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Understanding Community and Health Worker Perceptions of Integrated Health Services with Routine Immunizations in Mali

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An abstract of
A thesis submitted to the Faculty of the
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Understanding Community and Health Worker Perceptions of Integrated Health Services with Routine Immunizations in Mali

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Background: There has been great success in addressing vaccine preventable diseases through the Expanded Programme on Immunizations (EPI); however, this success has not translated into the delivery of other cost-effective interventions that can contribute to reducing child morbidity and mortality. There is increasing interest to build upon the expansive routine immunization (RI) network to increase the reach of other health services through integration into the routine immunization program. The *Global Immunization Vision and Strategy* (GIVS) has incorporated integrated health services as one of its four strategic areas to reducing global child mortality.

Objective: This study was conducted to better understand community preferences and perceptions for integrated health services at the health facility level through community and health worker perceptions of integrated service delivery using immunizations as a platform in Mali, West Africa.

Methods: A qualitative cross-sectional study consisting of 16 in-depth interviews with health workers and key informants; 12 focus group discussions with mothers, fathers, and paternal grandmothers; and 25 exit interviews with mothers leaving the health facility. The study was conducted in seven urban and rural sites within the Bamako, Kayes and Sikasso regions.

Results: Community members and health workers support an integrated delivery structure, with preferred interventions including: vitamin A supplements, Insecticide Treated Nets, growth monitoring, educational discussions, Ante- and post- natal consultations, and cooking demonstrations. Services preferred to be separated include HIV/AIDS related services (but not informational discussions) and family planning.

Discussion: The integration of additional health services should not negatively impact the EPI programme, but work to strengthen both the interventions and routine immunizations. The research confirms RI is the primary reason women visit the health facility, reinforcing the use of RI as a suggested platform for integrated services. The lack of human resources, training and supervision, stock-out, and poor service delivery structure are major barriers to efficiently and consistently delivering the services provided. Access to services through consistently maintaining supply and expanding outreach programmes is an important component to ensure equal distribution of services. Availability of services and the quality of service delivery are important elements to ensure the number of services integrated and how they are integrated are not compromising the quality of service delivery by offering too many services.

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Lina Mahy was my first mentor who taught me about the realities of this work, and how to maintain passion and motivation with a good sense of humor and an appreciation for all I have to learn from everyone who crosses my path in life.

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The reason I started in this work and will continue in this work will always return to the village of Dramétou, Mali. My passion and motivation was ignited during my two years with this community. I will be forever indebted to the kindness and love this community shared that opened my eyes in a world of poverty that is full of kindness, love and happiness. Dramétou taught me what life really is, how to laugh, and appreciate the small gifts that make living truly meaningful.

Finally, I would like to acknowledge my family. Without them, I would never be where I am today, they taught me to believe I can accomplish anything if I work hard enough for it. My mom and grandma have always been right behind me and been my biggest cheerleaders; my dreams have been accomplished for them, because of them.

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TERMS OF REFERENCE

ACSD	The Accelerated Child Survival and Development programme
ANC	Antenatal Care visits
BCG	Bacille Calmette-Guérin
CHW	Community Health Worker
DTP	diphtheria - tetanus - pertussis
EPI	Expanded Programme on Immunizations
GAVI	Global Alliance Vaccine Initiative
GIVS	Global Immunization Vision and Strategy
HF	Health Facility
HIHS	Health Impact Health Services
IMCI	Integrated Management for Childhood Illness
ITN	Insecticide Treated bed Net
Hep B	Hepatitis B
HIB	Haemophilus influenza type b
JE	Japanese Encephalitis
MDGs	Millennium Development Goals
NID	National Immunization Days
OPV	Oral Polio Vaccine
ORT	Oral Rehydration Therapy
PATH	Programme for Appropriate Technologies in Health
PCV	Pneumococcal Conjugate Vaccine
PHC	Primary Health Care
RI	Routine Immunizations

Rota	Rota Virus Vaccine
SIA	Supplementary Immunization Activities
SNID	Supplementary National Immunization Days
TT	Tetanus Toxoid
UN	United Nations
UNICEF	United Nations Children's Emergency Fund
VPD	Vaccine Preventable Disease
WHO	World Health Organization
YF	Yellow Fever Vaccine

1.0 INTRODUCTION

Communicable and vaccine preventable diseases continue to be the leading cause of child mortality globally.[1] There has been great success in addressing vaccine preventable diseases through the Expanded Programme on Immunizations (EPI); however, this success has not translated into effective delivery of other cost-effective interventions that can contribute to reducing child mortality.[2] Historically, routine immunization (RI) programs have successfully reached a wider population base than any other health intervention.[3] Globally, there is increasing interest to build upon the expansive routine immunization network in an effort to increase the reach of other health services through integration into the routine immunization program.[3] With the success of the EPI programme and its wide reach of hard to reach populations, the World Health Organization (WHO) and the United Nations Children's Emergency Fund (UNICEF) *Global Immunization Vision and Strategy* (GIVS) has incorporated integrated health services as one of its four strategic areas to reducing global child mortality.[3] Given the increased interest and pressure to integrate services into routine immunization programs, there is a need to better understand the impact of integration, both positive and negative, and what considerations should be addressed when making integration decisions.

This study was conducted to better understand community and health worker perceptions of integrated service delivery using immunizations as a platform in Mali, West Africa. Potential services include standard WHO-recommended health interventions such as: distribution of bed nets (ITNs); antenatal services (ANC); micronutrients (e.g. vitamin A); as well as provision of HIV and family planning services. In order for successful

program implementation, it is critical to understand community demands and preferences for various services and integrated delivery, in addition to assessing the potential impact on the community and health programs to ensure all services are delivered in a manner that meets the needs of the population, is within human resource capacity, and aligns with the policies at the national level. Careful consideration will need to be given to ensure the addition of health services will not negatively impact the EPI programme, but will work to strengthen both the intervention and RI. An appropriate approach to elucidate these issues is to conduct a qualitative evaluation, including interviews and focus groups with community members, immunization workers, and other health service workers at the community, district, and national level.

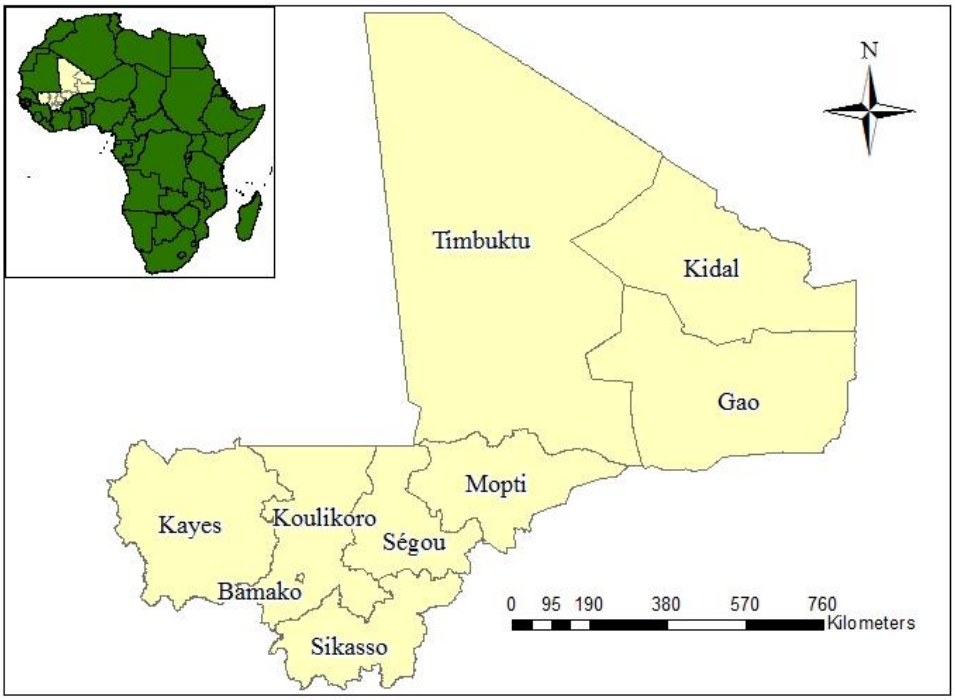
2.0 BACKGROUND

2.1 Mali

Mali is a large landlocked country located in the Sahel region of West Africa expanding a total 1.24 million square kilometers. The country is divided into eight regions: Kayes, Koulikoro, Sikasso, Segou, Mopti, Gao, Tombouctou, and Kidal. Mali has an estimated population of 12.7 million people. The climate is subtropical in the south gradually ascending to arid desert in the north. The hot season runs from March to May, with the rainy season lasting from June to October and a cold season spanning from November to February. The primary ethnic groups in Mali include the Mande (Bambara, Malinke, Sarakole), Peul, Voltaic, Tuareg/Moor, Songhai.

Mali gained independence from France in 1960, which fell under dictator rule until 1992 when President Alpha Konare was democratically elected into office. He stepped down in 2002 after his two term limit and was succeeded by Mali's current president Amadou Toumani Toure (ATT). The official language of Mali is French and the national language is Bambara. With 65% of its land area desert or semi-desert, Mali is one of the poorest countries in the world with about 10% of its population nomadic and 80% engaged in agriculture and fishing with cotton and gold being its primary exports. Mali's gross national income per capita in 2004 was $980, with 36.1 percent of its population living on less than US$1 per day.[4,5]

Figure 1: Map of Mali

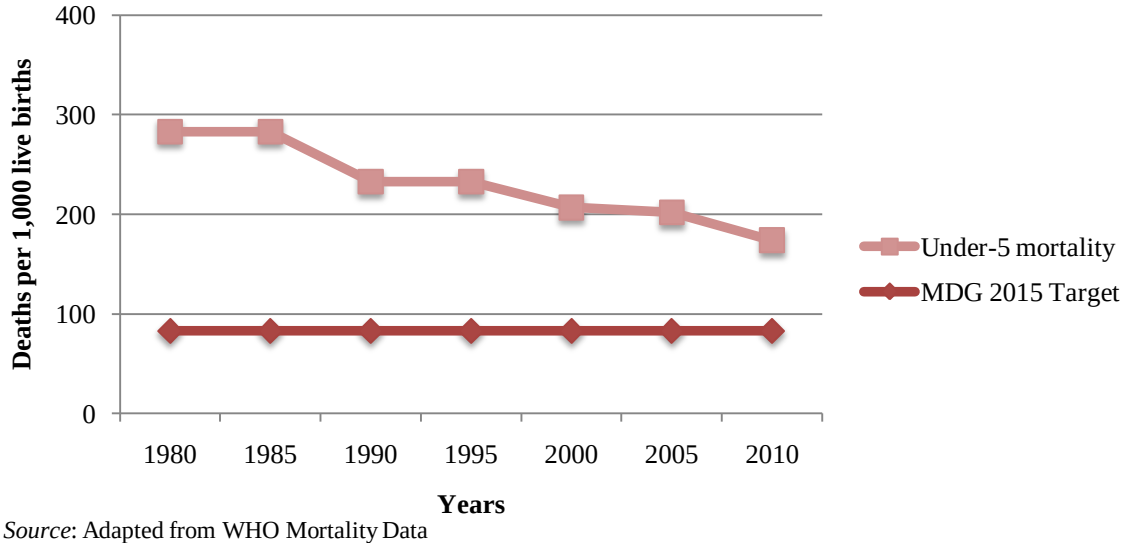


2.1.1 Mali Health Profile

Mali's health development indicators are some of the lowest in the world, with many health issues being attributable to poverty such as malnutrition, malaria, and inadequate hygiene and sanitation.[4] The life expectancy among males at birth is 44 years and 47 years for females, which does not differ greatly from other African countries.[5] Maternal mortality was reported as 1 200 per 100 000 live births in 2004, compared to 910 per 100 000 live births in the rest of Africa. The distribution of years of life lost by broader causes in both men and women in 2002 were communicable diseases (86%), non-communicable diseases (8%) and injuries (6%).[5] Among the proportion of women seeking antenatal care (ANC) in 2001, 53 percent visited the health center at least once, while 30 percent visited at least four times.[5] Mali has one of the highest under-five mortality rates in the world, with 191 per 1,000 live births dying before the age of five,

which reduced from 229 (17%) between 2001 and 2006 (Figure 2).[6] In order for Mali to achieve the MDG 4, this must be reduced to 83 per 1,000 by 2015.[6]

