

DEVELOPING MEASURES OF CARE COORDINATION FOR MATERNAL AND
NEWBORN HEALTH SERVICES IN DEVELOPING COUNTRIES: THE GAMBIA AS A
TEST CASE

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ABSTRACT

Koyejo A. Oyerinde: Developing Measures of Care Coordination for Maternal and Newborn Health Services in Developing Countries: The Gambia as a Test Case
(Under the direction of Harsha Thirumurthy)

Annually, 350,000 women die of pregnancy complications and about a million babies die during delivery in low and middle-income countries (LMICs). The healthcare system in The Gambia and in most LMICs requires a process of assigning patients to appropriate levels of care. By monitoring care coordination, lapses in the continuum of care can be addressed to improve health outcomes.

Specific aims:

1. To identify the principal components of care coordination for maternal and newborn health services
2. To develop measures of coordination of care
3. To evaluate the perceptions of feasibility of routine monitoring of care coordination

Literature review revealed that care coordination has not featured prominently in the discourse of maternal and newborn health service delivery in LMICs. Rate of transfer, and time to care were common measures in literature.

Study methods: (1) a single panel, 2-round Nominal Group Technique (NGT) for concept development and (2) key informant interviews (KIIs) to assess the feasibility of routine monitoring of care coordination in The Gambia. Audio recordings of interviews were transcribed into text and exported into WEFT QDA for data processing and content analysis.

The consensus among NGT panelists and key informants was that care coordination was essential in LMICs health systems and its monitoring is desirable. Key informants agreed that improvements in infrastructure and capacity development for health personnel were needed to support routine monitoring of care coordination. Most informants thought that data should initially be collected in regular surveys rather than through the HMIS and that a pilot study was needed.

A guiding coalition of local maternal and child health experts and civil society will lead the modification of policies and the development of new tools and processes, and communicate the benefits of the new policy to the general public. Effective care coordination is essential in a multi-tiered health system. It should be monitored and weaknesses should be addressed to improve maternal and child health survival in LMICs.

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TABLE OF CONTENTS

LIST OF TABLES	viii
LIST OF FIGURES.....	ix
LIST OF ABBREVIATIONS.....	x
CHAPTER 1: INTRODUCTION.....	1
Care coordination.....	4
Public health indicators	6
Specific Aims.....	7
Rationale for the study	8
Health Services in The Gambia	9
CHAPTER 2: LITERATURE REVIEW.....	12
Search term:.....	12
Care Coordination in Literature.....	16
Limitations of the literature search.....	19
CHAPTER 3: METHODOLOGY.....	20
Study Site	20
Key informant Interviews	23
Selection of Participants.....	24

Ethical Review	26
Potential limitations of the study	27
CHAPTER 4: FINDINGS	28
Description of study participants.....	28
Round 1 Nominal Group Technique Findings	30
Round 2 Nominal Group Technique Findings	33
Description of Key Informants	37
Findings from key informant interviews	37
CHAPTER 5: DISCUSSION.....	52
CHAPTER 6: RECOMMENDATIONS AND PLAN FOR CHANGE	62
Description of policy on routine monitoring of care coordination in maternal and child health services....	64
Policy Goals	67
Policy Implementation Plan	75
CHAPTER 7: CONCLUSIONS	78
APPENDIX I: ROUND 1 NGT QUESTIONNAIRE.....	79
APPENDIX II: ROUND 2 NGT QUESTIONNAIRE.....	85
APPENDIX III: KEY INFORMANT INTERVIEW GUIDE	91
APPENDIX IV: LETTER OF APPROVAL FOR STUDY	97
REFERENCES.....	98

LIST OF TABLES

Table 2-1: Literature search constructs and keywords	12
Table 2-2: Summary of indicators from literature review	14
Table 4.1: Suggested measures/indicators for routine monitoring of care coordination	32
Table 4.2: Main elements of care coordination sorted by rank order	34
Table 4.3: Indicators and measures of care coordination sorted by rank order	35
Table 4.4: Distribution of Key Informants by Cadre	37
Table 4.5: KII Data on Care Coordination Challenges.....	40
Table 4.6: KII Data on Care Coordination Measurement Feasibility	46
Table 6-1a: Stakeholder Analysis – Potential Policy Supporters.....	71
Table 6-1b: Stakeholder Analysis – Potential Policy Opponents	73
Table 6-2: Application of JP Kotter’s Eight Steps for Leading Change Efforts to Policy Implementation in The Gambia	76

LIST OF FIGURES

Figure 1.1: Concept Map of Healthcare Seeking Pathways	2
Figure 1.2: Map of The Gambia	10
Figure 3.1: Feedback to Round 1 NGT Participants	24
Figure 4.1: Distribution of NGT participants by occupation	31
Figure 4.2: Distribution of NGT participants by highest MCH qualification	31
Figure 4.3: NGT participants by location of most bedside clinical experience	32
Figure 4.5: World map showing current location of NGT participants	33

LIST OF ABBREVIATIONS

24/7	All day and night
A&E	Accident and Emergency Room
BEmOC	Basic Emergency Obstetric Care
BP	Blood Pressure
CEmOC	Comprehensive Emergency Obstetric Care
CEO	Chief Executive Officer
CFR	Case Fatalities Review
CR	Chart Reviews
C-Section	Cesarean Section
CSS	Client Satisfaction Surveys
DrPH	Doctor of Public Health Degree
EmONC	Emergency Obstetric and Neonatal Care
ER	Emergency Room
FIDA	International Federation of Women Lawyers
FLAG	Female Lawyers of The Gambia
GDP	Gross Domestic Product
HDSS	Health and Demographic Surveillance System
HIS	Health Information Systems
HMIS	Health Management Information System
HMN	Health Metrics Network
HR	Human Resources

IMR	Infant Mortality Rate
KII	Key Informant Interview
LMICs	Low and Middle-Income Countries
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
MMR	Maternal Mortality Ratio
MoHSW	Ministry of Health and Social Welfare
MRLT	Median Referral Lag Time
NGOs	Non-Governmental Organizations
NGT	Nominal Group Technique
NMR	Neonatal Mortality Rate
OIC	Officer -in-Charge
SOP	Standard Operating Procedure
TWG	Technical Working Group on Maternal and Child Health
UN	United Nations
VHWs	Village Health Workers
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

In recent years the attention of global and national health experts has been drawn to the seemingly intractable scourge of maternal and newborn mortality in low and middle-income countries (LMICs). Every year 287,000[1] to 350,000[2] women die due to pregnancy or childbirth complications, and about a million babies die during delivery – these are fresh stillborn babies who were alive at the onset of labor and minutes prior to delivery [3]. In addition, approximately 9 million newborns die before their fifth birthdays and about 40 percent of these die in the 28 days after birth [4].

At the beginning of the century, world leaders agreed on the Millennium Development Goals (MDGs); a package of indicators and targets that countries voluntarily set for themselves [5]. The fourth and fifth MDGs focus on the reduction of child mortality by two-thirds and maternal mortality by three-quarters respectively between 1990 and 2015 [1, 6]. In spite of the heightened attention and additional funding for maternal and newborn health services brought about by the fourth and fifth MDGs there has not been a commensurate reduction in maternal mortality ratio (MMR) and neonatal mortality rate (NMR) in most African and South East Asian countries. While there has been a downward trend to both MMR and NMR, most countries are not on course to meet their MDG targets [5, 7].

Childbirth affects the health of the mother and the newborn. Access to skilled attendance at delivery, and prompt access to emergency obstetric and newborn care services are therefore vital to

achieving significant reductions to MMR [8] and NMR [9]. Universal access to family planning services will also prevent unwanted pregnancies and thereby reduce the number of women at risk of maternal death and minimize the need for elective abortions [10]. When the entire continuum of care from pre-pregnancy, pregnancy, labor and delivery, to postpartum maternal and newborn care is characterized by quality and prompt access then maternal and newborn mortality will both reduce significantly.

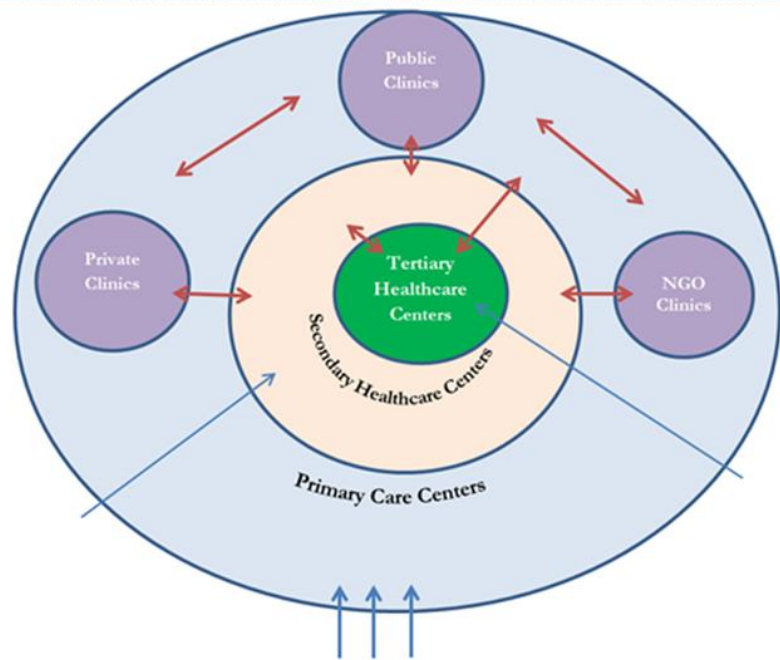
At the end of the “Health for All by Year 2000” campaign of the 1980s and 1990s the World Health Organization (WHO) issued its

influential report on health systems [11]. The report highlighted the need for the strengthening of national health systems to deliver quality health services but it failed to give guidance as to how services will be coordinated to achieve it. This omission is even more glaring because WHO and others,

starting with the Alma Ata Declaration, championed a primary health care system - a multi-tiered health system - as the ideal framework for the achieving health for all [12].

Most developing countries operationalize the primary health care concept as a pyramidal hierarchical healthcare delivery model with health posts and clinics at the base of the pyramid, health centers as second tier facilities and at the top of the pyramid are hospitals and specialized centers

Figure 1.1: Concept Map of Healthcare Seeking Pathways



Blue Arrows : Entry into the health system
Red Arrows: Pathways within the health system

[13]. Care is to be first sought at the primary care level and more severe cases are to be referred to secondary and tertiary level health facilities as severity demands (refer to Figure 1.1). Inherent in this design is the need for strong collaboration between all health facilities in the system.

A multi-tiered fragmented health system is inherently challenging, especially in developing countries where a sizeable proportion of patients may be unlettered and unsophisticated in the urban environments of many referral health facilities. Apart from the complexities of the health system, there are other factors that might limit access to and use of health services such as geographic inaccessibility[14], the financial cost of services, the cost of transportation or the loss of income due to time spent in a health institutions[15]. Cultural[16], language, communication and educational barriers[17] may also contribute to poor utilization of health services.

Successful delivery of care in a multi-tiered health care system will depend on how well care is coordinated up and down the tiers of the health care system. This is especially true for obstetric care because of the unpredictability of pregnancy complications [18] and the potential for rapid deterioration of the health of the mother or the baby if appropriate care is delayed.

In 2010 WHO released the World Health Report focusing on indicators for measuring the “building blocks” of health systems[19]. This report laid out indicators for several components of the health system but coordination of care did not feature. Murray and Pearson (2006) provide the most comprehensive literature review on maternity referral in the developing world [20]. Although they lamented the dearth of literature on the implementation of referral services, nevertheless their review led them to surmise that the “likely requisites for successful maternity referral systems include: a referral strategy informed by the assessment of population needs and health system capabilities; an adequately resourced referral center; active collaboration between referral levels and across sectors; formalized communication and transport arrangements; agreed setting-specific protocols for referrer

and receiver; supervision and accountability for providers' performance; affordable service costs; the capacity to monitor effectiveness; and underpinning all of these, policy support". Clearly, to be successful, the myriad of processes involved in referrals and other aspects of maternal and newborn care services must be coordinated.

In 2002, Mali established a national maternity referral system. Uncontrolled 'before and after' evaluation after year four of the program demonstrated that the number of women accessing emergency obstetric care services had doubled, cesarean sections for maternal indications had tripled, and the risk of maternal mortality was halved in women who were referred compared to those not referred [21]. Efficient coordination of maternity referrals and other forms of care will result in significant reductions in maternal and newborn mortality.

Care coordination

The concept of coordinated care is difficult to define. In the context of quality improvement initiatives in the US health system, MacDonalds et al (2007) defined care coordination as, "The deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of health care services. Organizing care involves the marshaling of personnel and other resources needed to carry out all required patient care activities, and is often managed by the exchange of information among participants responsible for different aspects of care"[22].

Even though care coordination may be difficult to define, its effects are describable. From my clinical experience some key elements of coordinated care are readily apparent:

- 1. Remote support for clinical care staff in rural areas and in lower level health facilities.**

Rural health facilities and lower level health facilities tend to have lower level human

resources and limited equipment. The more experienced staff in urban and higher level facilities should provide guidance to those in poorer resourced facilities. Where feasible this should occur in real-time if necessary. Some pre-referral care could be administered under the instruction of the receiving team. Remote clinical support will reduce inappropriate referrals and improve compliance with referral instructions.

2. **A clear expression of the need for transfer of care to the patient and appointed relatives.** Patients should know why they are being referred up or down the hierarchy of facilities and they should be clearly instructed as to the severity and prognosis.
3. **Advanced notice and prepositioning of resources.** The receiving health facility should be notified ahead of time as to the arrival of the patient and the resources needed for the care should be prepositioned before the patient arrives.

This notion underscores the need for up-to-date awareness of availability and readiness of health system resources at different health facilities. No one should be referred to a health facility unless the referring team knows that the requisite service is available there.

4. **The handoff from one team to the other.** A formal handoff process has to be established between the referring and the receiving provider
 - a. Transfer of care to named care provider – as much as possible, patients must be referred to a named care provider in a facility rather than to a health facility. In situations where communications technology permits, the receiving provider should speak with both patient and their families before referral occurs

- b. Maintaining a chain of custody – the formal handoff establishes a clinical chain of custody for the patient with a clear resource person at all times
5. **Counter referral.** At the end of acute care patients need to be sent back to their primary care center with clear instructions and feedback to their care provider who made the initial referral.

Public health indicators

Health measures or indicators are quantifiable descriptors (a number, proportion, percentage or rate) of population health. Indicators tell the extent to which planned activities have been conducted (input, process and output indicators) and the extent to which program goals have been achieved (outcome and impact indicators)[23]. To be useful, it must be feasible to reliably collect data for computing indicators throughout the population.

Types of indicators that could be considered for monitoring care coordination:

- **Input indicators** – these are to measure the availability of resources needed for the implementation of routine care coordination e.g. people, money, equipment, policies, etc.
- **Process indicators** – these are to measure whether planned activities to enable care coordination took place e.g. holding of meetings, revision of data collection tools, the conduct of training courses, development and testing of health education for medical records officers, logistics management etc.
- **Output indicators** – these are to measure the immediate effect (in both quantity and quality) of the processes done to enable care coordination e.g. the number and categories of health

providers trained in case management or communications skills, the number and categories of health providers trained to use revised data collection tools etc.

- **Outcome indicators** – these are to measure the objectives of care coordination i.e. it focusses on the reason why care coordination was implemented. For example, the proportion of women complying with referral advice, the percentage of cases with pre-arrival notification at referral centers etc. These tend to be coverage measures and are often measured through surveys. Intermediate outcome measures that track intermediate changes in the pathway to the outcome could be identified because the desired outcome might only come later e.g. the percentage of women recalled for a clinic could be an intermediate outcome measure for an intervention to increase the number of women who receive treatment for complications.
- **Impact indicators** – these are to measure the health status of the target population e.g. reduction in maternal mortality ratio, reduction in morbidity rates etc. These will generally be population level changes in health status.

Specific Aims

Specific Aim 1: To identify the most important or principal components of coordination of care in the context of the delivery of maternal and newborn health services in low and middle-income countries (LMICs)

Specific Aim 2: To develop measures of coordination of care for monitoring and evaluation of maternal and newborn health services.

Specific Aim 3: To evaluate the perceptions of the feasibility of implementing a framework for routine monitoring and evaluation of care coordination.

Rationale for the study

Access to maternal and newborn health services is critical to the reduction of maternal and newborn morbidity and mortality. In pregnancy, childbirth and the early neonatal period there are several conditions in both the mother and the baby that could rapidly evolve from mild inconsequential morbidities to severe life-threatening conditions. It is for this reason that WHO and most experts recommend that all pregnant women and their newborns ought to be under the care of a “skilled birth attendant”[24, 25]. A skilled attendant working in an enabling environment is expected to support women through the prenatal period, childbirth and up to 42 days after delivery. During this period the skilled attendant (usually a midwife), should promptly recognize the onset or presence of complications, manage or refer the patient to an appropriate level of care.

It is impractical to have a dedicated midwife for every pregnant woman in most LMICs; the health system therefore situates the skilled attendant in a health facility where patients can go to seek care. Ideally, once a patient is within the health system her care should be under the supervision of someone who is sufficiently skilled to obtain the best possible care for the patient at whatever level of care within the health system. This requires that care is coordinated within the health system.

In reality, lower level health facilities tend to be poorly staffed and equipped thus necessitating frequent referrals of patients to higher level facilities. There are many anecdotal reports of women sent off to hospitals and health centers in the city with a referral note but without the service of an ambulance. Without assistance, patients and their families have to navigate the unfamiliar streets of big cities and the unfamiliar settings of bigger hospitals and health centers. This scenario is a common contributor to service utilization delays or outright non-compliance with referral instructions. Mamady Cham et al (2005) in their qualitative study on access to emergency obstetric

care and maternal mortality in The Gambia cataloged a number of health systems failures that result in the death of women with obstetric complications[26].

