to the question: *What are the three most common consequences related to healthcare use of patient harm in ambulatory/primary care?*



Failure costs based on avoidable hospital admissions

Table 3.2. Impact of avoidable hospital admissions for five chronic conditions, 27 OECD countries, 2014

	Diabetes	Hypertensive diseases	Heart failure	COPD & Bronchiectasis	Asthma	Total
Admissions	1,041,407	717,028	1,750,617	1,427,355	492,741	5,429,148
% of all admissions	1%	0.7%	1.7%	1.4%	0.5%	5.2%
Average LOS (bed days)	9.5	8.8	10.1	9.5	6.4	8.9 (avg)
Total bed days	11,216,160	5,997,288	17,326,227	13,525,078	3,366,991	51,431,744
Proportion of all bed days	1.3%	0.7%	2.0%	1.6%	0.4%	5.9%
Typical admissions* foregone	1,338,147	652,696	2,182,225	1,967,705	475,956	6,616,730

Note: A 'typical admission' is the average LOS of admissions for all diagnoses and conditions treated in hospital. Foregone admissions assume that hospitals are operating at near full capacity.

Source: OECD.stat



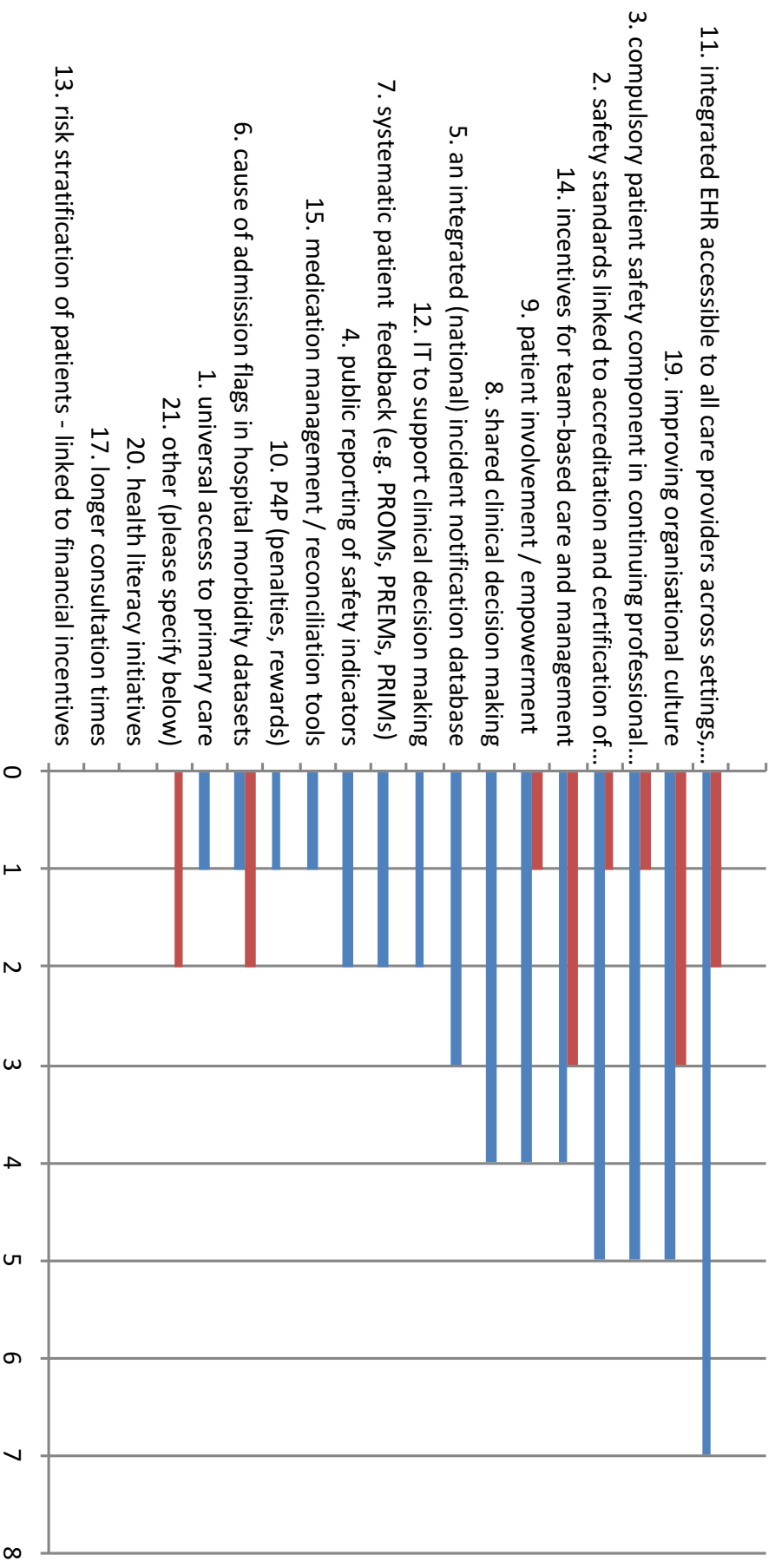
Barriers and enablers to a safer primary care

