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# Community-based interventions for improving maternal health and for reducing maternal health inequalities in high-income countries: a systematic map of research

Martha Perry<sup>1\*</sup>, Francisco Becerra<sup>2</sup>, Josephine Kavanagh<sup>3</sup>, Angéline Serre<sup>4</sup>, Emily Vargas<sup>5</sup> and Victor Becerril<sup>6</sup>

## Abstract

**Background:** This review is part of a European Commission project, MASCOT, aimed at reducing maternal and child health inequalities. The purpose was to identify and describe the literature on community-based interventions on maternal health in high-income countries (HIC) and conceptually map the literature according to country focus, topics addressed, nature of the intervention and the intervention provider, and interventions designed to address inequalities in maternal health.

**Methods:** The research protocol for this review was based on a low-income country (LMIC) systematic review protocol within the MASCOT Project. We searched PubMed and CINAHL databases for literature published between January 2000 and April 2013. OECD countries were used to determine the HIC and different terms were used to refer to community based interventions, defined as those “delivered in community settings or any activities occurring outside of health facilities”.

**Results:** 119 publications were selected for inclusion in this mapping study. 95 (80%) were Randomised Control Trials (RCTs) and 24 (20%) were systematic reviews (SRs). We categorised the study topics according to the main interventions covered: breastfeeding assistance and promotion, preventing and treating post-natal depression, interventions to support and build capacity around parenting and child care, antenatal interventions preparing women for birth, postnatal planning of future births and control trials around changing maternal behaviours. The home was used as the most common setting to implement these interventions and health professionals accounted for the largest group of intervention providers.

**Conclusions:** This review maps and brings knowledge on the type of studies and topics being addressed in community based interventions around maternal health in HICs. It opens the opportunity for further studies on interventions’ effectiveness and knowledge transfer to LMICs settings.

**Keywords:** Maternal health, Inequality, High income country, Systematic review

\* Correspondence: martha.perry@hapi.org.uk

<sup>1</sup>Health Action Partnership International (HAPI), Unit 31A, Eurolinks Business Centre, 49 Effra Road, Brixton, London SW2 1BZ, UK

Full list of author information is available at the end of the article

## Background

Health inequalities are defined as *differences in health status or in the distribution of health determinants between different population groups* [1]. The part of these inequalities attributable to the external environment and conditions outside the control of individuals result in disparities for disease incidence, health outcomes, access to health care, or quality of health care. They are particularly unjust and unfair and therefore referred to as inequities. The WHO Commission on the social determinants of health states that “*the poor health of the poor, the social gradients in health and the marked health inequities between countries are caused by the unequal distribution of power, income, goods and services*” [2] which means they could be avoidable. In the perspective of the Millennium Development Goals, numerous social and economic arguments appeal for a reduction of these inequities.

The “Multilateral Association for Studying health inequalities and enhancing north–south and south-south Cooperation” (MASCOT) [3] recognizes the need of stimulating knowledge transfer and exchange mechanisms among Low and Middle Income Countries (LMIC), as well as with High Income Countries (HIC) for shaping policies, programmes and health actions intended to provide better health and health services. The actions implemented in the framework of MASCOT are understood as a way to reduce inequities preferentially affecting children, adolescents and mothers as the end-result of the strengthened collaborative activities.

A primary objective of MASCOT was to identify the strategies and more particularly the health system interventions that are in place aiming at improving maternal health. As to complement country level work, a systematic review examined evidence of the impact of different supply and demand initiatives on maternal health in LMICs [4], taking a broad approach to health systems and also including community-based interventions, which often provide services and support for marginalised and disadvantaged populations. The preliminary results revealed community-based interventions in the LMIC literature only accounted for 2% of studies. The review was further expanded to include community-based interventions in HICs reinforcing the north–south collaboration and knowledge transfer embedded in MASCOT.

This paper reports the results of a systematic mapping of research, rather than a systematic review. Systematic maps follow the early stages of a systematic review, but do not attempt to critically appraise the literature, nor to extract, synthesise and analyse data. They can be used to: describe a body of literature which is not well understood or difficult to access; identify gaps in the literature; identify topics for systematic reviews; and, make research more

easily accessible to policy makers and practitioners, researchers and other users of research.