Whereas it is customary to isolate a referral system as a sub-system of the larger health system for study and analysis, a holistic approach is proposed in this study. Indeed, the health system needs to be coordinated with health activities and interventions in the community. However, the focus of this study will be limited to activities from arrival in a health facility to exit from the system.

By measuring and monitoring care coordination it will be possible to identify critical lapses in the continuum of care that if addressed could dramatically improve maternal and newborn health outcomes. When public health policy officials are able to effectively measure and monitor care coordination across levels of the health system they will be equipped with information to effect changes to improve the system and the overall performance of the health system.

Health Services in The Gambia

The Gambia is a West African country that is bordered to the north, south and east by the Republic of Senegal and to the west by the Atlantic Ocean. The River Gambia runs right through the middle of the country from its origins at the Futa Jallon Highlands to its Atlantic egress (refer to Figure 1.2). The Gambia has experienced several round of electoral politics since its return to civil rule in 1997, however, participatory democracy in The Gambia continues to grapple with several challenges.

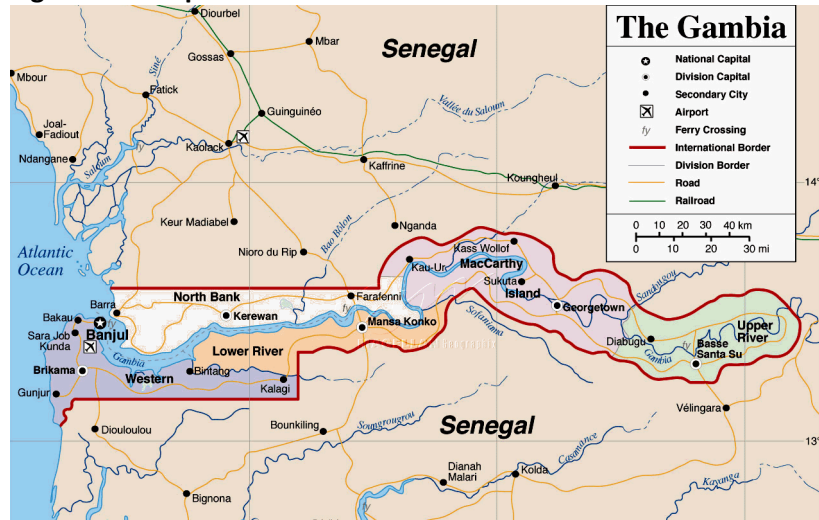
In spite of these challenges the government has made considerable investments in public health services. Health care expenditure accounted for 4.4% GDP in 2011 [27]. At this level, The Gambia spends much more on healthcare than some of its richer neighbors.

With the maternal mortality ratio (MMR) estimated at 730 maternal deaths per 100,000 live births and the infant mortality rate (IMR) estimated at 75 infant deaths per 1000 live births in 2011[28] the

relatively high proportion of government revenue spent on health care has not resulted in commensurate improvements in maternal and newborn survival. The Gambia unlike many of its neighbors has a relatively high uptake of maternal health services; 74 percent of expected births occurred in health facilities in 2012[29].

The recent nationwide health facility survey[29] revealed that all hospitals and major health centers were linked by motorable tared roads and all health facilities were covered by at least one mobile phone network. Barring a few sites with inadequate numbers of midwives

Figure 1.2: Map of The Gambia



Source: <http://www.gambia.gm/Statistics/images/THGAMBIA.gif> accessed April 17, 2014

and doctors, most hospitals and health centers had sufficient human resources, equipment and supplies for the delivery of maternal and newborn health services. Again, in spite of government’s investments in human resources and infrastructure, the high morbidity and mortality experienced by pregnant women and their newborns remains intractable.

Significant disparities in health outcomes for mothers and newborns exist in The Gambia and it is of great concern to both the political leadership of government and leaders of organized civil society; MMR is estimated to be two-fold higher in rural areas than urban areas and under-five mortality is three-fold higher in Lower River Region than Banjul Region [28, 29].

Health services in The Gambia are delivered through the primary care model as described earlier. The public health system provides most health services and some services are provided by Non-

Governmental Organizations (NGOs) and the private sector. Most of the major referral hospitals are located in the urban areas around the Atlantic coast while 60 percent of the population resides in rural areas. As a consequence of this distribution, patients need to move westwards from their rural clinics and minor health centers to referral hospitals and then return eastwards to their communities.

Some maternal and newborn health conditions demand immediate care by a highly skilled health worker, some can wait for weeks, and others that were initially evaluated to be inconsequential on the short run may suddenly become life threatening. The unpredictability of maternal and newborn health conditions coupled with the inherent fragmentation of health services in a primary healthcare model underscore the importance of care coordination for improving the survival of women and newborns.

There is a consensus among maternal health experts that about 15 percent of pregnancies are associated with a direct maternal complication[30]. With a crude birth rate of 46 per 1000 population and a national population of 1.79 million[31] it is estimated that 82,340 women will be pregnant and 12,351 may suffer from direct obstetric complications necessitating coordination between levels of care.

The current health management information system (HMIS) in the country doesn't capture any data elements on care coordination. It is currently impossible to know the health outcomes of pregnant women and newborns, especially if they received care for complications at different levels of the health system.

Routine monitoring of indicators of care coordination in maternal and child health services will provide critical data for the improvement of service delivery and the improvement of health outcomes for mothers and their newborns. The data and subsequent reports will permit health care providers to institute evidence-based reforms.

CHAPTER 2: LITERATURE REVIEW

A literature review was conducted to assess how care coordination has been conceptualized in maternal and child health literature in low and middle-income countries.

Literature search was started by laying out themes and alternative themes of the research question on a table (see Table 2.1 below). The table enabled the creation of a search term.

Table 2-1: Literature search constructs and keywords

Measurement Keywords		Process Keywords		Outcome Keywords
<ul style="list-style-type: none"> • Measures • Indicators 	and	<ul style="list-style-type: none"> • Care coordination • Referral • Linkage to care • Integrated services 	and	<ul style="list-style-type: none"> • Maternal and newborn health • Maternity • Labor and delivery • Childcare • Emergency obstetric care • Emergency newborn care

Search term:

("measures" OR "indicators") AND ("Care Coordination" OR "referral" OR "linkage to Care" OR "Integrated services") AND (maternal OR newborn OR maternity OR "Labor" OR "Labor and Delivery" OR "childcare" OR "Emergency obstetric care" OR "Emergency newborn care")

The literature search term was developed and applied to PubMed and Web of Science. These are two large repositories of peer-reviewed academic literature. The searches were kept broad because

subjects under review are well-established practices in developed countries. Studies conducted decades ago in developed countries could be relevant to developing country health systems today. Similarly, geographic location was not used as a filter because lessons learned from developed countries could be adapted for developing countries.

PubMed

The initial search yielded 983 papers. When the search was limited to human subjects and studies with abstracts the yield went down to 902. Additional limits to English language papers and papers with full text yielded 722 papers. Abstracts of 722 papers were exported to Endnote citation manager.

Web of Science

The same search terms were applied for the Web of Science search. The initial search yielded 406 citations. Limiting to English language articles yielded 395 citations.

When the articles from both databases were combined into an EndNote file there were 278 duplicate citations. Altogether, 839 unique citations were obtained from both databases. Given the high yield from the search it was decided that further search in other databases was unlikely to yield more relevant articles.

The titles of the 839 citations were reviewed to eliminate articles that were unrelated to care coordination or maternal and newborn health. The review of titles yielded 116 citations that were related to the subject matters under review. Abstracts for these 116 citations were retrieved and reviewed. Abstracts were read to include studies applying both qualitative and quantitative methods that might have measures of care coordination. Commentaries, editorials, and reports of case studies and case series were excluded because they were unlikely to focus on care coordination.

After reviewing titles and abstracts, articles from 21 citations from 1981 to 2012 were retrieved and reviewed. They were mostly uncontrolled observational studies reporting on projects in both developing and developed countries. There were two randomized clinical trials [32, 33], five were based on the secondary analysis of routine data [34-38], one systematic review [18] and there were 3 qualitative methods studies [39-41] (refer to Table 2.2).

Only 2 of the 21 studies reviewed used the term “care coordination” [37, 42] but all 21 implied several dimensions of care coordination. The conceptual framework upon which studies and delivery of maternal and newborn studies were based appears to presume that care has to be coordinated but no studies were found that specifically addressed it. The only study [42] that focused on care coordination was from Social Work literature. All the 21 articles reviewed focused on different components of the building blocks of the health system without paying attention to how the components work together and what makes them work together.

Table 2-2: Summary of indicators from literature review

Type of indicator	Indicators and source articles	Comments
Input Indicator or indicators of resource availability	<ul style="list-style-type: none"> • Availability of basic services • Screening test • Basic Emergency Obstetric Care (BEmOC) resources • Intrapartum care • General medical services • Anesthesiology resources • Human resources • Clinical protocols[32] 	The proportion of facilities that are providing assigned services or that have specific resources could be a function of how well services are coordinated.
Process Indicator	<ul style="list-style-type: none"> • Referral rate = number referred as a function of expected complications[34, 35, 39] • Transfer rate = number of intrapartum cases transferred to another facility[38, 43] • Hospital transfer rate [40] • Cause-specific transfer rate=percentage of intrapartum transfers attributable to a condition[43] • Incidence specific transfer rate=percentage of 	Referral /transfer rates had several definitions in the articles reviewed. They could be influenced by demography and risk profile of the client population, the distance to the referral center, mechanisms of transfer, definitions and diagnostic criteria and the clinical practice [43]. Therefore, interpret with caution.

Type of indicator	Indicators and source articles	Comments
	women with condition who were transferred[43]	
	• Time in ER or Waiting time (admission to doctor's evaluation) [44-46]	Time is of the essence in obstetric and newborn emergencies. Waiting time for procedures and transit time between facilities can be greatly reduced if care is coordinated
	• Time to transfer to ER or to referral center or Mean transport time between facilities[44, 45]	
	• Time to special investigation or C-Section decision to delivery interval[44, 45]	
	• Time to transfer acceptance[46]	
	• Percentage of hospital deliveries with complications referred-in [47]	Bailey et al (2005) suggest it highlights aspects of the functioning of the larger health system and of the community hospital relationship
	• Mean rate of calls to pediatricians or obstetrician or Frequency of calls from community to nurse[36]	The frequency of calls for assistance has to be interpreted within the context of care delivery. Inexperienced first level providers may make more calls or the lack of resources may necessitate frequent calls for assistance.
	• Proportion of non-emergency calls to nurses [36]	
	• Waiting times for nurse call back [36]	Compliance with referral could be a function of care coordination or a function of trust in the quality of care in the referral center.
• Referral compliance rate[45]		
Outcome/ Impact Indicator	• MMR or Institutional MMR or Maternal mortality reduction in referral center [32, 38, 39, 48]	Population-based MMR is estimated from expensive and laborious surveys in developing countries. Institutional maternal mortality rates are obtainable from routine service data but interpretation in the context of care coordination is not clear. Murray et al (2001) suggested MMR reduction in referral centers and perinatal outcomes in peripheral facilities.
	• Case fatality rate or Complication specific fatality rate [32, 38]	
	• Fetal outcome or Maternal outcome, Perinatal outcomes in peripheral facilities e.g. fresh stillbirth rate [32, 38, 45]	
	• Outcome of intrapartum referrals, Outcome post transfer [35, 44]	
Miscellaneous	• Proportion of births in emergency obstetric care facilities or coverage or Distribution of births across level of facility and population coverage of maternity services [38, 47]	Met need (proportion of expected complications treated) is a population-based estimate that can be monitored by district health managers but may be difficult to use by health facilities. At the institutional level elevation of C-Section (or other procedure) rates should trigger a review to confirm that there is no inappropriate use of procedures.
	• Met need or Use of emergency obstetric care facilities by women with complications [38, 47]	
	• C-Section rate or Assisted delivery rate or Blood transfusion rate or Hysterectomy rate [32, 38, 47]	Some of the articles raised the issue of inappropriate referrals and needless use of higher level facilities [38, 41].These are unaffordable wastes to the health system and should not happen if care is coordinated.
	• Inappropriate use of Comprehensive Emergency Obstetric Care (CEmOC) level = number of uncomplicated self-referrals as a proportion of referrals or total deliveries • Inappropriate referral rate = referral without complication [38]	

Care Coordination in Literature

Trute et al (2008) and Bethell et al (2011) were the only two articles that used the term: “coordination of care” [37, 42]. They wrote from the perspective of delivering social welfare services to children and on the financing care for children with special health care needs respectively. The social work approach caters for children with serious health challenges that often require the services of a wide range of professional, programs and agencies; parents and family can feel overwhelmed due to service fragmentation and inefficiency.

Whereas Edwards and Roelofs (2005) implied care coordination in their description of the safe motherhood Initiative as “a global effort to decrease illness and death associated with pregnancy and childbirth, focuses not only on provider competencies but also on the importance of community participation, collaborative relationships among health workers, supportive supervision, a strong communication infrastructure, decentralized management and problem-solving and political support” [49] their approach to designing a comprehensive referral system might have been different if they treated referral as a component of care coordination; none of the 7 key components of their comprehensive referral model system addressed care coordination directly.

Vogt et al (1981) demonstrated the lifesaving potential of improved care coordination in their study of the impact of a regional infant dispatcher service on newborn outcomes in Southern California [50] but they did not attribute the success of their project to coordination of care.

No definition of care coordination was found in the reviewed articles but Trute et al (2008) in their review of case management literature highlight some important concepts [42]. A coordinated care “provides information, advice and counseling and links service recipients with needed resources”; and “meets the needs of consumers with complex service needs, and has been recognized as the

most effective strategy for assisting and empowering consumers as they negotiate multiple service delivery systems”.

The successful delivery of maternal and newborn health services requires complex multi-faceted interventions and behavioral responses from service recipients. Dumont et al (2009) conducted an RCT of a multifaceted intervention to improve the delivery of emergency obstetric care services but coordination of care did not feature in their analytical framework in spite of the fact that many of the successes or failures of interventions in their study could be attributed to the presence or lack of care coordination.

Measures of Care Coordination in Literature

Many of the articles reviewed used measures that could be adapted for monitoring care coordination. On Table 2 the relevant measures of care coordination were classified into input, process, and outcome indicators and a miscellaneous category of indicators.

Some researchers framed coordination of care as a component of quality of care and included care coordination as a component of their composite index of quality [37]. A composite index of care coordination for maternal and newborn health services could be a valuable tool for comparing one facility to the other and for monitoring trends in a facility. The challenge is in the determination of the principal components of such a composite measure in LMICs.

Referral or transfer rate featured prominently in many of the articles reviewed (refer to Table 2).

Referral or transfer rates - the proportion of all cases that are referred - are easy to compute. Such a rate is revealing about the capacity of the health facility to treat certain diseases but fails to measure how care is coordinated. While some defined referral or transfer rate on the basis of transfer between health facilities others considered home to hospital transfers. Some also made distinctions

based on acuity of requisite care. Kempley and Sinha (2004) classified transfers into 3: short-term (non-urgent), elective and urgent while Amelink-Verburg et al (2008) classified referral into non-urgent and urgent. They highlight the need for clarity in the type of referral under review because different types of resources may be needed for the different types of referral. Similarly, the referral rate is dependent on the context in which care is being provided. Ahluwalia et al (2010) and Amelink-Verburg (2009) had different interpretations of the referral rate; the former implying that higher rates are better because it signifies improved access to referral services in Tanzania while for the later, less is better because higher referral rates are associated with poorer quality care by patients in Australia, Sweden and the United Kingdom.

Time also featured as an important component of care coordination. Obstetric and newborn emergencies tend to be rapidly fatal; the timeliness of intervention is often an important determinant of survival. Time in the emergency room (ER), time from one facility to the other and time to the onset interventions are some of the various time indicators in the studies reviewed. While time could be a good measure in western health systems, the poor documentation of time and dates in many health facilities could make time an impractical measure of care coordination in LMICs.

Lattimer et al (1998) used maternal mortality as their outcome but maternal mortality is slowly responsive to interventions and not suitable for immediate or medium-term monitoring of care coordination.

Most of the articles in the miscellaneous category on Table 2.2 were essentially service utilization indicators. They have to be interpreted with reference to the stated maternal and child health policies of the government regarding access to care, financing of maternal and child health services, authorized services at each level of care etc.

Limitations of the literature search

The poor yield of articles addressing care coordination in spite of the very broad limits set for this literature search suggests that care coordination has not featured significantly in maternal and child health services research. Perhaps more articles focusing on care coordination could be retrieved by a purposeful search of social work, child disability care and adult care literature. Other keywords such as integrated services and safe motherhood could help expand the search but it is unlikely that expanding the search within maternal and child health literature will yield significant numbers of articles on care coordination. Studies with an implementation science focus [51] may also better address the complex nature of maternal and newborn health service delivery.

CHAPTER 3: METHODOLOGY

Study Site

Farafenni is a major market town in the North Bank East Region of The Gambia. It hosts the Farafenni HDSS that follows up a community of about 47,000 people in rural Gambia [52]. The health, residency and socio-demographic status of all residents are monitored and documented. In particular, attention is paid to the observation of pregnancy and child health outcomes. The North Bank East Region of The Gambia was an ideal setting for this study because several studies occur in the HDSS sites every year. Residents of the North Bank East Region and their health service providers are quite familiar with hosting researchers. In addition, health facilities in an HDSS site will be the most appropriate setting in which to pilot the routine collection and reporting of measures of care coordination if it becomes public policy.

Data collection for the study proceeded in two phases. In the first phase, a Nominal Group Technique study was conducted with global health experts for concept development and in the second phase key informant interviews were held with key informants in the Ministry of Health of The Gambia to assess their perceptions of introducing routine reporting of care coordination measures.