Barriers	Enablers
fragmented nature of this care setting (5)	Data infrastructure (6)
lack of resources (5)	National leadership (4)
Patient complexity (4)	Patient-centeredness (4)
Busy practitioners (3)	No-blame culture (2)
Fear of sanction (3)	Education (2)
Workforce shortage (3)	Incentives (2)
Resistance to change (2)	Collaboration (2)





Interventions identified as the most cost-effective to reduce harm in primary care



THE SWEDISH GTT EXPERIENCE

- **Psychiatry**
- **Primary care**
- **Home healthcare**

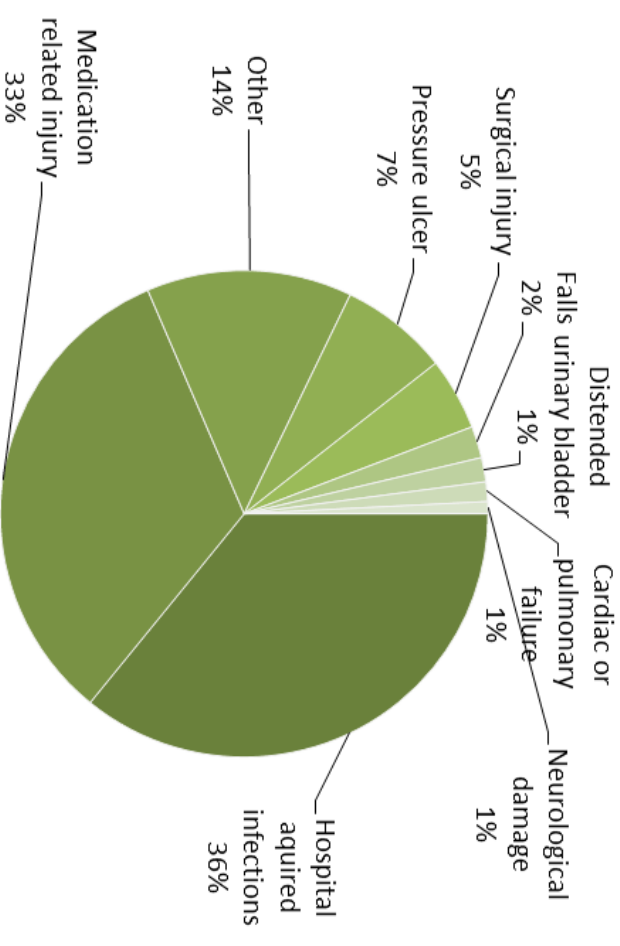
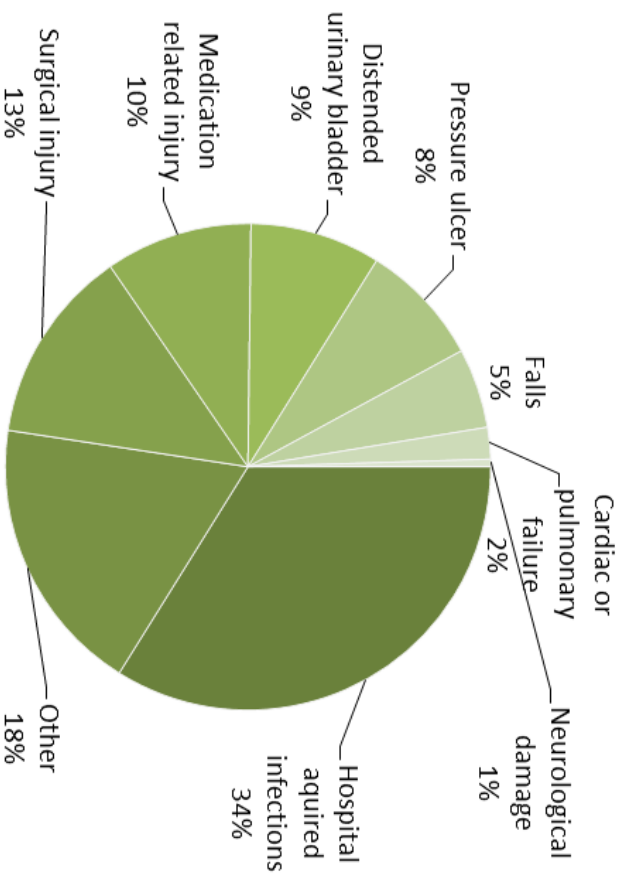
Psychiatry

