

Community interventions with women's groups to improve women's and children's health in India: a mixed-methods systematic review of effects, enablers and barriers

Sapna Desai ¹, Madhavi Misra,¹ Aikantika Das,¹ Roopal Jyoti Singh,¹ Mrignyani Sehgal ², Lu Gram ³, Neha Kumar ⁴, Audrey Prost ⁵

To cite: Desai S, Misra M, Das A, *et al.* Community interventions with women's groups to improve women's and children's health in India: a mixed-methods systematic review of effects, enablers and barriers. *BMJ Global Health* 2020;**5**:e003304. doi:10.1136/bmjgh-2020-003304

Handling editor Seye Abimbola

► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/bmjgh-2020-003304>).

Received 30 June 2020
Revised 8 October 2020
Accepted 13 October 2020



► <http://dx.doi.org/10.1136/bmjgh-2020-003304>



© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY. Published by BMJ.

For numbered affiliations see end of article.

Correspondence to

Dr Sapna Desai;
sdesai@popcouncil.org

ABSTRACT

Introduction India is home to over 6 million women's groups, including self-help groups. There has been no evidence synthesis on whether and how such groups improve women's and children's health.

Methods We did a mixed-methods systematic review of quantitative and qualitative studies on women's groups in India to examine effects on women and children's health and to identify enablers and barriers to achieving outcomes. We searched 10 databases and included studies published in English from 2000 to 2019 measuring health knowledge, behaviours or outcomes. Our study population included adult women and children under 5 years. We appraised studies using standard risk of bias assessments. We compared intervention effects by level of community participation, scope of capability strengthening (individual, group or community), type of women's group and social and behaviour change techniques employed. We synthesised quantitative and qualitative studies to identify barriers and enablers related to context, intervention design and implementation, and outcome characteristics.

Findings We screened 21 380 studies and included 99: 19 randomised controlled trial reports, 25 quasi-experimental study reports and 55 non-experimental studies (27 quantitative and 28 qualitative). Experimental studies provided moderate-quality evidence that health interventions with women's groups can improve perinatal practices, neonatal survival, immunisation rates and women's and children's dietary diversity, and help control vector-borne diseases. Evidence of positive effects was strongest for community mobilisation interventions that built communities' capabilities and went beyond sharing information. Key enablers were inclusion of vulnerable community members, outcomes that could be reasonably expected to change through community interventions and intensity proportionate to ambition. Barriers included limited time or focus on health, outcomes not relevant to group members and health system constraints.

Conclusion Interventions with women's groups can improve women's and children's health in India. The most effective interventions go beyond using groups to disseminate health information and seek to build communities' capabilities.

Key questions

What is already known?

- Women's groups are widely engaged in health promotion to improve women and children's health in India and other countries.
- There is little evidence on the effects of different kinds of women's groups interventions on women's and children's health in India, which social and behaviour change strategies work best and for what, and barriers and enablers to effectiveness.

What are the new findings?

- Moderate-quality evidence for health interventions with women's groups indicates positive effects on perinatal practices, neonatal survival, immunisation rates, women's and children's dietary diversity and the control of vector-borne diseases in India.
- We found no effects of interventions where groups tackled outcomes influenced by strong social and service-related constraints, such as violence against women, or women and children's nutritional status.
- Effective women's groups were open to other community members, inclusive of the most concerned and vulnerable, and had adequate intensity and facilitator capacity.

Trial registration number The review was registered with PROSPERO: CRD42019130633.

INTRODUCTION

Community interventions are key to achieving the Sustainable Development Goals for health, nutrition and gender equality.^{1,2} Interventions to improve women's and children's health can engage with groups to strengthen the capabilities of individuals, groups and communities to adopt beneficial health practices and shape the social determinants of health.^{3–5} Women's

What do the new findings imply?

- ▶ Working with women's groups can improve women's and children's health in India if the health outcomes selected are relevant to group members, multiple social and behaviour change techniques are used beyond knowledge transfer and sufficient intervention intensity is achieved.
- ▶ Providing health information to existing financial groups may modify some behaviours among group members but does not emerge as an effective approach to improving 'hard' health outcomes such as neonatal mortality or women and children's nutritional status at a group or population level.
- ▶ Population-level health improvements through women's groups require further scale up of community mobilisation interventions that go beyond using groups as a platform to disseminate health information and improve communities' capabilities.

groups vary in size, membership and goals but typically hold regular meetings for financial savings or livelihoods promotion, health training and action, or a combination. Women's groups can be 'closed', i.e., restricted to members who fulfil specific criteria, for example, those who make financial contributions, or 'open' to all women and other community members, in which case they are akin to community groups.^{6–9} Some community interventions use existing groups as a platform to share health information or seek to leverage group cohesion to improve members' health.¹⁰ Others aim to improve population health through community mobilisation, defined as 'a capacity building process through which community members, groups or organizations plan, carry out, and evaluate activities in a participatory and sustained basis to improve their health and other conditions'.¹¹

The Government of India currently has two large-scale community engagement initiatives involving women's groups. The National Rural Livelihoods Mission (NRLM) supports self-help groups (SHGs) engaged in savings, credit and livelihoods promotion. The NRLM has reached over 50 million households by 2020 and aims to reach 70 million by 2025. Capitalising on this coverage, the NRLM introduced health, sanitation and nutrition education into its SHG activities in 2017.¹² The second government initiative, led by the National Health Mission, incentivises around 1 million community health volunteers called Accredited Social Health Activists (ASHA), to facilitate regular meetings with women's groups. Meetings are open to all and offer health-related interventions and linkages to public health services.¹³

Despite the extraordinary scale of women's groups initiatives in India, there has been no review of their effects on women's and children's health or factors that can improve implementation.^{7–9 14} We aimed to: (1) review experimental studies that examined the effect of women's groups interventions with or without a health component on women's and children's health in India, compared with either women's groups without a health intervention or no exposure to a women's group and (2) identify barriers and enablers related to contextual

factors, intervention design and implementation, and outcome characteristics that explain these effects, through a synthesis of qualitative and quantitative studies.

METHODS

Design, inclusion and exclusion criteria

We conducted a mixed-methods systematic review and included:

- a. Studies on women's groups in India, published in English between 1 January 2000 and 31 December 2019.
- b. Randomised controlled trials (RCTs); non-randomised studies of interventions—referred to here as quasi-experimental studies—with both strong and weaker designs, including studies using difference-in-difference approaches, interrupted time series, regression discontinuity, instrumental variable estimation and propensity score matching;^{15 16} and non-experimental quantitative and qualitative studies.
- c. Studies of women's groups that examined health knowledge, behaviours or outcomes, including general illness, Reproductive, Maternal, Newborn and Child Health (RMNCH), nutrition, sexual health and HIV, mental health, communicable and non-communicable disease and violence against women.

We excluded studies that were not conducted in India, reported no empirical data, did not focus on health outcomes or focused on groups where adult women were not primary members. Our study population included all women aged 18 years and above and children under 5 years.

Literature search and quality appraisal

Two researchers (AP and MM) searched PubMed, SCOPUS, POPLINE, PsycINFO, OpenGrey, Social Sciences Citation Index, International Bibliography of the Social Sciences, 3ie Database of Impact Evaluations, Global Health and Econlit. Online supplemental table 1 lists the search terms. MM and MS screened titles and abstracts, then consulted two expert advisors and four coauthors (AP, LG, NK and SD) to identify other relevant studies. After completing the first round in March 2019, we updated the search to include studies published between April and December 2019. Six researchers (AD, AP, MM, MS, RJS and SD) extracted data on study characteristics, interventions, effects, enablers and barriers and conducted quality appraisals using the Revised Cochrane Risk of Bias for randomised trials, the Risk of Bias in Non-randomised Studies of Interventions and an adapted version of the Critical Appraisal Skills Programme (CASP) for qualitative studies.^{17–19} The review refers to studies as high-quality, moderate-quality or low-quality evidence to reflect the Risk of Bias (RoB) assessment: high quality indicates low RoB; moderate quality indicates some concerns/moderate RoB; and low quality signals high, serious or critical RoB. Two coauthors (AP

and SD) independently reviewed all data extracted, compared quality assessments and drafted the synthesis.

Synthesis

Our synthesis followed three steps. First, we tabulated the effects of women's groups across health domains that emerged from experimental studies, irrespective of study quality: (1) RMNCH; (2) nutrition; (3) violence against women; (4) vector-borne diseases; (5) sexual health and HIV; (6) water, sanitation and hygiene; (7) mental health; (8) health expenditure; or (9) multiple domains. Studies were classified by primary outcome domain(s) for RCTs, or main health outcome(s) for quasi-experimental studies. We did not do a meta-analysis or subanalyses as study types and outcomes were highly heterogeneous.

Second, we used harvest plots to examine results of high-quality or moderate-quality experimental studies for domains with more than three studies (n=21), along three dimensions as described in **box 1**: level of community participation, scope of capability strengthening and underlying group type.²⁰ Next, we identified social and behaviour change techniques employed in moderate-quality or high-quality studies of interventions with a health component (19/27 studies). We used a taxonomy developed by Kok *et al* to synthesise these in a heat map.²¹ The taxonomy categorises 14 types of techniques that broadly fall into two groups: those aimed at individual knowledge, capacity and skills (eg, using imagery and modelling behaviours) and those aimed at addressing social and environmental conditions (eg, mobilising social networks, participatory learning and action).²¹ We chose this taxonomy because it incorporated more group techniques than others.²²

Finally, we developed a summary of enablers and barriers related to contextual factors, intervention design and implementation, and outcome characteristics. Examples of contextual factors were rural/urban geography or migration levels. Implementation factors included types of group facilitator, behaviour change approach and the functioning of the underlying group. Outcome characteristics referred to the specific aim of the intervention, its relevance and feasibility specific to women's groups, such as whether pregnancy information would be relevant to older members of an SHG.

We described the results of all experimental studies after indicating their risk of bias. For all subsequent syntheses, however, we included only high-quality and moderate-quality experimental studies, along with qualitative studies and quantitative non-experimental studies that met basic criteria in the CASP checklist,¹⁹ that is, clearly reported methods and data pertinent to our research questions. We employed a results-based convergent synthesis approach²³: we integrated results from quantitative and qualitative analyses during a final synthesis using a thematic matrix and through iterative review and discussion with coauthors. We present results using the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols and Synthesis Without

Box 1 Panel 1: dimensions used to examine group interventions to improve health

Level of community participation*

Drawing on Arnstein,¹¹⁸ we identified three main levels of community participation:

- ▶ *Informed*: groups have little input into intervention priorities or actions; policymakers or implementing organisations choose the health domain and approach.
- ▶ *Consulted*: groups and/or other community members are involved in defining intervention priorities and actions, for example, through formative research.
- ▶ *Partnership*: groups and/or other community members define intervention priorities and/or actions.

Scope of capability strengthening*

Drawing on Labonte and Laverack's work and the 2017 WHO Global Strategy for Women's, Children's and Adolescents' health, we differentiated between four levels of capability strengthening for health:¹¹⁹

- ▶ *Individual*, for example, individual-level skills training with no emphasis on the group as an enabler.
- ▶ *Group*, for example, group-based health education, with little to no attempt to benefit non-group members.
- ▶ *Community*, for example, community mobilisation to improve health for group members and non-members.
- ▶ *None*, for example, groups that work together on finance, but no specific intention to build individual, group or community capabilities for health.

Underlying group type*

Based on studies in the review, we identified four different types of groups taking part in health interventions:

- ▶ *SHGs* primarily engaged in savings and credit activities, with membership restricted to 10–12 women who contribute financially.
- ▶ *Community-based women's groups* for women only, with no other membership requirements.
- ▶ *Open women's groups* that held meetings open to all women and other community members.
- ▶ *Special population groups*, for example, female sex worker collectives.

*We separate these three dimensions as they do not necessarily overlap. For example, the underlying group type does not necessarily prescribe the scope of capability strengthening or level of community participation. Similarly, a normally 'closed' SHG can open up to non-SHG members to identify and implement community-wide strategies to improve health.

Meta-analysis guidelines.²⁴ The review is registered with PROSPERO (CRD42019130633). The study was funded by the Bill and Melinda Gates Foundation, who had no role in data analysis, interpretation or writing.

RESULTS

We screened 21 380 studies and included 99 (**figure 1**). We found 19 RCT reports (17 unique trials and two subanalyses), 25 quasi-experimental study reports (24 unique studies and one subanalysis) and 55 non-experimental studies (27 quantitative and 28 qualitative). Online supplemental figure 1 describes the geographical location of studies, by state. Online supplemental table 2

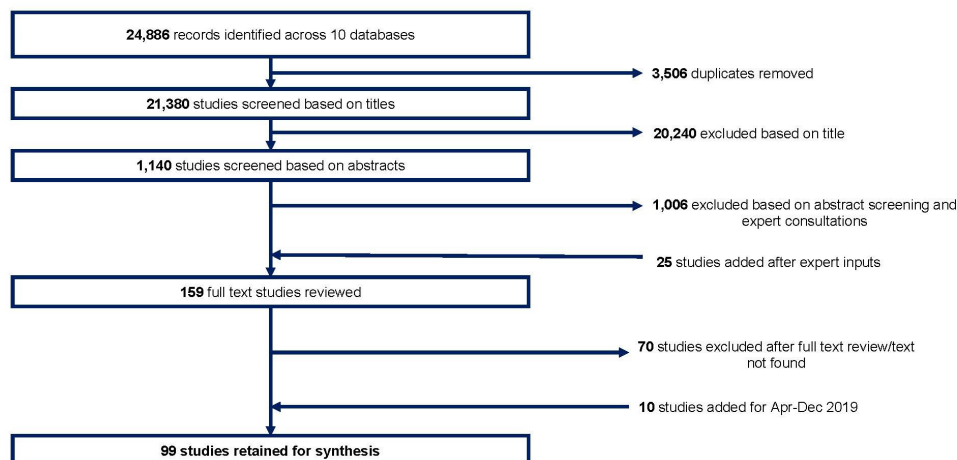


Figure 1 Study selection.

describes study settings, interventions and their characteristics, type of control, participant inclusion criteria, outcome measure(s), effect size and risk of bias assessment for all RCTs. Online supplemental table 3 describes all quasi-experimental studies. Online supplemental table 4 describes all non-experimental studies.

One-third (17/44) of experimental studies were at high, serious or critical risk of bias (4/19 RCTs and 13/25 quasi-experimental studies). Twenty-seven experimental studies reported on population-level outcomes, 15 reported outcomes only among group members and 2 studies reported outcomes for members and non-members separately. Over 85% of non-experimental studies (24/27 quantitative and 24/28 qualitative) were appraised as relevant and of good quality.

We present results related to our two objectives. First, we describe the effects of women's groups interventions within health domains and also according to level of community participation, scope of capacity strengthening, type of group and the type of social and behaviour change techniques used. Second, we map enablers and barriers related to context, intervention design and implementation, and outcome characteristics.

Intervention effects

Reproductive, maternal, newborn and child health

Seventeen studies (five unique RCTs, nine unique quasi-experimental studies and three subanalyses) reported on interventions to improve RMNCH. Kumar *et al* did a moderate-quality RCT of a community-wide behaviour change intervention with group meetings and home visits to improve birth outcomes in one rural sub-district.²⁵ They found a large reduction in neonatal mortality (adjusted risk ratio: 0.46, 95% CI 0.35 to 0.60) and improvements in maternal care-seeking behaviours.^{25 26} Acharya *et al*²⁷ tested a similar behaviour change strategy in a moderate-quality RCT across seven districts, with a less intensive approach. The trial found some improvements in selected perinatal preventive and care-seeking behaviours but no effect on neonatal survival (adjusted OR (aOR): 0.98, 95% CI 0.80 to 1.19).

Two moderate-quality to high-quality RCTs and a moderate-quality quasi-experimental study tested community mobilisation through women's groups practising participatory learning and action to identify and address problems in the perinatal period with support from the wider community. This approach, including one implemented by ASHAs in five districts, led to reductions in neonatal mortality of around 30% (aOR 0.68, 95% CI 0.59 to 0.78; aOR 0.69, 95% CI 0.53 to 0.89; aOR: 0.69, 95% CI 0.57 to 0.83), with greater reductions among more marginalised families (aOR: 0.41, 95% CI 0.28 to 0.59).²⁸⁻³¹ A moderate-quality trial of a similar perinatal intervention in Mumbai found no effects on neonatal mortality (aOR 1.42, 95% CI 0.99 to 2.04) or other birth outcomes.³² Seven quasi-experimental study reports, of which six were at serious or critical risk of bias, tested adding health information to SHGs in rural settings to improve behaviours in the perinatal period.³³⁻³⁹ They reported increases in knowledge of perinatal danger signs, selected essential newborn care and care-seeking practices among group members, but none measured birth outcomes.

