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Because we receive many more letters than we have room to publish we may shorten those that we do publish to allow readers as wide a selection as possible. In particular, when we receive several letters on the same topic we reserve the right to abridge individual letters. Our usual policy is to reserve our correspondence columns for letters commenting on issues discussed recently (within six weeks) in the BMJ.

Letters critical of a paper may be sent to the authors of the paper so that their reply may appear in the same issue. We may also forward letters that we decide not to publish to the authors of the paper on which they comment.

Letters should not exceed 400 words and should be typed double spaced and signed by all authors, who should include their main degree.

Privatisation: a therapeutic loss

SIR,—By government edict health authorities are being compelled to put out to tender and privatise whenever possible certain support services in the NHS. In respect of domestic and portering services in the psychiatric sector this policy will damage what the NHS is and what it stands for. Other sectors may be similarly affected. Not only is the policy misguided but it is a matter for concern that health authorities are having to abrogate their natural responsibility to staff who have given good service to the NHS and who would want to continue in that role.

There may be an economic case for privatising catering and laundry services. In terms of contribution to hospital life, however, domestic and portering services are qualitatively different: economics alone should not be the determining factor in their provision. A hospital, particularly a psychiatric hospital, is only as good as the staff who work in it. Domestic and porters are visible, accessible members of staff. On the wards patients confide in the domestic staff and are comforted and supported by them. Along with the porters, their pride in the hospital and their loyalty to it are therapeutic, and do much for the good reputation of the hospital. To a significant extent domestics and porters maintain the culture of a ward or day centre; they provide continuity when the professional staff have

responsibilities in different clinical areas and are subject to rotation or transfer. I doubt that an externally provided domestic or portering service will make the same, and necessary, contribution of loyalty, continuity, and comforting. The financial gain will be a therapeutic loss.

I have no objection to services being run efficiently and economically. It is, however, a poor state of affairs when health authorities are compelled to behave towards their staff in a way that contradicts the intended purpose of caring for the sick and the disadvantaged. External agencies are specifically not required to compete on the basis of a "fair wage" and consequently in house services are at a 20% to 30% cost disadvantage in tendering for the

contracts. Staff who have the good fortune or, as I suspect, the misfortune of being taken on by the new outside contractors will be paid at lower hourly rates and will lose their entitlement to sick pay and holiday pay. Is this the way to repay loyal staff who are already on low wages? Let us at least maintain proper standards for our staff as well as our patients. If there is to be competition let it be fair and proper.

Let us not allow the government to equate financial economy with quality of care.

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Can preliminary screening of dyspeptic patients allow more effective use of investigational techniques?

SIR,—The paper from Ms P M Davenport and others (19 January, p 217) is a welcome attempt to rationalise the growing demand for endoscopy and x ray services. Their analysis entails comparison of the computer diagnosis with the objectively verified "final" diagnosis; this poses problems.

Assigning a final diagnosis may be difficult when histological or operative confirmation

is unavailable. The "functional" or non-specific label is especially fraught since it will depend on the length and methods of follow up, which should therefore be described.

As the authors' example shows, their program displays percentage probabilities for certain common causes of dyspepsia, rather than risk groups. Almost all previous studies have taken the cause assigned the highest probability as the computer

diagnosis. Thus a printout of "Functional 56%, gastric ulcer 33%, gastric cancer 11%" would predict no organic disease.

Taking the highest probability as the diagnosis is intuitively reasonable and has some theoretical support. The computed probability is only a rough guide to the empirical risk of a given condition being present, but the higher the probability the greater the risk, and the rank order of conditions may be more reliable than the percentage probability.¹ De Dombal *et al* found that for appendicitis 50% was as good a criterion as any for declaring a "diagnosis."²

A multicentre trial suggested that the computer could identify cases of cancer presenting with acute abdominal pain. But cancers of all types were mixed in, and the criterion for declaring a computer diagnosis of cancer—a probability of $\geq 25\%$ —seemed to have been chosen in retrospect.³ Similarly, a recent study of health centre patients suggested that the computer was better than clinicians at identifying cancer,⁴ but neither the diagnostic criteria nor the type of cancer were specified.

