



**START CENTER**  
STRATEGIC ANALYSIS,  
RESEARCH & TRAINING CENTER

## AREA-BASED TEAMWORK FOR MNCH

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UNIVERSITY OF WASHINGTON STRATEGIC ANALYSIS, RESEARCH, & TRAINING (START) CENTER

REPORT TO THE BILL AND MELINDA GATES FOUNDATION

FEBRUARY 23, 2016

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## EXECUTIVE SUMMARY

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The START Center at the University of Washington received a work order (Appendix 1) from the maternal, newborn, and child health (MNCH) team at the Bill & Melinda Gates Foundation (the Foundation) in October 2015. The objective of the work order was to review the existing literature on area-based teamwork for MNCH or inter-facility collaboration and to identify areas of critical gaps in the literature to better understand potential for impact to help shape future investments in this area. Area-based teamwork denotes the systematic interaction between primary health centers (PHCs) or smaller hospitals with hospitals at the district or provincial level. A “district or provincial hospital,” in this case, would be defined as a hospital where comprehensive emergency obstetric and newborn care (CEmONC) is consistently provided. PHCs, on the other hand, typically provide primary health care and basic emergency obstetric and newborn care (BEmONC) services. Complicated EmONC cases from PHCs and smaller hospitals are referred to the district hospital. Systematic interaction between district hospitals and peripheral facilities is typically achieved through mechanisms such as regular meetings to share experiences, mentoring and supervision visits by district hospital staff to peripheral units, and interactive workshops to identify gaps and develop action plans to address common problems.

In response to the work order, the START team took a three-pronged approach to review and identify existing evidence on area-based teamwork for MNCH. The first approach involved search of the peer-reviewed literature primarily in PubMed using search terms such as “MNCH and inter-facility collaboration” and “improvement collaborative and MNCH.” Limited literature was identified this way. Thus, after consultation with the Foundation, the search was expanded to include area-based teamwork in non-MNCH health areas, as well as inter-facility collaboration at other levels of the health system. The second approach included a search of the grey literature for publicly available reports by global health non-profit organizations. This search was performed in Google Scholar. The third and final approach used by the START team was a review of articles identified from a database created by Doctor Alex Rowe at the US Centers for Disease Control and Prevention (CDC). In total, the START team conducted a preliminary review on 348 articles and reports. From these, the team selected 46 articles that met the scope of the work order for full review and analysis.

Of the 46 articles reviewed, 40 focused on MNCH while 6 focused on non-MNCH areas mainly HIV, malaria, and tuberculosis (TB). The annotated bibliography included as an Excel file with this report, provides a full list of these articles. The majority of the articles came from studies conducted in sub-Saharan Africa (24 articles) and Asia (14 articles). Study designs detailed in these articles included cluster-randomized controlled trials, quasi-experimental, observational, and descriptive designs. Following review and analyses of the articles, the START team developed a framework for categorizing the interventions described in the studies. The framework categorized interventions as relational, technological, or infrastructural. Relational interventions focused on promoting systematic interactions among health staff in order to improve MNCH outcomes. These included interactive workshops, regular meetings to share ideas and experiences, trainings, and regular supportive supervision and coaching visits. Technological interventions focused on the use on mHealth strategies such as SMS-based platforms, hotlines, and warmlines to connect various levels of the health system in order to improve MNCH outcomes. Infrastructural interventions focused on infrastructure changes such as improved roads, renovation of health facilities, and availability of ambulance services to improve MNCH outcomes. Most studies either used relational interventions in isolation (24 studies), or relational interventions combined with technological or infrastructural interventions (15 studies). This bias towards relational



interventions was not a surprising finding, as our search was primarily focused on identifying relational interventions.

In the studies reviewed, relational interventions, both alone and in combination with other interventions, often led to improved MNCH outcomes. For example Bhutta et al. reported a reduction in neonatal mortality from 57.3 per 1000 live births to 41.3 per 1000 live births, as well as an increase in facility-based deliveries from 18% to 30%, following the introduction of a relational intervention. Their intervention involved training of lady health workers and traditional birth attendants on essential maternal and newborn care and on linkage and referral of pregnancy complications to nearby health facilities.