- Adjusted GTT method
- 2 552 records reviewed nationally
- 3 months including in- and outpatient care
- AEs in approx. 17 % of medical records
- Avoidable AEs in approx. 8 % of medical records
- Most common AEs: prolonged course of illness, self injury
- Low compliance to guidelines

Primary care, harm categories

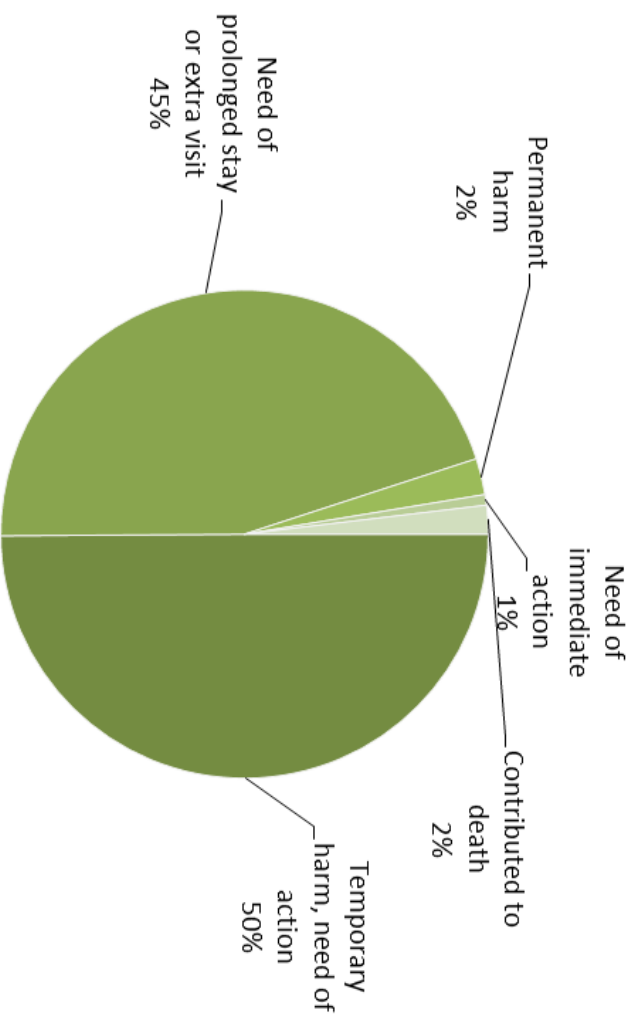
Hospital: 11 596 AEs

Primary care: 374 AEs

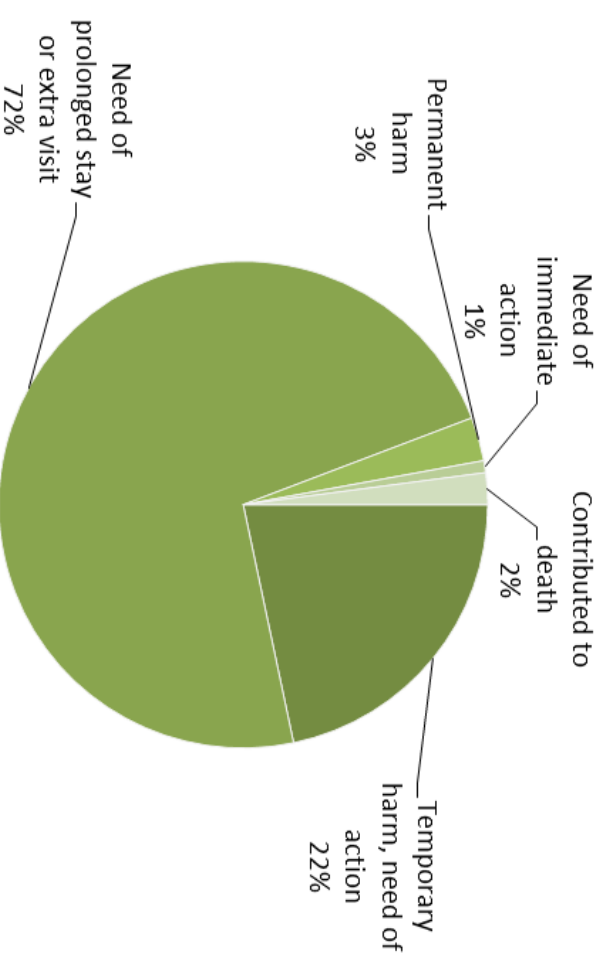


Severity level of identified harm

Hospital



Primary care



Home healthcare, background

- Home healthcare is the fastest growing arena in the healthcare system
- Limited knowledge about patient safety in this setting
- No Trigger Tool developed and validated for home healthcare

Development of a trigger tool to identify adverse events and no-harm incidents that affect patients admitted to home healthcare

Marlene Lindblad,¹ Kristina Schildmeijer,² Lena Nilsson,³ Mirjam Ekstedt,⁴ Maria Unbeck⁵

ABSTRACT

Background Adverse events (AEs) and no-harm incidents are common and of great concern in healthcare. A common method for identification of AEs is retrospective record review (RRR) using predefined triggers. This method has been used frequently in inpatient care, but AEs in home healthcare have not been explored to the same extent. The aim of this study was to develop a trigger tool (TT) for the identification of both AEs and no-harm incidents affecting adult patients admitted to home healthcare in Sweden, and to describe the methodology used for this development.

Methods The TT was developed and validated in a stepwise manner, in collaboration with experts with different skills, using (1) literature review and interviews, (2) a five-round modified Delphi process, and (3) two-stage RRRs. Ten trained teams from different sites in Sweden reviewed 600 randomly selected records.

Results In all, triggers were found 4031 times in 518 (86.3%) records, with a mean of 6.7 (median 4, range 1–54) triggers per record with triggers. The positive

challenges and patient safety risks that are important to identify. Patient safety has been investigated in hospital care in many studies,^{4–7} but more rarely in home healthcare settings.^{1 8} Studies of home healthcare in Canada showed an adverse event (AE) rate up to 13% and common AEs were falls with injury, adverse drug events, wound infections and pressure ulcers.^{1 8 9}

