Letters

Doctors' knowledge of exposure to ionising radiation

Finding was not surprising

Editor—Shiralkar et al surveyed doctors' knowledge of exposure to ionising radiation.[1] That doctors are unaware of the actual doses from specific examinations is not surprising.

However, rather than trying to remedy this deficiency, we should simply hammer home the message that all examinations involving irradiation should be properly justified clinically. Then everyone can be reasonably certain that, whatever the actual dose, the tiny hazard from the radiation will be outweighed by the benefits of speedy diagnosis and the institution of correct treatment (or avoidance of unnecessary treatment).

Bob Bury *consultant radiologist*
Leeds General Infirmary, Leeds LS1 3EX
bob.bury@doctors.org.uk

Competing interests: None declared.

1 Shiralkar S, Rennie A, Snow M, Galland RB, Lewis MH, Gower-Thomas K. Doctors' knowledge of radiation exposure: questionnaire study. *BMJ* 2003;327:371-2. (16 August.)

Use of chest radiography as standard comparator is flawed

Editor—While remaining keen to keep unnecessary medical exposures to a minimum, I think that the study by Shiralkar et al, and others like it, are flawed by their use of chest radiography as the standard comparator.[1]

Firstly, since this study makes it clear that none of the clinicians knew how much radiation is received during a chest x ray examination, it would be remarkable if they could estimate the relative dose from other examinations accurately.

Secondly, I suspect that most clinicians do not realise how little exposure is received during chest radiography; it is the one remarkable outlier in the range of exposures for common examinations, which makes its choice as the comparator rather pointless. The one advantage of this sort of comparison is that it allows us to scare our clinician colleagues with comments such as: "You fool, don't you realise that lumbar spine x ray is the equivalent of 120 chest *x* rays?"

I do not try too hard to prevent unnecessary chest radiography. Stopping one futile lumbar spine examination is 120 times more rewarding, especially given its low diagnostic yield.

Andrew C Downie *consultant radiologist*
Victoria Infirmary, Glasgow G42 9TY
adownie@doctors.org.uk

Competing interests: None declared

1 Shiralkar S, Rennie A, Snow M, Galland RB, Lewis MH, Gower-Thomas K. Doctors' knowledge of radiation exposure: questionnaire study. *BMJ* 2003;327:371-2. (16 August.)

Just tell them the dose

Editor—Shiralkar et al investigated doctors' knowledge of radiation exposure.[1] Our local radiology department produces x ray reports with the dose of the procedure given (in chest radiography equivalents) and (even more alarmingly) the total radiation dose given so far (also in chest radiography equivalents).

After noticing that a few of the sacroiliac views I had requested had notched up 200 or more chest radiography equivalents (each) I rapidly became an enthusiast for using magnetic resonance imaging to image this particular joint. (Fortunately we have comparatively easy access to magnetic resonance imaging—or perhaps our need for it followed directly from our awareness of radiation dose?)

Routinely reporting the radiation dose per procedure and total dose would seem (on my sample of one, me) quite effective at altering clinical practice. Perhaps this is something that should be taken on by the college nationally? After all, if you are not told the radiation dose for each procedure you are not likely to know it.

Matthew L Grove *consultant rheumatologist*
Tyneside General Hospital, North Shields
NE29 8NH
Matthew.Grove@northumbria-healthcare.nhs.uk

Competing interests: None declared.

1 Shiralkar S, Rennie A, Snow M, Galland RB, Lewis MH, Gower-Thomas K. Doctors' knowledge of radiation exposure: questionnaire study. *BMJ* 2003;327:371-2. (16 August.)

Ignorance is surprising

Editor—Although I am not surprised that all of the doctors in the study by Shiralkar et al[1] were unaware of the specific dose of radiation resulting from a chest x ray examination (how relevant is that really in clinical practice?), what I did find shocking was the revelation that some of them were unaware that ultrasonography and magnetic resonance imaging do not use ionising radiation.

