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FINAL REPORT

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NETWORKS OF CARE FRAMEWORK FOR MATERNAL AND NEWBORN HEALTH: **EXAMINING AND CONTEXTUALIZING THE RELATIONAL ELEMENTS FOR LOW AND MIDDLE INCOME COUNTRIES**

UCSF Institute for Global Health Sciences

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CITATION

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EXECUTIVE SUMMARY

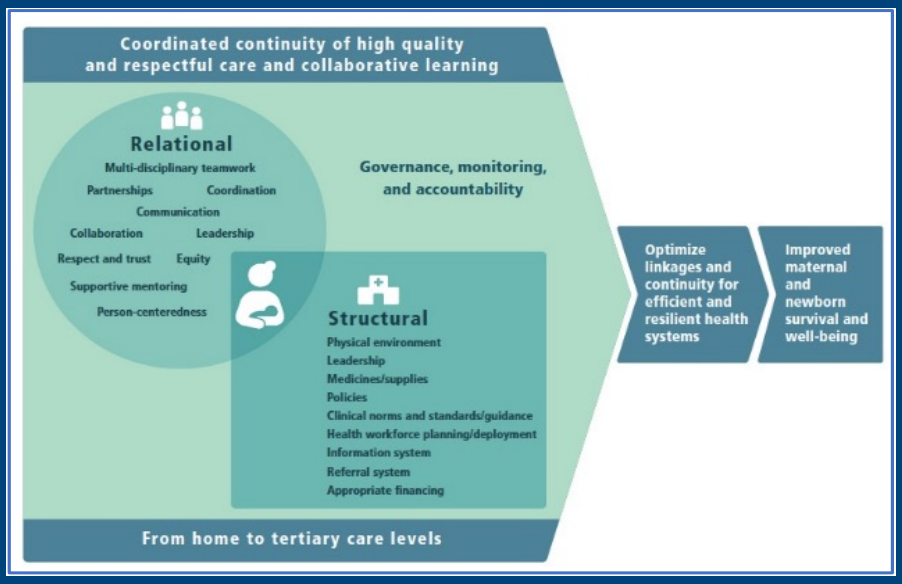
Interest in networks of care for maternal and newborn health (MNH) is growing and evolving in global health. Beginning in 2019, the World Health Organization (WHO), in collaboration with key partners, embarked on an effort to describe, define and develop a framework for network of care (NOC) for MNH. The concept of NOC emerged out of the growing need to highlight and strengthen an interconnected approach among diverse stakeholders responsible for delivering a comprehensive continuum of high quality care to ensure the survival and wellbeing of mothers and their newborns (Carmone et al., 2020; Kalaris et al., 2022). The original NOC framework emphasized the structural and relational linkages within health facilities and systems and incorporating different levels of care functioning in an ecosystem. It underscored collaborative and adaptive learning processes to deliver effective, respectful, and quality care to mothers and newborns.

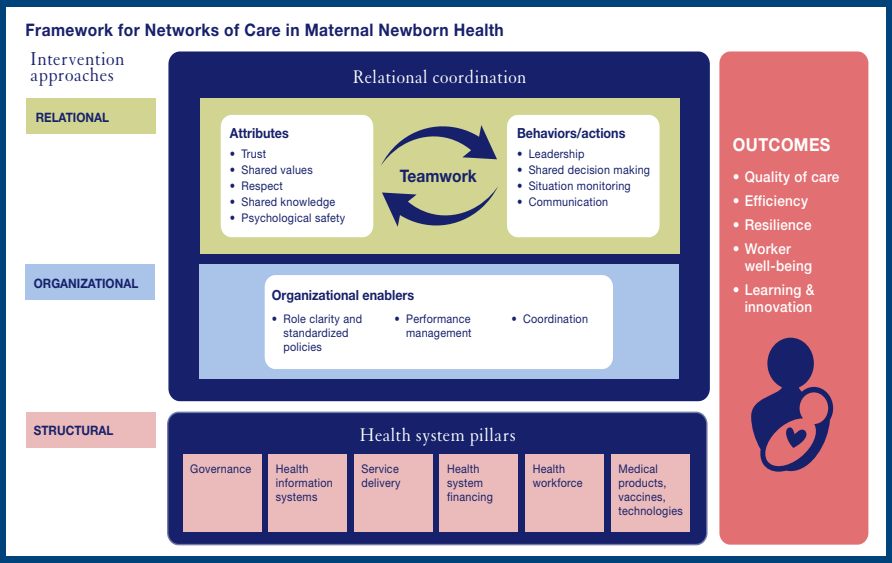
Our objective is to take a deeper dive into the relational aspects of the framework, as these components distinguish NOCs from other frameworks aimed at strengthening health systems and enhancing the quality of care. Understanding these elements is crucial for developing practical tools that countries, still grappling with the optimal service delivery model for improving maternal and newborn health, can use to implement an NOC approach, including both structural and relational elements. To accomplish this, we engaged in a series of discussions with key stakeholders who have knowledge of, or experience with, NOCs. Additionally, we conducted a literature review spanning disciplines such as business, the military, and aviation to explore how the concepts of relationships, teamwork, and communication are related to outcomes and productivity.

We reviewed several approaches and theoretical models applicable to health systems in low resource settings. Relational coordination theory stood out. It suggests that when job performance is highly interdependent and time sensitive, effective communication and coordination is crucial for achieving desired outcomes. Relational coordination theory identifies the organizational enablers that drive or initiate coordination and the expected outcomes. We found relational coordination theory captures the relational mechanisms for improving system performance, offering a clearer model to operationalize the NOC framework.

Informed by the theory of relational coordination among others, we identified the core relational elements of a NOC for MNH as components and representations of teamwork. We defined these teamwork elements as both attributes — trust, shared values, respect, shared knowledge, psychological safety – and actions that are necessary and mutually reinforcing of the attributes (leadership, shared decision making, situation monitoring and communication). We also identified three applicable groups of organizational enablers: Role clarity including standardized policies and processes, Performance management, and Coordination. Taken together, these teamwork relational attributes and actions, along with the organizational enablers, build on the necessary health systems pillars to make an NOC function and achieve the objectives of continuous improvement in quality of care for mothers and newborns across the MNH continuum, from households to specialty care services.

With this new understanding, we developed a revised NOC framework with applied definitions of the key terms of the core relational elements and organization enablers.





The original NOC framework developed by Kalaris et al. is at the top. The proposed revised NOC framework, incorporating relational coordination, is at the bottom.

The revised framework underwent a process of discussion and feedback with members of the NOC steering committee and was later shared with country stakeholders during a side session at the FIGO congress in October 2023. The revised framework received widespread acceptance among most stakeholders. They expressed positive feedback, acknowledging that this latest version of the framework better reflects a tool that countries can understand and apply to improve the functioning of their MNH care systems. Constructive feedback on taking this forward included the need to develop measures and indicators for teamwork in addition to tools that can be used by countries and teams that want to adopt the NOC service delivery model and assess progress. Additionally, there was emphasis on the potential for NOCs to encourage adaptive learning, and recognition of the important roles that governments and communities play in fostering functional NOCs.

Moving forward, the immediate priority is to identify pre-existing measurement tools for the relational elements that can be adapted and applied in the context of low- and-middle income countries (LMICs). We hope to identify, adapt, and test specific tool(s) in a country setting to validate the framework and its application to improving MNH service delivery and ultimately maternal and newborn outcomes. Further exploration of this approach is warranted given our stagnating rates of maternal and newborn mortality in many settings.

BACKGROUND

Networks of Care (NOC) for maternal and newborn health (MNH) is a rapidly growing and evolving area of interest in global health. Beginning in 2019, the World Health Organization (WHO) and others began the journey to describe, define and develop a framework for NOC for MNH with exploration of other applications to strengthening primary healthcare services (Agyekum et al., 2023). The WHO-led effort has involved multiple partners and built on previous efforts by other key players, including the Bill and Melinda Gates Foundation, the Clinton Health Access Initiative and several partners who have implemented integrated MNH programs in several countries.

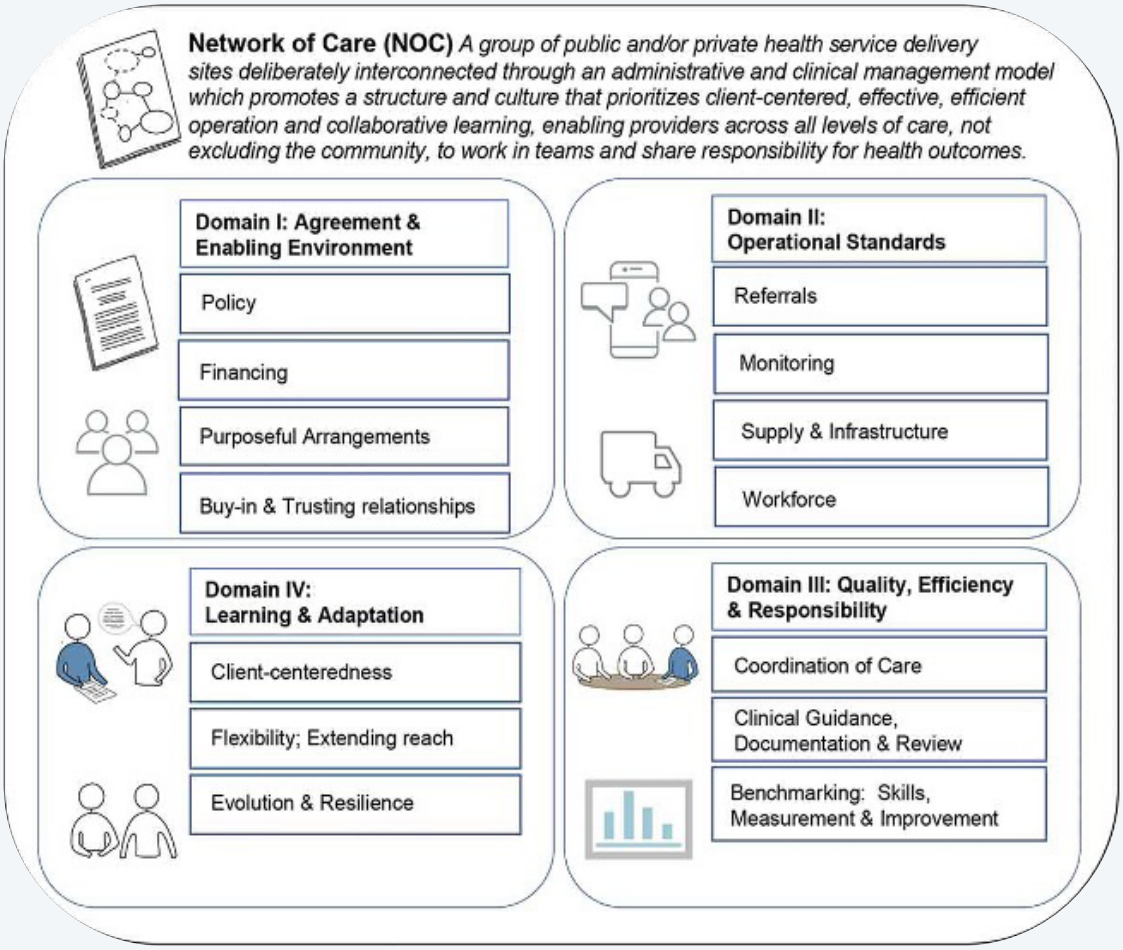
Despite the progress that has been achieved globally in reducing maternal and newborn mortality, the WHO report "Improving maternal and newborn health and survival and reducing stillbirth – Progress Report" released in 2023 showed that maternal and newborn mortality rates have stagnated since 2015 due to multiple factors (World Health Organization, 2023). Access to adequate MNH services remains inequitable across countries, with those in sub-Saharan Africa showing the least progress. These trends leave us far from the SDG goals in 2030 and represent an urgent call to action. This alarming data, in spite of a high median global coverage of skilled birth attendance across 136 countries (World Health Organization and the United Nations & Children's Fund (UNICEF), 2022), illustrates the need to identify more effective service delivery models and approaches to strengthening the quality of care. Ensuring that mothers and their newborns receive high-quality care that is both safe and comprehensive requires coordinated efforts across various service delivery points and providers, ranging from community-based initiatives to referral centers. This approach is supported by both practical experience and existing literature. Effective coordination of care for MNH requires a multidisciplinary approach that integrates vertically and horizontally across the healthcare system. Unfortunately, insufficient understanding of how care is delivered across multiple service points within the continuum of care has resulted in missed opportunities to improve services. As a result, there is a global need for a shared understanding of the networks of care framework and its application for MNH (Carmone et al., 2020; Samuels et al., 2017).

