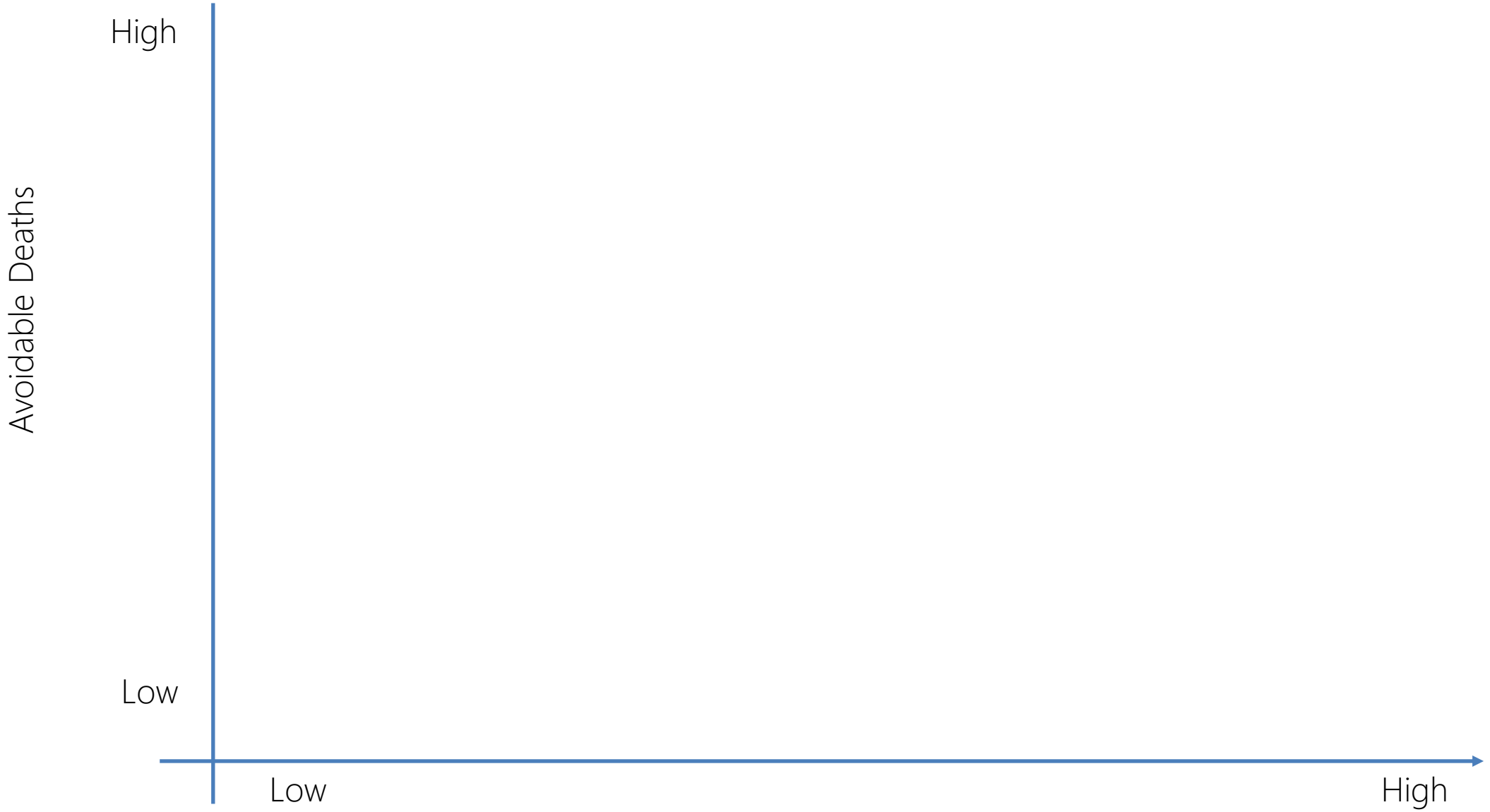
