Social Science & Medicine 195 (2017) 83–89

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Changing experience of adverse medical events in the National Health Service: Comparison of two population surveys in 2001 and 2013

Alastair M. Gray[a,*], Paul Fenn[b], Neil Rickman[c], Dev Vencappa[d]

[a] Health Economics Research Centre, Nuffield Department of Population Health, University of Oxford, Old Road Campus, Headington, Oxford OX3 7LF, United Kingdom
[b] Nottingham University Business School, Nottingham NG8 1BB, United Kingdom
[c] Department of Economics, University of Surrey, Guildford GU2 7XH, United Kingdom
[d] Economics, Finance & Entrepreneurship Department, Aston Business School, Aston University, Aston Triangle, Birmingham B4 7ET, United Kingdom

ARTICLE INFO

Keywords:
Great Britain
Adverse events
Medical errors
Disease frequency surveys
Quality indicators
Compensation and redress

ABSTRACT

Care quality is important to patients and providers, but is hard to measure. This study aimed to examine changes in the frequency and severity of one quality measure - adverse events associated with medical care - in Great Britain over a 12-year period when available resources initially expanded and were subsequently constrained. Data on perceived adverse events, collected from two representative population surveys in 2001 and 2013, were analysed and compared. The samples consisted of 8202 adults aged 15 and over in 2001 and 19,746 adults aged 15 and over in 2013. The main outcome measures were self-reported illness, injury or impairment caused in the opinion of the respondent by medical treatment or care. Respondents were also asked about the perceived severity of harm in terms of health and work, and any actions taken in response. The proportion of all respondents reporting that over the last three years they had suffered some illness, injury or impairment that in their opinion was caused by their medical treatment or care was 2.5% (497/19746) in 2013, compared with 4.8% (391/8202) in 2001, a reduction of 33% after adjusting for age, gender, income and social class differences between the two surveys. Perceived impact on health and work of these events was similar in both surveys, as was the proportion of injured respondents who pursued a legal claim for financial compensation, at 11% (53/497) in 2013 and 10.5% (41/391) in 2001. We also report multivariate analyses of perceived harm rates and severity, and propensity to seek, and accept, compensation. Our results suggest that the NHS became significantly safer over this period when measured by patient perceived harm from medical care. Our survey method could provide a valuable contribution to the monitoring of trends in health-care related adverse events and the impact of patient safety initiatives.

1. Introduction

Care quality (and how to encourage it) is of obvious importance to patients, but also to health care providers, who must strike a balance between treating each patient successfully and the need to allocate scarce resources across all patients. In many health care systems, this resource allocation problem includes the costs of compensating patients who are found to have suffered harm as a result of their treatment, and consequently interest has focused on the frequency and costs of adverse events associated with medical care (Huehns and Fletcher, 2010). Hospital-acquired infections became an election issue during the 2005 UK general election, and continuing concerns about safety and quality of care led to several inspection and regulation bodies being brought together in a new Care Quality Commission in 2009. Resources available for improving care quality do, of course, need to be considered in the wider context of total health care budgets, which have varied markedly depending on the state of the economy and the political context. In the UK this translated into a period of significant growth in real expenditures from 1997 to 2010, with a freeze in real growth subsequently. This makes it increasingly important to explore ways of monitoring changes in aggregate health care quality in such a way that the efficacy of new resources, as well as regulatory initiatives, can be assessed.

Despite its clear importance for health systems, care quality has proved a difficult variable to measure: not only is it impractical for researchers to observe/record every clinical intervention, but it often takes time for a subsequent health problem to arise and there may be differences of opinion about the role of any given intervention in producing an adverse event. As a result, the actual frequency of adverse events in health care is difficult to establish. A wide range of research

* Corresponding author.
E-mail addresses: alastair.gray@dph.ox.ac.uk (A.M. Gray), paul.fenn@nottingham.ac.uk (P. Fenn), n.rickman@surrey.ac.uk (N. Rickman), d.vencappa@aston.ac.uk (D. Vencappa).

https://doi.org/10.1016/j.socscimed.2017.11.016
Received 6 April 2017; Received in revised form 6 November 2017; Accepted 9 November 2017
Available online 11 November 2017

methods has been employed, including analysis of registries and administrative data (Bridgewater et al., 2007), ethnographic analyses of routine clinical meetings (Andrews et al., 1997) and of clinical incidents (Nicolini et al., 2011), studies of complaint and litigation rates (Fenn et al., 2000), and modelling using burden of disease methodology(Jha et al., 2013). Using record review after hospital discharge (Forster et al., 2003), the Harvard Medical Practice Study reported in 1991 that 3.7% of American patients suffered some sort of adverse event during hospitalization (Brennan et al., 1991), with error potentially responsible for 58% of these adverse events, and some form of negligent care for 28%. A similar study conducted in Utah and Colorado in 2000 found that adverse events occurred in 2.9% of non-psychiatric discharges, again with 58% attributable to some form of error(Studdert et al., 2000). We return to these widely-quoted studies in the Discussion. No such studies have been published in the UK, but one pilot study suggested that almost 11% of inpatients may be harmed during their hospital stay(Vincent et al., 2001). A systematic review in 2008 of all studies using a standard definition to evaluate the incidence of adverse events in adult hospital patients and that included a minimum of 1000 patient records identified eight such retrospective record reviews (3 USA, 2 UK, 1 each in Australia, Canada and New Zealand) and reported a median adverse event rate of 9.2%(de Vries et al., 2008).