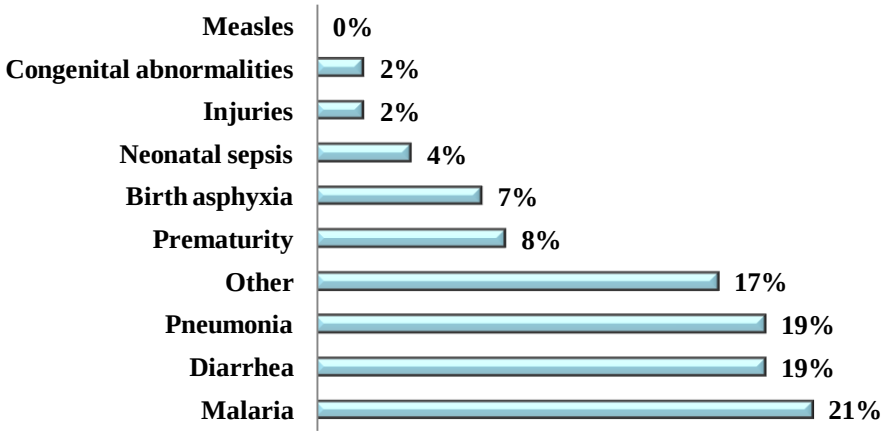
Figure 2: Under-5 mortality: Estimated trend and MDG goal Mali (1980-2004)



Source: Adapted from WHO Mortality Data

Part of the successes in child mortality reduction have been a result of immunization programmes with 48 percent of children being fully immunized today, compared to 29 percent in 2001; however the persistence of other preventable illnesses continues (Figure 3).

Figure 3: Distribution of causes of death in children under 5 years in Mali (2008)

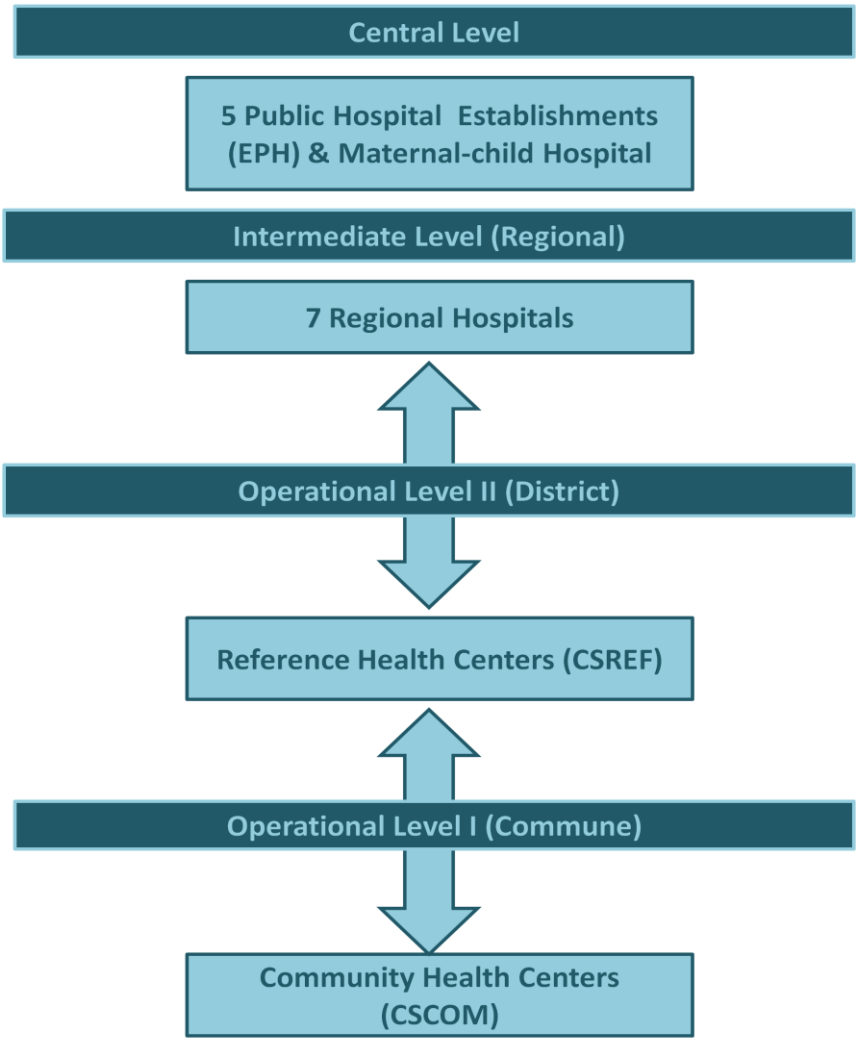


Source: WHO, 2010

2.1.2 Mali Health System Profile

Based on the Malian constitution, all citizens have a right to health. The health system structure has been decentralized since 1991 after a popular revolt, allowing for health policy to be developed through the Office of the Ministry of Health and administered by the National Health Directorate. The health system in Mali is comprised of three levels: central (national), intermediate (regional), and operational (district and commune) (Figure 4).[4]

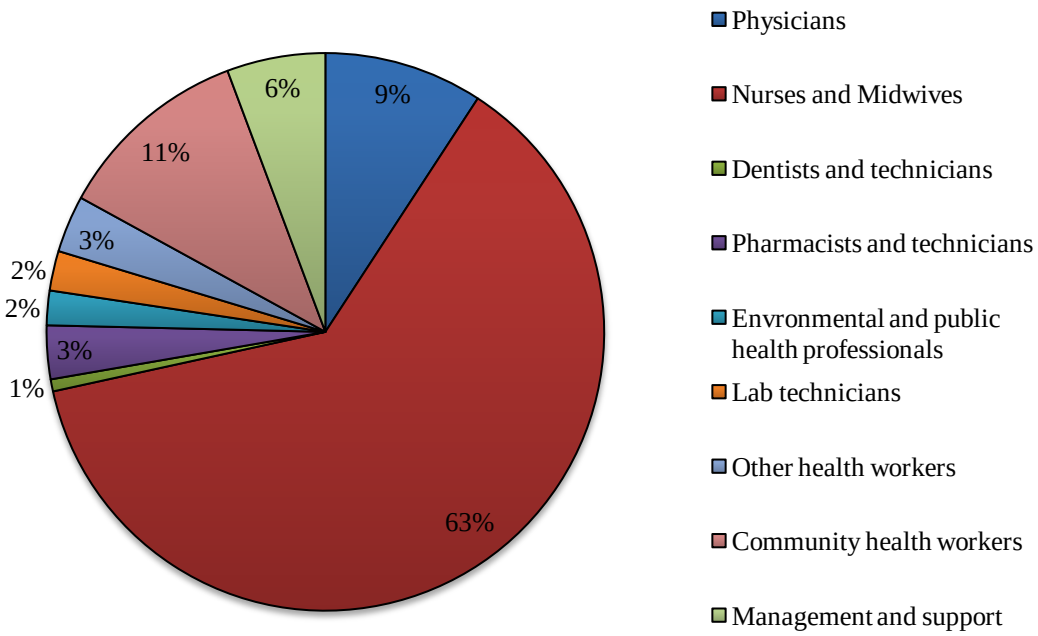
Figure 4: Mali Health System Structure



Source: Adapted from SAMSS Model

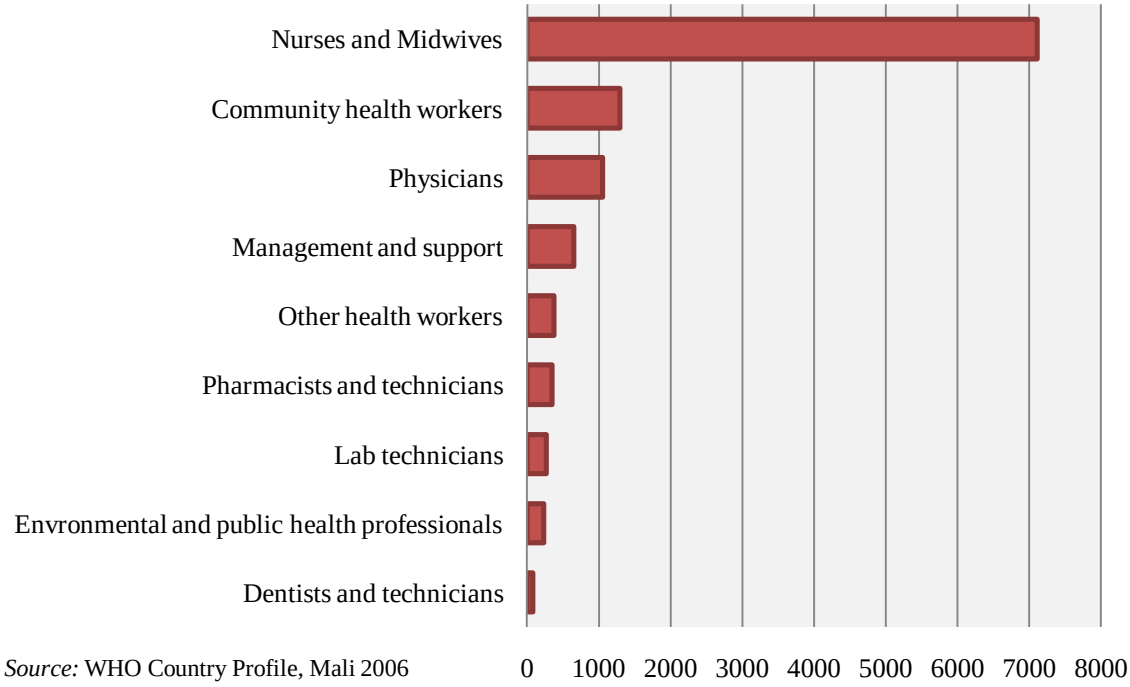
There is an uneven distribution of health workers in Mali (Figure 5) with the majority being comprised of nurses and midwives (Figure 6) with the total density of health workers in Mali lagging behind that of the rest of the WHO AFRO region (Figure 7).