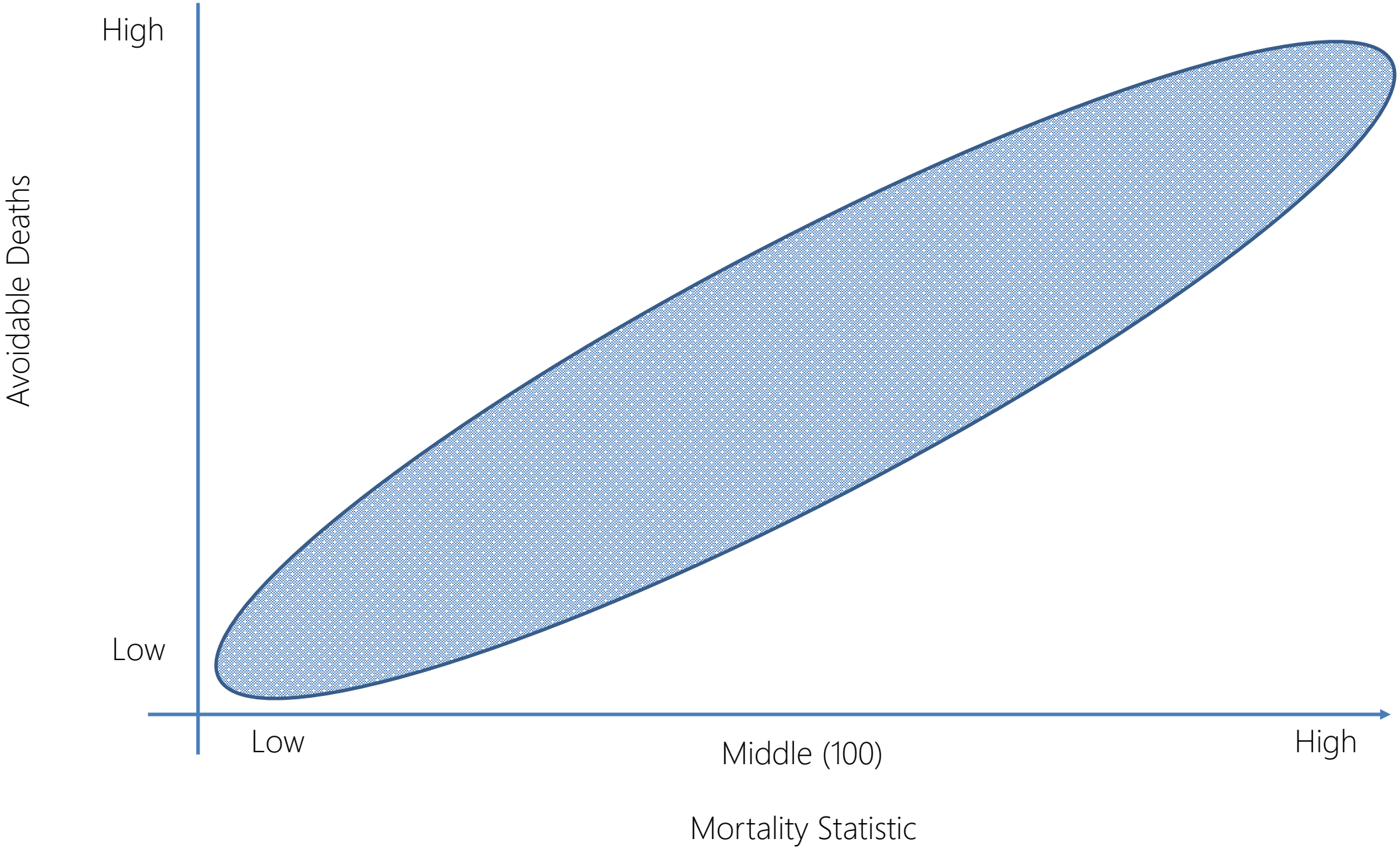
The Strategy Unit.

