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Reducing maternal and neonatal mortality in the poorest communities

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Current programmes are often failing to reach those at highest risk of maternal and neonatal death. The international community needs to learn from community trials in the South

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Every year 530 000 women die from maternal causes, four million infants die in the neonatal period, and a similar number are stillborn.^{w1 w2} Despite a plethora of newly validated interventions, the millennium development goals to reduce maternal mortality by three quarters and child mortality by two thirds are unlikely to be achieved.¹ One of the reasons for this is that current safer motherhood and newborn care programmes emphasise interventions that do not reach the poorest households. Community based interventions have been neglected and undervalued. In this article, we argue that large scale community effectiveness trials

are both necessary and feasible if we are to make further progress with reducing maternal and child mortality.

Problems with current interventions

The fact that poor people are both more likely to become ill and less likely to get appropriate treatment has not changed since Tudor Hart articulated it in the 1970s.^{w3} This fact also underlies the fallacy of the assumption that interventions to tackle conditions concentrated primarily among poor people will benefit primarily their poor victims.^{w4} The highest maternal and neonatal death rates occur in poor populations. In north India, three fifths of rural women do not have any antenatal care;^{w5} in Indonesia, a third of maternal deaths occur in the poorest quintile;^{w6} and in 44 countries mothers from the richest quintile are three times more likely to have a birth attendant than those in the poorest quintile.

Most maternal and neonatal deaths take place at home, beyond the reach of health facilities. Current international policy emphasises the provision of skilled birth attendants and improved obstetric services in health facilities as key interventions to reduce neonatal and maternal mortality.^{2 w7} The Averting Maternal Death and Disability programme goes further in arguing for a primary focus on the development of

Peer education is the best method of changing behaviour

References w1-w13 are on bmj.com

emergency obstetric care at district hospitals.³ Such policies are essential to achieve what should be a basic right for every woman. But skilled attendance and institutional delivery alone is not a credible strategy for reducing mortality in populations where most mothers deliver at home.

In a dissenting appendix to a recent global review, Abhay Bang questioned an approach based on skilled attendance and institutional delivery, suggesting that the inference that training traditional birth attendants did not succeed was a “half-truth,” and that community neonatal care was more cost effective than institutional care.⁴ Bang and colleagues showed a 62% reduction in neonatal mortality in rural India through a community based approach that included training of traditional birth attendants and local women to treat sick newborn infants at home.⁵ Our trial in Nepal of a less intensive community intervention showed a 30% reduction in neonatal mortality and, surprisingly, a significant reduction in maternal mortality.⁶ This supports the idea that primary care strategies can reduce maternal and neonatal mortality substantially in areas with high rates, even if institutional approaches are necessary to reduce them further.

What is the threshold for this? China reduced its maternal mortality to 120/100 000 through primary care, although Koblinsky and colleagues suggest that there is no evidence that a rate below 100/100 000 could be achieved using a primary care strategy alone.⁷ Yet 41 of 47 countries in Africa still have maternal mortality above 350/100 000, as do most countries in South Asia.¹⁸

Community based interventions

Epidemiology has been criticised for concentrating on biomedical rather than social issues, and researchers have been encouraged to tackle the political aspects of public health through community based participatory research.⁸ Such research is an example of transfer of knowledge from South to North. The philosophy, politics, and praxis of community engagement is at the core of work conducted over the past 50 years by such catalytic figures as Gandhi, Freire, and Chambers. Why not dignify this approach with best practice public health research? Evidence is growing for use of community based interventions to reduce maternal and neonatal mortality, as we describe below.

Interventions based on community participation

Our cluster randomised controlled trial of a community based intervention in Nepal shows the potential of this approach.⁶ In each intervention cluster, one woman facilitator convened nine, monthly women's group meetings. She supported the groups through an action learning cycle in which they identified local perinatal problems and formulated strategies to overcome them. Women in intervention clusters had more antenatal care, institutional delivery, trained birth attendance, and hygienic care. This social intervention harnessed the creativity, self interest, and self organising activities of poor women, and seems to have had results unpredicted by linear biological models.⁶

Communities often show an overwhelming preference to seek care locally.¹⁹ Safer motherhood and newborn care programmes must tackle the resulting delays

in seeking care—for example, recognition of a problem at home, a decision to seek care, getting transport to a health facility. As well as improving hygiene practices at home, the Nepal intervention probably shortened delays through better awareness of warning signs, less dependence on traditional remedies, and the development of stretcher schemes and funds to allow transport of sick mothers and newborns to health facilities.