Figure 5: Mali distribution of health workforce (2006)



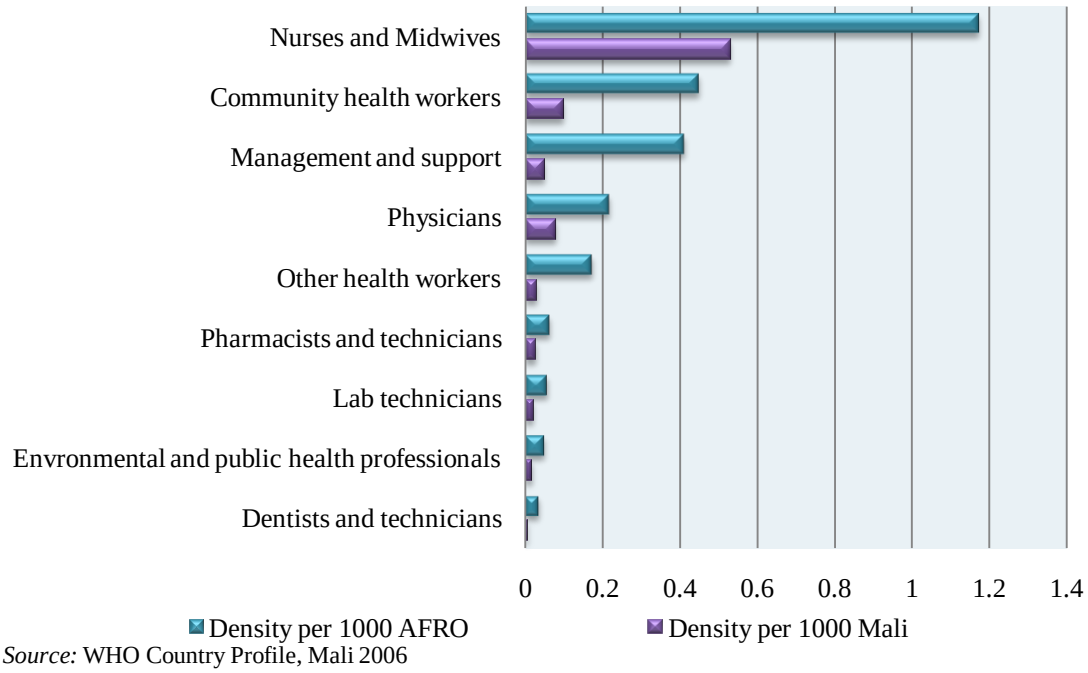
Source: WHO Country Profile, Mali 2006

Figure 6: Total number of health workers in Mali (2002)



Source: WHO Country Profile, Mali 2006

Figure 7: Total Density of the Health Workforce in Mali compared to the WHO AFRO Region per 1,000 (2002)



Source: WHO Country Profile, Mali 2006

In 2003, 4.8 percent of the gross national product was spent on health with a 57.4 percent general government expenditure on health, 42.6 percent private expenditure, and 13.7 percent external resources of total expenditure on health. The per capita expenditure on health in 2003 was US$16.[5]

2.2 Expanded Programme on Immunizations

Vaccines are considered one of the most successful and cost-effective child survival interventions, reducing morbidity and mortality, saving more lives globally than any other health intervention in history. During the successful Small Pox eradication programme in the 1970s, vaccination coverage rates for vaccines other than Small Pox in

developing countries were reaching an estimated 5% of children in the first year of life.[7] In response to these low coverage rates, the Expanded Programme on Immunizations (EPI) was launched in 1974 by the World Health Organization (WHO).[7] The EPI programme introduced four vaccines, preventing six endemic diseases (oral polio, diphtheria, tuberculosis, pertussis (whooping cough), measles and tetanus), which was adopted globally, becoming universal in 1980.[7] These four vaccines came to be known as routine immunizations (RI). Today routine immunizations include Bacille Calmette-Gu**é**rin (BCG), oral Polio, diphtheria-pertussis-tetanus (DPT), Hepatitis B, Haemophilus influenze type b, measles and have expanded to include endemic diseases such as Yellow Fever (YF) and Japanese Encephalitis (JE) (Table 1).

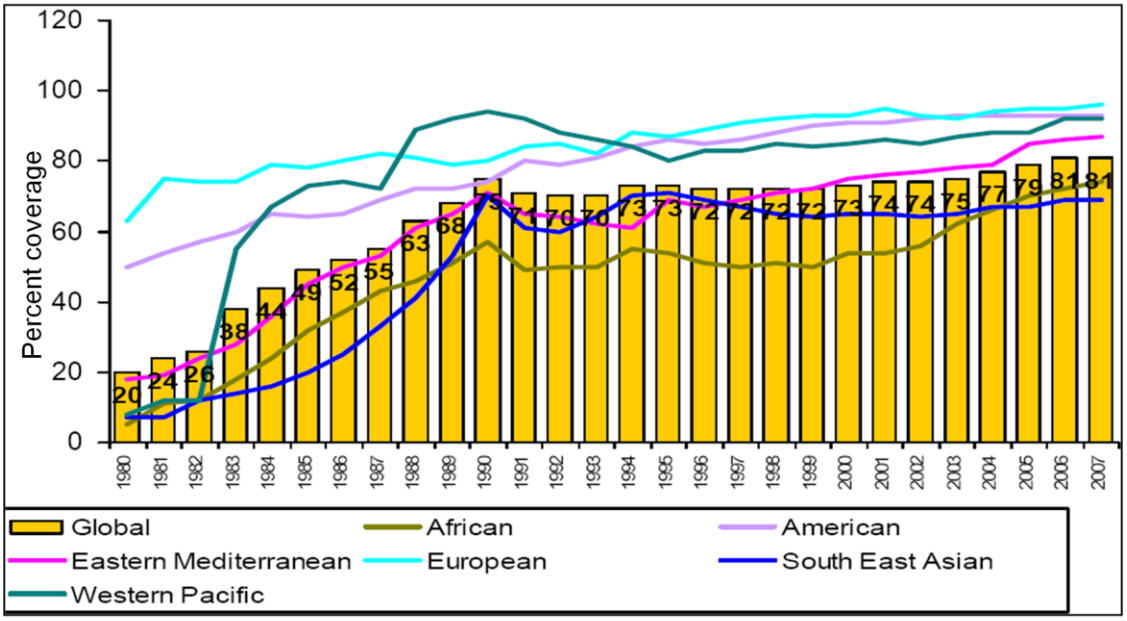
Table 1
Typical national immunization schedule in developing countries

Vaccine	**Recommended age for vaccination**				
	Birth	6 weeks	10 weeks	14 weeks	9 months
Bacille Calmette-Guérin (BCG)	X				
Oral Polio	X	X	X	X	
Diphtheria-pertussis-tetanus (DPT)		X	X	X	
Hepatitis B		X	X	X	
Haemophilus influenza type b		X	X	X	
Yellow fever					X
Measles					X

Source: Optimising the use of routine immunization clinics for early childhood development in sub-Saharan Africa. *Vaccine*, 2009; 27(28):3719-23. Epub 2009 May 3.

The EPI programme saw an increase in immunization coverage in the 1980s; however with a shift in health priorities by the early 1990s and immunizations receiving less funding, coverage gains leveled off (Figure 8).

Figure 8: Global Immunization 1980-2007, DTP3 Global Coverage

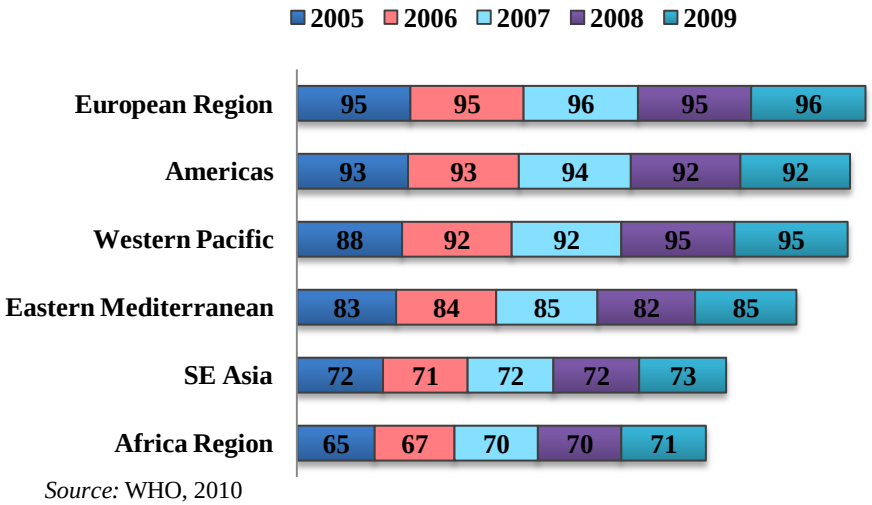


Source: WHO/UNICEF Coverage Estimates, 1980-2007, as of August 2008

In response, the WHO developed the Global Programme for Vaccines and Immunizations in 1994 to regain the progress previously made. In 1998, WHO partnered with the Programme for Appropriate Technologies in Health (PATH) to develop the Children's Vaccine Program, with the backing of the newly established Bill and Melinda Gates Foundation.[8] The goal of this program was to increase access to vaccines for children in developing countries in addition to accelerating the research and development of new vaccines.[8] These partnerships were the beginning of the Global Alliance Vaccine Initiative (GAVI) that was developed in 2000, and has contributed to the introduction of new vaccines like Hepatitis B (Hep B), Haemophilus influenza type b (Hib), Rota virus (Rota), and Pneumococcal (PCV). As a result of accumulated efforts since the 1970s, over 70% of children under the age of five are immunized globally, with millions of deaths and hospitalizations averted (Figure 9). Polio has seen a 99% reduction in

incidence since 1988, resulting in elimination in most parts of the world and close to eradication.[9] Measles has also seen a significant reduction, with a 78% decrease in measles-associated mortality between 2000-2008.[9] Additionally, DTP3 coverage was estimated to have 66% coverage in 2004, resulting in 22 of the 46 of WHO African region countries achieving 80% coverage.[10]

Figure 9: DTP3 Coverage by WHO Region



Source: WHO, 2010

Despite the great success of the EPI programme, achievements have not been sustained in all countries with an estimated 27 million infants and 40 million pregnant women not being reached in 2003.[3] Coverage rates have leveled off, initiating creative program planning to assist in scaling up coverage rates and additional health interventions. The current GIVS aims for 80% routine immunization coverage based on DTP3 in all districts with the ultimate goal to reach 90% coverage, an ambitious goal given the current disparities persisting between rural and urban populations.[10]

2.3 Millennium Development Goals

In September 2000, the United Nations (UN) Millennium Summit held a special session, during which the Millennium Declaration was adopted by a number of world leaders and the United Nations Millennium Development Goals (MDGs) were established to reduce extreme poverty by the year 2015. Eight goals were established, three of which being specifically related to child survival:[11]

- MDG 4: the reduction of child mortality among infants and children under the age of five;
- MDG 5: improve maternal health;
- MDG 6: combat HIV/AIDS, malaria and other diseases.

Immunization and other health programmes also help contribute to MDG 1 working toward reducing poverty by decreasing the number of disabilities caused by diseases in unimmunized children; in addition to MDG 2 by increasing education through the prevention of diseases that could otherwise keep children out of primary education.[3] Despite noticeable progress toward reducing child mortality, the highest rates of child mortality continue to persist in sub-Saharan Africa.[11] Child vaccination programmes are one of several efficacious and cost-effective interventions that can contribute to the reduction of child mortality.

2.4 Child Survival

In 1977, the World Health Assembly introduced an integrated approach that aimed at achieving health for all with a focus on primary health care that centered on programmatic delivery.[12] Child survival health programmes address the reduction of

morbidity and mortality in infants and children under the age of five through offering curative or preventative services. EPI has been very effective in improving child survival in developing countries; however, is unable to address all diseases contributing to poor health outcomes in infants and children. After the EPI programme started, UNICEF began focusing its efforts on other interventions (e.g. growth monitoring, ORT, breastfeeding, family planning, and female education) that eventually became known as child survival programmes which had a community oriented, population-based, primary health care approach that used affordable effective appropriate health care technologies.[12] The implementation of these interventions became known as "selective primary health care" as it was neither vertical nor horizontal, but a hybrid of both. Despite gains in child mortality reduction, this success has not been distributed evenly with child mortality remaining high in poor areas as the gap between rich and poor continues to widen.[12] Child survival interventions that are cost-effective, proven effective, and delivered with high coverage are necessary to achieve MDG 4.[13] The only interventions shown to reach high coverage are immunizations and vitamin A.[13,14]

2.5 Vertical and Horizontal Delivery Structures

For over 30 years, public health professionals have been debating how to most efficiently and effectively deliver child survival interventions. Historically, the method of delivering health programs have been defined as "vertical" or "horizontal" where vertical delivery seeks to tackle one or a few health problems, while horizontal is an integrated service package tackling multiple health issues toward primary health care.[15]

