

activity¹ because the study that forms its scientific basis was retrospective and included mainly older women² and because the test can be subject to large differences between observers.

The fact that the original study was retrospective would have biased the results if knowledge of the outcome of pregnancy influenced the person measuring the neutrophil alkaline phosphatase activity, which is in part subjective, or if the trauma of amniocentesis increased the activity. This is unlikely to have happened as the tests were done without knowledge of whether the blood film was from a woman whose fetus had Down's syndrome and the average activity in women who had an amniocentesis was similar to that in other women.

The distribution of maternal age in the study was indeed atypical of that in the general population, but this does not limit the applicability of the results because, in both pregnancies in which the fetus had Down's syndrome and pregnancies in which it did not, no association between maternal age and the activity was found.

Measurement of neutrophil alkaline phosphatase activity is semiquantitative so that there may be differences between observers. In the screening service offered by this department we have sought to minimise this by double reading blood films during a training period. As a result the scores obtained by our two readers are comparable, with a 7% coefficient of variance.

The NHS provides screening of maternal serum for Down's syndrome in some hospitals, including our own, and we hope that this will eventually be extended throughout the country. We will be using much of the funds raised through our private screening service to research ways of simplifying the neutrophil alkaline phosphatase test so that it can be made less labour intensive and, hence, more suitable for mass screening in the NHS. With the support of the Medical Research Council we will also be studying the effect of different approaches to counselling pregnant women on anxiety associated with screening.

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1 Wishart JG. Prenatal screening for Down's syndrome. *BMJ* 1991;302:54-5. (6 July.)

2 Cuckle HS, Wald NJ, Goodburn SP, Sneddon J, Amess JAL, Dunn SC. Measurement of activity of urea resistant neutrophil alkaline phosphatase as an antenatal screening test for Down's syndrome. *BMJ* 1990; 301:1024-6.

Ethics, commerce, and kidneys

SIR,—A rational decision, whether it be to sell a kidney or to sell a house, depends on more than a fair price or a free will.¹ It demands that the person concerned has full information regarding all the possible consequences of his or her choice and the ability to process the information rationally.

Conveying medical information to patients for the purpose of obtaining informed consent is widely accepted as being difficult when there is a clear benefit to the patient as well as an entailed risk. If a person sells his or her kidney he or she can expect no physical benefit, only a loss, with consequences that may be at best simply painful and at worst life threatening. The vendor relies on accurate information from someone who may have a vested interest in the welfare of the recipient and who views the donor only as a means to a greater good—that of the recipient.

Because a person's ability to appreciate the consequences of an action depends on his or her competence we would not allow a child or mentally subnormal person to sell a kidney whatever the price. What then of an unsophisticated person

selling a kidney without apparently appreciating the difference between a hotel and a hospital?

It is too simplistic to equate exploitation only with market forces; and it is a mistake to ignore the fact that vulnerability, as measured in terms of competence, is not always easy to assess.

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1 Wight JP. Ethics, commerce, and kidneys. *BMJ* 1991;303:110. (13 July.)

SIR,—I agree with Dr J P Wight that we need to know why obtaining organs for transplantation through payment is not permitted, but I disagree that the reason is practical rather than ethical.¹ I think that on certain fundamental questions his argument is flawed and that the conclusions he draws are potentially dangerous.

Believing that he can exert free will in matters such as selling his house, he assumes that free will is not compromised by financial concerns in other matters. He further argues that allowing the sale of organs increases personal freedom by increasing freedom of action. In my view these assumptions are incorrect. Free will cannot be assumed to exist in all situations. Even if lines of action are available to us our choices may be limited by various constraints, and financial means are particularly powerful.