Ms Davenport and her colleagues declare a computer diagnosis of gastric cancer at the 10% probability level; presumably this level was chosen in retrospect. Given a quantitative screening test that distinguishes imperfectly between low and high risk groups, there will always be some cut off point that gives the best discrimination. It is quite legitimate to return the test in retrospect to work from this point—for example, by reprogramming the computer to print out the risk categories described. But one cannot make inferences about accuracy until a further prospective series has been assessed using a preset cut off point, as Mann *et al* did for their scoring system.⁵ Even if confirmed, the risk groups would only reduce the negative investigation rate by about 5%. Some 30% of patients would be classed as low risk and have investigation deferred; about a quarter of these (8% of the total) would have specific disease, usually hiatus hernia.

For dyspepsia the development of diagnostic technology has outstripped its evaluation. The chief reason for caution in adopting computer technology is the distracting effect it may have on clinicians, to the detriment of simpler methods of improving performance. Worthwhile but unglamorous innovations such as structured, reproducible case history sheets, feedback to and education of doctors on common causes of dyspepsia and their discriminant features, and rationalised investigation protocols for outpatient clinics all promise much but may be neglected in the quest for a technological solution.

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- 1 Hilden J. Statistical diagnosis based on conditional independence does not require it. *Comput Biol Med* 1978;14:429-35.
- 2 de Dombal FT, Horrocks JC. Use of receiver operating characteristic (ROC) curves to evaluate computer confidence threshold and clinical performance in the diagnosis of appendicitis. *Methods Inf Med* 1978;17:157-61.
- 3 de Dombal FT, Matharu SS, Staniland JR, *et al*. Presentation of cancer to hospital as "acute abdominal pain." *Br J Surg* 1980;67:413-6.
- 4 de Dombal FT, Wenham JS, Kotwal MR, Brown JM. Early detection of gastrointestinal cancer—is computer aided analysis necessary? *Gut* 1984;25:A557.
- 5 Mann J, Holdstock G, Harman M, Machin D, Loehry CA. Scoring system to improve cost-effectiveness of open access endoscopy. *Br Med J* 1983;287:937-40.

SIR,—Ms P M Davenport and others (19 January, p 217) are too selective in their use of percentages. Appropriate measures of any screening programme include its sensitivity—that is, true positive rate—and specificity—that is, true negative rate. I have used the data in their paper to calculate these measures for their own system and also for the subgroup

they detail using the system devised by Mann *et al*.¹ The result is shown in the table.

The difference in sensitivity is 2% more for the method of Ms Davenport and colleagues, while the specificity is 5% less and the potential decrease in investigations performed 4% less. The conclusion that the authors' system is more effective is therefore questionable. Since neither system is 100% sensitive, the costs and benefits in using any predictive system must be considered. One cost is the false negative rate—that is, 100%—sensitivity—the acceptability of which, in terms of likely outcome, must be debated if investigation is to be refused using either system. The efficacy of treatment for oesophageal and gastric carcinoma is so low that the benefit of diagnosis becomes uncertain. Naturally clinical review can always override a previous scoring system decision in subsequent weeks if the patient does not improve.

Sensitivity and specificity of two predictive systems for upper gastrointestinal investigation

Scoring system and disease	Total	Investigation recommended		Effectiveness of scoring system
		Yes	No	
Davenport <i>et al</i>				
Serious	292	257	35	88% Sensitivity,
Not serious*	749	483	266	36% specificity,
Total	1041	740	301	29% potential reduction
Mann <i>et al</i>				
Serious	109	94	15	86% Sensitivity,
Not serious	288	171	117	41% specificity,
Total	397	265	132	33% potential reduction

*Not serious = Normal and hiatus hernia

Any change in likely outcome due to such delay is open to clinical debate. As to benign ulcer disease treatment is efficacious but spontaneous remission also occurs. Also haemorrhage or perforation may be the presenting feature in patients with previously unsuspected ulcer disease. This group will clearly remain undetected by any scoring system. The cost of the predictive system itself must also be taken into account, in terms of both effort and revenue required.

