them with a sample of patients who had had shingles but did not develop neuralgia. One of the findings was that the area of the residual scarring was considerably larger in those with post-herpetic neuralgia than in controls ($p<0\cdot001$).[2] We therefore suggest that measures that reduce the residual scarring may reduce post-herpetic neuralgia. We know that acyclovir given early enough reduces the lesions during the severe attacks of shingles.[3] We agree with Dr Pamela Todd and Dr John Thomson[4] that further studies are needed to look at the possible benefit of acyclovir in preventing post-herpetic neuralgia.

Also, we suspect that the incidence of post-herpetic neuralgia is falling. This proposition is supported by a recent study that found that the incidence was 13% at six months in patients over 60[5] and a study from 1957 that found an incidence of 83% in patients over 70.[6] If this is a true picture of the incidence of the disease and not a sampling error we suspect that it has declined because of a change in the virulence of the zoster virus.

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## The role of health economics

SIR,—Professor Rudolph Klein makes some valid observations about health economics.[1] Rather than concentrate, as he did, on the issue of quality adjusted life years (QALYs), he and the sociologists[2] might have commented more generally on the quality of evidence some economists are prepared to present in support of their arguments.

As a health economist I am most concerned about the variable quality of data collection, analysis, and presentation of results in economic research. A particular problem is the misuse of multiple regression to "explain" complex issues such as infant mortality or hospital production in terms of macroeconomic models, with inappropriate use of the principles of causal inference.

The usefulness or otherwise of QALYs has yet to be decided. The method is still a subject for debate, and health economists themselves have made the same criticisms. Whether it is done by economists or by anyone else, evaluating alternative health programmes requires statistically reliable, unbiased information about resources, short and long term outcomes, and how people feel about the outcomes.[3] Where information is known to be missing or incomplete, this will be stated by the responsible health economist.[4]

What economics offers is to make explicit how decisions to achieve particular objectives are affected by different valuations of resources or outcomes. Just as it is difficult for the clinician to present information impartially for the patient to make a decision, so it is also difficult for economists to present information impartially when pressed to identify "the cost effective option." As Professor Klein and Ashmore *et al* suggest, it is important that other health professionals, including general managers, should be familiar with the techniques of economics. Examples of useful multidisciplinary collaboration range from evaluation of heart transplantation[5] and hysterectomy care[6] to a study of the effect of routine umbilical cord care on the workload of community midwives.[7] Increased understanding of economics by non-economists might also avoid unreasonable expectations of what economists should do.

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## Twenty four hour care in inner cities

SIR,—The excellent paper by Dr Anna Eleri Livingstone and colleagues is yet further confirmation of the increased workload experienced by those working in areas of deprivation.[1] We work nearby in Bethnal Green, London E2, in a practice of two women and two men. We provide 24 hour care with a one in four rota. All patients are accepted on the list if they live within the designated practice area, where the Jarman indices are similar to those in London E14. There are three accident and emergency departments within easy reach of most patients, which compares favourably with Dr Livingstone and colleagues' practices.

The table raises several important issues. Total consultation rates from 2300 to 0700 in the two areas are about the same, but there is, however, a noticeable difference between rates of visiting and giving telephone advice. All out of hours consultations by contrast show rates in London E2 that are considerably lower than those in London E14, mainly owing to the reduced number of visits.

*Out of hours workload and overall consultation rates (per 1000 patients) in London E14 in 1988[1] and in London E2 from July 1988 to June 1989*

| | London E14 | | London E2 | |
|---|---|---|---|---|
| | No | Rate | No | Rate |
| *All out of hours consultations* | | | | |
| Total consultations | 2587 | 180·2 | 864 | 116·8 |
| Visits | 1888 | 131·5 | 444 | 60·0 |
| Telephone advice | 699 | 48·7 | 420 | 56·8 |
| *Consultations from 2300 to 0700* | | | | |
| Total consultations | 453 | 31·8 | 216 | 29·7 |
| Visits | 271 | 18·8 | 96 | 13·0 |
| Telephone advice | 182 | 13·1 | 120 | 16·2 |

The reasons for these differences are unexplained. Indeed, even within our own practice (where we run personal lists) the rate of out of hours requests varied between partners from 85·9 to 152 per 1000 patients per year.

We therefore wish to point out that as well as deprivation there may be other variables that influence out of hours work. These may include proximity to accident and emergency departments (though we have been informed that our patients visit less frequently than average), size of practice, familiarity with a doctor, personal lists, and other factors, all of which need further clarification.

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1 Livingstone AE, Jewell JA, Robson J. Twenty four hour care in inner cities: two years' out of hours workload in east London general practice. *Br Med J* 1989;**299**:368-70. (5 August.)

## Early thrombolytic treatment

SIR,—Dr M C Colquhoun has highlighted several unresolved problems in coronary thrombolysis before admission to hospital,[1] which are not limited to general practice. The logistics of operating a voluntary coronary ambulance service at St Bartholomew's Hospital during normal working hours, and a rapid turnaround time, have combined with lack of published data to prevent the routine use of intravenous thrombolytic therapy in the streets and workplaces of the City of London, which we serve.

Pending consensus guidelines and clarification of medicolegal implications, such treatment should be given before admission to hospital only if there is non-concave elevation of the ST segment of at least 2 mm in at least two concordant standard or two concordant precordial leads. Though the clinical picture may be characteristic, it may be mimicked by acute peptic ulceration, perforation or haemorrhage, pericarditis, and dissection or rupture of the aorta, all of which are contraindications to thrombolytic agents. Furthermore, in the absence of electrocardiographic changes a patient who is suffering an infarction may be indistinguishable from one with the preinfarction syndrome or unstable angina, for which short term thrombolysis does not have a role yet. The first hour is a grey area for benefit from intravenous streptokinase,[2] and this may be partly because the first hour is often a grey area for diagnosis as well. Twelve lead electrocardiograms need not be misleading as long as definite criteria are used and the traces are properly interpreted. This issue appears not to have been addressed by Dr Colquhoun's survey of general practice. Perhaps patients who think that they are at risk should keep a personal electrocardiogram for comparison if the need arises. Finally, soluble aspirin can be given as a prelude to hospital thrombolysis as an acceptable compromise by doctors who remain uncertain about the diagnosis.[2]

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1 Colquhoun MC. General practitioners' use of electrocardiography: relevance to early thrombolytic treatment. *Br Med J* 1989;**299**:433. (12 August.)
2 ISIS-2 (Second International Study of Infarct Survival) Collaborative Group. Randomised trial of intravenous streptokinase, oral aspirin, both, or neither among 17 187 cases of suspected myocardial infarction: ISIS-2. *Lancet* 1988;ii:349-60.

SIR,—If I were seized by a crushing central chest pain I would want my general practitioner to come and give me an intravenuous bolus of 600 000 units of streptokinase. We in Exeter have found this to be a convenient, effective, safe, and cheap mode of administration of a thrombolytic agent.[1] Arguments over the diagnosis and a domiciliary visit by a physician could come later. I would not want the strangulation of my myocardium to last a minute longer than was necessary and would accept the small risk of a diagnostic error. The British Heart Foundation report suggests this would be "unwise."[2]

The alternative, to my mind, would be far less acceptable: an uncomfortable ride to a busy