Changes to obituaries are insensitive

EDITOR,—I deplore the *BMJ*'s decision to tamper with the obituary pages.¹ It strikes me as mean minded, discourteous, and insensitive to the bereaved. The BMA isn't a trade union, a scientific organisation, or an environmental pressure group. It should be a sort of doctors' common room where we can gossip, moan about managers and patients, and generally encourage one another. It now seems unable either to support its members while they are alive or to respect them when they are dead.

I'm sorry that this letter is 131 words long, isn't evidence based, and hasn't been sent by email. Nevertheless, I hope that it will be published as it contains no clichés, Latin words, or imperial measures; I've been a member of the BMA for 20 years (£4608 at current rates); and I enclose a stamped addressed envelope (19p).

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1 Lock S. How to write an obituary for the *BMJ*. *BMJ* 1995;311:680-1. (9 September.)

Low back pain

EDITOR,—Philip Brien and Michael J Brien are wrong to state¹ that Meade *et al*'s research in 1990 "showed that spinal manipulation performed by a chiropractor was more effective for low back pain than manipulation performed by a physiotherapist."² Even Meade *et al* made no such claim, and it is dangerous to perpetuate myths based on a misreading of research findings.

The comparisons in Meade *et al*'s study were between chiropractors and hospital outpatient treatment, not manipulation by physiotherapists. A true comparison would have been between manipulation by chiropractors and manipulation by physiotherapists in private practice who specialise in manipulation.

Elimination of factors that may affect outcome, such as early treatment, the motivation of the patient, and the frequency and length of treatment, would then have been far more likely.

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1 Brien P, Brien MJ. Low back pain. *BMJ* 1995;311:568. (26 August.)

2 Meade TW, Dyer S, Browne W, Townsend J, Frank AO. Low back pain of mechanical origin: randomised comparison of chiropractic and hospital outpatient treatment. *BMJ* 1990;300:1431-7.

The hypertensive disorders of pregnancy

EDITOR,—I am disappointed that F Broughton Pipkin's review on the hypertensive disorders of pregnancy does not mention a treatment that is both benign and effective.¹ As long ago as 1984 a group of us, drawn from obstetrics and gynaecology, psychiatry, and psychology, showed that training patients in relaxation resulted in a halving of the rate of admission of patients with hypertension in pregnancy because of the reduction in blood pressure achieved.² This is a cheap and simple treatment, and it would be a pity to ignore it.

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- 1 Broughton Pipkin F. The hypertensive disorders of pregnancy. *BMJ* 1995;311:609-13. (2 September.)
- 2 Little BC, Hayworth J, Benson P, Hall F, Beard RW, Dewhurst J, Priest RG. Treatment of hypertension in pregnancy by relaxation and biofeedback. *Lancet* 1984;i:865-7.

Decision analysis and screening for Down's syndrome

Estimate of uptake of amniocentesis is overoptimistic

EDITOR,—J Fletcher and colleagues raise many important issues regarding the difficulties in making population policies for antenatal screening for Down's syndrome.¹ Unlike in some previous studies, the authors give full attention to a wide range of outcome measures in their comparison of possible alternative policies rather than focusing simply on the number of cases of Down's syndrome detected. They also recognise that the weight given to each of these outcome measures varies significantly between individuals and groups of women, according to factors including age, family status, and culture. They conclude, correctly we think, that no single policy can meet the needs of all women in the population and that policies should not be implemented too rigidly. Despite this, we wish to make several observations on the paper, which could influence the conclusions drawn from it and policy decisions made.

Firstly, the authors' assumption of 75% uptake of amniocentesis (table II) in the current policy option is overoptimistic. Experience elsewhere suggests that uptake of screening based on age is likely to be between 40% and 50%.^{2,4} The result of this is an overestimation of the cost of this policy option, the number of iatrogenic miscarriages, and the number of cases of Down's syndrome detected. This does not seem to be taken into account by the sensitivity analysis and may mean that alternative policies may compare more favourably than is concluded.

Secondly, the impact of restricting serum screening to women over 30 seems to be to detect 4.7 cases a year rather than 6.4—a difference of 1.7 cases a year. It is unfortunate that the abstract, which will be widely quoted, rounds this to one case a year, when the actual figure, 1.7, is comparable to the 1.7 (2.9–1.2) difference in the number of miscarriages induced by amniocentesis between these policy options.