In terms of the levels of inter-facility collaboration, we found that there was limited research published in the peer-reviewed or grey literature on systematic linkages between the PHC and the district hospital levels. Only 2-3 studies specifically focused on this level of collaboration. The majority of studies focused on linkages starting at the community level, with traditional birth attendants (TBAs) and community health workers (CHWs) playing an important role in the identification and referral of pregnancy complications to nearby health facilities. The levels of collaborations identified from the studies reviewed included community to the PHC level, community to the PHC to the district/provincial hospital level, PHC to district/provincial hospital level, and collaboration at the same level (e.g. hospital to hospital). In nearly all cases, interventions to improve linkages between different levels of the health system or across the same level of the health system led to improved MNCH outcomes, as discussed in the findings section below.

In summary, only the studies by Mwaniki et al. and McCaw-Binns et al. specifically addressed inter-facility collaboration between the PHC and district hospital levels. The majority of the evidence we identified came from interventions where area-based teamwork for MNCH started at the community level, with TBAs and/or CHWs playing an important role. Specifically, these community-level providers were utilized to identify danger signs and promptly refer pregnancy complications to facilities where CEmONC services were available. These studies have shown that improving relational linkages between TBAs/CHWs and health facilities can strengthen referral systems and improve MNCH outcomes. However, the paucity of literature available for studies focusing on area-based collaboration between primary and secondary health facility levels exclusively makes it difficult to conclude whether similar interventions would have comparable effects on MNCH outcomes. This is an area to assess in future research. Going forward, it may be necessary to explore Delphi approaches to complement the information compiled from this effort.



## PURPOSE

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This report summarizes work conducted by the University of Washington START team in response to a work order on area-based teamwork for MNCH from the Bill and Melinda Gates Foundation.

The report contains the following sections:

- 1) Introduction—summary of the Foundation request
- 2) Methods—START team approach
- 3) Findings—results organized thematically around the components of relational, technology, and infrastructure
- 4) Strengths and limitations—of the approaches by the START team
- 5) Conclusions
- 6) References

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## INTRODUCTION

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The University of Washington START Center received a work order from the maternal, newborn, and child health (MNCH) team at the Bill & Melinda Gates Foundation (the Foundation) to review the literature on area-based teamwork or inter-facility collaboration for MNCH. Area-based teamwork denotes the systematic interaction between primary health centers (PHCs) or smaller hospitals with hospitals at the district or provincial level. A “district or provincial hospital,” in this case, would be defined as a hospital where comprehensive emergency obstetric and newborn care (CEmONC) is consistently provided. PHCs typically provide basic primary health care services, but some may provide basic emergency obstetric and newborn care (BEmONC), with complicated EmONC cases referred to the district hospital. The systematic interaction between the district hospital and the peripheral units are maintained through mechanisms such as:

- Regular meetings for mutual feedback and experience sharing
- Coaching and supportive supervision visits by district hospital staff to the peripheral units
- mHealth-based methods for consultation, short trainings, reporting and referral of emergency cases
- Study visits by health center midwives to the district hospital
- Local adaptation of national guidelines and protocols
- Interactive workshops to identify gaps and develop action plans
- Joint trainings involving hospital staff in response to current needs

The MNCH team at the Foundation believes that inter-facility collaboration is a critical factor for improving quality of care in facilities and MNCH outcomes. Several countries that have achieved rapid reductions in their maternal mortality rate (MMR) and neonatal mortality rate (NMR) have health systems that have institutionalized continuous collaboration between the “district hospital,” and the peripheral units in their catchment area. However, limited published evidence seems to exist on this topic. To address this perceived gap in the literature, the MNCH team at the Foundation requested that the University of Washington START Center review the literature on this topic. Specifically, the START team sought to identify evidence linking inter-facility collaboration with improved quality of care and MNCH outcomes, and to identify critical gaps in the literature to help shape future research and investment in MNCH.