Home care systems appear to differ both between and within countries.¹⁰ In Sweden, home healthcare can be provided by either county councils or municipalities, but the county councils always provide the physician resources. Home healthcare in Sweden is defined as health-care that is administered in a patient's



BMJ Open

Adverse events in patients in home healthcare: a retrospective record review using trigger tool methodology

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ABSTRACT

Objective Home healthcare is an increasingly common part of healthcare. The patients are often aged, frail and have multiple diseases, and multiple caregivers are involved in their treatment. This study explores the origin, incidence, types and preventability of adverse events (AEs) that occur in patients receiving home healthcare.

Design A study using retrospective record review and trigger tool methodology.

Setting and methods Ten teams with experience of home healthcare from nine regions across Sweden reviewed home healthcare records in a two-stage procedure using 38 predefined triggers in four modules. A random sample of records from 600 patients (aged 18 years or older) receiving home healthcare during 2015 were reviewed.

Primary and secondary outcome measures The cumulative incidence of AEs found in patients receiving home healthcare; secondary measures were origin, types, severity of harm and preventability of the AEs.

Results The patients were aged 20–79 years. 280 men

Strengths and limitations of this study

- The review process was standardised and included a manual with detailed trigger definitions and preventability decision support.
- The review team members had long experience of home healthcare.
- Our recruitment of review teams was based on convenience sampling and did not enable review of a stratified sample of patients receiving home healthcare in Sweden.
- The results can only be generalised to facilities with similar organisations and clinical standards.

have been well-investigated in many countries and for several medical specialties.^{1–7} Despite the challenges related to an ageing population and limited resources, the