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- 1 Fletcher J, Hicks NR, Kay JDS, Boyd PA. Using decision analysis to compare policies for antenatal screening for Down's syndrome. *BMJ* 1995;311:351-6. (5 August.)
- 2 North West Thames Regional Health Authority Specialist Group in Clinical Genetics. *Purchaser's guide to triple testing for Down's syndrome*. London: North West Thames RHA, 1991.
- 3 Royal College of Obstetricians and Gynaecologists. *Report of the RCOG working party on biochemical markers and the detection of Down's syndrome*. London: RCOG, 1993.
- 4 Shackley P, McGuire A, Boyd PA, Dennis J, Fitchett M, Kay J, *et al*. An economic appraisal of alternative pre-natal screening programmes for Down's syndrome. *J Public Health Med* 1993;15:175-84.

Not using age specific values invalidates study

EDITOR,—J Fletcher and colleagues' paper does little to help purchasing authorities when they have to decide which screening programme and screening policy to choose when introducing screening for Down's syndrome.¹ While the methodology used in the paper is valuable when used correctly, the authors were wrong to apply the overall sensitivity and specificity of serum testing

obtained from whole population data rather than using age specific values. They argue that "this was done to reduce complexity." As a consequence of their not making allowance for the fact that in older women (those over 30) the sensitivity and specificity change dramatically with age, the results of their analysis are invalidated.

Making allowance for the changing sensitivity and specificity with age is quite simple, and several authors have published both theoretical and actual detection rates and false positive rates by broad age bands.^{2,4} The table gives the results for Fletcher and colleagues' option 5 if the data from my four year prospective study (which used the markers α fetoprotein and free β human chorionic gonadotrophin) and my observed detection rates and false positive rates are applied to their population and cost figures, uptake of amniocentesis, and fetal loss rates. These revised results show that, in routine practice, the proposed protocol will be more expensive than their current policy of offering amniocentesis to women over 35 and would result in the ratio of detected cases of Down's syndrome to fetal losses being close to that expected when screening the whole population. Also, the fetal loss rate is considerably higher than that calculated for a protocol screening the whole population but using a lower risk cut off; one might conclude that this policy is the most appropriate. In terms of cost per case detected, however, biochemical screening of women over 30 does have the lower unit cost.

Revised calculations for option 5 in Fletcher and colleagues' study (biochemical screening for women aged 30 and over) when appropriate age specific specificity and sensitivity are used

	Age band (years)		
	30-35	>35	>30
Specificity (%)	95.5	80.0	
Sensitivity (%)	71	92	
No screened	2192	874	3066
Cases of Down's syndrome in age group	3.24	4.77	8.01
Cases of Down's syndrome detected	2.30	4.39	6.69
Down's syndrome miscarriages in total population			2.00
Births with Down's syndrome			6.00
No of amniocenteses	93.71	166.06	259.77
No of miscarriages	0.94	1.66	2.60
Miscarriages due to amniocentesis per case of Down's syndrome detected	0.41	0.38	0.39
Total cost (£000)			110
Cost per case of Down's syndrome detected (£000)			16.4

This simple analysis of the data in Fletcher and colleagues' table II shows the danger of making invalid conclusions from oversimplified data. Similarly, the authors make oversimplifications in the data used to generate table III and figures 2 and 3. They use a sensitivity of 66% and a specificity of 95% when my and others' data suggest that the sensitivity in women over 30 is 82.6% and the specificity is 91.2%. Once more these oversimplifications make the conclusion virtually meaningless.

A decision analysis of this type is only as good as the assumptions made by the investigators. I am reminded of the computer adage "garbage in, garbage out." If policy is to be based on such procedures we must all ensure that the data that are used and the assumptions that are made do not invalidate the conclusions.

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1 Fletcher J, Hicks NR, Kay JDS, Boyd PA. Using decision analysis to compare policies for antenatal screening for Down's syndrome. *BMJ* 1995;311:351-6. (5 August.)