2.5.1 Vertical Health Delivery Structure

Vertical health programmes aim to focus on a few or several specific diseases that generally operate independently and are not always integrated into the primary health care system.[2] Vertical programmes are limited in purpose and are focused on a defined health need that are most commonly associated with mass campaigns to control specific diseases with the objective of the control or eradication of one or a few specific diseases.[15] Donors tend to be more attracted to vertical programmes because their aims and objectives are well defined, often have high impact, and are time limited with the potential for disease eradication; in addition to having a more specific structure for training and supervision.[15] Vertical programmes are sometimes the best options in countries where health systems are very weak and resources are few.[2] Currently, Polio is a popular vertical programme for a disease that has been eliminated from most of the globe and has potential for future eradication. This programme has come under criticism for the amount of resources being used toward eradication and is suggested that putting a significant amount of resources into a single programme would not be an efficient use of resources, especially if the investment in health systems strengthening is small.[16] A criticism of vertical programmes is that despite their ability to reach a large proportion of the population, it does not always impact behavior change and improve health seeking behavior among populations that are hard to reach.[15] For example, a study in Ghana concluded that many of the vertical programmes being implemented saw changes in technical aspects, but organizational structures had not adapted, staying largely unchanged.[16] The study also mentioned the challenges in programmes creating a division within the ministry, each programme controlling its own staff and being concerned with

its own area of intervention.[16] There is also criticism that disease specific interventions divert resources away from a primary health care approach.[16] The literature suggests for vertical programmes to be more effective and sustainable, it would be beneficial for them to also invest in health system strengthening and surveillance systems to help reduce over vaccination of multiple vaccine doses and strengthen the health system.[17]

2.5.2 Horizontal Health Delivery Structure

Horizontal health programmes generally seek to work toward primary health care (PHC) through a number of preventive and curative interventions that can address a number of disease areas.[15] Horizontal programmes are often less specific, as they address a range of diseases while strengthening the health system to support a sustainable primary healthcare programme, which can be considered less tangible and therefore less attractive for donors.[2] The benefits of a horizontal system are its holistic approach to providing inter-sectoral healthcare, while keeping sustainability of programmes and strengthening the health system as a priority to support such a system.[15] The challenges are the resource requirements needed to sustain it and its ability to access hard to reach populations to achieve equity.[15]

2.5.3 Vertical vs. Horizontal

Vertical programmes tend to be an independent entity within a health system, while horizontal programmes have an integrated approach and might have coordinators at the regional or district levels to oversee a number of programmes. Despite the debate between the two approaches, they are not mutually exclusive as neither can attain full

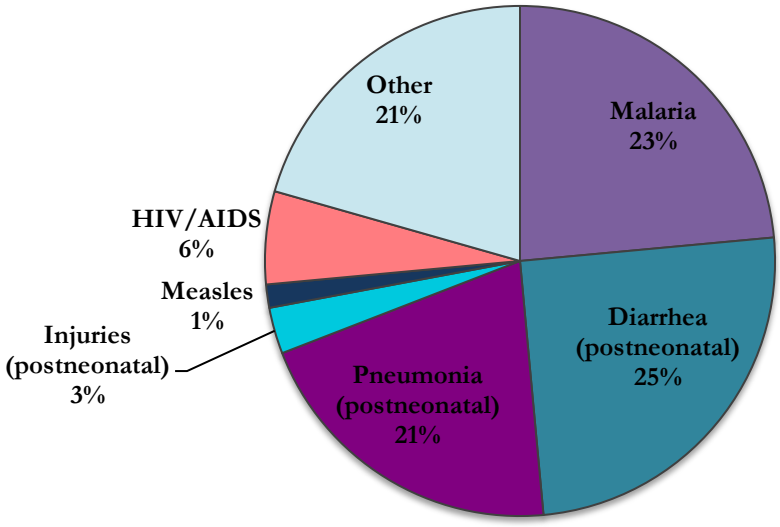
success independent of the other. While vertical programmes aim to have a large reach with high impact, horizontal programmes aim to change behavior and develop a system conducive to achieving primary health care coverage. It is through bringing these two health delivery structures together an integrated structure has been proposed, using the EPI programme as a platform to implement additional child survival interventions.

3.0 LITERATURE REVIEW

3.1 Integration

Integration of health services has been defined by WHO as the process of bringing together common functions within and between organizations to solve common problems, developing a commitment to a shared vision and goals, and using common technologies and resources to achieve these goals.[18] Alternatively, it is also defined as the eventual assimilation of health interventions into critical functions of the health system that include: governance, financing, planning, service delivery, monitoring, and evaluation and demand generation.[19] Integration works within a horizontal structure and tends to retain elements of a vertical structure with the goal of overall health improvement, implying multi-sector strategies, programmes and activities with the objective of bringing essential health interventions to scale.[2,15] Child survival interventions commonly integrated with immunizations include: micronutrients (vitamin A, iron, and iodine), ITNs, health education, growth monitoring, ANCs, and family planning.[14] These interventions address the most common causes of death and illness among the same target population including: acute respiratory tract infections, diarrheal diseases, malaria, tuberculosis, HIV/AIDS, malnutrition and vaccine preventable diseases (Figure 10).[10]

Figure 10: Major causes of death in children under 5 years in the WHO African region (2008)



WHO reports programmatic factors influencing the decision of interventions selected to be integrated generally consider burden of disease, availability of resources (operational funds, supplies, human resources, etc.), cost-effectiveness and feasibility, partner support, and acceptability of interventions by communities and political leaders.[18] The debate among vertical, horizontal, and integrated programmes has existed for over 30 years.[15] In recent years, this debate has been reignited, proposing a shift in program planning, moving away from vertical health programmes and moving toward a horizontal approach by integrating related health interventions, using the platform of immunizations, to maximize child survival and work toward achieving MDGs 4, 5, and 6.[3]

3.1.1 Integration Platforms

As a result of immunization programmes successfully capturing over 70% of its target population, the Global Immunization Vision and Strategy of 2006-2015 recommends in

one of its four strategic areas to integrate linked health interventions with routine immunizations.[3] Moving toward such an integrated service delivery model allows for efficient delivery of the maximum number of health interventions to achieve high impact and a wide reach among the target population. There are several immunization platforms other child survival interventions could be integrated with, they include: routine immunization services; Periodic Intensification of Routine Immunization services (PIRI); and Supplemental Immunization Activities (SIAs).[18]

Table 2
Child Survival Health Services

Routine health services	Includes all services provided in ANC and maternal and child health units, including child immunization.
Expanded or enhanced routine child health services	Child health weeks/days, and community outreach activities
Mass immunization campaigns	Measles catch-up, keep up, and polio NIDs and SNIDs. Generally used to accelerate control, eradication or elimination of VPDs.

Source: Adapted from WHO, *Experiences from the Africa Region*, 2006.

Routine health services are considered an effective platform for delivering additional child survival interventions to children under the age of five because a child will require at least five contacts with routine vaccination services during the first year of life to complete its vaccination series.[10] Mothers are also recommended to receive two TT vaccinations as part of her ANC visits, providing additional opportunities for contact and delivery of additional health services.[10]

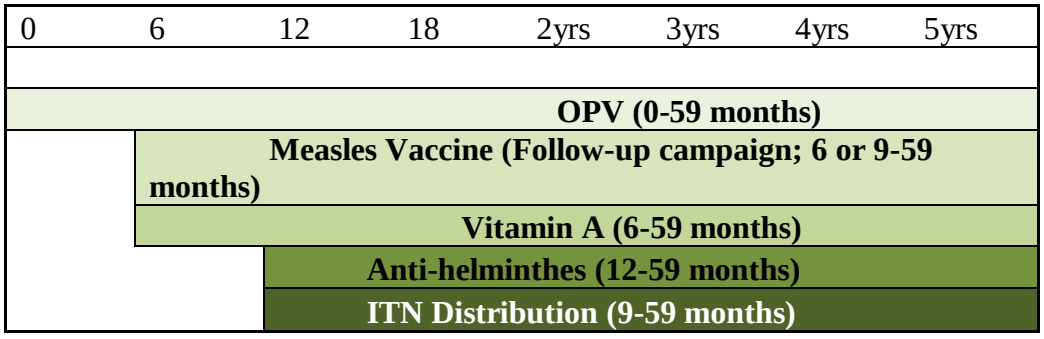
Based on experiences in the WHO Africa region, expanded or enhanced routine child health services are delivered with a district level approach and tend to take place annually or bi-annually. Examples of these programmes are child health days/weeks. The

packages of services provided depend on finances, human resources, supplies and logistics.[10]

Mass immunization campaigns are a rapid scale-up of additional child health interventions through supplementary immunization activities (SIAs) that seek to accelerate control, eradication or elimination of diseases.[10] Examples of SIAs are Polio campaigns that started integrating vitamin A in 1998, and most recently measles campaigns that have added vitamin A, ITNs, OPV, TT, and anti-helminthes.[10]

The GIVS highlights the integration of additional child survival interventions with routine immunizations does not only benefit each individual service, but they can provide a mutual benefit by achieving health goals that support each other. Immunizations are a consistent and regular opportunity for other preventative and curative interventions to have contact with the same target population (Table 3).[3] Building upon this platform will allow maternal and child health interventions to utilize immunization contacts to link together child survival programmes like vitamin A, ITNs, or ANC visits.

Table 3: Target ages of common child survival interventions[10]



3.1.2 Potential Integration Benefits

Integration can be beneficial when the linkages are well planned, helping facilitate the pooling of resources, joint training, improved management, and a reduction in costs.[20] Shared costs between interventions can improve the cost-effectiveness and free up funds to contribute to health system strengthening. Integration can also allow for a more efficient use of resources, in addition to offering integrated training and supervision. Taking advantage of immunization contacts will allow for increased coverage rates of child survival interventions, resulting in increased utilization of services to contribute to the reduction of child morbidity and mortality.

Table 4: Potential Challenges and Benefits to Integration

Issue	Potential Benefits	Potential Challenges
Supplies and Logistics	- Efficient Planning - Pooling of resources	- Limiting outreach capacity - Inconsistency of intervention supply - Stock out - Resource constraint - Resource allocation at national level and accurate forecasting
Health System Capacity	- Health system strengthening - Maximize efficiency - Empowers district and community level capacity and involved in decision making	- Health system absorptive capacity -Multiple interventions can have a negative impact on coverage - Strong health system essential element to sustain services
Cost	- Shared costs - Improve cost-effectiveness	- If not planned correctly can end up more expensive
Service Delivery	- Increased coverage for child survival interventions - Increased utilization of a greater number of services	- Fixed post, outreach, campaign, or SIAs - Perpetuate inequalities between rich and poor populations -Complexity of multiple interventions delivered at once - Community acceptance and uptake of intervention - Deliver with quality
Human Resources	- Integrated supervision - Integrated training	- CHW availability - Lack of health workers to support interventions - Absorptive capacity of CHWs -Work load
Stakeholder Coordination	- Increased coordination and cooperation among programmes - Improved public-private partnerships	- Independence between health programmes (funding, staff and strategies) - Vertical programmes not always integrated with current health structure
Monitoring and evaluation	- Coordinating M & E between programmes	- Integration of new programmes with well established EPI M & E

3.1.3 Potential Integration Challenges

Integration considerations and challenges concern primarily health system capacity, resource constraints, and the absorptive capacity of community health workers to sustain the benefits of an integrated system. The literature also underscores the importance of assessing which health issues to address in what context, to not only develop generic recommendations, but rather an integrated strategy that fits the health needs of each country.[2,15] Other considerations include what activities to implement, available technology, effectiveness of alternative organizational patterns, total resource availability, ease of use, effectiveness, methods of use, safety, supervision, coverage, and how much of the activities will be offered to whom, by whom, and in what form of delivery.[15]

Supplies and Logistics

High child mortality is attributable to essential health services not reaching hard to reach populations. As outreach programmes have been expanded, their capacity is limited and services not always consistent. Resource constraint on finances and CHW availability make it difficult to maintain these services, and are likely to be offered at a more limited capacity compared to fixed health posts. The allocation of resources takes place at the national level, and is then distributed to the regional then district or provincial levels. With a system as such, health centers have little autonomy in what services they offer as it is contingent upon what supplies they receive. As a result, resource allocation at the local level is based on national allocation, which sometimes runs the risk of over or under stocking health centers with vaccines and other supplies.

