Improved neonatal survival after participatory learning and action with women's groups: a prospective study in rural eastern India

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Objective To determine whether a women's group intervention involving participatory learning and action has a sustainable and replicable effect on neonatal survival in rural, eastern India.

Methods From 2004 to 2011, births and neonatal deaths in 36 geographical clusters in Jharkhand and Odisha were monitored. Between 2005 and 2008, these clusters were part of a randomized controlled trial of how women's group meetings involving participatory learning and action influence maternal and neonatal health. Between 2008 and 2011, groups in the original intervention clusters (zone 1) continued to meet to discuss post-neonatal issues and new groups in the original control clusters (zone 2) met to discuss neonatal health. Logistic regression was used to examine neonatal mortality rates after 2008 in the two zones.

Findings Data on 41 191 births were analysed. In zone 1, the intervention's effect was sustained: the cluster-mean neonatal mortality rate was 34.2 per 1000 live births (95% confidence interval, CI: 28.3–40.0) between 2008 and 2011, compared with 41.3 per 1000 live births (95% CI: 35.4–47.1) between 2005 and 2008. The effect of the intervention was replicated in zone 2: the cluster-mean neonatal mortality rate decreased from 61.8 to 40.5 per 1000 live births between two periods: 2006–2008 and 2009–2011 (odds ratio: 0.69, 95% CI: 0.57–0.83). Hygiene during delivery, thermal care of the neonate and exclusive breastfeeding were important factors.

Conclusion The effect of participatory women's groups on neonatal survival in rural India, where neonatal mortality is high, was sustainable and replicable.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

Of the world's 2.9 million neonates who die in the first month of life each year,[1] around 30% (i.e. approximately 876 000) are born in India.[2] Meeting the United Nations' Millennium Development Goal for reducing child mortality (MDG 4) requires a focus on India's poorest communities and, as neonatal deaths account for 52% of deaths in children aged under 5 years in the country, on the survival of neonates.[2,3]

The National Rural Health Mission, which was established by the Government of India, has introduced two initiatives for improving maternal and neonatal health: (i) a conditional, cash transfer scheme to increase the number of institutional deliveries, known as the *Janani Suraksha Yojana*; and (ii) the deployment of over 820 000 community-based, volunteer, Accredited Social Health Activists. The health activists help mothers access antenatal care, encourage delivery in a health-care institution, offer home-based neonatal care during the first 7 days of life and provide counselling on community health and nutrition through home visits and community meetings.[4,5] While these initiatives should help improve neonatal survival, achieving adequate and equitable coverage is difficult.[6,7] Recent evaluations found that the poorest mothers did not always receive payments under the *Janani Suraksha Yojana*, that institutional delivery was not necessarily synonymous with good obstetric care and that the *Janani Suraksha Yojana* had not yet resulted in a large reduction in neonatal mortality.[8] Moreover, little evidence is available about the coverage of the home-based interventions delivered by Accredited Social Health Activists or about their effect on neonatal survival on a large scale.

The success and sustainability of community-based programmes for improving maternal and neonatal health require the active involvement of women, families and community health-care workers, yet the strategies used to engage these groups are often externally driven and top-down. Community mobilization, which is defined here as a process through which communities plan and act together to address health problems, is generally viewed as an essential component of programmes for improving maternal and child health.[9–11] Can community mobilization help reduce the number of preventable deaths in the poorest communities at a time when initiatives to strengthen health services and interventions such as home-based neonatal care are being scaled up?

Since 2005, the Indian nongovernmental organization known as Ekjut has helped women's groups to improve maternal and neonatal health in tribal areas of the Indian states of Jharkhand and Odisha (formerly Orissa). Local female facilitators guide women's groups through a cycle of activities involving participatory learning and action, during which women identify, prioritize and analyse local maternal and neonatal health problems and subsequently devise and implement strategies to address them. The Ekjut intervention was initially evaluated in a cluster-randomized, controlled trial carried out between 2005 and 2008 in 36 largely tribal clusters of three contiguous districts of Jharkhand and Odisha. When the trial started, the estimated neonatal mortality rate was 48.6 per 1000 live births in Jharkhand and 45.4 per 1000 live births in Odisha. However, the rate in Scheduled Tribes, as recognized by the Indian Constitution, was higher: more than 60 per 1000 live births.[12–14]

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The present study involved the areas included in the original cluster-randomized, controlled trial, which we divided into two zones: zone 1 comprised the clusters in which the original intervention was implemented; and zone 2, the control clusters in the original trial. In 2004, before the original intervention, the neonatal mortality rate was high in both zone 1 and zone 2: 61.4 and 54.1 per 1000 live births, respectively. Access to health services was poor in zone 1, where only 34 of 193 villages (17.6%) were situated within 10 km of a primary-health-care centre, compared with 97 of 185 villages (52.4%) in zone 2.[15] Mothers in zone 1 were more likely to belong to a Scheduled Tribe, to have a low level of education and to have few household possessions. During the original trial, neonatal mortality declined substantially in zone 1 with the women's group intervention and the odds that an infant would die in the neonatal period in zone 1 during the last 2 years of the intervention was 45% lower than in zone 2 (odds ratio, OR: 0.55; 95% confidence interval, CI: 0.46–0.66).

The present study had three objectives: (i) to investigate the sustainability of the intervention's effect on neonatal mortality in zone 1 after the end of the original trial; (ii) to determine whether the effect of the intervention is replicable in zone 2; and (iii) to identify the mechanisms underlying the intervention's effect on neonatal survival by assessing trends in the study zones over 7 years.

Methods

Between August 2005 and July 2008, local women's groups in zone 1 were assisted by Ekjut; there were no groups in zone 2. After July 2008, the 244 women's groups in zone 1 continued to meet. They took part in a new cycle of participatory learning and action that focused on women's and children's health issues, as prioritized by group members themselves. This new cycle included meetings on: (i) the prevention of, and the seeking of care for, childhood illnesses such as diarrhoea, pneumonia and malaria; (ii) maternal nutrition; and (iii) family planning. One meeting was devoted to updating the strategies for improving neonatal health implemented during the original trial. During the meeting, facilitators prompted group members to recall previous strategies and to demonstrate key practices (e.g. wrapping neonates) within the group.

