

<b>Institution:</b> King's College London		
<b>Unit of Assessment:</b> 21 Sociology		
<b>Title of case study:</b> Detecting Failure: changing the way the Care Quality Commission uses big data to identify failing hospitals		
<b>Period when the underpinning research was undertaken:</b> 2013 – 2020		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Henry Rothstein	Reader in Risk and Regulation	From Aug 2006
David Demeritt	Professor of Geography	From Sept 1999
<b>Period when the claimed impact occurred:</b> 2016 – 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> N		

### 1. Summary of the impact

This impact study explains how King's College London research improved understanding within the national and international healthcare community of how to use big data for monitoring healthcare quality and protecting patient safety. This led the Care Quality Commission (CQC) – the independent regulator of health and social care in England – to redesign its statistical surveillance system for detecting poor quality hospital care to address problems highlighted by King's researchers with the data and models that it had been using for near real-time monitoring of care quality across the NHS. Those impacts on professional understanding and regulatory practice stemmed from targeted awareness-raising about findings from the first peer-reviewed evaluation of the operational use of big data for healthcare quality regulation, which was conducted as part of a wider programme of sociological research on the construction and use of risk-based governance tools.

### 2. Underpinning research

Over the last decade, government agencies have increasingly embraced the language and tools of risk analysis to rationalise decision-making and make themselves more effective and accountable. Risk analysis promises a universal calculus for optimising governance interventions by focusing efforts on reducing risks deemed unacceptable, based on formal assessments of their probability and impact, rather than putting disproportionate efforts into eliminating them altogether. That utilitarian ethos, however, not only rests on socio-technical capacities to develop tools to assess risk, but can compromise promises of security, solidarity, and equal protection often expected of the state.

Supported by competitively awarded research grants by the EU, ESRC and the Wellcome Trust, a programme of comparative qualitative and quantitative sociological research at King's College London has been exploring the construction and use of risk-based governance tools across countries and policy domains [1]. One policy domain that the research programme has paid particular attention to has been healthcare, where the Care Quality Commission (CQC) – the independent regulator of all health and social care in England – has become a global leader in developing statistical surveillance systems that use big data to detect substandard healthcare quality. Faced with regulating almost 25,000 healthcare providers that treat over one million patients every 36 hours, the CQC has sought to exploit the wealth of NHS performance indicators and other administrative big data to identify and target its inspections on the riskiest providers. However, novel research at King's on the construction and use of big data for statistical surveillance discovered that the CQC's new *Intelligent Monitoring* system was unable to detect which hospitals were delivering poor quality healthcare [2].

The CQC had introduced *Intelligent Monitoring* in 2013 following high-profile breakdowns in care quality, most notably at Mid-Staffordshire NHS Foundation Trust, where hundreds of patients died needlessly and many more suffered violations of their dignity between 2005 and 2009. The 2013 Francis Report from the public inquiry into that scandal concluded that it was “essential” that the

## Impact case study (REF3)

CQC conduct “*risk-related monitoring*” of providers “*in as near real-time as possible*”. On the advice of the consultancy firm McKinsey & Company, the CQC selected 150 indicators of care quality as ‘smoke detectors’ for poor or declining care quality in hospitals. Those indicators were aggregated to generate a numerical ‘risk score’ to help the CQC “*make better decisions about when, where and what to inspect*”, as it stated in its 2013-2016 strategy *Raising Standards, Putting People First*.

The statistical skill of the CQC’s new system was assessed by King’s researchers using quantitative social science approaches in the first peer-reviewed evaluation of the operational use of big data for healthcare quality regulation in the UK. Their study, which was published in the *BMJ Quality & Safety* [2], measured the accuracy of *Intelligent Monitoring* by comparing its predictive risk scores against the CQC’s subsequent ‘Ofsted-style’ quality ratings awarded to NHS hospital trusts following detailed on-site inspections by the Commission’s large expert teams. The King’s statistical analysis found that the *Intelligent Monitoring* risk scores could not: i) predict the CQC’s inspection-based quality ratings; ii) distinguish well-performing from poorly-performing trusts; or iii) even identify just the very worst performing trusts. Indeed, the research found that *Intelligent Monitoring* predictions of hospital quality were wrong more often than they were right. As a result, the CQC was unable to send its inspection teams where they were needed most.