Results

- AEs affect over a third of these patients (37.7%)
- Most AEs are preventable (71.6%)
- AEs resulting in temporary harm to the patient requiring extra healthcare resources (69.1%)
- Common types: healthcare-associated infections, falls, pressure ulcers
- The probability of falls being preventable was 43.9% whereas the majority of the other types of AEs was considered preventable to a greater extent

**WHAT CAN WE DO TO
IMPROVE PATIENT SAFETY?**



Experts chose among a set of interventions

1. System level interventions		2. Organisational (institutional) level interventions		3. Clinical-level interventions	
1.1 Safety Standards linked to accreditation and certification	2.1 Clinical governance systems and frameworks related to safety	3.1 Medication management / reconciliation			
1.2 Public reporting of patient safety indicators	2.2 Clinical incident reporting and management system	3.2 Transcribing error minimisation protocols			
1.3 Mandatory reporting of specified adverse events	2.3 Integrated patient complaints reporting system	3.3 Smart infusion pumps and drug administration systems			
1.4 Pay-for performance schemes for patient safety	2.4 Monitoring and feedback of patient safety indicators	3.4 Aseptic technique protocols and barrier precautions			
1.5 Professional education and training	2.5 Person- and patient-engagement initiatives	3.5 Urinary catheter use and insertion protocols			
1.6 Electronic Health Record (EHR) systems	2.6 Clinical communication protocols and training	3.6 Central line catheter insertion protocols			
1.7 No-fault medical negligence legislation	2.7 Digital technology solutions for safety	3.7 Ventilator-associated pneumonia minimisation protocols			
1.8 System-level public engagement and health literacy initiatives	2.8 Human resources interventions	3.8 Procedural / surgical checklists			
1.9 National interventions based on specific safety themes	2.9 Building a positive safety culture	3.9 Operating room integration and display checklists			
1.10 A national agency responsible for patient safety	2.10 Infection detection, reporting and surveillance systems	3.10 Peri-operative medication protocols			
	2.11 Hand hygiene initiatives	3.11 VTE prevention protocols			
	2.12 Antimicrobial stewardship	3.12 Clinical care standards			
	2.13 Blood and blood management protocols	3.13 Pressure injury (ulcer) prevention protocols			
	2.14 Medical equipment sterilisation protocols	3.14 Falls prevention protocols			
		3.15 Acute delirium & cognitive impairment management programs			
		3.16 Response to clinical deterioration			
		3.17 Patient hydration and nutrition standards			
		3.18 Patient identification and procedure matching protocols			

Source: OECD patient safety snapshot survey 2017



Highest and lowest impact and cost ratings for individual interventions, all respondents (n=23)