The 274 new women's groups in zone 2 began a cycle of meetings on maternal and neonatal health in August 2008. They met monthly for a total of 20 meetings, organized in four phases. In the first phase, groups identified and prioritized common problems for mothers and neonates in their community with the help of picture cards. In the second, they discussed and prioritized strategies for addressing these problems: (i) by analysing stories told by the facilitator on the causes of maternal and neonatal health problems; (ii) by playing games with picture cards that depicted preventive and care-seeking measures for common problems; and (iii) by using ranking and voting methods to prioritize feasible local strategies. In addition, each group organized a village meeting to enlist the support of other community members in implementing their chosen strategies. In the third phase, the groups implemented their chosen strategies and undertook practical activities, such as role-plays to rehearse the steps to take when there are danger signs during a pregnancy. Finally, in the fourth phase, groups evaluated the success of their chosen strategies and held a second village meeting to share information about their achievements. Since each group prioritized different problems, a wide variety of strategies were implemented. The women's group meetings were facilitated by a local woman (not a health worker) who received 7 days' training on participatory communication techniques and on the use of a facilitation manual. There were 18 facilitators in zone 2, each of whom was responsible for coordinating an average of 15 meetings per month in a population cluster of around 6000 people. The facilitator took part in weekly supervision meetings with the project intervention team. The meeting plan is described in detail in a women's group implementation guide.[16]

The intervention implemented in zone 2 differed from the original intervention in zone 1 in the Ekjut trial in one important respect. An analysis of neonatal mortality data from the previous 3 years in zone 1 showed that the largest reductions in mortality occurred during the winter months (i.e. November to February). Concurrent research from the state of Uttar Pradesh showed that hypothermia is common in rural Indian communities, even in the summer, and that substantial gains in survival can be achieved by improving thermal care for neonates.[17,18] We hypothesized that much of the reduction in neonatal mortality seen during the Ekjut trial was due to more hygienic delivery practices and to better thermal care for neonates (e.g. delayed bathing, early wrapping and skin-to-skin contact with the mother). Therefore, when the women's groups began to meet in zone 2, facilitators emphasized the importance of thermal care using stories, picture cards and problem-solving activities. As a result, the main strategies discussed by the groups were early and exclusive breastfeeding, delaying bathing in the first 24 hours after birth, wrapping neonates immediately after birth and "kangaroo mother care".

We recorded all births, stillbirths, neonatal deaths and maternal deaths between 2004 and 2011 in 36 geographical clusters located either in the West Singhbhum or Saraikela Kharswan district of Jharkhand or the Keonjhar district of Odisha. The surveillance system used to identify and report births and deaths has been described in detail elsewhere.[19] All mothers for whom a delivery was recorded were approached for an interview around 6 weeks after delivery and information was collected on events during the antenatal, delivery and postnatal period.

Statistical analysis

We calculated crude neonatal mortality rates and the mean of the cluster neonatal mortality rates (i.e. the cluster-mean neonatal mortality rate), with 95% CIs, for the period between August 2005 and July 2011 in the two study zones. We examined differences in mortality between zone 1 and zone 2 and between the periods during and after the original intervention using *t* tests on cluster-mean neonatal mortality rates and using logistic regression with random effects on data from individual participants. We examined changes in home care practices using population-averaged, generalized estimating equation models because random effects models proved unreliable for assessing these highly clustered outcomes. Data entry was carried out using Microsoft Access databases (Microsoft Corporation, Redmond, United States of America) and data analysis was performed using SPSS 18.0 (SPSS Incorporated, Chicago, USA) and Stata 12.0 (StataCorp. LP, College Station, USA).

Results

Fig. 1 (available at: http://www.who.int/bulletin/volumes/91/6/12-105171)

describes outcomes in mothers and neonates in zone 1 and zone 2 between 1 November 2004 and 30 July 2011. During this period, interviews were conducted for 41 191 of the 41 320 births (99.7%) identified by community-based key informants. Outcomes for these 41 191 births are reported in Table 1.

The change in cluster-mean neonatal mortality rate during the full intervention period (i.e. August 2005 to July 2011) in zone 1 and zone 2 is illustrated in Fig. 2. In zone 1, the rate was 34.2 per 1000 live births after the original Ekjut trial compared with 41.3 per 1000 live births during the trial ($P = 0.08$; Table 1), which suggests that the effect of the intervention was sustained. In zone 2, the rate was 41.0 per 1000 live births after the original trial compared with 57.0 per 1000 live births during the trial ($P < 0.0004$). Moreover, in zone 2, the cluster-mean neonatal mortality rate during the last 2 years of the post-trial period (i.e. August 2009 to July 2011) was 31% lower than in the last 2 years of the trial (i.e. August 2006 to July 2008): the rates were 40.5 and 61.8 per 1000 live births in the two periods, respectively (OR: 0.69; 95% CI: 0.57–0.83), after adjustment for institutional deliveries. The results were similar after adjustment for differences between zone 1 and zone 2 in household assets, maternal education and tribal status: the OR was 0.69 (95% CI: 0.58–0.82).