The research team then undertook qualitative research to understand why *Intelligent Monitoring* failed to serve as a reliable ‘smoke alarm’ of poor hospital healthcare [3]. Drawing on historical policy analysis and in-depth interviews with senior policy-makers and stakeholders, the team’s research identified a series of fundamental conceptual, technical and institutional challenges that had beset attempts by the CQC to predict which hospitals were most likely to provide poor quality healthcare. Those challenges included: i) historically unstable institutional understandings of ‘healthcare quality’ and its various dimensions, such as access, cost and safety; ii) reaching professional, political and wider societal agreement on the trade-offs implicit in the concept of ‘acceptable risk’; iii) constructing valid indicators with sufficient granularity to assess, in near real-time, the quality of heterogeneous healthcare services provided across multiple locations within each NHS trust.

Subsequent research by the team, funded by a Wellcome Trust Seed Award in the Humanities and Social Sciences, demonstrated the international relevance of these findings for the statistical surveillance systems that many healthcare regulators worldwide are developing. That research identified fundamental differences in the way healthcare quality indicators are constructed, the dimensions of quality they measure and the purposes for which they are used in different healthcare and governance systems; factors which are likely to impede international efforts to benchmark quality and identify best practice [4,5]. Such problems are not confined to healthcare but help explain the difficulties experienced in other policy domains, such as education and animal welfare, in organising quality assurance and regulation according to risk [6].

### 3. References to the research

These publications are entirely original work and have been published in internationally recognised, peer reviewed journals [1,2,3,4,6] and as a commissioned report [5]:

- [1] Rothstein, H, Borraz, O & Huber, M 2013, 'Risk and the limits of governance: Exploring varied patterns of risk-based governance across Europe', *Regulation & Governance*, vol. 7, no. 2, pp. 215-235. DOI: 10.1111/j.1748-5991.2012.01153.x
- [2] Griffiths, A, Beaussier, AL, Demeritt, D & Rothstein, H 2017, 'Intelligent Monitoring? Assessing the ability of the Care Quality Commission's statistical surveillance tool to predict quality and prioritise NHS hospital inspections', *BMJ Quality and Safety*, vol. 26, no. 2, pp. 120-130. DOI:10.1136/bmjqs-2015-004687
- [3] Beaussier, A-L, Demeritt, D, Griffiths, A & Rothstein, H 2016, 'Accounting for failure: risk-based regulation and the problems of ensuring healthcare quality in the NHS', *Health, Risk and Society*, vol. 18, no. 3-4, pp. 205-224 DOI: 10.1080/13698575.2016.1192585
- [4] Beaussier, A-L, Demeritt, D, Griffiths, A & Rothstein, H 2020, 'Steering by their own lights: Why regulators across Europe use different indicators to measure healthcare quality', *Health Policy*, vol. 124, no. 5, pp. 501-510. DOI:10.1016/j.healthpol.2020.02.012

## Impact case study (REF3)

- [5] Balog-Way, D, Demeritt, D, Rothstein, H 2019. Can Big Data Improve Healthcare Quality Regulation? An International Comparative Analysis. *Working Party on Health Care Quality and Outcomes (HCQO) Annex A*. Directorate for Employment, Labour and Social Affairs Health Committee (DELSA/HEA/HCC(2019)6/ANN), 21 May 2019, Paris: Organisation for Economic Co-operation and Development (OECD)
- [6] Escobar, MP & Demeritt, D 2017, 'Paperwork and the decoupling of audit and animal welfare: The challenges of materiality for better regulation', *Environment and Planning C: Politics and Space*, vol. 35, no. 1, pp. 169-190. DOI: 10.1177/0263774X16646771

#### 4. Details of the impact

King's research [2,3] improved understanding within the CQC and the wider healthcare community of how to design and use statistical surveillance systems to detect poor quality hospital care. This led to the CQC replacing its *Intelligent Monitoring* system with a new statistical surveillance system called *Insight* [A] to address the problems originally identified by King's research and help direct its inspection teams more appropriately. The CQC acknowledged the research team's evidence-based contribution to this change in a written submission to the Health and Social Care Committee of the UK Parliament in which it states that, in developing *Insight*, it had "*conducted extensive evaluation internally, looking in detail at the relationship between quality ratings and individual indicators and combinations of indicators to identify those with the strongest relationship, as well as the overall risk score used in the paper submitted by Professor Demeritt and Dr Rothstein. The new Insight model builds on what we have learned from this evaluation*" [B].

