

on the energetics of free living populations, but the data need to be assessed critically. The results illustrate the very real problems associated with determining the energy intake and expenditure of individuals or populations, and perhaps the different approaches represent the extreme range within which is the actual energy expenditure. There are several possible factors that could reasonably explain the apparent discrepancy between the results with the approaches used for measuring energy intake and total energy expenditure. We think that the bases of the discrepancy need to be explored much more fully before one or other approach is rejected as being unreliable because it may show significant bias.

A A JACKSON
S A WOOTTON

Department of Human Nutrition,
University of Southampton,
Southampton SO9 3TU

- 1 Livingstone MBE, Prentice AM, Strain JJ, *et al.* Accuracy of weighed dietary records in studies of diet and health. *Br Med J* 1990;300:708-12. (17 March.)
- 2 Brouns F, Saris WHM, Stroeken J. Eating, drinking and cycling. A controlled Tour de France simulation study. Part 1—Effect of diet manipulation. *International Journal of Sports Medicine* 1989;10:S32-40.

AUTHORS' REPLY.—We agree with Professor A A Jackson and Dr S A Wootton that the potential impact of our recent paper¹ is so great that it warrants the most careful analysis, interpretation, and presentation.

Our reasons for analysing the data by thirds of energy intake were deliberate and twofold. Firstly, it is common practice in nutritional epidemiology to evaluate data by dividing subjects into thirds (or fifths) of intake. Secondly, the purpose of the study was to assess the validity of suspiciously low intakes, and subjects were recruited accordingly by using a stratified random sampling procedure. As energy intakes in the first and second studies were highly correlated it is reasonable to present the data according to the initial protocol. The claim by Professor Jackson and Dr Wootton that total energy expenditure should be the independent variable enters a circular argument that relies on the assumption that the values for energy intake are not reliable: this is the whole premise of our paper. Their analysis confirms the fact that there is a serious discrepancy between the two measures. This is also confirmed by a Bland-Altman analysis,² which makes no assumptions about dependent and independent variables. The issue is not about whether there is a difference but about which method is most reliable. We can marshal a substantial body of evidence in support of our initial interpretation, much of which does not rely on the doubly labelled water technique.

In brief, the first point is an extension of the point made in our discussion that many values for energy intake are so low as to be physiologically impossible. Whole body calorimetry studies unequivocally show that the minimum total energy expenditure compatible with normal life is about $1.3 \times$ basal metabolic rate. (A minimum survival requirement of $1.27 \times$ basal metabolic rate has been accepted.)³ In the present study seven out of 31 results for energy intake fell below this physiological minimum and can therefore be rejected as unrepresentative of long term habitual intake. A further six out of 31 fell below $1.4 \times$ basal metabolic rate and must be regarded as highly suspicious. A similar approach can be applied retrospectively to published sets of data and shows equally disturbing evidence of underrecording in many studies (A E Black *et al.*, unpublished work).

The second line of evidence comes from carefully conducted metabolic balance studies (some are cited in our original paper) that frequently show real energy requirements to be higher than self recorded energy intake.

Finally, the doubly labelled water method has been extensively cross validated and shown to be accurate to within a few per cent under laboratory conditions. A recent workshop at which all of the major users of the method in the world were present examined possible sources of error and bias when the technique is used under field conditions and concluded that it was exceptionally robust.⁴

With regard to individual total energy expenditure values the reference to marathon running is misleading. High values can be generated by more sustained effort at a lower energy expenditure over long periods of the day. This was the case with two subjects (cases 2 and 11), whose manual work entailed considerable overtime.

Our data are unlikely to be surprising to many workers who acknowledge how difficult it is to measure such a psychologically sensitive variable as food intake without inducing observer effects and errors. Most agree that any errors in values of energy intake are likely to result in underestimates. We contend that our interpretation of the findings is probably accurate and merely confirms a widely held scepticism. Replication of this study and further exploration of the issues raised are urgently required. We would certainly not wish the pendulum of scientific fashion to swing away from food intake data on the basis of this study alone. In common with many other nutritional research teams we rely heavily on accurate information as to what people really eat.