The Maternal Health Scoping Review (MHSR) Steering Committee, jointly led by WHO, UNFPA and UNICEF, was formed in 2019 to "identify best practices and accelerate progress towards meeting the SDGs…including networks of care and referral systems." It first defined an NOC for MNH as "a collection of public and/or private health facilities and health workers deliberately interconnected to promote multidisciplinary teamwork and collaborative learning in order to provide comprehensive, equitable, respectful, person-centered care from home/community to primary through to tertiary levels" (Kalaris et al., 2022). The MHSR Steering Committee undertook an extensive mapping of existing MNH service delivery models to identify core elements of functional integrated NOCs and inform country plans and approaches to improve MNH services and accelerate progress towards the SDGs. Through this process, the committee identified the importance of an NOC for women and their babies and defined key elements of a functioning NOC, including both structural and relational elements.

The original NOC framework, which has gone through several iterations, emphasizes the linkages within and between different levels of care functioning in an ecosystem through collaborative and adaptive learning processes to deliver effective, respectful, and quality care to mothers and newborns, and is described as a pathway to achieving universal health coverage (Agyekum et al., 2023; Carmone et al., 2020; Cordier et al., 2020; Fasawe et al., 2020).

The CHAI scoping exercise defined the NOC as has having four domains that include I) agreement and enabling environment, II) operational standards, III) learning and adaptation, and IV) quality, efficiency and responsibility as shown in Figure 1 below.

Figure 1. A schematic of the four initial domains of Networks of Care and their themes (Carmone et al., 2020).

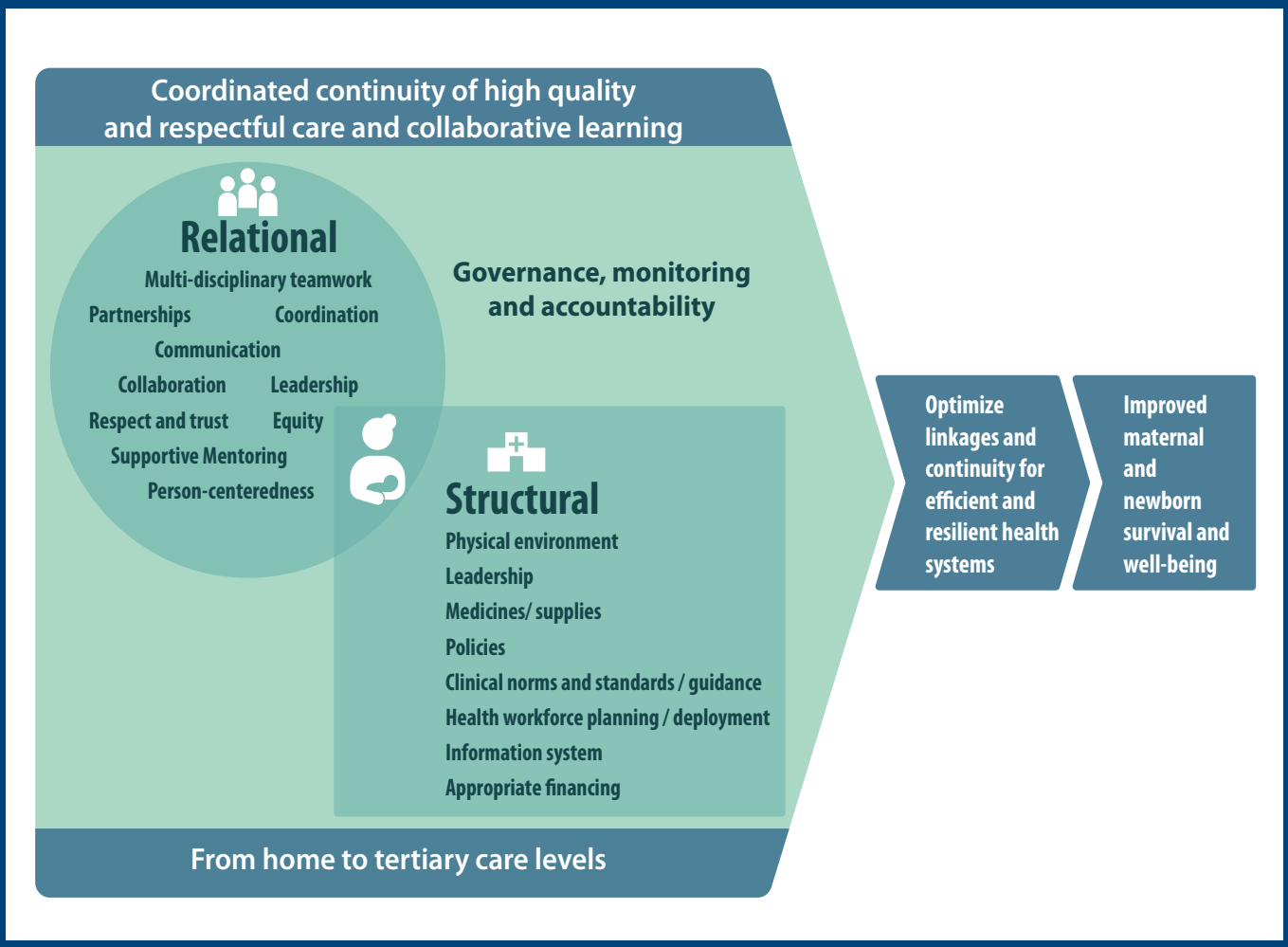


Subsequently, the WHO convened the NOC steering committee, including many members from the MHSR steering committee, that developed a revised version of the NOC framework and updated this framework in 2022.

A key differentiator of the NOC framework from conventional service delivery models is the emphasis on the relational elements inherent in functional networks. Literature from high income countries documents the importance of interpersonal, inter-organizational and intra-organizational relationships in improving patient care and outcomes (Gittell et al., 2000; Nickel et al., 2010; Sun et al., 2014). As identified in the framework put forward by Kalaris et al. (Kalaris et al., 2022), these relational elements as shown in Fig 2. include:

- Empowered, multidisciplinary, and respectful teamwork based on trust and relationships within and between facilities and levels of care
- Network leadership and stewardship
- Innovative modalities to facilitate communication and collaboration (e.g., WhatsApp groups, telemedicine) among providers, providers and patients, and facilities in the network
- Supportive supervision and mentoring among facilities in the network
- Collaborative learning, sharing, and problem solving
- Monitoring and accountability for achieving network goals

Figure 2. Key Structural and Relational Aspects of Networks of Care for Maternal and Newborn Health (Kalaris et al., 2022)



The relational elements of NOCs are often discounted as soft-skills, or non-technical skills, when in fact these skills are core to any functional NOC. One reason for shying away from clear definitions or constructs for these relational elements is that we lack a common understanding of how these core relational skills are functionally relevant, defined, measured, or strengthened in the context of an NOC. In part because there are no measures that exist specifically for relational elements of an NOC for MNH, we lack the ability to establish the evidence needed to determine the importance of the relational elements of an NOC to improved clinical outcomes. The relational elements within an NOC are crucial to the overall functionality of healthcare systems. Although healthcare systems are typically defined by their individual pillars, successful service delivery also requires seamless interactions and coordinated efforts across these pillars. By identifying and prioritizing the key relational elements that drive effective NOCs, we can optimize the delivery of high-quality and respectful MNH services. As seen in several case studies from Madagascar, Nigeria, Nepal, Philippines, the role of collaboration and communication in fostering functional referral systems, community engagement with facilities providing services, and strengthening service delivery systems (Cordier et al., 2020; Fasawe et al., 2020; Martinez Vergara et al., 2020). Common

These relational elements of NOCs are often discounted as soft skills or non-technical skills when in fact, these skills are core to any functional NOC.

case studies was the reference to building trust and linkages between different players across different levels of the health system from community to referral centers.

In many countries and health systems, hierarchies and power dynamics create barriers to effective communication, collaboration, and teamwork (Essex et al., 2023; Lingard et al., 2012; Nugus et al., 2019; Vazirani et al., 2005). Understanding how to assess and measure these and other barriers to interpersonal relationships within an NOC is needed before the barriers can be systematically addressed to test the validity of the NOC framework. In addition, the NOC framework, while promising, remains a largely theoretical concept and may be challenging to apply in practice at country and subnational levels for health systems looking to adopt newer service delivery models to improve MNH outcomes or even broader primary healthcare services. Therefore, it is imperative to unpack the relational elements, what they mean, and how they can be measured and acted upon to inform adoption of a more operational NOC framework. This is particularly important in LMICs where the burden of maternal and newborn mortality continues to be high and stalling declines in maternal and newborn mortality require innovative approaches and models.