Nominal Group Technique

The Nominal Group Technique is a structured small group process by which each group member is allowed full participation without hindrance by other group members. It takes advantage of the creative flow of ideas associated with brainstorming while avoiding the disadvantages of dominant voices and social inhibition that might be associated with group interaction[53]. It is a means of collating expert opinion where little evidence exists [54]. The anonymity of participants enables the free flow of ideas and opinions that may or may not conform to prevailing professional or institutional worldview. The NGT addressed Specific Aims 1 and 2 of the study i.e. to describe and to list the principal components of care coordination, and to suggest measures of care coordination. Coordination of care has not featured prominently in global maternal and child health literature. Consequently, there is no clear understanding of what it is and how it can be measured.

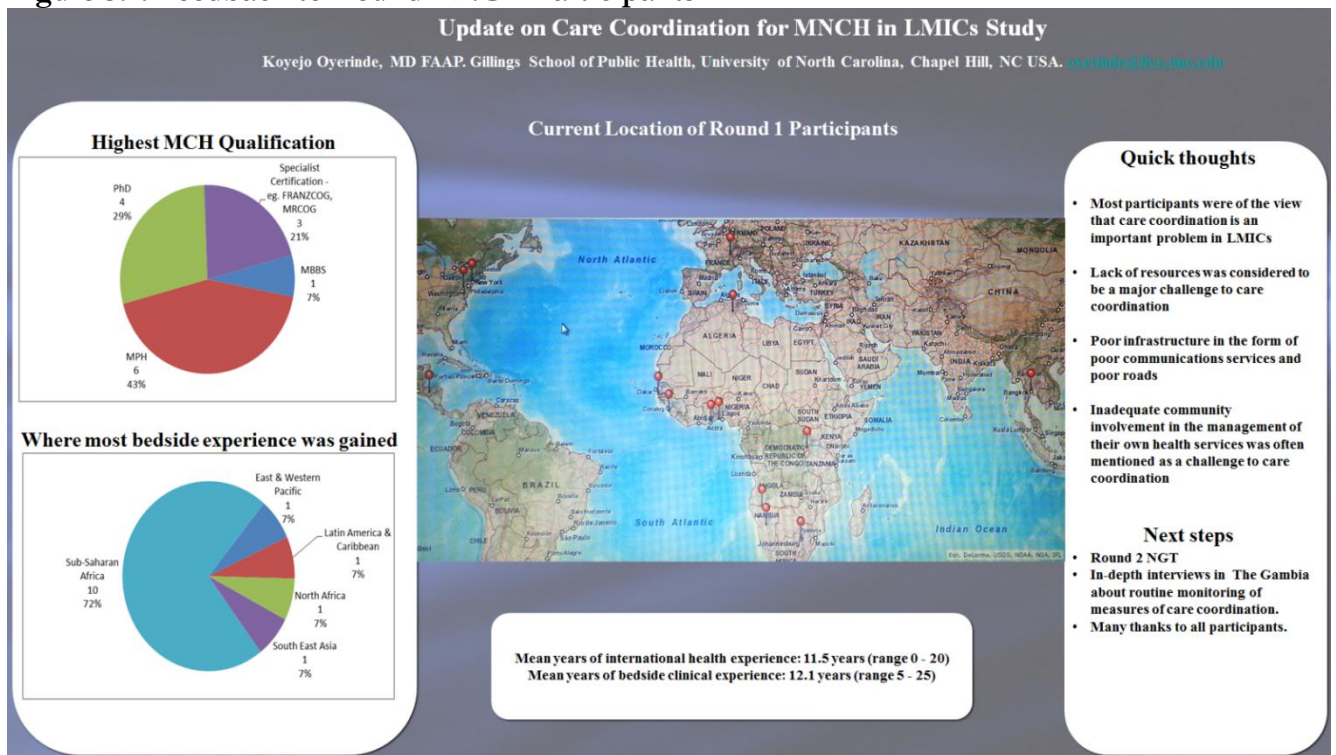
In October 2014 a web-based platform was used to send invitations to 20 maternal and child health experts in UN health agencies, International NGOs and in ministries of health in the Gambia, Sierra Leone and Ghana. Invitees were selected because of their subject matter expertise and their many years of maternal and child health work in low and middle-income countries. The ministries of health of Ghana and Sierra Leone were selected because of the similarities of their health care systems to the Gambia's. An invitation was sent out and the web-based platform automatically sent out weekly reminders to those who were yet to respond to the survey. By the end of the third week, there were 16 respondents and 4 non-responders. Of the 16 responders, 2 expressed their inability to participate due to lack of time. In the end, 14 maternal and child health experts completed the Round 1 NGT.

The Round 1 NGT questionnaire presented vignettes of poor coordination to participants to focus their thoughts on care coordination in low and middle-income countries. Participants were then

asked to define or describe care coordination, list five of the important elements of care coordination and relevant indicators (refer to Appendix I).

In November 2014, a summary of Round 1 NGT findings was presented to participants in Round 2 for potential revisions and ranking. The invitation to Round 2 NGT was limited to the 14 Round 1 participants. A chart (refer to Figure 3.1 below) to provide a summary of the Round 1 NGT accompanied the invitation to the second round.

Figure 3.1: Feedback to Round 1 NGT Participants



After an invitation and a reminder, Round 2 was closed because 12 of the 14 invitees had responded and most of the responses were similar to their Round 1 opinions. A detailed presentation of findings in both NGT rounds will be presented in Chapter 4.

The Round 2 NGT questionnaire offered participants a chance to see a summary of the opinions that they and their peers had made; they also could suggest modifications to the emerging concepts of care coordination and its measures (refer to Appendix II).

Key informant Interviews

Key informant interviews permit the researcher to develop an understanding of the respondent's views about a question. This method is particularly suited to situations in which the respondent might not want to speak openly about the subject matter. There is currently no policy on routine monitoring of measures of care coordination in The Gambia. Consequently civil servants may not want to commit themselves for or against the policy until they are more certain of the contents of such a policy.

The perceptions of the feasibility of the routine monitoring of the measures of care coordination suggested by NGT study participants were explored through key informant interviews. The participants were interviewed on their perceptions of care coordination and the feasibility of introducing routine reporting of care coordination measures. In addition the perspectives of participants on the mechanisms and resources that will enable routine monitoring of the indicators of care coordination were collected.

The interview guide (refer to Appendix III) started with a presentation of the top five components of care coordination as ranked by NGT round 2 participants. Interviewees were asked for their comments. Afterward the list of measures of care coordination suggested by NGT round 2 participants was presented to interviewees.

The interviewer elicited the perceptions of the feasibility of introducing the measures into the routine HMIS. The perceptions of feasibility were based on adaptations of five of the eight Bowen et al (2009) domains of feasibility[55]:

- Acceptability – the extent to which the suggested measures of care coordination are suitable, satisfying, or attractive to health workers, data collators and central level health surveillance officers
- Practicality – the extent to which the measures can be carried out with intended participants using existing means, resources, and circumstances and without outside intervention
- Adaptation – the extent to which the measures will perform when changes are made to the suggested format
- Integration – the extent to which the suggested measures can be measure be integrated within the existing health management information system (HMIS)
- Implementation – the extent to which the suggested measures can be successfully and sustainably delivered to intended participants in some defined, but not fully controlled context. This domain will explore the need for additional resources to enable implementation.

Selection of Participants

In December 2014, 21 key informant interviews were conducted with key informants in the North Bank East Region of The Gambia and also at the level of the central government in Banjul, The Gambia.

Health care providers generate service data, medical records officials collate the data and send same to the district and central HMIS offices where the data are analyzed and presented as reports. The feasibility of any policy on the routine monitoring of indicators will depend on these 3 groups of health workers: health care providers (mainly nurses, midwives and doctors), medical records staff in health facilities and District /Central level HMIS officials.

Typically, primary care level facilities in The Gambia had one or two enrolled clinical nurses or midwives and a community health nurse with preventive and outreach functions was co-located on the premises. All clinical nurses and public health nurses were selected for interview if they were on duty at the time of the visit to their health facilities. Seven interviews were conducted with care providers at the primary care level. There were no medical records officers stationed in primary care level facilities.

Secondary level facilities were called health centers. They tended to have more health workers and maternal and child health services were led by state registered nurse-midwives. The registered nurses and midwives on duty in maternity on the day of the visit were interviewed. One of the health centers also had a medical records officer on staff. In total six nurses and midwives and one medical records officer were interviewed at the secondary care level.

The tertiary care level is the domain of hospitals. AFPRC General Hospital, Farafenni is the only hospital in the North Bank East Region. The medical officers on duty in the maternity and the pediatric wards were interviewed. In addition, the hospital clinical supervisor (compares to a US nurse practitioner with oversight of all clinical activities in the hospital) and the medical records officer were also interviewed.

At the central level, a senior official in charge of the HMIS, a former clinician now in the public health research unit and a senior official of the Family Health Directorate were interviewed.

Interviews were held in English, digitally recorded and later transcribed into Microsoft Word files. A native speaker of West African English listened to all the audio files and typed the data verbatim.

The transcripts were imported into Weft QDA[56] – a qualitative analysis software for analysis.

Analysis of Data

Quantitative data from the NGT study in the form of ranks and scores provided by the panel of experts [54] were entered into Microsoft Excel worksheets for processing. By ranking, the priorities of the panel of experts emerged.

Qualitative data were generated from key informant interviews. Inductive content analysis was conducted by reading the transcripts several times to identify recurring themes, patterns and meanings in the data that enabled a deeper explicit or implicit understanding of their perceptions. Codes were assigned to relevant text segments with recurring, dominant or significant meaning. Similarities and differences across subgroups (e.g. service providers vs medical records staff, tertiary level vs secondary or primary level staff etc.) were explored. Codes included both a priori codes (based on prior data from the NGT, literature review, and prior understanding) and inductive codes (emerging concepts and in vivo codes). The presence of co-occurring concepts and linkages between categories were identified and highlighted.

Ethical Review

Ethical review for the protocol was sought and obtained from the Institutional Review Board of the University of North Carolina at Chapel Hill. In addition, in October 2014 the study protocol was presented to the Ministry of Health and Social Welfare of the Government of The Gambia in a request for approval of the study and ethical review. In December 2014, the study protocol was orally presented and discussed at a meeting with Ministry of Health and Social Welfare officials. A letter of approval for the study was issued in cognizance of prior ethical review by the University of North Carolina Institutional Review Board and the consideration that participants would only be health workers and the exercise could be treated as an administrative review of the health system. All participants were thoroughly briefed about the study before informed consent was obtained.

They all signed an informed consent sheet, a digital image of it was taken and participants kept the original. Photocopying services were limited in the study area.

Potential limitations of the study

The study employed two qualitative methods to garner the diversity of opinions on study objectives. Although participants have been selected widely to increase the diversity of opinions, findings cannot be generalized because they are not a representative sample. Nevertheless, the findings could be used to generate hypothesis for other studies.

CHAPTER 4: FINDINGS

Description of study participants

Most of the NGT panelists had both bedside clinical experience in low and middle-income countries as well as global health experience. The mean number of years of international experience was 11.5 years (range 0 - 20) while mean years of clinical experience was 12.1 years (range 5 - 25). Out of the 14 NGT panelists 7 were obstetricians, 4 were public health experts, 2 were medical officers and one was a midwifery tutor (refer to Figure 4.1).

Figure 4.1: Distribution of NGT panelists by occupation

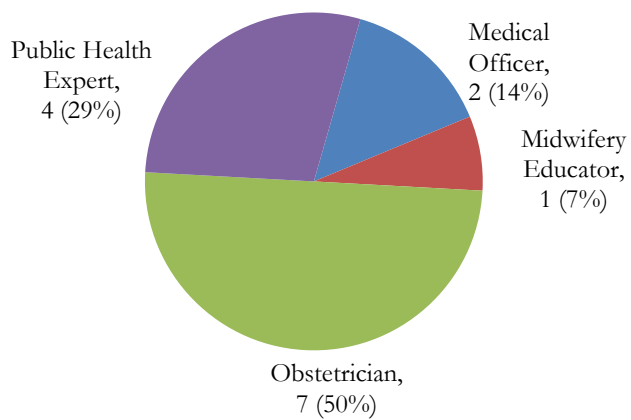


Figure 4.2: Distribution of NGT panelists by highest MCH qualification

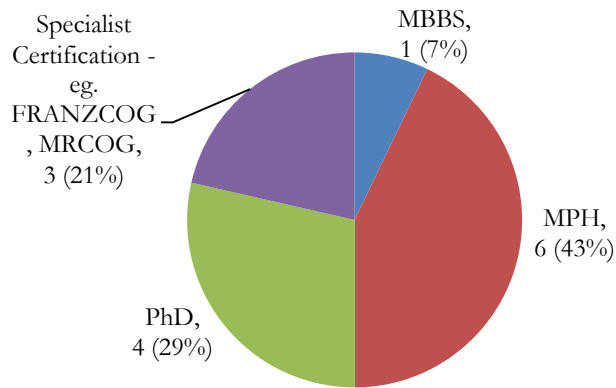
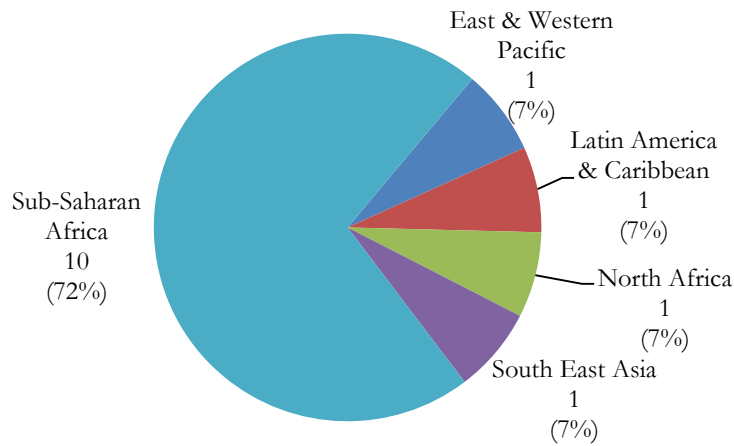


Figure 4.3: NGT panelists by location of most bedside clinical experience



The highest level of education reported by 7 seven of the panelists were specialist medical training or doctoral degrees, 6 reported MPH degrees and 1 reported a bachelor of medicine degree. Most panelists (10 out 14) reported that most of their bedside clinical experience was gained in sub-Saharan Africa.

Figure 4.4: World map showing current location of NGT panelists



Eight of the panelists currently reside and work in sub-Saharan Africa (refer to Figure 4.4).

Round 1 Nominal Group Technique Findings

Panelists opined on the lapses in care that they perceived as problematic in the four vignettes presented to them. There was a consensus that care coordination was an important feature of health care delivery. Many were of the opinion that poor care coordination was common in LMICs. A summary of unique responses to vignettes is presented in Textbox 4.1. Where more than one respondent said similar things, the most detailed and clear was selected.

Textbox 4.1: Summary of responses to vignettes

- Poor care coordination is common in LMICs
- Resources for care coordination such as ambulances and communication systems are often inadequate
- Inadequate financing and low prioritization make care coordination difficult
- Inadequate involvement of communities in their own care
- Poor quality of services in health facilities may result in the morbidity and mortality in spite of care coordination
- Poor planning for emergencies by patients, communities and the health system
- Lack of clear referral policy and guidelines

In keeping with study objectives panelists were asked to define or describe care coordination.

Several elements emerged from the various descriptions and definitions, a consolidation of the contributions was used as the operational definition of care coordination (refer to Textbox 4.2).

Panelists were then asked to list the most important elements of care coordination. The most important elements of care

Textbox 4.2: Definition of care coordination (summary of responses to Q10.)

“Care coordination is a process that links women, children and their families to multiple health care services from different providers in a complementary, coordinated, consistent and timely manner to provide them with optimal health care”. It requires that “all levels of the health system talk to each other in an effective way with the care of the patient at the center of their concerns”. “Care coordination can be defined as coordinated care provision at all levels with clear guidance on what is available where and with multi-sectoral participation”. It includes “Measures taken by healthcare personnel as part of an institutional norm, that allow an adequate management, assessment and care of the patient, included transfer if the case requires”.

coordination for MCH services in LMICs as reported by panelists (summary of Q11 submissions) were: (1) Continuum of care from the community until the tertiary level of the health care system, (2) Functioning referral systems (communication protocols, reporting systems, referral protocol etc.), including counter-referral across different levels of the system, (3) Regular review of care coordination activities to provide lessons for improvement, including the sharing of challenges and lessons learned between levels of the system, (4) Communications - good quality and reliable telecommunications between peripheral clinics and health centers and referral hospitals, (5) Standard operating procedures and protocols that include care coordination, with designated positions for specific roles, promotion of continuity of care by optimizing safety and accuracy during handoffs, or transfers between health care settings, (6) Community participation – demand for quality services (accountability), (7) Improved intersectoral collaboration , (8) Leadership and management to create a an enabling environment (infrastructure, drugs and equipment) through the deployment of

certified HR to ensure functional maternal and newborn emergency services, performance monitoring, effective logistics management and appropriate budget provision for care coordination.

Lastly, panelists were asked to list indicators and measures for the elements that they had mentioned earlier. Unique contributions are presented below, grouped into different categories of indicators.