The objectives of this systematic map were to:

- 1) systematically identify the literature on community-based interventions on maternal health in HICs; and
- 2) describe the literature according to concepts such as: country focus, topics addressed, nature of the intervention and the intervention provider, and interventions designed to address inequalities in maternal health.

## Methods

The research protocol for this review was based on a LMIC systematic review protocol [4] within the MASCOT Project. Maternal Health was considered as “the time from conception until two years after childbirth”, thus covering pregnancy, childbirth and the postnatal period. Community-based interventions were defined as those “delivered in community settings or any activities occurring outside of health facilities”. This definition was selected given the size of the review team and number of references to screen, making it difficult to operationalize a more complex definition of community.

We searched PubMed and CINAHL databases for literature published between January 2000 and April 2013. The latter extends one more year than the LMIC review, which search was limited to March 2012. We did not restrict publication type and languages were restricted to those of the MASCOT project country partners (English, French, Spanish and Portuguese).

OECD countries were used to determine the high-income countries [5]. Together, the HIC and LMIC reviews thus cover all countries.

Searches for community-based interventions combined free-text and controlled language terms which describe community interventions for maternal health and we also included specific terms identified in a WHO project on maternal health community interventions. We used a combination of the following terms: “social support” OR “husband” OR “Women’s health groups” OR “Women’s groups” OR “participatory intervention” OR “Lay health worker\*” OR “home based” OR “home visit\*” OR “Maternity waiting home\*” OR “Birth preparedness” OR “Male involvement” OR “Transport scheme\*” OR “community scheme\*” OR “traditional birth attendant\*” OR community OR “community organisation\*” OR “community organization\*” OR “Social Support” OR (“lay community” OR “lay people” OR “lay person” OR “peer deliver\*” OR “peer support”) OR “Community Networks” OR “Community Health Workers” OR “Community-Based Participatory Research” OR “Consumer Participation”.

Following systematic review methodology, publications were selected for full text review if they were either

Randomised Control Trials (RCT) or Systematic reviews (SR). The criteria used to determine the eligibility of studies is included in Table 1. Single screening on title and abstract was performed by five reviewers (MP, FB, JK, EV and VB). During screening, references were marked as ‘exclude’ taking a hierarchy approach and marking only the highest applicable item on the list. Included items were marked either ‘include RCT/SR’ or ‘include on TI/AB’, which referred to those studies which were maternal health community-based interventions, but the study designs were not RCTs or SRs.

Full text coding of RCTs and SRs was done by three reviewers (MP, FB and AS). First full text articles were checked for eligibility. Then data from the full text was extracted according to a set of generic codes shown in Table 2. These generic codes were developed by the LMIC systematic review team and this review used the same to ensure the studies from HIC literature could be classified similarly for comparison. In addition, a set of specific codes were added for HIC literature on the type of community-setting where the intervention was delivered and on who the intervention provider was. Besides health professionals, providers were either peers, defined as “women who have themselves had children or have the same socioeconomic background, ethnicity, or locality as the women they are supporting” and community volunteers, who are different from peers in that they were not mothers or women necessarily.

Because one of the principal objectives of the MASCOT project is to share knowledge and build capacity to reduce maternal and child health inequities, we also coded included articles on whether the intervention targeted disadvantaged populations. We define disadvantage through the acronym PROGRESS-Plus (Place of Residence, Race/Ethnicity, Occupation, Gender, Religion, Education, Socio-economic Status, and Social Capital, and Plus represents additional categories such as Age, Disability, and Sexual Orientation), used by the Campbell and Cochrane Equity methods Group and the Cochrane Public Health Review Group [4].

A total of 7178 documents were obtained from the literature search, from which 119 publications were

selected for further analysis following the review process shown in the study flow diagram (Figure 1). The list of publications is included in Appendix.

