Rapid assessment of avoidable blindness and needs assessment of cataract surgical services in Satkhira District, Bangladesh

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WORLD VIEW

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Aims: To estimate the magnitude and causes of blindness in people aged ⩾50 years in Satkhira district, Bangladesh, and to assess the availability of cataract surgical services.
Methods: 106 clusters of 50 people aged ⩾50 years were selected by probability-proportionate to size sampling. Households were selected by compact segment sampling. Eligible participants had their visual acuity measured. Those with visual acuity <6/18 were examined by an ophthalmologist. A needs assessment of surgical services was conducted by interviewing service providers.
Results: 4868 people were examined (response rate 91.9%). The prevalence of bilateral blindness was 2.9% (95% confidence interval (CI) 2.4% to 3.5%), that of severe visual impairment was 1.6% (95% CI 1.2% to 2.0%) and that of visual impairment was 8.4% (95% CI 7.5% to 9.3%). 79% of bilateral blindness was due to cataract. The cataract surgical coverage was moderate; 61% of people with bilateral cataract blindness (visual acuity <3/60) had undergone surgery. 20% of the 213 eyes that had undergone cataract surgery had a best-corrected poor outcome (visual acuity <6/60). The cataract surgical rate (CSR) in Satkhira was 547 cataract surgeries per million people per year.
Conclusions: Although the prevalence of blindness and visual impairment was lower than expected, the CSR is inadequate to meet the existing need, and the quality of surgery needs to be improved.

Global estimates suggest that there are approximately 141 million visually impaired people, of whom 37 million are blind.[1] VISION 2020—the right to sight is the joint initiative by the World Health Organization and the International Agency for the Prevention of Blindness to eradicate avoidable blindness by the year 2020. The VISION 2020 strategy depends on the development of district-level plans for the prevention of avoidable blindness.

The National Blindness and Low Vision Survey of Bangladesh was conducted in 2000.[2] A nationally representative sample of 11 624 adults aged ⩾30 years underwent detailed ophthalmic examination, of whom 1.4% were blind (95% confidence intervals (CI) 1.2% to 1.6%), most of which was due to cataract.[3] The prevalence of blindness in the poorest divisions was twice as high as that in the richest divisions. The national survey produced important data that have been used to plan a national strategy, but district-level planning and monitoring requires district-level prevalence data, together with an assessment of needs for eye care services. Satkhira is a poor district in Khulna division, located on the border of India in southwest Bangladesh. Conducting a survey of visual impairment together with a needs assessment will enable a VISION 2020 district model plan to be developed for Satkhira. This process can be used as a model for other districts in Bangladesh.

The aims of this study were to conduct a rapid assessment of avoidable blindness in Satkhira district, to estimate the prevalence and causes of blindness in people aged ⩾50 years, and to assess the availability of the cataract surgical services.

METHODS

Sample selection

The national survey indicated that the expected prevalence of blindness in adults aged ⩾50 years in Khulna division would be 5.7%.[3] Allowing for a required confidence of 95%, a precision of 20% (ie, worst acceptable result of 4.6%), a population size of about 207 500 adults aged ⩾50 years in Satkhira, a design effect of 1.7 for clusters of 50,[4] and 10% non-response, the required sample size was estimated to be 3166 people (EPI-INFO V.6.04). In all, 64 clusters of 50 adults aged ⩾50 years were required for this survey. This survey was part of a larger research project, and so for logistical reasons 106 clusters were selected.

The clusters were selected through probability-proportionate to size sampling,[5] using updated data from the 1991 national census as the sampling frame.[6] Four selected clusters had to be replaced because they were inaccessible or in unsafe areas. Households in clusters were selected by a modification of compact segment sampling.[7] The enumeration area was visited 2–3 days before the survey, and the village leaders were asked whether they could produce a sketch map of the enumeration area showing major landmarks and the approximate distribution of households. On the day of the survey, the enumeration area was divided into segments, so that each segment included about 50 people aged ⩾50 years. One of the segments was chosen at random by drawing lots and all households in the segment were included sequentially until 50 people aged ⩾50 years were identified. If the segment did not include 50 people aged ⩾50 years, then another segment was chosen at random and sampling continued.