Table 4.1: Suggested measures/indicators for routine monitoring of care coordination

Indicator type	Suggested measures and indicators of care coordination
A. Input indicators	<ul style="list-style-type: none"> • Percentage of health facilities with functioning radio, telephone or mobile telephone services • Proportion of health facilities with emergency transportation and standard operating procedures (SOPs) • The number of HR (e.g. midwives) per population <ul style="list-style-type: none"> i. No. of staff trained to competency for essential obstetric and newborn care ii. Percentage of health workers who know which services are available where • Number of basic and comprehensive 24/7 EmONC facilities for a defined population • Proportion of communities living less than 3hrs from a referral facility
B. Process indicators	<ul style="list-style-type: none"> • Number of coordination meetings held per trimester, quarter or year • Median Referral Lag Time – time from referral decision to definitive care • Adherence to SOPs in health facilities /Referral guidelines followed • Percentage stock out of tracer drugs and supplies (logistics) <ul style="list-style-type: none"> i. Number of lifesaving drugs reported as being out of stock in the past 6 months • Percentage of health facilities who regularly conduct maternal and perinatal death audit and take appropriate measures • Number of policy and guidelines produced and communicated <ul style="list-style-type: none"> i. No. and types of protocols, guidelines and standards available • Referrals with referral letter/prior notification to referral facility • Preparedness Plan for emergencies (Routine Assessment and Certification) • Presence and functionality of multi-sectoral coordination mechanisms at each level • Trends in no. of referrals, and types of diseases/condition reported by facilities
C. Output/ outcome indicators	<ul style="list-style-type: none"> • Percentage of budget used for designated purposes • Client satisfaction surveys • Clinical cases review & criterion based audits • Morbidity and mortality rates

Indicator type	Suggested measures and indicators of care coordination
D. Others	<ul style="list-style-type: none"> • Community involvement in management of health facilities • No. of recommendation from "community" on quality of care improvements that have been satisfactorily addressed in last 3 months • Number of counties with health strategic plans with intersectoral programs. • Knowledge, attitude, needs and practices of community members as related to the facilities available (health seeking behavior) • Accountability (review mechanisms in place and rewards/sanctions in place) • Proportion of providers trained in coordination system (training) • Availability and use of district health packages

Round 2 Nominal Group Technique Findings

During the second round of the NGT panelist were asked to review the definition of care coordination derived from their contributions in Round 1. Round 2 panelists also ranked the importance of the six main components of care coordination that emerged from Round 1. Higher ranks indicate greater importance.

Similarly, Round 2 panelists ranked the importance of the 23 indicators of care coordination, with higher ranks indicating greater importance. To make the task manageable, panelists were asked to identify and rank the 10 indicators they thought were most important. The summation of the ranks was used to determine the components and indicators that were presented to key informants because it

Textbox 3: Round 2 NGT comments on definition of care coordination (refer to Textbox 2)

- “I agree. Not sure if this would make sense but I feel "health education" for the community could also be an important component, when patients "approximately" know what to expect from which level of health care”.
- “The description is enriching and ably captures all the necessary ingredients/element critical for "Care Coordination". A final touch to the description would perhaps include "sustained effort" and ultimately some note to include "client outcomes" if need be, to lay emphasis on the benefits to the user of the services when CARE is well-coordinated”.
- “Where does the multi-sectoral participation come in this definition? We are only describing the care within the health care system (health sector)”.
- “Care coordination should also involve a learning process which means all level of the health system learn from each other through the patient centered care process”.

wasn't feasible to present the entire list of suggested components and indicators to them.

In general, the 12 panelists of the round 2 NGT were in agreement with the definition of care coordination that emerged from their contributions. However, some made comments about increasing emphasis on different components of the definition.

One of the panelists decried the lack of care coordination training for students in health training institutions in LMICs. He stated that, “I agree completely with these statements, as they reflect attention to maintaining and raising the quality of care. However many undergraduate and postgraduate medical, midwifery and nursing training programs do not teach the skill-set required for expert coordination and assume that this will occur at a high level, by default. In addition to teaching content and changing behavior undergraduates should also be exposed to the fundamentals of skills for care coordination”.

The summation of ranks assigned to each element of care coordination is presented in the last column of Table 4.2

Table 4.2: Main elements of care coordination sorted by rank order

Main elements of care coordination	Sum of ranks
Leadership/Management (Enabling Policy Environment). Enabling care environment in terms of infrastructure, drugs and equipment. <ul style="list-style-type: none"> • Effective logistics management; logistics resources and systems • Improved inter-sectoral collaboration. • Deployment of HR to ensure functional maternal and newborn emergency services. • Training and re-certification of HR Availability of reliable service data. • Appropriate budget provision for care coordination 	64
Standard operating procedures (SOPs) and protocols that include care coordination, with designated positions for specific roles. <ul style="list-style-type: none"> • Coordinated efforts to promote continuity of care by optimizing safety and accuracy during hand-offs, or transfers between health care settings. • Clear packages of services and communication of the policies and guidelines at all levels. 	44
Teamwork between providers; - communication between and among all members of the healthcare team and the patient, emphasizing shared decision-making with families. <ul style="list-style-type: none"> • Multidisciplinary teams, supervision and feedback 	44

Functioning Referral Systems (Communication protocols, Reporting Systems, Referral Protocol/Mechanism etc.)	
<ul style="list-style-type: none"> Continuum of care from the community until the tertiary level of the health care system. Referral and counter-referral system across different levels of the system. Communication - quality and reliable telecommunications between peripheral health centers and clinics and referral hospitals. 	40
Regular review of care coordination activities to provide lessons for improvement.	
<ul style="list-style-type: none"> Coordination meetings between levels of the system. Lessons learned and challenges shared. Feedback and auditing of death to avoid similar problems in the future. Performance monitoring - monitoring framework - Clinical cases review, case fatality reviews 	34
Community participation	
<ul style="list-style-type: none"> Demand for quality services (accountability) 	26

Next, panelists ranked the 23 indicators or measure that they considered to be the most important for routine monitoring of care coordination. All 23 items had to be ranked before panelists could proceed to the next question. Panelists ranked their top 10 indicators and assigned zeroes to all else.

Table 4.3: Indicators and measures of care coordination sorted by rank order

Serial #	Indicators and measures of care coordination	Sum of ranks
1	HR e.g. midwife per population: (1)No. of staff trained to competency in providing essential obstetric and newborn care (2) Percentage of health workers who know which services are available where (3)Number of facilities with skilled birth attendants	77
2	Proportion of health facilities with: (1)Reliable and functional communication facilities (2)Emergency transportation: (availability) (3)Standard Operating Procedure (SOP)	71
3	Median referral lag time & time from referral decision to definitive care	61
4	Percentage of health facilities conducting maternal / perinatal death audit and take appropriate measures	60
5	Adherence to SOPs in health facilities / Referral guidelines followed: (1)Clinical cases review, case fatalities review (CFR)/Criterion based audits / Annual reviews	53
6	Number of basic and comprehensive EmONC facilities for a defined population	39
7	Proportion of facilities providing emergency services 24/7	38
8	Client satisfaction surveys (1) proportion of patients satisfied with their care	36
9	Number of policy and guidelines produced and communicated: (1) No. and	35

	Types of Protocols, Guidelines and Standards Available	
10	Percentage stock out of tracer drugs and supplies (logistics) (1)Number of lifesaving drugs reported as being out of stock in the past 6 months	34
11	Accountability (review mechanisms in place and rewards/sanctions in place)	34
12	Referrals with referral letter / prior notification to referral facility: (1) Number of messages and notes exchanged between a primary care centers and hospitals (2) Feedback provided to referring facilities	32
13	Preparedness Plan for emergencies (Routine Assessment and Certification)	28
14	Community involvement in the management of health facilities (1) Proportion of health facilities with community involvement in management (2) Number of counties with health strategic plans with intersectoral programs.	27
15	Number of coordination meetings held per trimester, quarter or year	26
16	Presence and functionality of multisectoral coordination mechanisms at each level	25
17	Proportion of facilities with a dedicated budget for the referral system	23
18	Trends in No. of Referrals, and Types of Diseases/Condition reported by facilities	21
19	Proportion of communities living less than 3hrs from a referral facility	14
20	Knowledge, attitude, needs and practices of community members on the facilities available	14
21	Availability and use of district health packages	14
22	Training: Percentage of providers trained in coordination system	13
23	Percentage of budget used for designated purposes	3

The summation of ranks assigned to each indicator (or group of related measures) is presented in the last column of Table 4.3

The initial plan was to present the top 10 group of indicators to the key informant interview participants however; the number 10 and 11 group of indicators shared the same rank. They were both included in subsequent interviews. The sixth “main element” of care coordination on Table 4.2, “community participation” was not included in the key informant interview guide because it was poorly ranked and because it was a cross-cutting element that would be discussed under all the other elements.

Both rounds of the NGT helped to develop the concept of measurement of care coordination for maternal and child health services in low and middle-income countries and suggested indicators for

routine monitoring. The feasibility of routine monitoring of these indicators became the objective of the key informant interviews.

The key informant interviews focused primarily on the feasibility of implementing the measures of care coordination and elicited reactions to the measures of care coordination that the informants might not be familiar with such as median referral lag time, chart reviews and clients' satisfaction surveys. Nevertheless, informants also provided data on challenges, solutions and strategies for care coordination.

Description of Key Informants

Key informants were selected purposefully to reflect the cadres most likely to be involved with the introduction of routine monitoring of health service data: clinicians at the three levels of care, medical records officials, and central level bureaucrats.

Table 4.4: Distribution of Key Informants by Cadre

Service Area	Doctors	Nurses and Midwives	Records / HMIS Officers	Total
Tertiary Center	2	1*	1	4
Secondary Center	0	6	1	7
Primary Center	0	6	0	6
Regional Government	0	0	1	1
Central Government	0	2**	1	3
Total	2	15	4	21

**The 1 nurse-midwife interviewed at the tertiary center functioned as advanced nurse practitioner*

***The two central government nurse/midwives were a research officer and a senior family health administrator*

Findings from key informant interviews

The interview data were read and re-read to iteratively capture the meaning and content of each sentence or groups of sentences in the context of stated study objectives. Through this process, main categories or topics and relevant themes under them were identified. These categories and themes are not mutually exclusive; they are overlapping and interrelated.

The identification of key informants was as follows: 1, 2, 3, 4, and 5 at the beginning of each identifier signified the location of work - primary, secondary and tertiary level facilities, regional government level and central government level respectively. The alphabet “C” or “R” stood for the clinician and medical records /research respectively. The last number in the identifier is a serial number of persons interviewed in each work category. For example, 5C1 was the first central level clinician interviewed.

In general, all the five main components (Leadership creating an enabling policy environment, communication and teamwork between providers, compliance with clinical guidelines and protocols, functioning referral systems, and regular review of care coordination activities) of care coordination presented to interviewees were considered important and all key informants, irrespective of cadre or service post, agreed that care coordination is essential to the delivery of maternal and child health services.

“Yes I think all these five thematic areas, are very key and important for quality health care provision to the populace so I think they are very key and well selected”. - (central reproductive health officer - 5C1)

“Care coordination definitely is very very important. It should be looked at and improved”. - (secondary level records officer - 2R1)

Key informant data is presented in two tables below:

- 1) Care coordination challenges
- 2) Feasibility of routine measurement.

Care Coordination Challenges

Effective health service delivery, including care coordination requires an adequate supply of inputs: human resources, equipment and consumables.

Human resource constraints: Key informants at all levels of the health service and central administration were concerned that there were not enough health workers in both clinical [1C1; 3C2; 5R2] and non-clinical roles [2C6] and that the distribution of health workers was lopsided in favor of urban areas [5C1].

The inadequacy of transportation equipment and infrastructure: Inadequacy of transportation equipment and infrastructure was a common theme. Lack of ambulances at the primary care level was seen as a major challenge to care coordination [1C1; 1C4; 1C5; 1C6]. The secondary and tertiary levels of care also experienced transportation challenges; there were not enough ambulances for patient care and the field trips that they were used for [2C2], and the absence of ferries at river crossings especially at night meant referrals to the main reference hospital were often delayed [3C2; 5C1]. Nevertheless a few informants at the secondary level and in central administration expressed that the ambulance situation had greatly improved compared to years past [2C6; 5R2]. In the absence of data on the gaps in service delivery caused by the absence of ambulances in communities and at the primary health care level, the impression that the ambulance situation has improved could delay policy interventions for ambulances at the primary care level.

Interview participants universally appreciated the value of care coordination and the importance of measuring and monitoring it [2R1; 3C1; 5R1]. Surprisingly, many opined that care was well coordinated and not a problem in their health system [2C5; 2R1; 3C1; 4R1]. Interview participants expressed this view even in the absence of data to support it. For example, when asked for the number of health facilities without ambulances, a regional level records officer replied, “No, I don’t

have the statistics even though I can tell you from knowing” [4R1]. Perhaps this is a consequence of never measuring care coordination and the poor utilization of data for planning in The Gambia.

The inadequacy of equipment and supplies: The lack of equipment or the rationing of equipment between several departments was mentioned as a major impediment to care coordination. Time and energy spent moving equipment between departments contribute to delays in care and poor documentation by health workers.

Poor communication infrastructure and lack of communications equipment: Another input that was deficient and concerning to most informants was the communications infrastructure and the lack of communications equipment in health facilities. Mobile telephony is the mainstay of communications in many African countries. Some of the informants, especially in primary care centers which are often situated in rural areas, reported that the networks were often unreliable [1C3; 1C5]. Furthermore, health facilities did not have mobile handsets, care providers had to use their personal handsets for patient care purposes and it was not a reimbursable expense [1C1; 1C2; 1C3; 1C5]. In the absence of official health facility phone numbers secondary and tertiary level officers shared their private phone numbers with lower level officials [2R1; 3C1; 3C2]. It is conceivable that some important calls would not be made when health workers do not have adequate credit on their private phones. This situation with communications between health facilities is a major impediment to care coordination.

Table 4.5: KII Data on Care Coordination Challenges

Categories / Topics	Themes	Quotes
Inputs	Human resource constraints (amount and distribution of trained health care workers)	<p>“It [care coordination] depends on both human and material resources. So when you want to do all these things, the cost of resources, commitment and attitude are very important”. - (tertiary level nurse - 3C2)</p> <p>“There is a total disparity between the workforce</p>

Categories / Topics	Themes	Quotes
		and the workload”. - (central research officer - 5R2)
	Inadequacy of transportation equipment and infrastructure	“At the community level the community health workers will see patients at their level and refer those that they cannot handle. But actually there are no means of referral from that level; they have to come on their own”. - (primary level nurse - 1C6) “[Need for a river ambulance] So that whenever we have patients, they can be quickly transported across the river and they can have the essential interventions without delayance”. - (tertiary level nurse - 3C2)
	Inadequacy of equipment and supplies	“Sometimes you will go to a particular health facility, you will find only one functional BP machine. Maybe the A&E will be using it, the outpatient will be using it and the ward will be using it at the same time which is also a very big challenge sometimes”. - (primary level nurse - 1C5) “Care coordination should be simultaneously in line with the provision of the materials for the job, if it is not available coordination automatically falls down”. - (secondary level records officer - 2R1)
	Poor communication infrastructure and lack of communications equipment	“Sometimes the network is a problem you will have to call frequently before you will reach another guy so that he or she will communicate with the one on duty”. - (primary level nurse - 1C5) “As I told you, we have to take it from my own pocket to call”. - (primary level nurse - 1C3)
Processes	Poor implementation of referral SOP <ul style="list-style-type: none"> Weaknesses in current referral SOP Counter-referral challenges By-pass 	“No there's no specific document. Like if you are to refer, you can just call the OIC, or the person concerned but there is no protocol for calling”. - (primary level nurse - 1C3) “On the referral form, we have part A and part B. The part B is serving as the feedback that you are supposed to send back with the patient. Even with this, most of the time, the forms don't go back”. - (central research officer - 5R2) “Some people go to the clinic, and the child is not getting better, the following morning or two days after they will just decide to come without any referral from the clinic staff. The next day or two, they may come back again you will see them with two prescription packs: Farafenni prescription pack, Kerewan prescription pack”. - (secondary level midwife - 2C1)
	Lack of teamwork between health facilities	“If there is no teamwork, patients will suffer and it may lead to death or complications that could be managed somewhere else. Lack of teamwork may lead to somebody's death. That is why teamwork is very important”. - (primary level nurse - 1C5)

Categories / Topics	Themes	Quotes
Outputs/outcomes	Consequences of poor care coordination <ul style="list-style-type: none"> • Delayed care • Unsatisfied patients 	“She [nursing aide] cannot tell what exactly is wrong because the nurse or midwife that is knowledgeable is not escorting and has given the patient to an individual who doesn’t know much about the patient so that also causes delays”. - (central reproductive health officer - 5C1) “With obstetrics cases we are advised by the hospital to make sure they go with a male escort in case there is a need for blood because they find it very difficult to get blood at that place”. - (secondary level midwife - 2C5)
	Lack of accountability for coordinated care	“We don’t have any indicator that is tracking the adherence to referral guidelines”. - (regional level records officer - 4R1)
Solutions and Strategies	How to make care coordination work in spite of a challenging healthcare environment (limited input/weak processes)	“Somebody recommended that the time the patient is coming home, that’s the time you should then fill this form and give it to the patient”. - (secondary level midwife - 2C5) “Bills of right of patients should be placed somewhere where they will be able to see what their rights are. So that they know that definitely when we go to health facilities, this is what is expected from the personnel working in this institution”. - (tertiary level nurse - 3C2)

Poor implementation of standard operating procedures: In the presence of adequate inputs, the application of effective processes will help to create the desired care coordination. Standard operating procedures (SOPs) and guidelines are developed to formalize and standardize processes within the health system. The health ministry made SOPs available but it appears that, in general, they were not being followed [4R1; 5C1]. Some of the SOPs may also not be adequate. For example, there were no standards for handoff from one team to the other or from one facility to the other [1C3], often no advanced notices to the receiving team [2C1], providers typically referred their patients without knowing if the requisite services were available and they often did not know if care was received or not [2C2].