## Results

Of the included publications, 95 (80%) were RCTs and 24 (20%) SRs, which characteristics and country of origin are presented in Table 3. Because of the definition used for this work of community-based interventions, studies were focussed on prevention and health promotion for mothers, infants and families. Breastfeeding assistance and promotion (n = 27; 22.7%), preventing and treating post-natal depression (n = 30; 25.2%) or interventions to support and build capacity around parenting and child care (n = 27; 22.6%) accounted for about three thirds of studies (n = 84; 70.5%). The rest were primarily on antenatal interventions preparing women for birth (n = 9; 7.6%), postnatal planning of future births (n = 7; 5.8%) and control trials around changing maternal behaviours, including nutrition and physical activity promotion (n = 5; 4.2%), smoking cessation (n = 5; 4.2%) and drug use prevention (n = 4; 3.7%).

Service delivery mechanisms were generally interventions at the home (n = 44; 37.0%) and through telephone support (n = 7; 5.9%) or peer support groups (n = 6; 5.0%), and a little over one quarter of studies (n = 32; 26.9%) combined one or more of these; for instance a breastfeeding home visitation programme with additional telephone support. We also included studies which compared mainstream hospital or clinical care with enhanced care outside of the health setting, as well as those which combined health facility care with one or more of the community-setting support (n = 30; 25.2%). Over half of these interventions (n = 61; 51.3%) were provided by health professionals, which included nurses, doctors, midwives and also research groups from health-related disciplines. Interventions were provided by peers in 19.3% (n = 23) of studies and 4.2% (n = 5) by community volunteers. Both health and non-health intervention providers accounted for 21.8% (n = 26) of included studies.

The outcomes presented in the studies (summarised in Table 4) were mainly maternal health (n = 111; 93.3%) and child health (n = 51; 42.9%). The other two were related to costs (n = 14; 11.8%), in particular analysing any benefits or reductions in healthcare costs from community-based support, and service utilisation (n = 17; 14.3%), which was related both to interventions promoting the use of antenatal and post-natal services and service use post-intervention.

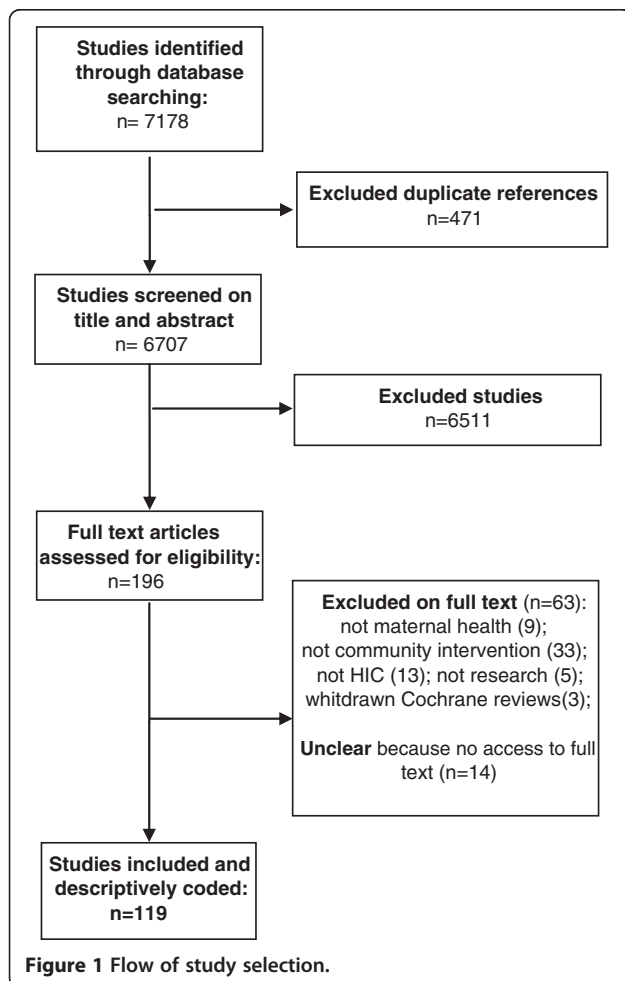
In relation to the PROGRESS-Plus classification, 39 studies (32.8%) included interventions which were targeted to specific population groups. As presented in Table 5, they were primarily women in low socioeconomic