The survey was carried out for 8 weeks from November to December 2005. In each cluster, the survey team visited households door-to-door, accompanied by a local village guide. The team conducted visual examinations in the household. If an eligible person was absent, the survey team

Abbreviations: CSR, cataract surgical rate; DEFF, design effect

Table 1 Composition of the district and sample population

	Men		Women	
Age groups (years)	District (n = 207 548)	Sample (n = 2160)	District (n = 94 831)	Sample (n = 4868)
50–59	51 058 (45.3)	789 (36.6)	43 559 (45.9)	1371 (50.6)
60–69	34 331 (30.5)	734 (33.9)	29 238 (30.9)	817 (30.2)
70–79	18 821 (16.7)	456 (21.1)	14 518 (15.3)	387 (14.3)
80+	8507 (7.5)	181 (8.4)	7516 (7.9)	133 (4.9)

Values are n (%).

returned to the household on the same day to examine the person before leaving the area. If after repeated visits the person could not be examined, information about visual status was collected from relatives or neighbours.

Ophthalmic examination

A standardised protocol was used for the rapid assessment of avoidable blindness. A survey record was completed for each eligible person. It included seven sections: general demographic information, vision and pinhole examination, lens examination, principal cause of visual impairment, history of visual impairment, why cataract operation had not been carried out and details about the cataract operation.

Visual acuity was measured by a doctor using a Snellen tumbling "E" chart, with optotype size 6/18 (20/60) on one side and size 6/60 (20/200) on the other side, at a distance of 6 or 3 m. All measurements were taken in full daylight with available spectacle correction. If visual acuity was <6/18 in either eye, then pinhole vision was also measured. Categories of visual impairment were defined as follows:

- *Blindness*: Visual acuity <3/60 in the better eye with available correction.
- *Severe visual impairment*: Visual acuity between ⩾3/60 and <6/60 in the better eye with available correction.
- *Visual impairment*: Visual acuity between ⩾6/60 and <6/18 in the better eye with available correction.

An ophthalmologist examined all participants. The lens status was assessed by a torch or by distant direct ophthalmoscopy in a shaded or dark environment without dilatation of the pupil. Lens status was graded as normal lens, obvious lens opacity present, lens absent (aphakia) or intraocular lens implantation. If the lens could not be examined (eg, corneal scarring present), then it was recorded as no view of lens. The ophthalmologist examined all eyes with a presenting visual acuity <6/18 using a torch, direct ophthalmoscope or portable slit lamp. The examination was made with pupil dilatation if the cause of visual impairment was not refractive error, cataract, aphakia or corneal scar. The principal cause of blindness or visual impairment was recorded according to the World Health Organization convention, where the major cause is assigned to the primary disorder or, if there are two existing primary disorders, to the one that is easiest to treat.[8]

Training

Four teams, each consisting of one ophthalmologist and one doctor, received 1 week training. Interobserver agreement was measured by repeat examination of 40 patients by each of the four teams. Measurement of visual acuity, lens examination and cause of blindness were compared between the teams to ensure that it was of an acceptable standard ($\kappa \geqslant 0.60$). A field supervisor accompanied the teams at least 1 day per week.

Needs assessment

To estimate the need for cataract surgery, five in-depth interviews were conducted by local ophthalmologists associated with all healthcare facilities that provided eye care services in Satkhira district. A previously validated questionnaire from the University of South Asia, Dhaka, was used. Data were collected regarding the equipment available, human resources and the number of surgeries conducted in the past year.

Statistical analysis

A software program developed for this survey (RAAB V.3.1 developed in EPI-INFO V.6.04d, using the Windows interface provided by EpiData V.3.1 and by EPI-INFO V.0.3.3.2

Table 2 Distribution by visual acuity with available correction in the better eye in adults aged ⩾50 years