Finally, two moderate-quality quasi-experimental studies focused on RMNCH beyond the perinatal period. One tested the impact of community-based women's groups engaging in collective action based on identified needs in three rural districts, leading to improvements in child immunisation rates (diphtheria pertussis tetanus: coefficient (β): 0.088, SE: 0.037; measles β : 0.076, SE: 0.038; tuberculosis: 0.071, SE: 0.038).⁴⁰ The other evaluated the effects of SHG membership with no health intervention in five districts and found no effects on assisted delivery, breastfeeding and child immunisation rates, knowledge of diarrhoea treatment or family planning.⁴¹

Nutrition

Three RCTs and four quasi-experimental studies focused on nutrition. One high-quality RCT found that giving information about key practices for maternal and child nutrition to SHG members had a small effect on child dietary diversity (mean number of food groups

consumed) for the youngest child in the family (β : 0.286, SE: 0.118), but not the index child (β : 0.169, SE: 0.080), and no effects on maternal body mass index (β : -0.025, SE: 0.082).⁴² A high-quality trial of participatory learning and action with groups and home visits to improve child growth reported no improvement in child length-for-age (adjusted mean difference 0.11, 95% CI -0.01 to 0.23) or weight-for-age and weight-for-height z scores, despite increases in maternal and child dietary diversity.⁴³ A third RCT found effects of SHGs with no health intervention on child weight-for-height z scores (adjusted β =0.38, 95% CI 0.16 to 0.61) but was at high risk of bias.⁴⁴ Two moderate-quality quasi-experimental studies found that SHG membership with food or livelihood inputs improved energy (109 kcal/day, $p \leq 0.05$) and protein intake (5.84g/day, $p \leq 0.01$) for participants in a state-wide programme.^{45 46} A third quasi-experimental study reported lower levels of underweight among the children of SHG members and higher protein intake for their households but was at serious risk of bias.⁴⁷ Finally, a moderate-quality quasi-experimental study testing participatory learning and action with women's groups combined with home visits and creches with meals for children under 3 years in five blocks found reductions in wasting, underweight and stunting (aOR: 0.73, 95% CI 0.55 to 0.97; aOR 0.60, 95% CI 0.47 to 0.75 and aOR 0.73, 95% CI 0.57 to 0.93, respectively).⁴⁸

Violence against women

We identified two RCTs and two quasi-experimental studies on violence against women. Both moderate-quality RCTs evaluated interventions providing gender-transformative training sessions to SHGs.^{49 50} The first, a rural trial, found no improvements in attitudes to gender roles (aOR: 0.69, 95% CI 0.35 to 1.02) or levels of physical marital violence (aOR: 0.69, 95% CI 0.46 to 1.02) and an increase in emotional marital violence (aOR: 2.95, 95% CI 1.75 to 4.97) among members.⁴⁹ The second, an urban RCT, found no effects on experience of physical or sexual violence (β : -0.006, SE: 0.022).⁵⁰ Two quasi-experimental studies examined the effect of SHG membership with no violence-specific intervention: one, a moderate-quality study, found no effect on an index of violence (β : 0.092, SE: 0.074), while the other, a low-quality study, found a small reduction in a similar index (difference-in-difference estimate: -0.448, $p=0.008$).^{51 52}

Vector-borne diseases

Two RCTs and one quasi-experimental study tested interventions to prevent vector-borne diseases. A moderate-quality RCT of an urban intervention to educate group members to control dengue found significant reductions in pupae per household and pupae per person indexes (difference in difference in % reduction from baseline: -14.7, $p=0.01$ and -0.35, $p=0.02$).⁵³ A moderate-quality RCT of a rural community mobilisation intervention engaging group and community members for malaria control reported increases in the proportion of people

sleeping under bed nets and receiving prompt diagnosis from a trained provider for a fever (aOR: 1.27, 95% CI 1.14 to 1.42 and aOR 1.45, 95% CI 1.09 to 1.94, respectively).⁵⁴ Finally, one low-quality quasi-experimental study tested the effect of group-led health education and monitoring households to control lymphatic filariasis in two rural villages and found a significant reduction in the proportion of people reporting mosquito-borne diseases (intervention: 75.8%, control: 48.8%, $p=0.05$).⁵⁵

Sexual health and HIV

All but one study that tested group interventions to improve sexual health and reduce sexually transmitted infection (STI)/HIV incidence ($n=6$) were conducted with female sex workers. One low-quality RCT reported improved HIV knowledge among rural SHG members exposed to a health education intervention (aOR for 'ever heard of HIV': 3.6, 95% CI 1.6 to 8.0).⁵⁶ A low-quality RCT among urban sex workers tested introduction of a microenterprise intervention with ongoing health education to reduce the number of sex exchange partners and reported positive results (reduction in partners β : -1.8 (-2.9, 95% CI -2.9 to -0.8)).⁵⁷ A moderate-quality quasi-experimental study that examined the effect of community mobilisation interventions with urban and rural sex workers reported reductions in gonorrhoea/chlamydia (aOR: 0.53, 95% CI 0.31 to 0.87), but not on HIV or syphilis (aOR: 1.07, 95% CI 0.54 to 2.14, aOR: 0.63, 95% CI 0.22 to 1.78, respectively), and improvements in condom use and HIV testing.⁵⁸ Another moderate-quality quasi-experimental study evaluated a community mobilisation intervention and reported improved knowledge of STI/HIV (know at least one STI: aOR: 48.5, 95% CI 14.4 to 163) and an overall effect on summary measures of empowerment and health (parameter estimate 4.81 (SE: 0.34), $p < 0.001$).⁵⁹ A moderate-quality evaluation of community mobilisation and peer groups reported reductions in gonorrhoea and/or chlamydia (aOR: 0.60, 95% CI 0.47 to 0.78) but no change in syphilis (aOR: 0.74, 95% CI 0.58 to 0.94) or HIV infection (aOR: 0.89, 95% CI 0.74 to 1.07).⁶⁰ Lastly, a low-quality quasi-experimental study reported positive effects of group training grounded in cognitive behavioural therapy on adherence to antiretroviral therapy (intervention: 54%; control: 0%).⁶¹

Domains with less than three studies

We found less than three studies on: health expenditure,^{62 63} water and sanitation^{64 65} and mental health,^{28 66} as well as two studies that addressed multiple health domains^{67 68} (detailed findings reported in online supplemental text).

Effects by level of community participation, scope of capability strengthening and group type

Figure 2 includes three harvest plots for the primary or main health outcomes in moderate-quality and high-quality experimental studies. We made separate plots to describe the relationship between intervention effects and levels of community participation, scope of capability strengthening and underlying group type, as defined in panel 1. We found

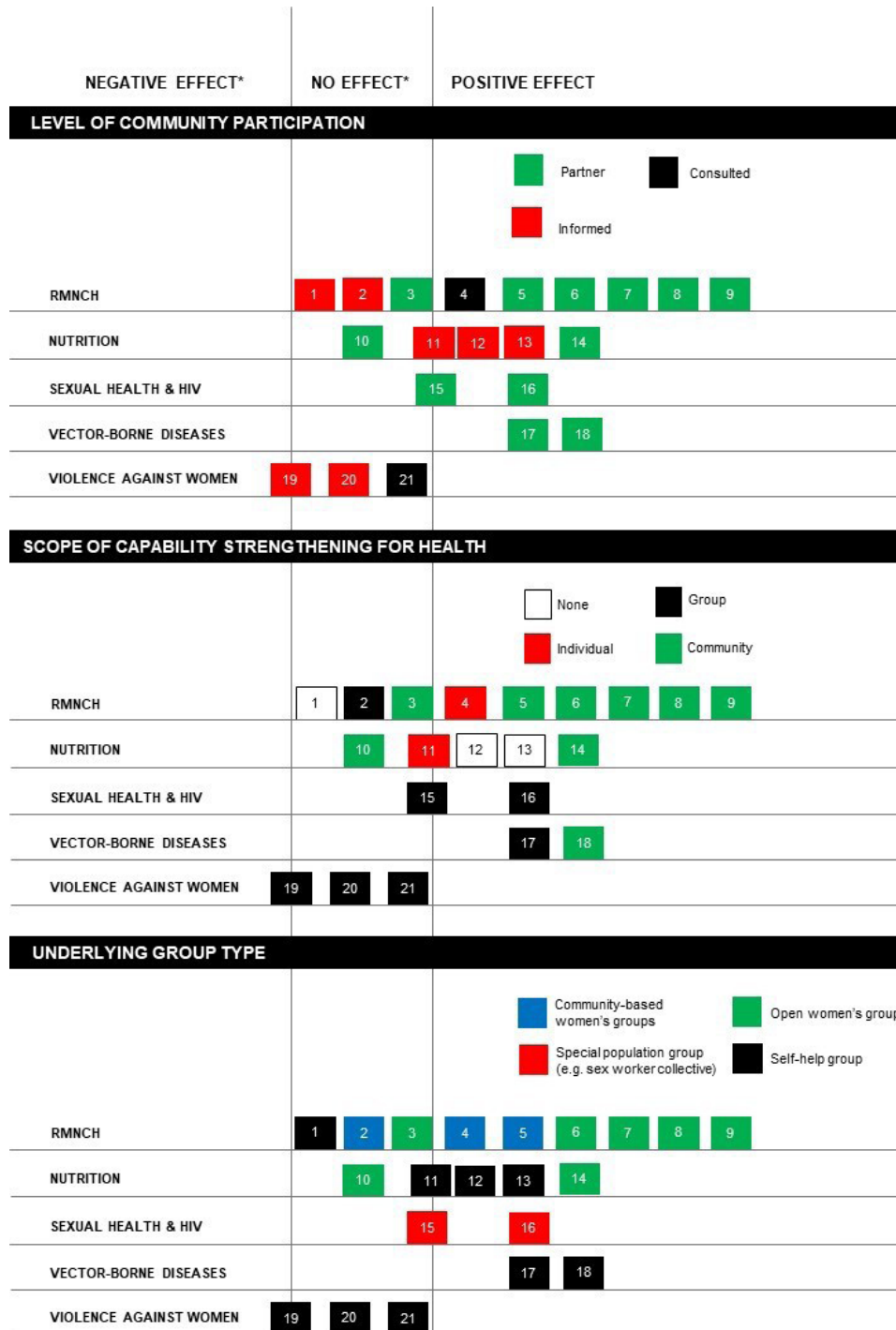


Figure 2 Harvest plots key to studies (first author):

1. Prennushi⁴¹ 2. Acharya²⁷ 3. More³² 4. Saha³⁸ 5. Janssens⁴⁰ 6. Tripathy²⁸ 7. Tripathy²⁹ 8. Kumar²⁵ 9. Roy³⁰ 10. Nair⁴³ 11. Gupta⁴² 12. Deininger⁴⁵ 13. Deininger⁴⁶ 14. Gope⁴⁸ 15. Beattie⁵⁸ 16. Bhattacharjee⁶⁰ 17. Arunachalam⁵³ 18. Das⁵⁴ 19. Jejeebhoy⁴⁹ 20. Holden⁵⁰ 21. Prillaman⁵¹

RMNCH, reproductive, maternal, newborn and child health. *Three studies had multiple primary outcomes with mixed effects: Gupta (11) had main outcomes with positive or no effects. Beattie (15) had main outcomes with positive or no effects. Jejeebhoy (19) had primary outcomes with no or negative effects.

more studies with positive effects as the level of community participation increased from informing community members (n=2/7) or consulting them (n=1/2) to building a partnership (9/12). Similarly, we found more studies with positive effects when interventions aimed to increase

community capabilities (n=7/9) rather than focusing only on building individual (n=1/2) or group capabilities (2/7). Lastly, we found more studies with positive effects through open or community-based groups (n=7/10) compared with SHGs (4/9).

Figure 3: Heat map of social and behaviour change techniques used in interventions*, using Kok et al. taxonomy

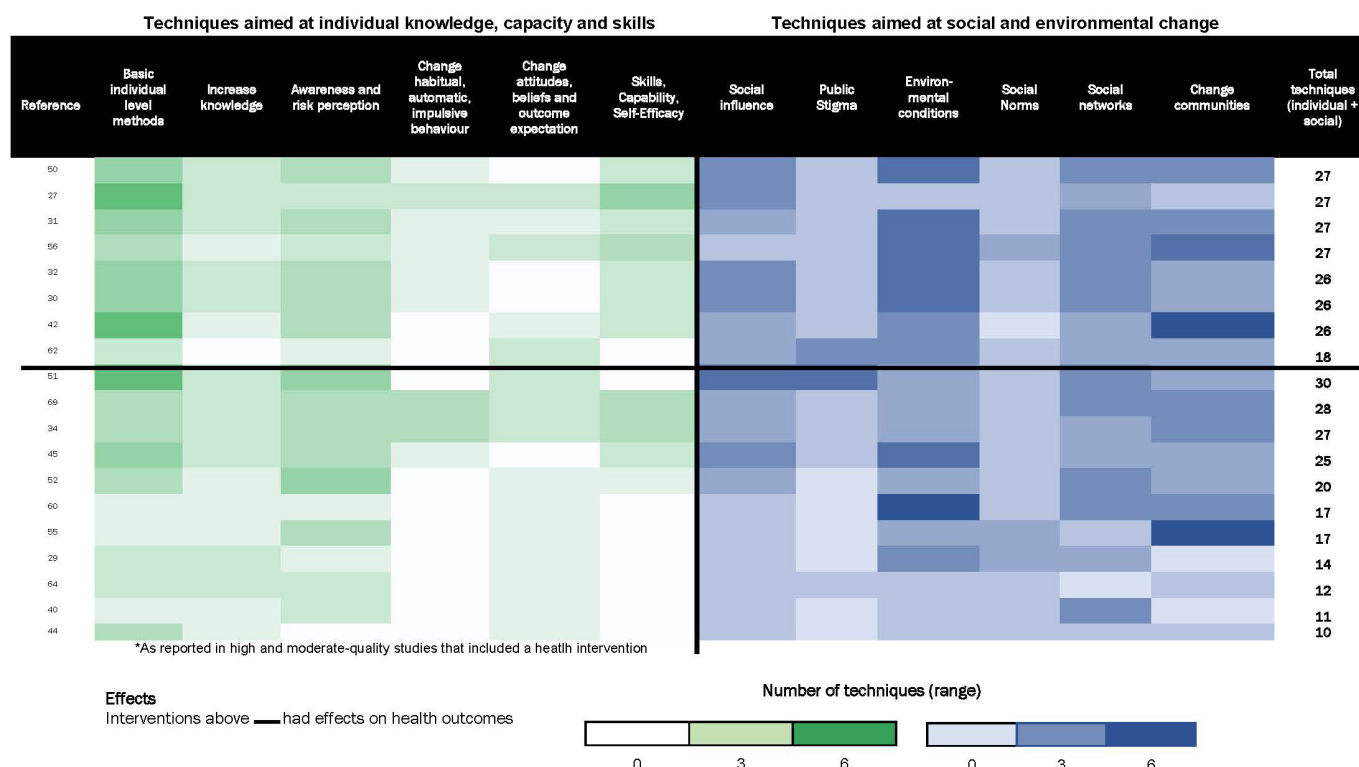


Figure 3 Heat map of social and behaviour change techniques used in interventions

Effects by type of social and behaviour change techniques employed

Figure 3 is a heat map of social and behaviour change techniques used in group interventions, using a taxonomy developed by Kok *et al.*²¹ It illustrates two findings. First, on average, interventions that succeeded in improving health outcomes^{25 28–30 40 53} used more social and behavioural change techniques (mean: 25.5, SD: 2.9) than those that did not succeed in improving health outcomes (mean: 19.2, SD: 6.9), with only a few exceptions.^{32 43} Second, successful interventions tended to use a combination of: (A) individual techniques aiming to increase knowledge and risk perception and (B) techniques to foster wider social and environmental change, including techniques to change social norms, and participatory problem posing and solving. Interventions that employed fewer, or mainly individual-level, techniques reported positive effects on self-reported behaviours but not on ‘harder’, objectively measured health outcomes (eg, mortality or anthropometry).^{27 42} In sum, using more and more diverse techniques mattered, especially to achieve changes in ‘hard’ outcomes.

Enablers and barriers in group-based interventions

► Table 1 summarises enablers and barriers related to context, intervention design, implementation and outcome characteristics.

Context

Two commonly cited contextual barriers to success were the lack of adequate health services in rural areas and

high levels of migration in urban areas.^{27 28 32 43 49 67 69}

Several quantitative and qualitative studies cited the presence of pre-existing SHGs as a key contextual enabler to improving health. Many hypothesised that SHG membership itself could improve financial security and health behaviours, which in turn would improve health outcomes.^{70–73} However, our review identified no high-quality or moderate-quality experimental studies reporting effects of SHG-only interventions on hard health outcomes such as mortality or anthropometry and only limited effects on self-reported behaviours.^{41 45 51 63 66}

Some researchers argued that the social cohesion of SHGs would make add-on health education interventions more effective.^{12 74–79} Yet several empirical studies identified barriers to integrating health interventions into SHGs: limited priority and time for health, exclusion of the most vulnerable and instability of the ‘platform’ due to group dissolution and irregular meetings.^{33 42 50 56 80–83} Finally, some studies argued that women’s groups could support health interventions through partnerships with government to monitor accountability as well as engage and mobilise communities, which appeared feasible in rural and urban settings.^{53 84–91}

Intervention design and implementation

Groups that improved health outcomes did not aim to ‘nudge’ new behaviours.^{92 93} Rather, they built individual, group and also communities’ capabilities by encouraging participation, problem solving and locally relevant solutions to address direct and underlying determinants

Table 1 Enablers and barriers

Thematic category	Enablers	Barriers
Contextual factors	<ul style="list-style-type: none"> ▶ Presence of existing SHGs ▶ Community willingness to develop groups ▶ Partnerships with municipalities in urban areas 	<ul style="list-style-type: none"> ▶ Migration (rural and urban) ▶ Poor supply of health services
Intervention design and implementation	<ul style="list-style-type: none"> ▶ Problem solving to identify feasible solutions that engage women ▶ Trusted, local female facilitator who leverages local practices and beliefs ▶ Inclusion of most vulnerable through active engagement ▶ Sufficient coverage to improve population health ▶ Intergenerational participation, such as mothers-in-law and adolescents 	<ul style="list-style-type: none"> ▶ Giving health messages without women's active participation ▶ Poor outreach to target women and influencers ▶ Group dissolution ▶ Irregular attendance ▶ Insufficient time spent on health, including duration and frequency
Outcome characteristics	<ul style="list-style-type: none"> ▶ Relevant to majority of group members and local community ▶ Supply-independent mechanisms to achieve effects possible or intervention addresses supply ▶ Limited, focused outcomes 	<ul style="list-style-type: none"> ▶ Driven by intrahousehold dynamics and social norms ▶ Dependent on diffusion

SHGs, self-help groups.

of health behaviour.^{40 94–98} Furthermore, the active involvement of community health workers provided a bridge to health systems.^{25 27 29 54 62 69 99} Motivated, trusted facilitators—local women hired with adequate training—enabled effective meetings, ensured inclusion of the most vulnerable and prioritised health.^{94 95 99} Interventions that recruited SHG members as facilitators noted challenges in leadership, communication and technical capacity.^{30 80} However, externally hired SHG community mobilisers who worked across finance, livelihoods and health juggled multiple priorities and gave limited priority to health.^{56 68 82} Training local women or recruiting existing community health workers emerged as the two most promising models to ensure quality facilitation that capitalised on local trust, knowledge and health systems links.^{25 29 62 94 99}

Effective group interventions attained sufficient intervention intensity: meetings held at least monthly, ranging from 1 to 2 hours per meeting, and over 1 year or more.^{26 30 96} Others reported irregular participation due to migration or lack of priority, resulting in limited time to discuss health—sometimes as short as 10 min⁴²—and inadequate intervention duration to improve health outcomes.^{32 42 62 80} Groups that improved population health outcomes, primarily open groups, attained sufficient coverage of concerned women, for example, pregnant women when groups were concerned with improving RMNCH.^{28 29} Open groups in rural areas reported that over 55% of targeted women attended meetings, whereas a similar intervention that did not achieve effects in urban areas reached only 8% of reproductive-aged women.^{28 29 32} Observational studies reported limited coverage of young mothers in SHGs^{100 101}: specific to RMNCH interventions, only one in four mothers with children under 2 years

were SHG members in three states.¹² Stability of groups varied: 27% of original microfinance and health groups in rural Bihar dissolved over a 1-year study period³⁴ and open groups in Mumbai had 30% annual population turnover,³² while rural, open groups and sex worker collectives sustained participation over longer intervention periods.^{59 95} Lastly, intergenerational participation in groups was noted as important to address culturally rooted practices or household dynamics where mothers-in-law and family play an important role, such as birthing practices or domestic violence.^{92 102}

Outcome characteristics

Women and community members participated in group activities when topics discussed were relevant to them, such as neonatal practices in high-mortality settings or condom use among sex workers.^{32 95 98} This was key to success: not enough women in urban Mumbai were interested in perinatal practices to sustain continued group participation, possibly because mortality rates were lower in this setting and improvements in birth outcomes depended on the quality of facility-based care, which required other mechanisms to influence.³² Government SHG members have a mean age of 38 years,¹⁰³ with typically two to four members who are pregnant or mothers of young children, making the success of RMNCH interventions entirely dependent on diffusion to non-SHG members.^{12 34 42 100} Inclusion of more outcomes to sustain interest among other members did not appear effective: interventions with more than two health domains had limited or no effects, plausibly due to lack of focus.^{62 67} Effective interventions addressed outcomes with mechanisms that were in women's control or addressed supply-side factors. For example, neonatal survival

improved through supply-independent mechanisms such as wrapping newborn infants, while child wasting, stunting and underweight only improved with direct food provision.^{48 95} Similarly, group-based gender sensitisation training was perhaps insufficient to address the patriarchal social norms that perpetuate violence against women.^{49–51 102 104 105}