M B E LIVINGSTONE
University of Ulster, County Antrim BT37 0QB
A M PRENTICE
MRC Dunn Nutrition Unit, Cambridge CB4 1XJ

- 1 Livingstone MBE, Prentice AM, Strain JJ, *et al.* Accuracy of weighed dietary records in studies of diet and health. *Br Med J* 1990;300:708-12. (17 March.)
- 2 Bland JM, Altman DG. Statistical methods for assessing agreement between two methods of clinical measurement. *Lancet* 1986;i:307-10.
- 3 Food and Agricultural Organisation, World Health Organisation, and United Nations University. *Energy and protein requirements*. Geneva: WHO, 1985. (Technical report series No 724.)
- 4 International Dietary Energy Consultancy Group. *The doubly-labelled water method: technical recommendations for use in humans*. Vienna: International Atomic Energy Agency/IDECG (TECH DOC series) (in press).

Autologous transfusion

SIR.—In relation to the informative article on autologous transfusion by Drs D Lee and J A F Napier¹ we would like to comment on the use of the technique in developing countries.

The use of autologous blood transfusion during surgery, by either predeposit or salvaging methods, has been practised widely in developing countries for many years. Avoiding the risk of transmission of infection through donated blood is undoubtedly one reason for its popularity, particularly in recent years because of the high incidence of HIV seropositivity in parts of Africa. A major stimulus to the use of autologous blood in the developing world has, however, been the problem of obtaining sufficient supplies of compatible donated blood, especially for emergency surgery. This is particularly the case in the provincial or rural hospitals, where blood transfusion services may be limited or absent.

The direct salvaging of uncontaminated blood lost into body cavities and its subsequent reinfusion can be a simple, cheap, and life saving procedure. We have found it particularly useful during surgery for ruptured spleen or ruptured ectopic pregnancy. The method relies on having in theatre several prepared sterile stoppered glass bottles of a volume of about 500 ml that contain a suitable anticoagulant. In practice the anticoagulant can be 2 g of sodium citrate and 3 g of dextrose made up to 120 ml with sterile water in each 500 ml bottle. Alternatively, the anti-

coagulant content from purpose designed venesection bags can be decanted into the glass bottles. At operation the surgeon collects the blood from the body cavity into a kidney dish (about 400-500 ml of blood in each dish), pours the anticoagulant from the glass bottles into the kidney dish, and mixes well the salvaged blood and anticoagulant. The blood is then filtered through four or five layers of sterile gauze into the glass bottles, which are then stoppered and handed to the anaesthetist for their contents to be reinfused through a filtered blood giving set.

Although this method of salvaging may seem less sophisticated than that of using purpose designed cell savers, it is a technique that we can personally attest to and which, in our experience, can be a life saving procedure in difficult locations.

RICHARD J E PAGE
IATN H WILSON

Bristol Royal Infirmary,
Bristol BS2 8HW

- 1 Lee D, Napier JAF. Autologous transfusion. *Br Med J* 1990;300:737-40. (17 March.)

Mental Health Act code of practice

SIR.—I would like to clarify the comments about the availability of the Mental Health Act code of practice made by Minerva.¹

When the *BMJ* approached us we advised it to contact the Department of Health, which is responsible for the production, publication, and distribution of the code of practice. Pending the completion of the code's progress through parliament (this occurred on 22 February), a limited number of copies were distributed by the Department of Health to health authorities, social services departments, and other relevant bodies.

I am pleased to be able to report the commission's understanding that a pocket sized, easy to use version of the code was due to be published around Easter by HMSO. It is the commission's hope that all doctors concerned in the operation of the Mental Health Act will obtain a copy.

WILLIAM BINGLEY
Mental Health Act Commission,
London SW1P 4HW

- 1 Anonymous. Views. *Br Med J* 1990;300:760. (17 March.)

General practitioner obstetrics in Bradford

SIR.—As general practitioners in Bradford and members of a quality and audit group we were dismayed that you published the paper by Dr F C Bryce and colleagues on general practitioner obstetrics in Bradford.¹ The paper is logically flawed and presents a misleading picture.

Some elements of obstetric care in Bradford are good. We are fortunate to have an integrated comprehensive patient held obstetric record book. There is also a well organised and extensive district midwifery service, which supervises community antenatal care and has strong links with both general practitioners and the hospitals.

Derived from, but not stated in, the paper is a perinatal mortality for consultant booked cases of 14.7/1000—46% in excess of general practitioner booked cases. The justification or lack of justification for the unusual and controversial claim that general practitioner obstetric care makes a significant contribution to the high perinatal mortality in Bradford is easily established by completing a table that breaks total perinatal mortality/1000 into: avoidable (general practitioners' responsi-

bility), avoidable (consultants' responsibility), and non-avoidable. This would need to be done as a cooperative interprofessional review of the 81 perinatal deaths in Bradford in 1988. The omission of this simple exercise undermines any scientific and numerical legitimacy of the paper.