Health System Capacity

The GIVS calls for a strengthening of health systems and for all national immunization plans to include sector-wide plans for human resources, financing and logistics to work toward integrating immunization, other health interventions and surveillance into the health system.[3] It is argued that at least three of the health related MDGs will not be achieved without the strengthening of health systems.[21] WHO reports that platforms offering multiple interventions can have a negative impact on coverage unless the interventions are well-targeted and good logistics are established that ensure accurate forecasting, supply and delivery, adequate human resources and good monitoring and evaluation.[20] The literature also maintains a strong health system is essential to the sustainability of integrated health interventions and all interventions should have an element of health system strengthening in order to sustain the interventions long term. Integration should be seen as "maximizing efficiency" and not be seen as "an end in itself."[22] It is recommended by Clements to consider the decision for what to integrate to be made at the district or provincial level as this helps empower districts, strengthen their health system, while allowing communities to be involved in deciding what health services to receive.[13]

Service Delivery

Delivery strategy is an important consideration that is often not separated from studies of the health intervention impact as the delivery of an intervention can contribute to its effectiveness and sustainability.[2] For example, EPI interventions can be delivered at a fixed post, outreach, a campaign, or immunization days, each intervention will have a

different level of impact but the delivery mechanism cannot be duplicated.[2] There is also concern about integration perpetuating inequities among populations as the gap between rich and poor continues to widen. If all interventions are delivered by the same mechanism, then a child either gets the entire package of interventions or nothing at all; arguing that if coverage is not universal, combined delivery approaches can create a detrimental effect on equity.[2] Further arguing if introduction of new technologies primarily benefits children who are already covered by existing interventions, packaging several interventions through a single delivery strategy, might make economic sense, but could contribute to increased inequalities unless population coverage is very high.[23]

It is argued that the adoption or diffusion of an intervention is also related to the complexity of the intervention, the more complex the intervention is, the slower it will be adopted. An example of complexity is a single dose pill of ivermectin to treat onchoceriasis or lymphatic filariasis that is given annually integrated with a health campaign.[19] It is simple and effective and therefore has seen quick adoption.[19] However, if contrasted with HIV/AIDS treatment that requires a number of treatments, education on treatment and prevention, in addition to visits to the health center illustrate how such an intervention is complex and therefore slow to adopt.[19] Adoption of additional health services is also impacted by how it is perceived by the community, the context, and health system; in addition to community acceptance through key actors, opinion leaders, social networks, systems and structure and absorptive capacity.[19] Finally, with health seeking behavior being inconsistent among populations, it is recommended that integrated interventions offered in fixed health centers should also be expanded in

outreach programmes to optimize child survival and maintain equity among populations receiving care.[3,14]

Human Resources

Having well trained health workers to effectively deliver a service is important, but is often times not prioritized with human resources being a neglected component of the health system. One study conducted between 1978 and 2001 found a causal link between the number of health workers and health outcomes, specifically referring to maternal mortality rates being most responsive to increased numbers of health workers, with the assumption that many maternal deaths occur because of the absence of a trained health worker.[21] It is also important to consider the number of interventions health workers are expected to deliver in a way that retains quality in the delivery of care to achieve optimal care.

Coordination among Stakeholders

With the establishment of many vertical programmes, many of the disease specific programmes operate independently, but are housed within the Ministry of Health. Many have their own funding, staff, and strategies. Although ideally aligning with the overall strategy for improved health within the country, they are not always integrated within the local health structure. This becomes further challenging at the district and community level when training and supervision is segregated among interventions. Bringing these programmes together as a horizontal coordinated body at the regional and district level to

capitalize on the benefits of integration is suggested, but may be challenging as programmes operate in a vertical fashion at the national level.

Monitoring and Evaluation

The monitoring and evaluation system currently in place for EPI is established and well functioning. Integrating new services within this system could be challenging.

3.1.4 Key Considerations for Integration

For integration to be sustainable and effective, researchers suggest the need for community participation, strong and effective public and private partnerships, establishing inter-sectoral links, while combining available technology with behavioral interventions.[12] To effectively support and implement the integration of additional health services with RI, the literature suggests the need for policies to be in place at the national level to reinforce such a structure. Some suggest to optimize access to integrated services, standardizing such a system runs the risk of not addressing or over addressing community health needs. Adapting a strategy for integrated health services to each country would help accomplish the GIVS vision for immunization and related interventions (to be) sustained in conditions of diverse social values, changing demographics and economies, and evolving diseases.[3]

3.2 Integration in Africa

Currently, a large number of fixed health centers in Africa offer a level of integrated services with immunizations, such as growth monitoring, nutritional advice, information on preventive care, referral to other services, and reproductive care for the mother.[3]

The most successful examples of simple cost-effective child survival interventions being integrated with immunizations are vitamin A supplements and ITNs. Since 2001, routine and supplementary polio and measles campaigns started integrating ITNs.[20] In 2004, Togo began integrating ITNs with mass immunization campaigns after a pre-distribution survey showed ownership and utilization of bed nets being low, and ownership positively associated with the higher wealth quintile.[24] The campaign reported achieving 90% coverage, with an increased ownership and usage rate among households nine months after the campaign.[24] The integration of ITNs and immunizations achieved rapid scale-up that was cost-effective, with costs being shared among the programs, in addition to reducing inequities among populations.[24] Other studies of ITNs integrated with tetanus, polio and measles campaigns showed similar results with high coverage and utilization post campaign period, with increased equity among wealth quintiles.[25] One study indicated the marginal cost was calculated at .32 cents per ITN delivered (the cost incurred by the measles campaign with the addition of ITNs) of which contributed to programme planning, social mobilization, health worker salary, cost of transport for personnel, and some supervision.[25] Roll Back Malaria has also been a partner in supplying ITNs for integrating with immunization campaigns, in addition to focusing on community and health systems components.

Vitamin A deficiency has been determined a problem in 44 of 46 WHO African region countries.[26] The distribution of Vitamin A supplements was very low in the 1990s, primarily offered during maternal and child health visits in health facilities.[26] Once

Vitamin A began being integrated in Child Health Days and/or campaigns in 1998, the deficiency saw a dramatic decrease between 2001-2005.[26] SIAs have integrated vitamin A, deworming tablets, and ITNs andthese interventions have been particularly present during measles campaigns.[20]

3.2.1 Integrated Management of Childhood Illness (IMCI)

IMCI is a programme developed and implemented to address integrated case management for child illnesses in developing countries with the highest burden of the most important causes of death.[27] IMCI focuses on the well-being of the whole child to reduce death, illness and disability, promoting improved growth and development among children under five years of age.[28] The primary components of IMCI include locally adapted case management guidelines; improvements in health systems for effective childhood illness management; improvements in family and community practices.[27] IMCI seeks to address the interaction of critical elements and barriers to accessing appropriate care through integrated critical child survival interventions, both curative and preventative, implemented by families, communities and health facilities (Table 4).[28] It was first implemented in Tanzania and Uganda in 1996, with now more than 80 countries having adopted the strategy.[29] IMCI child survival interventions include: antibiotic treatment for pneumonia, oral rehydration therapy for diarrhea, anti-malarials, immunizations, breastfeeding counseling, anemia diagnosis and treatment, and vitamin A supplementation.[29] There have been reported challenges with the IMCI programme with its implementation in some countries having been rolled out in two to three years, providing too short a timeline to effectively plan and train health workers, ultimately resulting in a negative effect of outcomes.[2]

Table 5: Interactions in IMCI Strategy	Promotion of growth, Prevention of disease	Response to sickness
Family and community	Community/home-based interventions to improve nutrition and ITNs	Early case management, Appropriate care-seeking, Compliance with treatment
Health services	Vaccination, Complementary feeding and breastfeeding counseling, Micronutrient supplementation	Case management of: ARI, diarrhea, measles, malaria, malnutrition, other serious infection. Complementary feeding and breastfeeding counseling, Iron treatment, Antihelminthic treatment

Source: Integrated approach to child health in developing countries. *The Lancet*, 1999; 354(Supplement 2):SII16-SII20

3.2.2 Accelerated Child Survival and Development programmes (ACSD)

In 2002, the Accelerated Child Survival and Development programme (ACSD) was developed to reinforce existing activities and health systems, focusing on strengthening CHW service delivery to increase the delivery of package health interventions in the districts of 11 African countries that had a high reported under five mortality rate.[20]

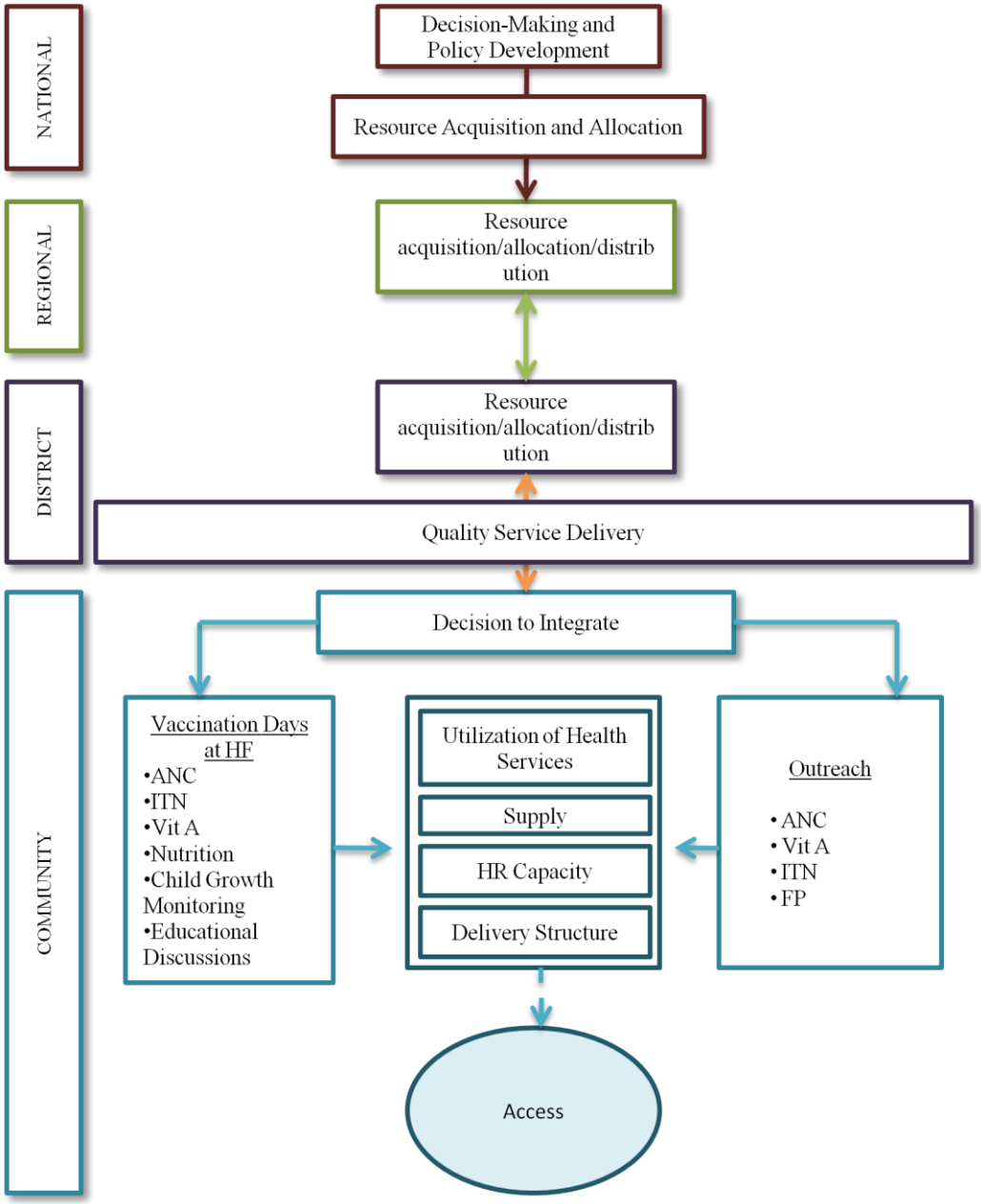
3.3 Integration in Mali

Interventions commonly linked with immunization services in Mali include vitamin A supplements, growth monitoring, ITN distribution, ITN re-treatment, health education, HIV/AIDS awareness, ANC visits, family planning services, distribution of iron tablets as well as the distribution of anti-helminthes to address the most common causes of mortality in children under five.[18]

All of these interventions were reported as being integrated with immunizations in Mali, while many were actually observed within the participating health facilities. As a

decentralized health system, the decision-making structure of what to integrate when and how ideally occurs at the community level based on community needs; however, health centers rely on resources allocated to health centers to make these decisions, which cause decisions to ultimately take place at the national level (Figure 11).

