

# Evaluation of a national surveillance system for mortality alerts: a mixed-methods study

Paul Aylin,<sup>1\*</sup> Alex Bottle,<sup>1</sup> Susan Burnett,<sup>2</sup>  
Elizabeth Cecil,<sup>1</sup> Kathryn L Charles,<sup>2</sup> Paul Dawson,<sup>2</sup>  
Danielle D'Lima,<sup>2</sup> Aneez Esmail,<sup>3</sup> Charles Vincent,<sup>4</sup>  
Samantha Wilkinson<sup>1</sup> and Jonathan Benn<sup>2</sup>

<sup>1</sup>Dr Foster Unit at Imperial, Department of Primary Care and Public Health, Imperial College London, London, UK

<sup>2</sup>Faculty of Medicine, Department of Surgery & Cancer, Imperial College London, London, UK

<sup>3</sup>Division of Population Health, Health Services Research & Primary Care, University of Manchester, Manchester, UK

<sup>4</sup>Medical Science Division, University of Oxford, Oxford, UK

\*Corresponding author [p.aylin@imperial.ac.uk](mailto:p.aylin@imperial.ac.uk)

**Declared competing interests of authors:** Paul Aylin and Alex Bottle report that the Dr Foster Unit at Imperial College London is partially funded through a research grant by Dr Foster, a commercial health-care information company (wholly owned by Telstra Health) that provides health-care analytics solutions to NHS organisations. Paul Aylin and Alex Bottle are part-funded by a grant to the unit from Telstra Health (formerly Dr Foster Intelligence) outside the submitted work. Charles Vincent reports funding from the Health Foundation for research and from Haelo (a commercial innovation and improvement science organisation) for consultancy work.

**Disclaimer:** This report contains transcripts of interviews conducted in the course of the research and contains language that may offend some readers.

Published February 2018

DOI: 10.3310/hsdr06070

## Plain English summary

### Evaluation of a national surveillance system for mortality alerts

Health Services and Delivery Research 2018; Vol. 6: No. 7

DOI: 10.3310/hsdr06070

NIHR Journals Library [www.journalslibrary.nihr.ac.uk](http://www.journalslibrary.nihr.ac.uk)

## Plain English summary

We set out to improve our understanding of an alerting system designed to generate signals about possibly high rates of patients dying in English hospitals. Hospitals are contacted when the number of deaths is higher than expected for specific illnesses or hospital treatments. It was this system that highlighted problems at Mid Staffordshire hospital, leading to a public inquiry that found serious failures in care and had profound implications for the NHS. We wanted to investigate the impact of the alerting system in English hospitals.

Our methods used statistical analysis of numerical data, information from the health regulator, national surveys and interviews with staff to understand the responses to the alerts, the relationship of the alerts to other measures of quality and the motivations for change. We investigated all alerts but focused our investigation on heart attacks and sepsis, conditions that commonly alert.

We found that the number of annual mortality alerts had decreased since 2007. In the time period we studied, 70% of investigations by the Care Quality Commission found associations between mortality alerts and problems with quality of patient care (89% in alerts for sepsis). Mortality alerts were also related with other measures of health-care quality such as patient satisfaction, overcrowding and staffing levels. Hospital mortality fell significantly after a mortality alert, suggesting that the alerting trusts are monitoring patient mortality and often take action before they are notified. Our site visits confirmed that a number of local organisational factors influenced trusts' responses to alerts and that case note review was commonly undertaken. Alerts were considered useful in providing a focus to address high levels of mortality.

# Health Services and Delivery Research

ISSN 2050-4349 (Print)

ISSN 2050-4357 (Online)

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) ([www.publicationethics.org/](http://www.publicationethics.org/)).

Editorial contact: [journals.library@nihr.ac.uk](mailto:journals.library@nihr.ac.uk)

The full HS&DR archive is freely available to view online at [www.journalslibrary.nihr.ac.uk/hsdr](http://www.journalslibrary.nihr.ac.uk/hsdr). Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: [www.journalslibrary.nihr.ac.uk](http://www.journalslibrary.nihr.ac.uk)

## Criteria for inclusion in the *Health Services and Delivery Research* journal

Reports are published in *Health Services and Delivery Research* (HS&DR) if (1) they have resulted from work for the HS&DR programme or programmes which preceded the HS&DR programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

## HS&DR programme

The Health Services and Delivery Research (HS&DR) programme, part of the National Institute for Health Research (NIHR), was established to fund a broad range of research. It combines the strengths and contributions of two previous NIHR research programmes: the Health Services Research (HSR) programme and the Service Delivery and Organisation (SDO) programme, which were merged in January 2012.