## APPROACH

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The START team’s search strategy consisted of a three-pronged approach to identify literature documenting area-based teamwork to improve MNCH outcomes in low and middle-income countries (LMICs). The preliminary literature search was restricted to the peer-reviewed literature using the PubMed database and search terms involving MNCH and inter-facility collaboration between PHCs and hospitals at the district or provincial level. The search strategy focused on identifying interventions implementing area-based teamwork and strengthening linkages between primary and secondary health facilities to improve MNCH outcomes. Boolean operators linked nested MNCH and equivalent terms with primary and secondary health facility terms and intervention strategies. The START team also implemented a chain-referral strategy culling relevant examples from two meta-analyses examining the efficacy of different MNCH interventions in LMICs.



Limited literature was identified with these narrow search terms. As a result, following internal discussions among the START team and approval from the Foundation, the search was expanded to include inter-facility collaborations in non-MNCH health areas, the grey literature, and linkages at other levels of the health system. Peer-reviewed examples of inter-facility collaboration in non-MNCH health areas were included as proof of concept of transferable area-based teamwork practices. The START team searched the grey literature for additional examples of area-based teamwork to improve MNCH outcomes. Using Google Scholar, the team searched publicly available reports by global health non-profit organizations, as well as bilateral and multilateral organizations (e.g. UNICEF and USAID) for examples of area-based teamwork not published in the peer-reviewed literature. Our search found that community health workers (CHWs) and traditional birth attendants (TBAs) were often targeted to improve referral and linkage from the community to primary and secondary health facilities. As a result, we expanded the scope of our search to include examples of area-based teamwork between the community, primary, and secondary health system levels.

The START team also utilized a database created by a team led by Dr. Alex Rowe at the CDC. From this database, we identified additional articles highlighting the role of strategies such as financing and incentives, group problem solving, supervision, and other management techniques as approaches for improving MNCH outcomes. In total, the START team performed a title and abstract review of 348 articles and reports (both peer-reviewed and grey literature). From these, the team selected 46 articles that met the scope of the work order for full review and analysis.

## FINDINGS

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A total of 46 articles (40 focused on MNCH and six focused on non-MNCH areas such as HIV, malaria, and tuberculosis) were selected for full review and analysis (see annotated bibliography for full list of the articles). These articles were selected because they investigated at least one mechanism of inter-facility collaboration in relation to an MNCH or non-MNCH outcome. Most articles came from studies conducted in sub-Saharan Africa (24 articles) and Asia (14 articles). Study designs detailed in these articles included cluster-randomized controlled trials, quasi-experimental, observational, and descriptive designs.

Following review and analyses of the articles, the START team developed a framework for categorizing the interventions. The framework categorized interventions as relational, technological, or infrastructural. We also identified mechanisms through which the three components of the framework functioned either in isolation or in combination to facilitate inter-facility collaboration and improved MNCH outcomes. Components of the framework and their associated mechanisms are discussed below.

## EMERGING THEMES IN MNCH LINKAGES

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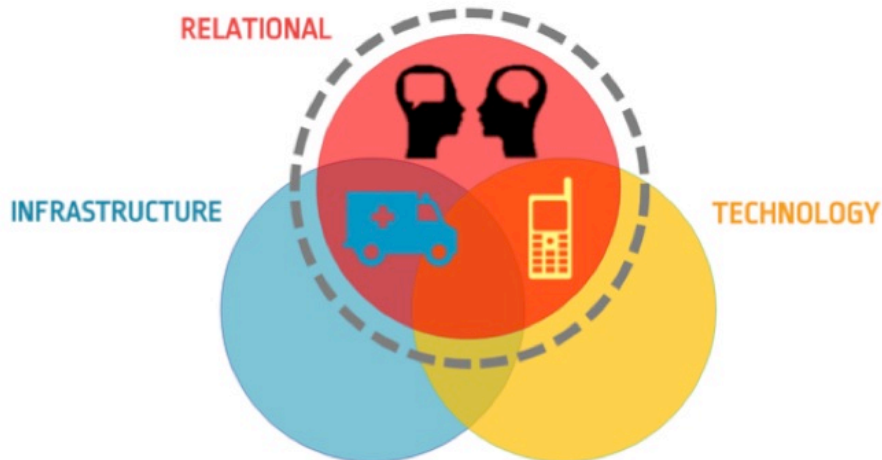
At each level of the health system along the continuum of care, there are opportunities for prevention and referral. Interventions that result in improved linkages between levels rely on strengthening prevention and referral at each junction. As stated above, our review of the existing literature on area-based teamwork or inter-facility collaboration for MNCH demonstrated that programs and interventions can be broadly categorized as having improvements in one or a combination of three core features (see figure below). These features include:

- Relational improvements of health facilities and health workers across the continuum of care



- Infrastructural improvements of health facilities and or transport systems
- Technological improvements

**Figure 1. Framework for categorizing area-based teamwork strategies for MNCH**



Our goal was to identify relational mechanisms of these programs and interventions, report their results, and evaluate their respective strengths and limitations. In addition to purely relational programs and interventions, we found a considerable number of programs and studies that paired a relational component with an infrastructural component, a technology component, or a combination of all three.

#### RELATIONAL

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Relational interventions focused on promoting systematic interactions between health staff to improve MNCH outcomes. They can be characterized as strategies to facilitate collaboration and communication between and within levels of the health system. These interventions included mentorship, supportive supervision and coaching, training, and joint-problem solving. Twenty four of the studies included in our review implemented an intervention or program that fostered inter-facility collaboration through the exclusive use of relational mechanisms. Interventions employing relational linkages primarily focused on quality improvement and management of MNCH services through the use of supportive supervision, mentorship, collaborative planning and improvement, interactive workshops, team building, training (onsite and peer to peer), and performance reviews. For example Mwaniki et al. investigated whether relational mechanisms such as working as a team to identify a common goal, sharing best practices and experiences across facilities through quarterly learning meetings, action planning, and bi-weekly meetings at the facility level, led to increased utilization of antenatal care (ANC) services and facility-based deliveries. They conducted their study at 21 health facilities (one hospital, 3 health centers, and 17 dispensaries/health posts) in a rural district in Kenya. The investigators found that within three months of implementation of the intervention, the mean number of pregnant mothers completing at least four ANC visits increased from 37% to 64% ( $p < 0.001$ ), and the number of facility-based deliveries increased from 33% to 52% ( $p = 0.012$ ) (1). A similar study in Jamaica evaluated the impact of improvements in service delivery on antenatal eclampsia. Relational strategies used in the study included regular meetings between PHC and hospital staff, clinical mentoring, and provision of guidelines and job aids. McCaw-Binns et al. found that when compared to control health facilities, pregnant women in the intervention facilities were 19% less likely to experience eclampsia (OR 0.19,





95% CI: 0.13-0.27,  $p < 0.001$ ). The investigators reported 50% reduction in the length of hospital stays for mild preeclampsia cases, and 38% decrease in antenatal admissions for preeclampsia in the intervention facilities (2).

#### RELATIONAL AND TECHNOLOGICAL

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Among the articles reviewed, one study paired relational linkages with a technological component in an effort to improve MNCH outcomes in rural Rwanda. In their study, Ngabo et al. described an intervention that used mHealth platforms (SMS and hotlines) along with training and supervision of CHWs to facilitate referral and linkage of pregnancy complications from the community to the health facility in a rural district in Rwanda. CHWs were elected village volunteers whose primary activities consisted of identifying pregnant women in their communities, conducting prenatal and postnatal follow up visits, and facilitating deliveries in health facilities. The program included a cascade training approach, coupled with supervision and refresher and feedback sessions, to ensure proper implementation. CHWs received training and supervision from professionals in the health system, and were equipped with mobile phones to serve as liaisons between the community and the ambulance service, health facility staff, district hospital, and tertiary care level. At the end of 12 months, 11,502 pregnancies were monitored through the SMS-based system, and facility-based deliveries increased from 72% to 92% (3).