Hospital mortality statistics

NHS
Midlands and Lancashire
Commissioning Support Unit


What bothers us about a high mortality statistic


High
Avoidable Deaths
Low
Low
High
Mortality Statistic


High
Avoidable Deaths
Low
Low
Middle (100)
High
Mortality Statistic

Theory - the case-mix adjustment equation

- Outcome (Mortality)
  - Function of
    - Patient case-mix factors
    - Play of chance
    - Quality of care
- Mortality statistics
  - Case-mix adjusted
    - Accounts for
      - Patient case-mix factors
      - Play of chance
    - Produces a residual or “unexplained” variation
      - Which implicates quality of care

thebmj | *BMJ* 2015;351:h3239 | doi: 10.1136/bmj.h3239

Avoidability of hospital deaths and association with hospital-wide mortality ratios: retrospective case record review and regression analysis

Helen Hogan,[1] Rebecca Zipfel,[1] Jenny Neuburger,[1] Andrew Hutchings,[1] Ara Darzi,[2] Nick Black[1]

WHAT IS ALREADY KNOWN ON THIS TOPIC

Hospital-wide standardised mortality ratios (SMRs) are commonly used as an indicator of a hospital's quality but have not been validated

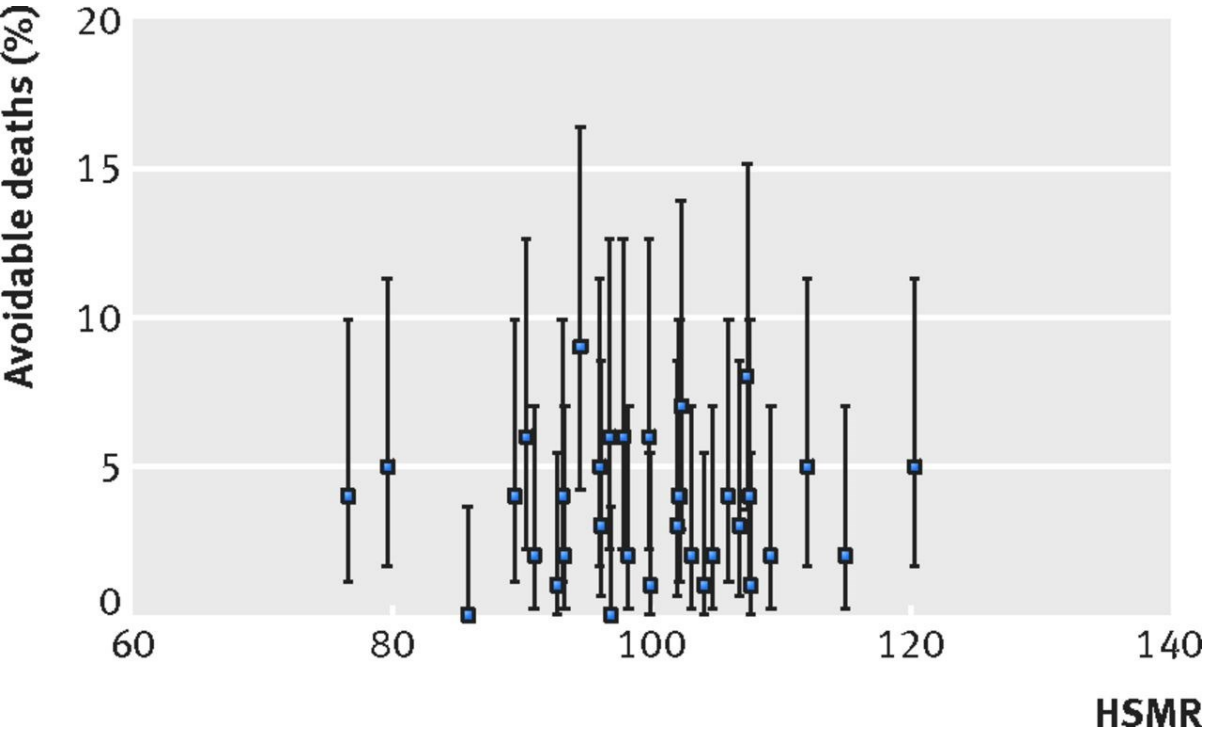
The proportion of hospital deaths judged to be avoidable based on retrospective case record review has been reported to be about 4-5%

