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Coping with winter bed crises

New surveillance systems might help

Sudden increases in hospital admissions have been a feature of the NHS for many years, but explicit plans for their management were not introduced until 1996, after a particularly severe crisis that January.[1] Since then research has been proposed,[2] and the emergency services action team has made practical recommendations on such issues as diverting hospital admissions or speeding discharge arrangements.[3] This work has concentrated on what to do when winter pressures arise, and this year most hospitals will be better prepared. However, the NHS also needs to be able to anticipate the rise in demand so it can implement plans and notify the public. This issue has received less attention, yet early indicators exist that could be used to warn of impending problems.

Effective forecasting of peaks requires an understanding of their causes and indicators that rise at least a few days before the increase in demand. In two of the past three years peak demand in the NHS coincided with the new year holiday.[1] Although this may seem predictable at national level, it hides much local variation. Indicators must therefore reflect what is happening locally.

The causes of "winter pressures" are complex,[4] but respiratory infections are definitely a major factor. Up to a third of excess winter deaths[5] and a significant number of hospital admissions may be linked to influenza or other respiratory disorders. Thus respiratory disease surveillance could be central to improved forecasting. The current system for the surveillance of influenza and influenza-like illness in England and Wales was not designed to monitor winter demand in the health service. Data on the number of consultations for influenza and influenza-like illness from "spotter" general practices are collected and published up to 10 days in arrears (www.phls.co.uk). More specific but less timely information is also obtained from virological surveillance, laboratory isolations, and death statistics.

How could the surveillance system be redesigned to provide information before demand reaches general practitioners' surgeries? Elsewhere in Europe indicators which are not specific for influenza but can be collected rapidly have been considered for flu surveillance systems. France has made the most progress, looking at absenteeism from work and sales of over the counter drugs, as well as general practitioner and paediatrician activity.[6] Germany and Belgium have also monitored absenteeism, and the value of supermarket drug sales data has been tested in a small study in the United States.[7–9] The French experience suggests that emergency home visits by general practitioners, absenteeism, and general practitioners' activity related to flu-like illness are sensitive indicators of influenza activity. General practice measures and absenteeism were the most timely, but overall, the indicators anticipated virological surveillance by one to four weeks.[10]

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Inevitably a trade off exists between precision and speed of reporting, and with positive predictive values for individual indicators as low as 65% these measures could warn of an influenza epidemic at the cost of one in three false alarms. At a population level, however, additional demand should be a reasonable predictor of demand further down the patient pathway. Predictive models based on such indicators as general practitioners' out of hours workload, ambulance service activity, or employee absence have the potential to provide timely warnings of demand for secondary care. These sources could easily incorporate data specific to a district, and the risks of drawing inappropriate conclusions from less accurate data would be lessened by trend analysis.

For accurate prediction we should also look beyond respiratory diseases. Nurse telephone advice lines have already proved valuable in surveillance during cryptosporidium outbreaks in the US.[11] If NHS Direct becomes an important first line service its data could be useful for surveillance. Many general practice cooperatives and deputising services collect computerised records of the number of calls taken; the value of harnessing these data into routine systems has not been explored.

Winter pressures affect the entire system—social services, community trusts, and informal care networks as well as primary care and acute services. The wealth of data collected by these bodies could be valuable in alerting the NHS to an impending crisis, and the duty of partnership placed on agencies by the recent white paper points towards such multiagency solutions.[12] The white paper also emphasises the importance of data collection to inform public health initiatives. As well as new uses for some of the old systems, novel ones should be considered. If electronic information systems were linked the impact of winter on the whole system could be monitored, including shifts of patients from secondary to primary care, or between health and social services. Such linkage would also help with evaluating interventions aimed at managing the demand: if successful they are likely to be multifaceted in nature and effect.

Although the current influenza surveillance system could play a part in helping to predict winter surges in demand, a broader view should be explored, with new sources of information, new indicators, and the use of local data. Multiagency problems with multiagency responses demand a new approach to surveillance.

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Screening for familial intracranial aneurysms

No justification exists for routine screening

Familial intracranial aneurysms are those which have been identified in two or more first degree relatives. The relative risk for intracranial aneurysms in such families is about four times that of the general population.[1 2] In the general population the prevalence has been estimated from a meta-analysis to average 2.3% (95% confidence interval 1.7 to 3.1), though the meta-analysis also pointed out the wide variation in prevalence according to method of diagnosis and selection processes.[3] In view of the high mortality and morbidity associated with ruptured intracranial aneurysms, screening for unruptured intracranial aneurysms has been suggested, is practised by many, and would at first sight seem a worthwhile goal. Once an aneurysm is discovered, options include treatment or further surveillance to detect growth. The recent improved sensitivity of non-invasive magnetic resonance angiography has made screening more practicable. So should we now be seriously considering screening people for familial aneurysms?

People with familial intracranial aneurysms represent about 5-10% of all patients presenting with an aneurysmal subarachnoid haemorrhage.[4] Both genetic and environmental factors have been implicated to explain the clustering of intracranial aneurysms in families. These cases usually bleed at an earlier age and form smaller intracranial aneurysms than those of the general population of people with a subarachnoid haemorrhage, indicating enhanced susceptibility of the vascular wall, whether genetically determined or otherwise.[5]

Screening for intracranial aneurysms demands a full understanding of the pathophysiological substrate for aneurysm rupture.[6] Effective screening presumes that intracranial aneurysms develop slowly in a similar manner to aneurysms elsewhere (notably those affecting the abdominal aorta), that they can be detected before potential rupture, and that treatment will significantly reduce the incidence of subarachnoid haemorrhage. The intervention of low risk surgery on some unruptured aneurysms may then be justified. However, recent thinking questions these presumptions.

Firstly, the assumption that intracranial aneurysms progress to rupture may not be correct. An alternative theory suggests that intracranial aneurysms form relatively acutely, possibly over the space of just a few hours, and rupture in only a proportion of cases.[7] The acute presentation of a painful third cranial nerve palsy secondary to an ipsilateral posterior communicating artery aneurysm is a precise example of this. Those that do not rupture may stabilise and represent the target for any practicable screening programme. In this case periodic screening for intracranial aneurysms will intercept asymptomatic incidental intracranial aneurysms which may not be a common substrate for aneurysmal subarachnoid haemorrhage. Screening under these circumstances would be futile. Secondly, most ruptured aneurysms causing subarachnoid haemorrhage are angiographically and surgically small (<10 mm), whereas the risk of rupture of incidental aneurysms increases with size. Thirdly, the prevalence of incidental intracranial aneurysms does not match regional variations in the incidence of aneurysmal subarachnoid haemorrhage.[8] Finally, if aneurysm formation represents a genetically or environmentally determined vascular fragility, then those who have already suffered an aneurysmal subarachnoid haemorrhage must be at the greatest risk of further haemorrhage rather than their unaffected relatives. Yet follow up cerebral angiography is not conducted in affected individuals because the yield is widely held to be very low.

Two recent publications raise further concern over the validity of screening programmes for familial aneurysms. The first is derived from the large international study of unruptured intracranial aneurysms (ISUIA), which showed a very low incidence of spontaneous rupture (about 0.05% per year) for most incidental anterior aneurysms less than 10 mm.[9 10] Even those patients found to have incidental aneurysms following a subarachnoid haemorrhage have a low rate of rupture (about 0.5% per year).[9] Thus most intracranial aneurysms appear to follow a relatively benign course, and progression in size is rare. In contrast, the risk of treatment for aneurysms was

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