These changes in the understanding, design and use of statistical surveillance systems for healthcare regulation were brought about by the research team's targeted engagement with three key audiences: the CQC itself, the wider healthcare policy community, and Parliament.

First, prior to publication in *BMJ Quality & Safety* [2], the research team shared its findings about the inaccuracy of *Intelligent Monitoring* with a senior CQC Director at a private meeting in June 2015. The CQC had not previously been aware that its statistical surveillance system could neither predict the quality ratings awarded to hospital trusts through in-depth inspections, nor differentiate between trusts providing good and poor quality healthcare. To explain that failure, the team shared early findings from its qualitative research [3] to highlight how efforts to use big data to monitor quality in near real-time were impeded by reliance on aggregate, NHS trust-level administrative data and difficulties in exploiting other data, like social media, with greater timeliness and hospital- and department-specific resolution.

Second, the research team raised awareness of the problems of exploiting big data for healthcare regulation amongst the wider healthcare community. To do this the team published its findings in *BMJ Quality & Safety* [2], which specially commissioned an editorial from a leading expert to accompany our publication [C]. The findings were also reported in a dedicated article in the *Health Service Journal* – the weekly news magazine for the UK healthcare sector [D]. The OECD Working Party on Health Care Quality Outcomes later invited the King's research team to present their research to its 37 member-state representatives, whose different healthcare systems face distinctive challenges in emulating the statistical surveillance methods developed by the CQC for regulating NHS hospital trusts through big data [5].

Third, the research team submitted evidence [E] in December 2016 to the House of Commons Health Select Committee's CQC Accountability Review, challenging the testimony of the then CQC chief executive and chair that *Intelligent Monitoring* enabled the CQC to make 'proportionate, targeted and risk based' interventions. The King's submission then prompted the Committee to follow-up and ask the CQC to explain how it was addressing the problems identified by the research team [B].

In its 2017 response to the Select Committee, the CQC explicitly acknowledged the impact of "*the paper submitted by Professor Demeritt and Dr Rothstein*" [B] in changing its understanding, design and use of big-data driven statistical surveillance to identify failing hospitals. The CQC had already announced in May 2016 that it would be replacing *Intelligent Monitoring* with a new approach called *Insight* [A]; almost one year after the research team first alerted the CQC to the failures of *Intelligent Monitoring* in a private meeting. The CQC's response to the Select Committee provided more detail about how the new *Insight* system would address the problems highlighted by the

**Impact case study (REF3)**

team's research [2,3], by drawing on more varied sources of intelligence to compensate for the limited granularity and timeliness of the NHS trust-level indicators relied on by its predecessor. Just as the team had recommended, the CQC's new system *"will look at different organisational levels of data – for example, at trust level, and service location, core service and key question level... and provide our inspectors with more timely information about a provider's performance"* [B].

**5. Sources to corroborate the impact**

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- [A] Care Quality Commission (2016) 'Shaping the future: CQC's strategy for 2016 to 2021'.
- [B] Care Quality Commission (2017) Written evidence from the Care Quality Committee [sic] (CQC0034) Health and Social Care Committee of the UK Parliament, Care Quality Commission accountability inquiry. (Sub-section titled: 'Additional information – written evidence from Professor Demeritt and Dr Rothstein, King's College').
- [C] Bardsley, M (2016), 'Learning how to make routinely available data useful in guiding regulatory oversight of hospital care' *BMJ Quality & Safety* 26(2), 90-92.
- [D] Health Service Journal (2017), 'CQC risk monitoring 'wrong more than right', study warns'
- [E] Demeritt, D & Rothstein, H (2016), Written Evidence from Professor Demeritt and Dr Rothstein (CQC0033), Health and Social Care Committee of the UK Parliament, Care Quality Commission accountability inquiry.