DISCUSSION

We have conducted the first mixed-methods systematic review of the effects, enablers and barriers to groups improving women's and children's health in India, a setting where groups are widely used for health promotion. Experimental studies provided moderate-quality evidence that health interventions with groups can improve perinatal care practices, neonatal survival, immunisation rates, women and children's dietary diversity and the control of vector-borne diseases. There was stronger evidence for interventions that were relevant to group members, actively built communities' capabilities, used multiple social and behaviour change techniques and attained sufficient implementation intensity. These characteristics resonate with existing social and behaviour change theory.^{21 22} Our finding that groups need to be engaged through multiple behaviour change techniques beyond those used with individuals also concur with the proposals made in a recent framework for behaviour change through groups and a review of techniques employed in low-income and middle-income settings.^{106 107}

Evidence of positive effects on maternal, newborn and child health outcomes among rural, open women's groups engaged in community mobilisation aligns with findings from global systematic reviews.^{2 9 14 108} The lack of evidence of effects on violence against women and anthropometry underscores the limitation of group interventions when constrained by adverse, deeply rooted social norms or a limited supply of health and nutrition services.^{8 97 109} Like other systematic reviews, we found little evidence that SHGs can improve health outcomes on their own.^{6–8 10 110}

In a separate article, we identified three 'ideal types' of group interventions to improve health: 'classrooms' that build individual capacities using the group as a platform for information dissemination; 'clubs' that intentionally build group capacity to address health among members; and 'collectives' that engage communities to identify and address underlying determinants of their health problems.¹¹¹ This review found limited evidence that classroom-type interventions are effective beyond improving self-reported knowledge or behaviour among group members.^{42 62} Examples of the club approach noted the importance of investing in group strength and actively facilitating group action for health.^{38 53} Collectives that invested time in participatory approaches more commonly reported improvements in outcomes at a population level.^{25 28 29 40}

SHGs are widely viewed as a useful platform to improve health in India, but our synthesis suggests that adding a health education component to meetings is unlikely to change population-level outcomes without opening health interventions up to non-SHG members, using both individual-level and community-level social and behaviour change techniques, and addressing common barriers to intervention intensity, such as giving too little time to discussions about health.^{42 50 80} Our review does however suggest promise for SHGs as community mobilisation partners in broader population health interventions, as illustrated by effective interventions for vector-borne disease control.^{53 54} For group-focused interventions, health issues beyond RMNCH—such as non-communicable diseases and access to entitlements—may be more aligned with the age profile of SHG members.^{101 112–114}

Our review has limitations. Many experimental studies included multiple secondary outcomes, but we limited our syntheses to primary or main reported outcomes, which may have led us to under-report effects for intermediate behaviours. We did not examine effects by population subgroups (eg, among the poorest), due to heterogeneity in outcomes and common lack of reporting by subgroup. Many studies did not provide sufficient detail on intervention design and processes, such as meeting frequency, facilitator characteristics or behaviour change approaches, and we did not contact authors for additional information. Furthermore, the Kok *et al* taxonomy was designed to guide intervention development rather than code techniques and thus contained some overlapping categories.²¹

Our recommendations were influenced by limitations in the evidence base. We found few evaluations from urban areas. One-third of experimental studies were at serious or critical risk of bias, largely because evaluations did not adequately address selection bias, missing data or failed to prespecify their main outcomes. Group-level findings that did not report population coverage limited our ability to examine the potential of such interventions to improve population health and equity. Only 13 experimental studies included process evaluations or qualitative findings, limiting the strength of our conclusions on enablers and barriers.^{29 32 38 50 51 53 60 62 67 68 80 82 94 95} Lastly, only 12 evaluations included cost data.^{28 30 42 43 45 48 52 55 56 67 115 116}

Box 2 summarises this review's recommendations for future interventions with women's groups in India. These have potential relevance for other countries that have community engagement programmes with women's groups, including Bangladesh, Nepal, Thailand, Bolivia, Haiti, Ethiopia, Nigeria and South Africa.⁶ Future research should estimate population-level coverage of groups and effects, rather than focusing solely on group members. More robust evaluations are needed from urban contexts and for key areas including family planning, water, sanitation and hygiene, non-communicable disease and violence against women. Studies should aim to include objectively measured health outcomes

Box 2 Panel 2: Suggested principles for women's groups interventions to improve health

- ▶ Interventions with women's groups should focus on changing health outcomes that are supply- independent or concurrently address supply-side factors.
- ▶ Groups should either open up to those interested in the selected health outcomes, choose health outcomes aligned with members' needs or allow members to decide which outcomes they wish to focus on.
- ▶ Community interventions with women's groups should go beyond disseminating information and seek to build communities' capabilities. Short modules to deliver health messages are rarely effective for outcomes that are determined by more than knowledge deficits.
- ▶ Women's groups interventions should have sufficient intensity: most successful interventions have groups that meet at least monthly, for at least an hour focused on health and for an intervention duration proportionate to the complexity of the outcome(s) tackled.
- ▶ Group-based interventions should aim to involve the wider community through specific, intentional mechanisms (eg, community meetings or outreach) given that most groups will not attain sufficient population coverage and there is limited evidence of diffusion.
- ▶ Motivated and capable facilitators—local women with adequate training or support—are required for almost all social and behaviour change approaches.
- ▶ Community health workers should be engaged in women's group interventions, either as facilitators or as participants, to facilitate links with the health system.

and measures to address social desirability bias with self-reported behaviours. Lastly, systematic reporting of behaviour change approach, group and intervention implementation processes and costs will help to inform policy and practice.^{21 117}

CONCLUSION

Community interventions with women's groups can improve women's and children health in India if they engage with whole communities and with sufficient intensity. Our review suggests that using women's groups only as a platform to disseminate health messages has limited rigorous evidence of effectiveness on population-level outcomes. There is more promise in community mobilisation approaches that seek to build communities' capabilities. These should focus on changing health outcomes that are of interest to group members and are either supply independent or with a concurrent focus on supply-side factors, have sufficient intensity, population coverage and good facilitators, preferably connected to the health system.

Author affiliations

¹Population Council India, New Delhi, Delhi, India

²International Food Policy Research Institute, New Delhi, India

³Institute for Global Health, University College London, London, UK

⁴International Food Policy Research Institute, Washington, DC, USA

⁵University College London Institute of Child Health, London, UK

Twitter Lu Gram @LuGram12, Neha Kumar @neha_DC and Audrey Prost @audreyprost2

Acknowledgements We would like to thank Dr Nayreen Daruwalla (Society for Nutrition, Education and Health Action, Mumbai), Dr Suneetha Kadiyala (London School of Hygiene and Tropical Medicine) and Professor David Osrin (University College London) for useful comments on the manuscript. We would like to thank Dr Helen Burchett (London School of Hygiene and Tropical Medicine) for advice on the review protocol.

Contributors AP and SD conceptualised the systematic review, with input from NK and LG. MM and AP conducted the searches, and MM and MS screened titles and abstracts. SD and AP screened full text. AD, AP, MM, MS, RJS and SD extracted quantitative and qualitative data. SD and AP conducted risk of bias assessments, synthesised findings and drafted the report. All authors reviewed and commented on the report.

Funding This review was funded by an award from the Bill and Melinda Gates Foundation (OPP1205836), to the Population Council, who partnered in a consortium with University College London and International Food Policy Research Institute.

Competing interests AP, LG, NK and SD have been involved in some of the studies included in the review.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on request. All data relevant to the study are included in the article or uploaded as supplementary information. Extraction sheets are available on request. All other data are included in the article and supplementary files.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution 4.0 Unported (CC BY 4.0) license, which permits others to copy, redistribute, remix, transform and build upon this work for any purpose, provided the original work is properly cited, a link to the licence is given, and indication of whether changes were made. See: <https://creativecommons.org/licenses/by/4.0/>.

ORCID iDs

Sapna Desai <http://orcid.org/0000-0003-2596-9726>

Mirignyani Sehgal <http://orcid.org/0000-0001-5534-3543>

Lu Gram <http://orcid.org/0000-0002-3905-0465>

Neha Kumar <http://orcid.org/0000-0001-7982-3277>

Audrey Prost <http://orcid.org/0000-0001-6121-8132>

REFERENCES

- 1 Jamison DT, Alwan A, Mock CN, *et al*. Universal health coverage and intersectoral action for health: key messages from disease control priorities, 3rd edition. *Lancet* 2018;391:1108–20.
- 2 World Health Organization. *An evidence map of social, behavioural and community engagement interventions for reproductive, maternal, newborn and child health*. Geneva: World Health Organization, 2017.
- 3 Kuruvilla S, Bustreo F, Kuo T, *et al*. The *Global strategy for women's, children's and adolescents' health (2016–2030)*: a roadmap based on evidence and country experience. *Bull World Health Organ* 2016;94:398–400.
- 4 Marston C, Hinton R, Kean S, *et al*. Community participation for transformative action on women's, children's and adolescents' health. *Bull World Health Organ* 2016;94:376–82.
- 5 Sen A. Capability and Well-Being. In: Nussbaum M, Sen A, eds. *The quality of life*. Oxford: Clarendon Press, 1993.
- 6 Brody C, Hoop Tde, Vojtkova M, *et al*. Can self-help group programs improve women's empowerment? A systematic review. *J Dev Effect* 2017;9:15–40.
- 7 Gugerty MK, Biscaye P, Anderson CL, Leigh Anderson C. Delivering development? evidence on self-help groups as development intermediaries in South Asia and Africa. *Dev Policy Rev* 2019;37:129–51.
- 8 Kumar N, Scott S, Menon P, *et al*. Pathways from women's group-based programs to nutrition change in South Asia: A conceptual framework and literature review. *Glob Food Sec* 2018;17:172–85.
- 9 Prost A, Colbourn T, Seward N, *et al*. Women's groups practising participatory learning and action to improve maternal and newborn health in low-resource settings: a systematic review and meta-analysis. *Lancet* 2013;381:1736–46.

- 10 Orton L, Pennington A, Nayak S, *et al*. Group-Based microfinance for collective empowerment: a systematic review of health impacts. *Bull World Health Organ* 2016;94:694–704.
- 11 Howard-Grabman L, Storti C, Hummer P, *et al*. *Demystifying community mobilization: an effective strategy to improve maternal and newborn health*. Geneva: USAID, 2007.
- 12 Reshma SR, Dinachandra K, Bhanot A, *et al*. Context for layering women's nutrition interventions on a large scale poverty alleviation program: evidence from three eastern Indian states. *PLoS One* 2019;14:e0210836.
- 13 MoHFW. *Training design and strategy for improved RMNCH outcomes ASHAs using participatory learning and action*. New Delhi, 2016.
- 14 Lassi ZS, Bhutta ZA. Community-Based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes. *Cochrane Database Syst Rev* 2015:CD007754.
- 15 Reeves BC, Wells GA, Waddington H. Quasi-experimental study designs series—paper 5: a checklist for classifying studies evaluating the effects on health interventions—a taxonomy without labels. *J Clin Epidemiol* 2017;89:30–42.
- 16 Higgins JP, Thomas J, Chandler J, *et al*. *Cochrane Handbook for systematic reviews of interventions*. John Wiley & Sons, 2019.
- 17 Sterne JAC, Savović J, Page MJ, *et al*. Rob 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019;2:14898.
- 18 Sterne JAC, Hernán MA, Reeves BC, *et al*. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *BMJ* 2016;355:i4919.
- 19 Noyes J, Booth A, Cargo M, Flemming K, Harris J, Harden A, Garside R, Hannes K, Pantoja T, Thomas J. Chapter 21:Qualitative evidence. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA(editors). *Cochrane Handbook for Systematic Reviews of Interventions version 6.0*. (updated July 2019). Cochrane, 2019.
- 20 Ogilvie D, Fayer D, Petticrew M, *et al*. The harvest plot: a method for synthesising evidence about the differential effects of interventions. *BMC Med Res Methodol* 2008;8:8.
- 21 Kok G, Gottlieb NH, Peters G-JY, *et al*. A taxonomy of behaviour change methods: an intervention mapping approach. *Health Psychol Rev* 2016;10:297–312.
- 22 Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011;6:42.
- 23 Hong QN, Pluye P, Bujold M, *et al*. Convergent and sequential synthesis designs: implications for conducting and reporting systematic reviews of qualitative and quantitative evidence. *Syst Rev* 2017;6:61.
- 24 Campbell M, McKenzie JE, Sowden A, *et al*. Synthesis without meta-analysis (swim) in systematic reviews: reporting guideline. *BMJ* 2020;72:i6890.
- 25 Kumar V, Mohanty S, Kumar A, *et al*. Effect of community-based behaviour change management on neonatal mortality in Shivgarh, Uttar Pradesh, India: a cluster-randomised controlled trial. *Lancet* 2008;372:1151–62.
- 26 Kumar V, Kumar A, Das V, *et al*. Community-Driven impact of a newborn-focused behavioral intervention on maternal health in Shivgarh, India. *Int J Gynaecol Obstet* 2012;117:48–55.
- 27 Acharya A, Lalwani T, Dutta R, *et al*. Evaluating a large-scale community-based intervention to improve pregnancy and newborn health among the rural poor in India. *Am J Public Health* 2015;105:144–52.
- 28 Tripathy P, Nair N, Barnett S, *et al*. Effect of a participatory intervention with women's groups on birth outcomes and maternal depression in Jharkhand and Orissa, India: a cluster-randomised controlled trial. *Lancet* 2010;375:1182–92.
- 29 Tripathy P, Nair N, Sinha R, *et al*. Effect of participatory women's groups facilitated by accredited social health activists on birth outcomes in rural eastern India: a cluster-randomised controlled trial. *Lancet Glob Health* 2016;4:e119–28.
- 30 Roy SS, Mahapatra R, Rath S, *et al*. Improved neonatal survival after participatory learning and action with women's groups: a prospective study in rural eastern India. *Bull World Health Organ* 2013;91:426–33.
- 31 Houweling TAJ, Tripathy P, Nair N, *et al*. The equity impact of participatory women's groups to reduce neonatal mortality in India: secondary analysis of a cluster-randomised trial. *Int J Epidemiol* 2013;42:520–32.
- 32 More NS, Bapat U, Das S, *et al*. Community mobilization in Mumbai slums to improve perinatal care and outcomes: a cluster randomized controlled trial. *PLoS Med* 2012;9:e1001257.
- 33 Mozumdar A, Khan ME, Mondal SK, *et al*. Increasing knowledge of home based maternal and newborn care using self-help groups: evidence from rural Uttar Pradesh, India. *Sex Reprod Healthc* 2018;18:1–9.
- 34 Saggurti N, Atmavilas Y, Porwal A, *et al*. Effect of health intervention integration within women's self-help groups on collectivization and healthy practices around reproductive, maternal, neonatal and child health in rural India. *PLoS One* 2018;13:e0202562.
- 35 Saggurti N, Mahapatra B, Atmavilas Y, *et al*. Improving Health Systems Response Through Women's Self-Help Groups in India: Repeated Cross-Sectional, Quasi-Experimental Study. *SSRN Electronic Journal* 2019.
- 36 Hazra A, Atmavilas Y, Hay K, *et al*. Effects of health behaviour change intervention through women's self-help groups on maternal and newborn health practices and related inequalities in rural India: a quasi-experimental study. *EclinicalMedicine* 2020;18:100198.
- 37 Madhivanan P, NiranjanKumar B, Shaheen R, *et al*. Increasing antenatal care and HIV testing among rural pregnant women with conditional cash transfers to self-help groups: an evaluation study in rural Mysore, India. *J Sex Transm Dis* 2013;2013:1–6.
- 38 Saha S, Kermod M, Annear PL. Effect of combining a health program with a microfinance-based self-help group on health behaviors and outcomes. *Public Health* 2015;129:1510–8.
- 39 Saggurti N, Porwal A, Atmavilas Y, *et al*. Effect of behavioral change intervention around new-born care practices among most marginalized women in self-help groups in rural India: analyses of three cross-sectional surveys between 2013 and 2016. *J Perinatol* 2019;39:990–9.
- 40 Janssens W. Measuring Externalities in Program Evaluation: Spillover Effects of a Women's Empowerment Programme in Rural India. *SSRN Electronic Journal* 2004.
- 41 Prennushi G, Gupta A. *Women's Empowerment and Socio-Economic Outcomes: Impacts of the Andhra Pradesh Rural Poverty Reduction Program*. Department WBSD, World Bank, 2014.
- 42 Gupta S, Kumar N, Menon P, Pandey S, Raghunathan K. Engaging women's groups to improve nutrition: Findings from an evaluation of the JEEViKA multisectoral convergence pilot in Saharsa, Bihar. Washington, DC International Food Policy Research Institute; 2019.
- 43 Nair N, Tripathy P, Sachdev HS, *et al*. Effect of participatory women's groups and counselling through home visits on children's linear growth in rural eastern India (CARING trial): a cluster-randomised controlled trial. *Lancet Glob Health* 2017;5:e1004–16.
- 44 Ojha S, Szatkowski L, Sinha R, *et al*. Rojiroti microfinance and child nutrition: a cluster randomised trial. *Arch Dis Child* 2020;105:229–35.
- 45 Deininger K, Liu Y. Economic and social impacts of an innovative self-help group model in India. *World Dev* 2013;43:149–63.
- 46 Deininger K, Liu Y. Evaluating program impacts on mature self-help groups in India. *World Bank Econ Rev* 2012;27:272–96.
- 47 De S, Sarker D. Women's Empowerment through Self-help Groups and its Impact on Health Issues: Empirical Evidence. *Journal of Global Analysis* 2011;2.
- 48 Gope RK, Tripathy P, Prasad V, *et al*. Effects of participatory learning and action with women's groups, counselling through home visits and crèches on undernutrition among children under three years in eastern India: a quasi-experimental study. *BMC Public Health* 2019;19:962.
- 49 Jejeebhoy SJ. *Empowering women and addressing violence against them through self-help groups (SHGs)*. Population Council, 2017.
- 50 Holden J, Humphreys M, Husain S, *et al*. Evaluation of the Madhya Pradesh safe cities initiative 2013–16. *Endline Report for DFID India* 2016.
- 51 Prillaman S. *Strength in numbers: How women's groups close India's political gender gap: Working paper*, 2017.
- 52 Yaron G, Gordon R, Best J, *et al*. Microfinance for the marginalized: the impact of the Rojiroti approach in India. *Enterprise Development and Microfinance* 2018;29:80–93.
- 53 Arunachalam N, Tyagi BK, Samuel M, *et al*. Community-based control of *Aedes aegypti* by adoption of eco-health methods in Chennai City, India. *Pathog Glob Health* 2012;106:488–96.
- 54 Das A, Friedman J, Kandpal E, *et al*. *Strengthening malaria service delivery through supportive supervision and community mobilization in an endemic Indian setting: an evaluation of nested delivery models*. The World Bank, 2014.
- 55 Nandha B, Krishnamoorthy K. Impact of education campaign on community-based vector control in hastening the process of elimination of lymphatic filariasis in Tamil Nadu, South India. *Health Educ Res* 2012;27:585–94.
- 56 Spielberg F, Crookston BT, Chanani S, *et al*. Leveraging microfinance to impact HIV and financial behaviors among