This is surely basic, fundamental information for doctors working in modern Western hospitals that regularly make use of these technologies.

Daniel P Edgcumbe *medical student*
Christ's College, Cambridge CB2 3BU
dpe23@cam.ac.uk

Competing interests: None declared.

1 Shiralkar S, Rennie A, Snow M, Galland RB, Lewis MH, Gower-Thomas K. Doctors' knowledge of radiation exposure: questionnaire study. *BMJ* 2003;327:371-2. (16 August.)

Radiation protection should be taught as a priority

Editor—Although the results of the survey by Shiralkar et al are worrying, they are not at all surprising.[1]

I cannot comment on the English senior house officers and specialist registrars surveyed, but many of their counterparts interviewed in south Wales are likely to be graduates of the University of Wales College of Medicine. Having trained there myself, radiation protection seems to be an after thought despite its importance.

Students of the college are required to attend a compulsory series of lectures on radiation protection to pass final MBBCh. This series of lectures is held (or was when I qualified in 1999) after completion of finals and before examination results. This is less than ideal as students are distracted by the pending results and upcoming holidays.

As radiation exposure affects doctors' everyday clinical practice it should perhaps be regularly reinforced during hospital induction programmes to improve knowledge.

Sarah J Gorse *senior house officer plastic surgery*
Frenchay Hospital, Bristol BS16 1LE
sgorse@doctors.org.uk

Competing interests: None declared.

1 Shiralkar S, Rennie A, Snow M, Galland RB, Lewis MH, Gower-Thomas K. Doctors' knowledge of radiation exposure: questionnaire study. *BMJ* 2003;327:371-2. (16 August.)

Doctors need to be aware of possible radiation injury from fluoroscopy

EDITOR—Shiralkar et al studied doctors' knowledge of radiation exposure.[1] Doctors ordering diagnostic tests using ionising radiation should know roughly how much radiation exposure these procedures will give to their patients. More important, doctors performing fluoroscopically guided procedures must be aware of the possibility of radiation injury if the radiation exposure from these procedures is not known.

Serious, radiation induced skin injuries to patients resulting from fluoroscopically guided procedures have been reported.[2 3] Many of these procedures require extended periods of fluoroscopic exposure compared with the exposure times associated with diagnostic procedures. The onset of these injuries is usually delayed.

The absorbed dose rate in the skin from the direct beam of a fluoroscopic x ray unit is usually between 0.02 Gy/min and 0.05 Gy/min. Radiation doses of 3 Gy, 6 Gy, and 15 to 20 Gy can cause temporary epilation (loss of hair), erythema, and more severe complications such as moist desquamation, dermal necrosis, and secondary ulceration, respectively.[4] These complications are preventable by doctors' awareness of the potential hazard.

Simon S Lo *assistant professor of radiation oncology*
Loyola University Medical Center, Maywood, IL 60153, USA
slo@lumc.edu

Competing interests: None declared.

1 Shiralkar S, Rennie A, Snow M, Galland RB, Lewis MH, Gower-Thomas K. Doctors' knowledge of radiation exposure: questionnaire study. *BMJ* 2003;327:371-2. (16 August.)
2 Food and Drug Administration. *Public health advisory: avoidance of serious x-ray-induced skin injuries to patients during fluoroscopically-guided procedures. September 30, 1994.* Rockville, MD: Center for Devices and Radiological Health, FDA, 1994.
3 Huda W, Peters KR. Radiation-induced temporary epilation after a neuroradiologically guided embolization procedure. *Radiology* 1994:193:642-4.
4 Wagner LK, Eifel PJ, Geise RA. potential biological effects following high x-ray dose interventional procedures. *J Vasc Intervent Radiol* 1994;5:71-84.