#### RELATIONAL AND INFRASTRUCTURAL

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Ten studies in our review discussed interventions that paired relational methods with improvements in infrastructure in an effort to improve MNCH outcomes. In one case study from Nepal reported by UNICEF, upgrading and expansion of health facilities into birthing and BEmONC centers led to improved access to skilled birth. Interventions included physical upgrades, training of health workers, and interactive workshops at the district and health facility levels to identify gaps and solutions. Upon implementation of the program, the number of delivery facilities that were open 24 hours a day increased from 16 to 201. Ninety five percent (95%) of delivery facilities had at least one skilled birth attendant, and access to delivery sites increased from less than 10% to 36% (4). Another study that utilized both infrastructural and relational strategies to improve MNCH outcomes was conducted by Jokhio et al. in Pakistan. The authors evaluated the efficacy of an intervention that deployed trained TBAs to rural health systems to improve perinatal mortality. In this study, TBAs were integrated into health systems to improve linkages between the community and primary health facilities. TBAs received training from a team of local obstetricians and female paramedics in clean delivery, use and proper disposal of delivery kits, newborn care, and recognition of obstetric and newborn emergencies requiring referral. During the six-month intervention period, obstetricians from a public-sector tertiary care center provided eight rotating clinic outreach sessions to each primary and secondary care facility in the intervention cluster. Compared to control areas, the odds of perinatal death for infants in the intervention clusters were 30% lower (OR: 0.70; 95% CI: 0.59-0.82). The odds of stillbirth and neonatal death also fell by a similar margin in intervention areas (OR: 0.69; 95% CI: 0.57-0.83 and OR: 0.71; 95% CI: 0.62-0.83 respectively). Additionally, the odds of postpartum hemorrhage (OR: 0.61 95% CI: 0.47-0.79) and puerperal sepsis (OR: 0.17 95% CI: 0.13-0.23) fell by 39% and 83% respectively in the intervention sites. The investigators noted that while referral to emergency obstetric care facilities was greater in the intervention sites, financial barriers to transportation and care may have impeded access to facility-based deliveries (5).





## RELATIONAL, TECHNOLOGICAL, INFRASTRUCTURAL

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Four studies evaluated the effects of interventions that combined relational, technological, and infrastructural strategies on MNCH outcomes. Interventions in these studies included strategies such as training of health workers, supportive supervision and mentorship, use of mHealth platforms such as SMS and phone calls to link various levels of the health system, and introduction of an ambulance system to facilitate referral and linkage of pregnancy complications from the community to the health facility level. A study by Midhet et al. in Pakistan provides one of the best case studies illustrating how these strategies work together to improve MNCH outcomes. In their cluster-randomized controlled trial, 16 intervention clusters received the following as part of the study: training for TBAs on clean delivery and recognition of obstetric and newborn complications, informational materials on MNCH for women, training of volunteers to facilitate village support groups, a local emergency transport/ambulance service (provided by local pick-up drivers who were trained on how to use stretchers and introduced to medical staff at the district hospital), training for obstetricians, pediatricians and anesthetists working at the district hospital, and very high frequency (VHF) wireless communication systems to link rural communities to the village health facilities and district hospital. The 16 clusters in the control arm continued to receive standard care. Compared to women in the control clusters, women from the intervention clusters were more likely to utilize the district hospital for problems arising in pregnancy, delivery, and immediately after delivery. Significantly more women in the intervention clusters had tetanus immunization and prophylactic iron therapy. Additionally, there was a small but significant increase in hospital deliveries in the intervention clusters compared to the control clusters. Perinatal and early neonatal mortality rates were significantly lower in the intervention clusters (perinatal: 95.6 per 1000 live births in control vs. 48.7 per 1000 live births in the intervention ( $p = 0.05$ ); early neonatal: 39.1 vs. 24.3,  $p = 0.05$ ) (6).

## LEVELS OF INTER-FACILITY COLLABORATION/AREA-BASED TEAMWORK FOR MNCH

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Our review identified three major health system levels where linkages and collaboration to improve MNCH outcomes can occur. These are the community level, the PHC level, and the secondary and tertiary facilities level. The studies we reviewed seem to indicate that the community level represents the front line, and a focus for many of the published reports of MNCH interventions. This is especially true in the more remote, under-resourced, and rural communities of low and middle-income countries. In these communities, the flow of patients from the community to the PHC and district hospital levels is limited by poor utilization of antenatal and postnatal care services and limitations in access to transportation and skilled clinical care at critical time points. Thus, in these communities, TBAs, CHWs, and volunteers are often utilized to perform important MNCH activities including identifying pregnancy complications, encouraging facility births, delivering education to address social and cultural barriers to access, and conducting referral of complicated cases to health centers or district hospitals.