**Table 1 Eligibility criteria of publications**

Exclusion criteria	Inclusion criteria for full text coding
1. Published before 2000	1. Study design was a Randomised Control Trial or systematic review
2. Not maternal health population (women in pregnancy, childbirth, or within two years postpartum)	
3. Not a community-based intervention	
4. Not a High-Income country	
5. Not research	

**Table 2 Generic codes applied to full text**

1. Country(ies) where study done	8. Intervention topic.
2. Country(ies) of first author	9. Period targeted by intervention: Pregnancy (which includes abortion and miscarriage); Intrapartum; Postpartum.
3. Paper targeted at or delivered to specific PROGRESS-Plus group or disadvantaged group as defined by PROGRESS-Plus. These categories are: Place of Residence (rural women for example), Race/Ethnicity, Occupation, Religion, Education, Socioeconomic Status, and Social Capital, and Plus represents additional categories such as Age, Disability and Sexual Orientation.	10. Data collected: maternal health; child health; cost/health economics; service utilisation
4. Paper addresses WHO health promotion topics. This includes health promotion activities and health education activities within the community, and for the community, including that which occurs in health service settings.	11. Funding
5. Research question(s) study might answer: Health systems; Community settings; Tracer conditions/single clinical interventions; Tracer conditions/ other interventions; Health service utilisation/non-intervention research; Health promotion; Other.	12. HIC Codes
6. Study design: RCT or SR	a. Intervention delivery: home; telephone; peer delivered; other
7. Intervention recipient: women; family; male partner; traditional birth attendant; community health worker; midwife/nurse; other mid-level provider; doctor/ obstetrician; community; manager(s); policy maker(s); system; rural setting; urban setting; other.	b. Intervention provider: health professional; peer; community volunteer; other



strata (n = 21; 17.6%), adolescents (n = 14; 11.8%), Black and ethnic minorities (n = 10; 8.4%) and others (n = 6; 5.0%) referred to indicators such as living in urban areas, being a single parent or born overseas.

The largest mentioned source of funding was governmental (n = 80; 67.2%) followed by not-for-profit organisations (n = 21; 17.6%), academic institutions (n = 11; 8.7%) and private sector (n = 4; 3.3%) (refer to Table 6). Only one systematic review [6] had international agency funding from the World Health Organization and European Commission.

## Discussion

In the literature on community-based interventions in maternal health from HICs in recent years, post-natal depression, breastfeeding and parenting are the main focus of interventions. Together, these topics represent 71% of all studies. According to the Global burden of Disease Heatmap, depressive disorder which amounts to 2.55% of the global burden of disease [7] is the 11th cause globally, being higher in Latin American and Caribbean countries than in HICs, but amongst the 10th place in some parts of the region, while in Africa it ranges between the 10th (Southern Sub-Saharan) and the 19th place (Western Sub-Saharan Africa) [8] Furthermore, the World Health Organization reports the burden of depression is 50% higher in women than men, and it estimates between 1 and 2 out of 10 mothers will experience post-natal depression to various degrees, which can limit their capacity to care for their children [9].

It is interesting to find that most of the RCTs were either comparing community-based interventions to health care facility services or providing a combination