OBJECTIVES

Through USAID's HEARD project, we aim to further define the relational elements of a network of care (NOC). Further refinement of the relational elements for maternal and newborn health (MNH) can help inform the development of practical tools and interventions for countries seeking to strengthen NOCs for MNH improvements and outcomes. This project had three main objectives:

- Conduct a rapid literature review and synthesize finding to guide further development of definitions and descriptions of the relational aspects of NOCs
- Consult with key stakeholders regarding relational aspects of NOCs and the application of the NOC framework to help inform the next iteration
- Synthesize findings and propose definitions, linking to WHO's pathway/framework for NOC implementation, and identify available tools to measure, operationalize and strengthen NOC-R for MNH service delivery

The project was undertaken over a six-month period from May 2023 to October 2023.

METHODS

As per the objectives, we followed the below process:

1. We consulted with global and country-level MNH experts who have knowledge about or experience implementing NOCs for MNH.
2. We conducted a rapid literature review to identify and define the relational elements of functional NOCs.
3. We synthesized the findings from the literature review and stakeholder consultations and developed a revised framework that includes the definition of the relational aspects of a NOC.
4. We presented the revised framework to MNH global and country-level experts for feedback and updates.
5. We updated the framework and revised the definitions of the relational elements accordingly.

To kick-off this activity we met with colleagues from WHO and USAID at the international Maternal Newborn Health Conference in Cape Town in May 2023. Two sessions on NOCs, one an interactive breakout to better understand how session participants thought of NOCs, and the second a panel discussion describing experiencing implementing NOCs, were very insightful. It became apparent that more work was needed to identify how the elements and aspects of an NOC are understood and defined, based on the published framework by Kalaris, et al.

This realization informed a strategic shift in approach which included expanding the focus of the stakeholder interview to more broadly understand their thoughts and perception of the entire NOC framework, not just the relational aspects. This shift led to a modification of the objectives with an immediate goal of using the findings from the rapid literature review and stakeholder consultations to inform a revised NOC framework that revisits the entire framework while unpacking the relational elements in more detail. We also prioritized the applicability of the NOC model for LMIC contexts, where specific interventions can be identified for implementation to drive service delivery improvements for MNH care. We initiated stakeholder interviews and the rapid literature review concurrently.

Stakeholder Consultations

Over the course of the summer of 2023, we engaged in conversations with 21 highly knowledgeable individuals who specialize in the fields of Maternal, Newborn, and Child Health (MNCH) and global health. The panel of experts we had the opportunity to speak with came from diverse backgrounds, including reputable multi-lateral organizations such as the WHO and the World Bank, academia including Stanford University, bilateral and donor organizations like the United States Agency for International Development (USAID) and the Bill and Melinda Gates Foundation, as well as Non-Governmental Organizations (NGOs) and country programs such as MOMENTUM, Jhpiego, IHI and CHAI. Additionally, we were fortunate enough to converse with esteemed members of the Maternal Health Supplies and Resource (MHSR) steering committee, who are government officials from different countries. We spoke with 13 global experts and eight country level experts.

We engaged in discussions to gain insight into stakeholder viewpoints on NOCs, both in theory and in practice. We sought input on the current NOC framework and its alignment with their conceptual beliefs, as well as its usefulness as a tool for applied action. We also explored perspectives on the relational aspects of NOCs and considered the varying importance of different elements, aspects, or behaviors for effective intervention implementation and evaluation. During these discussions, we were able to gain valuable insights into the latest developments and innovations in the field of MNH and global health. Our experts shared their experiences, expertise, and perspectives on various topics such as maternal and child health, reproductive health, family planning, health systems strengthening, and community-based healthcare. We are grateful for the opportunity to have learned from such a distinguished group of experts and for the contributions they have made to the academic discourse on these important topics.

Understanding of NOCs

Feedback from stakeholders indicated that conceptually there was a clear understanding of the components that are required for an NOC based on the definition, but operationalizing the relational components was more challenging. This is partly due to the nature of trying to define, train and standardize collaboration, trust, and leadership within a health facility and health system. A well-functioning MNH referral system was the most cited example of a practical application of an NOC – requiring structural and relational aspects – the staff and transport, (structural) as well as the teamwork and communication and collaboration among providers at health centers, and support from community health workers in some cases.

We noted some key differences between how stakeholders who represent more of a global lens and local implementers described NOCs. While there was consensus that communication, collaboration, and teamwork were critical, global stakeholders provided perspectives that were focused more on health system strengthening and tended toward an academic mindset with emphasis on how to measure impact and standardize processes for scale. Stakeholders with a country-level lens, in contrast, shared and highlighted their experiences and challenges implementing a version of a NOC, and noted the importance of strong leadership and local government buy-in. These comments also helped reinforce the re-visioning of a framework that is actionable and that can be linked to targeted interventions for teams, facilities, and systems. We spoke to a government official from Ghana who described the current implementation of an NOC model in the country called Networks of Practice. There were also representatives from Indonesia (Jhpiego) and Zambia.

Existing NOC Framework

With few exceptions, stakeholders agreed that NOCs encompass structural, governmental / organizational, and relational elements, per a review of the original NOC framework (Figure 1).

The structural aspects or health system pillars are well understood, though may not always be well-resourced (i.e. staffing and supply chain issues). They cannot be overlooked and are addressed in Health System Strengthening framings. The relational elements are critical to providing high-quality MNH care and until recently have not been a neglected component of health system and quality of care frameworks. What was not well understood was the role of governance, monitoring, and accountability, so much so that most of the stakeholders spent time emphasizing the importance of these aspects because they are the enablers that help define, predict and formalize HOW

individuals and teams work together. These include communities of practice, professional organizations and institutional committees, among others. Given the consistent association of what we labelled organizational enablers as the relational elements, we realized we needed to revisit the entire NOC framework and how it is conceptualized, not just the relational aspects.

Stakeholders described an understanding of and named different relational aspects of care – trust, communication and connections are paramount. They generally agreed that conceptually the presence of relational elements can be bundled together as a highly functioning interdisciplinary team working together with respect, coordination and collaboration. The concept of trust was a prominent theme in these discussions as an overriding characteristic critical to a functioning NOC.

Further exploration of the relational aspects of an NOC

We sought further reflection on the relational aspects of NOCs, including behaviors and challenges within current structures. We heard consistent comments regarding issues related to hierarchy and gender that persist in nearly all settings. And while healthcare is inherently hierarchical, stakeholders reinforced the importance of focusing on interdisciplinary teamwork, collaboration and trust. Joint decision-making, conflict resolution and accountability were also mentioned by multiple stakeholders as critical elements for an enabling environment and a successful NOC.

The stakeholder consultations were invaluable in helping to think through how to capture the importance of the relational components while also expanding upon the organizational enablers that help define how, or the rules by which, teams can work together. We heard multiple times that professional organizations, review committees, and communities of practice should be identified in the framework as these enablers provide the opportunities for coordination and communication.

Rapid literature review

We conducted a rapid literature review to identify existing literature on relational elements and definitions of these elements in relation to functioning organizations, teams, and NOCs. A rapid review is a simplified form of systematic literature reviews that is beneficial when there are time constraints and evidence synthesis is required for focused research topics (Khangura et al., 2012; Klerings et al., 2023; Moher et al., 2015; Tricco et al., 2015). Given the nascent literature on NOCs in global health particularly for MNH, we did not find any literature that focused specifically on relational elements for clinical health systems in LMICs. We then sought to identify other fields within and outside of health where networks as models for strengthening organization and performance have been studied. Thus, our rapid literature review focused on existing collaboration-based studies. We looked for literature that explored the elements or factors that define functioning or performance in intra-organizational and inter-organizational collaborations, partnerships, or networks. We searched for all available literature and did not limit the search to any specific country or year. We identified three main databases for the literature search – Pubmed, Embase, and EBSCO. These three databases were selected to give us a wide range of countries and fields outside of health where relational elements have been extensively studied. Our search terms included the broader fields of business, psychology, sociology, organizational behavior, military, and aviation.

Search terms used:

1. "Inter-organizational collaboration" AND ("health care" OR "maternal health services")
2. "Intra-organizational collaboration" AND ("health care" OR "maternal health services")
3. "Inter-organizational relationships" AND ("health care" OR "maternal health services")
4. (Teamwork OR Effective teamwork) AND ("health care" OR "maternal health") services") AND performance
5. "Organizational effectiveness" AND ("health care" OR "maternal health")
6. "Relational coordination" AND ("health care" OR "maternal health")
7. (Collaboration OR teamwork OR relationship) AND ("Inter-professional" OR "Inter-disciplinary") AND (Organizations OR "Organizational effectiveness") AND healthcare AND (facilitators OR enablers OR barriers)
8. ("Network functionality" OR "Network effectiveness" OR "Network relations") AND (Organizations OR "Organizational effectiveness" OR "Healthcare organizations")

We also searched the reference lists of the review papers identified for additional primary research studies. We included systematic reviews in this search. Through the stakeholder consultations, we identified additional program reports and grey literature that were also reviewed and included in the rapid review. Finally, some of the experts we spoke to also shared specific literature or authors and we searched for these papers and included those that were not initially picked up by our search terms.

We conducted an initial title screen of the search outputs, followed by an abstract screen, and subsequently a full article screen to identify the final set of articles. In the review of the abstracts, we excluded articles that had no direct link with the objectives and scope of the literature review, articles that were protocols for conducting studies to evaluate organizational relationships or collaboration (though these articles were valuable for identifying measures and tools), and articles that focused on training or education approaches for inter and intra-organizational collaboration. For the full article screen, we relied on the following inclusion criteria: 1) Paper written in English (no limit on year of publication or sector), 2) Primary research or systematic literature reviews, 3) Studies that investigated factors that define, or influence inter and intra-organizational collaboration, 4) Studies that investigated the mechanism by which collaboration improves performance. A search of relevant articles was conducted from June through September 2023, and included studies published between 1959 and September 2023.