2 Spencer K. Despitage de la trisomie 21 à l'aide de la β -HCG libre:

- 3 Reynolds TM, Nix AB, Dunstan FD, Dawson AJ. Age specific detection and false-positive rate: an aid to counselling in Down's syndrome. *Obstet Gynecol* 1993;81:447-50.
- 4 Wald NJ, Cuckle HS. Biochemical screening. In: Brock DJH, Rodeck CH, Ferguson-Smith MA, eds. *Prenatal diagnosis and screening*. Edinburgh: Churchill Livingstone, 1992:563-77.

Costs were overestimated

EDITOR,—J Fletcher and colleagues' paper on using decision analysis to evaluate screening for Down's syndrome is valuable, but several extra factors need to be considered.¹ The authors state that screening causes anxiety but fail to mention the reassurance that it gives to many women. In addition, they based their study on use of the triple test despite the considerable body of evidence showing that a double test is as effective.^{2,3} Indeed, the national external quality assurance scheme's reports on Down's screening show that a double test is the option favoured by most laboratories. Abandoning the excess assay would save roughly £15 000 (assuming £2 per oestriol assay).

The prospective trial of screening in south Wales (the first routine screening programme for Down's syndrome to be offered for NHS patients), which evaluated all pregnancies referred to the participating hospitals, showed an 85% uptake of screening (those who were not screened either refused or presented too late) and that 85% of those in whom screening gave a positive result opted for amniocentesis.⁴ These figures are similar to those of Fletcher and colleagues (80% and 95% respectively), but because they give a lower rate of amniocentesis they may result in a lower economic estimate.

Furthermore, because the false positive rate in younger women is lower, Fletcher *et al* have overestimated the cost of detecting a case of Down's syndrome, which I estimate to be nearer to £40 000. Overall, Fletcher and colleagues' paper shows the power of this method of making rational decisions, which could be used for a variety of screening scenarios. Interpretation of the findings will vary: £40 000 to prevent the birth of a baby with Down's syndrome to a woman under 30 may be perceived as expensive but is low compared with the costs of caring for someone with the syndrome. Furthermore, we must not forget the feelings of the women: what could we say to a 29 year old woman who gave birth to a baby with the syndrome after being refused screening? It is also helpful to learn from history. When screening for Down's syndrome was introduced in Cardiff it was offered only to women aged 26 and over, for reasons similar to those quoted by Fletcher and colleagues. Within six months "consumer pressure" resulted in it being made available for all women irrespective of age. I therefore strongly disagree with the

conclusion that it may be advisable to plan to offer screening only to women aged over 30.

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- 1 Fletcher J, Hicks NR, Kay JDS, Boyd PA. Using decision analysis to compare policies for antenatal screening for Down's syndrome. *BMJ* 1995;311:351-6. (5 August.)
- 2 Reynolds T, John R, Spencer K. The use of unconjugated estriol in Down syndrome screening is unproven. *Clin Chem* 1993;39: 2023-5.
- 3 Spencer K, Coombes E, Mallard A, Milford-Ward A. Free beta human choriongonadotropin in Down's syndrome screening: a multicentre study of its role compared with other biochemical markers. *Ann Clin Biochem* 1992;29:506-18.
- 4 Dawson A, Jones G, Matharu M, Reynolds T, Penney M, John R, *et al*. Serum screening for Down's syndrome: a summary of one year's experience in south Wales. *Br J Obstet Gynaecol* 1993;100:875-7.
- 5 Reynolds T, Nix B, Dunstan F, Dawson A. Age related detection rates in Down screening: an aid to counselling. *Obstet Gynecol* 1993;81:447-50.

Testing should be in all women

EDITOR,—The paper by J Fletcher and colleagues¹ was incorrect to conclude that restricting serum screening for Down's syndrome to women aged 30 or over is preferable to screening all women. Firstly, using a 58% detection rate and a 5% false positive rate for all pregnant women instead of estimates applicable to women aged 30 or over (72% and 12%^{2,3}), and, secondly, not comparing screening policies appropriately introduces important errors.

Screening tests involve a trade off between detection rate and false positive rate. To compare screening policies, cut off levels must be set such that among all pregnancies in a community either the detection rate is held constant and the false positive rates compared or the false positive rate is held constant and the detection rates compared. Fewer miscarriages are induced by amniocentesis for each case of Down's syndrome detected if serum is tested in all women than if it is tested only in women aged 30 or over (0.30 or 0.41 v 0.46 respectively) (table).