**Table 3 Results of conceptual mapping of included references**

Coding categories	All (n = 119)	Randomised control trials (n = 95)	Systematic reviews (n = 24)
<b>Countries</b>			
Australia		13 (13.7%)	12 (50.0%)*
Canada		14 (14.7%)	14 (58.3%)
United Kingdom		16 (16.8%)	17 (70.8%)
United States		42 (44.2%)	18 (75.0%)
Other HIC		10 (10.6%)	15 (62.5%)
<b>Topic</b>			
Birth preparedness	9 (7.6%)	8 (8.4%)	1 (4.2%)
Breastfeeding	27 (22.7%)	16 (16.8%)	11 (45.8%)
Drug use	4 (3.7%)	4 (4.2%)	0 (0.0%)
Family planning	7 (5.8%)	7 (7.4%)	0 (0.0%)
Nutrition and/or physical activity	5 (4.2%)	5 (5.3%)	0 (0.0%)
Parenting and child care	27 (22.7%)	24 (25.3%)	3 (12.5%)
Post-natal depression	30 (25.2%)	24 (25.3%)	6 (25.0%)
Smoking cessation	5 (4.2%)	4 (4.2%)	1 (4.2%)
Other	5 (4.2%)	3 (3.1%)	2 (8.3%)
<b>Intervention delivery</b>			
Home only	44 (37.0%)	40 (42.1%)	4 (16.7%)
Peer only	6 (5.0%)	4 (4.2%)	2 (8.3%)
Telephone only	7 (5.9%)	6 (6.3%)	1 (4.2%)
Combined community settings	32 (26.9%)	21 (22.1%)	11 (45.8%)
Combined community and health facility	30 (25.2%)	24 (25.3%)	6 (25%)
<b>Intervention provider</b>			
Community volunteer	5 (4.2%)	4 (4.2%)	1 (4.2%)
Peer	23 (19.3%)	21 (22.1%)	2 (8.3%)
Health Professional	61 (51.3%)	52 (54.8%)	9 (37.5%)
Combined health worker and peer and/or community volunteer	26 (21.8%)	14 (14.7%)	12 (50.0%)
Other	4 (3.4%)	4 (4.2%)	0 (0.0%)
<b>Population targeted</b>			
PROGRESS Plus group	39 (32.8%)	35 (36.8%)	4 (16.7%)
Universal	80 (67.2%)	60 (63.2%)	20 (83.3%)

\*The percentage represents the number of times that there are one or more studies from the country in the 24 systematic reviews included in this scoping study.

of both. This can be explained by the non-clinical nature of the studies' topics, which may not necessarily require the use or attendance at a health facility. Furthermore, arguments and evidence around cost-saving and cost-effectiveness to both the health sector and the mothers with the use of community settings can also be made.

**Table 4 Type of data collected in included references**

Data collected	Number of articles
Maternal health outcomes	111 (93.3%)
Child health outcomes	51 (42.9%)
Service Utilisation	17 (14.3%)
Cost/Health economics	14 (11.8%)

Mothers' homes were a common setting used to provide support outside of mainstream health service provision. Home visiting interventions are often designed to target women who are socially excluded, living in poverty or undereducated [10] and in our findings approximately 85% (n = 33) of the studies on disadvantaged women (n = 39) included home support.

The outcomes of maternal health programmes can also be assessed in terms of the background of the intervention provider. Half of the studies used health workers followed by combination of health worker and other lay type of supporter. The third most used intervention provider were peers based on an assumption that they can provide support for mothers and share commonalities which enhance confidence and trust [11,12]. Further evaluation of included studies can identify the effect of different types of providers, but this analysis was outside of the aim of this paper.

The scope of the targeted population by the HIC studies is mainly universal for both the RCT and SR studies. Of the PROGRESS Plus categories, adolescents, black and ethnic minorities and low socio-economic status are the main populations targeted. Adolescent pregnancy is high worldwide and one of the main causes of maternal death [13]. Teenagers tend to have more complications than women who have reached an adult age [14]. The problem is greater in the United States and Canada than in Europe and Japan, and is not only due to high pregnancy rates in minority groups in the United States, but also access to information and education on sexual health which play a positive role in preventing adolescent pregnancy [15].

Funding for these studies comes mainly from governments and not-for-profit organizations. This may be a reflection of the interest the issues being investigated and trying to find evidence-based models to respond to some of the current problems HIC have around

**Table 5 PROGRESS Plus Population targeted in included references**

PROGRESS-Plus group	Number of articles
Low socio-economic status	21 (17.6%)
Adolescents	14 (11.8%)
Black and ethnic minorities	10 (8.4%)
Other	6 (5.0%)



**Table 6 Sources of funding for community-based interventions in HIC**

Funding source	Number of articles
Government agency	80 (67.2%)
No funding acknowledged	26 (21.8%)
Not-for-profit organisation	21 (17.6%)
Academic institution	11 (8.7%)
Private sector organisation	4 (3.3%)
International organisation	1 (0.8%)

maternal health. Because of the focus of this study on those interventions outside health settings, treating post-natal depression is the only medical condition addressed. This does not mean that women in HICs do not experience other type of complications or conditions during pregnancy, childbirth and post-partum. Maternal mortality remains a global problem. A report comparing global Maternal Mortality Ratios (MMR) - the number of women dying for every 100,000 live births- found that in 2008 mothers in the United States died at a higher rate (16.7) than in most other high-income countries, they were followed by France (10.0), Denmark (9.4) and the United Kingdom (8.2); while Australia (5.1), Sweden (4.6) and Italy (3.9) had the lowest MMR [16].