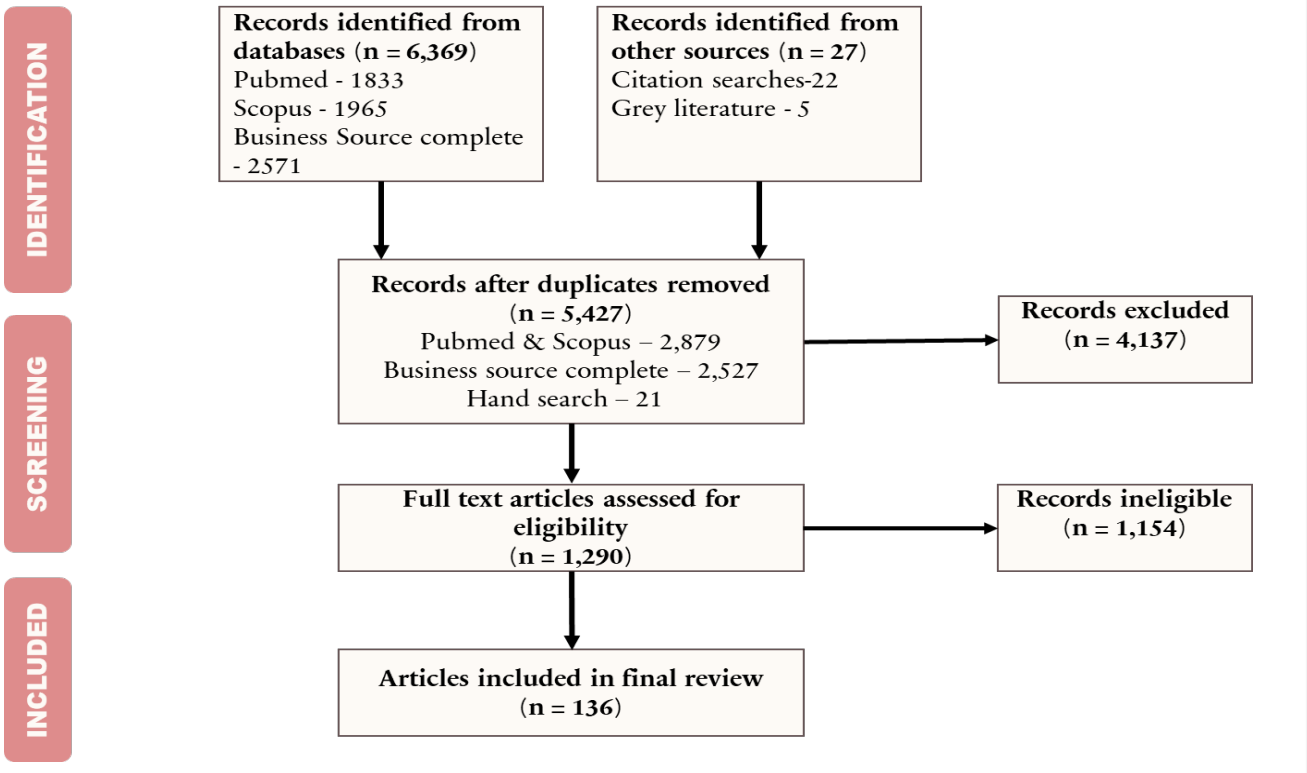
Data Extraction

We extracted the data from the retrieved papers into a standardized template in Excel. For the final full set of articles, we collected the information including the title of the article, the authors, the DOI or website, the year of publication, the abstract, description of the highlights of the article and the relational elements identified. We then synthesized the findings based on commonly occurring relational elements and interventions to enhance the development of the relational elements that were identified. We used the following three themes for the synthesis: 1) definitions of relations in inter/intra-organizational engagements or networks, 2) enablers and barriers of relational elements, 3) strategies for enhancing relational elements.

RESULT OF LITERATURE REVIEW

The rapid literature review resulted in 6,396 records from the databases and grey literature. The dates of publication ranged from 1959 to September 2023. After the removal of duplicates, there were 5,427 records. We subsequently excluded an additional 4,137 ineligible records through the title and abstract review and fully reviewed 1,290 records. We then assessed these for eligibility and identified a total of 136 eligible articles that were included in the review. The breakdown is shown in Figure 3.

Figure 3. PRISMA diagram for rapid review and included studies.
Databases searched included Pubmed, SCOPUS and Business Source Complete from 1959 through 2023.



Synthesis of literature review findings

We summarize the key findings from the literature under the thematic areas identified.

1) Definitions of relations in inter/intra-organizational engagements or networks

The studies identified the importance of structural elements and relationships as crucial to the delivery of healthcare services or team performance more generally. In many of the studies we reviewed, collaboration or relationships were identified as key for integrated healthcare delivery. Healthcare delivery systems are complex and operate at several intersections of organizations, professional disciplines, other technical disciplines, geographies, cultural and political contexts. Therefore, delivering high quality, patient-centered services requires functional and reliable collaboration within and between these boundaries (Rosen et al., 2018). Because healthcare services are complicated and require multiple players and specialties, the role of relationships in ensuring integration and coordinated delivery of patient-centered care cannot be understated. Collaborative engagements exist on a spectrum from formal to informal or can be developing, active or potential (Palinkas et al., 2014). This was an important finding from our literature review. In the context of the NOC framework, many of the stakeholders that we consulted with alluded to existing informal relationships which are built over time between people working in the networks often out of necessity and based on existing interpersonal relationships.

The studies also explored what constitutes and defines these relationships. MNH can be considered a high hazard or high reliability field like aviation, military action or manufacturing where processes are complex, and consequences of accidents are fatal (Gaba, 2000; Leape, 1994). To deliver effective, quality and patient-centered care, relationships require that providers of care across levels and within levels of the functioning healthcare system work toward a common and clearly defined goal, regularly communicate and exchange ideas, and cultivate relationships built on mutual trust, respect and clarity of roles and responsibilities (Behruzi et al., 2017; Grady et al., 2023). The relationships and connections between various entities and stakeholders or organizations are crucial for the functioning of the healthcare system (Palumbo et al., 2017).

For this review, we considered NOCs for MNH as constituting inter-organizational collaboration (vertical) and intra-organizational collaboration (horizontal). Delivering maternal and newborn care effectively requires coordination and collaboration among different groups of providers or organizations, as well as interdisciplinary collaboration within levels. This means that doctors, nurses, and community health workers working in the same facility need to work together, and team members within specific units, such as labor and delivery, need to collaborate. Additionally, different teams in the same facility, such as maternity and immunization teams, need to work together to ensure the best possible care for mothers and newborns. Several of the studies identified the following as the main characteristics of inter-organizational or intra-organizational collaboration and essential for coordination to happen in healthcare.

a. **Trust and mutual respect**. The reviewed literature consistently emphasized the indispensable role of fostering mutual trust and respect in achieving successful collaborations within and between organizations. Such a foundational element is essential for ensuring the effective functioning of these collaborations and the attainment of their intended goals. Building trust also requires that partners and stakeholders have a shared knowledge of each other's roles and expertise and how they contribute jointly to achieving the shared goals of the collaboration (Grady et al., 2023; Karlsson et al., 2020; Nicaise et al., 2021). The trust-building loop is a process that emphasizes the importance of building mutual trust between partners to determine their individual risk tolerance when agreeing on ambitious goals. This process involves collaboration, where progress strengthens trust and setbacks or failures can diminish it, thereby impacting risk tolerance cyclically. It is essential to establish a strong foundation of trust to avoid any negative consequences that may arise from a lack of trust in the partnership (Aunger et al., 2021; Vangen & Huxham, 2003). Therefore, trust, while critical in the formation and maintenance of networks, is dynamic and non-linear. Mutual respect among healthcare providers fosters collaboration and reduces conflicts, leading to better communication and teamwork. This ultimately improves client care (Papadimitriou & Cott, 2015).

b. **Shared knowledge**. Individuals need to be aware of the knowledge, skills and competencies of each member in the NOC and this can drive increased commitment and willingness to collaborate as it creates a more inclusive sense for partners in the NOC. Having a shared knowledge can also enhance teamwork as it increases flexibility that may be required in multi- and inter-disciplinary contexts allowing different groups to be able to step in and fill gaps to keep the NOC functioning where required (Alderwick et al., 2021; Papadimitriou & Cott, 2015). This is an important facilitator for the boundary spanning roles described below.

c. **Leadership**. Multiple studies identified the key role that leadership plays in enhancing relationships and collaboration in intra and inter-organizational work coordination. A leadership structure that fosters collaboration, coordination and shared decision making was consistently identified as a critical relational element, and an organizational enabler (Martinez Vergara et al., 2020; Sheppard et al., 2022). Leadership commitment to collaboration was often cited as essential for successful collaboration in healthcare service delivery (Alderwick et al., 2021; Auschra, 2018; Ervin et al., 2018). The right leadership structure was also identified as crucial to driving the commitment to shared goals, values and vision, fostering teamwork, managing conflicts and enhancing psychological safety for successful collaboration(Ervin et al., 2018; Palumbo et al., 2020; Portela et al., 2018; Spigel et al., 2022). Collaborative leadership is also important for joint planning, coordination across teams and groups of stakeholders, and building relationships (Grady et al., 2023). This requires breaking down many of the professional, social and gender hierarchies that are entrenched in many LMICs.

d. **Shared vision, goals and values. Bold them.**Successful collaboration vertically and horizontally across organizations and between organizations is defined by a shared vision, goals, and values. Multiple health focused studies identified the importance of all stakeholders being aligned on patient-centered care delivery, for example. Patient centered goals creates a value proposition for all stakeholders in the network and reduces interpersonal, interprofessional, inter-organizational and intra-organizational tensions which may arise from differences in priorities (Alderwick et al., 2021; Carlini et al., 2023; Cert, 1999; de Brito et al., 2022; Nicaise et al., 2021).

e. **Effective and frequent communication.** Most of the articles highlighted effective communication as a key feature of inter and intra-organizational collaborations. Communication between stakeholders and partners should be frequent, open, consistent and fosters joint problem-solving, planning, and relationship building (Grady et al., 2023). Communication avenues including regularly scheduled meetings, huddles, or debriefs can facilitate teamwork and cooperation where problems are identified and quickly resolved or addressed thereby reinforcing and promoting the shared commitment to defined outcomes (Fiscella et al., 2017).

2) Enablers and barriers of relational elements

On the enablers and barriers of relationships in collaborations, we identified the following as critical factors that influence strengthening or weakening of relationships that define collaborations.