Our review identified various levels of area-based collaborations as well as the mechanisms through which these collaborations are sustained. The collaborations we discuss below, illustrate that improving relational linkages between the community, and the PHC and district hospital levels can strengthen referral systems and improve MNCH outcomes even in cases where relational improvements were not the main interventional component. Descriptions of the various levels of collaboration and the



mechanisms employed to promote and sustain linkages across different levels of the health care system, are discussed below.

#### COMMUNITY LEVEL TO PRIMARY HEALTH CENTER AREA-BASED TEAMWORK FOR MNCH

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In this level of area-based teamwork, the main linkage is between CHWs, TBAs, and other health cadres at the community level, and midwives and other health staff at the PHC level. Several studies discussed interventions where this type of collaboration was the main form of area-based teamwork. In this collaboration, CHWs and TBAs trained by facilitators from various levels of the health system are tasked with creating awareness about MNCH services in their communities, conducting home visits, following mother-infant pairs, and identifying and linking complicated EmONC cases to the PHC or district hospital. The CHWs and TBAs work very closely with the PHCs through various mechanisms to ensure that complicated pregnancy cases are promptly brought to the attention of staff at the PHC level. These mechanisms of collaboration include regular supportive supervision visits and meetings between PHC staff and CHWs/TBAs, mentoring of CHWs/TBAs by PHC staff on how to identify danger signs, referral mechanisms such as mHealth systems (SMS and phone calls), and ambulance services (3, 7-10). Across the range of studies reviewed, this form of collaboration generally led to improved MNCH outcomes. For example Fauveau et al. conducted a quasi-experimental study to evaluate the impact of improved linkages between CHWs, TBAs, and midwives at PHCs on maternal mortality. The authors found significantly lower maternal mortality due to obstetric complications in the intervention areas compared to control areas (1.4 vs. 3.8 per 1000 live births,  $p=0.02$ ) (10).

#### COMMUNITY LEVEL TO PRIMARY HEALTH CENTER TO DISTRICT/PROVINCIAL HOSPITAL AREA-BASED TEAMWORK FOR MNCH

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In this form of collaboration, CHWs and TBAs work with PHCs, and in some cases with birthing centers and BEmONC clinics, to promote facility-based deliveries. The CHWs, TBAs, and PHC providers then work with district/provincial hospital staff to ensure unimpeded referral of complicated EmONC cases from the community level through the PHC to the district hospital. Several studies investigated the mechanisms through which CHWs, PHCs, and district hospitals worked together, and how effective these mechanisms were in improving MNCH outcomes (1, 3-6, 10-12). Mechanisms investigated included training for CHWs and PHC staff, supportive supervision visits by PHC or district hospital staff to CHWs and TBAs, and SMS and telephone calls to PHCs and district hospitals by CHWs and TBAs about complicated EmONC cases. For example, Ngabo et al. (2012) found that SMS-based reporting of EmONC cases coupled with a standby ambulance system facilitated collaboration between CHWs, health centers, and the district hospital and led to a 27% increase in facility-based deliveries within 12 months.

#### COMMUNITY LEVEL TO DISTRICT/PROVINCIAL HOSPITAL AREA-BASED TEAMWORK FOR MNCH

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This form of area-based teamwork for MNCH entailed CHWs and TBAs mainly working directly with district hospitals with limited involvement of the PHCs. This form of collaboration generally involved a referral process linking CHWs and TBAs directly to the district hospital. Such interventions were frequently facilitated using a mHealth mechanism such as mobile phones or VHF radio. These interventions also generally included standby availability of an ambulance system (3, 6, 13, 14). As discussed above, the study by Midhet et al. found that perinatal and early neonatal mortality rates were significantly lower in the intervention clusters where this form of collaboration was used.