The evidence on whether adverse events are becoming more or less common over time is even sparser. A detailed retrospective casenote study of 2341 admissions in 10 hospitals in North Carolina between 2002 and 2007 found no significant changes in the overall rate of harms per 1000 patient-days or the rate of preventable harms(Landrigan et al., 2010). Vincent and colleagues reviewed trends in a range of safety indicators in the UK and found significant improvements in important measures such as in-hospital mortality and mortality after surgery, but rising trends in other measures such as health care acquired infections and drug administration errors(Vincent et al., 2008).

Our paper seeks to contribute to the literature on measuring adverse event rates, and to the evidence base on trends in the incidence of adverse events over time, with a view to commenting on the impact of changes to health care resourcing and care quality initiatives. Unlike the above studies, we use a large population survey to obtain self-reported rates of adverse events arising from medical care in the British National Health Service. An initial survey was conducted in 2001 to inform the Chief Medical Officer's deliberations on reforming the approach to clinical negligence in the NHS (Department of Health, 2003), and a subsequent one was conducted in 2013, both to give more recent estimates of the rate and severity of adverse health care events and responses to such events, but also to permit direct comparisons with the earlier study and assess changes over time.

We argue that this survey approach complements existing literature, and trends in patient centred care, by providing a patient perspective on adverse events, and does so in a way that is in line with the increasing role of patient reported outcome measures in assessing the impact of treatment and the quality of care (Food and Drug Administration, 2006; Greenhalgh and Meadows, 1999; Valderas et al., 2008). Our approach has the important benefit of being consistent with widely accepted survey techniques in which large and representative samples can be obtained on a consistent and replicable basis, combining specific questions on adverse events with standardised information from respondents on demographic and other characteristics. The next section describes the survey methods and data. We then report the results before discussing the methods and findings.

2. Methods and data

A questionnaire was designed to provide data on the incidence of adverse events, where they happened, their severity in terms of health and employment, the response considered most appropriate, whether a legal claim was pursued, and the amount of compensation considered acceptable. In addition, demographic information was obtained on respondents' age, sex, region, ethnicity, level of qualification, social class, household composition and characteristics, and household income. The questionnaire was designed to be comparable with the one used in 2001, with some additional options and bands for specific questions, and a new question reflecting changes in the possible types of legal help available. Information was not obtained directly from respondents on the total number of NHS or private treatment episodes they had experienced, and so when calculating adverse event rates per contact we rely on the sampling representativeness and size of the sample in assuming that overall rates of use corresponded to age- and sex-group norms. The 2013 survey was administered using the IPSOS-MORI polling agency in face to face interviews by trained interviewers to a randomly selected sample of adults in ten waves at weekly intervals during January–April 2013. Approximately 2000 individuals across Great Britain were interviewed in each wave, giving a total sample size of 19,746. The 2001 survey was also administered using MORI, in face to face interviews by trained interviewers to a randomly selected sample of adults in four waves at weekly intervals during October and November 2001, with a final total sample size of 8202. In both surveys, responses were collated by IPSOS-MORI, and supplied to the researchers as anonymised data files. The 2013 study was considered and given a favourable opinion by the Medical Sciences Inter-Divisional Research Ethics Committee at the University of Oxford.

2.1. Statistical analysis

The distributions of respondents by age, gender, region, income, education and social class are reported separately for each survey. Within each survey, we calculated the adverse event rate, defined as the proportion reporting that over the last three years they had suffered some illness, injury or impairment that in their opinion was caused by their medical treatment or care, using weights provided by the survey organization to reflect differential sample selection and non-response rates. To adjust for changes in income levels over time (over a period with significant wage inflation as well as real income changes), we mapped individuals from the income category in which they placed themselves in the surveys (8 categories in 2001, 15 in 2013) into the most closely corresponding quintile of the national income distribution in each of these years.

We made comparisons between the two surveys in the perceived severity of adverse events, the response considered appropriate, actions taken and their outcomes, using *t* tests and chi-squared tests. To control for population changes over the 12-year time interval, and to assess the independent statistical effect of different factors, we used probit regressions to model the probability of reporting an adverse event. Survey year, age, gender, income, social class and region were used as covariates, with age, gender, income, social class and region entered directly and also interacted with survey year to capture the possibility that reporting behavior by different groups had changed over time.

3. Results

Descriptive statistics for the sample by age, sex, social class, household income quintile, educational qualification and region, are given in Supplementary Table 1. In both surveys the sample was designed to be representative of the general population of Great Britain. When weighted for representativeness and response rates, there were no significant differences between the surveys in age distribution, gender, or region, but income distribution and levels of educational qualification in the general population and so in the sample had changed significantly, as expected, with more respondents in the highest categories: for example, the proportion with degree or higher degree qualifications rose from 5.1% in 2001 to 28.6% in 2013. The survey organization was satisfied that the sample met all tests of representativeness.

In the 2013 survey, 2.5% of those interviewed (497/19746)