

**Improving Transportation and Referral for Maternal Health:
Knowledge Gaps & Recommendations**
Technical Report: May 19, 2010

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Emergency referral: An Impoverished and Demanding Requisite for Maternal and Newborn survival

Referral—the coordinated movement of health care seekers through the health system to reach different types of care—is a vital and often impoverished component of maternal and newborn health (MNH) services, especially in the case of obstetric and newborn emergencies where health seekers must reach a high level of care in a small and often fatal window of time.

But achieving effective referral for maternal and newborn emergencies demands exceptional cooperation between the subsystems it draws upon. As part of the *Maternal Health Dialogue Series* the Woodrow Wilson International Center for Scholars' Global Health Initiative, in collaboration with the Maternal Health Task Force, United Nations Population Fund, U.S. Agency for International Development, and Columbia University, convened a small technical meeting on May 19, 2010, with 25 experts from five countries to extend our understanding of emergency referral, especially the coordination of emergency transportation systems that directly facilitate the swift physical movement necessary for effective referral. This report serves to capture this discussion, which featured three case studies from Bolivia, Ghana, and India along with extensive discussion of the reasons for referral's neglect relative to other MNH research and advocacy areas and strategies to move referral forward.¹

Referral & Transportation: Statement of the Problem

Referral

Establishing a responsive emergency referral system—and the transportation mechanisms supporting these referrals—demands tightly interlocking components that can quickly interact and safely transfer a woman from the site of complication onset to a definitive level of care. The window of time to make this transfer and receive emergency care is small, and if exceeded, debilitating and life-threatening. In the case of postpartum hemorrhage (PPH), women may have a window of only two hours between the onset of PPH and death. In this small period of time, the components of the referral system that need to be tightly interlocked include clinical judgment, stabilization and transfer protocols, communications technology, transportation, and cost arrangements.

This highly time-sensitive referral process is even further challenged by neonatal complications which, in some cases such as asphyxia, require virtually immediate treatment. Where referral

mechanisms have been implemented they are frequently designed for obstetric emergencies; further work on referral is clearly needed to bridge the methods in place to bring emergency care to mothers and newborns. Specifically, the time-sensitivity of newborn complications requires us to think carefully about the most effective arrangements of referral and health service structures, which will demand additional community-level services but also protocols and equipment specific to newborns to facilitate transportation to higher levels of care. Low-tech solutions, such as Kangaroo Mother Care, may be an appropriate substitute for technologically more sophisticated solutions that in some contexts may prove unsuitable or prohibitively expensive.

The transportation component of referral

Reliable transportation is often the missing link to timely and affordable emergency care. Improved road infrastructure, readily available transport vehicles (ambulances, bikes, boats, donkey carts, motorcycle ambulances, tractors, etc), and funds for fuel and maintenance costs are necessary to bridge the time between complication onset (decision to seek a higher level of care) and utilization of care at the next level of the referral chain.

Donors are often reluctant to underwrite all terrain vehicles (ATVs) and fear ambulances will be abandoned. Donors and non-governmental organizations (NGOs) should support the costs incurred to train, maintain, fuel, and manage vehicle fleets. Purchasing and utilizing terrain-appropriate vehicles will also help prolong the mechanical life of the vehicle.

The Problem, Re-stated

Described this way, emergency referral for MNH can be understood as a complex system to establish and sustain, especially in many high maternal and newborn mortality countries where the health system and public infrastructure are already weak. Indeed, emergency obstetric and newborn referral can be seen as a metric for the overall functioning of the health system, reflecting the ability of the government to marshal all subsystems and actors that contribute to the emergency referral process.

Complexity aside, emergency referral for mothers and newborns faces a challenge at a different level, and this is the ***challenge of catalyzing more coordinated and systematic efforts to address referral***. Until now, emergency referral has been “under-documented, under-researched, and under-theorized”² and our discussion identified two critical factors contributing to referral’s impoverishment: (1) the multi-sectoral dimensions of referral, and (2) the (necessarily) cross-context variation in referral systems. While these factors make referral a potentially rich area for implementation research and comparative analyses, they have prevented systematic engagement with the issue up to this point.

