Systematic review of effect of community-level interventions to reduce maternal mortality


CRD summary
This review investigated whether community-level interventions could reduce maternal mortality. Improvement of perinatal care practices reduced maternal mortality (two randomised controlled trials), but minimal targeted antenatal care did not affect maternal mortality compared to standard care (three randomised controlled trials). The authors' conclusions reflected the limited available evidence and are likely to be reliable.

Authors' objectives
To review the effectiveness of community-level interventions to reduce maternal mortality.

Searching
MEDLINE, EMBASE, The Cochrane library, CINAHL, British Nursing Index, CAB Abstracts, IBSS, Web of Science, LILACS and African Index Medicus databases were searched from inception (or 1982) to June 2006. Search terms were listed in the review. Searches for unpublished works were performed using National Research Register website, metaRegister and the World Health Organization International Trial Registry. Bibliographies of identified papers and major relevant journals up to July 2007 were handsearched. Leading authors in the area were contacted. No language restrictions were applied.

Study selection
Eligible studies were controlled studies of general maternity populations or women of childbearing age (15 to 49 years) who took part in a community-level intervention that reported on maternal deaths. A community-level intervention was defined as one accessed locally at the participant's home, village, school or local clinic, or was delivered by any person within the community, including health personnel or lay individuals. Control groups were defined as concurrent comparable populations experiencing either usual care (including hospital-based care) or other community interventions. Maternal mortality was defined using the ICD-10 definition. Studies of non-general maternity or childbearing age women (for example, disease-specific studies) and pharmacological and nutritional interventions were not eligible for inclusion.

Studies conducted in primary care settings that were designed to provide normal pregnancy and childbirth services were eligible for inclusion. No further study design criteria were defined. The included studies were cluster randomised controlled trials and cohort studies. In the included studies, the interventions were various, but could be classified as either aimed at improving perinatal care practices or providing minimal goal-oriented antenatal care. Studies were set in various countries (Nepal, Pakistan, Zimbabwe, Argentina, Cuba, Saudi Arabia, Thailand, Switzerland, Senegal, Gambia, Bangladesh and China) in both rural and urban settings.

Two authors independently assessed titles and abstracts of potential references for eligibility. Two authors (one the same, one other) assessed all full papers for eligibility.

Assessment of study quality
Two authors independently assessed the internal validity of included papers based on selection, performance, measurement and attrition biases. For each bias, they ranked each paper as high, medium or low/unclear quality. Discrepancies were resolved by discussion with other authors.

Data extraction
Data were extracted to generate maternal mortality rates for each arm of the included studies. For cluster randomised trials, the design effect was computed from published data presented in the study reports. Sample size and number of events were adapted to allow for clustering. If required data were not available, a design effect was computed using the mean intra-class correlation coefficient from all other trials with available data. For each study, an odds ratio and confidence interval adjusted for clustering was calculated.
Two authors independently extracted data using a piloted data extraction form. Discrepancies were resolved by discussion with other authors.

**Methods of synthesis**
Odds ratios were pooled using the Peto method. Results of randomised trials and cohort studies were considered separately. Meta-analysis, stratified according to the purpose of the intervention, was performed for studies without a high risk of bias. The authors stated that there were inadequate data to test for heterogeneity.

**Results of the review**
Thirteen studies were included in the review. Two studies did not report participant numbers. The other studies included 118,467 maternities (pregnant women, pregnancies, deliveries or live births). Five studies were cluster randomised controlled trials of medium or high quality; eight observational studies were generally of low or unclear quality.

The authors stated that the non-randomised studies were of insufficient quality to draw conclusions about their effectiveness.

Improvement of perinatal care practices (two randomised controlled trials): The intervention was associated with lower maternal mortality, odds ratio 0.62 (95% CI: 0.39, 0.98, p=0.042). Both trials were in resource-poor rural settings.

Three randomised controlled trials found that minimal targeted antenatal care did not affect maternal mortality compared to standard care.

**Authors' conclusions**
Community-level interventions of improved perinatal care practices can reduce maternal mortality. Further studies in different settings and contexts were required.

**CRD commentary**
The review addressed a clear question. Participant, intervention and outcome inclusion criteria were clearly stated. The search strategy involved searching several databases, including searching for unpublished work. It was unlikely that the results were affected by publication or language bias. The authors used methods to reduce the chance of error in the study selection process. The validity assessment was appropriate and led to the authors excluding the results of observational studies due to their low quality.

Although combining studies of minimal targeted antenatal care might be questionable, the authors justified this well. Meta-analysis was appropriately conducted and reported. The authors noted the paucity of data precluded them from assessing heterogeneity.

This well-conducted review considered the limitations of the available evidence and its conclusions appear to be reliable.

**Implications of the review for practice and research**
Practice: Countries or agencies implementing community-level programmes to reduce maternal mortality could use cluster trial techniques, such as randomised roll-out, to generate effectiveness evidence and inform policy.

Research: Programmes to improve maternal mortality should be evaluated using randomised controlled studies. Further studies in different settings and contexts were required.

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