Institution: London School of Hygiene & Tropical Medicine (LSHTM)

Unit of Assessment: 2

Title of case study: New methods to review deaths and improve quality of care in the NHS

Period when the underpinning research was undertaken: 2009-2014

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed:
Helen Hogan	Associate Professor	25/09/2006-present
Nick Black	Professor	01/11/1985-31/07/2017, 01/09/2017-present

Period when the claimed impact occurred: 2013-2020

Is this case study continued from a case study submitted in 2014? No

1. Summary of the impact (indicative maximum 100 words)

Research by LSHTM experts prompted major changes in the way preventable deaths are measured and assessed in the NHS, leading to better and safer patient care. Their seminal Preventable Incidents, Survival and Mortality (PRISM) studies identified the true scale of avoidable deaths in hospitals and highlighted problems with existing measurement. The research shaped more effective and targeted policies. This included adding 'deaths attributable to problems in care' as an indicator of progress and shifting from hospital-wide measures of death rates for performance management to a more meaningful assessment of care. The impact of the research was evident in 2016, when a national programme of mortality reviews was introduced in English NHS hospitals – the first systematic programme of its kind in the world and a pillar of the Learning from Deaths policy.

2. Underpinning research (indicative maximum 500 words)

The hospital-wide standardised mortality ratio (SMR), a measure comparing the number of actual hospital deaths with the expected number, was used for a long time as a gauge of a hospital's quality. But by the mid-2000s, there was extensive debate among policymakers, NHS staff and academics about whether this approach was valid (3.1). In addition, it was not certain if claims about the total number of preventable deaths in England's acute hospitals were accurate, and this hindered progress in tackling the underlying causes of serious patient harm.

To address these challenges, LSHTM researchers Hogan and Black carried out the first PRISM study in 2009 and 2010, funded by the National Institute for Health Research's (NIHR) Research for Patient Benefit Programme. At the time, it was England's largest retrospective case record review (RCRR) of hospital deaths (3.2). Previous studies had featured too few deaths to make an accurate estimate of the percentage of preventable deaths. The study trained hospital consultant physicians to review 1,000 randomly sampled deaths from 10 randomly selected hospitals, and found that 5.2% were probably preventable. This equated to 11,859 deaths per year in NHS hospitals in England.

This estimate was substantially lower than the previous claims of 25,000 to 40,000 per year based on extrapolations from US studies. It also revealed that the proportion of preventable deaths was similar to other European countries (e.g. The Netherlands). Explanatory analyses revealed little or no correlation with other measures of safety, including hospital-wide SMRs (3.3). The research highlighted the particular vulnerability of frail and elderly patients to healthcare-related harm due to missed or delayed diagnosis, poor clinical monitoring, and errors in prescribing or administering medication.

The Department of Health and NHS England recognised the importance of these findings and asked for the research to extend to a larger sample of hospitals. In particular, policymakers wanted to compare preventable deaths found by case record review with 'excess deaths' calculated using

the hospital-wide SMRs. This second study, PRISM2, was carried out in collaboration with Lord Ara Darzi of Imperial College, with funding from the Department of Health Policy Research Programme (3.4). PRISM2 involved a further 24 acute hospitals and confirmed the proportion of deaths deemed preventable. When combined with data from the first study, the researchers found no significant association between rates of preventable deaths identified by review and hospital-wide SMRs.

PRISM2 also investigated whether RCRR could be used to produce a national estimate for the NHS of deaths due to problems in care (3.5). However, the fact that the method needed several highly experienced clinicians to review each death, to ensure a reliable judgement of preventability, made it prohibitively expensive. The study also demonstrated that only small numbers of preventable deaths occurred in each hospital, with little variation in rates between them, which limited the value of this approach as a way of comparing the quality of care between hospitals.

3. References to the research (indicative maximum of six references)

3.1 Black N. Assessing the quality of hospitals. Hospital standardised mortality ratios should be abandoned. 2010. *BMJ*. 340:933-4. doi: 10.1136/bmj.h3466

3.2 Hogan H, Healey F, Neale G, Thomson R, Vincent C, **Black N**. Preventable deaths due to problems in care in English acute hospitals: a retrospective case record review study. 2012. *BMJ Quality & Safety*. 21:737-45. doi: 10.1136/bmjqs-2011-001159

3.3 Hogan H, Healey F, Neale G, Thomson R, Vincent C, **Black N.** Relationship between preventable hospital deaths and other measures of safety: an exploratory study. 2014. *International Journal for Quality in Healthcare*. 26(3):298-307. doi: 10.1093/intqhc/mzu049.

