What can we learn from mortality data?

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Your mortality rate is your pulse
(keep your finger on it)

MEASURING MORTALITY IN THE NHS

WHAT ARE WE MEASURING?

Measuring mortality rates – comparing the number of deaths that occur in a hospital with the number that occur is similar patients being treated anywhere else in the NHS - is a good way of checking how well our hospitals are caring for patients. This is why we have been publishing mortality rates for more than ten years. These rates alert hospital trusts when things might be going wrong and they are used across the NHS. We share our information with all NHS hospitals, the people who buy services (known as commissioners) and the Care Quality Commission, which is responsible for inspecting hospitals.

SO WHAT DO WE DO?

First, we count all the patients who died in hospital within a given time period. Second, we know that each hospital treats different patients, and by the nature of the patients some hospitals are more likely to have a higher mortality rate than others.

Using hospital mortality rates to judge hospital performance: a bad idea that just won’t go away

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Standardised mortality rates are a poor measure of the quality of hospital care and should not be a trigger for public inquiries such as the investigation at the Mid Staffordshire hospital, say Richard Lilford and Peter Pronovost.

Lilford is the most tractable outcome or care – it is easy measure, of unspeakable importance to everyone, and is common in hospital settings. Mortality rates, especially overall hospital mortality rates, have therefore become the natural focus for measurement of clinical quality. In England a high death rate “raised the attention of the [patient] commissioning [PCC] and caused it to launch its investigation into the Mid Staffordshire NHS Foundation Trust.

So what is the problem with using hospital mortality rate and what alternatives can we offer?

Hospital mortality as a measure of quality: scientific issues

This problem stems from the rate of a low signal (in-avoidable deaths) in relation to high rates (deaths from other causes). A common but naïve response is to argue that risk adjustment to produce a standardised mortality rate (SMR) solves this problem. However, the idea that a risk adjustment model removes
Deaths due to medical error: jumbo jets or just small propeller planes?

Kaveh G Shojaie, Editor

MEDICAL HARM AND HOSPITAL MORTALITY: SOME HISTORY

The concept of medical harm has existed since ancient times. There is an ancient Greek legend of the God Apollo who cured a patient of a snake bite, but the patient died. Apollo explained that the patient died from pneumonia, which was caused by fear. The patient’s family was not satisfied with this explanation, and Apollo became angry. The family then decided to have another opinion, and Apollo was convinced of their point of view. The patient was given a fatal injection of snake venom and died. Apollo then gave the family a savage rebuke. The patient’s family was then satisfied with the explanation. The legend illustrates the importance of the patient’s perspective in medical care and the need for open communication between the patient and the doctor. The legend also highlights the concept of medical harm, which has been present since ancient times.

By the 1970s, many individuals had begun to labour in the vineyard of improving healthcare quality, but up in different countries, and new funding opportunities materialised. The attention towards medical error has initially appeared as if it might work too well and there was little interest left over for quality problems that could not be cast as medical errors. However, recent years have seen substantial interest in the optimal management of chronic & acute care, equitable access to healthcare, patient-centredness, and the pressure to estimate variants of practice, among other important quality problems.

The death of death rates?

Using mortality as a quality indicator for hospitals

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The problem with preventable deaths

Helen Hogan

Interest in the utility of measuring preventable hospital deaths to drive improvement is not new. But London Nightingale's first intuition that variations in mortality between London hospitals might reflect differences in quality of care.1 In 1999, the US Institute of Medicine’s report ‘To Err is Human’ published the frequently quoted estimate of 44 000–98 000 preventable deaths annually in US hospitals, claiming this represented the eighth most common cause of death in the country.7 This claim has fuelled ongoing and vitally important debate about the role of preventable deaths in quality improvement.

One important reason for the widespread attention given to the 1999 US Institute of Medicine (IOM) report ‘To Err Is Human’ was to estimate that medical error was to blame for 44 000–98 000 deaths each year in the US hospitals. This striking claim established patient safety as a public concern, strengthened the case for new healthcare systems, and provided a line of accountability for the Inspector General (OIG). The paper did not apply any established methodology for quantitative synthesis nor did it include a discussion of the implicit limitations of the studies used or of the errors associated with the extrapolation process. To bolster their case, the authors reviewed peer-reviewed articles (table 1). The paper did not apply any established methodology for quantitative synthesis nor did it include a discussion of the implicit limitations of the studies used or of the errors associated with the extrapolation process.
Why study mortality at all?

• Done well, it has potential for learning
• Done badly, it has potential for confusion, blame etc...
• There’s a legitimate public expectation that we will do so
• And a professional obligation to learn and improve
What do we know about those who die in hospital?
15m admissions

English NHS acute hospitals
15m admissions

5.25m emergencies (35%)

40% day cases
10% other elective
15% mothers and babies
15m admissions

5.25m emergencies (35%)

40% day cases
10% other elective
15% mothers and babies

300,000 deaths (2%)
15m admissions
5.25m emergencies (35%)
40% day cases
10% other elective
15% mothers and babies
300,000 deaths (2%)
Avoidable deaths (9-15,000)
Also...