- adolescents and their mothers in West Bengal: a cluster randomized trial. *Int J Adolesc Med Health* 2013;25:157–66.
- 57 Sherman SG, Srikrishnan AK, Rivett KA, *et al.* Acceptability of a microenterprise intervention among female sex workers in Chennai, India. *AIDS Behav* 2010;14:649–57.
 - 58 Beattie TSH, Mohan HL, Bhattacharjee P, *et al.* Community mobilization and empowerment of female sex workers in Karnataka state, South India: associations with HIV and sexually transmitted infection risk. *Am J Public Health* 2014;104:1516–25.
 - 59 Swendeman D, Basu I, Das S, *et al.* Empowering sex workers in India to reduce vulnerability to HIV and sexually transmitted diseases. *Soc Sci Med* 2009;69:1157–66.
 - 60 Bhattacharjee P, Prakash R, Pillai P, *et al.* Understanding the role of peer group membership in reducing HIV-related risk and vulnerability among female sex workers in Karnataka, India. *AIDS Care* 2013;25:S46–54.
 - 61 Shankar A, Sundar S, Smith G. Agency-Based Empowerment interventions: efforts to enhance decision-making and action in health and development. *J Behav Health Serv Res* 2019;46:164–76.
 - 62 Desai S, Mahal A, Sinha T, *et al.* The effect of community health worker-led education on women's health and treatment-seeking: A cluster randomised trial and nested process evaluation in Gujarat, India. *J Glob Health* 2017;7:020404.
 - 63 Joshi SP, Palaniswamy N, Rao V. Impact evaluation framework and results: Odisha rural livelihoods project. Washington, DC World Bank; 2015.
 - 64 Freeman MC, Trinies V, Boisson S, *et al.* Promoting Household Water Treatment through Women's Self Help Groups in Rural India: Assessing Impact on Drinking Water Quality and Equity. *PLoS One* 2012;7:e44068.
 - 65 Khush R, London A, Arnold J, *et al.* *Evaluating the sustainability and impacts of water, sanitation & hygiene interventions*. San Francisco: Aquaya, 2009.
 - 66 Anand P, Saxena S, Gonzalez R. *Can Women's Self-Help Groups Contribute to Sustainable Development? Evidence of Capability Changes from Northern India*. The World Bank, 2019.
 - 67 More NS, Das S, Bapat U, *et al.* Community resource centres to improve the health of women and children in informal settlements in Mumbai: a cluster-randomised, controlled trial. *Lancet Glob Health* 2017;5:e335–49.
 - 68 Subramanyam M, Ebert C, Bommer C. Impact of the Gram Varta programme on health, nutrition and women's empowerment in India.. New Delhi 3ie International Initiative for Impact Evaluation; 2017.
 - 69 Ruducha J, Hariharan D, Potter J, *et al.* Measuring coordination between women's self-help groups and local health systems in rural India: a social network analysis. *BMJ Open* 2019;9:e028943.
 - 70 Mohindra K, Haddad S, Narayana D. Can microcredit help improve the health of poor women? some findings from a cross-sectional study in Kerala, India. *Int J Equity Health* 2008;7:2.
 - 71 Saha S, Annear P, Pathak S. The effect of self-help groups on access to maternal health services: evidence from rural India. *Int J Equity Health* 2013;12:36.
 - 72 Feruglio F, Nisbett N. The challenges of institutionalizing community-level social accountability mechanisms for health and nutrition: a qualitative study in Odisha, India. *BMC Health Serv Res* 2018;18:788.
 - 73 Gopalan SS. *Micro-Finance and its contributions to health care access (a study of self-help groups (SHGs) in Kerala*. Kerala: Health and Population Department of Kerala on Health and Population, 2007: 134–49.
 - 74 Aruldas K, Kant A, Mohanan PS. Care-seeking behaviors for maternal and newborn illnesses among self-help group households in Uttar Pradesh, India. *J Health Popul Nutr* 2017;36:49.
 - 75 Dongre AR, Deshmukh PR, Garg BS. A comparison of HIV/AIDS awareness between self-help group leaders and other women in the villages of primary health centre, Anji. *J Commun Dis* 2007;39:101–4.
 - 76 Gupta M, Rs R, Kumar D, *et al.* Empowerment and engagement of SHGs against RTI/STI in Karnataka, India: an interventional study. *Int J Res Med Sci* 2015;3:680.
 - 77 Panda P, Chakraborty A, Dror D. Mobilizing community-based health insurance to enhance awareness & prevention of airborne, vector-borne & waterborne diseases in rural India. *Indian J Med Res* 2015;142:151–64.
 - 78 Sethi V, Bhanot A, Bhalla S, *et al.* Partnering with women collectives for delivering essential women's nutrition interventions in tribal areas of eastern India: a scoping study. *J Health Popul Nutr* 2017;36:20.
 - 79 Van Rompay KKA, Madhivanan P, Rafiq M, *et al.* Empowering the people: development of an HIV peer education model for low literacy rural communities in India. *Hum Resour Health* 2008;6:6.
 - 80 Jejeebhoy SJ, Santhya KG. Preventing violence against women and girls in Bihar: challenges for implementation and evaluation. *Reprod Health Matters* 2018;26:92–108.
 - 81 Sinha F, Harper M, Srinivasan G, *et al.* *Self help groups in India: a study of the lights and shades: a study by EDA and APMAS*. New Delhi, 2006.
 - 82 Avula R, Raghunathan K, Chauhan T, *et al.* *The Jeevika Multisectoral convergence pilot in Bihar: a process evaluation report*. The World Bank, 2019.
 - 83 Kumar A. Health inequity and women's self-help groups in India: The role of caste and class. *Health Sociology Review* 2007;16:160–8.
 - 84 George AS, Mohan D, Gupta J, *et al.* Can community action improve equity for maternal health and how does it do so? research findings from Gujarat, India. *Int J Equity Health* 2018;17:125.
 - 85 Agarwal S, Satyavada A, Patra P, *et al.* Strengthening functional community-provider linkages: lessons from the Indore urban health programme. *Glob Public Health* 2008;3:308–25.
 - 86 Hamal M, de Cock Buning T, De Brouwere V, *et al.* How does social accountability contribute to better maternal health outcomes? A qualitative study on perceived changes with government and civil society actors in Gujarat, India. *BMC Health Serv Res* 2018;18:653.
 - 87 Baruah B. Assessment of public/private/NGO partnerships: Water and sanitation services in slums. *Nat Resour Forum* 2007;31:226–37.
 - 88 Rajendran R, Sunish IP, Munirathinam A, *et al.* Role of community empowerment in the elimination of lymphatic filariasis in South India. *Trop Biomed* 2010;27:68–78.
 - 89 Kaur M, Jaswal N, Saddi AK. Evaluation of a women group led health communication program in Haryana, India. *Eval Program Plann* 2017;65:12–19.
 - 90 Euser S, Souverein D, Narayana Gowda PR, *et al.* Pragati[§]: an empowerment programme for female sex workers in Bangalore, India. *Glob Health Action* 2012;5:19279–11.
 - 91 Blankenship KM, West BS, Kershaw TS, *et al.* Power, community mobilization, and condom use practices among female sex workers in Andhra Pradesh, India. *AIDS* 2008;22:S109–16.
 - 92 Kumar V, Kumar A, Ghosh AK, *et al.* Enculturating science: Community-centric design of behavior change interactions for accelerating health impact. *Semin Perinatol* 2015;39:393–415.
 - 93 Sanyal P, Rao V, Majumdar S. *World Bank Policy Research Working Paper No. 7411. Recasting culture to undo gender: a sociological analysis of Jeevika in rural Bihar: India*. Washington, DC World Bank; 2016.
 - 94 Morrison J, Osrin D, Alcock G, *et al.* Exploring the equity impact of a maternal and newborn health intervention: a qualitative study of participatory women's groups in rural South Asia and Africa. *Int J Equity Health* 2019;18:55.
 - 95 Rath S, Nair N, Tripathy PK, *et al.* Explaining the impact of a women's group led community mobilisation intervention on maternal and newborn health outcomes: the Ekjut trial process evaluation. *BMC Int Health Hum Rights* 2010;10:25.
 - 96 Nic a Bháird C. The Complexity of Community Engagement: Developing Staff-Community Relationships in a Participatory Child Education and Women's Rights Intervention in Kolkata Slums. *J Community Appl Soc Psychol* 2013;23:389–404.
 - 97 Blankenship KM, Biradavolu MR, Jena A, *et al.* Challenging the stigmatization of female sex workers through a community-led structural intervention: learning from a case study of a female sex worker intervention in Andhra Pradesh, India. *AIDS Care* 2010;22:1629–36.
 - 98 Blanchard AK, Mohan HL, Shahmanesh M, *et al.* Community mobilization, empowerment and HIV prevention among female sex workers in South India. *BMC Public Health* 2013;13:234.
 - 99 Alcock GA, More NS, Patil S, *et al.* Community-based health programmes: role perceptions and experiences of female peer facilitators in Mumbai's urban slums. *Health Educ Res* 2009;24:957–66.
 - 100 Kadiyala S, Morgan EH, Cyriac S, *et al.* Adapting agriculture platforms for nutrition: a case study of a participatory, video-based agricultural extension platform in India. *PLoS One* 2016;11:e0164002.
 - 101 Kumar N, Raghunathan K, Arrieta A, *et al.* Social networks, mobility, and political participation: The potential for women's self-help groups to improve access and use of public entitlement schemes in India. *World Dev* 2019;114:28–41.
 - 102 Krishnan S, Subbiah K, Khanum S, *et al.* An intergenerational women's empowerment intervention to mitigate domestic violence:

- results of a pilot study in Bengaluru, India. *Violence Against Women* 2012;18:346–70.
- 103 3ie. *Findings from evaluation of National Rural Livelihoods Program Evidence-informed policymaking for rural transformation: An exploration of the role of women's collectives and community participation*. New Delhi, India: 3ie, 2020.
- 104 Hunt J, Kasynathan N. Pathways to empowerment? reflections on microfinance and transformation in gender relations in South Asia. *Gender & Development* 2001;9:42–52.
- 105 Kethineni S, Srinivasan M, Kakar S. Combating Violence against Women in India: *Nari Adalats* and Gender-Based Justice. *Women Crim Justice* 2016;26:281–300.
- 106 Briscoe C, Aboud F. Behaviour change communication targeting four health behaviours in developing countries: a review of change techniques. *Soc Sci Med* 2012;75:612–21.
- 107 Hoddinott P, Allan K, Avenell A, *et al*. Group interventions to improve health outcomes: a framework for their design and delivery. *BMC Public Health* 2010;10:800.
- 108 Gram L, Fitchett A, Ashraf A, *et al*. Promoting women's and children's health through community groups in low-income and middle-income countries: a mixed-methods systematic review of mechanisms, enablers and barriers. *BMJ Glob Health* 2019;4:e001972.
- 109 Vyas S, Watts C. How does economic empowerment affect women's risk of intimate partner violence in low and middle income countries? A systematic review of published evidence. *J Int Dev* 2009;21:577–602.
- 110 Maïtrot M, Niño-Zarazúa M. Poverty and wellbeing impacts of microfinance: what do we know? 2017. ISBN 978-92-9256-416-2.
- 111 Gram L, Desai S, Prost A. Classroom, Club or collective? three types of community-based group intervention and why they matter for health. *BMJ Global Health* 2020. doi:10.1136/bmjgh-2020-003302
- 112 Rao K, Vanguri P, Premchander S. Community-Based mental health intervention for underprivileged women in rural India: an experiential report. *Int J Family Med* 2011;2011:1–7.
- 113 Gupta SK, Pal D, Garg R. Impact of a health education intervention program regarding breast self examination by women in a semi-urban area of Madhya Pradesh, India. *Asian Pac J Cancer Prev* 2009;10:1113–7.
- 114 Gailits N, Mathias K, Nouvet E, *et al*. Women's freedom of movement and participation in psychosocial support groups: qualitative study in northern India. *BMC Public Health* 2019;19:725.
- 115 Sinha RK, Haghparast-Bidgoli H, Tripathy PK, *et al*. Economic evaluation of participatory learning and action with women's groups facilitated by Accredited Social Health Activists to improve birth outcomes in rural eastern India. *Cost Effectiveness and Resource Allocation* 2017;15:2.
- 116 Chandrashekar S, Saha S, Varghese B, *et al*. Cost and cost-effectiveness of health behavior change interventions implemented with self-help groups in Bihar, India. *PLoS One* 2019;14:e0213723.
- 117 Campbell M, Katikireddi SV, Hoffmann T, *et al*. TIDieR-PHP: a reporting guideline for population health and policy interventions. *BMJ* 2018;361:k1079.
- 118 Arnstein S. A ladder of citizen participation. *Journal of the American Planning Association* 1969;35:216–24.
- 119 Labonte R, Laverack G. Capacity building in health promotion, part 1: for whom? and for what purpose? *Crit Public Health* 2001;11:111–27.

Supplementary Text

Domains with less than three studies

Two studies on health expenditure reported no effects: a high-quality RCT of a health education intervention with a community-based women's group found no effects on women's utilisation of health insurance (aRR: 1.03, 95%CI: 0.81,1.30)⁶⁴ and a moderate-quality quasi-experimental rural study of SHG membership found no effects on health care expenses (intervention: USD 840 vs USD: 948 control, p=0.13).⁶⁵ Two studies at high risk of bias found positive effects of supply-side inputs on water and sanitation with rural SHGs on water quality (geometric mean thermotoler and coliform count: (13.7 [95% CI: 9.9-18.8; vs 44.5; 95% CI: 33.7-58.8]; p=0.01)⁶⁶ and toilet construction (intervention: 48% vs. 15% control).⁶⁷ Of studies that targeted multiple health domains, a high-quality RCT of participatory women's groups meetings combined with community resource centres and home visits in urban, informal settlements found improvements in unmet need for family planning, but not on child immunisation or wasting (aOR: 1.31, 95% CI: 1.11 -1.53; aOR 1.30, 95%CI: 0.84, 2.01; aOR: 0.92 (95% CI: 0.75,1.12, respectively).⁶⁹ A low-quality RCT reported no effects of a rural intervention to introduce participatory learning and action through SHGs on over 50 health outcomes.⁷⁰ Lastly, two moderate-quality studies that measured effects on mental health found no improvement in health-related capability indicators from SHG membership⁶⁸ or on overall maternal depression, except in the final year of a rural community mobilisation intervention with open groups (aOR: 0.74 95% CI: 0.40-1.37).³⁰

Supplementary Table 1: Search terms

Search domain	Query
1: Women	Woman OR Women OR Matern* OR Mother*
2: Groups	Group OR Groups OR Club OR Committee* OR Collectiv* OR Meeting* OR Participat* OR Organiz* OR Organiz* OR microfinance OR saving OR credit OR insurance
3: Health	Health OR illness* OR disease OR disorder* OR infect* OR well-being OR morbidit* OR medical* OR medicine OR deliver* OR Hospital OR Hospitals OR Hospitali?ation OR Child OR Children OR family* OR neonat* OR mortality OR reproductive OR sexual OR HIV OR condom OR family?planning OR contracept* OR sterili* OR mental OR depress* OR anxiety OR stress OR support OR emot* OR violen* OR psychosocial OR malaria OR tuberculosis OR diarrh* OR incidence OR respirator* OR utili* OR service* OR expen* OR insur* OR financ* OR bednet OR water OR toilet*
4: Nutrition	Nutrition OR Micronutri* OR Macronutri* OR Body Mass Index OR Anthropometr* OR Arm circumferen* OR Stunt* OR Wast* OR Underweight OR Anemi* OR Hemoglobin OR Diet OR Dietary OR Food OR Feed* OR Calori* OR Grow* OR Breastfe* OR Complementar* OR Feed* OR Birth* OR weigh* OR Vitamin*
5. Search string	1 and 2 and (3 or 4) and 5 and 6

Supplementary Table 2: Randomised controlled trials on the effects of women's groups

First author (year of publication)	Setting	Intervention	Group type	Scope of capacity building for health (individual, group, community or none)	Level of participation (informing, consultation or partnership)	Intervention duration	Control	Participants (n intervention, n control)	Level of outcome measurement (group only, members and non-members, population-level)	Primary outcome(s)	Effect size (95% CI)	Risk of bias‡
Reproductive, maternal, newborn and child health												
Kumar (2008)*	Rural Uttar Pradesh	NGO-trained, salaried community volunteers facilitated 4 monthly newborn care stakeholder meetings, 3 monthly community meetings, 3 monthly folk song meetings, one monthly volunteers' meeting and did two antenatal and two postnatal home visits to promote birth preparedness, essential newborn care and danger sign recognition.	Open	Community	Partnership	16 months (2004-2005)	Usual care	Pregnant women in the study area identified through a retrospective survey of all women of reproductive age at baseline (2007) and then prospectively until 2010 (Int n infants=1581; Con n=1143)	Population	Neonatal mortality	Adjusted Risk Ratio [ARR]: 0.46 (0.35,0.60)	Some concerns
Kumar (2012)*	Rural Uttar Pradesh	As above	Open	Community	Partnership	As above	Usual care	Pregnant women in the study area identified through a retrospective survey of all women of reproductive age at baseline (2007) and then prospectively until 2010 (Int n	Population	Maternal mortality	ARR: 0.44 (0.14-1.43)	Some concerns

								mothers=2681; Con n=1129)				
Tripathy (2010)*	Rural Jharkhand and Odisha	NGO-trained, salaried local women facilitated monthly women's groups meetings with a mix of newly formed groups and self-help groups opened up to non-members. Meetings followed a Participatory Learning and Action cycle in which group members identified and prioritised common perinatal problems, discussed and implemented strategies to address these, and evaluated their results. Groups organised two community meetings to elicit support for strategies. All clusters received Village Health Nutrition and Sanitation Committee (VHNSC) strengthening.	Mix of SHGs that opened up to non-members and newly formed open groups	Community	Partnership	Three years (2005-2008)	VHNSC strengthening only	All women who gave birth during the study period and their infants, (Infants Int n= 9388; Con= 8819)	Population	Neonatal mortality, maternal depression	AOR for neonatal mortality: 0.68, 95% CI: 0.59-0.78, moderate maternal depression AOR 0.74 (0.40-1.37)	Some concerns
Houweling (2013)*	Rural Jharkhand and Odisha	As above	Mix of SHGs that opened up to non-members and newly formed open groups	Community	Partnership	Three years (2005-2008)	VHNSC strengthening only	Less marginalized (Int n= 4384 Con n=4219) versus most marginalized mothers and infants (illiterate, very	Population	Neonatal mortality	AOR for most marginalised 0.41 (0.28; 0.59) AOR for less marginalized 0.64 (0.51; 0.80)	Some concerns

								poor, with little or no land, and belonging to Scheduled Tribes or Scheduled Castes (Int n=1897 Con n=1612)				
Acharya (2015)*	Rural Uttar Pradesh	NGO-trained, incentivised ASHAs facilitated newly formed monthly mothers' group meetings using oral and pictorial participatory methods to promote birth preparedness, essential newborn care and danger sign recognition. They were supported by Village Health Sanitation and Nutrition Committees and mass 'mid' media campaigns.	Community-based women's group	Group	Informing	Three years (2007-2010)	District-level campaigns with advocacy, mass media and "mid-media" (e.g., local street theatre)	All women who gave birth during between 2007 and 2010 in the study clusters (Endline Int n infants=5988; Con n=5897)	Population	Neonatal mortality	AOR: 0.98 (0.80,1.19)	Some concerns
More (2012)*	Mumbai, Maharashtra (informal settlements)	NGO-trained, salaried local women facilitated newly formed fortnightly women's groups meetings in informal settlements. Women improved their knowledge of local perinatal services, best practices and how to negotiate optimal care with family and	Open	Community	Partnership	Three years (2006-2009)	Usual care	Women who gave birth in the study clusters and their infants (Infants, Int n=7656; Con n=7536)	Population	Stillbirth rate, Neonatal mortality rate	Stillbirth rate AOR: 0.66 (0.46,0.93), Neonatal Mortality AOR 1.42 (0.99-2.04)	Some concerns