The multi-sectoral dimensions of referral

Emergency referral extends across a wide set of domains and expertise: while obviously a health systems issue, effective emergency transfer draws on infrastructure and public works (e.g. road development), transportation (e.g. traffic control), information and communications technologies (ICTs, e.g. mobile phone coverage), and even seemingly more removed domains such as security

and defense (e.g. emergency response). As a consequence, establishing effective emergency referral systems is “everybody’s problem, and nobody’s problem.”

The need for inputs and expertise undercuts the health sector’s ability to address inadequate and fragmented emergency referral systems: inter-ministerial and inter-sectoral cooperation and collaboration are needed to diagnose the current problems and weigh the effectiveness of possible solutions (the introduction of new vehicle fleets, the upgrading of facilities, the improvement of roads, the provision of mobile technologies, etc.).

Multi-sectoral engagement is necessary, while managing the distinctive priorities, motivations, and constraints of different agencies. We need to explore the following questions:

- How can we move beyond the health sector to work with relevant agencies/ministries? (How do these bodies currently interact? Is there an effective mechanism in place for these interactions and, if not, what would it look like?)
- Where can collaboration take place? That is, what questions can be jointly explored (e.g. can choice of roads for upgrading be the joint decision of health and public works ministries) and what levels of government can be involved in such collaboration (can such discussions happen effectively at a local level)?

In pursuing a more comprehensive and collaborative approach to referral, the need for a leading agency was also noted. The Ministry of Health—which “owns” the biggest share of emergency referral—emerges as the best candidate to leverage multi-sectoral collaboration.

Examples highlighting the positive impact of such collaboration can be found at both large- and small-scale levels. Subodh Satyawadi, Chief Operating Officer of GVK Emergency Management and Research Institute (GVK EMRI), discussed the public-private partnership (PPP) model that is the foundation of the 108 Emergency Service in India. This service, which reaches a population of 433 million across ten states and responds to approximately 11,200 emergencies per day, leverages expertise and resources across multiple agencies in the private and public sector. At the outset GVK EMRI, a private NGO, recognized the need for public participation in the creation and sustainability of an emergency service, not only from the Ministry of Health and Family Welfare but also from road departments, police departments, and other agencies. At the federal level GVK EMRI worked with the Ministry of Communications and Information Technology to acquire “108” as a toll-free number to ensure affordability requirements for its pro-poor objectives.

At a more local level public-private partnerships have also proved possible and effective. Transaid has documented the success of community-based transportation initiatives in Nigeria, which mobilize public health providers and private transportation unions to pre-arrange the price of transfers by local taxi drivers. These examples remind us of the potential of PPPs to form the basis of collaboration: referral not only requires the inputs of multiple sectors, it also stands to benefit from the combined resources and expertise of public and private spheres.

The opportunities for collaboration are particularly ripe in the ICT sector given the expanding coverage of mobile phones and the acceleration of mobile health applications with the mHealth

Alliance. In Ghana, text messaging (SMS) between physicians is free to facilitate effective and fast communication; other PPP examples exist between private phone companies and the public health sector, which may exchange SIM cards for advertising space on emergency vehicles. The application of mobile technologies to emergency referral has yet to be systematically explored and research questions abound in this area:

- How can mobile devices be integrated most effectively into emergency referral processes?
- How can the health sector collaborate with the ICT sector and private mobile phone companies?

Variations in referral across contexts

Another identified factor hindering systematic research and work on emergency referral concerns the necessary variation in referral systems across contexts. Like so many other health interventions, a “blueprint model” will not work for referral systems. Yet, the challenge to “one size fits all” is arguably amplified for a referral system, where its organizing structure must account for geography, terrain, population density, seasonality, human resource deficits, public infrastructure conditions—to name just a few inputs.

Dr. John Koku Awoonor-Williams, East Regional Director of the Ghana Health Service, highlighted some of the difficulties of generalizing referral mechanisms in the context of Ghana, where varying conditions in different regions prevent one-size solutions and instead encourage the creation of “locally appropriate referral strategies.” In the Upper East Region, ambulance and taxi models, that may otherwise suffice in urban centers, fail in many rural areas due to a lack of paved roads. Communities work locally to secure resources that are compatible with their environment: donkey-carts, tractors, and motorcycles for example are adaptable solutions organized by communities to get emergency health seekers across an initial distance and terrain barrier.