Table 2 (available at: http://www.who.int/bulletin/volumes/91/6/12-105171) shows the trends in key home care practices and care-seeking behaviour for the 40 277 singleton infants born in zone 1 and zone 2 between 2004 and 2011. Improvements were observed in both zones. However, in the period after the original trial, it was not possible to disentangle the effect of the women's group intervention on care seeking from the effect of better access to health services, in particular the effect of the increase in institutional deliveries caused by the *Janani Suraksha Yojana* scheme. The frequency of antenatal check-ups, institutional deliveries and care seeking for health problems during pregnancy all remained higher in zone 2 than zone 1 throughout the surveillance period. Access to health services was poorer at baseline in zone 1 than in zone 2 and improved more slowly in zone 1. It appears that the presence of women's groups alone was not sufficient to increase care-seeking behaviour substantially in the absence of good health service provision. In contrast, improvements in home care practices, particularly hand washing, clean cord care practice by birth attendants and exclusive breastfeeding in the first 6 weeks of life, appeared to be strongly driven by the women's group intervention: use of these practices increased rapidly between 2005 and 2008 in zone 1 and after the introduction of groups in 2008 in zone 2.

Table 3 summarizes the improvements in home care practices for infants delivered at home in zone 2 from the period during the original trial to the period after. In particular, there were significant increases in the use of clean cord care practices by birth attendants, the wrapping of infants within 30 minutes of birth, delaying bathing of infants for at least 24 hours and exclusive breastfeeding for the first 6 weeks of life.

During the original trial period, the reduction in neonatal mortality in zone 1 lagged behind the introduction of women's groups by around 9 months; the time lag was shorter in zone 2 (i.e. 4 to 5 months). The greater emphasis that facilitators placed on thermal care for neonates from 2008 onward ensured that groups in zone 2 discussed thermal care practices before the onset of winter, which resulted in the substantial increase in early wrapping and delayed bathing observed (Table 2 and Table 3). Fig. 3 shows the strong seasonal variation in neonatal mortality in the two zones and the marked reduction in deaths during the winter months that occurred after the introduction of women's groups, particularly in zone 2.

During the original trial period, each women's group in zone 1 covered a population of 468 on average and the proportion of mothers who had recently given birth and who had ever attended a group reached 55%.[15] In zone 2, after the introduction of women's groups, each of which covered a population of 416 on average, the proportion of mothers who had recently given birth and who had ever attended a group increased from 47% (i.e. 1401 of 1983 mothers) in 2008 to 2009 to 63% (i.e. 1822 of 2908 mothers) in 2009 to 2010.

We carried out a cost-effectiveness analysis for the first year of the intervention in zone 2 (i.e. January to December 2009), from the provider's perspective. The incremental cost of the women's group intervention was 706 United States dollars (US$) per neonatal life saved; this increased to US$ 948 (in 2009 prices) per life saved when the cost of strengthening health service activities was included. The incremental cost per life-year saved was US$ 22 or US$ 30 when the cost of strengthening health service activities was included. The average annual cost of facilitating a group was US$ 140. In total, an estimated 2192 meetings were conducted with women's groups during 2009, which corresponds to an average of eight meetings per group. Consequently, the average cost of facilitating each meeting was US$ 18.

Discussion

The results of this study indicate that the reduction in neonatal mortality associated with facilitating women's groups meetings involving participatory learning and action can be replicated in other areas with high neonatal mortality. In addition, the study identified some of the reasons for this reduction in mortality. The women's group intervention resulted in: better hygiene during delivery, particularly hand washing and clean cord care; improved thermal care of the neonate, with the largest mortality reduction occurring in winter; and an increase in exclusive breastfeeding in a context where neonates die of multiple overlapping causes, including prematurity, low birth weight and a high risk of sepsis.

Although our data indicate that the intervention's effect on neonatal mortality can be sustained over time, the question of whether the intervention can be sustainable as part of a programme is more complex. Accredited Social Health Activists can facilitate women's group meetings as part of a state or national programme since they are already mandated to deliver home-based neonatal care and to counsel mothers through home visits and group meetings. The Integrated Management of Neonatal and Childhood Illnesses programme in the Indian state of Haryana implemented between 2007 and 2010 covered a population of 1.1 million and involved *anganwadi* workers rather than Accredited Social Health Activists.[20] The health workers made postnatal visits to promote early and exclusive breastfeeding, delayed bathing, thermal care, cord care and care seeking for illness, and held community meetings every 3 months to raise awareness of essential neonatal care. This intervention led to a significant reduction in both infant mortality (adjusted hazard ratio, aHR: 0.85, 95% CI: 0.77–0.94) and neonatal mortality after

Table 1. **Birth outcomes, women's group intervention, rural India, 2004–2011**

Study area and birth outcome	Baseline	During the original intervention[a]			After the original intervention[b]			Total[c]	*P*[d]
	2004–2005[c]	2005–2006[c]	2006–2007[c]	2007–2008[c]	2008–2009[c]	2009–2010[c]	2010–2011[c]		
Zone 1									
All births	2457	3148	3382	3156	3049	2843	2991	21 026	NA
Stillbirths	110	98	118	82	78	88	90	664	NA
Live births	2347	3050	3264	3074	2971	2755	2901	20 362	NA
Neonatal deaths	144	167	121	109	104	108	93	846	NA
Crude neonatal mortality rate,[e] deaths per 1000 live births	61.4	54.8	37.1	35.5	35.0	39.2	32.1	41.5	NA
Cluster-mean neonatal mortality rate,[e,f] (95% CI)	60.0 (46.1–73.8)	53.9 (45.6–62.1)	36.3 (28.5–44.2)	34.4 (25.8–42.9)	33.3 (25.7–40.9)	37.0 (27.0–46.9)	31.9 (23.0–40.8)	40.5 (35.5–46.4)	NA
Cluster-mean neonatal mortality rate,[e] (95% CI)	NA			41.3 (35.4–47.1)			34.2 (28.3–40.0)	NA	0.08
Zone 2									
All births	2234	3003	3071	3015	2984	2908	2950	20 165	NA
Stillbirths	72	86	98	86	90	89	88	609	NA
Live births	2162	2917	2973	2929	2894	2819	2862	19 556	NA
Neonatal deaths	117	153	177	188	133	118	112	998	NA
Crude neonatal mortality rate,[e] deaths per 1 000 live births	54.1	52.5	59.5	64.2	46.0	41.9	39.1	51.0	NA
Cluster-mean neonatal mortality rate,[e] (95% CI)	52.5 (45.4–59.7)	49.8 (39.3–60.2)	58.2 (46.6–69.8)	63.3 (55.3–71.3)	44.7 (36.5–52.9)	39.8 (30.7–48.8)	38.7 (28.9–48.5)	49.5 (44.6–54.5)	NA
Cluster-mean neonatal mortality rate,[e] (95% CI)	NA			57.0 (50.3–63.8)			41.0 (35.7–46.2)	NA	0.0004

CI, confidence interval; NA not applicable.

