

Mortality in Iraq

The uncertainty of estimates from retrospective mortality surveys in humanitarian emergencies is composed of both sampling and reporting errors. Gilbert Burnham and colleagues, in their mortality study in Iraq (Oct 21, p 1421),¹ quantify the sampling error, but the security situation did not allow for the supervision and repeat interviews needed to estimate reporting errors.

Over-reporting of deaths was regarded as limited because 92% of reported deaths were supported by death certificates, but Burnham and colleagues do not report who issued these certificates. Neither do they discuss why the availability of death certificates increased from 81% in 2004.²

The existence of a substantial reporting error is supported by the finding of low child mortality. The study population only reported 54 non-violent deaths in those younger than 15 years, and 1474 births—ie, an under-15 mortality of 36 per 1000 births. This is a third of the estimated preinvasion under-5 mortality.³ Since nothing indicates that child mortality has decreased,⁴ the results suggest that fewer than half of child deaths were reported.

Without an explanation for the high availability of death certificates, one could assume that the reporting error is of the same size as the sampling error ($\pm 30\%$). This assumption still yields at least a five-fold higher number of violent deaths than the passive surveillance mortality numbers.⁵ If the death certificates are valid and the availability above 90%, it seems better to monitor mortality by compiling data from the local agencies that issue these certificates than by doing further dangerous household surveys.

We declare that we have no conflict of interest.

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- 1 Burnham G, Lafta R, Doocy D, Roberts L. Mortality after the 2003 invasion of Iraq: across-sectional cluster sample survey. *Lancet* 2006; **368**: 1421–28.
- 2 Roberts L, Lafta R, Garfield R, Khudhairi J, Burnham G. Mortality before and after the 2003 invasion of Iraq: cluster sample survey. *Lancet* 2004; **364**: 1857–64.
- 3 Ali MM, Blacker J, Jones G. Annual mortality rates and excess deaths of children under five in Iraq, 1991–98. *Popul Stud* 2003; **57**: 217–26.
- 4 UNICEF. The State of the world's children 2007. New York: United Nations Children's Fund, 2006.
- 5 Iraq Body Count. <http://www.iraqbodycount.net/> (accessed Dec 18, 2006).

Gilbert Burnham and colleagues¹ do a commendable study of mortality in Iraq in difficult circumstances. Our concerns are two: the reasonably small number of clusters, which might generate random errors, and selective biases if households over-reported mortality during the conflict period. The survey work was done by physicians, and it might well be that households reported mortality in homes other than their own.

To address possible biases, Burnham and colleagues might wish to report three specifics: (a) were the proportions of households who could produce a death certificate similar during the pre-conflict and conflict periods (and did the survey team have any way of assessing whether identifier information on the death certificates matched household details)? (b) was there any specific digit or date preference pattern in the deaths reported in the post-conflict period that might suggest false reporting? and (c) was there any difference in the death rates for the first, middle, and last thirds of the sampling period? (if households wanted to over-report mortality, news of the survey would have spread to other areas only after the survey began).

Similarly, as an additional validity check on rates, they might apply "capture-recapture" methods to

their earlier study² and their current study in areas that were in common in those sampled areas for the pre-conflict period. A general weakness of the method was the lack of resampling by independent teams. Our large-scale mortality studies in India^{3–5} find that repeat survey of at least 5–10% provides far more stable cause-specific mortality rates than do single surveys.

We declare that we have no conflict of interest.

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- 1 Burnham G, Lafta R, Doocy S, Roberts L. Mortality after the 2003 invasion of Iraq: a cross-sectional cluster sample survey. *Lancet* 2006; **368**: 1421–28.
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- 3 Registrar General of India. Special Fertility and Mortality Study, 1998: A report of 1.1 million households. New Delhi: Registrar General, 2005.
- 4 Jha P, Gajalakshmi V, Gupta PC, et al, for the RGI-CGHR Prospective Study Collaborators. Prospective study of one million deaths in India: rationale, design, and validation results. *PLoS Med* 2006; **3**: e18.
- 5 Gajalakshmi V, Peto R, Kanaka S, Jha P. Smoking and mortality from tuberculosis and other diseases in India: retrospective study of 43 000 adult male deaths and 35 000 controls. *Lancet* 2003; **362**: 507–15.

Crucial weaknesses exist in Gilbert Burnham and colleagues' study of Iraq's war-related mortality.¹

First, 47 clusters seem to be too few for a large population experiencing highly localised violent events.

Second, household sampling within clusters was not random: only households located on or near residential streets crossing a main street had a chance of inclusion,² and only if located near the "start household" for that cluster.

Third, it is infeasible that "One team could typically complete a cluster of 40 households in 1 day".

The printed journal includes an image merely for illustration

See [Perspectives](#) page 99