Testing all women increases the cost of serum testing, whereas testing only older women means that more amniocenteses are performed per case detected, increasing this cost. At a detection rate of 51%—as achieved by the policy proposed by Fletcher and colleagues in 1000 women (table)—there would be 1000 serum tests and 31 amniocenteses if all women were tested or 410 serum tests and 47 amniocentesis tests if only women aged 30 or over were tested. On the basis of estimates of cost and uptake of amniocentesis cited in the paper, testing all women could cost about 25% more than testing only women aged 30 or over—a

smaller difference than reported in the paper and one that is acceptable for the added safety of the policy.

If the cost of serum screening for Down's syndrome and testing for α fetoprotein were less than the authors' generous estimate of £13.70 per woman screened then the difference in cost between the two policies would be reduced; if it were £6 or less (a realistic sum, given that screening for neural tube defects and Down's syndrome can be provided for about £15), serum testing all women would be less expensive than testing only those aged 30 or over.

Testing only women aged 30 or over introduces inequity by denying testing to younger women. Some women aged 30 or over with a high risk of having a child with Down's syndrome determined by a serum test will be offered an amniocentesis, but younger women, who could be at even higher risk, will not.

Offering serum screening to all women is the safest and most effective method of screening, maximising the detection rate for a given false positive rate. For this reason, and on grounds of fairness, it is the screening policy of choice.

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- 1 Fletcher J, Hicks NR, Kay JDS, Boyd PA. Using decision analysis to compare policies for antenatal screening for Down's syndrome. *BMJ* 1995;311:351-6. (5 August.)
- 2 Wald NJ, Densem JW, Smith D, Klee GG. Four-marker serum screening for Down's syndrome. *Prenat Diagn* 1994;14: 707-16.
- 3 Office of Population Censuses and Surveys. *Birth statistics—England and Wales*. London: HMSO, 1995. (Series FM1, No 22.)

Authors' reply

EDITOR,—One of the advantages of using decision analysis as a tool for considering the consequences of different screening policies is that the assumptions and numerical values on which the model's predictions are based are explicit. If there is debate about the assumptions or the numbers that should be used in the calculations it is easy to recalculate the model with the new numbers.

David Murray and Barry Tennison suggest that our estimate of 75% for the uptake of amniocentesis in women aged 35 and over is too high. If their suggested figure of 45% is used the number of cases of Down's syndrome detected in Oxfordshire by a policy of offering amniocentesis to women aged 35 and over drops from 4.7 to 2.8/year, the number of miscarriages induced by amniocentesis from 6.6 to 4.0, and the total cost of the programme from £170 000 to £100 000. The cost per case detected and the number of pregnancies lost per case detected remain unchanged. Our conclusion that serum testing improves on testing based on age alone remains unchanged.

T M Reynolds and Kevin Spencer point out that the specificity and sensitivity of serum testing for Down's syndrome vary with maternal age. They are concerned that our decision to simplify the

Comparison of policies of screening for Down's syndrome with estimates of gestational age based on last menstrual period (estimates based on published estimates for performance of screening² with distribution of maternal age in Oxford in 1993³)

Screening policy	Risk cut off	Detection rate (%)	False positive rate (%)	No of miscarriages induced by amniocentesis per case of Down's syndrome detected*	
				Reported by Fletcher and colleagues ¹	Corrected
Triple test for all women	1:250	63	6.5	0.45	0.50
Triple test for only women aged 30 and over (A)	1:250	51†	4.7‡	0.25	0.44
Triple test for all women using cut off level to achieve:					
Same detection rate as A	1:130	51	3.1	§	0.29
Same false positive rate as A	1:190	58	4.7	§	0.39

*These estimates include cases of Down's syndrome that would be detected but would subsequently miscarry. If they were excluded the estimates would be about 33% higher.

†Proportion of all cases of Down's syndrome detected in whole community: 71% of babies with Down's syndrome are born to women aged ≥ 30 , in 72% of whom triple test will give positive result with risk cut off of 1:250— $71\% \times 72\% = 51\%$.

‡Proportion of amniocenteses among all pregnancies (women of all ages): 41% of unaffected births occur in women aged ≥ 30 , in 11.6% of whom triple test will give positive result— $41\% \times 11.6\% = 4.7\%$.

§Not specified.