substance misuse was 23.3%. We redid the analyses including secondary diagnoses of alcohol and drug misuse, which increased the population attributable risk fraction slightly to 24.7% (data not shown).

Comment

We found that 16% of all violent crimes in Sweden during 1988-2000 were committed by people who had hospital discharge diagnoses of alcohol misuse, and more than a tenth of all violent crimes were committed by patients diagnosed as having misused drugs. Treatment services aimed at alcohol and drug misusers can potentially reduce violent offending.

The approach of population attributable risk is one way of exploring the relationship between substance misuse and violent crime. It assumes a causal relationship between the two and so estimates the maximum possible impact that any intervention might have. However, the co-occurrence of substance misuse and violent crime does not necessarily imply a simple causal relationship.

Integrating mental health and substance misuse services leads to improved outcomes.[4] This integration should be extended to the criminal justice system. The costs to the criminal justice system of drug related crime are enormous—for example, in the United Kingdom, a conservative estimate is £1bn ($1.8bn; €1.5bn) annually.[5] Interventions to reduce the risk of violence in patients who misuse alcohol and drugs could be highly cost effective.

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Regional differences in outcome from subarachnoid haemorrhage: comparative audit

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Subarachnoid haemorrhage affects 10 per 100 000 UK residents a year. More than half the cases are fatal, and serious disability is common among the survivors. Modern management has reduced death and disability by about 30% compared with 30 years ago.[1] We conducted a prospective collaborative audit. No other units were involved.

Participants, methods, and results

The Newcastle neurosurgery unit serves a population of 2.4 million[2] and has 78 adult beds. It is one of five units in the British Isles that are deemed by *Safe Neurosurgery 2000* to have enough beds for their populations.[2] The Nottingham unit serves a population of three million[2] and has 36 beds. It is one of the three most under-resourced units in the British Isles.

We audited all patients presenting with a subarachnoid haemorrhage confirmed on computed tomography or lumbar puncture between 1992 and 1998. Patients' demographic and presenting clinical data were recorded during their admission. Outcome was recorded at clinic follow up, by postal questionnaire, or telephone and was obtained for 1822 of the 1851 cases in the study. The shortest interval between presentation and follow up was 6 months, and the average 12 months; these were similar for both units.

Logistic regression of outcomes

Variable	Odds ratio of unfavourable outcome W (95% confidence limits)	P value
Unit:		
Newcastle	1.07 (0.82 to 1.41)	0.60
Nottingham	1	
WFNS grade*:		
1	1	
2	2.08 (1.51 to 2.85)	<0.0001
3	5.06 (2.96 to 8.63)	<0.0001
4	7.49 (5.16 to 10.89)	<0.0001
5	38.16 (25.05 to 58.14)	<0.0001
Patient age	1.04 (1.03 to 1.05) (per year)	<0.0001

*Grading according to the World Federation of Neurological Surgeons.[4]
Regression coefficients are given as a geometric model with constant = 0.0159 so that probability of unfavourable outcome = $0.0159 * W * 1.04^{age(years)}$.

Full time research assistants were employed in each unit to collect the data. After careful and in-depth work, important errors were found and corrected in a quarter of cases. Funding was not available after 1998.

Good recovery and moderate disability (according to the Glasgow outcome score[3]) were classed as favour-

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able outcomes; severe disability, vegetative state, or death were unfavourable.

We used the χ^2 test to compare the unfavourable outcome rates of the two units and the time periods (up to or after 1995), and we used logistic regression to include age and presenting condition (according to the World Federation of Neurological Surgeons' (WFNS) grading[4]).

The rate of an unfavourable outcome was 35% in Newcastle and 19% in Nottingham. This difference was significant ($P < 0.0001$). The results in Newcastle worsened over time. These differences disappeared when the effects of age and presenting condition were included. Newcastle operated a less selective admissions policy than Nottingham because it did not have the deficiency of beds that Nottingham had. Between 1992 and 1998 Newcastle became progressively less selective, admitting more patients with a poor WFNS grading and more older patients. The table shows the independent effects of age, WFNS grade, and neurosurgery unit.

Comment

The observed difference in outcomes between the units does not necessarily reflect the quality of care given, but rather it can be explained by case mix and the impact of the availability of resources on admission criteria. This only became evident through careful and specifically funded audit. The use of the crude results to guide clinical governance and policy making would have been highly pernicious.

It is easy to apply methods of performance analysis to medicine. The problems are not a lack of such methods but rather a lack of appropriate processes for collecting data and a poor understanding of likely confounding factors and how to measure them. Political motivation leads to pressure to produce easily accessible results. This approach is considerably worse than doing nothing and should be resisted. Collection of data on factors that may influence outcome is a prerequisite of the statistical comparison of results between units. These include, but are not restricted to, the quality of care given. Had Newcastle come under pressure from clinical governance to improve results without this being appreciated, the service it offers would have been compromised.

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Hospital mortality league tables: influence of place of death

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League tables that rank hospitals according to their death rates are now regularly published in England.[1–3] The rationale for publication is that differences in death rates may indicate differences in quality of hospital care. Yet a hospital is not only a place for treatment and cure, it is also a place for care of the dying. Currently 55% of all deaths in England occur in NHS hospitals.[4] Provision and use of different facilities for the care of the dying varies geographically.[4] We investigated how this variation might influence the scale and ranking of hospital death rates.

Method and results

Dr Foster Ltd has published in-hospital death rates for 167 acute NHS hospital trusts (hereafter termed hospitals) in England over the three year period April 1999 to March 2002.[1–5] The denominators were the number of episodes of admission to each hospital, as recorded in the hospital episode statistics system, and the numerators were the number of these episodes that ended in death. The rates were standardised by age, sex, source of admission, length of stay, and diagnosis, expressed relative to the rate for all hospitals combined, multiplied by 100, and termed hospital standardised mortality ratios (HSMRs). The report highlighted 15 hospitals with the highest and 15 with the lowest mortality ratios. The investigators showed that the probability of these being in the top or bottom 15 was not attributable to random error. We used data on these hospitals for our analysis but excluded London hospitals because of difficulty in determining their catchment areas. This left 11 hospitals with high ratios and nine with low ratios.

P+ *A table showing rates for places of death is on bmj.com*

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