## Conclusions

The review aimed to produce a descriptive map of research on community based interventions, but did not look into the further implementation of the proven strategies as to make them full-status programmes, nor did it look into the analysis of success rates and meta-analysis.

This is the only systematic map attempting to cover community-based interventions around maternal health in HIC that the authors are aware of. This systematic map is useful as it brings knowledge on the type of studies and topics being addressed, opening the opportunity for further studies or a full systematic review assessing the effectiveness of a range of community based interventions. One of the principal objectives of the MASCOT project is to share knowledge and build capacity to reduce maternal and child health inequities,. The inclusion of community based interventions in HIC was considered to be of particular relevance due to increased interest in these types of interventions in LMICs, an interest which has yet to be matched with relevant research. Identifying and describing what is being done in HICs is a useful starting point to open learning perspectives between LMICs and HICs. HIC standards and perceptions might also play a role in the definitions of the studies and the people involved in delivering the services and support. The role of information channels and publicity might also create awareness on the selected topics for the studies by the researchers, as previously noted, post-

natal depression was the key topic on studies. Evidence is central to inform policy and practice. Further research is needed to analyse and compare the effectiveness of the interventions mapped in this study to make recommendations to policy makers and practitioners. Moreover, it would be useful to include literature on community-based interventions in LMIC identified through the MASCOT project to better understand differences between settings and be able to inform other priority areas related to maternal wellbeing and parenting, in addition to preventing birth complications and providing safe deliveries.

## Appendix

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#### Abbreviations

AB: Abstract; CINAHL: Cumulative Index to Nursing and Allied Health Literature; HIC: High income countries; LMIC: Low and middle income countries; MASCO: Multilateral Association for Studying health inequalities and enhancing north-south and south-south Cooperation; OECD: Organisation for economic co-operation and development; PROGRESS-Plus: Place of residence, race/ethnicity, occupation, gender, religion, education, socioeconomic status, and social capital, and plus represents additional categories such as age, disability, and sexual orientation; RCT: Randomised control trials; SR: Systematic reviews; TI: Title; WHO: World Health Organization.

#### Competing interests

The authors declare that they have no competing interests.

#### Authors' contributions

MP contributed to the conception, design, reviewing, data analysis, wrote the methods and results sections of the manuscript and incorporated revisions from the co-authors. FB contributed to the conception, design, reviewing, wrote the discussion and conclusions sections of the manuscript and provided revisions. JK contributed to the conception, design and reviewing. AS contributed to reviewing full text and wrote the background. EV and VB contributed to screening on full text. All authors read and approved the final manuscript.

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#### Author details

<sup>1</sup>Health Action Partnership International (HAPI), Unit 31A, Eurolinks Business Centre, 49 Effra Road, Brixton, London SW2 1BZ, UK. <sup>2</sup>Council of Health Research and Development (COHRED), 1-5 Route des Morillons, PO Box 2100, 1211 Geneva 2, Switzerland. <sup>3</sup>Institute of Education, University of London, 20 Bedford Way, WC1H 0AL London, UK. <sup>4</sup>Euroquality, 2, Place de la Bourse, 33000 Bordeaux, France. <sup>5</sup>National Institute of Public Health (Instituto Nacional de Salud Pública), Av. Universidad No. 655 Colonia Santa María Ahuacatitlán, Cerrada Los Pinos y Caminera, C.P. 62100 Cuernavaca, Mor, México. <sup>6</sup>National Institute of Public Health (Instituto Nacional de Salud Pública), Av. Universidad No. 655 Colonia Santa María Ahuacatitlán, Cerrada Los Pinos y Caminera, C.P. 62100 Cuernavaca, México.

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