Doctors' exposure to ionising radiation may be cause for concern

EDITOR—Concerns about patients' exposure to radiation at the hands of their doctors should extend to health professionals.[1] Orthopaedic theatre staff may be unaware of the following simple facts:

- Lead gowns should be 0.35 mm thick
- Surgeons' exposure is reduced by the inverted C-arm (image intensifier) technique[2]
- Any distance <90 cm from the C-arm is unsafe[3]
- The thyroid gland should be protected at all times[4]
- Hands are at high risk from radiation and orthopaedic surgeons controlling the image intensifier can reduce hand exposure.[5]

In addition to the Ionising Radiation (Medical Exposure) Regulations 2000 (www.doh.gov.uk/irmer.htm), all orthopaedic theatre staff should be monitored for central and peripheral exposure to radiation. Lead gowns should be regularly checked for cracks and thickness, and the image intensifier for radiation scattering. A study of all radiation related head and neck and upper limb malignancies would, no doubt, be of great interest to the British Orthopaedic Association.

Eleftherios Tsiridis *consultant orthopaedic surgeon*
etsiridis@hotmail.com

Patrick J Lusty *specialist registrar in trauma and orthopaedics, North East Thames Rotation*
Ali A Narvani *specialist registrar in trauma and orthopaedics, North West Thames Rotation*
Whittington Hospital, London N19 5NF

Eva M Tsapakis *clinical research fellow*
King's College Hospital, London SE5 8AF

Competing interests: None declared.

1 Shiralkar S, Rennie A, Snow M, Galland RB, Lewis MH, Gower-Thomas K. Doctors' knowledge of radiation exposure: questionnaire study. *BMJ* 2003;327:371-2. (16 August.)
2 Tremains MR, Georgiadis GM, Dennis MJ. Radiation exposure with use of the inverted-c-arm technique in upper-extremity surgery. *J Bone Joint Surg Am* 2001;83-A:674-8.
3 Mehlman CT, DiPasquale TG. Radiation exposure to the orthopaedic surgical team during fluoroscopy: "how far away is far enough?". *J Orthop Trauma* 1997;11:392-8.
4 Tse V, Lising J, Khadra M, Chiam Q, Nugent R, Yeaman L, Mulcahy M. Radiation exposure during fluoroscopy: should we be protecting our thyroids? *Aust N Z J Surg* 1999;69:847-8.
5 Noordeen MH, Shergill N, Twyman RS, Cobb JP, Briggs T. Hazard of ionizing radiation to trauma surgeons: reducing the risk. *Injury* 1993;24:562-4.

Diagnosing pigmented skin lesions in general practice

Objective assessment of skin lesions is possible

EDITOR—The paper by English et al confirms a view that serial photography does not alter the final diagnosis of a skin lesion[1]; a suspicious lesion that remains will require a biopsy to confirm the pathological diagnosis.

With serial photography it is difficult to obtain a standard image. The ambient lighting and other external factors change the view of the skin lesion—objective comparisons are therefore not possible. Furthermore, photographs may not differentiate skin lesions such as pigmented seborrhoeic keratoses and melanomas.

The dermatoscope is mandatory in evaluating a skin lesion and invaluable in helping differentiate a benign or suspicious lesion. Although lesions may be assessed visually, what is required is an objective assessment that can be recorded or photographed through the dermatoscope.[2] Had English et al performed their study by using the dermatoscope the results would have been of major interest. Unfortunately this study contradicts that by Del Mar et al and does not help primary care workers differentiate between benign and suspicious lesions.[3]

Ackerman said that "no one should die of melanoma" as this mostly arises on the external skin.[4] Therefore the principles to be applied when examining a patient with one skin lesion are that the skin is an organ and therefore the whole organ must be examined; a dermatoscope is a safe, non-invasive and cheap tool that is invaluable in differentiating suspicious lesions. These two principles will be of benefit in assessing skin lesions and enable a thorough evaluation of the patient.

