have been professionally top heavy, but we included representatives from the community health council and the National Childbirth Trust to ensure that someone could speak—and vote—on behalf of consumers. The point is that, because marginal analysis is explicitly based on value judgments, careful consideration of “whose values?” is a condition of its use. Contrast this with alternative methods of setting priorities used elsewhere.

The exercises in Mid Glamorgan were admittedly far from perfect, but they were judged to have been successful and to have provided a better framework for setting priorities than the alternatives. The process is under review, the aim being to achieve an improvement in the next round. But there will be a next round, and while suggestions on how to do a better job are welcome, others should not forgo the opportunity to improve priority setting in their quest for perfection.

DAVID COHEN
Reader in health economics

University of Glamorgan Business School,
Pontypridd,
Mid Glamorgan CF37 1DL

Interpreting results of observational research

Problem with confounders can be tackled

EDITOR,—Paul Brennan and Peter Croft argue that the application of tests of significance in observational studies is inappropriate because of the lack of randomisation and consequent likelihood of confounding.¹ The authors conclude that neither the P value nor the 95% confidence intervals should be used as evidence for the validity of findings of an observational study. We believe that this conclusion is unwarranted and unwise.

While confounding is a major problem in observational studies, statistical methods exist to test for its presence or absence. Medical statistics would be well served by the adaptation of statistical methods and tests from the discipline of econometrics. Almost all econometric data are observational, and there is no such luxury as the randomised controlled trial. Econometricians have therefore had to develop sophisticated, yet easily applied, tests for the presence of confounding factors—“omitted variables” in econometric jargon. These tests are widely accessible in standard econometric textbooks in the case of time series data² and are becoming more available for probability data.³

For example, multivariate regression analysis could be undertaken on the data in Brennan and Croft’s example of neural tube defects. In a probit model the probability of a neural tube defect occurring is estimated as a function of many independent variables, one being the treatment group to which the subject has been allocated. The coefficient on the treatment group variable gives the relative effectiveness of the placebo and active treatments, and standard statistical tests can be applied to investigate whether it is significantly different from zero. The influence of known confounders can be isolated, and, more importantly, the analysis can be tested for unknown general confounding.

The usefulness of these techniques and the dangers of forsaking statistical testing should be emphasised. To argue for the abandonment of statistical testing based on P values and confidence intervals because of possible confounding implies the loss of valid and useful information. Testing for confounding, on the other hand, affords more certainty about the usefulness of existing information and results in at least three ways. Firstly, if confounding is tested for by a general test and not found, conventional P tests and confidence intervals can be interpreted with confidence in observational studies. Secondly, if confounding is found as a consequence of a general

test the hunt for confounders can proceed. Thirdly, if there are prior suppositions to suggest what these confounders might be a specific test can be performed to investigate and isolate the influence of these factors.

DAVID BUCK
Research fellow
MATTHEW SUTTON
Research fellow

Centre for Health Economics,
University of York,
York YO1 5DD

- 1 Brennan P, Croft P. Interpreting the results of observational research: chance is not such a fine thing. *BMJ* 1994;309:727-30. (17 September.)
- 2 Maddala GS. *Introduction to econometrics*. New York: Macmillan, 1988.
- 3 Greene WH. *Econometric analysis*. New York: Macmillan, 1993.

P values are still useful

EDITOR,—While we agree with Paul Brennan and Peter Croft that the greatest emphasis in reporting observational studies should be on questions of confounding and bias, we believe that their suggestion that the term “statistically significant” should be abandoned is akin to banning a useful implement such as a kitchen knife on the grounds that some people misuse it.¹ Epidemiologists accustomed to dealing with large populations are well used to ignoring statistical significance; when the sample size is measured in millions any perceived differences are bound to be statistically significant. With small samples, however, chance can play some surprising tricks, as anyone who has used simulation in teaching statistics can vouch for. For example, if one wished to see whether males were at greater risk of sudden infant death than females and found that of 2000 deaths, 1200 were of males, there would be no need for a test, but what if the figure was 120 of 200 or 12 of 20? In many situations there is no opportunity to collect more data to render chance variation unimportant compared with the variation due to bias. The P value conveys valuable information over and above that supplied by the confidence interval, and a recent paper suggested ways in which understanding of statistical inference may be improved by supplementing P values with subjective posterior probabilities.²

Useful analyses should lead to informed decisions, and surely one should not suppress any information that can help the decision making process. This includes the P value and the confidence interval.