		providers through peer-learning and the identification and implementation of local strategies following Participatory Learning and Action and Appreciative Inquiry approaches.										
Tripathy (2016)*	Rural Jharkhand and Odisha	NGO-trained, incentivised ASHAs facilitated monthly women's groups meetings with a mix of newly formed groups and self-help groups opened up to non-members in their own working areas. Meetings followed the Participatory Learning and Action cycle described above. All clusters also received Village Health Nutrition and Sanitation Committee (VHNSC) strengthening.	Open	Community	Partnership	Two years (2011-2012)	VHNSC strengthening only	All women who gave birth during the study period and their infants, (Infants Int n= 9388; Cont= 8819)	Population	Neonatal mortality	AOR 0.69 (0.53, 0.89)	Low
Nutrition												
Nair (2017)*	Rural Jharkhand and Odisha	NGO-trained, salaried community health workers did monthly home visits in the third	Open	Community	Partnership	30 months	VHNSC strengthening only	Pregnant women identified and recruited in the study clusters and their children	Population	Children's length-for-age z score at 18 months	Adjusted mean difference 0.11 (-0.01, 0.23)	Low

		trimester of pregnancy and the first 24 months after birth, and facilitated a cycle of Participatory Learning and Action meetings focused on identifying problems and strategies related to maternal and child health and nutrition in the first 1000 days of life. All clusters also received VHNSC strengthening.						(Infants Int n=1460; Cont n=1541)				
Gupta (2019)*	Rural Bihar	Jeevika community mobilisers met with SHG members (women aged above 18 years who participate in microfinance activities) to deliver messages on maternal and child health, nutrition and WASH twice a month through videos on health and nutrition, as well as targeted home visits, peer group meetings, and community events.	SHG	Individual	Informing	2.5 years (2016-2018)	Groups with no health and nutrition intervention	Women belonging to a household where at least one woman was a member of a Jeevika SHG and with at least one child aged 6–23 months (Endline households n=2119)	Group	Women's BMI Dietary diversity for children aged 6–23 months	Effect on mean BMI z score: B coefficient: -0.025 SE: (0.082) Reported dietary diversity of youngest child: B coefficient: 0.286 SE (0.118) Reported dietary diversity of index child: B coefficient: 0.169 SE (0.080)	Low
Ojha (2019)*	Rural Bihar	NGO-supported women's self-help groups (SHGs) involved in	SHG	None	Informing	18 months	Usual care	All children < 5 years resident in study clusters (n=2534 in total)	Population	Weight-for-height z score of children < 5 years	AOR: 0.46 (0.28, 0.74)	High

		savings and credit activities through four weekly SHG meetings and after six months, loans from the NGO for emergencies (e.g. access to health services) and general purpose (e.g. investment and consumption purposes).										
Violence against women												
Jejeebhoy (2017)*	Rural Bihar	Peer facilitators met fortnightly with SHGs supported by the Women Development Corporation (WDC), and monthly with husbands of SHG members. The intervention included gender transformative group learning sessions with SHG members and similar sessions with husbands; activities to link SHG members with livelihood training opportunities; and community mobilisation at the village level by SHG members and their husbands to change gender norms and attitudes.	SHG	Group	Informing	15 months (2014-2015)	Groups with usual care	Married women in SHGs aged 18-49 years residing in the study areas Endline: Arm I (n=567) Arm II (n=531 members); n=1053 non-members Arm III (n=588 members) (n=1025 non-members)	Members and non-members	Attitudes relating to gender roles among SHG members Experience of marital violence	Index of gender role attitudes AOR: 0.69 (0.35, 1.02) Violence: Emotional AOR: 2.95 (1.75,4.97) Physical AOR: 0.69 (0.46,1.02) Sexual AOR: 1.23 (0.64,2.36)	Some concerns
Holden (2016)*	Urban Madhya Pradesh	Trained facilitators delivered	SHG	Group	Informing	15 months (2013-2014)	Usual care	SHG members (Endline n=1751) and	Members and non-members	Women: 1. Experience	Women's experience of physical or	Some concerns

	(informal settlements)	training to: strengthen SHG functioning and gender training with information on Violence Against Women and Girls (VAWG) referral networks; increase women SHG members' understanding of the root causes and trigger factors related to VAWG and build women's capacity to take action and respond to VAWG. This included meetings to connect the SHGs and their members with services to prevent and respond to VAWG, and SHG members doing women's safety audits to identify actions that might be taken to improve the safety of slum areas. Life skills training with men and boys through new groups of adolescent boys and young men (aged 15-25 years) to build their capacity to challenge harmful social norms and take actions against					adult women 18-49 in the same community who were not members (Endline n=1660) Men and boys (older and younger) in the community, direct and indirect beneficiaries		of physical and/or sexual IPV 2. Experience of violence and harassment in public spaces Men: perpetration of physical and/or sexual IPV and perpetration of violence and harassment against women and girls in public spaces.	sexual violence: Female direct Coefficient (SE) -0.006 (0.022) Female indirect 0.002 (0.021) Perpetration of physical or sexual violence by men 0.025 (0.075) Male indirect -0.003 (0.017) Experience of violence or harassment in public spaces Female Direct 0.005 (0.017) Female indirect 0.03* (0.017) Male Direct (perpetrated) 0.022 (0.02) Male indirect 0.018 (0.015)	
--	------------------------	---	--	--	--	--	---	--	--	---	--

		VAWG in the community.										
Vector-borne diseases												
Arunachalam (2012)*	Peri-urban Tamil Nadu	10 SHGs were enrolled, and one person from each SHG was identified as a 'dengue' focal point to mobilize other members of the group. The community participated in the distribution of water container covers and health education materials and helped researchers to organize meetings. School heads in the intervention clusters were informed about the objectives of the dengue project and encouraged the teachers and students to participate. Educational materials were distributed through SHGs and school children in the intervention clusters. Netted frames of three sizes were made locally by sub-contractors and distributed to each household with an accompanying SHG member.	SHG	Group	Consultation	c.10 months (2009-2010)	Usual care	Households in study areas (Int households n=1000 Con=1000)	Population	Mosquito pupal indices in house and per person	Difference in reduction, between two arms House index for pupae: Difference: -14.7%, p=0.012 Per person pupae index: Difference: -0.35, p=0.0200	Some concerns
Das (2014)*	Rural	Two	SHG	Community	Partnership	c.12-15	Group with	All individual	Population	Unclear, but	- Total %	Some

	Odisha	<p>interventions were tested. In Arm 1, NGO field workers visited ASHAs at least twice a month to share information about the transmission, diagnosis and treatment of malaria; hands-on support for performing and interpreting rapid diagnostic tests; administration of the correct dosage of ACT and follow-up to ensure compliance; management of malaria surveillance records; orientation on community mobilisation and health centre engagement. Community mobilisation focused on increasing consistent use of insecticide treated bed nets provided to the community free of cost by government, and timely care-seeking for febrile illnesses from the ASHA. Messages were disseminated to local governance bodies, social organizations, women, men,</p>				months (2010-2011)	usual case management by ASHA, with no other support	recent fever cases within each village in study areas, n= 768 (Arm 1); n=781 (Arm 2); ; n=755 (Arm 3, Control)		possibly: (1) % HH who used at least one LLIN 2) % HH who had fever tested for p. falciparum in 24 hours	<p>population slept under bed net last night: Arm B (community mobilisation) vs Control: 1.274 (1.143, 1.419)</p> <p>- Fever diagnosis <24 hours Total pop, B vs control: 1.01 [0.74,1.38]</p> <p>-Prompt diagnosis by trained provider: B vs control: 1.45 [1.086,1.937]</p>	concerns
--	--------	--	--	--	--	--------------------	--	--	--	--	--	----------

		youth, school and religious groups were chosen through posters, leaflets, cinema shows and street plays. SHGs were assigned 10-15 homes each in every village to monitor bed net use at night. Arm 2 included community mobilisation alone, without training for ASHAs.										
Sexual health and HIV												
Sherman (2010)†	Peri-urban Tamil Nadu	Health educators offered sex workers eight hours of HIV prevention education through didactic methods and interactive activities twice weekly, plus 100 hours of tailoring training taught by master tailors.	Special population group	Individual	Informing	Five weeks	HIV prevention education only	Sex workers aged over 18 years (Int n=58 Con = 48)	Group	Mean n of sex exchange partners	Int mean: 3.1 [2] Con mean: 5.1 [3] p <.0001	High
Spielberg (2013)†	Rural West Bengal	An NGO trained local self-help promoting institutions to deliver learning games for Girls and other non-formal education on health, livelihoods, and family finance to SHGs of poor women and adolescent girls during their regular savings and	Special population group	Group	Informing	Three years (2006-2009)	Usual care	Women SHG members who attended the first session (Int n=471, Con n=409), and their daughters or daughters in law (Int n= 897, Con n= 450)	Group	% who ever heard of HIV	AOR: 3.6 (1.6, 8.0)	High

		loan meetings. Health education included information on diarrhoea, hygiene, and HIV to SHG members and their daughters or daughters in law, and to SHGs with adolescent girls only.										
Health expenditure												
Desai (2017)*	Peri-urban Gujarat	NGO-trained health workers provided preventive care group health education to women on hysterectomy, diarrhoea, fever/malaria and sanitation using films, interactive discussions and games. All clusters received home visits and group education on common illnesses (excluding diarrhoea, malaria and hysterectomy), accompaniment to referral to health services; medicine sales and insurance promotion; linkages with government providers; support to activate VHSNCs.	Community-based women's group	Individual	Consultation	18 months (2010-2011)	Regular SEWA community health worker services	For primary outcome: all women who had made an insurance claim in the study clusters; for secondary outcomes: insured and uninsured women in study clusters at baseline and follow-up surveys. Participants were 3340 insured women residents, point, Int n=1436 person-years; Con n=1227 person-years.	Population	Insurance claims rate for 3 conditions (malaria, hysterectomy and diarrhoea)	ARR: 1.03; 95% CI: 0.81, 1.30	Low
Multiple outcome domains												
More (2017)*	Mumbai,	Community	Open	Community	Partnership	Three years	No Centre	Ever-married	Population	Met need for	Met need for	Low

	Maharashtra (informal settlements)	Resource Centres were created and employed full-time, salaried community organisers who made home visits, organised group meetings, provided services, day care for malnourished children, did community events and liaised with existing systems.				(2011-2014)		women aged 15-49 years residing in study clusters and any children under five years		family planning, full immunisation for children, childhood wasting	family planning, AOR:1.31, (1.11, 1.53). Full immunisation for children : AOR 1.30, (0.84, 2.01) Childhood wasting: AOR 0.92, (0.75, 1.12)	
Subramanyam (2017)*	Rural Bihar	Jeevika community mobilisers facilitated fortnightly meetings with self-help groups that opened up to non-members, using a Participatory Learning and Action cycle focusing on identifying and addressing problems related to maternal and child health and nutrition, WASH and violence against women, with two wider community meetings.	SHG	Community	Consultation	12 months (2015-2016)	Usual care	Household heads and women of reproductive age, pregnant women and their husbands, community mobilisers and Anganwadi workers (AWW) in study areas: at endline, n=3340 households, n=1612 women, n=282 community mobilisers n=233 Anganwadi workers	Population	59 outcomes related to health, nutrition, violence and social capital – no primary outcome specified	The authors found no evidence of effects on health, nutrition, WASH and violence.	High

* Cluster randomised controlled trial † Individual randomised controlled trial ‡ Risk of Bias assessment based on Cochrane ROB-2¹⁸

Supplementary Table 3: Quasi-experimental studies on the effects of interventions with women's groups

First author (year of publication)	Setting	Intervention	Group type	Scope of capacity building	Level of participation	Intervention duration	Control	Study design	Participants (n intervention, n control)	Main outcomes *	Population or group-level measurement	Effects (95% CI or SE)	Risk of bias†
Reproductive, maternal, newborn and child health													
Roy (2013)	Rural Jharkhand and Odisha	The Participatory Learning and Action cycle tested in Tripathy (2010), implemented in the previous RCT's control areas	Open	Community	Partnership	Three years (2009-2011)	No control for implementation in control areas	Non-randomised, controlled	All women who gave birth during the study period and their infants, (Infants n=39,918)	Neonatal mortality	Population	AOR:0.69 (0.57–0.83)	Moderate
Saggurti (2018)	Rural Bihar	Community health facilitators did eight weekly cycles of participatory communication (banners, stories, picture cards or songs with messages) with existing women's self-help groups using different thematic modules on antenatal and postnatal care, maternal and child nutrition, routine immunisation, family planning, personal hygiene and use of toilet.	SHG	Individual	Informing	12 months (2013-2014)	SHGs with no health intervention, no matching	Non-randomised, controlled	Group members who had a birth in the past 12 months (Endline Int women n=718; con = 217)	Maternal, neonatal and child health knowledge and practices	Group	Adjusted Difference In Difference [ADID]: 4+ antenatal care visits: -0.4 (-6.2, 5.5); Consumption of IFA tablets/syrup for 100+ days: 4.9 (-1.1, 10.8); Institutional delivery: 8.8 (-0.1, 17.8); visit by a health worker within 2 days after delivery: -4.6 (-13.6, 4.4); Skin-to-skin care for newborn infants: 17.0 (-0.5, 34.1); Delayed infant bathing for 3+ days: 19.2 (3.8, 34.6); Timely initiation of breastfeeding: 20.5 (5.7, 35.3); Exclusive breastfeeding: 26.7 (9.4, 44.1); Fed solid/semi-solid food: 4.7 (-5.3, 14.6); Age appropriate immunization: 9.1 (1.0, 19.6); Use of modern contraception methods: 9.3 (1.3, 17.2)	Serious

Saha (2015)	Rural Gujarat and Karnataka	Facilitators from two NGOs (Self Employed Women's Association, or SEWA and Shri Kshetra Dharamstala Rural Development Project (SKDRDP). SEWA included health insurance and primary health care delivered through stationary and mobile health camps, health education and training, the production and marketing of traditional medicines. SKDRDP included health education in routine credit group meetings, home visits by a village health worker, the promotion of low latrines, and insurance with health cover.	Community-based women's group	Individual	Consultation	One year (2012-2013)	Groups with no health intervention, matching at block and group level	Non-randomised, controlled	Women of reproductive age with a child younger than two years (Women, Int = 219; Con = 253)	Institutional delivery; Feeding a newborn infant colostrum; Having a toilet at home; Diarrhoea among children	Group	Institutional delivery AOR 5.08 (1.21-21.35) Feeding colostrum AOR 2.38 (1.02-5.57) Have a toilet at home AOR 1.53 (0.76-3.09) Diarrhoea among children AROL 0.86 (0.42-1.76)	Moderate
Prennushi (2014)	Rural Andhra Pradesh	Government-employed community resource persons formed SHGs. Government gave SHGs seed funds and links to banks to expand access to low-cost credit and training in social and economic skills. Government also set up federations of SHGs in villages, blocks, and districts.	SHG	None	Informing	Four years (2004-2008)	Usual care	Propensity score matching with panel survey	4,250 households	Assisted delivery Breastfeeding Immunization Knowledge of diarrhea treatment Knowledge of FP methods Visit by FP worker	Group	DID % points: Assisted delivery: +2 % Breastfeeding: + 3% Immunization: -11% Knowledge of diarrhea treatment: +2% Knowledge of FP methods: +2% Visit by FP worker: +2% *None significant at 0.05 level	Moderate
Hazra (2019)	Rural Uttar Pradesh	Swasthya Sakhi, SHG members, were trained as volunteer peer educators. They conducted monthly meetings with SHGs where she disseminated maternal and child health	SHG	Group	Informing	24 months (2015-2017)	SHGs with no intervention, block-level matching	Non-randomised, controlled	Eligible women from SHG household were currently married, 15-49 years and had given birth in the 12 months	1. Reproductive and maternal health practices: At least four ANC visits, at least three	Group	Net change, %, with CI At least 4 ANC visits 5.2 [1.6, 8.7] At least 3 tests during ANC visits: 8.3 [4.4, 12.2] Consumption of 100 + IFA tablets during	Serious

		information on preventive and care-seeking perinatal care practices and family planning. Community outreach activities including home visits, community meetings using of audio visual aids such as health videos.							prior to the survey, Intervention: n=2165; Control: n=2085	ANC check-ups, consumption of 100 or more iron folic acid (IFA) tablets, institutional delivery, PNC check-up within first seven days of delivery, and current use of any contraceptive method. 2. Newborn care practices Clean cord-care to prevent cord infection, skin-to-skin care to keep the newborn warm, timely initiation of breastfeeding, and exclusive breastfeeding.		pregnancy 1.9 [-0.9, 4.8] Institutional delivery - 0.7 [-3.7, 2.3] Postnatal check-up within a week of delivery 4.6 [1.0, 8.2] Current use of any contraceptive method 11.2 [7.0, 15.4], Clean cord care (0-5 months) 7.4 [2.3, 12.4] Skin-to-skin care (0-5 months) 3.7 [-1.6, 9.0] Timely initiation of breastfeeding (0-5 months) 5.8 [0.1, 11.5] Exclusive breastfeeding (0-5 months) -1.8 [-11.1, 7.4]	
Janssens (2011)*	Rural Madhya Pradesh	The Mahila Samakhya programme set up women's groups in villages. Programmed facilitators women to join the groups and improve their daily lives through collective action, without prescribing the	Community-based women's group	Community	Partnership	5-10 years (data collection in 2003)	Villages with no Mahila Samakhya groups	Regression discontinuity using a single cross-sectional survey	Women who were participants in MS (n=718) and non-participants (n=714) women in control villages (n=559)	Childhood immunization rates	Population	Probit: Programme participant Measles: 0.038** (adjusted) Program village DPT 0.195 0.114*; Measles: 0.324 0.103*;	Moderate

		activities that a group have to engage in but assisting women in identifying their own needs and solutions. Groups took up literacy trainings, set up savings and credit groups and informal primary schools for girls. Almost all groups sought to improve their knowledge of health and hygiene through regular visits from a facilitator and health trainings for the groups. Groups conducted their own immunisation campaigns within villages as one of their collective actions.										TB: 0.224 0.131*	
Madhivanan (2013)	Rural Karnataka	SCIL (Saving Children and Improving Lives) delivered integrated antenatal care and HIV testing services to rural villages using mobile medical clinics. In a more intensive arm (SCIL+), a cash transfer was given to local women's SHGs for assisting in mobilizing attendance at the mobile medical clinics. The entire group earned cash that could then be loaned to members.	SHG	Group	Informing	12 months (2011-2012)	Provision of the mobile clinic service without the cash transfer to SHGs	Non-randomised controlled, no adjustments for potential confounders	Pregnant women aged 18 years or more and residing in a study village for more than six months. SCIL: 418 pregnancies; SCIL+: 512 pregnancies	Proportion of total pregnancies in these villages for which women received ANC and HIV testing HIV prevalence	Population	ANC visit- at least one SCIL clinic attended- SCIL arm- 43% SCIL+ arm received 67% more pregnant women received ANC and HIV testing SCIL+ arm- 72.5% Prevalence of HIV: SCIL arm- 0.6%; SCIL+ arm-0.9%	Critical
Mozumdar (2018)	Rural Uttar Pradesh	NGO-established SHGs to provide information on healthy maternal and newborn practices by engaging SHG members in discussions on HBMNC (home based	SHG	Individual	Informing	4 months	Households with SHG member in areas without	Non-randomised controlled	Households with at least one SHG member and at least one married woman	Knowledge of maternal and newborn care	Group	DiD results on knowledge (%): Importance of ANC, 10.7* At least 4 ANC check-ups 1.3 2 TT injections required, 15.0*	Serious

		maternal and newborn care) topics for one or two meetings per month. SHG members were encouraged to share information on maternal and newborn caregiving with others					health intervention		aged 18-49 years Endline (n=470)			Minimum 100 IFA tablets need to be consumed, 17.4* First PNC check-up for mother within 24 h, 12.7* Number of danger signs during pregnancy, Mean (SD) 1.1* First PNC check-up for child within 24 h, 10.5 Number of at least 3 PNC check-ups within 7 days, 4.3 Number of danger sign of newborn, Mean (SD) 1.1* Early BF 6.4 Nothing should be applied on cord, 15.2* Keep cord clean and dry, 13.9 Delayed bath greater than 48 h, 5.9 Heard of KMC, 30.8* Correct method of KMC, 21.4* Return of fertility after 6 weeks 6.5	
Saggurti (2019a)	Rural Bihar	Two modules on newborn health practices and was delivered across 1–2 months in all the groups. Information included immediate postnatal behaviors and breastfeeding practices. Information repeated in the month of implementation (in 3/4 other meetings) and in year 2 but not 3.	SHG	Individual	Informing	2-3 months per module (over three years)	Govt-nurtured SHGs with no health intervention, no matching	Non-randomised, controlled	Married SHG women aged 18-49 with child <6 months age Control: 2013, N=112 2014, N=183 2016, N=99 Intervention: 2013, N=343 2014, N=534 2016, N=604	Clean cord care; initiation of skin to skin care; timely initiation of breastfeeding; exclusive breastfeeding on day 1; delayed bathing	Group	Intervention vs Control: Clean cord care: 1.9 (1.5–2.3) Initiation of skin-to-skin care: 1.8 (1.5–2.3) Timely initiation of breastfeeding: 1.3 (1.0–1.7) Exclusive breastfeeding on day 1: 1.9 (1.4–2.6) Delayed bathing: 2.3 (1.8–2.9)	Serious