Figure 11: Decision Making Structure to Integration in Mali



WHO has reported IMCI as being initiated in 25-50% of districts in Mali. ACSD was implemented in Mali as one of several countries, focusing on vaccine delivery, vitamin A supplements, and ITNs. The programme consisted of three elements: EPI+: RI, periodic

measles catch-up and mop-up, Vitamin A twice annually, ITNs for children and pregnant mothers and re-dipping every six months; ANC+: malaria prophylaxis, Tetanus for pregnant women, iron and folic acid during pregnancy with vitamin A post partum; IMCI+: promotion of exclusive breastfeeding and weaning, improved and integrated management (health facility, community, and family levels) of children with pneumonia, malaria, and diarrhea; and consumption of ORT.[14] An evaluation conducted by Jennifer Bryce and colleagues concluded there was no decline in under five mortality among children in ACSD intervention areas; despite an increase in coverage of preventive interventions. There was found to be an increase in coverage as a result of outreach and campaign delivery, where communities' behavior did not need to adapt to the intervention to seek services (e.g., RI, vitamin A, and ITNs). There was no increase in health seeking behavior for families to visit health facilities, and even declines in coverage. Interventions that relied on outreach or community strategies such as vaccines, vitamin A, and ITNs were most effective, resulting in HF interventions either staying stable or dropped. There were also issues reported with stock-out of ITNs. Finally, it was concluded that CHWs did not receive enough training and supervision, despite being given additional tasks without receiving incentives.

High Impact Health Services (HIHS) is a USAID programme that started in 2003 with a ten year timeline, seeks to improve the delivery of an integrated package of effective services proven to reduce child and maternal morbidity and mortality by improving access, availability and quality of essential service, while working to improve healthy behaviors in households.[30] This programme focuses on six technical areas: family

planning/maternal health, malaria prevention/control, HIV/AIDS prevention/counseling and testing, nutrition, vaccination and control of diarrheal diseases. The program is partnering with nine non-governmental organizations to implement integrated service delivery of the specified technical areas focusing on service delivery, capacity strengthening, health worker training, logistics, social marketing, behavior change, access to essential medicines, integrated malaria prevention, disease management, working with the Ministry of Health to improve human resource capacity.

4.0 METHODS

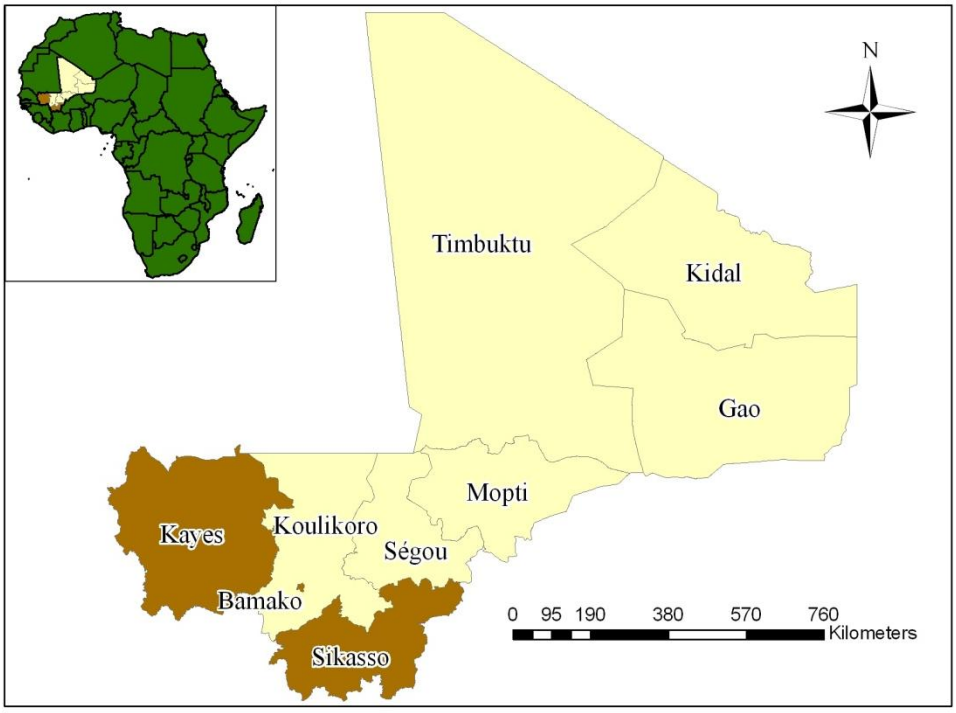
4.1 Overview

A cross-sectional qualitative study was conducted consisting of in-depth interviews (IDIs) and focus group discussions (FGDs). This study was conducted in Mali, chosen randomly as a back up selection among the countries of the WHO African Region, West Africa sub-region. Study subjects included community members (mothers, fathers, and paternal grandmothers), community leaders (community association leaders, chief of the village, religious leaders, etc.), health care workers/administrators (National and district level health officials, and community health workers); and exit interviews with mothers leaving the health center. These subjects were chosen to attain a holistic understanding of influences impacting health seeking behavior and service delivery.

4.2 Site Selection

Interviews were conducted at the national level with relevant government and Non-Governmental program managers to identify perceptions and experiences with integrated services. Data collection from health workers and community members occurred in three regions of Mali: Bamako, Kayes, and Sikasso (Figure 12). Regions and districts were purposely selected by WHO, Ministry of Health and CDC staff to include diverse populations of interest based on ethnicity, geographic location, socioeconomic status, and level of activity from aid agencies.

Figure 12: Map of Regions where Data Collection Occurred



Within each region, one urban and one rural (peri-urban in Bamako) community health centers were selected. In Bamako, one urban health center and one peri-urban outreach post were selected. In Kayes and Sikasso, health centers were identified with the assistance of Peace Corps volunteers working in the area who were familiar with health center activities, community health workers, and community members. Health facility interviewees were selected based on their knowledge and involvement in immunizations and integrated activities.

4.3 Data Collection

Qualitative questionnaires were developed with the assistance of a qualitative research expert from the University of Georgia. These questionnaires were initially pilot-tested in Kenya on a CDC project integrating hygiene interventions with routine immunizations.

The data collection tools were further pilot tested the first week of data collection in Mali and adapted to the research environment. The list of interventions to observe was also finalized during the pilot phase.

Data collection took place over 17 days in December 2009. Data were collected in each health center for a minimum of two days, with the exception of Sikasso where a day and a half was spent at each site.

Qualitative data collection was conducted by a team of two researchers, including one local anthropologist. All interviews and focus groups were conducted in Bambara (national language) or French (official language) and audio recorded (with verbal participant consent), and were subsequently transcribed into French and then translated into English. The anthropologist was a native Malian, and the primary investigator was very familiar with Mali with a fluency in French and advanced proficiency in Bambara. The anthropologist led all interviews and focus groups. The primary investigator took notes in all in-depth interviews and focus groups for which she was present. A second team of 2-3 researchers conducted national level interviews during the first week of data collection.

National programs interviewed were identified through a Ministry of Health representative and included: Tuberculosis, Malaria, Non-Communicable diseases, Nutrition, Leprosy, Schistosomiasis, and Guinea Worm. Two additional interviews were

conducted with program coordinators at the United Nations Children's Fund (UNICEF) and United States Agency for International Development (USAID).

In-depth interviews (IDIs) were carried out with district health officials responsible for the EPI programme in their districts. At least one interview was conducted at the district and community levels in each site. Interviews conducted at the community level were with community health workers working within the vaccination programme. There were a total of 14 IDIs, four with district EPI coordinators, six with community health workers/vaccinators, and four with key informants.

Focus group discussions (FGDs) were conducted to assess attitudes and perceptions of integrated health services with routine immunizations among members of the community. FGD participants were selected purposefully using gatekeepers in the community to select participants. Seven FGDs of 8-14 participants were conducted with mothers of children of vaccination age (<12 months); three FGDs with fathers of vaccination age, and two with paternal grandmothers, for a total of 12 FGDs.

One interview with a key informant of the community was conducted at each site, for a total of six. These participants were selected by gatekeepers in the community based on their role and influence within the community. Key informants were chosen based on their influence within the population and how their perceptions of vaccines and other child survival interventions influenced the perceptions of community members. These

participants included two village chiefs, one religious leader, one traditional midwife and two community association presidents.

Exit interviews were also conducted with mothers leaving the health center after receiving vaccinations or integrated services. A maximum of five interviews were held at each site, until information saturation, for a total of 25 interviews.

The transcriptions of all interviews and focus groups were translated into English. Focus groups lasted approximately 45 to 120 minutes and individual interviews lasted approximately 10 to 45 minutes. There was no direct follow-up with any participants. All participants provided verbal informed consent prior to participation.

Table 6: Data Collection Summary

	Bamako	**Kayes**	**Sikasso**	**Total**
IDI – Regional Level	2	1	1	4
IDI – Health Facility Level	2	2	2	6
IDI – Key Informant	2	2	2	6
FGD – Mothers	2	2	3	7
FGD – Fathers and paternal grandmothers	0	3	2	5
Exit interviews	11	10	4	25

4.4 Data Analysis

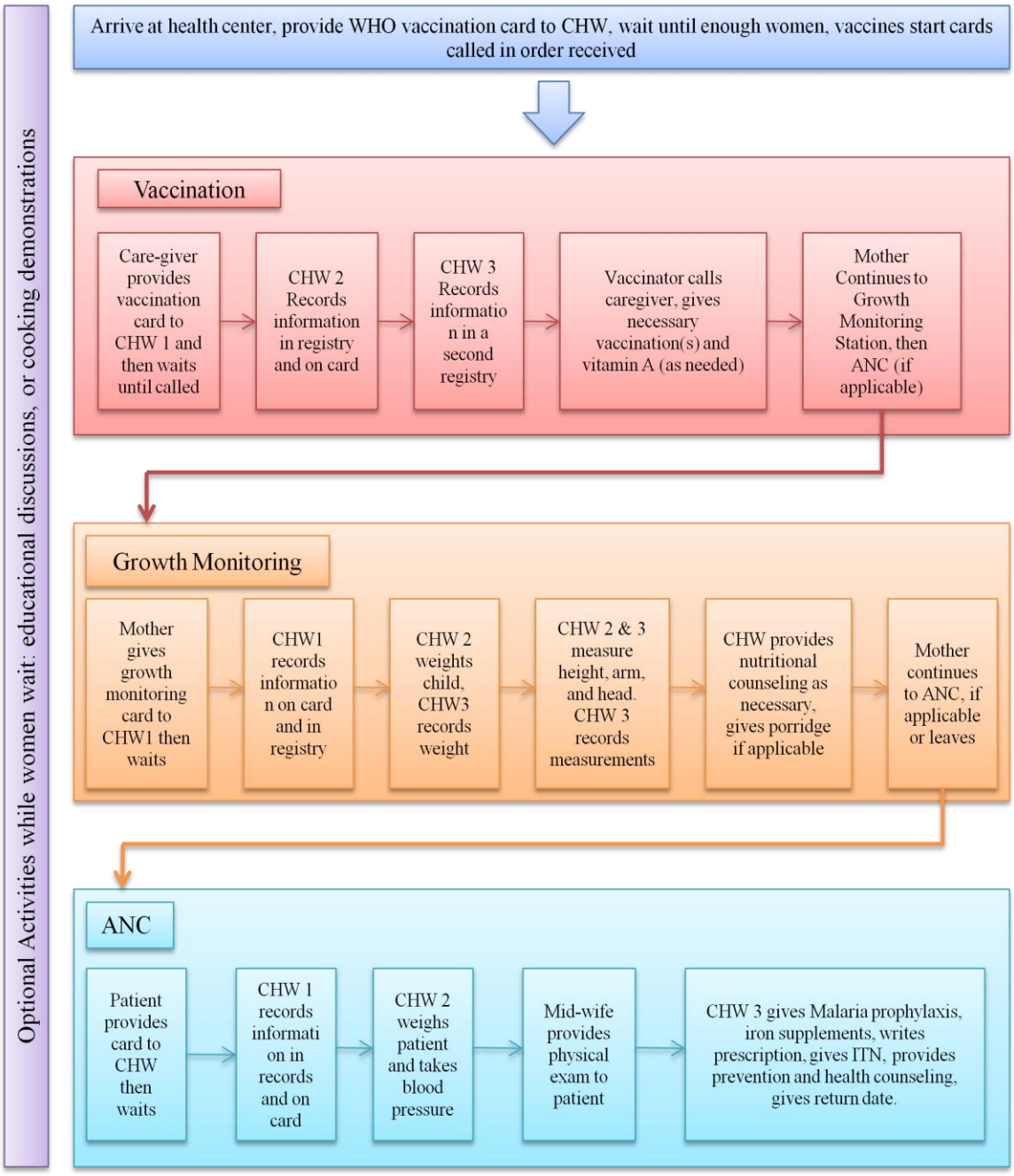
Data analysis began by identifying emerging themes from the focus groups and in depth interviews, conducted concurrently with transcription translation. Once all transcriptions were translated into English, the data were organized by primary and secondary themes, then analyzed using color coding in Microsoft Word and Excel.