[a] The original intervention involved assisting local women's groups in zone 1 between January 2005 and July 2008; zone 2 served as a control.

[b] After July 2008, women's groups in zone 1 continued to meet and new groups began to meet in zone 2.

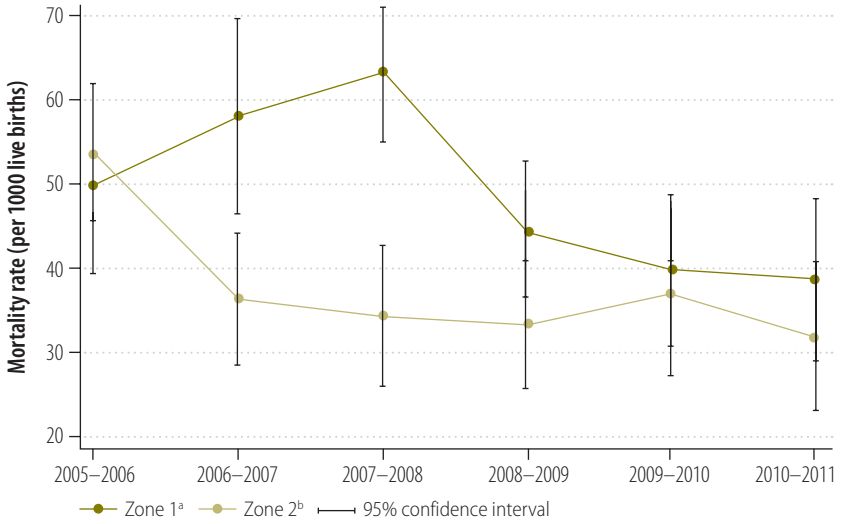
[c] All values in the column represent absolute numbers unless otherwise stated.

[d] *P*-values were obtained by comparing the cluster-mean neonatal mortality rate in 2005 to 2008 with that in 2008 to 2010 using a *t* test.

[e] Deaths per 1000 live births.

[f] The cluster-mean neonatal mortality rate is the mean of the neonatal mortality rates calculated for each cluster.

Fig. 2. **Cluster-mean neonatal mortality rate, rural India, 2005–2011**



[a] Zone 1 comprised the 18 clusters in which the original women's group intervention was implemented between 2005 and 2008. Women's groups continued to meet after 2008.
[b] Zone 2 comprised the 18 control clusters for the original women's group intervention between 2005 and 2008. Women's groups were established between 2008 and 2011.

the first 24 hours of life but not in overall neonatal mortality including deaths in the first 24 hours of life (aHR: 0.91, 95% CI: 0.80–1.03). However, it is likely that, with adequate coverage, a combination of home visits to improve home-based neonatal care, more deliveries in mother- and baby-friendly institutions and community mobilization through women's groups has the potential to reduce neonatal morality in the poorest communities. The key questions are how best to scale up community mobilization and at what cost.

A new trial is under way in Jharkhand and Odisha to assess how maternal and neonatal health are affected by community mobilization through women's groups facilitated by Accredited Social Health Activists.[21] It will provide information on how health activists integrate group meetings with other tasks. Further guidance may also come from an initiative by the Government of Jharkhand to scale up women's groups to improve maternal and neonatal health. The initiative covers a population of 1.6 million in 12 blocks and has trained approximately 3000 Accredited Social Health Activists who facilitate meetings in their own villages. The cost of training each Accredited Social Health Activist is US$ 16.60, with training and supervision mainly carried out by existing government personnel, and there is an incentive of US $ 3.20 for each meeting, in 2011 prices. The total cost per meeting, including the cost of the incentive and picture cards, is US$ 3.70.

Our findings may also be relevant for settings with high neonatal mortality outside India. It has been estimated that between 130 and 180 million births will take place without a skilled birth attendant present in countries of southern Asia and sub-Saharan Africa between 2011 and 2015, with 90% in rural areas.[22] Low-cost, community-based interventions, such as participatory meetings with women's groups, could lead to a rapid improvement in survival in these areas as countries scale up the use of skilled birth attendants and neonatal care services.

Limitations

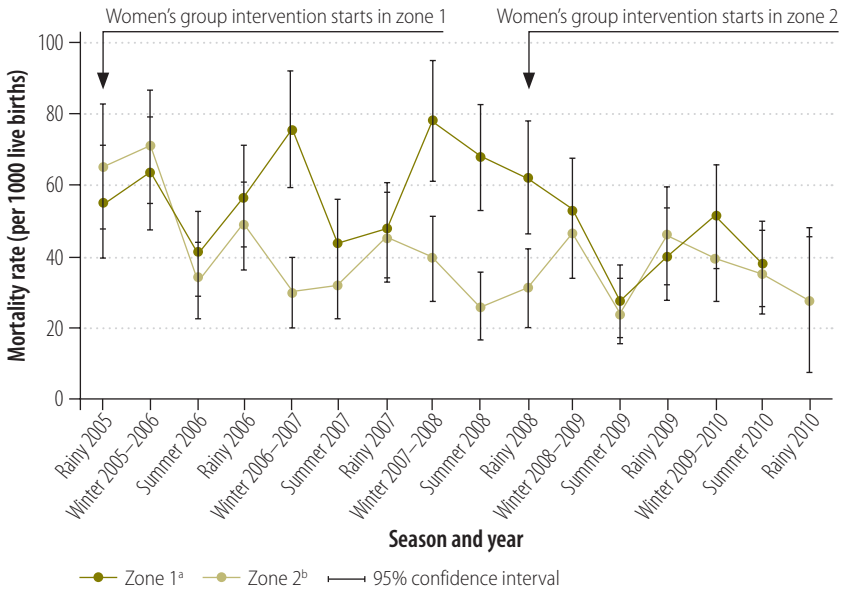
The study has two main limitations. First, although data collection was prospective, after 2008 there was no control area with which to compare the changes in mortality and health indicators observed in the study zones. Consequently, we may have underestimated the effect of any secular decrease in neonatal mortality and of any increase in care-seeking behaviour. Although