The HS&DR programme aims to produce rigorous and relevant evidence on the quality, access and organisation of health services including costs and outcomes, as well as research on implementation. The programme will enhance the strategic focus on research that matters to the NHS and is keen to support ambitious evaluative research to improve health services.

For more information about the HS&DR programme please visit the website: <http://www.nets.nihr.ac.uk/programmes/hsdr>

## This report

The research reported in this issue of the journal was funded by the HS&DR programme or one of its preceding programmes as project number 12/178/22. The contractual start date was in May 2014. The final report began editorial review in September 2016 and was accepted for publication in March 2017. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health and Social Care. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health and Social Care.

**© Queen's Printer and Controller of HMSO 2018. This work was produced by Aylin *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.**

Published by the NIHR Journals Library ([www.journalslibrary.nihr.ac.uk](http://www.journalslibrary.nihr.ac.uk)), produced by Prepress Projects Ltd, Perth, Scotland ([www.prepress-projects.co.uk](http://www.prepress-projects.co.uk)).

## **Health Services and Delivery Research Editor-in-Chief**

**Professor Jo Rycroft-Malone** Professor of Health Services and Implementation Research, Bangor University, UK

## **NIHR Journals Library Editor-in-Chief**

**Professor Tom Walley** Director, NIHR Evaluation, Trials and Studies and Director of the EME Programme, UK

## **NIHR Journals Library Editors**

**Professor Ken Stein** Chair of HTA and EME Editorial Board and Professor of Public Health, University of Exeter Medical School, UK

**Professor Andrée Le May** Chair of NIHR Journals Library Editorial Group (HS&DR, PGfAR, PHR journals)

**Dr Martin Ashton-Key** Consultant in Public Health Medicine/Consultant Advisor, NETSCC, UK

**Professor Matthias Beck** Professor of Management, Cork University Business School, Department of Management and Marketing, University College Cork, Ireland

**Dr Tessa Crilly** Director, Crystal Blue Consulting Ltd, UK

**Dr Eugenia Cronin** Senior Scientific Advisor, Wessex Institute, UK

**Dr Peter Davidson** Director of the NIHR Dissemination Centre, University of Southampton, UK

**Ms Tara Lamont** Scientific Advisor, NETSCC, UK

**Dr Catriona McDaid** Senior Research Fellow, York Trials Unit, Department of Health Sciences, University of York, UK

**Professor William McGuire** Professor of Child Health, Hull York Medical School, University of York, UK

**Professor Geoffrey Meads** Professor of Wellbeing Research, University of Winchester, UK

**Professor John Norrie** Chair in Medical Statistics, University of Edinburgh, UK

**Professor John Powell** Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), UK

**Professor James Raftery** Professor of Health Technology Assessment, Wessex Institute, Faculty of Medicine, University of Southampton, UK

**Dr Rob Riemsma** Reviews Manager, Kleijnen Systematic Reviews Ltd, UK

**Professor Helen Roberts** Professor of Child Health Research, UCL Institute of Child Health, UK

**Professor Jonathan Ross** Professor of Sexual Health and HIV, University Hospital Birmingham, UK

**Professor Helen Snooks** Professor of Health Services Research, Institute of Life Science, College of Medicine, Swansea University, UK

**Professor Jim Thornton** Professor of Obstetrics and Gynaecology, Faculty of Medicine and Health Sciences, University of Nottingham, UK

**Professor Martin Underwood** Director, Warwick Clinical Trials Unit, Warwick Medical School, University of Warwick, UK

Please visit the website for a list of members of the NIHR Journals Library Board:  
[www.journalslibrary.nihr.ac.uk/about/editors](http://www.journalslibrary.nihr.ac.uk/about/editors)

**Editorial contact:** [journals.library@nihr.ac.uk](mailto:journals.library@nihr.ac.uk)