The benefits may include a reduction in unnecessary or dual investigations. This will benefit those patients without serious disease and also the investigation services, which may then transfer investigation time to other techniques. The revenue savings are likely to be minimal. Stilwell has estimated that in Dudley a barium meal costs £24.52 and a gastroscopy £26.79, both excluding hospital overheads.² A reduction in investigations performed would not lead to these savings without reducing staff levels because the cost of materials for a barium meal amounted to only £1.00. The reduced investigation costs are therefore unlikely to pay for the necessary research assistant in the system of Ms Davenport and colleagues.

A scoring system can therefore improve the efficiency of investigation by better target selection, at a cost of some missed lesions, and without much change in revenue requirement. The balance of costs and benefits for this, and other interventions, must be considered and acted on.

The system of Mann *et al* is at present being assessed in Salisbury, and we hope that the subsequent debate will address the issue of benefits and costs for the service and the community served.

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- 1 Mann J, Holdstock G, Harman M, Machin D, Loehry CA. Scoring system to improve cost effectiveness of open access endoscopy. *Br Med J* 1983;287:937-40.
- 2 Stilwell JA. The costs of x-rays. *Br J Radiol* 1984;57:647-9.

SIR,—Ms P M Davenport and colleagues are right to conclude that computer aided scoring systems may help improve the use of investigational techniques and are useful educational aids. As part of their study, however, they compared their system with our recently described one¹ and conclude that our system was less efficient. This conclusion is not substantiated by their results.

Firstly, they used a simplified version of our system which is no longer recommended¹ and then only on a limited number of patients. With their system they defined a low risk group of 301 patients out of a total of 1041 (29%). Our low risk group was 132 out of 397 (33%). The incidence of ulcers or cancers in these groups was, respectively, 32/301 (11%) and 15/132 (11%). Such conditions were found in 30% of their high risk group (30% of total) and 43% in ours (score ≥ 11 ; 34% of total). Moreover, when the data from general practice (which our system was not designed to assess) were excluded the yield of pathology in the high risk group (39% of total) was 48%.

Using our system properly in 1279 patients we defined a low risk group of 26%, among whom the incidence of serious disease was only 3%.² Furthermore, we have seen 95 consecutive patients with gastrointestinal malignancies and none has yet fallen into the low risk group in our system. We are therefore surprised that they found two out of 15 such patients in their study. I believe the number was too small for analysis.

Some differences in interpretation occur because in our study and in the above calculations we did not include hiatus hernia as serious disease, as we believe management of this condition is mainly symptomatic and early diagnosis is not crucial. Our system was not designed to detect this condition, but this point was not clarified by the authors. Their system requires a 10 minute interview and use of a computer and needs considerable skill, ours five direct questions and a score that can be read from a prepared chart in seconds.² If the authors are advocating using their complicated system rather than our simple one, rigorous unbiased statistical comparison is required, and this has not been provided. In any such study it should be remembered that each system is designed to achieve a slightly different aim.

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- 1 Mann J, Holdstock G, Harman M, Machin D, Loehry CA. Scoring system to improve cost effectiveness of open access endoscopy. *Br Med J* 1983;287:937-40.
- 2 Holdstock G, Patel C, Harman M. Prospective testing of a scoring system to predict the individual risk of serious pathology in patients undergoing upper GI endoscopy. *Gut* 1984;25:579

SIR,—The paper by Ms P M Davenport and colleagues (19 January, p 217) is an interesting contribution to the issue of the more effective use of scarce clinical resources. However, we have some reservations about their methods and results.

If a decision aid is to be acceptable the problem domain, in this case "dyspepsia," must be clearly defined. In this paper no such definition is given, and we find it surprising that on the criteria of an earlier study¹ none of the 1041 patients was shown to suffer from gall bladder disease. Using similar criteria Gear and Barnes investigated 393 patients with dyspepsia and concluded that in 26 the symptoms were due to gall bladder disease.² Similarly, it is surprising that reflux oesophagitis, ischaemic heart disease, and pancreatic disorders are not represented in the final analysis. This raises doubts about the means by which the "final diagnoses" were reached, and it is not clear how exhaustively