The current referral SOP requires that a counter-referral slip should be returned to the referring care team for each person that they referred but most of the primary and secondary care providers

interviewed reported that they rarely received the slip [2C1; 2C5]. Their frustration was corroborated by central level officials [5R2]. Similarly, the referral SOP requires that a trained clinical staff should accompany patients in the ambulance but due to shortage of staff, it is often not done [5R2; 5C1]. There is no point preparing SOPs and clinical guidelines if they will not be followed. As a consequence of the lack of monitoring of compliance with SOPs, there is only anecdotal evidence that several aspects of different SOPs were not being followed. Public health policy formulation needs much more than anecdotal evidence.

One concern for the poor care coordination that currently existed was the potential of overdosing patients. Some patients picked up prescriptions from their primary care provider then presented with the same condition at the secondary or tertiary level without informing them that they had prescriptions from the clinic or health center [2C1].

Lack of teamwork between health facilities: Effective collaboration between care teams within a health facility (multiple departments) and between teams in one facility and a care team in another facility are essential for care coordination. Almost all key informants valued teamwork but they described it only in the context of collaborations within their health facilities [1C4; 1C5; 3C1; 3C2; 5C1]. There was not much thought given to collaboration between providers in different health facilities as an essential form of teamwork required for effective care coordination.

Consequences of poor care coordination: The output from a health system with inadequate input and poor processes is poorly coordinated care. The consequences of poorly coordinated care include delayed care that might lead to fatalities and unsatisfied patients. For example, patients may have to go from one health facility to another before they are finally accepted for care. At each facility care is delayed because the receiving team first reviews the referral note before sending them to another health facility if they are not able to manage the condition.

Lack of accountability for coordinated care: In the absence of objective measures of compliance with guidelines and SOPs, accountability for care coordination is difficult. No measures were in place to monitor adherence to SOPs such as referral guidelines [4R1].

How to make care coordination work in spite of a challenging healthcare environment:

Some of the informant made suggestions to improve care coordination in spite to a challenging healthcare environment characterized by inadequate, inputs and weak or nonexistent processes. Strategies for improving telecommunication [1C3; 1C4; 2C1] between health facilities such as unique numbers for health facilities topped the array of suggested strategies. Other suggestions included the use of the patients as couriers of counter-referral slips [2C5], the posting of the patients' bill of rights in health facilities to facilitate accountability [3C2] and the training of village health workers as important agents of care coordination [1C3].

Care Coordination Measurement Feasibility

When faced with the question of the feasibility of routine measurement and monitoring of care coordination measures, the additional workload associated with data collection and reporting, and the quality of data collection were the main concerns that exercised the minds of key informants. Other contributions were categorized as the value of data to care coordination, and the modality of feasibility.

Human resource constraints: Many of the key informants strongly expressed their concerns that the current excessive workload would only get worse if additional data points were to be added to their reporting schedules [1C1; 2C3; 3C3; 5R1].

The weakness of data collection tools: The fact that existing data collection tools were not designed to capture data on care coordination was often mentioned by tertiary level clinicians and central administration officials [4R1; 5C1; 5R1].

Lack of computers: Data collection within health facilities was paper-based; at the tertiary level, key informants [3C3; 3C2] thought the computerization of medical records would lighten the workload and enable the collection of more data. At the tertiary level, most informants were senior officials who probably had their personal computers and understood the value that computerization might bring to their work. The ability to use computers might be less common among health workers at the primary care level.

Poor documentation and record keeping: Many of the clinicians interviewed were concerned about poor documentation due to the heavy workload of health workers [2C3; 3C3], some of them also commented on poor documentation that could arise because health workers might not be adequately trained to document and collect data accurately [2C2; 1C6] or they may just be plain negligent [3C3]. Even when health workers want to document their work, the medical records forms might not be available [1C3]. To get credible data it will be important to ensure that data forms are available at all times and staff do not need to improvise.

Falsification of records: Another data quality issue raised by clinicians was the deliberate falsification of data that might occur if health workers want to avoid blame and punishment [2C5; 3C3]. It will be important to avoid the perception that the monitoring of care coordination measures will be a witch-hunting exercise.

Table 4.6: KII Data on Care Coordination Measurement Feasibility

Categories / Topics	Themes	Quotes
Data workload	Human resource constraints	<p>“We need more hands to do the work. By what is in the policy, each health facility should have at least one data entry clerk but there are some other facilities that don’t even have one. In some it is the health workers and nurses who are seeing patients at the same time doing the recording. It’s too much. Yes, we need more people. - (central records officer - 5R1)</p> <p>“If you look at every quarter, you will send in your quarterly reports, you will send in your monthly returns, facility reports, you will send in your quarterly family planning report on those days, you have different data”. - (primary level midwife - 1C1)</p>
	Weakness of data collection tools	<p>“It [care coordination] is not captured in any set of tools to show us the pictures. It is a gap in our system. It’s not captured anywhere”. – (central reproductive health officer - 5C1)</p>
Data quality	Lack of computers	<p>“I think currently our documentation is only done on paper. I think it will be good if we have a computerized system of collecting data”. - (tertiary level medical officer - 3C3)</p> <p>“We need computers in every unit that is offering services, the patients’ data needs to be captured and it’s very very important”. - (tertiary level nurse - 3C2)</p>
	Poor documentation and record keeping	<p>“You alone cannot do the work of two or three people. That is one of the problems. It is why data is not accurate or all information has not been recovered”. - (secondary level midwife - 2C3)</p> <p>“In the printing aspect of it at times having the A4 size plain paper for printing out the form is a problem”. - (primary level nurse - 1C3)</p>
	Falsification of records	<p>“If I know that this one if I write the exact thing I may be implicated or I may be seen differently, they may just adjust for what is expected while that’s not the reality on the ground. I know it’s human”. - (secondary level midwife - 2C5)</p> <p>“The problem here is that even those referring, actually they wouldn’t put the time they see that the lady needs a referral for instance, they would just wait until for instance when the ambulance is there and then that’s the time they would record it”. – (tertiary level medical officer - 3C3)</p>
Value placed on use of data	Feedback tool	<p>“Because at times you make your own diagnosis, then the doctor will put a different diagnosis”. - (primary level midwife - 1C1)</p> <p>“Even from time to time you have these audit committees at the national assembly wherein you have to go and present the financial report of the institution over a year or two; those statistics are important”. - (tertiary level medical officer - 3C1)</p>
	Quality improvement tool	<p>“It’s also very important to know where you are, where you have problems and then know how to make coordination work better, I think it’s necessary to be reviewing it from time</p>

Categories / Topics	Themes	Quotes
	Accountability tool	to time. - (tertiary level medical officer - 3C3) “We collected that information and we drew a graph for them to see how they are growing in months, January, February up to December then we keep it here for our own consumption”. - (secondary level midwife - 2C1) “No no no they don’t demand for the data. We use that as a medium of convincing some of them to know the level of HIV or STI level in the community”. - (regional level records officer - 4R1)
Modality of feasibility	Acceptability of routine monitoring of care coordination measures	“I think it will be accepted because it’s all geared towards improving patient care or management”. - (tertiary level medical officer - 3C3) “It will not be a problem it will only help the HMIS to work”. - (secondary level records officer - 2R1)
	Proposed new measures	“If at all we can embark on that [client satisfaction survey], it will be very very good”. - (secondary level nurse - 2C6) “That will again just prepare nurses because if the survey is conducted and nurses get a feedback, they will improve how they approach patients”. - (primary level midwife - 1C1) “It’s [chart reviews] feasible looking at your day to day activities and comparing it to protocols”. - (primary level nurse - 1C3) “That [chart reviews] can be done in an institution where the record keeping system is robust”. - (central research officer - 5R2) “You need to do, one - confidential inquiry and two - you need to follow the road to death. You need to look at the case notes of the woman that died to establish the cause of death”. - (central research officer - 5R2)
	Adaptable structures	“We report according to the form that we are given. What the form requires is the information you will take from the register”. - (secondary level records officer - 2R1) “It will be better to do it as a survey for now maybe anytime we are up there and then we are ready to collect these things routinely”. - (central records officer - 5R1)
	Steps to introduction of care coordination measures	“To review of data collection you must first call a national consultative workshop where you involve the directors, the PS, many program managers, and a cross-section of the health workforce and they have to look at the tools”. - (central records officer - 5R1) “It would be nice if programs can design their data reporting system to be incorporated in the system”. - (regional level records officer - 4R1) “Training is important because if you design a template or a program you have to train the service providers”. - (regional level records officer - 4R1)
	Leadership	“If you have a good leader that creates the environment and there is the continuous training of staffs, it will help to improve the standard of care”. - (secondary level midwife -

Categories / Topics	Themes	Quotes
		2C1) “This brings us back to the supervision aspect. Who is there to see it’s not going right? It starts from the officer in charge himself who needs to know the importance of documentation. If the documentation is poor, you cannot track anything”. - (central research officer - 5R2)
	Budget	“Yes it’s a possibility but since it’s a public sector initiative; everything depends on public funding. It could be done. Everything is determined by how much fund you have”. - (tertiary level medical officer - 3C1) “It depends on both human and material resources. So when you want to do all these things, the cost of resources, commitment and attitude are very important”. - (tertiary level nurse - 3C2)
	Role of local and international partner agencies	“Our chief executive is concerned with maternal health issues and because the maternal ward is adopted by Trust Bank, we do have to report periodically”. - (tertiary level medical officer - 3C1) “Normally every quarter we make a bulletin that is sent to partners and to the ministry to make them know these things are happening in the system and they know what is being consumed”. - (central records officer - 5R1)

Feedback tool: The use of data as an important tool for care coordination was highly valued by most key informants. At the primary care level many saw it as a feedback tool to help improve their diagnostic skills and selection of treatment options [1C1]. At the tertiary level data served as a feedback tool when reporting to the audit committee of the National Assembly and when reporting to private sector sponsors of different services within the hospital [3C1; 3C2]. The feedback that was important to primary level care providers was the counter-referral document that enabled them to validate their diagnoses and treatment choices. Perhaps more attention will be paid to documentation if they also presented reports to the local government officials.

Quality improvement tool: Others commented on the quality improvement value of data; they reported on the use of data as pointers to problems and regular reviews as a means to improving service quality [3C3; 2C1].

Accountability tool: Even though the general public did not seem to demand for health service data from their health facilities [4R1; 2C3], many of the informants - clinicians at all levels and medical records and research officials - were all enthusiastic about the role that data could play in their communications with the public [1C5; 2C6; 4R1; 5R2].

Acceptability of routine monitoring of care coordination measures: In general, interview participants accepted the need for monitoring data on care coordination [1C1; 2R1; 3C3; 4R1]. A tertiary level medical officer said that, “I think it will be accepted because it’s all geared towards improving patient care or management”. Other key informants expressed that the introduction of routine monitoring of care coordination measures would strengthen the existing information system [3C3; 2R1; 4R1].

Proposed new measures: When the proposed measures of care coordination were discussed, most participants were supportive of routine clients’ satisfaction surveys [2C6; 1C2; 1C5; 5R2]. Some of them suggested that clients’ satisfaction survey should be in the form of exit interviews because, “then the care they received is fresh in their memory” [5R2], others suggested that household surveys could be conducted by the village health service [1C2] or medical records officials [2R1]. However, some of the key informants sounded a note of warning because the lack of satisfaction expressed by clients might not be due to poor patient care. For example, a secondary level nurse stated that, “It’s important because if you don’t have enough drugs definitely the patients don’t feel satisfied” [2C2]. Another nurse suggested that the recent fee hike might be the cause for dissatisfaction [1C4]. The onus will be on the reviewers of clients’ satisfaction surveys to separate complaints about health policy from complaints about provider attitudes and systemic lapses.

Similarly, there was widespread support for chart reviews [1C3; 5R1; 5C1; 2C1] to evaluate compliance with SOPs. The suggestions for how to conduct chart reviews included the supervision

of the process by former clinicians in the Regional Health Teams [5R1] and the use of a “very good – good – fair” rating scale for referral notes. A central level reproductive health officer suggested that, “Yes that can be best revealed by surveys or assessment conducted: looking at the mode of management and comparing it with the protocol” [5C1]. Central level officials were concerned that doing chart reviews might not be feasible in lower level facilities where record keeping might be less than optimal [5R2] and doing chart reviews might take the limited number of health workers away from essential clinical service provision [5C1].

One of the proposed new measures of care coordination is the computation of median referral lag times. Current processes appear inadequate for calculating such an indicator [2C6; 5R2]. A central level research officer recommended that regular surveys in the form of confidential inquiries into maternal death could be used to calculate median referral lag time [5R2]. However, confidential inquiries are currently not done in The Gambia. Some of the informants were concerned that the interpretation of the median referral lag time could be inaccurate because some delays occur because families want to consult marabouts (revered Islamic scholars) before proceeding on referrals or they may delay in finding someone to accompany the patient [1C1; 5C1].

Adaptable structures: Several existing processes and registers that could be adapted for the proposed new measures were suggested by key informants; reporting forms [2R1] and processes [2C1; 3R1; 5R2] could be adapted. Some of the central level officials who understand the workings of the bureaucracy suggested that care coordination measures should be first be introduced as surveys and not into the routine HMIS [5R1; 5R2]. The findings could then be presented quarterly along with other maternal child health indicators [5R2].

Steps to the introduction of care coordination measures: Some of the key informants commented on the steps needed before care coordination measures can be introduced. Widespread

consultations with health ministry leadership, regional level officials and health service providers were considered important [5R1; 5R2]. The involvement of program managers in the design of data reporting systems [4R1] and the training of service providers on new data capture templates [4R1] were also considered important.

Leadership: The importance of having a leadership that creates an enabling environment for measuring care coordination featured in several of the comments, especially for continuous training of staff [2C1] and for the provision of drugs and equipment [3C1]. The need for the leadership to provide effective supervision was reiterated [5R2]. A primary level nurse expressed her concern about the futility of monitoring care coordination measures when the government might not be able to do anything about the poor conditions by stating that, “Even if they monitor it whether they will be able to provide a communication system is another question” [1C6].

Budget: There were a few informants who thought the cost of introducing the routine monitoring of new measures may be prohibitive [2C2; 3C1; 3C2].

The role of local and international partner agencies: Many of the key informants believed that the support of local and international partners will be needed for the introduction of new measures to succeed. The mobile phone companies already partner with the Ministry of Health to provide access to mobile networks and provide support for data verification exercises [3C1; 5R2]. The UN health agencies also support quarterly maternal death reviews [3C1] while the private sector receives regular reports about activities of the different departments because of the support that they provide.

CHAPTER 5: DISCUSSION

Care coordination is a poorly developed concept in maternal and child health services in low and middle-income countries. In this study, the collective experience of a global panel of maternal and child health experts was successfully appropriated for concept development. They bemoaned the poor state of care coordination in LMICs (refer to Textbox 1). The emerging consensus is that care coordination is inadequately funded and of low priority in these countries. The five main components of care coordination (Leadership creating an enabling policy environment, communication and teamwork between providers, compliance with clinical guidelines and protocols, functioning referral systems, and regular review of care coordination activities) identified through the NGT aligns nicely with the WHO's six domains of quality interventions[57]: leadership, information, patient and population engagement, regulation and standards, organizational capacity and models of care.

The definition of care coordination, a synthesis that emerged from the NGT study, highlights the need for a formal and purposeful process of transferring patients from one level of care to the other and from one care provider to the other.

“Care coordination is a process that links women, children and their families to multiple health care services from different providers in a complementary, coordinated, consistent and timely manner to provide them with optimal health care”. It requires that “all levels of the health system talk to each other in an effective way with the care of the patient at the center of their concerns”. It is “coordinated care provision at all levels with clear guidance on what is available where and with multi-sectoral participation”. It includes “Measures

taken by healthcare personnel as part of an institutional norm, that allow an adequate management, assessment and care of the patient, included transfer if the case requires”.

NGT panelists were asked to assign measures to the main elements of care coordination that they listed earlier. In the end, it appears that both in the listing and ranking of the measures the assignments were independently done without reference to the list or ranking of the main elements of care coordination. Some of the main elements such as leadership and teamwork are difficult to measure; this might explain why most of the highly ranked measures focused on operational and functional elements such as the supply of human resources and adherence to SOPs.

Key informants were generally in agreement with the definition above and with the need to improve care coordination in The Gambia. What is perplexing to them is how to measure care coordination and how to improve care coordination in the face of limited funding, inadequate supply of human resources and poor infrastructure. Monitoring of the measures of care coordination can be seen as a tool that will highlight these and many of the other weaknesses that health workers complain about. Conversely, failure to monitor care coordination doesn't solve the problems of incoordination that may be resulting in loss of lives in spite of health sector investments.

The key informant interviews aimed to elicit the perception of informant about the feasibility of introducing routine monitoring of care coordination measures. Deborah Bowen et al in their work on the design of feasibility studies, identified domains of feasibility that are relevant to program implementation[55]. They described intervention as “any program, service, policy, or product that is intended to ultimately influence or change people’s social, environmental, and organizational conditions as well as their choices, attitudes, beliefs, and behaviors”. In this study the introduction of routine monitoring of care coordination indicators was the intervention upon which health officials in The Gambia were asked to opine. Bowen et al (2009) identified eight domains that could

be addressed by feasibility studies. These were acceptability, demand, implementation, practicality, adaptation, integration, expansion and limited efficacy testing. Expansion and limited efficacy testing were not considered in this study because they are more relevant to the scale-up of a pre-existing intervention rather than the introduction of a new policy or program.

Acceptability: Proctor et al (2011) described acceptability as the perception among implementation stakeholders that a given treatment, service, practice, or innovation is agreeable, palatable, or satisfactory [58]. The focus under acceptability was the reaction of the health officials in The Gambia to the idea of introducing routine monitoring of care coordination measures. There was a universal understanding of the need for care coordination and all participants – be they clinicians, medical records officials or central level policy makers, wanted greater care coordination in the interests of their patients. Nevertheless, some of the informants were concerned that the monitoring of care coordination measures will merely reveal and quantify problems but the solutions may not be forthcoming because of the limited resources available to the Ministry of Health or the lack of political will to address adverse findings.