Enablers

a. **Shared Mental Models**. Santos et al. found in their study that Shared Mental Models (SMM) enhance trust building, reduce conflict within the collaborative and in turn drive team effectiveness and satisfaction (Santos et al., 2015). They found that when team members have SMM, they are less likely to engage in conflict behaviors. This, in turn, allows them to be more creative, achieve higher levels of performance, and feel satisfied with the team (Santos et al., 2015). Having a shared mental model that focuses on joint delivery of healthcare services to patients towards improving patient health outcomes and less focus on individual provider or fixed facility-driven healthcare can improve coordination and team effectiveness (Fiscella et al., 2017).

b. **Interpersonal relationships and social ties.** In their study, Kerrissey and Singer found that lack of familiarity and pre-existing personal relationships affected the development of trust and respect in the collaboration between clinical and community-based social service organizations for diabetes prevention in the United States (Kerrissey & Singer, 2023). In the same vein, pre-existing collaborative engagements that were successful or past experience of collaboration can enhance trust building which is essential for developing and sustaining collaborations (Aunger et al., 2021).

c. **Formalized partnerships through agreements.** Some articles described the role of formalized processes and agreements in facilitating the development of relationships that are needed for effective collaboration in healthcare or other inter-organizational partnerships (Kerrissey & Singer, 2023). Establishing formal agreements such as MOUs, terms of reference, and other governance documents serve as a foundational structure that bolsters and reinforces trust between partnering entities. This scaffolding mechanism supports a robust and enduring collaborative environment that aids in achieving common goals, objectives, and mutually beneficial outcomes. (Aunger et al., 2023; Zaheer et al., 1998). Establishing rules through a written or formal mandate presupposes the mutual commitment of all parties and describes collaboration principles and practices what will also serve as a mechanism for accountability (Murray et al., 2018).

d. **Boundary spanning roles.** "Boundary spanners" or staff who work across different boundaries (organizational, professional, geographical) are necessary for maintaining commitments toward the shared goals for the collaborative efforts across the different groups in the network (Alderwick et al., 2021). In the world of organizational management, individuals known as "boundary spanners" play a vital role in facilitating the exchange of knowledge and expertise between groups that may be separated by differences in hierarchy, geography, or function (Levina & Vaast, 2005). Boundary spanner roles may be designated formally such as managers in practice or informal where individuals may find themselves playing the role as part of their job (Hunt et al., 2016). Boundary spanning activities can be defined as actions that focus on enhancing communication sharing and coordination between different groups of professionals, with a primary emphasis on promoting a shared willingness to collaborate. These activities can also facilitate knowledge transfer and integration by enabling each group of professionals to present their specific knowledge in a structured and comprehensive format that can be integrated with individuals on either side of the role boundary (Hunt et al., 2016; Zhao & Anand, 2010). Boundary spanners can sustain collaboration and reduce conflict that may erode the trust and communication in the relationship (Palumbo et al., 2020)Another example of a boundary spanning role would be the coordinator or individual responsible for overseeing the process of collaboration for the NOC itself.

e. **Collaborative leadership.** Most studies identified the importance of a leadership style that supports inclusion, fosters communication, teamwork and shared decision making. There is evidence from business and organizational psychology that describe the role of collaborative leadership in defining and coordinating team communication processes (Guzzo & Dickson, 1996; Salas et al., 2004).

f. **Geographic or physical proximity.** Co-location of stakeholders or team members can foster or accelerate the process of developing team shared mental models and commitments to defined shared values and goals for the collaboration (Wise et al., 2022). In some articles the need for in-person face-to-face communication was identified as an enabler of the relationships required for intra- and inter-organizational collaborations (Kerrissey & Singer, 2023). The availability of shared space was also identified as a factor that facilitated collaboration (Bolton et al., 2021; Wranik et al., 2019).

g. **Conflicts** can sometimes act as enablers in that they create opportunities to clarify roles and responsibilities or shared goals/purpose of the collaboration and can engender trust building.

h. **Functioning systems.** Facilitating collaboration and coordination in healthcare delivery relies on essential factors such as sufficient infrastructure, appropriate staffing ratios, and adequate funding (Wranik et al., 2019).

Enablers of relationships in collaborations

1. Interpersonal relationships and social ties
2. Formalized partnerships through agreements or other forms
3. Having a coordinator or someone responsible for overseeing the functioning of the process of collaboration
4. Boundary spanning roles
5. Collaborative leadership
6. Geographic or physical proximity
7. Conflicts can sometimes act as enablers in that they create opportunities to clarify roles and responsibilities or shared goals/purpose of the collaboration and can engender trust-building
8. Functioning health systems i.e., infrastructure, financing, adequate staffing, availability of drugs and essential supplies, governance

Barriers

Barriers to the relational elements are important to acknowledge and understand. These include unresolved conflicts which can erode trust and weaken relationships, and the lack of a mutual understanding of the purpose of the collaboration (Sheppard et al., 2022). Other key barriers identified include the setting of complex goals and targets that are difficult to achieve and can dampen motivation among stakeholders for collaborating, and high staff turnover which can affect the development of social ties and interpersonal relationships which as earlier defined are enablers of developing the relational elements (Auschra, 2018). Some studies and the project on "Networks of Practice" in Ghana highlighted key systemic and structural issues which may impact the development of the relational elements. These include weak health system governance, lack of political will, and poor healthcare financing. (Behruzi et al., 2017). This illustrates the important role that structural elements play in the overall functioning of an effective NOC for MNH.

3) Strategies for enhancing relational elements.

Interpersonal interactions play a big role as a collaborative mechanism and are often strengthened when driven by client needs (Nicaise et al., 2021). However, formalization of collaboration can also strengthen collaboration and requires clear governance

processes and tools and enabling leadership.

We identified documented strategies or interventions that can initiate or strengthen relationships to enhance organizational performance and strengthen collaborations. We grouped these strategies into three main categories including 1) Role clarity and standardized policies, 2) Performance management, and 3) Coordination. See Figure 4. These strategies include but are not limited to:

Role clarity and standardized policies

a. Define the purpose of the collaboration. Having shared goals and a shared vision. Making patient-centered care the focus (with an agreed upon specific goal such as antenatal, intrapartum, postnatal, or referral care) can promote the collaborative process (Vyt, 2008). This requires formalizing (as necessary) the processes through agreements for processes including information sharing, planning and problem solving. Establishing clear frameworks is part of the process for ensuring that stakeholders are aligned on the shared goal, purpose and expected outcomes for the collaboration. Define roles and responsibilities. Job descriptions should be made available to all team members for all roles (Clark, 2021). In defining roles and responsibilities, adoption of standardized tools, protocols, and checklists can help reduce the variation in delivery of services and improve coordination between stakeholders. This also helps define "boundary spanners" and identify pathways for mutual support and task sharing.

b. Train staff for teamwork and communication in addition to training in clinical competencies. According to the research conducted by Wise et al., the effectiveness of a team is not solely dependent on their individual skills and competency to carry out their designated task but also on their ability to coordinate with each other (Wise et al., 2022). Mentoring by team work specialists is an effective way to build capacity teamwork in addition to professional skills and competencies. Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) is a patient safety program that has been designed based on empirical evidence. It is intended to enhance communication and teamwork in healthcare settings. The program is aimed at improving quality and safety of patient care by providing healthcare professionals with the necessary tools and strategies to work collaboratively towards a common goal (Epps & Levin, 2015; Weaver et al., 2010). Developed by The Department of Defense, the Agency for Healthcare Research and Quality, and leading scientific experts, this program centers around the principles of team training and crew resource management. Its ultimate goal is to emphasize the importance of collaboration and communication, thereby guaranteeing that patients receive optimal care (Agency for Healthcare Research & Quality (AHRQ): TeamSTEPPS™: National Implementation., n.d.).

Performance Management

c. Implement a management framework. Successful implementation of cooperative endeavors requires functional synchronized management frameworks, as well as supplementary audit mandates and integration of performance evaluation mechanisms. However, the incorporation of these measures may result in the disruption of conventional managerial norms. Inadequate capacity to navigate these complexities may prove to be a significant impediment to active participation in collaborative networks. We identified effective decision-making and clear accountability arrangements as key factors that contribute to the success of collaborative efforts (Alderwick et al., 2021; Carlini et al., 2023; Clark, 2021; Howell et al., 2022; Martinez Vergara et al., 2020). Applying organizational performance tools such as Lean management or Plan-Do-Study-Act (PDSA) where there is breakdown of trust and mutual respect between stakeholders allows one to conduct gap assessments and apply these techniques/strategies to solve the problems (Bolton et al., 2021). Lean management has been found to have positive impact on improving teamwork, communication, and coordination among health workers (Mahmoud et al., 2021; Radnor et al., 2012).

d. Institute accountability and performance measures. Processes for measuring performance, addressing conflict, correcting mistakes in a timely fashion and standardizing how these performance audits are done (Kerrissey & Singer, 2023). Setting targets that are measurable, measuring them, and rewarding performance (O'Leary et al., 2012) as well as focusing on the performance of teams instead of individuals (Merry et al., 2014).

e. Strengthen leadership capacity to foster teamwork, build trust, and transparency (Kerrissey & Singer, 2023). This includes building leadership capacity on teamwork, collaboration, and shared decision-making across the network and overseeing the network. Studies found that leadership involvement in identification of problems and shared decision-making to identify and implement solutions can strengthen collaborative relationships in healthcare service delivery (Howell et al., 2022). This also means reducing hierarchy in

the networking relationships and focusing on equal partnerships in the collaboration.

f. **Maintain team stability,** which helps to strengthen social ties and interpersonal relationships. This applies to both intra-organizational teams and inter-organizational teams which make up the NOC. This is particularly important in the healthcare setting and in LMICs where staff turnover is high and can lead to weakening or reversal of the network of care requiring the need to build from scratch.

Coordination

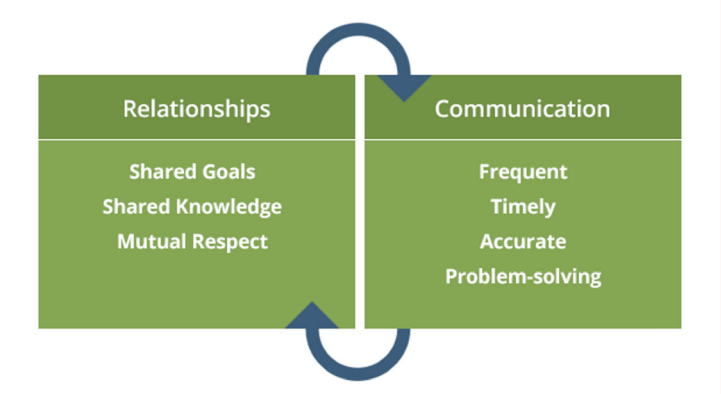
g. **Create opportunities for physical connections**, joint problem solving and decision making through meetings, huddles, and other engagements (Kerrissey & Singer, 2023).

h. **Provide information and communication technologies** to enhance communication and frequency of communication. This could include intranet, emails, WhatsApp groups, intercom phones, and virtual teleconferencing/ videoconferencing tools.

i. **Assign a coordination agent.** This is a boundary spanning role that is necessary to build trust and foster communication and collaboration.

j. **Operationalize relational coordination through interventions to strengthen relationships and improve performance**. In the review, we came across popular frameworks that have been used to assess integration, collaboration and coordination including the network theory (Burns et al., 2022), and competing values framework (Bravi et al., 2013). However, the relational coordination theory stood out among the theories we identified and appears to be the most suited to the concept of networks of care. Effective communication and coordination are crucial for achieving desired outcomes in work that is highly interdependent and time sensitive, according to the theory developed by Joy Hoffer Gittell in the mid-1990s based on an in-depth field study of flight departures in the airline industry (Bolton et al., 2021). It expanded on previous work done and literature on coordination. The theory of relational coordination proposes that "relationships with shared goals, shared knowledge, and mutual respect are critical to support frequent, timely, accurate, problem-solving communication, and vice versa, enabling stakeholders to effectively coordinate their work across boundaries" (Bolton et al., 2021) See Figure 4.