In normal circumstances a patient is kept under general practitioner care until a clinical situation necessitates transfer. Of course we agree that all necessary measures should be carried out properly beforehand, but table III of the paper by Dr Bryce and colleagues shows only 22 cases out of 259 in which a "failure" of antenatal care could be claimed—that is, undiagnosed breech presentation and 11 elective requests for epidural anaesthetic. All other problems arose in labour, and the women were rightly transferred at the correct time.

General practitioners infrequently attend during labour partly because the labour ward rarely tells them when a patient enters in labour (despite repeated requests). General practitioners also infrequently attend when a decision on transfer is made. This may be appropriate as the professional judgment of the midwife is usually not altered by the presence of the general practitioner. In emergencies speed overrides other considerations. In non-urgent situations we accept that it is of benefit to the patient for the general practitioner personally to explain the reasons for transfer; but we have never heard of a consultant personally attending to take over responsibility for a transferred patient.

A review of general practitioner obstetric performance is not a suitable subject of research for hospital obstetricians alone. There is not a single general practitioner included among the authors despite the fact that a regional adviser in general practice, who holds an FRCOG, works as a hospital practitioner within their department.

It is true that general practitioners rarely attend perinatal review conferences, mainly because the organisers refuse to tell them which cases will be discussed. We therefore cannot prioritise our finite time between "general education" and specific peer review with feedback.

Most importantly, the paper fails to recognise the fundamental distinction between service satisfaction (for patients and staff) and formal outcome measures. It is relatively easy to establish a link between health service provision and satisfaction. It has proved very difficult to show a connection between health service input and outcomes such as perinatal mortality and life expectancy. Bradford has one of the highest levels of general morbidity and mortality in Britain. It also has the highest perinatal mortality. Not all of this can be explained, but most has little to do with health service provision. Reasons include poverty, housing, smoking, nutrition, ethnic background, and birth spacing. Opportunities for obstetricians and gynaecologists to influence these outcomes are limited to two approaches. To date, they have done neither. The first is a district based management protocol for the care of pregnant women. This needs to be arrived at by agreement with general practitioners and modified in the light of experience. It should entail not just secondary and tertiary but also primary prevention. Regarding both smoking and vitamin D deficiency Bradford lacks both a coherent information system and any integrated service to ameliorate these problems at the patient level. The vast majority of patients do not need subtle clinical skills and specialist intervention. They do, however, need foolproof organisation and clear management protocols.

Secondly, gynaecologists can contribute to birth spacing, specifically in providing services for termination of pregnancy. Only 15% of all terminations in women in Bradford are performed within the NHS (the national average is 41%), and many of these are in those who live in affluent border areas and undergo termination in adjacent districts. The total abortion rate in Bradford

women aged 15-44 is 12/1000 (compared with 15/1000 in England and Wales). Most of the discrepancy—about 220 women—is likely to come from poorer patients who cannot afford to have private operations and do not live in affluent border areas. As the difference between a perinatal mortality of 13.9/1000 and 9/1000 (national average) is 26 births a difference of 220 terminations, not provided to at risk women requesting them, might easily account for much of the difference. East Anglia has the greatest percentage of NHS terminations and the lowest perinatal mortality.

The challenge of having the highest perinatal mortality in Britain demands honest analysis, mature judgment, good communication, and imaginative solutions. As a first step we challenge the gynaecologists to undertake the exercise described above in order to complete the proposed table that breaks down perinatal mortality into avoidable and unavoidable deaths.

MICHAEL ROSS	ADRIAN KENNY
MARK BROOKE	NINA PEARSON
JOHN CONNOLLY	MARK PURVIS
CLARE CONNOLLY	DAVID SHOESMITH
JUDITH DANBY	KATIE SIMMONS
IAN DEAKIN	MARTIN TAYLOR
JONATHAN GORE	WENDY TONKS
ALUN GRIFFITHS	ANDREW WILSON
SETH JENKINSON	LINDA WILSON
	ANDREW WITHERS

Bradford,
West Yorkshire

1 Bryce FC, Clayton JK, Rand RJ, Beck I, Farquharson DIM, Jones SE. General practitioner obstetrics in Bradford. *Br Med J* 1990;300:725-7. (17 March.)

SIR,—I was puzzled by the paper by Dr F C Bryce and colleagues¹—not by the fallacies and false conclusions in the paper, which have already been dealt with by other correspondents,^{2,4} but by the motivation of the authors in publishing what is less than half an audit. Previous reports of general practitioner obstetric care have shown that with commitment and support this is something that can be done well.⁵ The paper by Dr Bryce and colleagues sets out to prove that it is something that can be done badly. In this general practitioner obstetrics is no different from any other human or medical endeavour. Certainly no one has ever claimed that it is automatically safe regardless of whether it is done well or badly.