Table 3. **Neonatal care practices for infants delivered at home[a] in zone 2, rural India, 2005–2011**

Neonatal care practice or infant category	No. (%) before women's group intervention (2005–2008)	No. (%) during women's group intervention (2008–2011)	OR (95% CI)[b]
All singleton home births	7056 (100)	4831 (100)	NA
Birth attendant washed hands	1588 (23.8)[c]	1547 (33.3)[c]	1.60 (0.98–2.63)
Singleton, liveborn infants delivered at home	6879 (100)	4704 (100)	NA
Birth attendant used clean cord care practices[d]	592 (8.6)[e]	1050 (22.3)[e]	3.05 (1.50–6.20)
Infant not bathed during the first 24 hours of life	976 (14.2)[e]	1260 (26.8)[e]	2.21 (1.28–3.81)
Infant wrapped within 30 minutes of birth	3015 (43.9)[e]	2805 (59.7)[e]	1.88 (1.25–2.85)
Initiation of breastfeeding within 30 minutes of birth	442 (6.5)[e]	670 (14.5)[e]	2.43 (1.39–4.24)
Infants alive at 6 weeks	6508 (100)	4506 (100)	NA
Exclusive breastfeeding for the first 6 weeks	4463 (68.6)[f]	3742 (83.0)[f]	2.24 (1.55–3.23)

CI, confidence interval; NA, not applicable; OR, odds ratio.
[a] Care practices are reported for only singleton, liveborn infants.
[b] The odds ratio is for the difference between the period during the women's groups intervention in zone 2 (i.e. 2008–2011) and the period before (i.e. 2005–2008).
[c] Percentage of home births, including stillbirths, during which the birth attendant washed her or his hands.
[d] Clean cord care practices included the use of a new blade and a boiled thread and the application of either antiseptic or nothing to the cord.
[e] Percentage of singleton, liveborn infants delivered at home for whom the care practice was performed.
[f] Percentage of infants alive at 6 weeks who were exclusively breastfed during this period.

Fig. 3. **Seasonal variation in cluster-mean neonatal mortality rate, rural India, 2005–2010**



Note: The winter months were November to February; the summer months, March to June; the rainy months, July to October.

[a] Zone 1 comprised 18 clusters in the Indian states of Jharkhand and Odisha in which the original women's group intervention was implemented between 2005 and 2008. Women's groups continued to meet after 2008.

[b] Zone 2 comprised 18 control clusters in the original women's group intervention. Women's groups were established between 2008 and 2011.

there were more institutional deliveries in both zones after the introduction of the *Janani Suraksha Yojana* scheme in 2008, our analysis controlled for this change. In addition, because the Accredited Social Health Activists recruited in the study zones from 2008 onwards were not trained in home-based neonatal care until 2012, their activities were not likely to have affected the neonatal mortality rate, suggesting that the reduction in neonatal mortality seen in zone 2 after 2008 is most likely due to the women's group intervention.[23]

A second limitation is that the large number of interviews conducted over a prolonged period by the monitoring team may have resulted in increased concern with maternal and neonatal health in the study areas and in improved practices. However, since interviews were carried out 6 weeks after delivery, they could not have influenced events in the neonatal period unless a mother was interviewed more than once. Furthermore, since monitoring was performed in the same way in all study areas, the potential bias introduced by data collection is unlikely to be responsible for any difference between zones in the observed changes in mortality.

In conclusion, our findings suggest that community mobilization through women's groups can produce a sustainable and reproducible improvement in neonatal survival in rural areas of India. The potential for community mobilization to act synergistically with government initiatives for improving home-based neonatal care, such as the *Janani Suraksha Yojana* scheme or the Accredited Social Health Activist programme, should be further evaluated. Making home deliveries safer by empowering women and their families has the potential to save many neonates, especially in communities where the mortality rate is high. Further reductions in mortality will come from paying attention to the quality of the care provided during institutional deliveries and in the postnatal period. ■

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ملخص

تحسين بقاء المواليد على قيد الحياة بعد التعلم والعمل على نحو تشاركي مع جماعات المرأة: دراسة استطلاعية في المناطق الريفية شرق الهند

الغرض تحديد ما إذا كان لتدخل جماعات المرأة الذي يتضمن التعلم والعمل على نحو تشاركي تأثير مستدام قابل للمماثلة على بقاء المواليد على قيد الحياة في المناطق الريفية شرق الهند.

الطريقة في الفترة من 2004 إلى 2011، تم رصد المواليد ووفيات المواليد في 36 مجموعة جغرافية في جاركند وأوديشا. وفي الفترة بين 2005 و2008، كانت هذه المجموعات جزءاً من تجربة عشوائية أجريت في بيئة خاضعة للمراقبة حول مدى تأثير اجتماعات جماعات المرأة التي تتضمن التعلم والعمل على تشاركي على صحة الأمومة والمواليد. وفي الفترة من 2008 إلى 2011، واصلت الجماعات في مجموعات التدخل الأصلية (المنطقة 1) اجتماعاتها لمناقشة القضايا المتعلقة بمرحلة ما بعد المواليد والتقت الجماعات الجديدة في مجموعات المراقبة الأصلية (المنطقة 2) لمناقشة صحة المواليد. وتم استخدام الارتداد اللوجيستي لدراسة معدلات وفيات المواليد بعد عام 2008 في المنطقتين.