M Dalvi Humzah *consultant plastic and reconstructive surgeon*
Plastic Surgery Department, Wordsley Hospital, Stourbridge, West Midlands DY8 5QX
dhumzah@hotmail.com

Competing interests: None declared.

1 English DR, Burton RC, del Mar CB, Donovan RJ, Ireland PD, Emery G. Evaluation of aid to diagnosis of pigmented skin lesions in general practice: controlled trial randomised by practice. *BMJ* 2003;327:375. (16 August.)
2 Dermoscopy of pigmented skin lesions. *Clin Dermatol* 2002;20:3.
3 Del Mar CB, Green AC. Aid to diagnosis of melanoma in primary medical care. *BMJ* 1995;310:492-5.
4 Ackerman. AB. No one should die of malignant melanoma. *J Am Acad Dermatol* 1985;12:115-6.

Authors' reply

EDITOR—We hope that views on the effectiveness of a diagnostic technique are based on the results of well conducted randomised trials. We believe that our paper was useful in showing that a method found to be effective in improving specificity without decreasing sensitivity in an earlier and less rigorous trial was, in fact, not effective.[1]

Skin surface microscopy (dermatoscopy, dermoscopy) improves the accuracy of diagnosis of pigmented skin lesions when used by experts but not when used by inexperienced examiners.[2 3] Only one randomised trial has been conducted with general practitioners; diagnoses from clinical photographs of 100 pigmented lesions were compared with those from dermoscopic photographs of the same lesions. When the general practitioners were trained, their diagnoses from the dermoscopic images were more accurate than those from the clinical photographs, but without training no difference in accuracy was observed.[4]

In the absence of trials that mimic actual general practice more closely we believe it is premature to conclude that dermoscopy in routine general practice will improve the diagnosis of pigmented skin lesions. Such a trial is in the planning stage in Australia.

D R English *associate professor*
Cancer Council Victoria, Carlton, Melbourne, VIC 3053, Australia
dallas.english@cancervic.org.au

C B Del Mar *professor of general practice*
University of Queensland, Herston, Brisbane, QLD 4006, Australia

R C Burton *professor*
National Cancer Control Initiative, Carlton, Melbourne, VIC 3053, Australia

Additional authors are R J Donovan, professor, Centre for Behavioural Research in Cancer Control, Curtin University of Technology, Perth, Australia, and G Emery, general practitioner, Perth, Australia.

Competing interests: None declared.

1 Del Mar CB, Green AC. Aid to diagnosis of melanoma in primary medical care. *BMJ* 1995;310:492-5.

2 Kittler H, Pehamberger H, Wolff K, Binder M. Diagnostic accuracy of dermoscopy. *Lancet Oncol* 2002;3:159-65.
3 Mayer J. Systematic review of the diagnostic accuracy of dermatoscopy in detecting malignant melanoma. *Med J Aust* 1997;167:206-10.
4 Westerhoff K, McCarthy WH, Menzies SW. Increase in the sensitivity for melanoma diagnosis by primary care physicians using skin surface microscopy. *BR J Dermatol* 2000;143:1016-20.

Cumulative effects of soccer heading are not fully known

EDITOR—McCrory says in his editorial that heading a soccer ball results in head accelerations of less than 10 *g* (or less than 1000 rad/s^2), whereas the minimum values for the development of sports related concussions are 40-60 *g* (or 3500-5000 rad/s^2),[1] with a reference to an article published by our group.

To mix or equate linear acceleration measured in *g* (1 *g*=9.8 m/s^2) with angular acceleration measured in rad/s^2 is not appropriate. Also, although several of our earlier studies indicated linear accelerations near 10 *g* during soccer heading, our most recent studies at higher speeds (12 m/s or 26 mph) have shown average linear accelerations of more than 20 *g* and average angular accelerations of 1500 rad/s^2 for direct frontal impacts.[2] Soccer ball speeds notably higher than 12 m/s (26 mph) are reached on the soccer field; speeds up to 54 m/s (80 mph) have been reported.[3] At these speeds, the linear and angular accelerations would be higher with greater potential for injury.