Figure 4. Communicating and Relating For The Purpose Of Task Integration

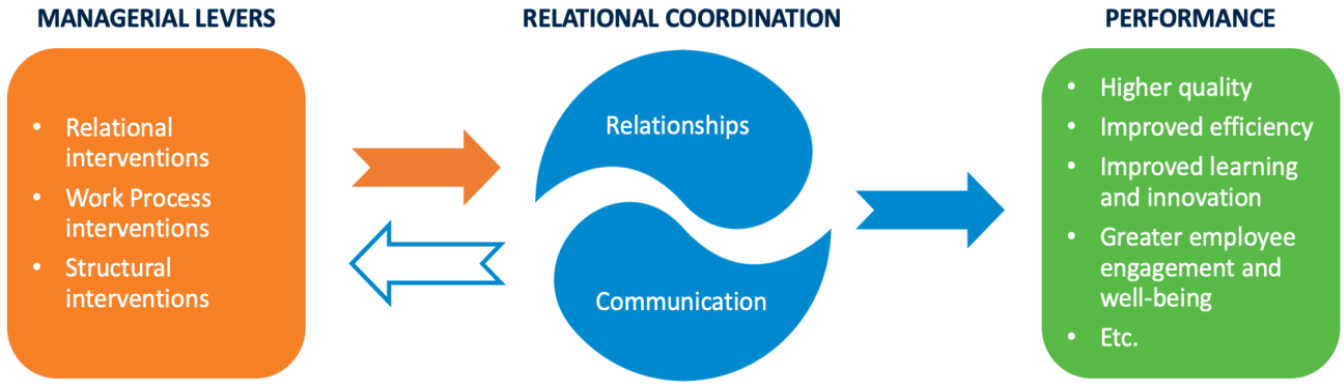


The theory of **relational coordination** proposes that highly interdependent work is most effectively coordinated through relationships of shared goals, shared knowledge, and mutual respect, and supported by frequent, timely, accurate, and problem-solving communication.

Source: https://rcanalytic.com/

The relational coordination theory outlines three essential aspects of coordinating work and what enables coordination, the organizational enablers that drive coordination or can initiate the coordination, and the expected outcomes (Figure 5). The relational coordination theory arose out of business organizational performance and has since been applied in various settings including healthcare organizations and studies suggest that it leads to improvements in quality of care, increased provider job satisfaction, patient-reported care continuity and adaptive learning (Falatah & Conway, 2019; Gittell et al., 2000; House et al., 2022; Hustoft et al., 2018). We found the relational coordination theory captures the relational mechanisms for enhancing system performance and provides much of the foundation for the MNH Network of Care model.

Figure 5. Theory of Relational Coordination



Source: *https://cisr.mit.edu/publication/2022_0501_RelationalEcosystems_SebastianGittell.*

Opportunities exist to identify strategies and interventions to improve both organizational and relational elements. Figure 6 provides some examples of ways to implements possible strategies.

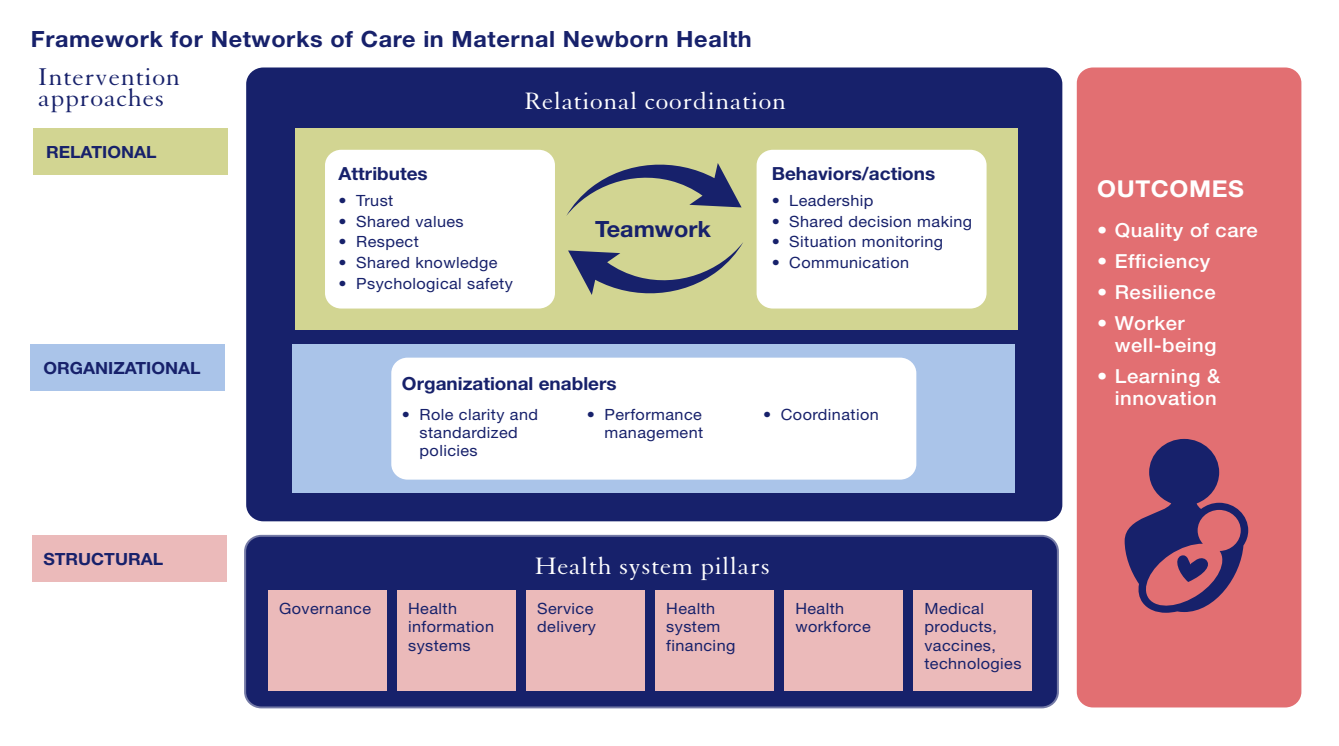
Figure 6. Strategies to improve relationships and coordination

Organizational	Relational
Role clarity/Policies 1. Define roles and responsibilities 2. Train staff for tasks and teamwork 3. Standardize clinical protocols e.g., care pathways **Performance Management** 1. Establish policies to promote transparency and accountability 2. Assign coordinator(s) to facilitate collaboration across the network **Coordination** 1. Establish regular communication channels 2. Create platforms for discussions, joint problem solving, joint decision-making	1. Define a shared vision, common goals (patient-centered care) 2. Build capacity for consensual/participatory/collective leadership at all levels 3. Reinforce communication and teamwork (Mentorship & coaching) 4. Co-locate stakeholders 5. Institute interpersonal conflict resolution processes 6. Reward performance 7. Promote staff retention/reduce attrition

DEVELOPMENT OF REVISED FRAMEWORK AND DEFINITIONS

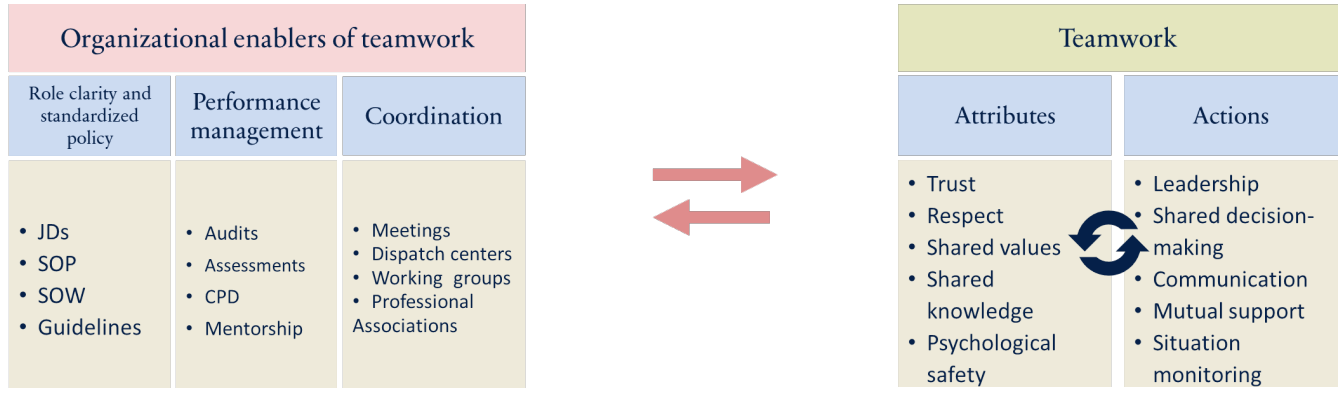
Taking the synthesis of the rapid literature review and the feedback from the MNH experts at global and country level, we adapted the relational coordination theory to inform a revised NOC framework (Figure 7). This revised framework is conceptualized from an applied perspective and as a framework that implementers, systems and policy decision makers can use to guide approaches to strengthen NOC including those targeting the structural, organizational, and relational aspects. The revised framework has two main elements for a functional NOC model – 1) Structure – made up of the WHO health systems building blocks and 2) Relational Coordination, which is subdivided into organizational enablers and teamwork.

Figure 7. Revised framework for NOCs for maternal and newborn health.



The dynamic concept of Relational Coordination includes those items and the iterative processes that lead to effective teamwork and adaptive learning as well as the organizational enablers to help maintain and build effective teamwork (Figure 8). Relational coordination includes organizational enablers and teamwork. Organizational enablers can be subdivided into targets for addressing role clarity and standardized processes, performance management, and coordination. Teamwork is a dynamic state in which a set of attributes drives actions which in turn strengthen attributes and so on.

Figure 8. Organizational enablers and teamwork



We reviewed existing definitions within the concept of teamwork and based on expert opinion we generated definitions (Figure 9) that most appropriately describe both the attributes and actions of teamwork in the context of NOC.

Figure 9. Defined attributes and actions within the concept of teamwork.