The data as presented expose justifiable concern about some aspects of general practitioner obstetric care in Bradford. The challenge to those involved is whether such concerns can be addressed and the care improved. I suggest that they start with a few simple questions such as, Why are the general practitioners not observing the booking criteria strictly? Is it because they are sloppy in their practice, or because the criteria are too restrictive? Why do the general practitioners believe that they do not have access to ultrasonography² when the hospital doctors think that they do³? Why do the general practitioners not, apparently, attend deliveries of their own patients? Again, is it only because they are not committed to good obstetric care, or is it because they feel unwelcome and excluded by others? Such questions are of enormous interest to readers trying to interpret and learn from the data. They should not, however, be asked or answered through correspondence columns but should be discussed among midwives, general practitioners, and obstetricians.

This leads on to questions about the ownership and publication of audit data. We have been told that the authors circulated a draft of the paper to general practitioners at an earlier stage but that it was modified only slightly as a result, despite wide ranging comments.⁴ This is not to suggest that "bad" audit results should be censored but does

indicate that those responsible for the clinical work should have time to respond and to participate in the decisions whether the results should be published and, if so, in what form. In this particular case, for instance, the paper would have carried more weight if the women booked for general practitioner intrapartum care had been compared with a low risk sample of women booked for specialist care (a technique used in an audit of general practitioner obstetric care in Keynsham). If that is denounced as special pleading by a general practitioner with an axe to grind I ask how Dr Bryce and his colleagues would respond to general practitioners doing an audit of their work which included comparing their results unfavourably with those of the Oxford unit, and publishing it without their involvement.

I have one further question, which I direct to the editor of this journal. Whatever the validity or otherwise of this paper's conclusions its adversarial tone and its attempt, betrayed by the comments in the authors' subsequent letter,³ to pin at least part of the blame for the high perinatal mortality in Bradford on the general practitioners leave a very bad taste. Would the cause of honesty and science be better served by journals insisting that doctors whose clinical activity is under scrutiny have either a share in the authorship of a paper or at least an opportunity to respond to the findings at the same time as its original publication?

There are still wider questions about the use and ownership of audit data. Publication is only one of the uses to which such data can be put. With the increasing demand for figures to inform management decisions at all levels there will be increasing temptation to collect statistics on the performance of others without their knowledge or agreement or to use the results of audit for purposes that they were never intended to fulfil. Perhaps we should consider whether there is a need for a code of practice governing the use of audit data.

DAVID JEWELL

Department of Epidemiology and
Public Health Medicine,
University of Bristol,
Bristol BS8 2PR

1 Bryce FC, Clayton JK, Rand RJ, Beck I, Farquharson DIM, Jones SE. General practitioner obstetrics in Bradford. *Br Med J* 1990;300:725-7. (17 March.)

2 Bahrami J, Haywood K, Givans RJ. General practitioner obstetrics in Bradford. *Br Med J* 1990;300:873. (31 March.)

3 Clayton JK, Farquharson DIM, Rand RJ, Jones SE, Beck I, Bryce FC. General practitioner obstetrics in Bradford. *Br Med J* 1990;300:938. (7 April.)

4 Danby J, Simmons K. General practitioner obstetrics in Bradford. *Br Med J* 1990;300:939. (7 April.)

5 Jewell D. General practitioner obstetrics. *Br Med J* 1989;298:690-1.

6 Lowe SW, House W, Garrett T. Comparison of outcome of low-risk labour in an isolated general practice maternity unit and a specialist maternity hospital. *J R Coll Gen Pract* 1987;37:484-7.

* Like midwives, editors are not usually involved in conception. They try to ensure that authors can take responsibility for their work but they cannot insist on who should be an author. Nor, within limits, should they censor the way authors choose to tell their stories. We could have invited a response in the same issue, but the subsequent—and continuing—debate in the correspondence columns has, we think, served the cause of honesty and science just as well.—Ed, *BMJ*.

SIR,—As general practitioners in Bradford who are actively involved in intrapartum care we think that we must reply to recent attacks on our professional standards and commitment in the paper by Dr F C Bryce and colleagues¹ and the further insulting and inaccurate generalisation in their letter.²

The focus of criticism has centred on general practitioners not visiting their patients during labour and delivery. In September 1989, after the paper by Dr Bryce and colleagues had been circulated, we established a dedicated maternity