We do not believe that the minimum values of acceleration at which concussion occurs are known. In any head injury the linear and angular acceleration of the skull may combine to cause brain injury. Angular acceleration is assumed to be more important because the brain is more susceptible to the ensuing shear deformation.

In the original experiments by Gennarelli et al it was reported that monkeys that were immobilised by cervical collars were much less likely to receive concussions than animals whose heads were allowed to rotate.[4] This leads us to speculate that factors that affect angular acceleration (head position, angle of heading, location of impact) will affect the potential for injury.

Perhaps the most important predictor of concussion is a history of prior concussion. A person who has had one concussion is three times more likely to have a second, and eight times more likely to have a third concussion than a member of the general population.[5] This cumulative effect may be present at subconcussive levels as well. For this reason we do not believe that the cumulative effects of soccer heading are fully known.

Rosanne S Naunheim *associate professor*
Division of Emergency Medicine, Box 8072, Washington University School of Medicine, 660 South Euclid, St Louis, MO 63110, USA
Naunheir@msnotes.wustl.edu

John Standeven *engineer, human performance laboratory*
Department of Neurosurgery, Box 8057, Washington University School of Medicine

Philip Bayly *professor of mechanical engineering*
Box 1185, Washington University, 1 Brookings Drive, St Louis, MO 63130, USA

Competing interests: None declared.

1 McCrory PR. Brain injury and heading in soccer. *BMJ* 2003;327:351-2. (9 August.)
2 Naunheim RS, Bayly PV, Standeven J, Neubauer JS, Lewis LM, Genin GM. Linear and angular head accelerations during heading of a soccer ball. *Med Sci Sports Exercise* 2003;35:1406-12.
3 Smodlaka VN. Medical aspets of heading the ball in soccer. *Physician Sportsmed* 12:127-31.
4 Gennarelli TA. Head injury in man and experimental animals: clinical aspect. *Acta Neurochir*1983;32(suppl):1-13.
5 Annegers JF. The incidence, causes and secular trends of head trauma in Olmstead county, MN, 1935-1974. *Neurology* 1980;30:912-9.

Risk of suicide in twins

Intelligence of twins and singletons may explain risk

EDITOR—Tomassini et al presented evidence for a lower suicide rate of twins compared with singletons.[1] However, they did not present any data supporting their preferred explanative factor ("strong family ties") for this finding, and their explanation is therefore speculative. Other causal factors need to be considered. I give one example.

According to de Catanzaro's evolutionary theory of human suicide, a threshold intelligence is necessary for suicidality.[2] A corollary of this hypothesis is that human intelligence and suicide mortality should be positively related.

This prediction has been confirmed in an ecological study of 85 countries.[3] National intelligence is significantly positively related to the national suicide rate, and ethnic differences in intelligence correspond to ethnic differences in suicide rates. Furthermore, excess suicide prevalence has been observed in the highly gifted.[3]

Following these convergent strands of evidence it would be expected that population subgroups with a lower intelligence level than the generality also show lower suicide mortality than the generality. It has long been known that mean scores in intelligence tests are some 6 IQ points (or 0.4 standard deviation units) lower for twins than for singletons.[4 5] The current finding of Tomassini et al is consistent with the expectation that subgroups that are on average less intelligent than the general public also have a reduced suicide risk compared with the general public. It seems that the intelligence of twins needs to be considered as an explanatory factor for the current finding.

Martin Voracek *research resident*
Department of Psychoanalysis and Psychotherapy, Statistics and Documentation Branch, University of Vienna Medical School, A-1090 Vienna, Austria
martin.voracek@akh-wien.ac.at

Competing interests: None declared.