The cautionary view is shared by some of the global health experts (NGT panelists) who commented on the “inadequate funding and the low priority given to care coordination” in low and middle-income countries. It appears that a precondition to monitoring care coordination is investments in human resources, equipment, supplies and infrastructure. Nevertheless, care coordination can and should be addressed with the resources that are currently available. Reporting on the gaps will facilitate interventions.

Demand: By demand the focus is on quantifying the need for care coordination and its measurement. This is an arduous task in most LMICs because of the weaknesses of health data systems. What is clear from this study is that there is a high demand for care coordination especially

because of an inadequate supply of human resources, equipment, drugs and supplies in primary and secondary level facilities. Many patients are referred for laboratory tests, to receive blood products and drugs, and because a certain equipment is lacking or out of order. This observation also highlights the need for greater investments in primary and secondary level health facilities.

The demand for data on health system performance and maternal and child health outcomes is already created by reporting to the audit committee of the National Assembly and by private sector support of the maternity service and the pediatric ward in the tertiary center. The next step is to explicitly demand data on care coordination and to expand the scope of reporting to include primary and secondary levels of care.

Communities are not currently making data demands; it behooves public health leaders to sensitize catchment communities around each health facility about their civic duty to participate in the running of their health facilities - including the review of health systems performance data.

Implementation: Bowen et al (2009) describe implementation as the extent, likelihood, and manner in which an intervention can be fully implemented as planned and proposed [55]. The manner in which routine monitoring of care coordination measures could be introduced was the subject of several comments. The emerging consensus from this study is that a pilot study needs to be done in a part of the country before recommendations could be made for a nationwide rollout.

A reconciliation meeting with program managers, a national consultative workshop with stakeholders, the design of data capture template and the training of personnel to use it, and the sensitization of health workers to avoid a sense of a persecutory audit process are some of the steps suggested by informants. The current HMIS tools are said to be “overdue” for review; it is an appropriate time to introduce tools for capturing data on care coordination. Furthermore, the

current Health Information System Strategic Plan[59] is set to expire in 2015; it is important for care coordination to be a central focus of the next strategic plan.

Many of the providers were comfortable with adding additional data points to their monthly reporting exercise but their medical records and research colleagues suggested that at the initial or pilot phase, data should be collected quarterly in the form of surveys rather than through the HMIS. Providers may not be familiar with the logistics of data collection and aggregation, it will be essential to comply with the advice of medical records and research officials

Practicality: This is the extent to which an intervention can be delivered when resources, time, commitment, or some combination thereof are constrained in some way[55]. In the context of The Gambia, the extent to which it is possible to introduce routine monitoring of care coordination measures in spite of the obvious constraints under which health services are delivered exercised the minds of several key informants.

Informants expressed several severe constraints under which they worked. A lot of the constraints expressed by clinicians were corroborated by central level policy formulators. It is noteworthy that higher level clinicians were not expressive of concerns about operational constraints in lower level facilities. Care coordination will not succeed if providers in higher level facilities do not take responsibility for the care of patients in lower level facilities.

The inadequacy of human resources – both clinicians and medical records officer – was the most often mentioned constraint. Others were the lack of resources to make care coordination possible such as telephone services, ambulances and the drugs and equipment needed to provide services.

It appears that inadequacy of human resources and, lack of health facility telephone services, and ambulances especially at first and second level health facilities are the immediate needs to be tackled to improve care coordination.

Adaptation: This involves changing program contents or procedures to be appropriate in a new situation[55]. The adaptation of existing structures increases the likelihood that a program will succeed as compared with the creation of an entirely new program. In order to facilitate the implementation of the monitoring of care coordination measures some changes to programs, processes and tools are warranted.

There is general agreement by clinicians, medical records officers and research personnel that the monthly or quarterly reporting forms could be adapted. There is an existing protocol for data collection, verification and transmission to the central office; all that needs to be done is to modify each of these processes.

Village health workers (VHWs) work with households and families in villages and they host the Malaria program's outreach to communities. A data sharing and care coordination component could be added to the proceedings at these meetings. Similarly, the in-service meetings and maternal death audit meetings should specifically focus on discussing care coordination and review of the data on care coordination.

Integration: The domain of integration assesses “the level of system change needed to integrate a new program or process into an existing infrastructure or program”[55]. The degree of disruption of the existing HMIS and other health system processes that could occur with the introduction of care coordination measures will influence the success of the intervention. The perception among most informants was that there should not be much disruption to the HMIS if care coordination measures were to be introduced.

Nevertheless, it is important to heed the advice of central level researchers and medical records personnel who recommended a local pilot project with quarterly surveys, and a series of consultative and planning meetings before a national rollout is proposed.

Specific New Measures or Indicators of Care Coordination

The current HMIS report includes data on some maternal health outcomes such as maternal mortality ratio, the number of deliveries, birth rate etc. When care coordination is poor these indicators are poor. However, these indicators do not provide a clear path to improvements in quality of care. While the HMIS must continue to report these outcome indicators, four additional indicators or measurement processes emerged from this study: median referral lag time, clients' satisfaction surveys, chart reviews and compliance with counter-referral.

- Median Referral Lag Time (MRLT)

In the multi-tiered pyramidal health care system run by most LMICs, referral is an essential function for moving patients from one level of care to the other. It needs to be addressed comprehensively in the context of care coordination but there is as yet no known indicator that directly addresses it. The median referral lag time (MRLT) is an attempt to address this deficiency. MRLT could be defined as the period from the decision to refer a patient to the time when definitive care is started in the receiving health facility.

It is not possible to calculate MRLT with data from the current HMIS. One of the informants suggested that confidential inquiries into maternal deaths could be a means of obtaining data for MRLT because all the patient's medical records from all levels of care are assembled for the inquiry. Confidential inquiries into maternal deaths[60, 61] typically collect medical reports of all maternal deaths over a given period and a panel of experts review them to determine the causes of death and the contributions of health sector inefficiencies to maternal death. While it is possible to calculate

MRLT for persons who died from maternal causes through the confidential inquiries process, there will still be no data on women who might have suffered from poor care coordination but who did not die and there will also be no data on children. MRLT could be reported as disease specific or procedure specific estimates or both depending on the concerns of the Ministry of Health and data requirements for program planning. Ultimately, a referral surveillance system that can produce reliable MRLT estimates is needed.

- Client Satisfaction Surveys (CSS)

If care is well-coordinated patients are more likely to have a pleasant healthcare experience. CSS also encourages active participation of patients in the delivery of their health services. When providers know that the policy formulator is interested in knowing how satisfied patients are with the service that they received, providers are compelled to provide better and timely services.

CSS have been used as research tools to assess the quality of care in several African countries [62, 63] but there is no evidence in literature for its routine use specifically for monitoring care coordination.

CSS presupposes that patients and communities are sufficiently aware of the standards of care that they should expect from their providers and that they will be forthright with their grievances with the health system when they are interviewed. It might be necessary to prominently place bill of rights posters in health facilities as part of a comprehensive awareness and sensitization campaign. Client satisfaction surveys could be reported as the proportion of patients or clients who received a service who were satisfied.

- Chart Reviews (CR)

Unlike CSS that assesses the quality of care (including care coordination) from the clients' point of view, chart reviews assess the quality of care from the point of view of professional peers. An important component of quality of care is compliance with the protocol. The review of clinical charts provides an opportunity for retrospective evaluation of the compliance of clinicians with clinical guidelines [64, 65]. Chart reviews by peers can be a valuable resource for non-persecutory enforcement of compliance with clinical guidelines and protocols. If clinical guidelines and protocols are evidence-based and take into account local realities, compliance with them should improve patient outcomes.

One of the challenges of conducting chart reviews expressed by many informants is the lack of clinical staff. Many of the Regional Health Team officials were former clinicians and they could be mandated to review charts with a checklist. The fine details of the frequency of reviews and who does them could be determined locally by consultation. The data from chart reviews could be reported as a proportion of charts compliant with selected clinical guidelines.

- Compliance with Counter Referral

One of the concerns raised by informants is the poor compliance with counter-referrals. The Part B portion of the standardized referral form was not always reaching referring care providers as required in the referral protocol. To improve compliance with counter-referral requirements, the proportion of referrals with completed counter-referrals could be reported routinely.

- Other measures of care coordination

Other measures that could be considered include the proportion of pregnant women complying with referral, the proportion of newborns discharged to a healthcare provider, the proportion of mothers and newborns visited by a healthcare provider in the first week of life etc.

Care coordination is an essential component of health service delivery and it is particularly important to maternal and child health service. It is clear that more formal approaches to care coordination are desirable in The Gambia. Measures of care coordination will be acceptable if introduced but widespread consultations and planning will be needed before a pilot study can be done in a region and then to be followed by nationwide rollout once the demonstrable value is achieved.

CHAPTER 6: RECOMMENDATIONS AND PLAN FOR CHANGE

A number of desirable interventions emerged from this study. In this chapter both specific and general recommendations are presented. The chapter ends with a plan for change that proposes approaches that will ensure that the introduction of routine monitoring is successful. The plan for change relies significantly on change management literature and suggestions made by interviewees.

Recommendations

Short-term Recommendations

These are immediately feasible and essential to the establishment of care coordination as a health system function that will be measured and monitored.

- Sensitization and training of health workers from village health level to tertiary level on care coordination
- Reassuring providers that data from monitoring of care coordination measures will not be used for persecutory purposes but for patient care and identification of in-service training opportunities
- Designation of the newly established Department of Research of the MoHSW as the lead agency for monitoring care coordination measures

Medium-term Recommendations

The recommendations under this category will need more time and resources than the short-term recommendations. Extensive consultations and consensus building efforts are time-consuming but essential to policy introduction and health systems-wide change.

- Updated HMIS policy – including revision of data capture tools to facilitate computation and reporting of measures of care coordination
 - Convening of a consultative meeting
 - Selection of indicators and reporting schedules
 - Linking reporting on measures to decision-making process
 - Defining a minimum data processing and analysis service by health facility type
- Computerization of medical records
- Training and recruitment of health facility management cadre and medical records personnel
 - Data training for all hospital CEOs and in-charge of lower level facilities
 - Training of health workers on new data capture forms

Long-term Recommendations

These are recommendations that will ultimately ensure that the success of the policy on measurement and monitoring of care coordination. Resources will be needed for recruitment of health workers and for the provision of infrastructure that will facilitate care coordination and its measurement and monitoring.

- Recruitment of more health workers
- Improvements in infrastructure – especially mobile telephony

- Ambulances at village and primary care level – partnership between communities and government

Plan for Change

It is hoped that this study will enable the Ministry of Health and Social Welfare, The Gambia to develop and implement a policy on the routine monitoring of care coordination measures in The Gambia.

A suite of indicators (refer to Chapter 5) for the monitoring of care coordination for maternal and newborn health services in low and middle-income countries emerged. In addition, routine monitoring of these indicators is feasible and desirable in The Gambia.

Being an innovative approach to the monitoring of service delivery, it is imperative that a pilot project is conducted to showcase the feasibility and benefits of monitoring care coordination. The demonstration project will present data on care coordination and childbirth outcomes for both mothers and newborns in project areas. The findings will then be compared with health outcomes for mothers and newborns in non-implementing areas.

Description of policy on routine monitoring of care coordination in maternal and child health services

There are no measures of care coordination in The Gambia's health information management system (HMIS). One can recall an old management adage that states that, "You can't manage what you don't measure". Unless public health managers are able to "measure" care coordination they would not know if it is adequate or inadequate, or if it is getting better or worse.

The introduction of a suite of indicators specifically for assessing care coordination in the HMIS or as regular surveys will provide public health managers with data to enable them manage and improve care coordination in maternal and newborn health services.

- **Requirements**

In 2006 the World Health Organization (WHO) and the Health Metrics Network (HMN) Secretariat evaluated The Gambia's digital HMIS [66]. Some of the findings included an inadequate HMIS policy, a lack of adequate management capacity and a lack of adequate computer hardware and software. The introduction of measures of care coordination will ride on the pre-planned HMIS upgrade. Some of the requirements for addressing the HMIS system include the following:

- HMIS policy revision workshop that focusses on existing weaknesses and incorporates measures of care coordination.
- Installation of updated version WHO open-source HMIS software – there is pre-existing capacity to make necessary adaptations to the software
- Pilot study of the revised HMIS in one district – to enable fine-tuning of the HMIS process and adaptation of data capture tools
- Nationwide rollout of revised HMIS
- Distribution of revised HMIS policy and revised data capture tools

A national rollout of the policy on measuring and monitoring care coordination needs to occur only after the revision and upgrade of the HMIS. Nevertheless, as a first step, individual health facilities could make some local changes to documentation and workflow. For example, health facilities could document whether they received counter-referral slips (Part B of the referral forms) and report on the percentage of referrals that are compliant with the policy on counter-referral. Another measure

that could be readily implemented at the institutional level is the use of chart reviews to monitor compliance with protocols and guidelines. Percentage compliance with counter-referrals and chart reviews are two simple measures that can be implemented in a health facility even before a national framework for reporting them is functional. These indicators do not need to wait for the proposed HMIS upgrade. Moreover, health facility administrators could intervene based on these indicators to improve documentation as well as care coordination.

The Gambia currently has one of the highest coverage levels for childhood immunization on the African continent [67-69]. The success of its childhood immunization program can be attributed to the government's commitment to high immunization coverage as a strategy for reducing child mortality and attaining MDG4 targets. Routine monitoring and reporting on the proportion of children who are fully immunized enable immunization program managers to increase immunization campaigns in areas with low coverage. As program managers monitor and report on the measures of care coordination, they will seek to maintain an upward trend toward better care coordination. Low or declining levels of care coordination will stimulate interventions to improve the level of care coordination. Within six months of the introduction of the proposed measures there should be enough evidence to guide remedial interventions. The measures of care coordination will provide evidence for the introduction of homegrown remedial interventions that may otherwise be difficult to justify. If interventions are promptly instituted, the impact on maternal and newborn survival should be evident in about 12 – 18 months from the introduction of measures of care coordination.

The introduction of monitoring of care coordination measures is largely apolitical, in the sense that the electorate is not particularly interested in what is measured but the availability and quality of health services. However, once data is made publicly available it behooves public health authorities

to address concerns that might be raised by data. A political reward might come to the government when the public start to benefit from interventions dictated by the monitoring of care coordination.

This policy has a high likelihood of being sustainable because there is a very important need for care coordination and health workers and policy-makers interviewed in this study have been overwhelmingly supportive of the idea of measuring and monitoring care coordination.

Policy Goals

Maternal and newborn mortality indices are unacceptably high in The Gambia. The underlying premise of this study is that greater coordination of care across different levels of the health system will improve survival of pregnant women and their newborns.

There are currently no measures for care coordination in The Gambia's routine health data reports. It is therefore difficult to assess the level of care coordination and to determine how to intervene. Care coordination is an important necessity in any healthcare system; while it makes intuitive sense that weaker care coordination will be associated with poorer health outcomes, no data was found in literature to support or refute this assumption. Routine monitoring of measures of care coordination in The Gambia will provide much-needed evidence. It is quickly achievable; it is politically feasible and sustainable.

a) Long-term policy goal

The introduction measures of care coordination into the HMIS system will not in itself result in a reduction of maternal and newborn mortality. It is the prompt and appropriate response to measurable and demonstrable trends in care coordination that will improve the delivery of health services and improve the health outcomes for mothers and their newborns. The measures of care

coordination will provide evidence for the introduction of remedial interventions that may otherwise be difficult to justify.

The long-term policy goal is to establish a framework within the MoHSW for the prompt and appropriate response, initially to the state of care coordination and eventually to care coordination trends.

b) Short-term policy goals

The short-term policy goals will advance the cause of routine monitoring of care coordination measures in The Gambia.

- The commissioning of a group of experts to review a list of proposed indicators and an implementation strategy.
- Commissioning of a pilot study of the policy in the Farafenni HDSS site in order to further develop the evidence base in support of the policy.

These short-term policy goals will develop some of the processes that will facilitate the eventual adoption of a nationwide policy on routine monitoring of care coordination measures.

Regulatory Advocacy Strategy

The Board Health of The Gambia is currently being established by parliament to make health policies[70]. The board will function to review the health standards, to monitor the quality of health services and to certify health facilities for service delivery. The 15-member board is made up of representatives of District Councils, Clinical Audit Units, and Health policy makers within and outside of government. No new legislation is required from the parliament. The policy on routine monitoring of measures of care coordination can be implemented by regulations of the MoHSW but

support from the Board of Health will demonstrate high-level support for the proposed change in policy.

A two-pronged Regulatory Advocacy Strategy is proposed. One to be led by the Technical Working Group on Maternal and Child Health (TWG) and the other by a partnership with a nonprofit such as the Female Lawyers of The Gambia (FLAG).

TWG is a group of MoHSW leaders and MCH professionals from international agencies [71]. The TWG was set up to avoid duplication of efforts and to create synergies through collaborative efforts to reduce maternal and child mortality in The Gambia. TWG serves as an informal but rapid policy making a quasi-autonomous agency that is able to get the buy-in of the individual agencies at very short notice. The TWG will lead the advocacy campaigns for the proposed policy at the level of government and institutional alliances. It would be essential to revisit the terms of reference of its members to ensure clarity as to who leads different aspects of the policy implementation. The TWG will be positioned to provide the strong leadership required to drive the policy change and to address any policy incongruences that might arise. The TWG being constituted of national and international civil servants, its members are constrained by civil service rules and organizational mandates. A civil society organization will be needed for mobilization of the general public.