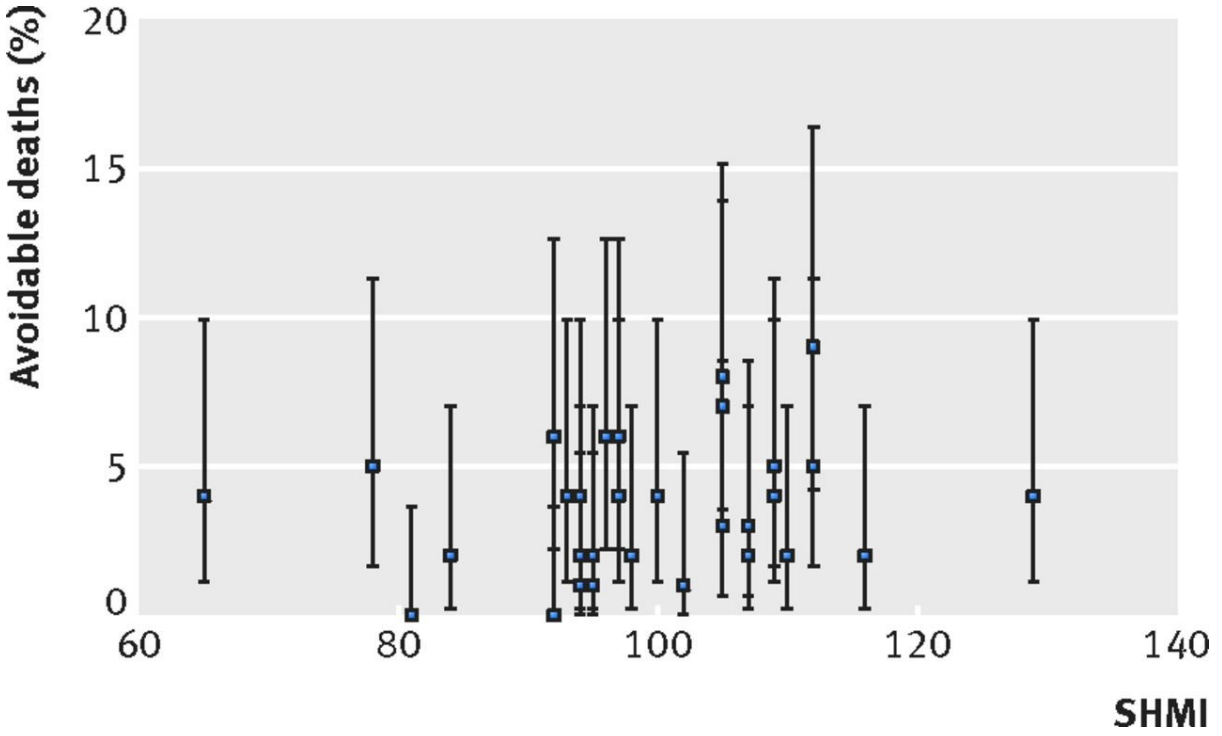
The association between hospital-wide SMRs and the proportion of avoidable deaths is uncertain; one study found no association but was too small to provide definitive evidence

WHAT THIS STUDY ADDS

The lack of a statistically significant association between hospital-wide SMRs and the proportion of avoidable deaths was confirmed

Both hospital-wide SMRs and avoidable death proportions based on the judgment of only one or two reviewers have methodological shortcomings making them unsuitable indicators to compare the quality of hospitals





Helen Hogan et al. BMJ 2015;351:bmj.h3239

Mid-Staffordshire Hospital

Repeat after me: ‘‘Mid Staffordshire’’.
BMJ 2010; 340:c188.

‘Which is the odd-one out?

Mid Staffordshire is particularly curious if you compare the death tolls associated with the scandals:

Alder Hey (0)
Bristol (30 to 35)
Shipman (probably 250)
Mid Staffordshire (400 to 1200)’

In 2009, Dr Mike Laker was asked to conduct an independent review into the detailed case notes of every contentious death at MSNHS during the period in question. To identify which cases needed reviewing, the Trust offered all patients who had been treated by the Trust, or their families, the opportunity to ask for a detailed case note review – and 'detailed' is the right word: each review would take 5-6 months to complete, so a large number of expert, independent clinicians were needed to complete the process within a reasonable timeframe.

60 such requests were received – which already puts a massive question mark against the figures of 400-1200 'excess deaths'. In the course of the review, Dr Laker eventually interviewed 120 families and edited the case notes of 40-50 cases. He was asked by Tom Kark, Counsel to the Francis Inquiry, how many 'excess deaths' had occurred among the cases he had reviewed. Mr Kark related Dr Laker's answer in his 'final submission' to the 2010 inquiry:

10. Dr Laker was clear that the ICNR process could not identify the 'excess deaths' at the trust during the period 2005-09. During his work, which included editing 40 to 50 reports, he had come across perhaps one such death.[10]

http://skwalker1964.wordpress.com/2013/02/26/the-real-mid-staffs-story-one-excess-death-if-that/

Repeat after me: ''Mid Staffordshire''.
BMJ 2010; 340:c188.
Which is the odd-one out?
'Mid Staffordshire is particularly curious if you compare the death tolls associated with the scandals: Alder Hey (0), Bristol (30 to 35), Shipman (probably 250), Mid Staffordshire (400 to 1200)"

Here is an example from one hospital Trust that reduced its HSMR from 84 to 71.
'The mortality improvement equated to about 255 patients. In other words, there are 255 people still walking around attending family weddings, grandchildren's christenings and so on who would otherwise be dead if this action had not been taken'.