3.4 Hogan H, Zipfel R, Neuberger J, Hutchings A, Darzi A, **Black N.** Avoidability of hospital deaths and association with hospital-wide mortality ratios: retrospective case record review and regression analysis. 2015. *BMJ.* 351:h3239. doi: 10.1136/bmj.h3239

3.5 Hogan H, Healey F, Neale G, Thomson R, **Black N,** Vincent C. Learning from preventable deaths. What is the added value of exploring reviewer narratives? 2014. *Journal of the Royal Society of Medicine.* 107(9):365-75. Doi: 10.1177/0141076814532394

We believe this body of research meets the ‘at least 2*’ definition given its reach, significance and rigour.

4. Details of the impact (indicative maximum 750 words)

Pioneering LSHTM research identified the true scale of avoidable deaths in hospitals in England, and provided the evidence and methodology for a new national approach to preventable deaths, leading to better and safer patient care across NHS trusts.

Shedding light on the true scale of the problem

After the PRISM studies were published, the then Health Secretary Jeremy Hunt adopted the LSHTM estimate that there were 10-12,000 preventable deaths in hospitals in England per year, about a quarter of the previously-held belief of 40,000. In a Commons debate on building a safer NHS, he said:

‘The pioneering work of Helen Hogan, Nick Black and Ara Darzi … estimated that 3.6% of hospital deaths had a 50% or more chance of being avoidable, equating to over 150 deaths every week.’ Hansard 9 March 2016 (5.1).

Hogan and Black’s estimate appeared in the National Patient Safety Strategy for England, the first of its kind, which set out how the NHS would continuously work towards improving patient safety. It was launched in July 2019 with the observation from PRISM findings showing that older people were particularly vulnerable to gaps in care leading to preventable deaths.

'The opportunity is huge. Hogan et al's research from 2015 suggests we may fail to save around 11,000 lives a year due to safety concerns, with older patients the most affected.' National Patient Safety Strategy, July 2019 (5.2).

Press coverage of the research findings in the Guardian, the BBC and other media outlets emphasised the scale of the problem, increasing public awareness and government accountability for taking action to avoid preventable deaths (5.3).

Casting doubt on the use of hospital-wide SMRs
Epidemiologists, statisticians and clinicians were already criticising the use of hospital-wide SMRs as indicators of quality of care. The PRISM study showed that these measures did not reflect the actual preventable death rates for each hospital found on review of case records. This was recognised by the Medical Director of NHS England, Bruce Keogh, and the Director of Patient Safety, NHS England and NHS Improvement, Mike Durkin. In a letter to the medical directors of all NHS trusts in England in December 2015, they said they intended to establish standardised methodology for reviewing deaths in hospitals, and wrote:
'*Prof Nick Black from the LSHTM and Prof Lord Ara Darzi ... determined that about 4% of deaths in our hospitals were potentially avoidable and that there was no obvious relationship with excess deaths over and above the average.'* (5.4)

A new national approach to measuring preventable deaths in hospitals
The LSHTM research raised concerns about the safety of hospital care and provided the basis for a new direct approach to tackle it. Initially, the plan was to use PRISM methodology to review 2,000 deaths per year from hospitals across the NHS, using PRISM estimates of preventable deaths as the national baseline. However, the research had also highlighted the limitations of RCRR as a measure to compare hospital quality, and identified that structured, skilled case note review was best used locally to identify failings in care and determine whether a death was preventable. These findings influenced the Health Secretary to modify policy to focus on a standardised approach of trust-specific quality improvement (Hansard December 2016) (5.5).

The 2017 NHS-wide National Guidance on Learning From Deaths states: '*acute trusts should use an evidence-based methodology for reviewing the quality of care provided to those patients who die… such as those based on the PRISM methodology.'* (5.6) Trust Boards were required to regularly collect and annually publish a range of specified information on potentially avoidable deaths and consider what lessons should be learned. This included estimates of preventable deaths within individual organisations, and an assessment of why this might vary from the national average, using methods adapted from Hogan and Black's work. The guidance has since been expanded to ambulance trusts, paediatric services, and those with learning disabilities. The 2019 National Patient Safety Strategy has acknowledged that examining the care patients received at the end of their lives has provided crucial safety insights and highlighted problems including failure to identify and respond to deterioration.