FLAG is a “non-political, non-sectarian, non-partisan, non-governmental and non-profit association” of women in the legal profession in The Gambia formed in 2006. They are a local organization affiliated with the International Federation of Women Lawyers (FIDA). They seek to “advocate [for] and to improve the rights of women and children in The Gambia”. Being a nonprofit organization, FLAG is able to work through civil society and informal societal structures in ways in which the TWG is unable to function. There is evidence that strong leadership and

support for quality needs to come from national and community leaders[57]. The proposed collaboration with FLAG will serve as a bridge between the TWG and other civil society groups.

The regulatory advocacy strategy seeks to address individual members of the board based on their perceived inclinations. For example, the Director of Basic Health Services, a mother herself, will be tasked with convincing the women on the board that the introduction of routine monitoring of care coordination measures will health authorities to identify weaknesses and improve the delivery of health services to mothers and children. FLAG members could also join the Director of Basic Health Services in reaching out to the women on the board.

FLAG officials could bring together faith leaders, women's associations, and youth groups to provide them with information as well as receive commitments from them. They could also work with various media houses to give visibility to the new policy changes.

Stakeholder Analysis

As with every policy initiative there will be those who support it and those who are opposed to it. It behooves public health leaders to mitigate the concerns of opposing voices while taking advantage of the support from supporters of the policy. The stakeholder analysis is presented on Tables 6-1a and 6-1b below examines the roles of stakeholders and how they would be involved.

Table 6-1a: Stakeholder Analysis – Potential Policy Supporters

Stakeholder	Role/ Affiliation	Interests	Comments
Director, Basic Health Services	Government	This Directorate oversees public health facilities; it is in the interest of the Director that quality of care is improved and that health outcomes are better for mothers and children.	Strong leadership support from the Director will ensure early wins and the Director could facilitate the liaison with maternal and child health (MCH) professionals and women on the Board of Health
Director, Planning and Information	Government	The proposed HMIS review is to be led by this Directorate; some of the senior officials of the Directorate who served as key informants already signified their desire to incorporate measures of care coordination as part of routine reports of the MoHSW.	Placement of the of discussions of relevant policy changes on the agenda of the HMIS review consultations will be crucial because the next review might be in 5 years
The Gambia Medical & Dental Association and The Gambia Nurs es & Midwives Association (GaNMA)	Professional Associations	Health professional often bear the brunt of attacks from the media and the general public for perceived widespread disrespect, neglect and abuse of patients in health facilities. Improvements in care coordination could alleviate this perception	Professional associations could bring along the doctors on the Board of Health as well as their members in public health services nationwide.

Stakeholder	Role/ Affiliation	Interests	Comments
Female Lawyers Association Gambia- (FLAG)	Nonprofit	FLAG has been at the forefront of the call for better health services for women. They can be expected to support the policy.	With its reputation and credibility on women's health issues, FLAG's support is desirable - especially among women and civil society groups.
Other women's associations e.g. TRY Oyster Women's Association	Nonprofit	There is a myriad of women's groups who have been brought into health sector campaigns in the past. It is expected that they can be brought into a coalition to support the policy	Some board members have political ambitions for which they would like to be seen to do what is right for women and children
Faith-based Organizations	Nonprofit	Moslem and Christian Associations have supported immunization and supplemental feeding programs in the past. They are likely to support initiatives for greater survival of mothers and their children.	Most board members belong to congregations of faith. Visibility of the policy in churches and mosques will be beneficial.
UN Health Agencies e.g. UNICEF, WHO, UNFPA	International agency	Their mandate includes the provision of technical and material support to the health sector. Currently, they are jointly supporting the proposed HMIS review process.	The demonstration of the technical and financial support of the policy by UN agencies will be persuasive to members of the Board of Health and other stakeholders.

Table 6-1b: Stakeholder Analysis – Potential Policy Opponents

Stakeholder	Role/ Affiliation	Interests	Comments
Clinicians in health facilities	Government	Clinicians are the primary generators of HMIS data. There is a tendency for them to see the exercise as creating work that distracts them from patient care. The measures of care coordination could also reveal lapses in the standard of care that they are providing. Many of these views were expressed by key informants	The support of healthcare providers for the policy change is essential for its success. The advocacy strategy must demonstrate to them that the policy will improve patient care outcomes without undue interference with their professional judgment
Middle and lower level medical records officials	Government	The fear of additional work has already been expressed by some middle-level managers. Many feel that they are currently underpaid and overworked and would welcome the training and recruitment of more medical records personnel.	Dissent from medical records officials who will implement the policy could have a damaging influence on the board. It is important to demonstrate to them that the additional work created by the new indicators will improve the health outcomes of patients.

Stakeholder	Role/ Affiliation	Interests	Comments
Private Doctors Association of The Gambia	Nonprofit	<p>Widespread positive developments in the public health sector lead to a smaller private sector market share. In a relatively small population of 1.7 million.</p> <p>Private doctors will have to swap their medical records forms for the new forms that will include data elements for the monitoring of care coordination. Thus absorbing additional operational costs.</p>	<p>As a group, this is potentially a formidable opponent.</p> <p>The MoHSW might have to offer free exchange of their stocks of unused medical records forms for the new ones</p> <p>The professional associations might have some leverage to weaken their opposition.</p> <p>The media might also be helpful because private doctors never want to be seen as obstacles to progress.</p>

Communications Strategy

The media will be invited to a nonprofit forum where the contributions of the current lack of care coordination to maternal and newborn mortality will be discussed. Similarly, they will be shown how routine monitoring could lead to reforms of health service delivery. Connections will be made to the success of measuring and monitoring of childhood immunizations and how that experience could help to reduce maternal and newborn deaths in the country. Nonprofits and journalists will be shown the kind of data that could be available to them once the policy is running. Current HMIS

quality assurance protocols require that data are reviewed by the HMIS Review Committee of the Directorate of Planning and Information before they are released in reports or to the general public. This process has to be strengthened to prevent abuse of the data and reports. Furthermore, there ought to be safeguards to protect individual providers and health facilities from undue bad press. As much as possible, data will be de-identified and aggregated but it must be possible to “name and shame” erring health facilities when it is in the public’s interest.

Slogans such as “Save a child’s life through better care coordination”, “Coordination saves lives” will be used to communicate the need for greater care coordination to the general public and to health workers.

Talk radio is a major form of trans-generational communications in The Gambia; it will be used to reach out to the general public. Listeners will have a chance to call-in to ask questions or make comments. The panelists for the phone-in program will include MoHSW officials and representatives of nonprofits. This kind of program could be sponsored by some of the international partners represented in the TWG.

Policy Implementation Plan

Implementation of an innovative policy such as the proposed policy on the routine monitoring of care coordination measures will result in major health systems-wide changes. John P Kotter identifies eight steps for leading change efforts [72]. By identifying each step and taking the right actions while avoiding potential pitfalls at each step, successful and sustainable change can be expected.

Table 6-2: Application of JP Kotter’s Eight Steps for Leading Change Efforts to Policy Implementation in The Gambia

Stage	Actions Needed	Pitfalls	Plan for Change in The Gambia
Establish a sense of urgency	<ul style="list-style-type: none"> • Examine market and competitive realities for potential crises and untapped opportunities. • Convince at least 75% of your managers that the status quo is more dangerous than the unknown. 	<ul style="list-style-type: none"> • Underestimating the difficulty of driving people from their comfort zones • Becoming paralyzed by risks 	<p>A sense of urgency will be established by highlighting cases studies of mothers and newborns with adverse birth outcomes as a result of poor care coordination. Cham et al reported some this experiences in The Gambia that will highlight to health professional and the general public that surveillance of care coordination will provide information for remedial public policy and action</p>
Form a powerful guiding coalition	<ul style="list-style-type: none"> • Assemble a group with shared commitment and enough power to lead the change effort. • Encourage them to work as a team outside the normal hierarchy. 	<ul style="list-style-type: none"> • No prior experience in teamwork at the top • Relegating team leadership to an HR, quality, or strategic planning executive rather than a senior line manager 	<p>A guiding coalition of the Technical Working Group (TWG), Female Lawyers of The Gambia (FLAG) and other civil society groups will assume the responsibility for driving the policy change and the subsequent pilot study</p>
Create a vision	<ul style="list-style-type: none"> • Create a vision to direct the change effort. • Develop strategies for realizing that vision. 	<ul style="list-style-type: none"> • Presenting a vision that’s too complicated or vague to be communicated in five minutes 	<p>The involvement of all health workers and interested civil society groups is essential. The simple slogan to convey the message is as follows:</p> <ul style="list-style-type: none"> • Coordination saves lives! • Mainstreaming Care Coordination: All health workers will be encouraged to seek ways to improve care coordination in all aspects of their work and to support the introduction of care coordination measures
Communicate the vision	<ul style="list-style-type: none"> • Use every vehicle possible to communicate the new vision and strategies for achieving it. • Teach new behaviors by the example of the guiding coalition. 	<ul style="list-style-type: none"> • Undercommunicating the vision • Behaving in ways antithetical to the vision 	<p>A section on care coordination and its measures will be created on the agenda of quarterly in-service meetings of Farafenni Hospital (supervises secondary and tertiary health facilities) and the Regional Health Team (supervises primary care health centers). All clinicians and medical records officials will be informed through these meetings. They will also be required to report on care coordination measures once awareness becomes universal</p>

Stage	Actions Needed	Pitfalls	Plan for Change in The Gambia
Empower others to act on the vision	<ul style="list-style-type: none"> • Remove or alter systems or structures undermining the vision. • Encourage risk taking and nontraditional ideas, activities, and actions. 	<ul style="list-style-type: none"> • Failing to remove powerful individuals who resist the change effort 	All health workers, under the guidance of their unit heads, will be required to implement care coordination reforms and incorporate measures of care coordination. This is akin to quality improvement projects that most Western hospitals are familiar with.
Plan for and create short- term wins	<ul style="list-style-type: none"> • Define and engineer visible performance improvements. • Recognize and reward employees contributing to those improvements. 	<ul style="list-style-type: none"> • Leaving short-term successes up to chance • Failing to score successes early enough (12-24 months into the change effort) 	The pilot study is quite important because of its role as a demonstration of the value of monitoring measures of care coordination. Prompt response to early reports of incoordination will build support for the policy. The support of international organizations and the private sector will be sought for the funding of necessary interventions.
Consolidate improvements and produce more change	<ul style="list-style-type: none"> • Use increased credibility from early wins to change systems, structures, and policies undermining the vision. • Hire, promote, and develop employees who can implement the vision. • Reinvigorate the change process with new projects and change agents. 	<ul style="list-style-type: none"> • Declaring victory too soon—with the first performance improvement • Allowing resisters to convince “troops” that the war has been won 	<p>Ongoing support from the MoHSW and its partners will ensure that the gains of policy change can become entrenched and health workers and the general public can embrace the policy change.</p> <p>The role of labor unions and professional associations is highly crucial in this regard. They will be co-opted into reviewing reports generated on care coordination and it is hoped that they will in turn mobilize their members to improve care coordination and health outcomes for women and children.</p>
Institutionalize new approaches	<ul style="list-style-type: none"> • Articulate connections between new behaviors and corporate success. • Create leadership development and succession plans consistent with the new approach. 	<ul style="list-style-type: none"> • Not creating new social norms and shared values consistent with changes • Promoting people into leadership positions who don’t personify the new approach 	As the value of policy change become more evident and entrenched in the pilot test area, other contingent districts will start to implement the policy. Where feasible, health workers from implementing districts will help to train other health workers in new districts selected for implementation.

CHAPTER 7: CONCLUSIONS

In conclusion, care coordination is an essential component of health service delivery; it is important especially for maternal and newborn health conditions because they often experience rapid deterioration and require the transfer of care from one level of care to another. Local and international experts in this study respectively decried the inadequacy of care coordination in The Gambia's health system and in LMICs in general. Lessons learned from measuring and monitoring care coordination in maternal and child health services are also relevant for other health care services.

Care coordination is measurable and policy-makers should incorporate measures of care coordination into routine health reporting platforms, either through the HMIS or in the form of regular surveys.

It is hoped that more studies of care coordination and its measurement will be conducted in LMICs health services research. The expansion of the knowledge base of the interaction between care coordination and health outcomes will equip health policy formulators and managers with additional tools for improving the quality of care that they provide. It is only when many LMICs start to report on care coordination measures for maternal and child health services that the global health community will be able to learn from such experiences.

APPENDIX I: ROUND 1 NGT QUESTIONNAIRE

Draft Dissertation Proposal for the fulfillment of the Doctor of Public Health (DrPH) degree

The Program in Health Leadership,
Department of Health Policy and Administration
Gillings School of Global Public Health
University of North Carolina, Chapel Hill

Developing measures of care coordination for maternal and newborn health services in developing countries: The Gambia as a test case

NGT Questionnaires 1

DrPH Candidate: Koyejo A. Oyerinde
Chair of Dissertation Committee: Harsha Thirumurthy
Chapel Hill

July 2014

NGT 1 Questionnaire

Dear Colleague,

We would like to solicit your help in a nominal group technique (NGT) study of a topical issue for international maternal and child health experts, especially for those for whom service and research on the strengthening of health services in low and middle-income countries (LMICs) are the focus of their vocation. The study is designed to elicit the response of maternal and child health experts on the concept of care coordination in the context of the delivery of maternal and newborn health services in LMICs.

The NGT technique is a widely used method for gathering group consensus from a panel of experts that incorporates anonymity of responses while reducing the pressure to conform. There will be two rounds of questions. The first is to describe the principal components of care coordination and its relevant measures while the second, 2-3 weeks later - will focus more on ranking the consolidated response from the first round. Because you are an expert in maternal and child health, your contributions and participation in the research effort will be invaluable and greatly appreciated.

Sincerely

Koye Oyerinde (Principal Researcher & Doctoral Candidate)

Harsha Thirumurthy (Professor and Chair of Doctoral Dissertation Committee)

Round 1:

Biodata of panelists

Q1. What is your primary professional classification (Ob/Gyn, pediatrician, medical officer, midwife etc.)? _____

Q2. What are your highest Maternal and Child Health or public health related qualification? (please translate to English if need be) _____

Q3. How many years of international health experience do you have? (Please round to the lower whole number and state 0 if you have never worked in international health) _____

Q4. How many years did you spend providing bedside clinical/midwifery care in low and middle-income countries (LMICs)? (please round to the lower whole number and state 0 if you have never worked as a bedside clinician in LMICs) _____

Q5. Where did you do most of your Maternal and Child Health work in LMICs? (Please select only one option below)

- Sub-Saharan Africa
- South East Asia

- Middle East and North Africa
- Western Pacific
- Latin America and the Caribbean
- Other (please specify) -----

Questionnaire

In general, health services in LMICs are organized in a pyramidal and hierarchical model; certain services and procedures are by policy not offered at lower level facilities and sometimes some services are meant to be provided only at lower level facilities.

The concept of care coordination in MCH literature from LMICs is poorly developed. A recent review revealed that the concept is implicit but not explicit. The consequence is that there is very little literature and data on this very important element of the primary health care approach to health service delivery.

Maternal mortality often has a multifactorial etiology; lack of care coordination is only one of such factors. In the four vignettes below, examples of how some of the elements of poorly coordinated care contribute to maternal mortality are presented. All 4 vignettes were adapted from M. Cham et al (2005)¹

¹ Cham, M., J. Sundby, and S. Vangen, Maternal mortality in the rural Gambia, a qualitative study on access to emergency obstetric care. *Reproductive Health*, 2005. 2(3): p. 1-8.

Vignettes	My Commentary	Your Reaction to vignette and commentary
<p>(1)</p> <p>"The patient came to the health center at around 4:00 pm.....she cannot be managed here because she may need an operation [caesarean section]. We planned to evacuate her to the hospital but our ambulance had a breakdown a week ago. We looked for transport in the village throughout the night but could not get one. The following morning we went to the agricultural department to look for transport but their vehicle had already left for trek. It returned around 11:00 am and thereafter it came to transport the patient to the hospital".</p>	<p>If the care of the patient had been coordinated she would not have to wait 19 hours to begin the journey for a lifesaving procedure.</p> <p>Making sure that there is transportation for unexpected emergencies ought to be part of the coordination of care.</p>	
<p>(2)</p> <p>"She was admitted in the hospital for two weeks and discharged on a Monday. On her return to our village [85 km away from the hospital] she fell down unconscious. We took her to the health center in our village where she was transferred to another health center [20 km]. She was again transferred to the hospital [60 km away]. She spent few hours at the hospital and died".</p>	<p>Transfer of care from a referral center back to the primary care provider (aka counter-referral) might have made the difference between life and death in this case.</p> <p>It is poor care coordination to transfer a patient to a facility without the requisite skills and resources to manage the problem.</p>	

Vignettes	My Commentary	Your Reaction to vignette and commentary
<p>(3)</p> <p>"She was pouring blood at home so we took her to the health center. There we were told she urgently needed blood but blood bags were not available. She was then transferred to the hospital [60 km away]. At the hospital blood bags were finished. She was in the hospital from mid-day up to the following day in the evening but had not received blood. Late at night she died".</p>	<p>Another case of poor care coordination. The referring provider ought to know that a service is available at a particular facility before referring the patient.</p>	
<p>(4)</p> <p>"We took her to the health center in the village...she was examined by the nurse who later transferred her to another health center [44 km away]. There she spent the night and the following morning she was again transferred to the hospital [36 km away]. On our way to the hospital we had to cross the river at two different crossing points. Immediately after we reached the hospital she died".</p>	<p>Yet, another case of poor care coordination in a multi-tiered hierarchical health system.</p> <p>Perhaps her life would have been saved if she went directly to the hospital from her village health center.</p>	

Q10. In the context of the delivery of maternal and child health services in LMICs, how will you describe care coordination?