	Men (n = 2160)		Women (n = 2708)		Total (n = 4868)	
VA with available correction	n	Prevalence (%, 95% CI)	n	Prevalence (%, 95% CI)	n	Prevalence (%, 95% CI)
VA <3/60						
Bilateral blindness	61	2.8 (2.2 to 3.5)	82	3.0 (2.3 to 3.8)	143	2.9 (2.4 to 3.5)
Blind eyes	270	6.3 (5.4 to 7.1)	349	6.4 (5.6 to 7.3)	619	6.4 (5.7 to 7.0)
VA between <6/60 and ⩾3/60						
Bilateral severe visual impairment	31	1.4 (0.9 to 2.0)	47	1.7 (1.2 to 2.3)	78	1.6 (1.2 to 2.0)
Severe visually impaired eyes	110	2.6 (2.0 to 3.1)	135	2.5 (2.0 to 3.0)	245	2.5 (2.1 to 2.9)
VA between <6/18 and ⩾6/60						
Bilateral visual impairment	193	8.9 (7.7 to 10.2)	215	7.9 (6.9 to 9.0)	408	8.4 (7.5 to 9.3)
Visually impaired eyes	510	11.8 (10.5 to 13.1)	538	9.9 (8.9 to 11.0)	1048	10.8 (9.9 to 11.6)
Bilateral aphakia	21	1.0 (0.5 to 1.4)	27	1.0 (0.6 to 1.4)	48	1.0 (0.7 to 1.3)
Unilateral aphakia	52	2.4 (1.8 to 3.0)	79	2.9 (2.3 to 3.5)	131	2.7 (2.2 to 3.1)
Aphakic eyes	94	2.2 (1.6 to 2.7)	133	2.5 (2.0 to 3.0)	227	2.3 (2.0 to 2.7)

VA, visual acuity.

Table 3 Causes of blindness, severe visual impairment and visual impairment in people with available correction

	Bilateral blindness, VA <3/60 (n = 143)	Bilateral severe visual impairment, VA between <6/60 and ≥3/60 (n = 78)	Bilateral visual impairment, VA between <6/18 and ≥6/60 (n = 408)
Refractive error	1 (0.7)	4 (5.1)	216 (52.9)
Cataract, untreated	113 (79.0)	61 (78.2)	171 (41.9)
Aphakia, uncorrected	2 (1.4)	0	1 (0.2)
Surgical complications	2 (1.4)	1 (1.3)	1 (0.2)
Phthysis	1 (0.7)	0	1 (0.2)
Other corneal scar	5 (3.5)	0	1 (0.2)
Posterior segment	19 (13.3)	12 (15.4)	16 (3.9)
Globe abnormalities	0	0	1 (0.2)
Avoidable blindness	124 (86.7)	66 (84.6)	391 (95.8)

VA, visual acuity.
Values are n (%).

(International Centre for Eye Health, London School of Hygiene and Tropical Medicine, London, UK)) was used for data entry and automatic standardised data analysis. The prevalence estimates took account of the design effect (DEFF) when estimating the CIs (calculated in Csample module of EPI-INFO v. 6.04b). The cataract surgical coverage of people, or the proportion of people needing surgery who had undergone cataract surgery, was calculated by dividing the number of cataract surgeries (sum of the number of people with bilateral pseudophakia or aphakia and the number of people with unilateral pseudophakia or aphakia and unilateral visual impairment) by the sum of the number of surgeries and the number of people visually impaired from cataract. Cataract surgical coverage was also calculated for eyes. As visual acuity before surgery was not known, we assumed, in turn, that only patients with visual acuity below a certain threshold (<3/60, <6/60 and <6/18) received surgery for their cataract.

Ethical approval

Ethical approval for this work was granted by the Bangladesh Medical Research Council, Dhaka, Bangladesh, and the London School of Hygiene & Tropical Medicine, London, UK. Informed verbal consent was obtained from the participants after they were given an explanation of the nature and possible consequences of the study. All people with operable cataract or other treatable conditions were referred for treatment.

Table 4 Cataract surgical coverage by person and eyes in people aged ≥50 years (best correction)

	CSC by persons (%, 95% CI)	CSC by eyes (%, 95% CI)
VA <3/60		
Men	63.6 (53.3 to 72.9)	34.6 (29.0 to 40.6)
Women	59.0 (50.3 to 67.2)	34.9 (30.2 to 40.0)
Total	60.9 (54.4 to 67.1)	34.8 (31.1 to 38.6)
VA <6/60		
Men	57.9 (48.3 to 67.0)	30.9 (25.8 to 36.5)
Women	55.1 (47.0 to 62.9)	30.4 (26.1 to 34.9)
Total	56.3 (50.1 to 62.2)	30.6 (27.3 to 34.1)
VA <6/18		
Men	34.5 (28.1 to 41.4)	17.4 (14.4 to 21.0)
Women	36.4 (30.7 to 42.5)	18.7 (15.9 to 21.8)
Total	35.6 (31.3 to 40.1)	18.1 (16.1 to 20.4)

CSC, cataract surgical coverage; VA, visual acuity.