## PRIMARY HEALTH CENTER TO DISTRICT/PROVINCIAL HOSPITAL AREA-BASED TEAMWORK FOR MNCH

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This form of area-based teamwork was of particular interest to the MNCH team at the Foundation. However, despite a comprehensive search, the START team found few studies that specifically investigated this form of collaboration (1, 2, 15). One study that explored the PHC to district hospital collaboration was conducted in Jamaica. In this study on antenatal preeclampsia, McCaw-Binns et al. investigated how inter-facility collaboration between health centers (antenatal care clinics) and a CEmONC hospital might reduce the incidence of antenatal eclampsia. The intervention included guidelines on how to identify CEmONC cases requiring referral to the hospital. These were developed by the CEmONC hospital and disseminated to health centers in the intervention area. The intervention also included protocol changes on how to manage EmONC cases, and regular meetings between the health center staff, private practitioners, and the hospital staff. Compared with control parishes, the odds of experiencing eclampsia were significantly lower in the intervention parish: OR 0.19 (95% CI: 0.13-0.27;  $p < 0.001$  trend) (2).

## PRIMARY HEALTH CENTER TO PRIMARY HEALTH CENTER OR HOSPITAL TO HOSPITAL COLLABORATIONS

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This form of “horizontal” area-based teamwork for MNCH entails collaboration within the same level of the health system in the form of either PHC to PHC collaboration, department to department collaboration, or hospital to hospital collaboration (16-19). For example Robinson et al. reported findings of an intervention in Indonesia where experienced immunization nurses were posted to facilities with underperforming or inexperienced immunization nurses for a period of 1-2 weeks to provide on-the-job training. The visiting and host nurses were generally from PHCs in the same province. In some cases, they knew one another from quarterly MOH meetings. After 11 months, the number of reported doses in the 13 participating PHCs increased by 34% for diphtheria/pertussis/tetanus (DPT) vaccinations (4051 to 5421,  $p < 0.0001$ ), 38% for polio vaccinations (3626 to 4996,  $p < 0.001$ ), and 40% for measles vaccinations (3276 to 4593,  $p < 0.001$ ). Non-participating PHCs saw no improvement in the reported number of DPT vaccinations (16).

## STRENGTHS AND LIMITATIONS

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In completing this project, we identified a number of strengths to our approach. The literature search for this work order drew articles and reports on area-based teamwork from multiple sources including PubMed, Google Scholar, and a CDC database. Our results reflect articles from both MNCH and non-MNCH health areas. The framework used to categorize the interventions provides a useful approach to understanding area-based collaborations.

There were also limitations to our approach in this project. First, we utilized comprehensive literature review approach. This is more efficient than a formal systematic review, but may have failed to capture some articles. Additionally, we found limited evidence that specifically addressed the main objective of the work order. We believe this is primarily a result of the paucity of publications on this topic, rather



than a specific issue with the search strategy. Finally, most of the evidence presented in this report came from evaluation of exploratory programs and preliminary studies, rather than institutionalized forms of inter-facility collaboration.

## CONCLUSIONS

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Our review in response to this work order found that programs and interventions in area-based collaboration for MNCH can be broadly categorized as focusing on improvements in one or more of three core features. These features include relational improvements to improve communication between health facilities and health workers across levels of the health system, infrastructural improvements to health facilities and transport systems, and technological improvements.

Evidence suggests that strengthening relational linkages between primary and secondary health facilities leads to improved MNCH outcomes. However, the majority of the evidence for relational linkages came from interventions geared towards improving collaboration between TBAs and CHWs at the community level and health staff at the PHC and district hospital levels. These studies have shown that improving relational linkages between the community level and the PHC or district hospital level can strengthen referral systems and improve a number of MNCH outcomes. However, optimal settings for improved relational linkages typical of quality improvement and collaborative programs require that minimum communication and infrastructural components are in place. We suspect that in the absence of linkages to the community level, the flow of patients to the PHC and district hospital levels would be limited. This may account for the relatively larger number of studies identified in our search that aimed to improve relational linkages beginning at the community level as a component of an intervention.