1 Tomassini C, Juel K, Holm NV, Skytthe A, Christensen K. Risk of suicide in twins: 51 year follow up study. *BMJ* 2003;327:373-4. (16 August.)
2 de Catanzaro D. *Suicide and self-damaging behavior: a sociobiological perspective*. New York: Academic Press, 1981.
3 Voracek M. National intelligence and suicide rate: an ecological study of 85 countries. *Pers Individ Dif* (in press).
4 Record RG, McKeown T, Edwards JH. An investigation of the difference in measured intelligence between twins and single births. *Ann Hum Genet* 1970;34:11-20.
5 Byrns R, Healy J. The intelligence of twins. *J Genet Psychol* 1936;49:474-8.

No protective effect is needed to explain the findings

EDITOR—Tomassini et al invoke strong family ties to explain their finding that twins had a lower suicide rate than the general population.[1] The phrase seems to refer to close interpersonal relations, as distinct from and in contrast to genetic similarities.

Family and twin studies have tended to show that the higher the genetic similarity between any two individuals the higher the probability that if one dies as the result of lethal self-harm the other one also will die of that cause.[2–5] Complementarily, the higher the genetic similarity between two individuals the higher the probability that if one does not die of lethal self harm the other one will not either.

By far the majority of twins, in common with people generally, die of causes other than lethal self harm. It follows that members of a group of twins are less likely to die of lethal self harm than members of a group of non-twins. No protective effect, such as strong family ties, needs to be invoked.

Thomas J Verberne *clinical neuropsychologist, retired*
14 Crampton Crescent, Rosanna, VIC 3084, Australia
Verberne@melbpc.org.uk

Competing interests: None declared.

1 Tomassini C, Juel K, Holm NV, Skytthe A, Christensen K. Risk of suicide in twins: 51 year follow up study. *BMJ* 2003;327:373-4. (16 August.)
2 Brent DA, Bridge J, Johnson BA, Connolly J. Suicidal behavior runs in families: a controlled family study of adolescent suicide victims. *Arch Gen Psychiatry* 1996;53:1145-1152.
3 Qin P, Agerbo E, Mortensen PB. Suicide risk in relation to family history of completed suicide and psychiatric disorders: a nested case-control study based on longitudinal registers. *Lancet* 2002;360:1126-30.
4 Runeson B, Åsberg M. Family history of suicide among suicide victims. *Am J Psychiatry* 2003;160:1525-6.
5 Roy A, Segal NL. Suicidal behavior in twins: a replication. *J Affect Disord* 2001;66:71-4.

Suicide has social side

EDITOR—The article by Tomassini et al and the responses to it all show an unexpected degree of social naivety in that the analysis of European suicide is not mentioned or the analysis of Scandinavian suicide by Retterstol.[1–4]

There seems to be an overemphasis verging on theoretical pathology, on the psychological factors involved in suicide, and a commensurate ignoring of the sociological factors. As Durkheim himself noted over a century ago, there is an explanatory problem with post facto psychological explanations of behaviour whose remarkable regularity over time strongly imply that factors external to the individual are operating.

If this is so, sociological factors seem to be primary, and psychological factors important with regard to the timing of the suicide: they are a contributory, but not a sufficient, cause. The sufficient cause seems to be the social relationships in which individuals are involved. The more intense and the wider the range of social ties in which an individual is enmeshed the less likely he or she is to feel "out of things," or socially marginal, and hence likely to take his or her life.

Twins are reared together and may have a more intense social life than other

children, and so the lower incidence than expected of suicide among twins is sociologically understandable.

Gerald D Sack *lecturer in social anthropology*
Safed Regional Academic College, Jezre'el Valley Regional Academic College, Mitzpe Amoka, Doar Na Merom Hagalil, Israel 13802
sack@netvision.net.il

Competing interests: None declared.