Definition	
Attributes	
Trust	the predictive understanding of another's behavior. Shared willingness of team members to be vulnerable to the actions of other members. Required for psychological safety.
Respect	the belief that all persons have unconditional intrinsic value as human beings (dignity) and team members and act in light of that belief.
Shared Values	beliefs that are jointly held among members of a team which guide individual and interdependent team behavior and guide decision making.
Shared knowledge	an organized understanding of relevant knowledge that is shared by team members.
Psychological safety	the willingness of team members to take interpersonal risks, for example by admitting an error, asking a question, or seeking help.
Actions	
Leadership	the practice of influencing team members through effective communication to fostering psychological safety to achieve a shared purpose under conditions of uncertainty.
Communication	the exchange of information between two or more team members in the prescribed manner and using proper terminology. Often the purpose of communication is to clarify or acknowledge the receipt of information.
Mutual support	team members (1) assisting one another; (2) providing and receiving feedback; and (3) exerting assertive and advocacy behaviors when patient safety is threatened. The essence of teamwork.
Situation monitoring	knowing what is happening in the changing environment and using new knowledge to adapt to the situation and to support team members.
Shared decision making	a process that draws on the combined knowledge of all team members to made smarter, more effective decisions.

Finally, after developing the revised framework including the theory of relational coordination and iteration based on stakeholder feedback, we felt it was necessary to modify the NOC definition to better reflect the dynamic processes and mechanisms by which an effective NOC can drive quality improvement. This includes acknowledging the role of formal and informal relationships and interdisciplinary teams and is as follows:

"NOCs for MNH exist on a spectrum from informal or formal collaborations between and within public and private health service providers, interconnected to form interdisciplinary teams with health system supports, relational coordination and adaptive learning to deliver high quality equitable, respectful person-centered care from household through tertiary levels."

Application of the NOC framework

Based on feedback and suggestions from the stakeholder review and validation workshop held with WHO and USAID, we developed a case scenario, or a possible application for this NOC model (Figure 10) that focuses on both intra- and inter-organizational interventions. Importantly, it identifies both the Who and the What that are key to implementation (in the context of stable health system building blocks). An NOC brings together the appropriate actors with a common goal to assess their service delivery models in the context of structural, relational, and organizational aspects to identify gaps, propose interventions, and optimize function. See Appendix 2 for a more detailed use case description.

Figure 10. Potential intervention approaches to implementing the NOC framework.

	Intra-organizational	Inter-organizational/System level
WHO?	Facility manager Head of department Clinical team Outreach coordinator	District Manager State Health Director National program coordinator Commodities or Transfer coordinator
WHAT?	**Relational** 1) Mentor and coach on team goals, shared vision, working together and resolving conflict, 2) Recognize performance and reward performing teams in the facility or community, 3) Conduct regular debriefs after procedures or activities, 4) Create psychologically safe space to encourage learning and innovation, 5) Develop team goals, values and norms **Organizational** Role Clarity & Standardized policies: 1) Develop JDs and team roles; 2) Develop clinical protocols, and SOPs for other processes in facility e.g., restocking, conflict resolution policies, Performance Management: 1) Conduct regular data reviews and track progress towards facility and district targets Coordination: 10 Hold review meetings to provide feedback, problem-solve and make joint decisions	**Relational** 1 Train facility managers on leadership skills and provide ongoing coaching to facility managers 2) Recognize performance and reward performing facilities or outreach teams; 3) Develop shared goals, objectives and expected results for district/state, and regularly update 4) Problem-solve and make joint decisions, 5) Create psychologically safe space for team members to encourage learning and innovation, **Organizational** Role Clarity & Standardized policies: 1) Develop vision for district NOC and share responsibilities for each partner/player or stakeholder 2) Develop clinical protocols, and standardized guidelines for clinical procedures, and operational processes, Performance Management: 1) Conduct regular data reviews and track progress towards overall district/state/national targets 2) Regularly assess teamwork effectiveness and bottlenecks) Coordination: Conduct review meetings to provide feedback, TWGs and other coordination platforms

NEXT STEPS

We plan to further disseminate and sensitize key stakeholder groups to the framework of NOCs for MNH and the important role of teamwork. For this work to be impactful, we need to continue building the foundation and tools for future applied implementation research on interventions targeting NOCs.

The NOC framework for MNCH has the potential to elucidate the connectedness between and within health system levels. The structural aspects (health system pillars) of an NOC are both well-defined and well understood as targets for strengthening care in real world settings. However, the relational aspects of NOCs are both less clearly defined and not yet measurable in LMIC healthcare settings.

Building on the insights gained from investigating the relational aspects of NOCs we propose a second phase of this project to achieve the following objectives:

1. Convene key stakeholders including WHO, country health systems leaders, ministry officials, and funders, to exchange ideas and refine the proposed framework.
2. Identify existing measures for relational components such as teamwork, leadership, supervision, communication, mutual support, psychological safety, from diverse disciplines including health, business, aviation, and military), and adapt and propose a set of tools and measures for NOC-R.
3. Conduct interviews with stakeholder to assess acceptability, feasibility, usability of proposed measures.
4. Apply the selected tools to a previously identified and described NOC for a comprehensive evaluation, assessing and validating the accuracy and usefulness of these measures.
5. Continue to search for, identify and describe examples of strategies that target NOC-R components.
6. This initiative will serve as the foundation for future applied implementation research on NOC-R informed by a consensus. It will be guided by a consensus Theory of Charge (TOC), mutually agreed upon measures, and proposed approaches. Ultimately, this concerted effort aims to accelerate the evidence-to-action cycle and improve MNH outcomes.

APPENDIX 1.

Stakeholder consultation meeting – September 26,2023

Dr. Allisyn Moran, lead of the Maternal Health Team in the Department of Maternal, Newborn, Child and Adolescent Health and Ageing at the World Health Organization, convened a meeting of the NOC Steering Committee and additional stakeholders to seek feedback on the proposed revised NOC framework.

Participants (in alphabetical order):

Andy Carmone, CHAI	Allisyn Moran, WHO
Robyn Churchill, USAID	Dennis Mulwa, County health officer – Kenya
Tim Colbourn, University College London	Emma Radovich, LSHTM
Gary Darmstadt, Stanford	Jeffery Smith, BMFG
Olufunke Fasawe, UC Berkeley	Suzanne Stalls, Jhpiego
Anne Hyre, Jhpiego	Nana Twum-Danso, IHI
Alisa Jenny, UCSF	Marite Vergara, Philippines
Katherine Kalaris, Oxford	Dilys Walker, UCSF
Mike English, Oxford	

The meeting started with a framing of the work done to date on NOCs by Allisyn Moran and colleagues.

The University of California team provided an overview of the NOC activity and briefly reviewed the slides that were distributed in advance of the meeting. The main questions that were of interest to discuss in the convening were:

1. Is the revised overall NOC framing graphic reflective of your inputs and suggestions?
2. Does the concept of Relational Coordination (teamwork & organizational enablers) as we have presented make sense regarding relational aspects of NOC?
3. How do you see this conceptual framework being applied in practice?
4. Additional input or guidance on next steps?

Overall participants responded positively to the revised framework and NOC definition.

Participants particularly liked the emphasis on the operational and implementable approaches that could be integrated into local interventions, and that rely on relational coordination.

Key takeaways:

- Inter- and intra-organizational mapping, and calling out the distinction between those two spaces, across a network is very important for understanding how groups interact
- As important as relational aspects are, the health system pillars are the foundation from which to build
- Conflict resolution and de-escalation of conflict are critical in the relational elements.
- Further exploration of difference between authority and leadership would be beneficial in next phase.
- Joint problem solving should be a part of the teamwork development

Further suggestions:

- Identify the role community and beneficiaries plays in a network to measure how NOCs impact the end users
- Acknowledge the importance of government leadership (in framework and interventions)
- Professional organizations are important organizational enablers

APPENDIX 2

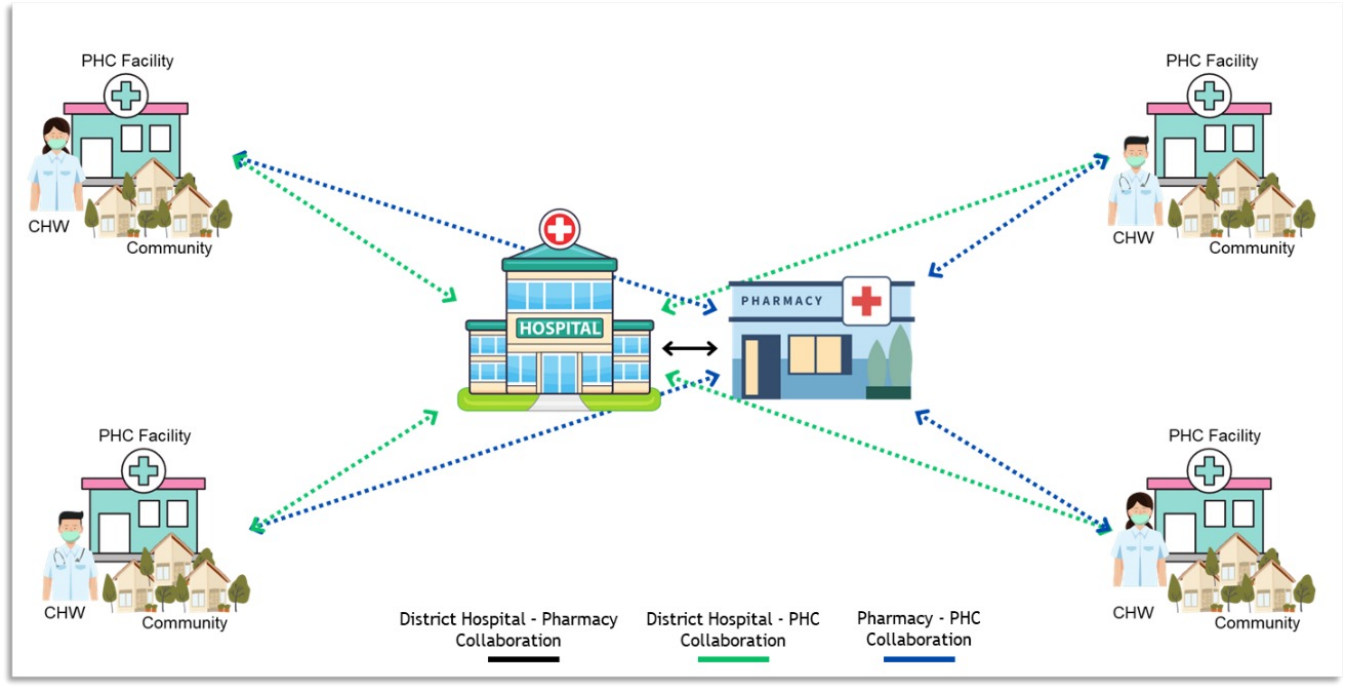
Case scenario of the application of NOC-R strengthening in an LMIC context

Consider a district that has adopted an NOC approach to improve timely identification and referrals of complications occurring during labor.

