Dr Foster's case notes

Trends in admissions and deaths in English NHS hospitals

The in-hospital death rate for particular diagnoses can shift substantially over time for a range of reasons. We examined some trends in inpatient admissions and deaths using hospital episode statistics and ICD-10 disease groups in England between 1996-7 and 2001-2.

The bottom line

- The in-hospital death rate for ischaemic heart disease fell from 8.7% to 6.8% over the six year period to March 2002. Within this category, in-hospital death rates for myocardial infarction fell from 18.9% to 16.5%
- Cerebrovascular disease accounted for over 10% of all deaths occurring in hospital in 2001-2, but mortality has fallen by 10%
- Admissions for septicaemia (excluding meningococcal) have increased by 53% between 1996-7 and 2001-2 and carry a significant risk of mortality (40% in 2001-2)

The decrease in admissions for ischaemic heart disease and myocardial infarction reflect the national patterns in death registrations and are consistent with a decrease in incidence. In an ageing population, an increase in admissions might be expected. For patients who are admitted, the odds of death are significantly decreased each year. Assuming that the severity of disease in those who are admitted has not changed since 1996, this would be consistent with an improvement in treatment.

Changes in admission thresholds and discharge patterns may lead to changes in the numbers of patients being treated in hospital. Admissions for HIV showed a 53% reduction between 1996-7 and 2001-2, despite an increase in incidence, reflecting the impact of effective antiviral therapy and the shift to treatment in the community. Alzheimer's disease also showed a large reduction in admissions (43%), although this was accompanied by an increase in mortality (6% annual increase in the odds of death), suggesting

Top 15 ICD-10 mortality groups by numbers of deaths, England, 2001-2

ICD-10 mortality group*	No of deaths (% of all in-hospital deaths)	In-hospital mortality rate (%) (95% CI)
Cerebrovascular diseases	22 907 (10.1)	30.2 (29.9 to 30.5)
Pneumonia	22 322 (9.9)	29.7 (29.4 to 30.0)
Other heart diseases	18 842 (8.3)	11.2 (11.0 to 11.3)
Ischaemic heart diseases (including myocardial infarction)	14 108 (6.2)	6.8 (6.7 to 6.9)
Myocardial infarction	10 620 (4.7)	16.5 (16.2 to 16.8)
Injuries and poisonings	12 186 (5.4)	2.1 (2.1 to 2.1)
Malignant neoplasms (other than trachea etc, colon etc, and breast)	10 365 (4.6)	12.2 (12.0 to 12.4)
Malignant neoplasm of trachea, bronchus, and lung	8 536 (3.8)	24.4 (23.9 to 24.8)
Chronic lower respiratory diseases	7 920 (3.5)	5.1 (5 to 5.2)
Remainder of respiratory diseases	6 000 (2.7)	2.8 (2.7 to 2.8)
Remainder of circulatory diseases	5 355 (2.4)	4.5 (4.4 to 4.7)
Other acute lower respiratory infections	4 350 (1.9)	4.9 (4.8 to 5.0)
Septicaemia	4 074 (1.8)	39.6 (38.7 to 40.6)
Malignant neoplasm of colon, rectum, and anus	4 072 (1.8)	9.9 (9.6 to 10.2)
Diseases of the liver	2 642 (1.2)	17.2 (16.6 to 17.8)
Malignant neoplasm of breast	2 093 (0.9)	5.1 (4.9 to 5.4)

*ICD-10 mortality tabulation list 2; excludes "Symptoms, signs and abnormal clinical findings NEC" and all other diseases not included in specific diagnosis groups.

a reduction in the number of less severe cases being admitted to hospital. Admissions for septicaemia (excluding meningococcal) increased by 53% between 1996-7 and 2001-2 and carried a significant risk of mortality (40% in 2001-2). This reflects an increase in death registrations for England and Wales (from 1117 to 1798 during the period), consistent with a real increase in incidence.

Some of these results lend support to what is already known (for example, reduction in heart disease), and some point to areas requiring further research (for example, septicaemia). For some of the diagnosis groups in the ICD-10 list, such as malignancies, the tables are difficult to interpret, as length of stay, discharge policies, readmissions, and availability of palliative care services are likely to have a much larger role. The imminent availability of English hospital data linked to death registrations will help in this kind of analysis.

Basic figures

- In 2001-2, a total of 5 282 080 complete inpatient spells (admissions) were recorded. In-hospital deaths accounted for 46% (226 071/496 100) of total deaths in England in 2001. Cerebrovascular disease, pneumonia and heart disease accounted for 35% of all these deaths, but only 10% of admissions
- Cerebrovascular diseases accounted for the largest number of in-hospital deaths in 2001/2 (22 907), followed by pneumonia (22 322). Non-ischaemic heart diseases (18 842) came in third, followed by ischaemic heart diseases (14 108) and injuries and poisonings (12 186). Septicaemia (4074) and diseases of the liver (2642) were also associated with high numbers of hospital deaths.
- Septicaemia had the highest mortality rate (40%), followed by cerebrovascular diseases (30%), pneumonia (30%) and malignant neoplasm of trachea, bronchus, and lung (24%).

Dr Foster's Case Notes are compiled by Prof Brian Jarman, Dr Paul Aylin and Dr Alex Bottle of the Dr Foster Unit at Imperial College. Dr Foster is an independent research and publishing organisation created to examine measures of clinical performance.

Full methodological details and extra tables and figures are available on bmj.com and drfoster.com