Saggurti (2019b)	Rural Bihar	Eight weekly cycles of participatory behavior communication using different thematic modules on maternal, neonatal, child health and promoting collectivization processes facilitated by community health facilitators or sahelis. The intervention was delivered by sahelis, active women with some literacy and mobility who could learn and deliver health messages.	SHG	Individual	Informing	8 weeks	Group with no intervention, no matching	Non-randomised, controlled	N of eligible women interviewed were: 2407 (in 2013), and 2970 (in 2016) Control: 601 607 Intervention 1806 2363 Groups interviewed Control: 174, 347 Intervention: 535 1115	(1) whether in the past six months, respondent negotiated with staff of health care provider in order to help a fellow community member (self-advocacy with health care providers), (2) whether in the past six months, respondent negotiated with frontline health workers in villages in order to help a fellow community member (self-advocacy with local frontline workers), and (3) how confident are you in going to a government health center to get reproductive health services	Group	DiD (%) Group-based questions Collective interaction with health facility 15.5 (10.3-20.8), p<0.001 Collective agency to negotiate with health centre 1.1 (-3.4-5.7), p=0.626 Collective agency to negotiate with anganwadi worker 4.8 (-4.9-14.4), p=0.334 Individual questions Self-advocacy with health care providers 4.8 (1.8-7.8), p=0.002 Self-advocacy with local frontline workers 1.9 (-2.2-5.9), p=0.371 Self-confidence in accessing health services 20.3 (12.0-28.7), p<0.001 Treated fairly by: Accredited Social Health Activists (ASHAs) 1.6 (-3.1-6.3), p=0.512 Anganwadi Workers (AWWs) 3.6 (-1.7-8.8), p=0.184 Auxiliary Nurse Midwives (ANMs) 1.8 (-2.8-6.4), p=0.438 Women reported that ASHAs from health system Treat with respect 3.1 (0.2-6.1), p=0.035 Direct to appropriate health providers 6.2 (1.6-10.8), p=0.009 Respond quickly to emergency situations 9.7 (3.0-16.5), p=0.005	Serious
------------------	-------------	---	-----	------------	-----------	---------	---	----------------------------	--	---	-------	---	---------

										(self-confident in accessing health services).		Available when needed 11.4 (4.8-18.1), p=0.001 Service availability Iron Folic Acid tablets for 100 or more days 5.3 (3.2-7.4), p<0.001 Post-natal care within one week of delivery 14.1 (4.6-23.6), p=0.004 Advise on use of clean cloth for drying baby 25.8 (17.2-34.3), p<0.001 Advise on use of clean blade to cut the cord 32.4 (23.7-41.1), p<0.001 Advise on use of disposable delivery kit 41.1 (33.7-48.6), p<0.001 Accompanied by frontline health worker for delivery 14.0 (4.9-23.2), p=0.003	
Nutrition													
Gope* (2019)	Rural Jharkhand and Odisha	Two interventions were tested: either NGO-trained and salaried facilitators facilitating a cycle of monthly Participatory Learning and Action meetings focusing on maternal and child health and nutrition home visits to children identified as undernourished using MUAC or Anganwadi records plus creches for children aged 6 months to 3 years;	Open	Community	Partnership	Three years (2012-2015)	Usual care	Non-randomised, controlled	All mothers residing in the study areas who have children aged <36 months (Intervention a n=1256, Intervention b n=1177, Con n= 1130)	% of children under three years who are wasted	Population	Arm a: PLA group + home visits: AOR: 0.66 (0.51, 0.88) Arm b: PLA groups + creches: AOR: 0.73 (0.55, 0.97)	Moderate

		or PLA meetings and home visits only.											
De (2011)	Rural West Bengal	Self-help groups with microfinance promoted by the government or through NGO linkages with Govt SHGs for at least 1 year or for 8 years.	SHG	None	Informing	1-8 years	Three control groups: 1. Male borrowers 2. Female and male borrowers in SHG for at most 1 year 3. Non-SHG members who wanted to join SHGs	Cross-sectional survey with propensity score matching	Households with female and male borrowers from SHGs intervention n= 120 Control group 1 n= 40 Control group 2 n= 90 Control group 3 n= 120	Weight-for-age z score among children <15 years Household protein intake	Group	Z score/weight for age: coefficient for intervention 0.250, p=0.13 (control 1&2) Z score/weight for age: 0.228, p=0.254 (control 1,2,3) Protein intake: 0.364, p=0.384 (control 1&2) Protein intake: 0.494, p=0.213 (control 1&2)	Serious
Deininger (2012)	Rural Andhra Pradesh	The Society for the Elimination of Rural Poverty (SERP), established by the government of AP, trained facilitators and established federations of SHGs at village, block, district, and eventually state levels, with a focus on including the poorest.	SHG	None	Informing	5 years (2001-2006)	Households with members who have participated in SHGs for 2.5 years	Non-randomised, controlled using propensity score matching	Participant HH involved with SHGs for at least 3 years (n=438); less than 3 years (n=234) HH that did not participate in SHGs in treatment villages (n=892) and HH in control villages (n=241)	Consumption (food and non-food items in past 30 days and lumpy items in past year) energy intake (Kcal/per day) asset accumulation (consumer durables, productive	Population	DiD (SE) Energy intake p.c. (kcal/day) 202 (94) p<0.05 Protein intake p.c. (g/day) 4.35 (2.39) p≤0.10	Moderate

										assets, and livestock assets)				
Deininger (2013)	Rural Andhra Pradesh	The Indira Kranti Pratham (IKP) was implemented in 2 phases, DPIIP- District Poverty Initiatives project; RPRP- Rural poverty Reduction Project): i) the program establishes federations of SHGs at village mandal (block), district, and eventually state levels ii) to reach out to the poor.	SHG	None	Informing	3 years (survey conducted in 2004)	Households in the RPRP areas	Cross-sectional survey with propensity score matching	Int: Households in DPIIP areas N=1964; Con: Households in RPRP areas N=3789	Female empowerment; nutritional intake; per capita income, consumption and assets.	Population	Gain in intervention arm, 2001 vs. 2004 Energy intake p.c. (kcal/day), 109, $p \leq 0.05$ Protein intake p.c. (g/day), 5.84 $p \leq 0.01$	Moderate	
Violence against women														
Yaron (2018)	Rural Bihar, Uttar Pradesh and Madhya Pradesh	As in Ojha et al (2019)	SHG	None	Informing	18 months	Women in areas with no SHGs	Panel survey with propensity score matching	SHG members in intervention areas and matched adult women in control areas Intervention (n=740) Control (n=308)	Index of domestic violence	Population	DID: Index of domestic violence mean score: -- 0.448 $p=0.008$	Serious	
Prillaman (2017)	Rural Madhya Pradesh	Self-help groups supported by the NGO Pradan for c.15 years	SHG	None	Consultation	c.15 years	Women in areas with no SHGs	Geographic regression discontinuity design	Women who were part of Pradan SHGs and women in control areas (n=2152 across both areas)	Intimate partner violence	Group	No effects on IPV: - 0.092 (0.074) index of violence	Moderate	
Sexual health and HIV														
Beattie (2014)	Urban Karnataka	Drop-in centres that provided presumptive treatment for Gonorrhoea and Chlamydia and meeting place for FSWs to share experiences and gain a sense of solidarity. The program worked to support and develop critical thinking among	Special population group	Community	Partnership	7 years of intervention (2004-2011) evaluated in last three years (2008-2011)	Regression analysis comparing groups with different levels of	FSW not exposed to community mobilization activities	FSWs who sold sex at home, brothels and phone-based in the project area with low, medium medium (attended nongovernmental organization meeting or	HIV and STI prevalence; HIV risk behaviours; and collective and individual power among FSWs	Population	Adjusted analyses: 1st: No/Low vs Med; 2nd: No/Lo vs High (All AOR) Visited STI clinic in past 6 months: 12.2 (7.89, 18.94) 24.5 (15.3,39.3) HIV-1 infection 1.26 (0.63,2.52)	Moderate	

		the FSW community, providing a forum where FSWs could discuss difficulties and reflect on how they could work together to address the challenges they faced through collective action. FSWs formed community-based institutions including peer groups and collectives.					exposure to community mobilisation		drop-in centre) or high (member of collective or peer group) exposure to community mobilisation activities (Endline n=1934)			1.07 (0.54,2.14) Reactive syphilis 1.29 (0.47,3.55) 0.63 (0.22,1.78) HSV-2 0.93 (0.44,1.93) 0.49 (0.23,1.02) Chlamydia 0.76 (0.45,1.27) 0.64 (0.37,1.09) Gonorrhoea 0.95 (0.41,2.22) 0.39 (0.13,1.19) Ever taken HIV test 8.15 (4.78,13.88); 25.13 (13.07,48.34) Condom use last sex, occasional clients: 2.28 (1.11,4.69) 4.74 (2.17,10.37) Condom use last sex, repeat clients 2.63 (1.40,4.93) 4.29 (2.24,8.20) Condom use last sex regular partner 1.67 (0.87,3.17); 2.80 (1.43,5.45)	
Bhattacharjee (2013)	Rural and urban Karnataka	Female Sex Workers joined community based mobilization activities including peer groups focusing on building individual capabilities to foster positive perception of self, enhance self-confidence and agency among individual FSWs and promote collective	Special population group	Community	Partnership	Five years (2005-2010)	Usual care	Propensity score matching using 3 surveys	Sex workers taking part in Behavioural tracking survey (BTS) and Integrated Biological and behavioural assessment (IBBA) BTS: Int n=1330 Con n=409	Condom use with regular partner at last sex; Consistent condom use with all partner/clients; Experience of violence	Population	All AOR: Gonorrhoea and/or Chlamydia AOR: 0.60 (0.47, 0.78) Syphilis 0.74 (0.58, 0.94) Condom use with regular partner at last sex: 1.25 (0.93, 1.68)	Moderate

		identity to address their immediate needs. It also aimed to create an enabling environment by sensitizing a range of stakeholders in and beyond the community level to address factors in the macro-level social environment that creates structural barriers to empowerment among FSWs.							IBBA: Int n=17, Con, n=2937,	in the past six months; Beaten/forced to have sex in past one year; Did not give bribe to police to avoid trouble; Obtained any form of identification document in past five years; Gonorrhoea and/or Chlamydia infection; Syphilis infection; HIV infection		Consistent condom use with all partner/clients 1.07 (0.71, 1.62) Experienced violence in the past six months 0.70 (0.53, 0.92) Beaten/forced to have sex in past one year 0.84 (0.62, 1.14) Did not give bribe to police to avoid trouble 1.46 (1.04, 2.06) Obtained any form of identification document in past five years 1.23 (0.96, 1.58) HIV infection 0.89 (0.74, 1.07)	
Shankar (2019)	Urban Maharashtra	A group-based workshop over the course of 8 days, with sessions running 3.5 h/ day. Individuals engaged in an introspective examination of aspects of their lives, using a cognitive reframing process, with counselling during and after the workshop.	Special population group	Individual	Informing	8 days	Sex workers who did not participate in the workshop	Individual, non-randomised controlled	Sex workers who participated in full training and one year follow-up (n=58) and controls (n=43)	Adherence to HIV meds Alcohol/tobacco use General health status Desire to leave sex work Left sex work	Group	Increased adherence to HIV meds: 54% vs 0% Decreased adherence to HIV meds: 4% vs 20% Improvement in addiction to alcohol/tobacco: 9% vs 12% Improvement in health status: 52% vs. 19% Deterioration in health status: 2% vs 14% Stated desire to leave sex work: 47% vs 47% Stated desire to leave and left sex work: 34% vs 2% Left sex work: 24% vs 2%	Serious
Swenden (2009)	Peri-urban	Sonagachi Health Intervention Project activities primarily aim	Special population group	Community	Partnership	16 months	Control: STD clinics	Non-randomised	Sex workers in treatment (n=110) and	STD/HIV knowledge score	Population	Parameter estimates and standard errors (SE) from random-	Serious

	West Bengal	to impact HIV/STD-related knowledge and skills, in addition to providing treatment and condoms. The programme also diffused rights-based messages to motivate change, building social support and community solidarity, mobilizing political participation to build social capital to enhance advocacy, and diffusing new norms for savings and alternative income enabled by a micro-finance service.				(2000-2001)	established, and provision of peer education	controlled	control (n=110) recruited at baseline			effects linear regression: intercept, 6.7, SE 0.35 Know at least one STD 48.5 (14.4, 163) Condoms prevent STDs 23.22 (7.69, 70.3) Condoms prevent AIDS 23.3 (11.2, 48.1) At risk for STDs 6.5 (3.28, 12.9) Important condom decision-maker 24.7 (11.0, 55.6) Can refuse client 9.5 (4.82, 19.0)	
Water, Sanitation and Hygiene													
Freeman (2012)	Rural and peri-urban Andhra Pradesh	Representatives from a private company gave presentations to SHG members about sources and risks of contaminated drinking water and methods to effectively treat their water at home, with a demonstration of their company's water filter. After the SHG could take out a loan to buy a filter.	SHG	Group	Informing	18 months (2009-2010)	Female members of an SHG that offered loans for filters but who had not purchased the filter.	Case-control study. A case was defined as a female SHG member whose household had acquired a filter.	SHG women from villages within 1.5 hours radius of central water testing facility. Adopters (n=265) non-adopters (n=247)	Uptake of filter and Thermotole rant Coliform (TTC) count per 100ml	Group	Of the 67230 members who received the program, 9.8% bought the filter. The geometric mean TTC count was 13.7 (95%CI: 9.9–18.8) among adopters, and 44.5 (95%CI: 33.7–58.8) among non-adopters (p=0.01).	Serious
Khush (2009)	Rural Tamil Nadu	12 independent community-level programs that employed similar implementation strategies and were initiated at different time points over 3.5 years, e.g. providing	SHG	Group	Informing	3.5 years (2003-2007)	Control group villages with no intervention	Non-randomised controlled	All households in study villages with a child under five years Control (n=456) and Intervention (n=444)	Water and sanitation infrastructure improvements	Group	48% of intervention households had a new private toilet vs 15% of control; 26% of intervention households had a new water source compared with 18% of control;	Serious

		households with toilets, taps, renovating handpumps and hygiene education campaigns in the community and schools, repair of school water facilities and a micro-credit scheme to take loans from SHGs to construct sanitation infrastructure.										12% of intervention households had a new private tap vs. 8% of control households	
Vector-borne diseases													
Nandha (2012)	Rural Tamil Nadu	Health education in schools by a social scientist and teachers. Students educated community members at fortnightly intervals on elimination of breeding sites of mosquitoes SHGs were trained in environmental management methods for mosquito control, who in turn educated their members in monthly meetings and visited households to ensure prevention of mosquito breeding.	SHG	Community	Informing	12 months (2009-2010)	A single village comparable to intervention village in relation to geographic conditions, filarial prevalence, population structure and economic status.	Non-randomised controlled	All household members in the study villages	The proportion of respondents who provided at least one correct answer to each question of the knowledge test	Population	Knowledge: Breeding sites (I:83.9%; C:48.8%, p<0.05); Mosquito-borne diseases (I:75.8;C:48.8,<0.05); preventive measures (I:83.9; C:48.8, p<0.05); transmission by mosquito bite (I:93.5; C:73.2, p<0.05). Intervention area: fewer mosquito breeding sites <0.05; better use of personal protection methods (<0.05), better waste water management use (p<0.05) and were more likely to clean surrounding daily (P<0.05). and reduced per man-hour density of mosquitoes	Serious
Health expenditure													
Joshi (2016)	Rural Odisha	The Odisha Rural Livelihood Project (TRIPTI) formed SHGs, Gram Panchayat Level Federations (GPLFs) and provided community Investment Funds to improve	SHG	None	Informing	36 months (2011-2013)	Control Gram Panchayats where the program had not	Non-randomised controlled	Int (n=1152) HH Control (n=1189 HH)	HH expenditure on healthcare	Population	Expenses per capita: healthcare (annual)- Treatment- \$839.6 vs control- \$948, p value=0.126	Moderate

		credit access and promote the productive use of these funds.					been implemented						
Mental health													
Anand (2019)	Rural Uttar Pradesh	Mahila Vikas Pariyojana SHGs with regular meetings focused on the collection of these savings. Regular monthly meetings provide an opportunity to take part in financial and educational activities and build mutual support. SHG members sometimes share maternal and neonatal health-related information by themselves or after training by specialists.	SHG	None	Informing	Not reported	No group	Cross-sectional survey with propensity score matching	5433 members and non-members	15 capability indicators	Group	No changes in capabilities more directly related to health: (1) health limits activities; (2) lost sleep because of worry (mental health).	Moderate

* Outcomes are primary unless specified. †Risk of Bias assessed using ROBINS-1 (Sterne 2016)

Supplementary Table 4: Non-Experimental (Quantitative and Qualitative) Studies

First author (year of publication)	Title	Setting	Objective	Data collection methods	Group type	Key findings
Acharya (2014)	Knowledge on health and nutrition among self-help groups affects the nutritional status	Odisha	To assess the nutritional status of SHG members in tribal areas of Odisha, and whether joining a Self Help Group (SHG) improved nutrition and health knowledge	Cross-sectional quantitative survey	SHG	Low education, scanty income, deficient savings, and meagre assets are barriers to attaining health and improving nutritional status amongst SHG women
Agarwal (2008)	Strengthening functional community provider linkages: Lessons from the Indore urban health programme	Madhya Pradesh	To describe an Urban Health Programme which aimed to increase coverage of services and adoption of key health behaviours related to neonatal survival, diarrhoea control, and other child health priorities by improving the capacities of local stakeholders and slum-based groups in health behaviour promotion	Cross-sectional quantitative survey	Open	An urban health programme integrating demand-supply and ward coordination enhanced utilization of services among slum communities and helped improve immunization coverage and other maternal and child health indicators, in a potentially replicable approach
Alcock (2009)	Community-based health programmes: role perceptions and experiences of female peer facilitators in Mumbai's urban slums	Urban Maharashtra (Mumbai)	To explore the role perceptions and experiences of facilitators of peer-led health interventions as change agents in a community setting	Qualitative - focus group discussions, semi-structured interviews and observations	Open	Peer-led health programmes need to account for the nature of relationships between peer workers and groups, role perceptions of peer leaders and perceptions and expectations of intervention recipients. Conceptual frameworks to describe the relationship between peer facilitators and groups should be based on empirical (street-level) evidence as well as theory. Programmes need to emphasise rapport-building, communication and negotiation skills for peer educators, and consider how recruitment, training and supervision of peer workers can enhance their credibility in the community.
Aruldas (2017)	Care-seeking behaviours for maternal and newborn illnesses among self-help group households in Uttar Pradesh, India	Rural Uttar Pradesh	To understand the processes of recognition and care-seeking for maternal and newborn illnesses; the sequences of actions for care-seeking when families experience maternal and newborn illnesses; and how health interventions using SHG platforms influence care-seeking for mothers and newborns' illnesses	Qualitative interviews focused on illness narratives	SHG	Deep-rooted cultural beliefs and rituals guided care-seeking behaviour. When the onset of illness was during pregnancy, care was sought from health facilities. As the step of care for maternal illness, SHG households went to government facilities, and non-SHG households used home-based care. Home-based care was the first step of care for newborn illnesses for both SHG and non-SHG households; however, SHG households were prompt in seeking care outside of home, and non-SHG households delayed seeking care until symptoms were perceived to be severe.