- Most patients who die have had good care
- Most patients who have poor quality or unsafe care do not die
- So, death rate or “avoidable death” rate are unlikely to be good measures of overall hospital quality
What do we know about those who die in hospital?

There are three broad categories;

1. Unexpected deaths in low risk groups
2. Those with defined conditions with a recognized mortality (stroke, heart attack, bypass surgery, hip fracture etc)
3. The majority (75%+);
   • Frail elderly
   • multiple comorbidities
   • emergency admission
   • limited life expectancy
   • Cared for on general wards
Adults dying in acute hospitals

-median age 82 years, 80% 70 years or older*

*RCP end of life care audit, 2015
What do we know about those who die in hospital?

• The issues leading to unexpected or preventable deaths are likely to be very different in each group
• ...so each group probably requires different methodology for understanding what’s going on
Understanding mortality

- Qualitative methodology
  - Individual case record review
  - Structured case record review of all or a sample of notes (Retrospective case record review)

- Quantitative methodology
  - Data from national audits, databases etc
  - Standardized measures (HSMR, SHMI etc)
Unexpected deaths in low risk groups
Unexpected deaths in low risk groups
Unexpected deaths in low risk groups

(Could be individual or systems factors)

- Need detailed individual case record review, for;
- Recognized, but uncommon, system factors
- Gaps in the Swiss Cheese
- Individual factors
- Review in the context of similar cases, near misses, incident reports, previous cases etc
- May be helped by external expert review
Deaths in those with well defined conditions with a recognized mortality
Mortality; National Hip Fracture database, 2013
2013 national lung cancer audit

Fig 3. Graph showing variation in casemix-adjusted mortality by cancer network. Results are given as the hazard ratio for mortality based on median survival after adjustment for age, sex, stage, performance status and socioeconomic status.
Deaths in those with conditions with a recognized mortality

- High death rates usually reflect poor performance on other process and outcome measures
- Investigation usually reveals problems specific to that clinical pathway
The majority of deaths..

- are in frail, elderly, emergency patients with multiple co-morbidities
- Quality problems usually reflect those of the emergency pathway and general ward care
  - Poor sepsis management, medication issues, poor clinical monitoring, failure to respond to early warning systems etc.
- “avoidability” is rarely clear cut
Standardized mortality measures
Standardised mortality measures
(*HSMR, SHMI, RAMI etc*)

- A ratio of actual to expected mortality
- Risk adjusted model for expected mortality based on administrative databases
- Risk adjustment (and therefore expected mortality) is very sensitive to accuracy of coding
Standardised mortality measures
(*HSMR, SHMI, RAMI etc*)

**Advantages**
- A single measure
- Superficially attractive to patients, the public, policymakers, politicians etc
- May be useful to track at individual hospital level over time

**Disadvantages**
- High noise to signal ratio
- Lack face validity to most clinicians
- Can easily be manipulated by coding changes
- Are easily influenced by external factors, beyond the control of the hospital
Standardized mortality measures

- Comparison between hospitals will remain fraught with difficulty
- Could be made more meaningful by trying to reduce the effects of coding, small numbers of data points, case-mix etc
Retrospective case record review
Retrospective case record review (RCRR)

- 92% of acute hospitals in England have some sort of system
- But there is wide variation in what they do
- Many approaches seem to lack understanding of the basic principles
- Various validated qualitative methodologies exist (IHI GTT, PRISM, SJR)
The PRISM studies
(Hogan et al BMJ 14/07/15)

- 2400 randomly selected case records
- 90% emergency admissions
- Estimate life expectancy less than 1 year in 60%
- c13% of deaths had a “problem in care”
- 3-5% of deaths thought “avoidable”
- No correlation with HSMR
RCP work on RCRR

• Contracted by HQIP to develop and implement a standardized method of RCRR
• Adult deaths in acute hospitals
• England and Scotland
• Based on Structured Judgment Review
• Linked to specific QI initiatives
• Not about a measure of avoidability
Partners

- Improvement Academy, Yorks & Humber AHSN
- Datix
- Steering group members;
  - RCPE, Healthcare Improvement Scotland, RCN, AoMRC, AVMA, FMLM, AHSN network etc
Structured Judgement Review

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What is SJR

- An evidence-based methodology
- A standardised yet flexible model
- An internal review process
- A source of explicit judgements on safety and quality
- A method for individual cases as well as groups
Structured case note review data collection

Phase of care: **Admission and initial management (approximately the first 24 hours)**

Please record your explicit judgements about the quality of care the patient received and whether it was in accordance with current good practice (for example, your professional standards or your professional perspective). If there is any other information that you think is important or relevant that you wish to comment on then please do so.

Please rate the care received by the patient during this phase.