Simply giving a fair price does not protect people from exploitation. Poverty is becoming less well tolerated by society, and welfare support is increasingly difficult to obtain. It is not difficult to imagine an unemployed parent with debts being advised by the social security office of various methods of raising money, which might include the sale of an organ. A choice between hunger or the break up of your family and a kidney gives little room for freedom. Similarly, our health service may become run on a system of credit that we can choose to use in various ways. The catch phrase is patient choice. There is little freedom in choosing between an operation for cataract and a colonoscopy if they are both needed. The needs of treatment might demand that we sell a kidney to obtain enough credit.

It is only a short step to consider using euthanasia to obtain organs. One of the dangers of allowing euthanasia even without payment is that pressure may influence people's decision on the matter. I might choose euthanasia to relieve not only my own suffering but the financial burden on my family. The benefits of selling an organ could influence this decision. It is a sinister reminder that in Nazi Germany euthanasia was first introduced by medical researchers for the mentally ill and those with learning disabilities.²

I think that the question is not whether we should be free to sell parts of our body but whether it is appropriate to place financial value on human life. Our profession must guard against undue simplification as a solution to real ethical conflicts.

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2 Birley JLT. Psychiatrists and citizens. *Br J Psychiatry* 1991; 159:1-6.

Cervical samplers

SIR,—The statistical analysis in a paper¹ quoted by Dr Margaret Wolfendale in her editorial on cervical samplers² is fatally flawed. An appropriate analysis gives a very different conclusion from that stated: there was no significant difference between the

ability of the five sampling methods to diagnose cervical intraepithelial neoplasia (p values being between 0.2 and 0.97). A reader of Dr Wolfendale's editorial might be left with the incorrect impression that "the Cervex sampler improved the yield of . . . smears suggestive of cervical intraepithelial neoplasia grade III when compared with the modified Ayre spatula." In fact, the paper provides no evidence in favour of this conclusion.

The quoted paper has several problems. The most serious is in the analysis of data relating a diagnosis of cervical intraepithelial neoplasia to the five methods of cervical sampling (its table III). Boon *et al* obtain $p < 0.01$ by using a test for trend based on the observed ordering of the five methods rather than some predetermined natural order. With five categories such an analysis will frequently give a "significant" result. An appropriate test for differences in detection of cervical intraepithelial neoplasia grade I or II between the methods yields $\chi^2 = 0.50$, $df = 4$, $p = 0.97$. Results for cervical intraepithelial neoplasia grade III are similar. A trend test should be used only when the ordering is determined before data are collected, such as when the methods represent increasing doses or ordered age groups. This is because, even if all treatments are equally good, invariably the study's results will be ordered: one will be best and one worst. With 100 treatments, plotting the results against their ranks will yield an impressive curve that is always rising. Indeed, if the ordering was based on increasing dose it would be safe to infer a dose-response relation.

The work cited does show that certain methods (such as using a spatula with a Cytobrush) collect endocervical cells more commonly than others, but the data do not show that the methods differ with respect to detecting cervical intraepithelial neoplasia. They may detect cervical intraepithelial neoplasia grade III with quite different rates (95% confidence intervals allow a threefold to fourfold difference in rates between any two methods), but the data simply lack the power to detect any such difference.

The important lesson is not so much the particular statistical mistake or the correct analysis of such data but rather that authors should read articles (even those published in reputable journals) carefully before quoting results.

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2 Wolfendale M. Cervical samplers. *BMJ* 1991;302:1554-5. (29 June.)

AUTHOR'S REPLY,—I am grateful to Dr Sasiene for pointing out that there are flaws in Boon *et al*'s analysis of five different sampling methods for the preparation of cervical smears. This underlines the point I made regarding the absence of good comparative trials of many of these cervical samples. Though, in an ideal world, authors should check the statistical analysis of all the papers they quote, from a practical angle it is much more to the point that reputable medical journals should have a duty to their readers to ensure that the statistical analyses are correct before they accept papers for publication.

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SIR,—We agree with Dr Margaret Wolfendale that in cervical smear testing the skill of the operator is probably the most important variable in obtaining