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Original Research

The correlation between National Health Service trusts' clinical trial activity and both mortality rates and care quality commission ratings: a retrospective cross-sectional study

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ABSTRACT

Objectives: Evidence supporting the notion that clinical research activity in itself is of benefit to organisations as a whole is inconclusive. In the recent past, a positive association between research activity and reduced mortality has been shown. This study aimed to ascertain if clinical research activity is associated with established organisational outcome measures.

Study design: Retrospective cross-sectional study.

Methods: For 129 English National Health Service hospital Trusts, National Institute for Health Research study activity data, Summary Hospital-level Mortality Indicator (SHMI) scores and Care Quality Commission (CQC) ratings were collected. Research activity was controlled for Trust size by dividing it by clinical staffing levels. Multiple linear regression and Spearman correlation analyses were performed.

Results: Although there is a significant association between the number of studies and participants with both SHMI score and CQC rating, one particular variable is correlated more significantly than others: the number of participants recruited into interventional studies. It shows a significant correlation with better CQC ratings (standardised coefficient beta 0.26, *P*-value 0.003) and lower SHMI scores (standardised coefficient beta −0.50, *P*-value 0.001).

Conclusions: The mortality-related results corroborate with other published data showing a correlation between increased research and reduced deaths. Furthermore, there is also a statistically significant association between clinical trials activity and improved CQC ratings. However, these tie-ins are predominantly driven by the number of participants in interventional research rather than observational research activity.

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Introduction

Since its inception in 2006, the UK National Institute for Health Research (NIHR) has transformed the clinical research landscape in the United Kingdom. Its mission, 'To provide a health research system in which the National Health Service (NHS) supports outstanding individuals working in world-class facilities, conducting leading-edge research focused on the needs of patients and the public', is backed by expenditure of more than 1 billion British pounds.[1] Money is primarily spent on provision of research grants for projects and also delivery staff based in NHS Trusts to deliver both NIHR-funded and other peer-reviewed and funded studies. The sizeable amount of money spent on clinical research in the United Kingdom by the NIHR has not increased the number of studies appraising the effect it may have on the overall functioning of the NHS Trusts hosting and conducting its research.[2] Reduced mortality rates have been linked with increased NIHR-adopted clinical research activity and academic output within NHS Trusts.[3,4] Furthermore, one study demonstrated that colorectal patients participating in NIHR-adopted oncology trials survived longer and were at lower risk of death after surgery.[5] Other cohort studies investigating the potential associations between research activity and other patient and organisational outcome measures, including hospital length of stay and adherence to clinical guidelines, have produced more mixed results.[6] A more recent review of literature, led to Boaz et al., concluded that there is a positive association between engagement in research by healthcare organisations and improvements in healthcare performance; a caveat being that all 33 source articles in that review involved different specialities rather than whole organisations.[7]

In this study, we test the hypothesis that NIHR-adopted clinical research activity in NHS Trusts is associated with improved mortality rates, represented by the Summary Hospital-level Mortality Indicator (SHMI), and better organisational performance, represented by Care Quality Commission (CQC) ratings.

Methods

Ethics statement and data sources

This concerns a retrospective cross-sectional study of English NHS hospital Trusts. All data used in this study are readily available to the public via NHS and NIHR electronic depositories. The NIHR research activity data have been published in the past by the Guardian newspaper's website. No personal identifiable information has been used as part of this study. Therefore, from an ethics point of view, this is classed as a service evaluation and no formal ethics clearance is required.

NIHR research activity was obtained from NIHR Open Data Platform website; this information is also published annually on the NIHR website.[8] Totals for the years 2012–13, 2013–14, 2014–15, 2015–16 and 2016–17 were calculated for the total number of studies and recruited participants and separately for observational and large-scale studies ('observational') and interventional and commercial studies ('interventional'). Of the variables included, research activity can be subject to significant year-on-year variability due to e.g. a single high-recruiting study being conducted in a single year. Clinical staffing numbers, determined in August 2016, per NHS Trust were obtained from NHS Digital.[9]

The CQC is an independent regulator of health and social care in England. Organisations intending to provide such services have to register with the CQC, and this therefore includes NHS hospitals. Organisations are monitored and inspected based on five key questions that are asked by the CQC, namely whether care is safe, effective, caring and responsive. Failure to do so may result in registration being revoked.[10] CQC ratings were obtained from the CQC website; the latest rating for each Trust was used for analysis.[10] The SHMI is the ratio between the actual number of patients who die after hospitalisation at a given NHS Trust hospital and the number that would be expected to die on the basis of average England figures, while taking into account the characteristics of the patients treated there. It covers all deaths reported of patients who were admitted to non-specialist acute trusts in England and die either while in hospital or within 30 days of discharge. The statistical models are derived using a three-year dataset from trusts throughout England. Data from the final year of this period are used to calculate the SHMI and accompanying contextual indicators for each individual trust.[11] The average SHMI value for each NHS Trust for the calendar years 2014, 2015 and 2016 was calculated after obtaining data for each calendar year from the NHS Digital web pages.[11] To minimise basing analysis on incidental higher mortality rates for NHS Trusts, we applied an average of three years, an approach taken by others in the past.[12]

Data processing and analyses

Data were collected in Excel and transferred to SPSS, version 20, for analysis. NIHR research activity can fluctuate year-on-year, and hence, a total of five years was combined to counteract any variance. Trusts can be split by size because they are officially classed as small-, medium-, large-sized and acute teaching status, which introduces stratification. To maintain one sample, the total research activity (studies and also participants recruited) was divided by the clinical staff number for each Trust to correct for Trust size. This produces a 'studies quotient' and a 'participants quotient' (i.e. number of active NIHR studies or number of recruited participants divided by the Trust clinical staff number). Spearman correlation analyses and multiple linear regression analyses were conducted. Because CQC rating is an ordinal-dependent variable, ordinal regression analysis was performed first for this dependent variable to validate if the results of the ordinal and multiple linear regression analysis gave comparable outcomes; for the purpose of comparability with the SHMI-dependent variable, results from multiple linear regression analysis are presented. Overall number of studies and participants were not included in multiple linear regression analysis models to minimise risk of multicollinearity. A P-value of <0.05 was considered statistically significant. NHS Trusts often operate more than one hospital; however, the terms 'Trust' and 'hospital' are used interchangeably and are meant to indicate the same throughout the text.

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