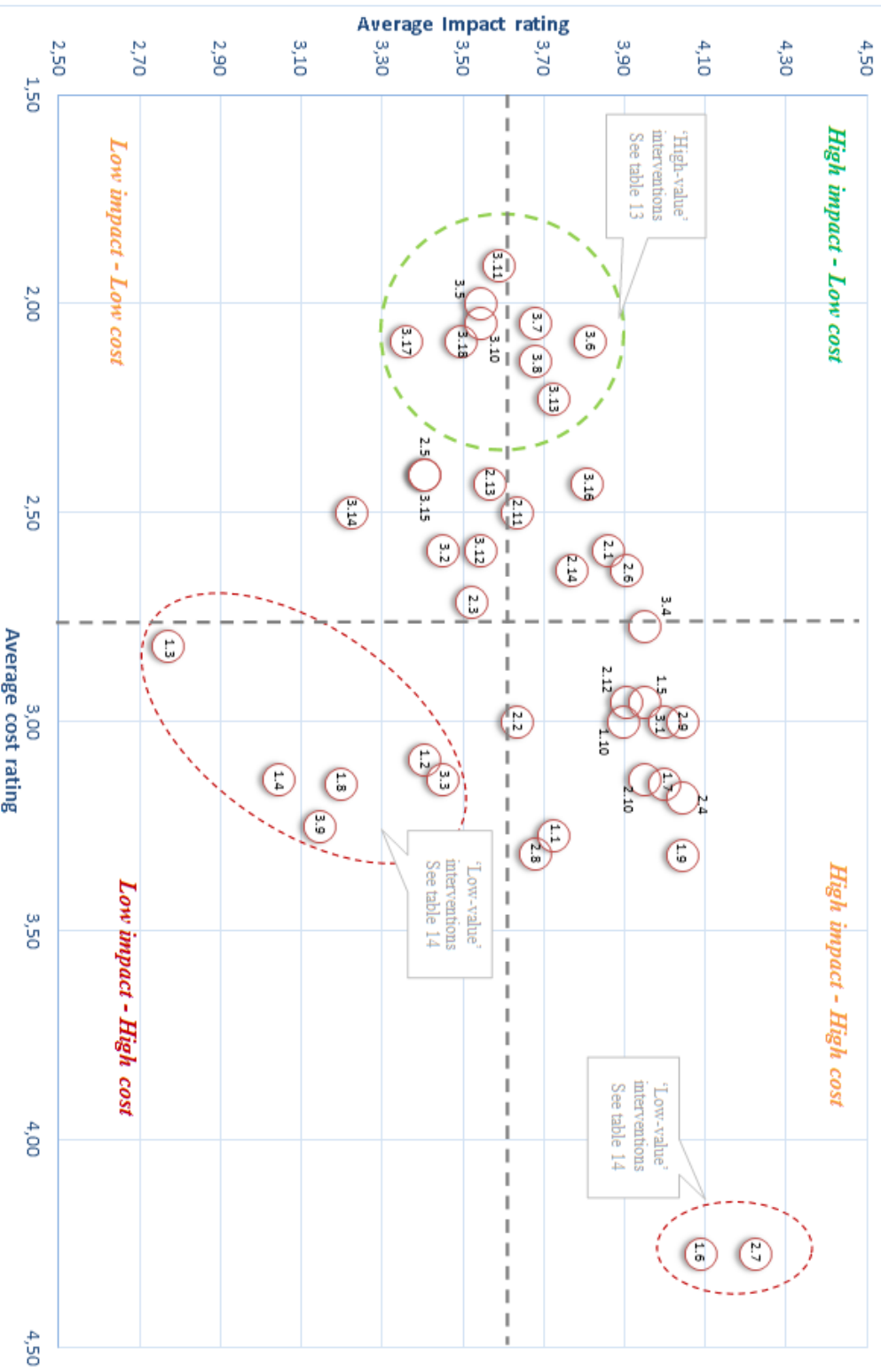
Table 12. Highest and lowest impact and cost ratings for individual interventions, all respondents (n=23)

Highest impact ratings		Rating	Highest cost ratings		Rating
2.7 Digital technology solutions for safety		4.23	2.7 Digital technology solutions for safety		4.27
1.6 Electronic Health Record (EHR) systems		4.09	1.6 Electronic Health Record (EHR) systems		
1.9 National interventions based on specific safety themes			1.9 National interventions based on specific safety themes		3.32
2.4 Monitoring and feedback of patient safety indicators		4.05	2.8 Human resources interventions		
2.9 Building a positive safety culture			1.1 Safety Standards linked to accreditation / certification		3.27
1.7 No-fault medical negligence legislation			3.9 Operating room integration and display checklists		3.25
3.1 Medication management / reconciliation		4.00	2.4 Monitoring and feedback of patient safety indicators		3.18
Lowest impact ratings			Lowest cost ratings		
1.3 Mandatory reporting of specified adverse events		2.77	3.11 VTE prevention protocols		1.91
1.4 Pay-for performance schemes for patient safety		3.05	3.5 Urinary catheter use and insertion protocols		2.00
3.9 Operating room integration and display checklists		3.15	3.7 Ventilator-associated pneumonia minimisation protocols		
1.8 System-level public engagement and health literacy initiatives		3.20	3.10 Peri-operative medication protocols		2.05
3.14 Falls prevention protocols		3.23	3.18 Patient identification and procedure matching protocols		
3.17 Patient hydration and nutrition standards		3.36	3.17 Patient hydration and nutrition standards		2.09
			3.6 Central line catheter insertion protocols		

Source: OECD patient safety snapshot survey, 2017



Average impact and cost ratings for all 42 interventions (n=23)





Most and least favourable impact/cost

Table 13. Interventions with most favourable impact and cost ratings by average impact/cost ratio (n=23)

Intervention	Avg. impact/cost ratio
3.11 VTE prevention protocols	1.88
3.6 Central line catheter insertion protocols	1.83
3.7 Ventilator-associated pneumonia minimisation protocols	1.80
3.5 Urinary catheter use and insertion protocols	1.77
3.10 Peri-operative medication protocols	1.73
3.8 Procedural / surgical checklists	1.72
3.18 Patient identification and procedure matching protocols	1.67
3.13 Pressure injury (ulcer) prevention protocols	1.67
3.17 Patient hydration and nutrition standards	1.61