Avula (2019)	The Jeevika Multisectoral Convergence Pilot in Bihar - A Process Evaluation Report	Bihar	To understand implementation platforms, training and awareness of roles, implementation processes, exposure of SHG households to key messages, and utilization of an intervention with JEEVika groups in Bihar	Mixed-methods process evaluation	SHG	At the mid-point of this JEEVika intervention, key intervention platforms for the behaviour change communication were, to a large extent, in place and functional. The staff's knowledge of the aim of the pilot, and of their specific roles and responsibilities and intersections of roles with one another was good. The Behaviour Change Communication (BCC) content was largely accurate and comprehensive, covering much of the material in the ASHA training manuals and providing many of the same messages. New cadres of Community Nutrition Resource Persons (CNRPs) and the Health Sub Committee (HSC) were being trained began working, which will ease the burden on the Community Mobilisers (CMs) and Cluster Coordinators (CCs). In about 65 percent of the SHG meetings observed as part of the process evaluation, health and nutrition topics were discussed. The topics of discussion were dietary diversity, pregnancy and newborn care, breastfeeding, and complementary feeding, and these correspond to the topics on which the CMs received training most recently.
Barman (2016)	How is perceived community cohesion and membership in community groups associated with children's dietary adequacy in disadvantaged communities? A case of the Indian Sundarbans	West Bengal	To examine the association between community cohesion and child nutrition	Quantitative cross-sectional survey	SHG, CBWG	With each increase in the perceived community cohesion score (scale 0-9), a child was 1.31 times more likely to have minimum acceptable diet (95 % CI 1.14, 1.50). The odds of minimum acceptable diet were also higher among children whose mothers had primary education (2.09, 95 % CI 1.03, 2.94).
Baruah (2007)	Assessment of public-private-NGO partnerships: Water and sanitation services in slums	Gujarat	To explore opportunities and constraints faced by non-governmental organizations (NGOs) collaborating with public- and private-sector organizations on developing and delivering housing, water and sanitation programs for low-income urban families living in slums	Qualitative case study – secondary reports, focus group discussions, observations and interviews	Open	Through their participation in Community-based Organizations (CBOs), women have become much more vocal about their problems and have acquired the skills and confidence to interact with municipal authorities. Instances were also recorded of women from upgraded slums giving information and guidance to women from other slums to join the project. SEWA's stature as a development organization of national and international repute played a large part in enabling The Gujarat Mahila Housing SEWA Trust (MHT) to negotiate a pivotal role for itself during interactions with the other partners. Development of infrastructure and the provision of basic amenities have a positive influence not only on health, education and income, but also the social lives and sense of confidence of slum residents.
Bhaird (2012)	The Complexity of Community Engagement: developing staff-community relationships in participatory child education and women's rights intervention in Kolkata slums	West Bengal	To examine how sociocultural factors influenced relationship building between NGO staff and community members, and how this mediated community participation in a child education and women's rights intervention in Kolkata	Qualitative - interviews and focus group discussions	CBWG	The more participatory and community-led an intervention, the less predictable it becomes. In this context, community-based women's groups became very powerful, often using violence as a problem-solving mechanism, thereby disrupting the social fabric of the community. The flexibility needed to gain community acceptance and manage unanticipated events relies on trusting relationships between both communities and staff, and also between staff and donors.

Blanchard (2013)	Community mobilization, empowerment and HIV prevention among female sex workers in south India	Karnataka and Maharashtra	To test the associations between exposure to community mobilisation, empowerment, and health-related outcomes (condom use, violence and service use) among sex workers in Karnataka and Maharashtra	Quantitative cross-sectional survey	SPG	Engagement with HIV programs and community mobilization activities was associated with different domains of empowerment. Power within (a measure of self-esteem and confidence) and power with (a measure of collective identity and solidarity) were positively associated with more program contact ($p < 0.01$ and $p < 0.001$ respectively). These measures of empowerment were also associated with outcomes of "personal transformation" in terms of self-efficacy for condom and health service use ($p < 0.001$). Collective empowerment (power with others) was most strongly associated with "social transformation" variables including higher autonomy and reduced violence and coercion, particularly in districts with programs of longer duration ($p < 0.05$). Condom use with clients was associated with power with others ($p < 0.001$), while power within was associated with more condom use with regular partners ($p < 0.01$) and higher service utilization ($p < 0.05$).
Blankenship (2008)	Power, community mobilization, and condom use practices among FSW in AP, India	Andhra Pradesh	To analyse the association between power and condom use practices among female sex worker (FSW); to analyse extent to which exposure to a local community mobilization intervention affects these associations	Quantitative cross-sectional survey	SPG	Control over both the type of sex [adjusted odds ratio (AOR) 1.70, 95% confidence interval (CI) 1.23–2.34] and the amount charged (AOR 1.56, 95% CI 1.12–2.16), and economic dependence (AOR 0.54, 95% CI 0.35–0.83) are associated with consistent condom use as is programme exposure (AOR 2.09, 95% CI 1.48–2.94). The interaction between programme exposure and collective agency was also significant. Among respondents who reported both programme exposure and high levels of collective agency, the odds ratio of consistent condom use was 2.5 times that of other FSW.
Blankenship (2014)	Challenging the stigmatization of female sex workers through a community-led structural intervention: learning from a case study of a female sex worker intervention in Andhra Pradesh, India	Andhra Pradesh	To contribute to the growing set of case studies analysing the implementation of Community-led structural interventions (CLSIs) to promote HIV prevention among FSW	Qualitative – ethnography with formal and informal interviews	SPG	The CLSI, through its participation in the government-sponsored AIDS education program raised awareness of Community-led structural interventions (CLSIs) among FSW and mobilised them. The CLSI also organized an alternative public rally, outside of but parallel to the government program, where they reframed FSW not as the carriers of HIV but as public health workers combating it. CLSIs for HIV prevention among FSW are implemented in a context of inequality that constrains their actions, but they can still employ strategies that have the potential to transform that context.
Chakravarty (2012)	Health care and women's empowerment: the role of SHGs	Jharkhand	To estimate the level of health care services provided by the SHGs and the awareness and satisfaction level of their members	Qualitative – interviews and focus group discussions	SHG	SHGs can play a role in creating awareness of health issues through group meetings with women, by holding specific capacity-building trainings on health issues and facilitating exposure to important up-to-date medical information. A substantial influence on women's health and empowerment can only be achieved when these activities are taken up with a view to improving the public provision of health care facilities and accessibility.
Chandrashekhar (2019)	Cost and cost-effectiveness of health behaviour change interventions implemented with self-help groups in Bihar, India	Bihar	To assess the cost effectiveness in terms of cost per neonatal death averted and life year saved resulting from phase 1 of the Parivartan program	Decision modelling and cost-effectiveness analysis	SHG	The cost of forming an SHG group in Bihar was US\$254 and that of reaching a woman within the group was \$US 19. The unit cost for delivering health interventions through the Parivartan program was US\$148 per group and US\$11 per woman reached. During an 18 month period, Parivartan program reached around 17,120 SHGs and an estimated 20,544 pregnant women resulting in an estimated prevention of 23 neonatal deaths at a cost of US \$3,825 per life year saved.

Dongre (2007)	A comparison of HIV/AIDS awareness between self-help group leaders and other women in the villages of Primary Health Centre, Anji.	Maharashtra	To examine levels of HIV knowledge among SHG leaders vs other women in villages served by one primary health centre.	Quantitative cross-sectional survey	SHG	The leaders of SHGs had better levels of education and awareness about HIV/AIDS than other women in the village. Considering the significant high level of awareness regarding HIV/AIDS, the leaders of women's self-help groups could act as potential resource persons for the delivery of health education to other women.
Dongre (2009)	A Community Based Approach to Improve Health Care Seeking for Newborn Danger Signs in Rural Wardha, India	Maharashtra	To examine the effect of health education and community mobilization intervention on health care seeking of families with sick newborns and explore reasons for changes amongst mothers	Cross-sectional	SPG	There was a significant improvement in mothers' knowledge regarding newborn danger signs. About half of mothers got information from Community-led interventions for Child Survival (CLICS) <i>doot</i> (female community health worker). The monitoring over three years period showed encouraging trend in level of awareness among pregnant women. After three years, the proportion of mothers giving no treatment/home remedy for newborn danger signs declined significantly. However, there was significant increase in mothers' healthcare-seeking from private health care providers for sick newborns.
Euser (2012)	Pragati: an empowerment programme for female sex workers in Bangalore, India	Karnataka	To describe the effects of a broad empowerment programme among female sex workers (FSWs) in Bangalore, India, which seeks to develop the capacities of these women to address the issues that threaten their lives and livelihoods	Quantitative process evaluation with implementation, coverage and cost data	SPG	Between 2005 and 2010, the number of women who received help from a crisis response team increased, more women participated in alcohol de-addiction programmes, and the number of saving accounts and distributed microfinance loans was expanded. Furthermore, condom use increased over time, and more FSWs were treated for STIs. In contrast, the number of Sexually Transmitted Infections (STIs) and the STI incidence rate increased over time.
Feldman (2015)	Women's Political Participation and Health: A Health Capability Study in Rural India	Uttar Pradesh	To use a health capability framework with four domains (agency—participation, autonomy, self-efficacy, and health systems) to understand dimensions of health agency and illuminate how local political economies affect health.	Qualitative – semi structured interviews, focus group discussions	Open	Better understanding of cultural norms surrounding autonomy, the local infrastructure and health systems and male and female perceptions of political participation and self-efficacy are needed to improve women's health agency. For a community based participatory health intervention to improve health capabilities effectively, explicit strategies focussed on health agency should be as central as health indicators.
Feruglio (2018)	The challenges of institutionalizing community-level social accountability mechanisms for health and nutrition: a qualitative study in Odisha, India	Odisha	To examine how community accountability mechanisms have sought to strengthen community-level nutrition and health services (Integrated Child Development Services and National Rural Health Mission) when institutionalised at scale	Qualitative – in-depth interviews and focus group discussions	CBWG + SHG	The degree of effectiveness of different groups in strengthening accountability varied depending on their ability to offer meaningful avenues for participation of their members and empower women for autonomous action. In most of the mechanisms, community participation is very weak, with committees largely controlled by the frontline workers who are supposed to be held to account. However, SHGs showed real levels of autonomy and collective power. Despite not having an explicit accountability role, these groups were nevertheless effective in advocating for better service delivery and the broader needs of their members to a level not seen in institutional committees.
Gailits (2019)	Women's freedom of movement and participation in psychosocial support groups: qualitative study in northern India	Uttarakhand	To examine the factors influencing women's participation in psychosocial support groups, within an approach where community members work together to collectively strengthen their community's mental health	Qualitative – key informant interviews and focus group discussions	SPG	Mental health access and gender inequality are inseparable in the context of Northern India, and women's mental health cannot be addressed without first addressing underlying gender relations that prevent participation in support groups. Community-based mental health programs are an effective tool and can be used to strengthen communities collectively; however, attention towards the gender constraints that restrict women's freedom of movement and their ability to access care is required.

George (2018)	Can community action improve equity for maternal health and how does it do so? Research findings from Gujarat, India	Gujarat	To examine the equity effects of community action for maternal health led by Non-Government Organizations (NGOs) on facility deliveries	Mixed methods – qualitative data using project documents and interviews and quantitative data on self-reported use of services	Open, CBWG	The study found substantial increases in receipt of information of entitlements and utilization of antenatal and delivery care, and a switch from private facilities to public ones among the most vulnerable. Implementation required: a) alignment among NGO organizational missions; b) participatory development of project tools; c) repeated capacity building and; d) government interest in improving utilization and recognition of NGO contributions.
Gopalan (2007)	Microfinance and its contributions to health care access: a study of self-help groups (SHGs) in Kerala	Kerala	To understand the role played by self-help groups in Kerala vis-à-vis health	Qualitative – individual interviews	SHG	In order to obviate the difficulties (like inability to repay the loans regularly) experienced by the extremely poor members of microfinance institutions, it is necessary to make the terms and conditions of savings and borrowings more poor-friendly than they are at present. Setting up of a welfare fund at the SHG level to address emergency medical needs is essential. SHG members are often willing to participate if their contributions are supplemented by a government subsidy. Inter-sectoral coordination, by keeping microfinance mechanism as the pivot or by incorporating microfinance mechanism can ensure an easy, appropriate, affordable and effective service delivery at the doorstep.
Gopalan (2015)	Leveraging Community-Based Financing for Women's Nonmaternal Health Care: Experiences of Rural Indian Women	Odisha	To explore the potential of community-based financing for nonmaternal health care through a demand-side qualitative assessment among rural Indian women	Qualitative – focus group discussions	CBWG	Community-based financing provided financial access and risk protection for women's non-maternal health care, though not adequately. Schemes covering outpatient care (or mild illnesses) provided relatively more financial access. The major determinants of their restricted financial access were limited sum assured, noncomprehensive coverage of services, exclusion of elderly women, and the low priority that households gave to non-maternal health care. Community-based financing requires relevant structural changes along with demand-side behavioural modifications to ensure optimal attention to women's nonmaternal health care.
Gupta (2009)	Impact of a Health Education Intervention Program Regarding Breast Self-Examination by Women in a Semi-Urban Area of Madhya Pradesh, India	Madhya Pradesh	To determine the awareness and practice regarding Breast Self-Examination (BSE) in women; to assess the impact of health education on awareness and practice of BSE; to identify other factors affecting on the awareness and practices of BSE	Quantitative pre-post uncontrolled intervention study	SPG	The study found significant improvement in knowledge regarding all aspects of BSE of the intervention group. After the intervention program, 590 (59%) women had good knowledge and among them 90.7% practiced BSE compared to 0% at pre-test. An overall increase in the awareness of BSE practice (43% to 53%) was observed in the study group after intervention.

Gupta (2015)	Empowerment and engagement of SHGs against RTI/STI in Karnataka, India: an interventional study	Karnataka	To evaluate the effect of multi-centric action research to sensitize, mobilize and engage women through SHGs, to improve reproductive health, particularly Reproductive Tract Infection (RTI)/STIs and cervical cancer	Quantitative pre-post intervention study, (no baseline variables) and qualitative focus group discussions	SHG	The Intervention was effective in improving women's awareness about RTI/STIs, correct knowledge about white discharge, capability to identify the symptoms of RTI/STI and health seeking behaviour of the respondents. There was no observed change in prevalence of RTI/STIs.
Hamal (2018)	How does social accountability contribute to better maternal health outcomes? A qualitative study on perceived changes with government and civil society actors in Gujarat, India	Gujarat	To explore social accountability mechanisms in relation to maternal health, the factors they address and how the results of these mechanisms are perceived	Qualitative – in-depth interviews and focus group discussions	CBWG	Social accountability mechanisms influenced structural determinants (governance, policy, health beliefs, women's status) and intermediary determinants (social capital, maternal healthcare behaviour and availability, accessibility) and quality of health service delivery system. These further positively influenced the increased use of maternal health services. The social accountability mechanisms, through the process of information, dialogue and negotiation, particularly empowered women to make collective demands of the health system and brought about changed perceptions of women among actors in the system. It improved relations between women and the health system in terms of trust and collaboration, and generated appropriate responses from the health system to meeting women's groups' demands.
Hunt (2001)	Pathways to empowerment? Reflections on microfinance and transformation in gender relations in South Asia	Bihar (and Bangladesh)	To critically reflect on the pathways between microfinance and empowerment, including mobility and violence against women	Qualitative – interviews	SHG	Microfinance must be re-assessed in the light of evidence that the poorest families and the poorest women are not able to access credit. A range of microfinance packages is required to meet the needs of both the poor and the poorest. Development agencies need to acknowledge that microfinance does not directly or automatically lead to women's empowerment and gender transformation. More reflection and documentation is needed on pathways to empowerment, and on programme strategies that assist women to take greater control of decision-making and life choices.
Jejeebhoy (2018)	Preventing violence against women and girls in Bihar: challenges for implementation and evaluation	Bihar	To describe mechanisms and challenges through which the <i>Do Kadam</i> programme brought about change in outcomes that it sought to affect	Mixed methods process evaluation	SHG	Contextual challenges to the intervention success included lack of leadership skills of those delivering the intervention and the gap between expected responsibilities and activities of government platforms and reality. Implementation challenges were encountered in reaching men and boys, younger women and the community at large and ensuring their regular attendance; and in maintaining the fidelity of the intervention activities. Evidence-supported dialogue on these challenges and how best to anticipate and address them is essential.
Kadiyala (2016)	Adapting Agriculture Platforms for Nutrition: A Case Study of a Participatory, Video-Based Agricultural Extension Platform in India	Odisha	To examine the process of integrating Maternal, Infant and Young Child Nutrition (MIYCN) into the existing low-cost, participatory, video-based agricultural extension platform targeted to women's self-help groups and compare the development and delivery of agriculture and nutrition content; To assess the	Qualitative – in-depth interviews, structured observations, knowledge tests and questionnaires	SHG	Nutrition intervention were well-received by rural communities and viewed as complementary to existing frontline health services. However, compared to agriculture, nutrition content required more time, creativity, and technical support to develop and deliver. Experimentation with promoted nutrition behaviours was high but sharing of information from the videos with non-viewers was limited. There is a need for collaboration with existing health services; continued technical support for implementing partners; engagement with local cultural norms and beliefs; empowerment of women's group members to champion nutrition; and enhancement of message diffusion mechanisms to reach pregnant women and mothers of young children at scale.