Funding for this study was provided by the Center's for Disease Control, Global Immunization Division, Routine Immunizations and implemented in collaboration with the WHO and Ministry of Health in Mali. The study protocol was submitted to the Institutional Review Board at Emory University and accepted as a non-exempt study.

5.0 RESULTS

The Expanded Programme on Immunizations (EPI) in Mali is well established, used often, and relatively functional. All visited community health centers (Centre de Santé Communautaire) conduct vaccination days at least one time per week, offering routine immunization services (depending on vaccination availability). At least two community health workers (CHWs) are tasked with immunizations on a vaccination day (depending on CHW availability, fixed vs. outreach, and urban vs. rural). One health worker collects vaccination cards (stacked in order from arrival), recording the child's information in two registers and vaccination card. Vaccination services begin when there are enough children to open the vials. The CHW recording information calls the mother, a second CHW gives the vaccination (providing information on adverse side effects and return date), the mother then collects the card and leaves (Figure 13).[31]

Figure 13: Integrated Delivery Structure, Urban Health Facility



5.1.1 Integration in Bamako, Kayes and Sikasso

The Integration of additional health services with routine immunizations is common practice among communities within the observed sites of Bamako, Kayes, and Sikasso regions, as reported by health workers and community members. The most common services observed and reported through FGDs and IDIs were antenatal consultations, mosquito net distribution, vitamin A distribution, educational discussions, and growth monitoring of the child. Additional services observed and reported in few health centers were cooking demonstrations with nutritional education, family planning, post-natal consultations, and the distribution of flour porridge for child nutrition (Table 7).

TABLE 7: Health Services Integrated with Routine Immunizations at Observed Health Centers, Data Obtained from Observation, Interviews, and Focus Group Discussions [31]

INTEGRATED SERVICES PROVIDED	URBAN	RURAL	OUTREACH
Mosquito Nets	X	X	X
Health Education Discussions	X	X	
Child Growth Monitoring	X		
Ante-Natal Consultations	X	X	X
Post-Natal Consultations	X		X
Vitamin A Capsules	X	X	X
Family Planning			X
Cooking Demonstration	X		
Flour for Porridge	X		

Among these integrated activities, each CHW had a specific role in the service delivery, and their tasks did not integrate with the tasks of other CHWs. In a comprehensive

integrated delivery structure, within the vaccine station, there was a designated vaccinator, with one to two additional health workers to record information in vaccination cards and health facility registries. The only integrated activity the vaccinator performed was providing vitamin A supplements to children receiving vaccinations. At the Antenatal Care station, one to three health workers recorded information in patient cards and health facility registries, in addition to taking the weight and blood pressure of the patient. The midwife performed the physical exam, and a different health worker provided malaria prophylaxis, iron supplements, any additional needed medication or vitamins supplements, in addition to an ITN, while also providing her with health information and her next return date. Finally, at the child growth monitoring station, one to two health workers recorded information in the patient card and health facility registries, while another health worker weighed the child and took measurements of the child's head and arm circumference (refer to Figure 12). A different health worker provided nutritional counsel, if applicable (which was not observed being done often). This scenario was variable based on the stock of health intervention supplies and health facility (urban versus rural).

Community Mobilization

In depth interviews with key informants revealed that although they are largely unaware of the specifics of vaccination days, the key informants are an integral part of disseminating vaccination day information in the community, in addition to playing an active role in community mobilization of campaigns and the distribution of campaign services. They are informed when outreach services or campaigns are taking place and

motivate the community and hold them accountable to keep their child healthy through vaccinations.

> *… If your work coincides with harvest season, you often times have the impression to force people to do it [vaccinate]. This is the harvest time, but for us, we force them to get their children vaccinated because we know the importance of vaccinations…Our role is to ask children, one by one, were you vaccinated? Or to ask the mothers whether her children were vaccinated; if we do not see unvaccinated children, it's done. If we find a child unvaccinated, we go to the sage femme and she finds a solution. – Key Informant IDI (KI IDI)*

5.1.2 Vaccine and Integration Perceptions

The community and health worker perceptions of integration are overall positive. There was no discussion of discontent by community members or health workers with the current integrated services offered, however discontent was expressed with how the services are being delivered. District heath workers and CHWs both mentioned integration providing an opportunity to reinforce the sustainability of health services that could otherwise not function alone. For example, growth monitoring is an activity that was reported by one health center as being under-utilized if it is offered on a day without vaccinations, and are not able to be sustained as a functioning stand alone intervention. One district health director believes integration is a solution to poor child health:

> *Before we had a lot of problems with child health because women did not come to go directly to child growth monitoring…we had a low performance with child health. So now with integration, we have returned*

back to an acceptable level. So I don't think we can say there have been difficulties because I believe this was a solution to our problem. –District In-Depth Interview (DI IDI)

5.1.3 Vaccine and Integration Benefits

Among community members within the observed sites, the EPI programme is widely accepted and usually the primary reason mothers visit community health centers. Community members understood vaccines are a method of prevention that ultimately help save money, as treatment is expensive. All mothers in Focus Group Discussions (FGD) confirmed vaccinations improve health, while four of the seven FGDs discussed the noticeable reduction in vaccine preventable diseases. Fathers in one FGD saw vaccinations as a method of prevention and an economic issue.

Since this [vaccinations] has started, us and our children no longer experience problems. This is very reassuring for us. When we vaccinate our children, they are protected from polio, meningitis, diphtheria, and other illnesses. – Mothers Focus Group (FGD)

They say that the child has fallen ill… They bring him to the health center and they give him a prescription. The treatment is bought for 10,000 F, 5,000 F, 2,000 F. All those are expenses. If she would have vaccinated the child, all of that could have been avoided.

–Fathers Focus Group (FGD)

5.1.4 Vaccine and Integration Concerns: Access

Access for villages located further from community health centers is a challenge to reaching target populations. There were clear differences in concerns expressed between participants from rural versus urban areas when discussing their ability to access integrated services. These concerns were also expressed in district and CHW interviews in all sites in Kayes and Sikasso, in particular inconsistencies with outreach services not being provided frequently enough due to motorcycles that do not function properly, lack of funds for gas, or lack of available health workers to provide services, creating disparities between urban and rural populations. Community health workers also talked about outreach having limited support, but they considered it an effective method to reach those who would otherwise not receive services and beneficial to catching missed opportunities. A CHW also added the importance of outreach to educate mothers about the importance of vaccinations.

> *…we will still continue with the outreach because it is not easy to get these people to understand, but it's little by little understanding begins to surface.*
>
> *–Community Health Worker In-Depth Interview (CHW IDI)*

Among the community members in all sites with a fixed post, or consistent outreach services, vaccinations were a priority and their importance is understood. However, one focus group conducted with mothers in a village ten kilometers from the community health center discussed issues of access. Only half of those participating mothers' children were vaccinated because they did not have the time or household support to walk to the health center, therefore they waited for the outreach CHW to provide services in

village. Additionally, among the four mothers whose children had received vaccinations, only one of them had visited the health center while the other three had been vaccinated during the last outreach session. Distance was also an issue for FGD participants coming from neighboring villages in all regions.

5.1.5 Vaccine and Integration Concerns: Supply

Additional system challenges included issues of stock out, mentioned in all FGDs and In-Depth Interviews (IDIs) across regions. Here stock out is defined as the supply of a product (e.g. vaccinations or mosquito nets) that has been used up and not yet replenished. The consistency of integrated services is largely determined by the supply of materials allocated from the national level (e.g. ITNs or vitamin A capsules). District health workers indicated community health centers have little autonomy to command a desired number of vaccinations because allocations are made at the national level. District and community health workers were all in favor of integration and believe it is convenient for mothers, efficient and cost saving for health centers, increases utilization of services, increases vaccination coverage, and reduces morbidity of disease. However, they asked in order for the integration of services to increase, to ensure there is a plan to maintain a consistent supply of the service in order to prevent stock out or the service to be offered only on occasion. From district and community health workers, there is concern that stock out is negatively impacting vaccination coverage because of mothers being discouraged and not returning for the vaccination when stock is available.

> *There are some who even miss their date as a result of stock out, the children are delayed in getting their vaccination. –CHW IDI*

Despite significant satisfaction with the EPI program, mothers expressed displeasure with the inconvenience of stock out. Most mothers anticipate the possibility of stock out and leave their homes early to ensure their child receives its vaccination dose. Despite arriving early, the mother is obligated to wait until the vaccination session begins. Mothers explained when attending vaccination sessions, they anticipate being at the health center most of the day. When stock out takes place, mothers discussed losing confidence in services and sometimes do not return to vaccinations, which was confirmed through CHW IDIs.

> *They tell us that BCG is the first vaccination, but it has been more than three months since we last had BCG, every time you go, they tell you there is no BCG, the problem with BCG has made us tired and discouraged…when I finally heard there was BCG, I waited 30 minutes before they told me it was gone…if there are vaccinations, everyone should benefit. That is to say, you should not come, wait a long time, and after be told there is not more. –FGD MOTHERS*

5.1.6 Vaccine and Integration Concerns: Service Delivery

For health workers, there is a concern of integration impacting the quality of services being delivered. When asked if integration could impact their work, they confirmed it could cause them to not do some activities very well.

> *You can integrate, but it is necessary to know how to integrate up to what level without asking too much. Also it can place at risk the quality of everything you are doing. I mean I am for integration of activities but in*

integrating many things that places the quality at risk…are we sure that all of these activities can be provided with the quality we want? That there is really my worry about integrating activities. – DI IDI

I think it is necessary to have vaccinations and other activities at the same time because when you leave that for another day, no one will come. –CHW IDI

Health workers would also like to see the system set up to support effective delivery of services with training, modified forms, increased personnel, and improved supervision. In reference to modified forms, one district health worker used Vitamin A on vaccination cards as an example and suggested additional integrated activities should be added to relevant forms (e.g. growth monitoring or prenatal consultation forms) instead of having several separate cards for separate services. Health workers also discussed the necessity of having proper training and support for services to maintain sustainability and community understanding of the advantages of services offered.

Among district and community health workers, there was certainty many health services, like child growth monitoring, could not work without being integrated with routine immunization services due to a lack of attendance. In an integrated delivery structure, the vaccination should be the final service offered because that is the priority service for the women, everything else is secondary.