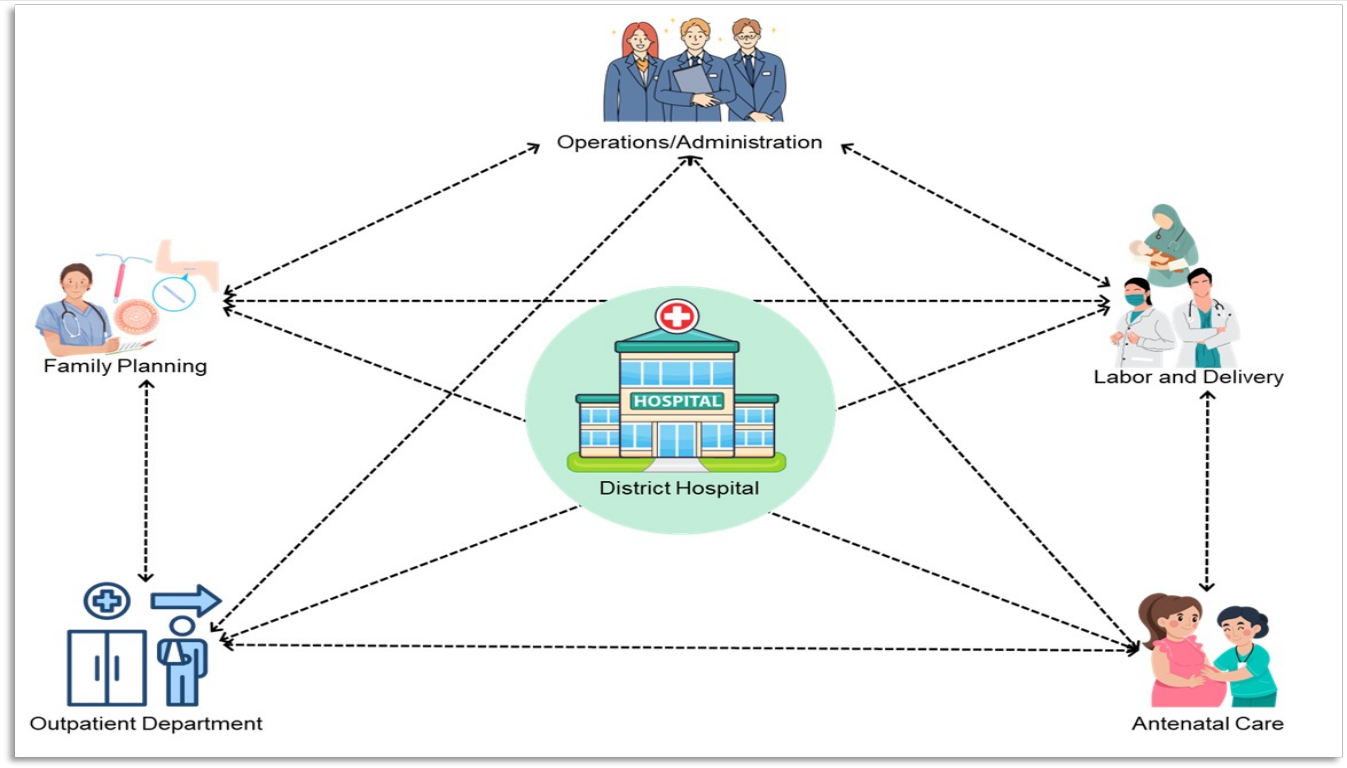
An "inter-organizational" NOC has been formally established by the local district health council linking PHC facilities which conduct normal, uncomplicated deliveries and the main district hospital which has the capacity to perform caesarean sections and blood transfusion. The district NOC also includes health outposts located in the rural and remote communities where community health workers (CHWs) work to conduct household visits and health promotion activities including ANC counseling for birth preparedness, identification of complications and postnatal family planning counselling, for example, as well as and referrals for institutional delivery.

There is also an "intra-organizational" NOC that may be focused on the same overarching goal, that exists within a PHC facility or district hospital which requires formation and maintenance. Both the inter and Intra organizational NOC requires dynamic and interactive teamwork including both attributes and actions. The intra-organizational NOC includes all professional and non-professional roles working within the facility to optimally coordinate the care of women seeking birthing services and collectively identify complications and refer when needed.

Illustrative example of a district level NOC



Illustrative example of a facility level NOC



Examples of Interventions to strengthen the relational elements of the district inter-organizational NOC aiming to strengthen identification, stabilization, referral and outcomes for complications occurring during labor

Who are the key stakeholders? (example)

- Community/women
- Community health workers (in the health posts)
- PHC clinical facility team lead(s)
- District hospital clinical leaders and management team
- District health council
- District and facility supply chain managers
- Transportation dispatch center manager

What are examples of the structural elements and targets for intervention?

- Governance. District health system, District level referral guidelines and protocols
- Health information systems. Telephones, referral form, electronic medical record (EMR), Whats App, computers for emails
- Service Delivery. The physical facility buildings including electricity and water supply, labor and delivery facilities, CS and transfusion facilities, ambulances
- Health system financing. Paid staff, purchase of essential supplies and commodities
- Health workforce. CHWs, nurses, midwives, medical doctors, lab technicians, obstetrics and gynecology (O&G) specialists, other operations staff
- Medical products, technologies. Uterotonics, antibiotics, antihypertensives, etc.
- External elements (e.g., road network)

What are organizational targets for intervention?

A) Role clarity and standardized policies

- Establish a district NOC leadership team that is comprised of at least one representative of the different professions (doctors, nurses, CHWs), and representatives of the different levels. This leadership team is responsible for making the most important decisions about the NOC structure and functionality, creating an equal playing field for all stakeholder groups to participate in shared decision-making and holding equal power in the relationship. Identify NOC coordinator and establish MOU or terms of reference for convening, membership, goals and values
- Identify and train leaders in each stakeholder group on the shared vision, goals, and objectives to create alignment across the different groups towards the common goal. These leaders will play a role in reinforcing the goal of the NOC and measuring progress towards the goal. Share Scopes of Work and Standard Operating Procedures for each stakeholder group. They will define NOC goals and values and ensure that everyone who is part of the NOC including new staff are onboarded and align with the shared vision.
- Provide training opportunities for NOC leaders as well as interdisciplinary teamwork and communication training for CHWs, the PHC facility staff, and the district hospital staff within and across NOC institutions and stakeholders.
- Set up mentoring teams that mentor staff and conduct regular obstetric complication simulation training in the district hospital, the PHC facilities, and the CHWs for individual provider groups and interdisciplinary across facilities and levels of care to practice communication. Include training on respectful care, conflict management.
- Clinical mentoring teams to support reinforcement of clinical skills and competencies and case-based simulation training
- Establish standardized referral communication processes including CHW, transport, PHC and District players. Include referral form and telephone call protocols.
- Develop clearly defined standard clinical protocols and operating procedures for managing uncomplicated and complicated deliveries, referral protocols, conflict resolution, data reporting and for requesting supplies or other systems related inputs required for service delivery.

B) Performance management

- Develop method to assess progress and accountability to agree upon MOU or terms of Reference that defines the shared vision of the NOC, the goals, short and long-term objectives and target measures.
- Regularly measure the relational levels of trust, mutual respect, and shared vision held by the team (see below).
- Set up community level, district hospital, PHC facility MPDSR units to conduct maternal death

audits at each level and improve quality, monitor psychological safety and define measurable action pathways.

- Set up a district level MPDSR committee that brings the different MPDSR units together regularly to discuss challenges in the district hospital, PHC facilities, and communities that affect maternal health outcomes, and jointly discuss and adopt solutions.
- Identify high performing communities, CHWs, and facilities and recognize them at public forums in the district to encourage healthy competition between facilities.

C) Coordination

- Set up regular data reviews to review data on service provision at all levels, service outputs, and outcomes. The NOC leadership should define standards and measures. These reviews should involve participation of all stakeholder groups including the community, the CHWs, the PHC facilities, transport, and the district hospital leadership.
- Regular technical working group meetings at district level with participation of different professional groups working in each of the stakeholder groups – O&G, medical practitioners, nurses and midwives, CHWs, and community leaders, to discuss the functioning of the NOC, identify process challenges and jointly problem-solve. One option is that the technical working group becomes the NOC leadership group.
- Set up communication lines for the NOC preferably district funded with a phone number database that is available across each level and easily accessible to all.
- Implement an EMR system that has functionality for CHWs in enrolling pregnant mothers, PHC facilities in updating information on services received, and referrals, and for district hospital use.
- Where feasible, create social events in the district that bring groups across the different levels to the same physical space and can foster team bonding, and social ties.

What are relational targets for intervention?

- All stakeholders need to align on the shared vision of reducing or ending preventable maternal deaths in the district through a focus on improved prevention, recognition, management, and referral for cases complicating during labor.
- All stakeholders need to be aligned on their common objectives and have a shared understanding of each other's roles and responsibilities in achieving the district objectives towards the broader vision.
- All stakeholders must appreciate and work towards collaborative leadership, shared decision making (equitable, situational monitoring (awareness of availability of staff, supplies, services), and regular communication. This will foster trust, shared values, respect, shared knowledge and psychological safety. An environment in which all stakeholders have a voice and contribute equity to the process of improved network function.
- All stakeholders need to communicate frequently, and collectively identify challenges and bottlenecks that may be impeding their ability to carry out their roles and responsibilities and participate in shared decision-making regarding solutions to assure timely recognition and care for complicated cases.
- Once a shared decision is made on an improvement strategy, all stakeholders must understand and acknowledge their role. For example, if improved referrals is the target, then CHW must define and share their strategy for increasing community awareness of risk and understanding of transport services, the PHC providers must work with CHW to identify opportunities to strengthen early recognition, PHC providers must have opportunities to strengthen their teamwork and communication skills for a team-based approach to complication recognition and response, the PHC providers together with the DH providers need to agree on referral communication strategies and guidelines including documentation. The transport system including dispatch and drivers must work with providers to develop the communication methods to assure availability. Through this process it becomes clear the interconnectedness required to optimize care and the shared roles and responsibilities along the referral pathway.
- There needs to be a mechanism by which all stakeholders come together to safely share A space to share and discuss the progress and challenges of their collaborative efforts need to be able to assess how their collaborative efforts are contributing to achieving the goal will build trust, respect, and mutual support.
- Through a collaborative leadership model, stakeholders need to feel heard, empowered to act, and resourced to carry out their role and responsibilities.
- The process for change should be dynamic, iterative, and continuous.

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