النتائج تم تحليل البيانات المعنية بالمواليد البالغ عددهم 41191 مولوداً. وفي المنطقة 1، تم الحفاظ على تأثير التدخل: بلغ معدل وفيات المواليد لمتوسط المجموعة 34.2 لكل 1000 مولود حي (فاصل الثقة 95 ٪، فاصل الثقة: من 28.3 إلى 40.0) في الفترة من 2008 إلى 2011، مقارنة بنسبة 41.3 لكل 1000 مولود حي (فاصل الثقة 95 ٪، فاصل الثقة: من 35.4 إلى 47.1) في الفترة من 2005 إلى 2008. وتم نسخ تأثير التدخل في المنطقة 2: وانخفض معدل وفيات المواليد لمتوسط المجموعة من 61.8 إلى 40.5 لكل

摘要

妇女团体参与式学习和行动有助于提高新生儿存活率：印度东部农村的前瞻性研究

目的 确定涉及参与式学习和行动的妇女团体干预是否对印度东部的新生儿生存率有可持续和可重复的影响。

方法 从 2004 年到 2011 年，对贾坎德邦和奥里萨邦的 36 个地理集群的分娩和新生儿死亡进行监测。在 2005 年至 2008 年之间，这些集群是随机对照试验的组成部分，这些试验研究涉及参与式学习和行动的妇女团体集会如何影响孕产妇和新生儿健康。在 2008 年至 2011 年间，原始干预集群的团体（区域 1）继续集会，以讨论新生儿后期的问题；原始对照集群的新团体（区域 2）集会，以讨论新生儿保健问题。使用逻辑回归查看在 2008 年之后两个区域中新生儿的死亡率。

结果 分析了 41191 例出生的数据。在区域 1，干预效果保持：集群平均新生儿死亡率在 2008 年至 2011 年是每千活产 34.2 例（95% 置信区间，CI：28.3–40.0），与之相比的是 2005 至 2008 年每千活产 41.3 例（95% CI：35.4–47.1）。干预效果在区域 2 得到重复：在两个期间，2006-2008 和 2009-2011 年，集群平均新生儿死亡率从每千活产 61.8 例降低至 40.5 例（优势比：0.69，95% CI：0.57–0.83）。分娩时的卫生保健、新生儿体温护理和纯母乳喂养是重要因素。

结论 在新生儿死亡率高的印度农村地区，与新生儿生存相关的参与性妇女团体的效果是可持续和可重复的。

Résumé

Amélioration de la survie néonatale suite à des activités d'apprentissage et des actions participatives avec des groupes féminins: une étude prospective dans l'Inde de l'Est rurale

Objectif Déterminer si un groupe féminin menant des activités d'apprentissage et des actions participatives a un effet durable et reproductible sur la survie néonatale dans l'Inde de l'Est rurale.

Méthodes De 2004 à 2011, les naissances et la mortalité néonatale ont été suivies dans 36 zones géographiques des États du Jharkhand et de l'Odisha. Entre 2005 et 2008, ces zones ont été intégrées dans un essai contrôlé randomisé portant sur l'influence sur la santé maternelle et néonatale des réunions de groupes féminins menant des activités d'apprentissage et des actions participatives. Entre 2008 et 2011, les groupes provenant des zones d'intervention d'origine (zone 1) se réunissaient toujours pour débattre des questions post-néonatales, et les nouveaux groupes provenant des zones de contrôle d'origine (zone 2) se sont réunis pour aborder le sujet de la santé néonatale. On a eu recours à la régression logistique pour analyser les taux de mortalité néonatale après 2008 dans ces deux zones.

Résultats Les données de 41 191 naissances ont été analysées. Dans la zone 1, l'effet de l'intervention s'est révélé durable: le taux de mortalité néonatale moyen de la région a été de 34,2 pour 1 000 naissances vivantes (intervalle de confiance de 95%, IC: 28,3–40) entre 2008 et 2011, par rapport à 41,3 pour 1 000 naissances vivantes (IC de 95%: 35,4–47,1) entre 2005 et 2008. L'effet de l'intervention s'est reproduit dans la zone 2: le taux de mortalité néonatale moyen de la zone a baissé de 61,8 à 40,5 pour 1 000 naissances vivantes entre les deux périodes: 2006–2008 et 2009–2011 (rapport des cotes, RC: 0,69, IC de 95%: 0,57–0,83). L'hygiène pendant l'accouchement, le maintien de la température corporelle du nouveau-né et l'allaitement maternel exclusif ont été des facteurs importants.

Conclusion L'effet des groupes féminins participatifs sur la survie néonatale dans l'Inde rurale, où la mortalité néonatale est élevée, s'est révélé durable et reproductible.

Резюме

Повышение неонатальной выживаемости после проведения коллективного обучения и занятий с женскими группами: проспективное исследование в сельских районах восточной Индии

Цель Установить, оказывают ли мероприятия по проведению коллективного обучения и занятий в женской группе продолжительное и воспроизводимое влияние на неонатальную выживаемость в сельских районах восточной Индии.

Методы В 2004-2011 гг. проводился мониторинг рождаемости и неонатальной смертности в 36 географических кластерах в штатах Джаркханд и Орисса. В период с 2005 по 2008 гг. данные кластеры участвовали в рандомизированном контролируемом исследовании влияния собраний женских групп, включающих коллективное обучение и занятия, на охрану здоровья матери и ребенка. В период с 2008 по 2011 гг. группы в исходных кластерах проведения мероприятий (зона 1) продолжали проведение встреч для обсуждения постнеонатальных вопросов, а в новых группах исходных контрольных кластеров (зона 2) на встречах обсуждались вопросы неонатального здоровья. В обеих зонах использовалась логистическая регрессия для изучения уровней неонатальной смертности после 2008 года.