RESULTS

Of the 5295 people in the study population, 370 people (7.0%) were not available and 57 people (1.1%) refused to be examined, so that 4868 people (91.9%) were included in the survey. The sampled population was relatively representative of the district population in terms of age and sex distribution, although women were slightly over-represented in the sample (table 1).

In all, 143 bilaterally blind people with available correction gave a sample prevalence of blindness of 2.9% (95% CI 2.4% to 3.5%), with an observed DEFF of 1.2 (table 2). The prevalence of bilateral severe visual impairment was 1.6% (95% CI 1.2% to 2.0%; DEFF 1.2) and that of bilateral visual impairment was 8.4% (95% CI 7.5% to 9.3%; DEFF 1.3). The prevalence estimates were similar in men and women. The prevalence of visual impairment and blindness increased rapidly with age. We found 48 people who had pseudophakia or aphakia in both eyes and 131 people who had unilateral (pseudo) aphakia. Men and women were equally likely to have (pseudo)aphakia.

Cataract was the primary cause of bilateral blindness (79.0%) and bilateral severe visual impairment (78.2%; table 3). Posterior segment disease (including glaucoma, diabetic retinopathy and age-related macular degeneration) was the second leading cause of bilateral blindness (13.3%) and bilateral severe visual impairment (15.4%). Refractive error was responsible for most cases of bilateral visual impairment (52.9%), followed by cataract (41.9%). Avoidable causes—that is, cataract (including unoperated and post-operative complications), refractive error and corneal scar—were responsible for almost all cases of bilateral blindness (86.7%), bilateral severe visual impairment (84.6%) and bilateral visual impairment (95.6%).

On extrapolating survey data to the age and sex distribution in the people aged ≥50 years in Satkhira district,[6] it is estimated that 2673 men and 3390 women would be blind, 1374 men and 1776 women would be severely visually impaired, and 8633 men and 7832 women would be visually impaired. The age-adjusted and sex-adjusted prevalence was 2.9% (95% CI 2.4% to 3.4%) for blindness, 1.5% (95% CI 1.1% to 1.9%) for severe visual impairment and 7.9% (95% CI 7.0% to 8.8) for visual impairment. A total of 4972 people (2080 men and 2892 women) with best-corrected bilateral visual acuity <6/60 due to cataract are estimated to require surgery.

The cataract surgical coverage was moderately high for both people and eyes (table 4). Sixty four per cent of people needing surgery at visual acuity <3/60 had received surgery. Thirty one per cent of eyes with cataract at visual acuity <6/

Table 5 Postoperative visual acuity in 213 eyes after cataract surgery, by intraocular lens status

	Non-IOL eyes (n = 96)		IOL eyes (n = 117)		All eyes (n = 213)	
Available correction	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**
Available correction						
Can see 6/18	32	33.3 (24.2 to 43.8)	96	82.1 (73.6 to 88.3)	128	60.1 (53.2 to 66.7)
Cannot see 6/18, can see 6/60	21	21.9 (14.3 to 31.7)	14	12.0 (6.9 to 19.6)	35	16.4 (11.9 to 22.3)
Cannot see 6/60	43	44.8 (34.7 to 55.3)	7	6.0 (2.6 to 12.4)	50	23.5 (18.1 to 29.9)
Best correction						
Can see 6/18	42	43.8 (33.8 to 54.2)	102	87.2 (79.4 to 92.4)	144	67.6 (60.8 to 73.7)
Cannot see 6/18, can see 6/60	17	17.7 (10.9 to 27.1)	9	7.7 (3.8 to 14.5)	26	12.2 (8.3 to 17.5)
Cannot see 6/60	37	38.5 (28.9 to 49.1)	6	5.1 (2.1 to 11.3)	43	20.2 (15.1 to 26.3)

IOL, intraocular lens.

60 had been operated. Of the 377 people from the sample who needed spectacles for distance correction (people with spectacles and people with uncorrected refractive errors), 156 people wore spectacles, giving a coverage of 41% (95% CI 36% to 47%).

