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Commentary: Participatory interventions reduce maternal and child mortality among the poorest, but how do they work?

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In this issue of *IJE*, Houweling *et al*[1] report a remarkable impact of a participatory intervention in India on neonatal mortality, particularly among the poorest families in the study population. Coming out on the year of John Snow's bicentenary, this article made me feel as puzzled as I think Snow did, when he made his groundbreaking observations on cholera transmission. Without any question, Snow detected a clear and strong association, but he could not describe the biological mechanism behind the observed effect, because micro-organisms were yet to be discovered. This also applies to the present paper.

Houweling *et al*[1] add an equity dimension to a previously published trial. The earlier report provided

experimental evidence that a participatory intervention through women's groups improves maternal and child mortality outcomes. The present article shows that the impact was largely due to improvements among the poorest. In their report, attendance at a cycle of 20 meetings over a 2-year period was associated with a 71% reduction in neonatal mortality among the most marginalized groups after 3 years. Neonatal mortality has a variety of causes including complications of preterm birth, intrapartum-related conditions, sepsis, pneumonia and congenital abnormalities, among others.[2] A 71% reduction would require sizable reductions in several of these conditions. Yet, there was no increase in health care use among the most marginalized relative to the comparison group. Also, there was no strong statistical evidence of changes in life-saving behaviours in the intervention group. The most consistent findings were that birth attendants in the intervention group were more likely to employ hygienic measures during childbirth, even though caregivers were not targeted by the intervention. To make results even harder to interpret, attendance among the most marginalized was barely over 50% after 3 years.

Therefore, 70% of deaths were prevented although only 50% of the women attended. A note of caution is that the reported reduction has very wide confidence intervals, being also consistent with smaller estimates of impact. However, these are not isolated findings. Trials led by the same team of investigators were carried out in Nepal,[3] where a similar intervention led to a 30% reduction in neonatal mortality and a 70% reduction in maternal mortality (again with wide confidence intervals). In that trial, however, there were important improvements in use of health services in the intervention group, although only 37% of pregnant women (8% of all women) attended the groups. In contrast, a similar trial in Bangladesh also led by the same team, but reaching a much larger population, found no evidence of a reduction in neonatal mortality and—if anything—a slight increase in maternal mortality.[4] Possible explanations for the discrepancies in the findings of the three studies were proposed by the authors: the size of intervention clusters in Bangladesh was much greater than in the other studies; intervention quality was less adequate; and contextual factors (gender issues and transportation difficulties) may have played a negative role.[4]

There is little doubt that the three trials, including the one reported in the present issue, provide solid evidence. The randomized design, high rates of follow-up and state-of-the-art statistical analyses all support the existence of a real effect in two of the trials. What I find most puzzling is understanding more precisely how this effect took place, or why if failed to occur in the Bangladesh study.

Participatory women's groups are not directly aimed at changing specific health related behaviours or boosting use of services, but are based on Paulo Freire's concept of 'conscientização', or creating critical consciousness.[5] This entails understanding the causes of poverty and related problems, so that communities can be empowered to take control over resources and decision-making.[6] The mere fact that the authors have decided to employ rigorous scientific methods to evaluate this type of intervention is laudable. Yet, there is a long causal chain between critical consciousness and mortality. This effect is likely to mediated by increased access to economic resources and information, greater uptake of preventive and curative interventions, and improved health-related behaviours. The trials are not consistent in showing which of these aspects were likely to have played a larger role, as mechanisms seemed to vary from one study site to another.

We are therefore in a situation that is not unlike that faced by Snow over 150 years ago. There was undoubtedly a clear association, but the precise mechanism was unknown at that stage. Let us hope that further research will help us understand these mechanisms more precisely, not only to increase the believability of the trial results, but also to understand how such interventions may be scaled up effectively. This will help convince conventional epidemiologists to think outside the box and look beyond proximate, biomedical determinants of maternal and child mortality. Such evidence may also help us understand the persistent socioeconomic inequalities in maternal and child mortality, which are likely to be affected not only by access to economic resources and health care, but also by issues related to empowerment and ability to control one's life conditions.

Further research is badly needed—and hopefully we will not have to wait for decades after the original study findings, as was the case for the discovery of *Vibrio cholerae* that only took place 25 years after Snow's death.

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