Результаты Проведен анализ данных по 41 191 родам. В зоне 1 влияние проводимых мероприятий было продолжительным: средний уровень неонатальной смертности в кластере составил 34,2 на 1000 живорождений (95% доверительный интервал, ДИ: 28,3–40,0) в период с 2008 по 2011 гг., по сравнению с 41,3 на 1000 живорождений (95% ДИ: 35,4–47,1) в период с 2005 по 2008 гг. Аналогичное влияние проводимых мероприятий отмечено в зоне 2: средний уровень неонатальной смертности в кластере снизился с 61,8 до 40,5 на 1000 живорождений в обоих периодах: 2006-2008 гг. и 2009-2011 гг. (относительный риск: 0,69, 95% ДИ: 0,57-0,83). Важными факторами являлись соблюдение гигиены во время родоразрешения, тепловая защита новорожденных и исключительно грудное вскармливание.

Вывод Влияние коллективных женских групп на неонатальную выживаемость в сельских районах Индии с высоким уровнем смертности являлось продолжительным и воспроизводимым.

Resumen

La mejora en la supervivencia neonatal tras un aprendizaje y acción participativos con grupos de mujeres: un estudio prospectivo en el este rural de India

Objetivo Determinar si las intervenciones con aprendizaje y acción participativos con grupos de mujeres tienen un efecto sostenible y reproducible en la supervivencia neonatal en las zonas rurales del este de India.

Métodos Desde 2004 hasta 2011 se controlaron los nacimientos y muertes neonatales en 36 agrupaciones geográficas en Jharkhand y Odisha. Entre 2005 y 2008, esas agrupaciones formaron parte de un ensayo controlado aleatorio para averiguar cómo las reuniones de grupos de mujeres que incluyen un aprendizaje y acción participativos influyen en la salud materna y neonatal. Entre 2008 y 2011, los grupos en las agrupaciones originales de intervención (zona 1) siguieron reuniéndose para debatir sobre cuestiones posneonatales y otros grupos nuevos en las agrupaciones originales de control (zona 2) se reunieron para debatir sobre la salud neonatal. Se empleó una regresión logística para examinar las tasas de mortalidad neonatal en ambas zonas tras del año 2008.

Resultados Se analizaron los datos de 41 191 nacimientos. En la zona 1, el efecto de la intervención fue prolongado: la tasa de mortalidad neonatal media en la agrupación fue de 34,2 por cada 1000 nacidos vivos (intervalo de confianza del 95%, IC: 28,3–40,0) entre 2008 y 2011, comparada con el 41,3 por cada 1000 nacidos vivos (IC del 95%: 35,4–47,1) entre los años 2005 y 2008. El efecto de la intervención se repitió en la zona 2: la tasa de mortalidad neonatal media descendió del 61,8 hasta el 40,5 por cada 1000 nacidos vivos entre dos periodos: 2006–2008 y 2009–2011 (cociente de probabilidades: 0,69, IC del 95%: 0,57–0,83). Algunos factores importantes fueron la higiene durante el parto, la atención térmica de los neonatos y la lactancia materna exclusiva.

Conclusión El efecto de los grupos participativos de mujeres sobre la supervivencia neonatal en las zonas rurales de India, donde la mortalidad neonatal es elevada, resultó sostenible y reproducible.

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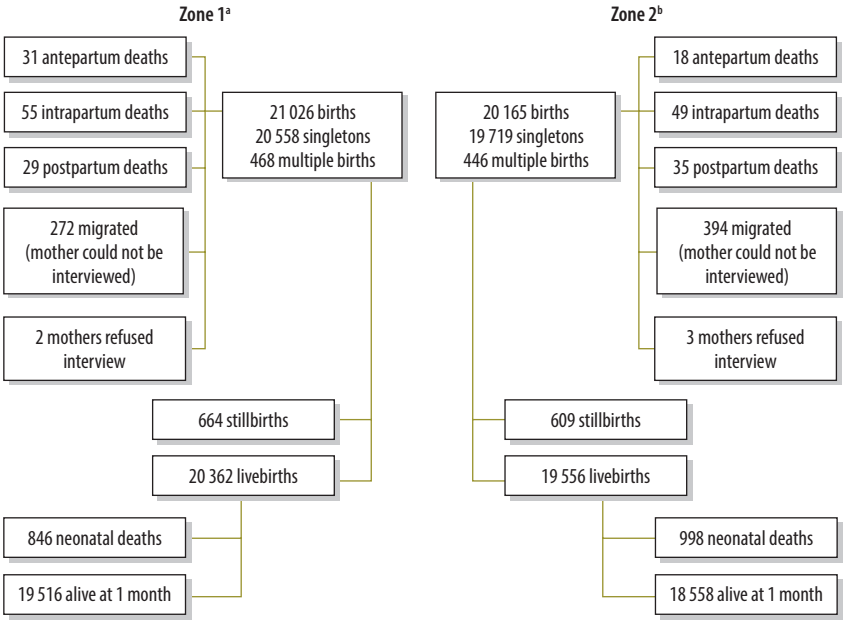
Fig. 1. **Birth outcomes, rural India, 2004–2011**



[a] Zone 1 comprised 18 clusters in the Indian states of Jharkhand and Odisha in which the original women's group intervention was implemented between 2005 and 2008. Women's groups continued to meet after 2008.

[b] Zone 2 comprised 18 control clusters in the original women's group intervention. Women's groups were established between 2008 and 2011.