Source: OECD patient safety snapshot survey, 2017

Table 14. Interventions with least favourable ratings by quadrant and average impact/cost ratio (n=23)

Quadrant	Intervention	Avg. impact/cost ratio
<i>Low impact High cost</i>	3.9 Operating room integration and display checklists	0.97
	1.4 Pay-for-performance schemes for patient safety	0.97
	1.3 Mandatory reporting of specified adverse events	0.98
	1.8 System-level public engagement and health literacy initiatives	1.02
<i>High impact High cost</i>	2.7 Digital technology solutions for safety	0.99
	1.6 Electronic Health Record (EHR) systems	0.96

Source: OECD patient safety snapshot survey, 2017



Most frequently selected for OECD countries
– clearly advocating for a national approach to improving patient safety

- 1.5 Professional education and training (14 times)
- 2.1 Clinical governance systems and frameworks (13 times)
- 1.1 Safety standards linked to accreditation and certification (11 times)
- 2.5 Person- and patient-engagement strategies (9 times)
- 1.6 EHR systems (9 times)
- 1.9 National interventions based on specific safety themes (9 times)
- 1.7 No-fault medical negligence legislation (8 times)
- 1.10 A national agency responsible for patient safety (8 times).



Frequency of interventions included in OECD context 'best buys' bundles (n=22)



Safety failure is a system failure



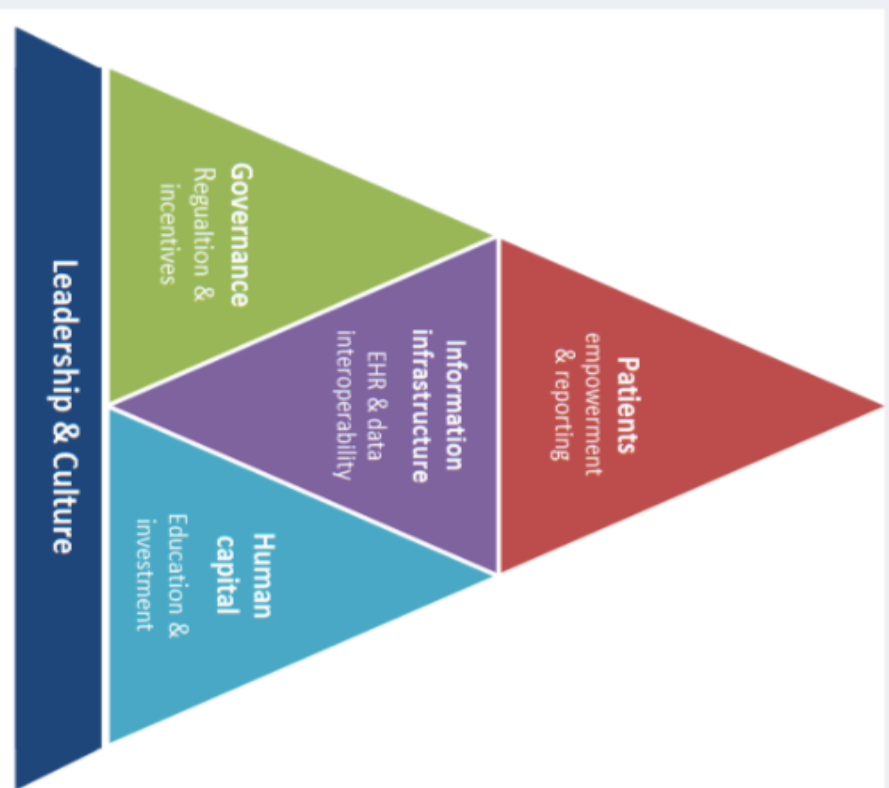
Every system is perfectly designed to achieve the results it gets

- Paul Batalden, IHI [...David Hanna, Arthur Jones]





Equip and strengthen our health systems,
providers and patients to minimise harm



Source: The authors





Wrapping it up...

- **Patients** at the center every step through the treatment pathway
- **Robust measurement methods**
- **Strong culture** promoting safe practice and abolishing 'blaming and shaming' culture
- **Safety** as a component of **leadership** at every level



For discussion

What enabling factors or barriers have you encountered when implementing patient safety programs?





Thank you!



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