Even where distance and transportation do not prevent emergency health care access, other formidable barriers exist, and Dr. Víctor Conde Altamirano of CARE underscored the equity issues at stake in both urban and rural Bolivia. In this context, ambulances are in adequate supply and insurance covers the cost of transfer and health services. Yet, poor referral structures—notably the lack of clear communication protocols between facilities—result in unnecessary deaths. Marginalized populations have difficulty accessing emergency health services due to perceptions of quality of care (and related inter-cultural barriers) and literacy barriers that prevent effective communication of emergency birth plans. Thus, equity emerges as an important consideration for referral systems across contexts, where the metaphorical “last mile” may refer to the literal physical distance barriers that exist for many remotely-located marginalized groups, or to social barriers, such as literacy and education, that in other contexts may cut groups off from emergency services.

A vast number of choices exist in the creation of emergency referral systems, and a number of innovative solutions await further study and evaluation. In terrains characterized by extremely mountainous areas or large inland bodies of water, other modes of transportation may be more

appropriate to mobilize. In Lesotho, the Flying Doctor Service uses small aircrafts to pick up emergency patients and fly them to the nearest hospital. Other referral innovations include the introduction of way-finders or “system navigators,” such as in Bangladesh where BRAC program officers are stationed at a tertiary facility to facilitate the admittance of referred women and ensure they receive timely medical attention once in the hospital.

Ways Forward

This discussion leaves us with the stark reality that—despite many ongoing activities—referral is still an emergent subfield of MNH that requires coordination and systematic investigation. In order for this to occur, emergency referral demands (1) indicators, and (2) knowledge-sharing.

The formulation of indicators is a central activity to moving referral work forward. Above all else, it fills a gaping hole: we do not have good indicators for referral in part because the diversity of inputs and cross-contextual variation make it difficult to identify what appropriate referral targets should be. Standardized indicators are needed not only to monitor and evaluate the effectiveness of referral systems, but to create effective protocols in the first place. In a study of 3 districts in the Upper East Region of Ghana, Dr. Awoonor-Williams and colleagues found that the 69% of providers trained in emergency obstetric and newborn care (EmONC) had a solid foundation of 4.4 years training, whereas there was virtually no referral-specific training. Because of the wide variation in referral system structures, we must carefully consider how to measure effectiveness (i.e. population covered, timeliness, equity) and develop minimum standards. Standardizing indicators for referral also helps communicate and make tangible an abstract and complicated system. Finally, it enables referral work to link to global momentum and initiatives for indicators.

We end this discussion with some thoughts on knowledge-sharing: more dissemination of ongoing activities will catalyze advocacy, research, and action on this issue. Whereas case studies illuminate many of the nuances of referral systems, an integrated framework is also required that clearly articulates the problems and complexities of emergency referral for MNH. Linking with work in the newborn field, the Maternal Health Task Force and partners are in a position to promote this dissemination and collaboration, and this meeting report lays a partial foundation for the work ahead.

¹ The *Improving Transportation and Referral for Maternal Health* meeting took place on May 19, 2010, at the Woodrow Wilson International Center for Scholars (WWICS) in Washington, D.C and was jointly organized by the Maternal Health Task Force, WWICS, UNFPA, Averting Maternal Death and Disability Program (AMDD)/Columbia University, and USAID. This report attempts to capture the rich discussion generated by the following participants: Koki Agarwal, Deb Armbruster, John Koku Awoonor-Williams, David Aylward, Julie Babinard, Patricia Bailey, Ann Blanc, Victor Conde Altamirano, Etheline Enoch, Gary Forster, Allegra Giovine, Seenen Hounton, Goldy Mazia, Talia McCray, Pavitra Mohan, Susan Murray, Mike

Norman, Calyn Ostrowski, Jennifer Potts, Subodh Satyawadi, Erin Sines, Pete Sonderskov, Tim Thomas, and Defa Wane.

² Murray, Susan F. and Stephen C. Pearson. 2006. Maternity referral systems in developing countries: Current knowledge and future research needs. *Social Science & Medicine*. Vol. 62, pp. 2205-15.