Table 2. **Home care practices and care-seeking behaviour for singleton births, women's group intervention, rural India, 2004–2011**

Home care practice or care-seeking behaviour	Zone	Baseline no. (%)	No. (%) during the original intervention[a]			No. (%) after the original intervention[b]		
		2004–2005	2005–2006	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
All births	1	2413 (100)	3073 (100)	3299 (100)	3096 (100)	2976 (100)	2781(100)	2920 (100)
	2	2188 (100)	2945 (100)	2991 (100)	2931 (100)	2924 (100)	2854 (100)	2886 (100)
Mother had three or more antenatal check-ups	1	525 (21.8)	914 (29.7)	1061 (32.2)	1021 (33.0)	1061 (35.7)	1081 (38.9)	1378 (47.2)
	2	687 (31.4)	1150 (39.0)	1266 (42.3)	1210 (41.3)	1212 (41.5)	1404 (49.2)	1697 (58.8)
Health problem during pregnancy	1	1869 (77.5)	2370 (77.1)	2385 (72.3)	1851 (59.8)	1493 (50.2)	1477 (53.1)	1467 (50.2)
	2	1702 (77.8)	2283 (77.5)	2193 (73.3)	1843 (62.9)	1651 (56.5)	1689 (59.2)	1624 (56.3)
Care seeking for a health problem during pregnancy	1	742 (39.7)	983 (41.5)	930 (39.0)	748 (40.4)	644 (43.1)	635 (43.0)	778 (53.0)
	2	666 (39.1)	963 (42.2)	1076 (49.1)	913 (49.5)	828 (50.2)	914 (54.1)	911 (56.1)
Institutional delivery	1	260 (10.8)	382 (12.4)	453 (13.7)	529 (17.1)	847 (28.4)	940 (33.8)	1141 (39.1)
	2	327 (14.9)	500 (17.0)	547 (18.3)	764 (26.1)	1041 (35.6)	1298 (45.5)	1494 (51.8)
Home delivery	1	2153 (89.2)	2691 (87.6)	2846 (86.3)	2567 (82.9)	2129 (71.5)	1841 (66.2)	1777 (60.9)
	2	1861 (85.1)	2445 (83.0)	2444 (81.7)	2167 (73.9)	1883 (64.4)	1556 (54.5)	1392(48.2)
Birth attendant washed hands[c]	1	579 (26.9)	941 (35.0)	1163 (40.9)	1192 (46.4)	1071 (50.3)	984 (53.4)	925 (52.1)
	2	504 (27.1)	674 (27.6)	503 (20.6)	411 (19.0)	464 (24.6)	533 (34.3)	550 (39.5)
Birth attendant used clean cord care practices[c]	1	87 (4.2)	375 (14.3)	879 (31.8)	959 (38.3)	788 (37.8)	706 (39.5)	723 (41.8)
	2	107 (5.9)	214 (9.0)	217 (9.1)	161 (7.6)	257 (14.0)	381 (25.2)	411 (30.2)
Maternal problem after delivery[d]	1	1305 (60.6)	1736 (64.5)	1671 (58.7)	1023 (39.9)	687 (32.3)	548 (29.8)	543 (30.6)
	2	1095 (58.8)	1641 (67.1)	1709 (69.9)	994 (45.9)	746 (39.6)	578 (37.1)	555 (39.9)
Maternal care seeking for a problem after delivery[d]	1	376 (28.8)	556 (33.0)	504 (31.1)	317 (31.2)	179 (26.1)	137 (25.0)	240 (44.2)
	2	311 (28.4)	516 (32.8)	487 (29.4)	221 (22.3)	150 (20.1)	161 (27.9)	201 (36.2)
Infant not bathed for the first 24 hours of life[e]	1	160 (7.7)	252 (9.6)	472 (17.1)	606 (24.2)	468 (22.5)	441 (24.7)	791 (45.8)
	2	211 (11.6)	357 (15.0)	350 (14.7)	269 (12.7)	282 (15.4)	376 (24.9)	602 (44.2)
Infant wrapped within 30 minutes of birth[e]	1	779 (37.6)	783 (29.9)	945 (34.2)	1148 (45.9)	1279 (61.5)	1340 (75.0)	1331 (77.0)
	2	738 (40.7)	994 (41.7)	1015 (42.7)	1005 (47.5)	916 (50.0)	871 (57.6)	1018 (74.7)
Breastfeeding initiated within 30 minutes of birth[e]	1	105 (5.1)	83 (3.2)	190 (6.9)	90 (3.6)	194 (9.3)	201 (11.3)	258 (14.9)
	2	144 (7.9)	140 (5.9)	188 (7.9)	114 (5.4)	164 (9.0)	199 (13.2)	307 (22.5)
Exclusive breastfeeding for first 6 weeks[f]	1	1241 (63.3)	1839 (73.7)	2125 (79.5)	2098 (86.7)	1719 (85.4)	1518 (88.3)	1512 (90.4)
	2	982 (56.9)	1430 (63.1)	1531 (68.1)	1502 (75.4)	1361 (77.5)	1225 (85.4)	1156 (87.8)
Infant illness (e.g. cough, fever or diarrhoea)[f]	1	633 (30.6)	538 (20.5)	312 (11.3)	151 (6.0)	130 (6.2)	130 (7.3)	130 (7.5)
	2	502 (27.7)	655 (27.5)	396 (16.7)	266 (12.5)	169 (9.2)	104 (6.9)	95 (7.0)
Care-seeking for an infant problem in the postnatal period[f]	1	198 (31.3)	250 (46.5)	152 (48.7)	85 (56.3)	31 (66.0)	86 (66.2)	83 (63.8)
	2	161 (32.1)	233 (35.6)	140 (35.4)	95 (35.7)	22 (38.6)	47 (45.2)	58 (61.1)

[a] The original intervention involved assisting local women's groups in zone 1 between January 2005 and July 2008; zone 2 served as a control.
[b] After July 2008, the women's groups in zone 1 continued to meet and new groups began to meet in zone 2.
[c] Reported for only home deliveries of singleton infants.
[d] Excludes mothers who died intrapartum.
[e] Reported for only singleton, liveborn infants delivered at home.
[f] Reported for only singleton infants alive at 6 weeks.