			viability of promoting nutrition-specific actions through the platform, including acceptance and trial of promoted behaviours and diffusion of key messages; and to assess synergies with government health and nutrition services			
Kaur (2017)	Evaluation of a women group led health communication program in Haryana, India	Haryana	To describe the functionality and reach of Sakshar Mahila Smooh (SMS) as well as Auxiliary Nurse Midwives (ANM) and rural women's perceptions of the SMS	Cross-sectional	Open	Out of 2009 villages, 1732 (86%) had functional SMSs. In three years, Most ANMs opined that SMSs are better health communicators. SMS members were aware about their roles and responsibilities. The majority of village women reported that SMS carry out useful health education activities. The characteristics of SMS members were similar, but program performance was better in districts where health managers were proactive in program planning and monitoring.
Kermode (2008)	Some peace of mind: assessing a pilot intervention to promote mental health among widows of injecting drug users in north-east India	Manipur and Nagaland	To learn about women's perspectives on mental health and well-being and the links between mental health and HIV; to assess changes in the women's quality of life and mental health during the course of the intervention; to assess changes in engagement in HIV risk behaviours; to describe the process and outcome of the intervention from the perspective of the women.	Mixed methods process evaluation – questionnaire survey and focus group discussions	SPG	Widows of injecting drug-users, organized into participatory action groups showed significant improvements in quality of life, mental health and experience of somatic symptoms, and the women told stories reflecting a range of significant changes. A participatory approach to mental health promotion can have a positive impact on the lives of vulnerable women and has the potential to contribute to HIV prevention.
Kethineni (2016)	Combating Violence against Women in India: Nari Adalats and Gender-Based Justice, Women & Criminal Justice	Karnataka	To examine the effectiveness of Nari Adalats as an alternative avenue for women seeking justice; To identify the role of Mahila Samakhya in empowering rural and disadvantaged women in India	Qualitative – interviews	CBWG	Nari Adalats (women's courts) exercise broad authority to investigate and address a wide range of domestic violence cases in India. The Mahila Samakhya (women's federation) serves as an advocacy group and provides shelter, legal assistance, and social help as well as education for victims of domestic violence. The Mahila Samakhya is committed to empowering women who cannot find justice through formal governmental means.
Krishnan (2012)	An Intergenerational Women's Empowerment Intervention to Mitigate Domestic Violence: Results of a Pilot Study in Bengaluru, India	Karnataka	To present findings on intervention feasibility, acceptability and safety from a pilot study of 20 Daughter-in-Law - Mother-in-Law (DIL-MIL) dyads in urban low income communities in Bengaluru	Qualitative – focus group discussions and in-depth interviews	SPG	A family-based approach to violence prevention is highly promising. With increased awareness and knowledge of gender inequities, violence, and health, enhanced relationship skills, and peer support, intergenerational relationships can be safely mobilized to mitigate domestic violence.

Kumar (2007)	Health inequity and women's self-help groups in India: The role of caste and class	Bihar	To review the scope and limitations of SHGs in improving women's health using the example of Bihar, India, and in particular to assess the extent to which SHGs can be involved in attaining better health for women and children by exploring the role of caste and class in access to health services	Qualitative – field surveys, interviews, focus group discussions and case studies	SHG	Caste imposes serious limitations on the extent to which SHGs can be used in improving women's health. Women's health is very much dependent on existing gender relations, and their interaction with income, education and general standards of living. SHG programmes are functioning in a vacuum without addressing these contextual issues, severely constrained in being able to have a significant effect on women's health. Decentralisation and local accessibility of public health facilities is a pressing requirement to advance the health of poor and marginalised women.
Kumar (2009)	Participation in Self-help Group Activities and Its Impacts: Evidence from South India	Tamil Nadu	To compare household income and expenditure among households with women SHG members and households with women who do not belong to SHGs	Quantitative cross-sectional survey	SHG	SHGs generate substantial income and have significance in the household. The quantity and quality of food consumed, the health of household members and children's education improve. Institution building contributes greatly towards improving household welfare.
Kumar (2015)	Enculturating science: Community-centric design of behaviour change interactions for accelerating health impact	Uttar Pradesh	To describe a systems approach for community-centric design of interactions, highlighting key principles for achieving intrinsically motivated, sustained change in social norms and family health behaviours, elucidated with progressive theories from a range of disciplines.	Qualitative – case study	Open	Behaviour change can be achieved when biomedical and traditional socio-cognitive systems are understood to co-develop solutions to address a health issue. This requires recognition of the fact that one is not dealing with individuals, but community systems that were designed over generations keeping in mind a certain worldview and a common social purpose. In order to design scientifically guided effective interactions, it is important to understand the causal mechanisms and underlying system that govern these behaviours.
Kumar (2019)	Social networks, mobility, and political participation: The potential for women's self-help groups to improve access and use of public entitlement schemes in India	Madhya Pradesh, Odisha, Chhattisgarh, Jharkhand and West Bengal	To examine the potential for women's SHGs to improve access to and use of public entitlement schemes	Quantitative cross-sectional survey	SHG	SHG members are more politically engaged and more likely to know of certain public entitlements than non-members. They are significantly more likely to access a greater number of public entitlement schemes. SHG members have wider social networks and greater mobility as compared to non-members. SHGs can enforce accountability amongst public entities and demand what is rightfully theirs. SHGs themselves cannot be expected to increase knowledge in absence of an external agency.
Long (2013)	Determinants of better health: a cross-sectional assessment of positive deviants among women in West Bengal	West Bengal	To identify factors associated with positive health outcomes among women with primary education or less (positive deviants)	Quantitative cross-sectional survey	SHG	Positive deviants in this context are shown to be women who are able to earn an income, who have access to information through media sources, and who, despite little schooling, have marginally higher levels of formal education that lead to improved health outcomes.

Mohindra (2008)	Can microcredit help improve the health of poor women? Some findings from a cross-sectional study in Kerala, India	Kerala	To examine associations between female participation in SHGs, and women's health in Kerala	Quantitative cross-sectional survey	SHG	Compared to non-participants living in a household without a SHG member, the odds of facing exclusion is significantly lower among early joiners, women who were members for more than 2 years (OR = 0.58, CI = 0.41–0.80), late joiners, members for 2 satisfaction compared to non-members (OR = 0.52, CI = 0.30–0.93; OR = 0.32, CI = 0.14–0.71). No associations were found between SHG participation and self-assessed health or exposure to health risks. The relationship between SHG participation and decision-making agency is unclear.
Morrison (2019)	Exploring the equity impact of a maternal and newborn health intervention: a qualitative study of participatory women's groups in rural South Asia and Africa	Jharkhand and Odisha	To understand the mechanisms that led to the equitable impact of the Participatory Learning and Action (PLA) approach across socioeconomic strata in 4 sites in India, Nepal, Bangladesh and Malawi	Qualitative – focus group discussion, interviews, key informant interviews	Open	Participatory learning and action led to increased knowledge, confidence to act, and acceptability of recommended practices. The equitable behavioural effects were facilitated by the accessibility, relevance, and engaging format of the intervention across socioeconomic groups, and by reaching-out to parts of the population usually not accessed. A participatory approach improved health behaviours across socioeconomic strata in rural communities, around issues for which there was a knowledge deficit and where simple changes could be made at home.
Panda (2015)	Mobilizing community-based health insurance to enhance awareness & prevention of airborne, vector-borne & waterborne diseases in rural India	UP and Bihar	To evaluate the effect of a health education program -- campaigns with SHGs -- on airborne, vector borne and waterborne disease	Quantitative uncontrolled pre-post intervention study	SHG	The study found significant increases both in awareness (34%, $p < 0.001$) and in preventive practices (48%, $P = 0.001$), suggesting that the awareness campaign was effective. However, average practice scores (0.31) were substantially lower than average awareness scores (0.47), even in post campaign. Awareness and preventive practices less prevalent for vector-borne diseases than in airborne and waterborne diseases. Education was positively associated with both awareness and practice scores. The awareness scores were positive and significant determinants of the practice scores, both in the pre- and in the post-campaign results. Affiliation to Community-based health intervention (CBHI) had significant positive influence on awareness and on practice scores in the post-campaign period.
Prabhakaran (2016)	Impact of Community-led Total Sanitation on Women's Health in Urban Slums: A Case Study from Kalyani Municipality	West Bengal	To understand the impact of improved sanitation and specifically of the Community-led total sanitation (CLTS) process on women's physical health in terms of reduction in disease burden; and the social and psychological wellbeing of women in selected slums of Kalyani; to understand the impact of the CLTS process on aspects of women's empowerment and its effect on women's wellbeing and overall health in selected Open Defaecation Free (ODF) slums of Kalyani; to understand the external environmental factors that have played a key role in improving sanitation in	Qualitative – focus group discussions, personal interviews, key informant interviews	Open	Political will, commitment from local institutional actors, the ability to mobilise resources and capacity to work with the community are all needed to achieve long-term change with CLTS. Institutional actors such as politicians, administrators, health workers, engineers and contractors can play in achieving successful outcomes, not as direct implementers of the programme or as providers of infrastructure, but as facilitators supporting the community to design and implement its own initiatives. The community has to take ownership and accept accountability for their sanitation and hygiene behaviour and practices. Collective community demand and action in activating and strengthening formal health delivery systems and integrating health programmes into sanitation initiatives.

			Kalyani and therefore the health of women			
Raghavendra (2014)	Nature of activities organised by self-help groups formed by two non-governmental organisations for the integrated development of the members and the community	Karnataka	To describe the nature of activities organised by SHGs formed by 2 NGOs in the state	Qualitative – focus group discussions, observations	SHG	The SHGs carried out 31 different types of activities, indicating that the women could do a wide range of activities if they were organised and trained. SHGs are an appropriate forum for rural women to expose themselves to mainstream economic sphere and become economically independent as well as participate in decision making process in their respective families.
Rajendran (2010)	Role of community empowerment in the elimination of lymphatic filariasis in south India	Tamil Nadu	To examine how a community empowerment-focussed IEC intervention worked to improve use of mass drug administration to eliminate lymphatic filariasis	Cohort and focus group discussions	SHG	After four rounds of mass drug administration (MDA), there was a significant decline in the filarial infection variables. The microfilaraemia and antigenaemia declined by 59% and 67% respectively. The transmission indices lowered by 89% and 94% (in resting and landing catch of mosquitoes respectively). The decline in these variables, with a drug consumption rate of >80% was achieved due to the effective Information Education Communication (IEC) campaigns prior to each MDA. After 4 MDAs almost 97% of the respondents were aware of lymphatic filariasis. SHGs and school students were observed to be integral to MDA campaigns for the enhancement of drug compliance, thus leading to lymphatic filariasis elimination.
Rao (2011)	Community-Based Mental Health Intervention for Underprivileged Women in Rural India: An Experiential Report	Karnataka	To share experiences from a project that integrates a mental health intervention within a developmental framework of microcredit activity for economically underprivileged women in rural India	Qualitative – focus group discussions	SHG	Women in the mental health intervention group reported reduction in psychological distress and bodily aches and pains. The majority reported that the quality of their sleep had improved with regular practice of relaxation and that sharing their problems in the group had helped them to unburden. The social support extended by the members to each other, made them feel that they were not alone and could face any life situation. Adding the mental health intervention to the ongoing economic activity made a positive difference in the lives of the women. Addressing mental health concerns within livelihood initiatives can help to enhance both economic and social capital in rural poor women.
Rath (2010)	Explaining the impact of a women's group led community mobilisation intervention on maternal and newborn health outcomes: the Ekjut trial process evaluation	Jharkhand and Odisha	To report process evaluation data from the Ekjut trial of a Participatory Learning and Action (PLA) cycle with women's groups	Mixed-methods process evaluation	Open	Participatory interventions with community groups can influence maternal and child health outcomes if key intervention characteristics are preserved and tailored to local contexts. Scaling-up such interventions requires a detailed understanding of the way in which context affects the acceptability and delivery of the intervention; planned but flexible replication of key content and implementation features; strong support for participatory methods from implementing agencies.
Reshmi (2019)	Context for layering women's nutrition interventions on a large scale poverty alleviation program: Evidence from three eastern Indian states	Bihar, Chhattisgarh, Odisha	To describe the scenario or context prior to layering of women's nutrition interventions on NRLM platforms	Quantitative cross-sectional survey	SHG	BMI indicated at least 45% mothers were undernourished irrespective of their enrolment in SHGs. Higher proportion of SHG members (77%-87%) belonged to food insecure households than non-members (66%-83%). Current use of family planning (FP) methods was excruciatingly low (8.2%-32.4%) in all states but positively skewed towards SHG members.

Ruducha (2019)	Measuring coordination between women's self-help groups and local health systems in rural India: a social network analysis	Uttar Pradesh	To assess how health services coordination and emergency referral networks between SHGs and local health systems, along with other key stakeholders, changed over the course of a 2-year learning phase of the project using social network analysis (SNA)	Quantitative uncontrolled pre-post intervention study with cross-sectional surveys	SHG	The health services coordination and emergency referral networks increased in density and the number of connections between respondents as measured by average degree centrality have increased, along with more diversity of interaction between groups. The network expanded relationships at the village and block levels, reflecting the rise of bridging social capital. The accredited social health activist, a village health worker, occupied the central position in the network, and her role expanded to sharing information and coordinating services with the SHG members.
Saggurti (2013)	Community collectivization and its association with consistent condom use and STI treatment-seeking behaviours among female sex workers and high-risk men who have sex with men/ transgenders in Andhra Pradesh, India	Andhra Pradesh	To examine community collectivisation among FSWs (female sex workers) and HR-MSM (high risk Men who have sex with men), and measure its association with select outcome indicators	Quantitative cross-sectional survey	SPG	High levels of collective efficacy (adjusted OR: 1.3, 95% CI: 1.11.7) and collective action (adjusted OR:1.3, 95% CI: 1.11.8) were associated with consistent condom use (CCU) with regular clients among FSWs. Among HR-MSM, participation in a public event (adjusted OR: 2.7, 95% CI: 2.03.6) and collective efficacy (adjusted OR: 1.9, 95% CI: 1.52.3) were correlated with condom use with paying partners.
Saha (2013)	The effect of Self-Help Groups on access to maternal health services: evidence from rural India	All India	To assess the impact of the presence of SHGs on maternal health service uptake	Secondary analysis of a quantitative cross-sectional survey (District-Level Household Survey)	SHG	Respondents from villages with a SHG had a 19% increased odds (OR: 1.19, CI: 1.13-1.24) of delivering in a health facility, increased knowledge of (OR: 1.48, CI 1.39 – 1.57) and utilization of family planning products and services (OR: 1.19, CI 1.11 – 1.27). These results were significant after controlling for individual and village-level heterogeneities.
Sanyal (2015)	Recasting Culture to Undo Gender: A Sociological Analysis of Jeevika in Rural Bihar, India	Bihar	To understand how Jeevika induced large scale cultural change in Bihar	Qualitative –interviews, focus group discussions, non-participant observation, structured interviews	SHG	Jeevika created new “cultural configurations” by giving economically and socially disadvantaged women access to a well-defined network of people and new systems of knowledge, which changed women's habitus and broke down normative restrictions constitutive of the symbolic boundary of gender.
Sethi (2017)	Partnering with women collectives for delivering essential women's nutrition interventions in tribal areas of eastern India: a scoping study	Odisha, Jharkhand and Chhattisgarh	To examine the feasibility of engaging women collectives in delivering a package of women's nutrition messages/services as a funded stakeholder in three tribal-dominated districts	Mixed methods – secondary of quantitative data, interviews and focus group discussions	SHG	Limited targeting of pre-pregnancy period, delays in first trimester registration of pregnant women, and low micronutrient supplementation supply and awareness issues impact women's nutrition. SHGs with organisational readiness for receiving and managing grants for income generation and community development activities varied from 41% to 94%.

Sinha (2006)	Self-help groups in India: a study of the light and shades	Andhra Pradesh, Karnataka, Odisha, Rajasthan	To examine the efficiency of SHGs in their financial transactions; their sustainability; the extent to which they are able to take social action; who benefits from these actions; who drops out and why	Qualitative – semi-structured interviews, transect walks, informal interviews, focus group discussions	SHG	Understanding the effectiveness of SHGs – whether in terms of financial or social empowerment - requires greater clarity of vision and objectives and a systematic approach to building capacity and providing guidance. There is a need to define objectives for creating SHGs based on the needs of its members, as well as understanding the impact of social networks and local politics. Additionally, there is a need to deliberate on the extent and length of support provided to SHGs as well as dealing with members dropping out or SHGs becoming defunct.
Sinha (2017)	Economic evaluation of participatory learning and action with women's groups facilitated by Accredited Social Health Activists to improve birth outcomes in rural eastern India	Jharkhand and Odisha	To assess the cost-effectiveness of a PLA intervention facilitated by ASHAs to improve neonatal outcomes	Used cluster RCT data (Tripathy 2016) and cost data collected	Open	The incremental cost of the intervention was USD 83 per averted disability-adjusted life years (DALY) (USD 99 inclusive of VHSNC strengthening costs), and the incremental cost per newborn death averted was USD 2545 (USD 3046 inclusive of Village Health, Sanitation and Nutrition Committee (VHSNC) strengthening costs). The intervention was highly cost-effective according to WHO threshold, as the cost per life year saved or DALY averted was less than India's Gross Domestic Product (GDP) per capita. The robustness of the findings to assumptions was tested using a series of one-way sensitivity analyses. The sensitivity analysis does not change the conclusion that the intervention is highly cost-effective.
Swamy (2013)	Women Financing and Household Economics	Karnataka	To assess whether women's financing through groups improves food security (through measuring food expenditure) and standard of living, especially of women and vulnerable caste groups	Quantitative uncontrolled pre-post intervention study with cross-sectional surveys	SHG	Access to finance through groups has significant impacts on poor families' food security and non-food expenses. The study has evidenced significant outreach of impact of women financing in terms of physical as well as qualitative factors on the socially weaker sections of the society such as Women, Scheduled Castes /Scheduled Tribes and Other Backward Classes category of the poor.
Van Rompay (2008)	Empowering the people: Development of an HIV peer education model for low literacy rural communities in India	Tamil Nadu	To describe a HIV peer education model to educate and empower low-literacy communities in a rural district	Mixed-methods process evaluation with pre- and post-test surveys and focus group discussions	SHG	Using established networks (such as community-based organizations already working on empowerment of women) and training women's SHG leaders and barbers as peer educators was an effective and culturally appropriate way to disseminate comprehensive information on HIV/AIDS to low-literacy communities. Similar models for reaching and empowering vulnerable populations should be expanded to other rural areas.

Supplementary Figure 1: Location of included studies, by state

