

Dr Foster's case notes

How often are adverse events reported in English hospital statistics?

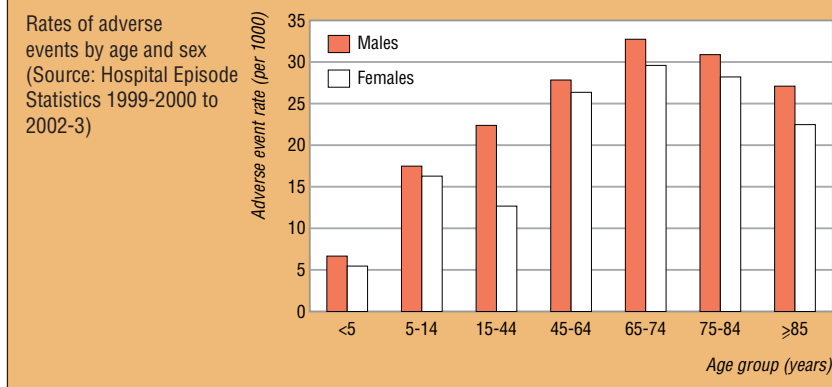
About 850 000 medical errors occur in NHS hospitals every year, resulting in 40 000 deaths.¹ In the United Kingdom, the National Patient Safety Agency (NPSA) was created to learn from patient safety incidents occurring in the NHS.² In February 2004, it launched a new patient reporting system, drawing together reports of patient safety errors and systems failures provided by health professionals across England and Wales.³ An adverse event can be defined as "an unintended injury caused by medical management rather than a disease process, resulting in death, life threatening illness, disability at the time of discharge, admission to hospital, or prolongation of hospital stay."⁴ A medical or surgical misadventure is an adverse event that might have been avoided if the patient had received ordinary standards of care. We look at four years of hospital episode statistics to examine patterns in the recording of adverse events within this routinely collected source of data and ask whether it could be of use in monitoring this problem.

The bottom line

- 2.2% of all hospital episodes contain a mention of an adverse event
- Nearly 4000 misadventures are recorded each year

We examined four years of hospital episode statistics (1999-2000 to 2002-3) comprising 50 215 687 episodes of care. We identified 41 three-digit ICD-10 diagnosis codes with some indication of an adverse event (see table on bmj.com). Eight of these codes (Y60-Y69) related directly to medical or surgical misadventures. We examined the proportion of all episodes with a mention of one or more of the 41 codes by age, sex, method of admission, year, and trust.

We found, on average, 2.2% of all episodes (276 514 per year) included a code for an adverse event. Events were more likely to occur in men, in elderly people, and in emergency admissions. The differences may be due in part to the severity of underlying disease in the



different groups and the length of time people are in hospital. Other studies have found overall rates of 0.97%⁵ and 36%,⁶ but a study using routine hospital data in Australia found a rate of 4.75%.⁷ Studies using routine data tend to have lower estimates than those based on casenote reviews or purpose designed systems. Some trusts reported zero levels of adverse events, which seems unlikely. Therefore, adverse events may be under-recorded within hospital episode statistics. We will have missed some conditions arising as a complication of treatment not specifically coded as an adverse event (for example, pulmonary embolus following surgery or stroke following carotid endarterectomy). Hospital acquired infections are also poorly represented within ICD-10 (there is no specific code for methicillin resistant *Staphylococcus aureus*, MRSA). We have not included obstetric complications, and there may be additional codes that might be used. We have demonstrated that adverse events are recorded within hospital episode statistics; for these statistics to accurately monitor adverse events, hospitals should be encouraged to improve the recording of events on their systems.

The basic figures

- On average 2.2% of all episodes (about 27 500 per year) included a code for an adverse event
- Misadventures were mentioned in 0.03% of episodes (3980 per year)

Episodes of care (number (rate per 1000)) with mention of adverse events and misadventure. Source: Hospital Episode Statistics 1999-2000 to 2002-3

Category	Adverse events*	Misadventure†
Admission method:		
Emergency	560 110 (28.2)	4322 (0.2)
Elective	492 220 (21.6)	10 854 (0.5)
Other	51 384 (6.8)	760 (0.1)
Type of case:		
In-patient	981 890 (27.7)	12 215 (0.3)
Day case	119 678 (8.3)	3746 (0.3)
Sex:		
Male	548 914 (25.0)	6356 (0.3)
Female	556 367 (19.7)	9558 (0.3)

*ICD-10 codes (defined in table on bmj.com) including misadventure.
†ICD-10 codes Y60-Y69.

- Incidence did not change over time
- The rate of adverse event recorded in each trust ranged from 0% to 15% and the rate of misadventures recorded ranged from 0% to 1.02%
- Adverse events were mentioned more frequently in emergency than elective admissions (2.82 v 2.16%, $P < 0.001$), but misadventures were similar
- Inpatient episodes were more likely to mention an adverse event than day cases (2.77% v 0.83%, $P < 0.001$)
- Adverse events were recorded more commonly in men (2.5%) versus women (2.50% v 1.97%, $P < 0.001$)
- Adverse events were more common in elderly people

This month's Dr Foster's case note was compiled by Paul Aylin, Shivani Tamma, Alex Bottle, and Brian Jarman at the Dr Foster Unit at Imperial College. Dr Foster is an independent research and publishing organisation created to examine measures of clinical performance.

References, full methodological details, and a table of ICD-10 codes are on bmj.com and drfoster.com