Information was available on 213 eyes operated for cataract. Outcome after surgery was relatively poor (table 5). With available correction, only 60.1% (95% CI 53.2% to 66.7%) of eyes achieved a good outcome (visual acuity ≥6/18) after surgery, whereas 16.4% (95% CI 11.9% to 22.3%) had a borderline outcome (visual acuity <6/18 to 6/60) and 23.5% (95% CI 18.1% to 29.9%) had a poor outcome (visual acuity <6/60).[9] This improved with best correction, so that 67.6% (95% CI 60.8% to 73.7%) of eyes achieved a good outcome. Satisfaction with surgery was reported by 160 respondents. Most people were very satisfied (41.3%) or somewhat satisfied (41.9%) with the surgery, whereas few were indifferent (3.1%), somewhat dissatisfied (7.5%) or very dissatisfied (6.3%). People with a cataract causing a visual acuity <6/60 in the better eye were asked why they had not gone for surgery. The most common reasons were "not aware of surgery" (45.0%) or "cannot afford the operation" (36.0%).

Needs assessment

Five healthcare facilities provided eye care services in Satkhira district, seeing more than 34 000 outpatients in 2005. Three of the facilities also carried out cataract surgery. All surgeries were extracapsular cataract extraction or phaco. All surgeries were funded by the patient, with costs ranging from Taka (Tk) 3500 (about £35) for a locally produced intraocular lens to Tk8500 for a European or a US intraocular lens. Two of the healthcare facilities interviewed did not carry out surgery. Despite the presence of a surgeon, one of these units had been unable to carry out surgery for the past year because of the absence of a bulb for their operating microscope. The other unit arranged transport for patients to a large eye hospital about 90 mins drive away, every 90 days. In all, 729 cataract surgeries were carried out in Satkhira district in the 12-month period up to December 2005, and there were 280 referrals for cataract surgery to a hospital in Khulna. This produces a cataract surgical rate of 547 operations per million people per year.

DISCUSSION

The rapid assessment of avoidable blindness of people ≥50 years old in Satkhira district found a relatively low prevalence of bilateral blindness, severe visual impairment and visual impairment. Most cases of blindness and severe visual impairment were due to cataract, whereas most cases of visual impairment were due to cataract and refractive error. Almost all cases of blindness, severe visual impairment and visual impairment were due to avoidable causes. The cataract surgical coverage was reasonably high, despite a low overall CSR and concerns about quality of surgery. Fewer than half of the people who needed spectacles wore them, possibly owing to limited access to refractive services. Although the prevalence of blindness and visual impairment was low, it still represents a sizeable number of people. Most of the visual impairment is avoidable, but current levels of service provision are inadequate to tackle this problem.

The current CSR in Satkhira is about 550 surgeries per million people per year, which is low for Asia and similar to the CSR of African countries.[10] The CSR in Satkhira could be increased by following simple measures, such as ensuring that hospital equipment is functioning. The quality of surgery also needs to be improved, as almost one in four eyes had a poor outcome after surgery. Implementing a monitoring system for cataract surgical results could sensitise surgeons to quality control, thereby improving outcomes after surgery.[11–14] The coverage with spectacles was relatively poor, as only 4 of every 10 people who needed spectacles at visual acuity <6/18 had them, supporting the widespread unmet need for spectacles shown in the national survey.[15] Although we did not examine for presbyopia, most survey participants will also need presbyopic glasses owing to their age. Availability of spectacles can be improved by training more mid-level ophthalmologists and offering off-the-shelf spectacles.[15]

On the basis of the national survey, the prevalence of blindness observed in the rapid assessment of avoidable blindness in Satkhira district was lower than expected, although the distribution of causes was similar.[3] It is surprising that the prevalence of blindness was lower in Satkhira than in the country as a whole, as Satkhira is a poor and underserved area with few eye care services. The difference in prevalence is unlikely to indicate a falling trend, as the time between the two surveys was relatively short. The difference is not likely to be explained by bias in the Satkhira survey. Serious selection bias is unlikely, as the response rate was high and the sample was representative of the district population. Information bias in the survey was also unlikely, as the examinations were conducted by experienced ophthalmologists with acceptable interobserver reliability. The national survey used the random walk method for selecting people in the cluster,[16] which may have led to an overestimation of the prevalence of blindness if blind people were preferentially included. In contrast, compact segment sampling was used for the survey,[7] which ensured objectivity in household selection[17] and avoided other biases inherent in the random walk methodology.[18]

CONCLUSIONS

The RAAB survey in Satkhira found a lower than expected prevalence of blindness. Most cases of blindness and visual impairment can be treated by cataract surgery and by distributing spectacles. The CSR is insufficient to meet current needs and attention needs to be paid to improving outcome after surgery.