In summary, we identified a relatively small body of literature addressing area-based teamwork to improve outcomes in MNCH. Nonetheless, the available data generally support the importance of area-based communication between the community, primary health care facilities, and district hospitals to improve outcomes for pregnant women and newborns. Many health programs may not publish the findings from their efforts to improve communication across levels of the health care system. Delphi approaches could be used to complement the information compiled from this effort. Finally, while we have shown that there is a relatively small body of literature addressing area-based communication for MNCH, we feel that this may represent an opportunity in terms of potential for new implementation research and program evaluation.



## APPENDIX 1: WORK ORDER

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Date: 8/25/2015

Request Name: Jerker Liljestrand

Work Order ###, Request ###

This Request scope (“**Scope**”) is agreed pursuant to and hereby made a part of Work Order ### (the “**Work Order**”), by and between the Bill & Melinda Gates Foundation (the “**Foundation**”) and the University of Washington (“**University**”). Capitalized terms not otherwise defined in this Scope shall have the same meaning as set forth in the Agreement between the parties dated **March 31, 2011**. The Work Order’s terms will control over any conflicting terms in this Scope, unless this Scope expressly states otherwise.

### SPECIFIC DESCRIPTION OF BRIEFING/PROJECT, INCLUDING PURPOSE AND AUDIENCE:

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#### **Background:**

“Area based teamwork for MNCH” seeks to find local mechanisms for systematic interaction between health center level and hospital level, e.g. in a province. The MNCH team believes “area based teamwork for MNCH” is a critical factor for improving quality of care in facilities however there is limited evidence on this topic.

With the rapid increase in facility births in many low and middle-income countries, quality of care issues have come in focus. For skilled birth attendance or facility birth to be effective, and not do more good than harm, quality needs to be gradually improved, and clinical interventions need to develop over time.

While there are many approaches to quality improvement, one that mostly is missed is to establish continuous collaboration between the local referral hospital (RH), and the peripheral units (health centers or smaller hospitals) in the respective catchment area. Since the local referral hospital (typically the closest CEmONC hospital, or provincial hospital) will/should receive the referred, complicated cases that cannot be solved at the primary level, the RH is a natural partner. Key RH staff, e.g. a few committed doctors/obstetricians and a few committed midwives, can do much to improve care at health center (HC) level.

This continuous “area based team work for maternal newborn health” can consist of e.g.

- Regular meetings for feedback on recent cases, eventually with mutual feedback
- Trainings responding to current needs
- HC midwives spend time in the hospital
- Developing a common “care approach” to various scenarios
- Mentoring or supervision of HC staff
- “clinical hotline” – HC midwives being able to call in to the delivery room of the RH to get advice, report on an ongoing emergency referral, call for feedback 1-2 days after such a referral, or call for a advice on a current non-emergency case
- General “stewardship” by key hospital staff towards HC midwives



In many countries, there is little communication between RH staff and HC staff. HC staff do not know the evolution of women/babies they have referred, and do not get any guidance from RH staff ...nor possibility to provide feedback to the RH staff. This is a missed opportunity.

Little has been published on “area based teamwork for MNCH”, even though some countries have strong experiences of such work. The study aims to carefully search the literature for such experiences and studies. Trying to improve primary MNH care, could possibly require some limited co-investment into RH care, for RHs to be able to be good shepherds of primary care facility staff.

**Objective:**

To identify and review existing evidence of “area based teamwork for MNCH”. The objective is to review previously documented cases, and to identify areas of critical gaps in the literature to better understand potential for impact to help shape future investments in this area.

**TIMELINE / DUE DATE:**

Final draft - December 2015

**DELIVERABLE:**

A comprehensive literature review of area based teamwork for MNCH.

**SHARING PERMISSION: yes/no**

Do you allow the contents and deliverables developed from this work order to be shared and published to the public? If the contents resulting from this work order are shared, the university team will determine the authorship, as well as, any medium and publications used; including, but not limited to: journals, external websites, and symposiums.



## REFERENCES

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