E COBO
Statistician

Departament d'Estadística,
Universitat Politècnica de Catalunya,
08010 Barcelona,
Spain

University of Southampton,
Southampton SO16 6YD

- 1 Brennan P, Croft P. Interpreting the results of observational research: chance is not such a fine thing. *BMJ* 1994;309:727-30. (17 September.)
- 2 Burton PR. Helping doctors to draw appropriate inferences from the analysis of medical studies. *Stat Med* 1994;13:1699-713.

Diet and cancer

EDITOR,—In her review of diet and cancer Joan Austoker lists several dietary factors that may protect against cancer, but she does not mention the possible role of lower energy intake.¹ At a meeting of the US President’s Commission on Breast Cancer, summarised by Hunter and Trichopoulos,² studies on rodents were described that indicated that “energy (calorie) restriction of as little as 10% . . . had a steeper and better-fitting

dose-response relation with mammary tumours than did restriction of dietary fat.” Hunter and Trichopoulos and others have urged investigation of the effects of various energy and fat intakes in early childhood and adolescence.

Among rural Africans living traditionally, cancers related to diet—colon, prostate and breast cancers—are uncommon, although cervical, oesophageal, and liver cancers are common regionally.³ Although the pattern is altering in city dwellers, this pattern of a low prevalence of cancers related to diet prevails throughout the continent. African diets, especially among young people, are relatively low in energy and fat and high in plant foods. The habitually low energy intake of the young people is insufficiently appreciated. In the region of Johannesburg recent studies of 5 year olds showed approximate mean energy intakes to be 4.6 MJ in rural African children, 6.3 MJ in urban African children, and 8.4 MJ in white children.⁴ The rural African children were on average about 6 cm shorter (6%) and 3.5 kg lighter (20%) than white children. These dichotomies remain with increasing age, although their magnitude diminishes. In stark contrast, in the United States Afro-American girls aged 10 are now on average about 3 cm taller and 6 kg heavier than white girls.⁵ Total mortality from cancer in Afro-Americans is now higher than that in the white population.

Whether the setting be Western or urban African, any policy aimed at reducing the energy intake of young people would be hard to operate. Nevertheless, as many have emphasised, we should seek to learn more of the proneness to degenerative diseases of those who in early youth were accustomed to relatively low energy intakes.

ALEXANDER R P WALKER
Head of human biochemistry

Human Biochemistry Research Unit,
South African Institute for Medical Research,
Johannesburg 2000,
South Africa

- 1 Austoker J. Diet and cancer. *BMJ* 1994;308:1610-4. (18 June.)
- 2 Hunter D, Trichopoulos D. Breast cancer: nutritional factors. *Lancet* 1992;340:905.
- 3 Walker ARP, Walker BF, Segal I. Cancer patterns in three African populations compared with the United States black population. *Eur J Cancer Prev* 1993;2:313-20.
- 4 Cleaton-Jones P, Granath L, Richardson B, eds. *Dental caries, nutrient intake, dietary habits, anthropometric status, oral hygiene, and salivary factors and microbiota in South African black, Indian and white 4-5 year-old children*. Parow: Medical Research Council, 1991.
- 5 Campaigne BN, Morrison JA, Schumann BC, Falkner F, Lakatos E, Sprecher D, et al. Indexes of obesity and comparisons with previous national survey data in 9- and 10-year-old black and white girls: the National Heart, Lung, and Blood Institute growth and health study. *J Pediatr* 1994;124:675-80.

Persistent post-traumatic stress disorder

EDITOR,—Brigitta Bende and Robin M Philpott report on a patient with post-traumatic symptoms 50 years after the precipitating events who improved after appropriate treatment.¹ The NHS could do a great deal to treat post-traumatic symptoms in its own workers and so ensure that as few as possible develop similar syndromes.

One study found that up to 61% of clinical staff who report assaults by patients experience symptoms of post-traumatic stress disorder, and 10% meet the criteria for caseness according to the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised*.² A Scottish Health Management Efficiency Working Group collected all accident report forms returned by the NHS in Scotland in one week: 262 staff were injured, and the commonest cause of injury (82 cases) was assault. If this was a typical week around 4000 injuries due to assault could be expected to be reported in Scotland each year. If the American