Still happening….

Crying wolf: the misuse of hospital data

We have received a letter from the Care Quality Commission informing us that our institution, Papworth Hospital, has triggered an Imperial College Dr Foster mortality outlier alert, instigated by an apparent finding of 46 deaths for March, 2015, to February, 2016, compared with the 27·8 expected deaths.

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One might ask, however, what harm is done? After all, it is better to monitor than not and a hospital falsely accused of being a negative outlier can defend itself with robust data and performance monitoring. That is true but, because of this spurious alert, our hospital morale was shaken; management and trust board members were preoccupied with this issue for weeks; and our already stretched audit department expended over 50 person-hours of work reviewing data and formulating a response to satisfy the Care Quality Commission that we are most certainly not a negative outlier, but a unit with cardiac results among the best in the country. This false alert was an inconvenience, not a disaster. However,

Theory - the case-mix adjustment ~~equation~~ fallacy

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    - Play of chance
    - Quality of care
- Mortality statistics
  - Case-mix adjusted
    - Accounts for
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Spiegelhalter “Have there been 13 000 needless deaths at 14 NHS trusts?”

“Zombie statistic -
one that will not die in spite of repeated demolition.”

BMJ 2013;347:f4893

Preventable deaths due to problems in care in English acute hospitals: a retrospective case record review study

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ABSTRACT

Introduction: Monitoring hospital mortality rates is widely recommended. However, the number of preventable deaths remains uncertain with estimates in England ranging from 840 to 40 000 per year, these being derived from studies that identified adverse events but not whether events contributed to death or shortened life expectancy of those affected.

Methods: Retrospective case record reviews of 1000 adults who died in 2009 in 10 acute hospitals in England were undertaken. Trained physician reviewers estimated life expectancy on admission, to identified problems in care contributing to death and judged if deaths were preventable taking into account patients' overall condition at that time.

Results: Reviewers judged 5.2% (95% CI 3.8% to 6.6%) of deaths as having a 50% or greater chance of being preventable. The principal problems associated with preventable deaths were poor clinical monitoring (31.3%; 95% CI 23.9 to 39.7), diagnostic errors (29.7%; 95% CI 22.5% to 38.1%), and inadequate drug or fluid management (21.1%; 95% CI 14.9 to 29.0). Extrapolating from these figures suggests there would have been 11 859 (95% CI 8712 to 14 983) adult preventable deaths in hospitals in England. Most preventable deaths (60%) occurred in elderly, frail patients with multiple comorbidities judged to have had less than 1 year of life left to live.

Conclusions: The incidence of preventable hospital deaths is much lower than previous estimates. The burden of harm from preventable problems in care is still substantial. A focus on deaths may not be the

255 000 NHS patients each year suffer serious disability or death as a result of healthcare interventions.[2] This estimate was derived from retrospective case record review (RCRR) studies conducted in USA in the 1980s and 90s.[3 4] These and other national studies using comparable methods were not designed to establish the proportion of deaths that were preventable.[5–8]

Two smaller studies have specifically assessed the degree to which problems in care contributed to death. In one study of 111 deaths in US hospitals, reviewers judged 6% as either probably or definitely preventable.[9] A study from New Zealand concluded that 3.4% of 118 deaths were related to preventable errors in healthcare.[10] More recently, a large RCRR study in the Netherlands reported a figure of 4.1%,[11] which would be consistent with a more modest estimate of 9000 such deaths annually in England. These findings suggest that existing estimates in England based on extrapolations from studies with small numbers of deaths have overestimated preventable deaths.[10–12]

Given the considerable attention paid to hospital mortality as an indicator of quality of care,[13 14] we aimed to estimate more accu-

Misconception

- Excess deaths (O-E) ≠ clinically avoidable deaths
- Expected deaths ≠ clinically expected deaths
- Unexpected deaths ≠ clinically avoidable deaths

Spiegelhalter "Have there been 13 000 needless deaths at 14 NHS trusts?"
BMJ 2013;347:f4893

"Zombie statistic"

Case-mix adjustment fallacy

- Outcome is a function of
  - Patient case-mix factors
    - (errors in measurement, data definitions, immeasurable factors)
  - Play of chance
    - (errors – type I and type II)
  - Quality of care
    - (assumes a closed form of the function)
    - (No direct measurement of care)