Family planning

The importance of family planning in reducing maternal mortality is uncontroversial. As many as 50% of pregnancies are unplanned and 25% are unwanted, and complications of unsafe abortion are responsible for a substantial proportion of deaths.¹⁰ The existing demand for family planning services could reduce maternal deaths in developing countries by 20% or more. Bangladesh, which achieved great success in expanding family planning uptake and reducing fertility rates, reduced maternal mortality from 850/100 000 in 1990 to 380/100 000 in 2000, even though, in 2002, only 12% deliveries had a skilled attendant.¹⁸

Treatment of perinatal sepsis

Semmelweis convincingly showed the contribution of puerperal sepsis to maternal mortality in 1846. Attention to hygiene greatly decreased maternal mortality, but cleanliness in childbirth remained poor in the industrialised world well into the 20th century. Detailed analysis of the fall in maternal mortality in the United Kingdom in the middle of the last century showed that 40% of the reduction followed treatment of infection rather than sophisticated obstetric care; maternal mortality from sepsis fell from 203/100 000 in 1931, when sulphonamides became available, to 58/100 000 just nine years later.⁹ A recent meta-analysis of community based treatment of acute respiratory infections underlines the potential for reducing neonatal mortality,¹⁰ and the results of our Nepal trial seem to reflect prevention or early treatment of sepsis.⁶

Management of postpartum haemorrhage

Because postpartum haemorrhage can kill within two hours, an effective community based intervention could prevent many of the 140 000 annual deaths.¹² In 1996, it was suggested that misoprostol (a prostaglandin E1 analogue) might be a suitable treatment as it is inexpensive, orally administered, and does not require refrigeration.¹¹ By 2001, WHO had reported a hospital based trial of misoprostol versus oxytocin. The authors concluded that oxytocin was preferable for clinical use, but the study did not examine whether misoprostol could reduce haemorrhagic death outside hospital in high risk populations.¹¹ Despite numerous clinical evaluations showing misoprostol's safety and effectiveness,¹² no trial has examined this, and a low cost drug that could be carried by community health workers is little used. The failure to evaluate misoprostol properly is a serious omission in international public health. Pharmaceutical and international politics may have played a part, given its use to induce abortion.

Collaboration with traditional birth attendants

Speculation about the cost and effectiveness of programmes to train traditional birth attendants has led to their widespread abandonment, despite an

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absence of trial evidence.¹³ Absence of evidence of effect is not evidence of absence of effect. A recent meta-analysis of 60 studies showed that training traditional birth attendants was associated with significant improvements in performance and mortality.¹² Concerns about the cost effectiveness of training traditional birth attendants are legitimate in settings where their coverage or workload is low. Nevertheless, they are often key providers of support and opinion in their communities. We believe that in countries where maternal mortality is high and use of traditional birth attendants common, programmes should collaborate with them to promote reproductive health and hygiene, avoid delays in seeking care for complications, and perhaps to help with vital surveillance.

Need for large scale community public health trials

Improving obstetric care and midwifery skills should remain a core element of safer motherhood and newborn health programmes. The low coverage of health centre based obstetric care and the potential value of primary care strategies, however, provides an imperative to evaluate the cost effectiveness of community interventions.

Only one community effectiveness study has reported maternal mortality as a primary outcome, a trial of vitamin A supplementation in pregnancy which showed a 40% reduction in maternal mortality in Nepal.¹³ This paucity of evidence reflects a widely held belief that trials, even if necessary, are not practicable. We disagree with the assertion that large scale community effectiveness trials would "require resources ... that could ... be much better spent on programs to save lives."¹² Our trial in Nepal was inexpensive and took four years to complete. Such randomised trials are important: they measure the true scale of a problem, accurately assess community and cost effectiveness, and avoid investment in ineffective strategies.

In communities where maternal mortality is above 150/100 000 and neonatal mortality above 35/1000, we suggest that a combination of the approaches described above could potentially reduce maternal and neonatal mortality by 30% or more, and should at least be evaluated. In areas of high prevalence of malaria and HIV, community initiatives could also address prevention of malaria in pregnancy and voluntary

Summary points

The millennium development goals for reducing maternal and child mortality will not be achieved in most developing countries

Programmes emphasising skilled attendance and institutional delivery are missing the poorest populations, where most mothers deliver at home

Evidence is growing that community based interventions are effective in reducing maternal and neonatal deaths in countries with high mortality

Randomised, controlled trials of the community effectiveness of interventions are urgently required

counselling, testing, and use of antiretroviral drugs for HIV. A trial with maternal mortality as an outcome would require a sample size of 30 000-120 000 pregnancies depending on baseline rates, the design effect for clustering, and the desired statistical precision. Studies of neonatal mortality would require much smaller sample sizes. Both would allow analysis of other outcomes such as rates of use of birth attendants and referrals for obstetric care.

Contributors and sources: For six years AC, DO, and DM have worked together on a community effectiveness trial to improve maternal and newborn care in rural Nepal. DM has been a national adviser to the government of Nepal on safer motherhood and newborn health policy. AC and DO are collaborating with local partners on perinatal community effectiveness trials in Bangladesh, India, and Malawi. AC will act as guarantor.

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Learning from low income countries

Webchat

At 4 pm local UK time, Thursday 18 November, we're hosting a one hour webchat devoted to the topic.

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