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REFERENCES

1 **Resnikoff S**, Pascolini D, Etya'ale D, *et al*. Global data on visual impairment in the year 2002. *Bull World Health Organ* 2004;**82**:844–51.
2 **Bourne RR**, Dineen B, Modasser Ali S, *et al*. The National Blindness and Low Vision Prevalence Survey of Bangladesh: research design, eye examination methodology and results of the pilot study. *Ophthalmic Epidemiol* 2002;**9**:119–32.
3 **Dineen BP**, Bourne RR, Ali SM, *et al*. Prevalence and causes of blindness and visual impairment in Bangladeshi adults: results of the National Blindness and Low Vision Survey of Bangladesh. *Br J Ophthalmol* 2003;**87**:820–8.
4 **Limburg H**, Kumar R, Indrayan A, *et al*. Rapid assessment of prevalence of cataract blindness at district level. *Int J Epidemiol* 1997;**26**:1049–54.
5 **Mathenge W**, Kuper H, Polack S, *et al*. Rapid assessment of avoidable blindness in Nakuru district, Kenya. *Ophthalmology*. In press.
6 **Bangladesh bureau of statistics**. *Bangladesh population census 1991*. Dhaka: Statistics Division, Ministry of Planning, 1997.
7 **Turner AG**, Magnani RJ, Shuaib M. A not quite as quick but much cleaner alternative to the Expanded Programme on Immunization (EPI) Cluster Survey design. *Int J Epidemiol* 1996;**25**:198–203.
8 **World Health Organization**. Programme for the Prevention of Blindness and Deafness. *Coding instructions for the WHO/PBL eye examination record (version III)*. Geneva: WHO, 1988:1–17.
9 **World Health Organization**. *Informal consultation on analysis of blindness prevention outcomes*. Geneva: WHO, 1998, WHO/PBL/98.86.
10 **World Health Organization**. *Cataract Surgical Rate (CSR)*. Geneva: WHO, 2006, http://www.who.int/blindness/data_maps/cataract_surgery_rate/en/ (accessed 27 Jul 2006).
11 **Limburg H**, Foster A, Vaidyanathan K, *et al*. Monitoring visual outcome of cataract surgery in India. *Bull World Health Organ* 1999;**77**:455–60.
12 **Yorston D**, Gichuhi S, Wood M, *et al*. Does prospective monitoring improve cataract surgery outcomes in Africa? *Br J Ophthalmol* 2002;**86**:543–7.
13 **Limburg H**, Foster A, Gilbert C, *et al*. Routine monitoring of visual outcome of cataract surgery. Part 2: results from eight study centres. *Br J Ophthalmol* 2005;**89**:50–2.
14 **Limburg H**, Foster A, Gilbert C, *et al*. Routine monitoring of visual outcome of cataract surgery. Part 1: development of an instrument. *Br J Ophthalmol* 2005;**89**:45–9.
15 **Bourne RR**, Dineen BP, Huq DM, *et al*. Correction of refractive error in the adult population of Bangladesh: meeting the unmet need. *Invest Ophthalmol Vis Sci* 2004;**45**:410–17.
16 **World Health Organization**. WHO Expanded Programme on Immunization. *Training for mid-level managers: The EPI coverage survey*. Geneva: WHO, 1991.
17 **Milligan P**, Njie A, Bennett S. Comparison of two cluster sampling methods for health surveys in developing countries. *Int J Epidemiol* 2004;**33**:469–76.
18 **Bennett S**, Radalowicz A, Vella V, *et al*. A computer simulation of household sampling schemes for health surveys in developing countries. *Int J Epidemiol* 1994;**23**:1282–91.

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