Q11. In your opinion, what are the most important elements of care coordination for MCH services in LMICs? List as many as five

1. -----
2. -----
3. -----
4. -----
5. -----

A well-known public health maxim states that, ‘what gets measured gets done’; it is important that public health officials are able to measure aspects of care coordination. This will enable them to routinely determine that care is coordinated and they can intervene once lapses are identified.

Q12. For each of the elements of care coordination listed in Q11 please list at least one measure or indicator that can be routinely measured to ascertain that care is coordinated

1. -----
2. -----
3. -----
4. -----
5. -----

Many thanks!

A shorter questionnaire that includes a summary of this round of the nominal group technique will be sent out to you in about 2-3 weeks. Best wishes.

APPENDIX II: ROUND 2 NGT QUESTIONNAIRE

Draft Dissertation Proposal for the fulfillment of the Doctor of Public Health (DrPH) degree

The Program in Health Leadership,
Department of Health Policy and Administration
Gillings School of Global Public Health
University of North Carolina, Chapel Hill

Developing measures of care coordination for maternal and newborn health services in developing countries: The Gambia as a test case

NGT Questionnaires 2

DrPH Candidate: Koyejo A. Oyerinde
Chair of Dissertation Committee: Harsha Thirumurthy
Chapel Hill

November 2014

NGT 2 Questionnaire

Dear Colleague,

Thank you for your participation in the first round of the nominal group technique (NGT) study of care coordination in the context of the delivery of maternal and newborn health services in LMICs.

In this second and final round of the study we present to you a summary of findings from round 1 and solicit your assistance to rank the principal components of care coordination and a list of potential indicators for routine monitoring of care coordination.

Your contributions to this study are invaluable and greatly appreciated.

Sincerely

Koye Oyerinde (Principal Researcher & Doctoral Candidate)

Harsha Thirumurthy (Professor and Chair of Doctoral Dissertation Committee)

Q1: The following description for care coordination in the context of maternal and child health service delivery in LMICs emerged from the Round 1 NGT study.

“Care coordination is a process that links women, children and their families to multiple health care services from different providers in a complementary, coordinated, consistent and timely manner to provide them with optimal health care”. It requires that “all levels of the health system talk to each other in an effective way with the care of the patient at the center of their concerns”. “Care coordination can be defined as coordinated care provision at all levels with clear guidance on what is available where and with multi-sectoral participation”. It includes, “Measures taken by healthcare personnel as part of an institutional norm, that allow an adequate management, assessment and care of the patient, including transfer if the case requires it”.

Please share any thoughts you might have about this description. *(Please write none if you have no comments)*

Q2. Below is the list of 6 principal components of care coordination that emerged from round one of the NGT study. In the spaces provided please rank them in the order of importance from 1-6 (1 being the least important and 6 the most important). A number cannot be used twice and a number must be assigned to all components.

The most important elements of care coordination for MCH services in LMICs (summary of Round 1 Q11 submissions)

- Functioning Referral Systems (Communication protocols, Reporting Systems, Referral Protocol/Mechanism etc.)
 - Continuum of care from the community until the tertiary level of the health care system
 - Referral and counter-referral system across different levels of the system
 - Communication - Good quality and reliable telecommunications between peripheral health centers and clinics and referral hospitals.

- Regular review of care coordination activities to provide lessons for improvement
 - Coordination meetings between levels of the system – for “lessons learned and challenges shared”

- Feedback and auditing of death to avoid similar problems in the future
- Performance monitoring - monitoring framework - Clinical cases review, case fatalities review
- Standard operating procedures and protocols that include care coordination, with
 - Coordinated efforts to promote continuity of care by optimizing safety and accuracy during handoffs, or transfers between health care settings
 - Clear packages of services and communication of the policies and guidelines at all levels
- Community participation – demand for quality services (accountability)
- Leadership/Management (Enabling Policy Environment)
 - Enabling care environment in terms of infrastructure, drugs and equipment
 - Effective logistics management – logistics resources and systems
 - Improved intersectoral collaboration
 - Deployment of HR to ensure functional maternal and newborn emergency services
 - Training and recertification of HR
 - Availability of reliable service data.
 - Appropriate budget provision for care coordination
- Teamwork between providers - communication between and among all members of the healthcare team and the patient, emphasizing shared decision-making with families
 - Multidisciplinary teams, Supervision and feedback

Q3. If you would like to add any comments regarding your rankings or anything else, please do so here: *(Please write none if you have no comments)*

Q4. Below is the list of the measures of care coordination obtained from round one of the NGT study. If you were to choose 10 measures that you would want Ministries of Health to routinely report on, which of these would they be?

In the spaces provided please rank your top 10 measures from 1-10 *(1 being the least important and 10 the most important. Please put 0 in the spaces for those you have not selected).*

E. Input indicators

- Proportion of health facilities with:
 - i. reliable and functional communication facilities
 - ii. Emergency transportation: (availability)
 - iii. Standard Operating Procedure (SOP)

- HR e.g. midwife per population
 - i. No. of staff trained to competency in providing essential obstetric and newborn care
 - ii. Percentage of health workers who know which services are available where
 - iii. Number of facilities with skilled birth attendants

- Number of basic and comprehensive EmONC facilities for a defined population

- Proportion of facilities providing emergency services 24/7

- Proportion of communities living less than 3hrs from a referral facility

- Proportion of facilities with a dedicated budget for the referral system

F. Process indicators

- Number of coordination meetings held per trimester, quarter or year

- Median Referral Lag Time – time from referral decision to definitive care

- Adherence to SOPs in health facilities /Referral guidelines followed

- Percentage stock out of tracer drugs and supplies (logistics)
 - i. Number of lifesaving drugs reported as being out of stock in the past 6 months

- Percentage of health facilities who regularly conduct maternal and perinatal death audit and take appropriate measures

- Number of policy and guidelines produced and communicated
 - i. No. and Types of Protocols, Guidelines and Standards Available

- Referrals with referral letter/prior notification to referral facility
 - i. Number of messages & notes exchanged between a primary healthcare center and the hospital (or among network members)
 - ii. Feedback provided to referring facilities

- Preparedness Plan for emergencies (Routine Assessment and Certification)

- Presence and functionality of multi-sectoral coordination mechanisms at each level

- Trends in No. of Referrals, and Types of Diseases/Condition reported by facilities

G. Output/outcome indicators

- Percentage of budget used for designated purposes
- Client satisfaction surveys
- Morbidity and mortality rates
- Clinical cases review, case fatalities review (CFR)/Criterion based audits / Annual reviews

H. Others

- Community involvement in management of health facilities
- No. of recommendation from "community" on quality of care improvements that have been satisfactorily addressed in last 3 months
- Number of counties with health strategic plans with intersectoral programs.
- Knowledge, attitude, needs and practices of Community members on the facilities available (Health Seeking Behavior)
- Accountability (review mechanisms in place and rewards/sanctions in place)
- Training: Providers trained in coordination system
- Availability and use of district health packages

Q5. If you would like to share your thoughts about how you ranked these measures or anything else, please do so here. *(Please write none if you have no comments)*

This concludes the nominal group technique study. Many thanks indeed for your assistance.

APPENDIX III: KEY INFORMANT INTERVIEW GUIDE

Draft Dissertation Proposal for the fulfillment of the Doctor of Public Health (DrPH) degree

The Program in Health Leadership,
Department of Health Policy and Administration
Gillings School of Global Public Health
University of North Carolina, Chapel Hill

Developing measures of care coordination for maternal and newborn health services in developing countries: The Gambia as a test case

Interview Guide

DrPH Candidate: Koyejo A. Oyerinde
Chair of Dissertation Committee: Harsha Thirumurthy
Chapel Hill

December 2014

Feasibility Assessment for the Introduction of Routine Measures of Care Coordination in maternal and Newborn Health services in Low and Medium Income Countries

Key Informant Interview Guide

INSTRUCTIONS: The following guide is to be used to collect information from key informants; the Director of Health Information Systems (HIS) at the central government level, the district manager responsible for collating data for the HIS and health facility-based maternal and newborn health services clinicians. The purpose of the key informant interviews is to gather a group of experts' perspectives on the feasibility of routine collection of data on measures of care coordination as related to maternal and newborn health services.

Begin by introducing yourself and the purpose of the interview. Confirm that the respondent is willing to participate in the interview and explain that participation is optional.

Tick box if written consent has been given:

Notify the respondent that the interview will be recorded and that you are about to begin the audio recording.

Start recording and begin the discussion.

No.	Item	Response/Comments
	Interviewer's name	Koyejo Oyerinde _____
	Interview date	____ / ____ / _____ (dd / mm / yyyy)

	Role of interviewer	HMIS Director (central government)1 HMIS District Officer2 Clinician (3 ⁰ care level)3 Clinician (2 ⁰ care level)4 Clinician (1 ⁰ care level)5 Medical Records Officer (3 ⁰ care level)6 Medical Records Officer (2 ⁰ care level)7 Medical Records Officer (1 ⁰ care level)8
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First, let's discuss care coordination and the 1st phase of this study

It is important that the care provided in a multi-tiered health system like you have in your country is coordinated. Maternal and newborn health conditions tend to be unpredictable and rapid deterioration are fairly common. It is therefore particularly important that that the care of mothers and newborns are coordinated.

We have asked maternal and child health experts around the world to suggest the principal components of care coordination and the measures that should be collected on a routine basis to ensure that care is coordinated.

The following components of care coordination were identified:

- a. **Leadership/Management (Enabling Policy Environment)**
 - Enabling care environment in terms of infrastructure, drugs and equipment
 - Effective logistics management – logistics resources and systems Improved inter-sectoral collaboration
 - Deployment of HR to ensure functional maternal and newborn emergency services
 - Training and recertification of HR Availability of reliable service data.
 - Appropriate budget provision for care coordination

- b. **Teamwork between providers communication between and among all members of the healthcare team and the patient, emphasizing shared decision-making with families**
 - Multidisciplinary teams, supervision and feedback

- c. **Standard operating procedures(SOPs) and protocols that include care coordination, with designated positions for specific roles**
 - Coordinated efforts to promote continuity of care by optimizing safety and accuracy during handoffs, or transfers between health care settings
 - Clear packages of services and communication of the policies and guidelines at all levels
- d. **Functioning Referral Systems (Communication protocols, Reporting Systems, Referral Protocol/Mechanism etc.)**
 - Continuum of care from the community until the tertiary level of the health care system
 - Referral and counter-referral system across different levels of the system
 - Communication Good quality and reliable telecommunications between peripheral health centers and clinics and referral hospitals.
- e. **Regular review of care coordination activities to provide lessons for improvement**
 - Coordination meetings between levels of the system – for “lessons learned and challenges shared”
 - Feedback and auditing of death to avoid similar problems in the future
 - Performance monitoring framework
 - Clinical case review, case fatalities review

Question: Any thoughts about these 5 principal components?

The following **measures of care coordination** were identified:

- a. **HR e.g. midwife per population:**
 - No. of staff trained to competency in providing essential obstetric and newborn care
 - Percentage of health workers who know which services are available where
 - Number of facilities with skilled birth attendants
- b. **Proportion of health facilities with:**
 - Reliable and functional communication facilities
 - Emergency transportation: (availability)
 - Standard Operating Procedure (SOP)
- c. **Median referral lag time & time from referral decision to definitive care**
- d. **Percentage of health facilities conducting maternal / perinatal death audit and take appropriate measures**
- e. **Adherence to SOPs in health facilities / Referral guidelines followed:**
 - Clinical case reviews, case fatality reviews (CFR)/Criterion based audits / Annual reviews
- f. **Number of basic and comprehensive EmONC facilities for a defined population**
- g. **Proportion of facilities providing emergency services 24/7**
- h. **Client satisfaction surveys**
 - Proportion of patients satisfied with their care
- i. **Number of policy and guidelines produced and communicated:**
 - No. and Types of Protocols, Guidelines and Standards Available
- j. **Percentage stock out of tracer drugs and supplies (logistics)**
 - Number of lifesaving drugs reported to have been out of stock in the past 6 months
- k. **Accountability (review mechanisms in place and rewards/sanctions in place)**

Do you routinely collect data on any of these indicators and measures? If yes, could you show me any data entry forms or data summaries?

If data is collected, do you routinely report on any of these indicators? If yes, how frequently do you report? Can you share any recent reports?

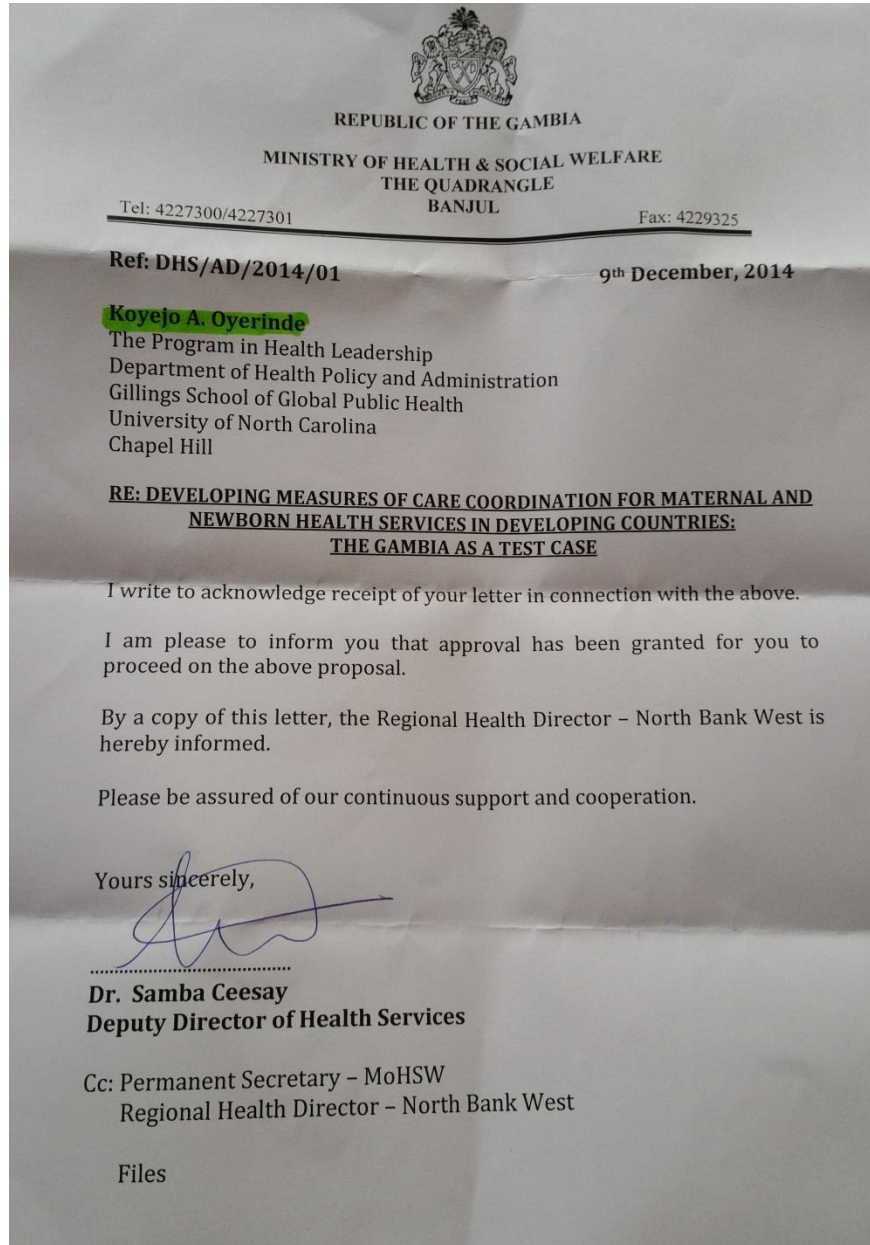
	Definition	Questions (Remember to probe for the sub-bullets)
A	Acceptability – the extent to which suggested measures of care coordination are suitable, satisfying, or attractive to health workers, data collators and central level health surveillance officers	1. In your opinion, would health workers be willing to collect data for the following measures? (If response is brief, add a probe – e.g., “Can you tell me more about this?”) <ul style="list-style-type: none"> a. b. c. d. e.
B	Practicality – the extent to which the measures can be carried out with intended participants using existing means, resources, and circumstances and without outside intervention	2. How do you think the measures could be introduced into the routine HMIS? Do you think they could be introduced without additional material and human resources? If yes→ Can you tell me how this could be done? <ul style="list-style-type: none"> a. b. c. d. e.
C	Adaptation – the extent to which the measures will perform when changes are made to the suggested format	3. Can you talk about the changes that need to be made to enable the collection of data for the following measures? <ul style="list-style-type: none"> a. b. c. d. e.

<p>D</p> <p>Integration – the extent to which the suggested measures can be measure be integrated within the existing health management information system (HMIS)</p>	<p>4. Do you think the proposed measures would disrupt the pre-existing processes for collection and reporting on HMIS data? How could this be done, if at all, without disruption?</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>d.</p> <p>e.</p>
<p>F</p> <p>Implementation – the extent to which the suggested measures can be successfully and sustainably delivered to intended participants in some defined, but not fully controlled context</p>	<p>5. Do you have any thoughts on how could the proposed measures be implemented most successfully?</p> <p>6. How could they be implemented in a way that is sustainable?</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>d.</p> <p>e.</p>

7. What do you think could get in the way of collecting the data for measuring care coordination?
8. What would help enable the collection of the data?
 - a. Can you think of any incentive schemes that could improve routine collection of measures of care coordination?
 - b. Can you think of any incentive schemes that could improve reporting on measures of care coordination?
9. How would costs affect collecting the data?
10. How would regulations, if any, affect collecting the data?
11. Are there any other thoughts you would like to make about the measures of care coordination in maternal and newborn health services suggested in Phase 1 of this study?
 - a. Any other general comments?

Thank you for your time

APPENDIX IV: LETTER OF APPROVAL FOR STUDY



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