1 Tomassini C, Juel K, Holm NV, Skytthe A, Christensen K. Risk of suicide in twins: 51 year follow up study. *BMJ* 2003;327:373-4. (16 August.)
2 Electronic responses. Risk of suicide in twins. bmj.com 2003. bmj.bmjjournals.com/cgi/eletters/327/7411/373 (accessed 7 Nov 2003).
3 Durkheim E. *Suicide: a study in sociology.* New York: Free Press, 1966. (Translated by J A Spaulding and G Simpson.)
4 Retterstol N. *Suicide: A European perspective.* Cambridge: Cambridge University Press, 1993.

Authors' reply

Editor—Population based studies from Denmark have shown that family ties, such as having both parents together, being married, and having young children,[1] are associated with a lower risk of suicide. Twins represent a unique and close relationship,[2 3] which made us hypothesise that twins have a lower suicide rate. Our 51 year follow up study of more than 20 000 twins confirmed this hypothesis, but this does not in itself shed any light on the causal mechanisms.

Voracek thinks that a lower intelligence level in twins may be the reason for the lower suicide rate. Setting aside concerns about drawing causal inferences, Voracek's argument also relies on the premise that twins have a lower IQ than singletons. New research on this topic, overcoming methodological problems in the older studies, indicates that this assumption does not hold.[4]

Verberne says that our observation could simply be due to correlation in cause of death within twin pairs. Correlation within twin pairs affects the estimation of the standard error (which is, however, not a problem in our study owing to low twin concordance for suicide), but it does not bias the point estimate,[5] and therefore this cannot be the explanation of our finding of a reduced suicide rate in twins.

Sack argues that the finding should be interpreted in a sociological context, and we agree that the aetiology of suicide is complex. We believe that it has to be sought in an interaction between biological, psychological, and social factors.

Kaare Christensen *professor of epidemiology*
Institute of Public Health, University of Southern Denmark, Sdr Boulevard 23A, DK-5000 Odense C, Denmark
KChristensen@health.sdu.dk

Cecilia Tomassini *research fellow*
Centre for Population Studies, London School of Hygiene and Tropical Medicine, London WC1E 7HT

Knud Juel *senior scientist*
National Institute of Public Health, DK-2100 Copenhagen, Denmark

Additional authors are: Niels V Holm, consultant, and Axel Skytthe, senior scientist, both of the Danish Twin Registry.

Competing interests: None declared.

1 Qin P, Agerbo E, Westergard-Nielsen N, Eriksson T, Mortensen PB. Gender differences in risk factors for suicide in Denmark. *Br J Psychiatry* 2000;177:546-50.
2 Neyer FJ. Twin relationship in old age: a developmental perspective. *J Soc Pers Relat* 2002;19:155-77.
3 Tomassini C, Rosina A, Billari FC, Skytthe A, Christensen K. The effect of losing the partner and losing the twin on mortality. *Twin Res* 2002;5:210-7.
4 Posthuma D, de Geus EJC, Bleichrodt N, Boomsma DI. Twin-singleton differences in intelligence. *Twin Res* 2000;3:83-87.
5 Holm NV. The use of twin studies to investigate causes of diseases with complex etiology with a focus on cancer. PhD thesis. Odense: Odense University, 1983.

Sex difference in infant mortality in India is reflected in England and Wales

Editor—Sex differences in infant mortality have been the subject of previous international comparison and discussion, and the results presented by Khanna et al provide confirmation.[1 2] I examined whether similar sex differences exist in England and Wales.

I used unpublished data on births and infant deaths by mother's country of birth from the Office for National Statistics. In the absence of national data by ethnic origin, the data for children born to first generation migrants provide the closest proxy to outcomes for minority populations in England and Wales.

For the 19 663 births registered between 1996 and 1998 to mothers born in India, infant mortality for both sexes was 5.49 per 1000 births, an odds ratio of 1.00, which is not significantly different from the overall England and Wales ratio of 0.80 (table).