Very poor  1  2  3  4  5  Excellent

Please circle only one score.
Judgement comments

• Tendency to be implicit e.g. "No ABG"
• "Poor care as no senior review for 4 days" (Score = 2)
• "Timely review but failure to start Abx" (Score = 2)
• "Prompt Mx of sepsis & ICU review" (Score = 5)
Why use SJR?

- Highlights good and poor care
- Examines interventions and holistic care
- Allows organisations to ask 'why' questions
- Records the qualified judgements of single reviewers
- Reinforces findings through second stage reviews
What does SJR produce?

• Explicit qualified judgements with reference to notes
• Scores for phases of care and overall care
• Quantitative & qualitative data for analysis
• Nuanced themes around quality & safety
• Timely, local information
• Targets for QI initiatives
Giving a phase of care score

- 1 Very poor care
- 2 Poor care
- 3 Adequate care
- 4 Good care
- 5 Excellent care
Phases of care

Admission and Initial care – first 24 hours
Ongoing care
Care during a procedure.
Perioperative care.
End of life care
Learning to date

- Missed opportunity for end of life care
- Inappropriate interventions - related to end of life
- Early senior clinical involvement
- Communication with patient and family
- Incomplete management plans
- Cross-cutting
  - recognition of deterioration, fluid management, sepsis etc
Improvement projects

- Cardiac arrests
- Deteriorating patient
- ICU admissions
- Sepsis
- Timely intervention and early senior review
What we expect to find

• Not much that we don’t know already
• Problems in the care of frail elderly patients in the emergency pathway and general wards
• Local variations depending on casemix
• Occasional issues around individual clinical performance, behaviour etc
• Occasional deaths in low risk groups which haven’t been detected before
A structured judgement method to enhance mortality case note review: development and evaluation

Allen Hutchinson, Joanne E Coster, Katy L Cooper, Michael Pearson, Aileen McIntosh, Peter A Bath

ABSTRACT

Background: Case note review remains a prime means of retrospectively assessing quality of care. This study examines a new implicit judgement method, combining structured reviewer comments with quality of care scores, to assess care of people who die in hospital.

Methods: Using 1566 case notes from 20 English hospitals, 40 physicians each reviewed 30-40 case notes, writing structured judgement-based comments on care provided within three phases of care, and on care overall, and scoring quality of care from 1 (unsatisfactory) to 6 (very best care). Quality of care comments on 119 people who died (7.6% of the cohort) were analysed independently by two researchers to investigate how well reviewers provided structured short judgement notes on quality of care, together with appropriate care scores.

Results: Physiciang reviewers made informative, clinical judgement-based comments across all phases of care and usually provided a coherent quality of care score relating to each phase. The majority of comments (85%) were explicit judgements. About a fifth of patients were considered to have received less than satisfactory care, often experiencing a series of adverse events.

Conclusions: A combination of implicit and explicit methods has resulted in a major public debate. Concerns about hospital deaths in well-developed health systems, especially when linked to the occurrence of adverse events, have also been expressed internationally. This has resulted in a number of rigorous epidemiological studies of adverse event frequency for example in Australia, Canada and Sweden. More recently, there have been large studies of hospital deaths, together with associated events, which have examined whether some hospital deaths might have been preventable. On a day-to-day level, however, there remains a need for rigorous methods to enable clinical teams to retrospectively assess quality of care in a timely manner and, thus, to identify when deaths were inevitable or whether they might have been prevented with better care. This could assist, for example, in the discussions on care that currently take place in hospital ‘morbidity and mortality’ meetings.

Internationally, case note review remains a prime means of retrospectively assessing quality of care, despite the known methodological and practical challenges of this review method. Two principal review methods are used: explicit criterion-based methods and implicit
Timelines

• 6 pilot sites since July 2016
• Formal programme launches Harrogate, London and Edinburgh November 2016
• Next wave of training Jan 2017
Challenges

• High levels of political (P and p) interest
• Avoiding “league table” territory
• Balancing “learning & improving” with appropriate challenge
• Some Trusts will be reluctant to give up their current systems
• Duty of candour issues
Suggestions

- Have a system; know something about all deaths
- Have formal records and review of themes
- But it’s not “one size fits all”
  - Detailed individual review in low mortality areas, unexpected deaths, low risk conditions etc
  - Use existing databases if they are good
  - Probably 2 stage process for high volume areas
  - Formal links to processes for incident reporting, DoC, other governance, feeding themes into QI etc
Take home messages

• Quantitative approaches have limited value because;
  • Number of deaths is a poor indicator of safety
  • Death is uncommon (quiet signal)
  • Measures can be affected by numerous confounding factors (loud noise)
  • ..but may be helpful in specific conditions alongside other process and outcome measures
Take home messages

• Qualitative review using a structured process can unearth common themes
• This works best if judgements are explicit
• Most issues uncovered will be systems ones
• There will be some individual clinician factors

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Further information

• https://www.rcplondon.ac.uk/projects/outputs/national-mortality-case-record-review-nmcrr-programme-resources

• E mail; mortality@rcplondon.ac.uk