PostScript

LETTER

Altitude, latitude and sex ratio at birth in Iran

It has been reported that sex ratio at birth (SRB; the ratio of male to total live births) in Europe declines with increase in latitude.¹ However, the same authors observed that changes in SRB by increasing latitude in North America compared to Europe are the reverse, and they could not explain this finding.² The aim of the present study was to test two null hypothesis that there are no differences in the ratio of male births to total births in Iran associated with either geographical latitude or altitude.

The annual number of live births by sex for the period 20 March 1993 to 19 March 2004 (1372 to 1382 Hejrae Shamsi, Iranian calendar) was obtained from the Annual Statistical Book of 27 provinces. (It should be mentioned that all provinces were included in the study except East Azarbaijan, because the data was not published for the study period.) A total of 5 294 495 births (male, 2 701 758; female, 2 592 737) were recorded in 294 Iranian towns and cities. Stillbirths are not included in this study. It should be emphasised that neither sex selection abortion nor female infanticide is practiced in Iran. Altitude and latitude information were obtained using the Geographical Atlas of Iran.

We used the odds ratio (OR) and χ^2 test for linear trend as statistical analysis methods. An OR>1.0 shows an increase and an OR<1.0 shows a decrease in SRB in comparison with the sex ratio in cities with less than 100 m of altitude as a reference value. A value of $p<0.05$ was considered statistically significant.

To investigate the effect of altitude on SRB, the towns and cities were classified into four altitudinal levels as following: <100 m, 100–1000 m, 1001–2000 m and >2000 m. Table 1 shows the total number of males and females in different altitude classes. The SRB increase with increase in altitude (χ^2 for trend is equal to 15.891, $p<0.001$).

To consider the effect of altitude in two different latitudinal areas, we classified the towns and cities of altitude level <100 m into two latitudinal levels—low latitude (25° to 32°) and high latitude (36° to 38°) regions (table 2). There was no significant difference in SRB in the two areas ($\chi^2 = 0.042$, $df = 1$, $p = 0.837$).

Our present finding is not consistent with previous reports concerning latitude and SRB. Grech *et al* found a decrease in SRB with increasing latitude in Europe¹ and a reverse effect was observed in North America.² In Europe, mountains stretch along an east–west direction, whereas in North America they stretch along a north–south direction. Therefore, it might be suggested that the reverse observed trends of SRB in Europe and North America, at least in part, is due to altitude effect. A possible correlation of SRB in Europe and North America should be investigated to test the reliability of the finding in this report.

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Table 1 Sex ratio at birth in four altitudinal areas of Iran

Altitude levels*	Male births	Female births	Total	SRB	OR† (95% CI)	p Value
<100 m	477,066	459,903	936,969	0.5092	1.0	–
100–1000 m	587,167	566,516	1,153,683	0.5089	0.999 (0.994–1.005)	0.764
1001–2000 m	1,585,295	1,516,166	3,101,461	0.5111	1.008 (1.003–1.013)	0.001
>2000 m	52,230	50,152	102,382	0.5101	1.004 (0.991–1.017)	0.548
Total	2,701,758	2,592,737	5,294,495	0.5103	–	–

*Number of towns and cities at different altitude levels of <100, 100–1000, 1001–2000 and >2000 m were 59, 56, 162 and 17, respectively.
† χ^2 for trend is equal to 15.891, $p<0.001$.

Table 2 Sex ratio at birth in low and high latitude areas with less than 100 m of altitude

Altitude levels	Number of towns and cities	Male births	Female births	Total	SRB
Low latitude	19	290,048	279,558	569,606	0.5092
High latitude	31	161,584	155,598	317,182	0.5094
Total	50	451,632	435,156	886,788	0.5093

$\chi^2 = 0.042$, $df = 1$, $p = 0.837$.

References

- 1 Grech V, Vassallo-Agius P, Savona-Ventura C. Declining male births with increasing geographical latitude in Europe. *J Epidemiol Commun Health* 2000;54:244–6.
- 2 Grech V, Vassallo-Agius P, Savona-Ventura C. Unexplained differences in sex ratios at birth in Europe and North America. *BMJ* 2002;324:1010–11.

BOOK REVIEWS

Screening in disease prevention: what works?

Edited by Walter W Holland, Susie Stewart. Published by Radcliffe Medical Press, 2005, 168 pp. ISBN 1-85775-770-X

Holland and Stewart have updated their book on screening from 1990. The new edition gives the inexperienced reader a thorough introduction to the specialty of medical screening, with numerous valuable references for further reading. The authors want to cover the entire subject of screening and that is probably the weakness of the book. We never really get an in-depth knowledge or a discussion of the specific screening programmes. Therefore, the impression after having read the book is a quick superficial introduction to a complex topic full of dilemmas.

The message to the reader is that screening does harm and some screening programmes also have benefits. Therefore, throughout the book the authors repeat the necessity to be aware of the quantitative scale: the harm-and-benefit ratio. However, a lot of the harm resulting from screening is not necessarily measurable or countable. Qualitative research would often be more adequate in describing some of the side effects of screening—for example, the medicalised society, body control, paternalism, surveillance and governmentality in prevention. Some of these perspectives are mentioned in the book but are not discussed, and important qualitative studies are not quoted—for example, Posner and Vessey's study "Prevention of cervical cancer, the patients' view". The harm-and-benefit ratio is valuable information when sustainability of a screening programme is assessed. Therefore, it would have been useful for the reader if chapters describing specific screening programmes had included a box with the harm-and-benefit ratio. In some chapters, finding these numbers is difficult, and in other chapters they are not reported.

The authors plead for full and understandable information to be given to people invited to screening. They emphasise that such information should include all possible benefits and harm, including the benefits and harm from the additional examinations a person with an abnormal screening result will be offered. It is difficult to disagree on this subject. However, published studies dealing with the lack of information at invitation to screening are not