For the 37 947 births registered in the same period to mothers born in Pakistan, mortality among girls was higher than that for boys, with an odds ratio of 1.09, significantly higher ($P < 0.05$) than the overall ratio in England and Wales. For no other country of birth group was such an effect observed. Also noteworthy are the much higher infant mortality rates for this group when compared with births to other South Asian born mothers.

Odds ratios (95% CI) of female to male birth ratio by mother's country of birth, England and Wales, 1996-8

Mother's country of birth	Odds ratio	
	Female:male	95% CI
United Kingdom:	0.78	0.75 to 0.81
England and Wales	0.78	0.75 to 0.81
Scotland	0.88	0.64 to 1.22
Northern Ireland	0.83	0.46 to 1.50
Europe outside United Kingdom:	0.90	0.82 to 0.99
Irish Republic	0.62	0.40 to 0.95
Other European Union	0.78	0.56 to 1.08
Rest of Europe	1.12	0.67 to 1.86
Commonwealth:		
Australia, Canada, New Zealand	1.22	0.67 to 2.21
New Commonwealth:	0.91	0.81 to 1.02
Bangladesh	0.84	0.61 to 1.17
India	1.00	0.69 to 1.46
Pakistan	1.09	0.90 to 1.31
East Africa	0.83	0.53 to 1.29
Southern Africa	0.81	0.30 to 2.16
Rest of Africa	0.69	0.52 to 0.91
Far East	1.00	0.44 to 2.26
Mediterranean	0.79	0.40 to 1.57
Caribbean	0.85	0.54 to 1.33
Rest of New Commonwealth	0.73	0.28 to 1.91
Rest of the world and not stated	0.95	0.74 to 1.20
All	0.80	0.77 to 0.83

Source: Office for National Statistics (unpublished).

Ian Dawson *independent researcher*
Birchington, Kent CT7 9HX
tismollett@aol.com

Competing interests: None declared.

1 United Nations Department of Economic and Social Affairs, Population Division. *Too young to die: genes or gender.* New York: UN, 1998.
2 Khanna R, Kumar A, Vaghela JF, Sreenivas V, Puliyel JM. Community based retrospective study of sex in infant mortality in India. *BMJ* 2003;327:126-0. (19 July.)

Complete data are published on bmj.com

Don't blame religion for poor funerals

Editor—The funeral of Fletcher's father obviously became part of the crematorium assembly line.[1] But the fault lies not with religion or the minister but with the undertaker who chose that system and the relatives who agreed to it without asking how Mr Fletcher's life would be celebrated.

Fletcher describes how any conscientious minister, or funeral celebrant, prepares for a funeral. Religious or not, if the family had made use of the vicar of their parish they might have had a more appropriate service, where many could join in marking his father's life and death, without the time constraints of the "crem assembly line."

I suspect that Fletcher's religion of humanism colours his view of the evidence for God (many distinguished scientists believe in God) and leads to his unjustified implication that the more remarkable people request non-religious funerals. Everyone is remarkable in some way, and it is often only at their funerals that we discover just how remarkable.

Preparation for a funeral is important not just to those officiating, but to the bereaved. When my 26 year old son was killed the organisation of the funeral service, painful though it was, helped to preserve our sanity.

The task of funeral celebrants, religious or secular, is to support the bereaved through that traumatic, tearful, and rudderless time so that they can express their grief, celebrate the dead, and prepare for the long, painful struggle towards acceptance of their loss.

Anthony E J Fitchett *general practitioner*
Mornington Health Centre, 169 Englinton Road, Dunedin, New Zealand 9001
t_fitchett@yahoo.com

Competing interests: AEJF is a member of the Anglican Church in Aotearoa, New Zealand and Polynesia, and a lay representative on its general synod/te Hintoa Whanui, and he representd that church on the Anglican Consultative Council.

1 Fletcher R. From cardiac anaesthetist to humanist officiant. *BMJ* 2003;327:748. (27 September.)