Nationwide impact and further tools for hospital improvements
To support the work on deaths in hospitals at a national level, NHS England commissioned the National Mortality Case Record Review Programme (NMCRR) to develop mortality reviews in each trust (led by the Royal College of Physicians with Yorkshire and Humber Improvement Academy, in conjunction with software company Datix). The 3 year programme from 2016 to 2019 introduced a proven method of retrospectively reviewing deaths in acute hospital settings (5.7), referencing Hogan and Black's work, and was a successful vehicle for development of trust-wide quality improvement frameworks (5.8). The Structured Judgement Review (SJR) form, applied to case notes of patients to review the care they received and developed in Yorkshire and Humber, was modified based on PRISM findings to create the final RCRR tool utilised within the programme.

The NMCRR was adopted as a mechanism for implementing the Learning from Deaths policy in England. It was implemented in over 120 of England's 217 NHS Trusts, and also in a number of Scottish hospitals. According to the 2019 NMCRR statement for stakeholders (5.9), the

programme trained around 600 healthcare professionals who cascaded their training to thousands of clinicians throughout NHS Scotland and England. One of the examples of success is Buckinghamshire Healthcare NHS Trust. Within 6 months of implementing the NMCRR, it screened 97% of deaths and made notable improvements in end-of-life care, including increased use of personalised care plans, improved sepsis recognition and treatment, and increased awareness of timely Do Not Attempt CPR decisions. Other successes include the collaborative regional implementation of the SJR by the West of England Academic Health Science Network. The Mid Yorkshire Hospitals NHS Trust incorporated the SJR alongside demographic analyses which identified areas for improvement in care for patients with cerebrovascular disease, and Barking, Having and Redbridge NHS Trust has been developing a faculty of junior doctor mortality reviewers (5.7).

5. Sources to corroborate the impact (indicative maximum of 10 references)

5.1 NHS: Learning from Mistakes. 9 March 2016, Volume 607, Column 295. House of Commons Hansard. The Secretary of State for Health (Mr Jeremy Hunt). Accessed at: https://hansard.parliament.uk/Commons/2016-03-09/debates/16030943000003/NHSLearningFromMistakes?highlight=hogan#contribution-1388326F-10C9-4F23-86BF-CA9F257EFCBB

- Uses estimates of avoidable hospital deaths

5.2 The NHS Patient Safety Strategy: safer culture, safer systems, safer patients (2019).

5.3 750 avoidable deaths a month in NHS hospitals, study finds. The Guardian. July 2015. Accessed at: https://www.theguardian.com/society/2015/jul/14/avoidable-deaths-nhs-hospitals-study

NHS in England told to reveal avoidable deaths data. BBC. December 2017. Accessed at: https://www.bbc.co.uk/news/health-42347942

5.4 Letter from Dr Mike Durkin, Director of Patient Safety, NHS England and NHS Improvement, and Professor Sir Bruce Keogh, National Medical Director, NHS England to Medical Directors of Acute, Mental Health and Community Trusts. Re: self-assessment on avoidable mortality. 17 December 2015.

5.5 CQC NHS Deaths Review. House of Commons Hansard. 13 December 2016, Volume 618, Column 621. The Secretary of State for Health (Mr Jeremy Hunt). Accessed at: https://hansard.parliament.uk/commons/2016-12-13/debates/A9008047-29BB-48FC-93C7-1CBD7A849F77/CQCNHSDeathsReview

- Includes statement to say from the following year, all boards and trusts are required to collect estimates on preventable deaths, based on the methodology adapted by Royal College of Physicians from work done by Hogan and Black

5.6 National Guidance on Learning from Deaths: a framework for NHS trusts and NHS foundation trusts on identifying, reporting, investigating and learning from deaths in care. National Quality Board. March 2017.

- Research referenced pg 5-6

5.7 National Mortality Case Record Review Programme. National Mortality Case Record Review (NMCRR): Annual Report 2018.

- References Hogan paper and cites research defining need for case note review and development of programme

5.8 Dr Andrew Gibson, Royal College of Physicians. Using the structured judgement review method: a clinical governance guide to mortality case record reviews. National Mortality Case Record Review Programme. 2016.

- Pg 1 cites that the SJR is developed by modifying methodology in the PRISM2 study and uses avoidable deaths figure from research

5.9 RCP's National Mortality Case Record Review Programme leaves a lasting legacy in patient safety. NMCRR statement for stakeholders, 5 June 2019. Accessed at: https://www.rcplondon.ac.uk/news/rcps-national-mortality-case-record-review-programme-leaves-lasting-legacy-patient-safety

- Includes numbers of NMCRR implementation and examples of success