Vaccinate last because that is why women come to the health center, if vaccinate first, they will go home and not take advantage of other services. –CHW IDI

As discussed in nearly all FGDs and IDIs, if growth monitoring, for example, was offered on a separate day from vaccinations, they would not be attended. Some health workers mentioned women do not attend other services on separate days because they do not understand the importance of these services.

One of the primary concerns from all groups was the current wait time to receive vaccinations (as the preferred intervention by community members) and whether additional services added would increase that wait time. There is additional concern from all groups whether the current number of health workers would be able to manage the various interventions in a timely manner?

> *Now if there is too much work…they need to come together as two or four people because one person cannot perform all of those tasks because there are too many people [waiting]. If everyone comes at the same time, it is too much, if you're all by yourself and you say you can accomplish all of those tasks, it will never work…even if there is a place to hand out mosquito nets by themselves, one single person could not do all of that. – FGD Mothers*

Delivery of services and wait time also bring into question current health worker capacity in delivering additional services. Because the system is already set up where one health worker performs a single task, organizational changes will be necessary to how health workers deliver services and the potential addition of health workers to fulfill additional tasks, as needed.

The majority of mothers see the integration of services with routine immunizations as time saving. However, two urban focus groups and one peri-urban focus group discussed their desire for separate services. They were concerned with increased wait times and the ability of health workers being able to manage additional services efficiently. They also expressed concern with the quality of service delivery being impacted and mothers retention of information received would be minimal. In exit interviews with mothers leaving the health center after receiving services, when asked what illness their child was vaccinated against and what the secondary side effects were, few were able to recall. It is important to note, health workers were observed providing this information to mothers.

There is also a question of missed opportunities when considering integration. One district health worker expressed concern specifically with ANC visits and administering Tetanus vaccinations to women of child bearing age. ANCs were offered Monday through Saturday at all health centers visited; however, Tetanus vaccinations were often offered once or twice a week. Therefore, when a woman comes for her ANC on a non-vaccination day, she is told to come back for the next vaccination day.

> *I think you must take advantage every time that a woman comes for ANC; we must take advantage to vaccinate the woman even if it is a hassle. That is why we see in every report when you compare the number of ANC to the number of women who are vaccinated, you truly see that there is often an unexplainable difference, a difference that people don't know exists when they tell a woman to come another day. –DI IDI*

5.1.7 Vaccine and Integration Concerns: Human Resources and Health Worker Capacity

According to district health workers and CHWs, supervision was mentioned as a key issue when considering integration. Almost all health workers expressed concern in the implementation of additional integrated services and the need to implement in a sustainable manner. Among the IDIs where supervision was discussed, all CHWs reported liking supervisory visits. They see supervision as an opportunity to become better at their work, correct their mistakes, and ultimately improve the quality of their service delivery. Although all district and community health centers report receiving supervision, it is not reported to occur regularly. Only half of the health centers had received supervisory visits in the last three months, while two health centers had not received supervision in the last year.

> *We want supervision, we want follow up, because if there is an eye from the exterior that observes your work, they can see your weaknesses or your problems, that you would otherwise think is fine that you do not have any problems when that is not the case. –CHW IDI*

The concern of health worker capacity was expressed in all FGDs and IDIs. For example, district level health workers discussed the success of Ante-natal Consultations integrated with vaccinations, but were struggling to maintain the same success with post-natal consultations. In one district, when post-natal consultations were finally integrated with vaccinations, they saw improved success with the utilization of the service, but it did require an increase in health worker training and time to manage the number of women receiving consultations. The health worker specified women's challenge with wait times and health workers challenge with the time it took to accomplish a single post-natal

consultation visit (10 to 15 minutes). The health worker in charge of the activity was, therefore, obligated to increase health worker staff by reorganizing health workers that normally worked in other areas to assist with post-natal consultations on vaccination days. Another district health worker added some health workers feel overloaded by providing additional services while there are many women waiting. He provided the example of ANC visits and the midwife needing to go to the refrigerator for the Tetanus vaccine for each patient in need. Some CHWs find this too much to do; therefore suggesting a problem with organization. He said that if organization were improved, integrated activities could be more manageable. Another district health worker also commented on the need to efficiently coordinate how information is reported:

> *The heads of post presently furnish at least 15 reports during the month on integrating the activities and correlating the collection tools. That can even facilitate filling out the forms, for example with these tools instead of collecting the same furnished information, other partners also ask for the same information. I mean, the same information is asked for in multiple reports and through integrating the activities and consolidating the collection tools, I think can improve the quality of the data and even the activities that we are providing. I think that really improves the quality. The number of data tools is large but in integrating the activities and consolidating the tools instead of doing multiple reports independent of one another, one single tool can collect the information.*

CHWs also expressed concern about their responsibilities for other patients continuing during vaccinations. This was especially an issue in rural areas, where CHWs are few,

they are still responsible for taking care of sick patients while managing vaccination activities. It was observed in one urban health center a large number of health workers assisting with vaccinations and other integrated activities at separate stations, creating an efficient work flow with little wait time. An efficient patient flow is necessary for a successful integration program, while offering minimal wait time for mothers. At this health center, each health service was set up as a station, upon arrival, the mother gave the child vaccination card to the vaccinator, while recording the information in the registry, the woman had her child weighed, received nutrition counseling, then went back to the vaccination station, received information of what diseases her child was being vaccinated against, the child was vaccinated, she was told her return date, then went to the pharmacy for a mosquito net if the child was nine months and received a measles vaccination (refer to Figure 12). Meanwhile, educational discussions were being provided by a community health worker and a nutritional porridge was distributed to mothers upon being told its ingredients and nutritional significance for the child, and antenatal consultations were being offered at the maternity. This flow kept the women moving, receiving services, health prevention information, with minimal wait time and leaving the health center early enough to prepare lunch for her family. The only concern women expressed with such a structure is the feeling of being told to go from station to station, receiving a multitude of information concerning her childs' health without having the ability to absorb the information provided and consequently not retaining important information, verified by the exit interviews conducted. When interviewed, the CHW said they had enough people to accomplish the tasks in a short amount of time.

5.1.8 Vaccine and Integration Concerns: Incentives

Health workers and community members recognized that some services offered can be an incentive to motivate mothers to vaccinate their children:

> *We need to encourage women and help them understand the advantages [of vaccinations] so that she will come more often to benefit from the advantages of the health center. For example, mosquito net distribution is a real source of motivation for women – Father's FGD*

> *The advantage is that mothers like ITNs. Before, when are started vaccinating, if you asked a mother to come back at nine months, for the most part…there are some who do not return. But at nine months, the women know very well, we give them an ITN, they do not miss this opportunity. – CHW IDI*

However, some health workers and fathers mentioned women become so focused on receiving incentives (i.e. mosquito net at nine month vaccination), they lose perspective on the importance of child vaccinations. There was concern additional "incentives" could continue to perpetuate reduced understanding.

5.1.9 Integration Preferences

Every district EPI coordinator fervently expressed the need to scale up the integration of nutrition activities. When discussed with CHWs, they believe it is an important activity but worry about their capacity to carry it out on busy vaccination days. One health worker went on to explain growth monitoring once being offered on its own day, but few

women came and it wasn't until it was integrated with vaccinations that women began to understand the importance and utilized the service. Another CHW mentioned the recent decision to provide the first growth monitoring visit with the first vaccination visit, then requiring the mother to return on a different day for subsequent growth monitoring visits in an effort to alleviate the CHW workload. Although the mothers did not verbally react to this change, the CHW cited a significant reduction in the utilization of this service. Despite the fact that child growth monitoring was not offered in every health center, all but one focus group expressed the desire to integrate this service with vaccinations. Mothers indicated their pleasure of child growth monitoring by wanting to know the weight of their child, but not all understood the importance of nutrition, as indicated by district and community health workers.

The majority of mothers are in favor of integration, when asked what services they would like to see integrated when coming for vaccination days they were happy with ITN distribution, Vitamin A supplements, educational discussions, growth monitoring/nutrition services, and ANCs.

> *What we prefer and what we think is good is to have at least two activities the same day. That is what is better for us, to offer all activities the same day. –FGD MOTHERS*

Two villages said they would like to see malaria treatment integrated, while others also mentioned the importance of maternal health being just as important as child health. Mothers would like to see services offered to improve their health so they can better take care of their children, although they could not name specific services, except medication

and malaria treatment. Additionally, mothers seemed to prefer services that are quick with high impact (e.g., vitamin A and ITNs) to ones that might take more time (e.g., growth monitoring). Rural villages also expressed the desire to see an increase in outreach services. These preferences were also shared by grandmothers. Fathers gave fewer specifics but did mention the need to improve the quality of services being delivered and to increase outreach. They also expressed the need to increase the understanding of services they are receiving and comprehension of their importance through educational discussions.

Community health worker preferences of integrated services mostly aligned with those of mothers, except only two CHWs expressed support for growth monitoring activities. District health workers differ slightly from CHWs in preferring the aforementioned services, with two district health workers adding interest in family planning, post-natal consultations, and vitamins. All district health workers mentioned repeatedly the importance of nutrition and the need to scale up activities and improve community understanding. One district health worker mentioned the vitamin A capsules that were observed being distributed to children at some vaccination sessions were from stock left over from campaigns. He said it would be helpful to maintain a continual stock of Vitamin A to offer consistently on vaccination days. One district health worker also mentioned the desire to offer additional vitamins like zinc. Other district health workers also discussed the need to support growth monitoring programs to identify malnourished children and continue nutrition education for mothers.

> [Integration has not had an impact] *on EPI, but on the health of children, we were able to take advantage of the number of women coming to the health center for vaccinations to reach out to children for growth monitoring. –CHW IDI*

5.1.10 Support to Separate Services

Family Planning

District health workers support integrating family planning, but recognize it is a culturally difficult issue and suggest identifying those barriers prior to trying to integrate. One district health worker also pointed out family planning has not worked at the maternity level and suggested integration as being a solution to getting mothers to use the service, given women with children of vaccination age are the target group for family planning services:

> *I think family planning, because we hide from it, it does not work…I think, if we could integrate family planning with these activities because many of the mothers bringing their children to be vaccinated are bringing their newborns. They are the target population for this program; we could therefore catch them while here. –DI IDI*

Another district health worker mentioned the issue of privacy for women practicing family planning. He said many women practicing family planning do not want their husbands to know. At the community health center, women's names are usually recorded in a register, removing their anonymity. In contrast, their identity is protected if family planning is purchased from another source, making them more appealing to women who

prefer to keep their use of family planning private. As a result, he suggested these sources should be supported by the health system.

Among community members, one mother was concerned with the family planning stigma to transfer over to vaccinations. They said there is a lack of understanding by too many mothers. Some mothers also referenced the need to reproduce many children and that not all are as fortunate as others to achieve fertility desires and do not want the pressure to practice family planning. Both grandmother FGDs said to leave family planning out of vaccination days. They said there is too much stigma and misunderstanding surrounding family planning, it would be better to offer on separate days or at a woman's convenience (e.g. daily). All but one FGD with mothers confirmed this sentiment.

HIV/AIDS

When asked about integrating HIV/AIDS testing or other related activities, a district health worker suggested special attention be made to the training of community health workers when delivering such messages and services.

> *If a health worker does not master the theme, rather than educating the population that will create problems…if I am in charge of key messages and I have a hard time understanding the message what I will say to others is bad. –DI IDI*

This health worker went on to say those who are infected with HIV/AIDS are in need of separate support systems, suggesting such support being beyond the capacity of a community health worker. From the community perspective, among mothers and fathers

asked about HIV/AIDS activities, they do not mind educational discussions concerning this topic, but would prefer related activities be separate.

For activities relating to both HIV/AIDS and Family Planning, mothers expressed their concern with the stigma surrounding these topics and the lack of privacy that exists during vaccination days. They said they would be less likely to utilize these services during vaccinations and more likely to utilize them on days with less people at the health center. It is important to note these opinions came from FGDs with mothers who have access to health facilities in their communities.

General Services

Vaccination campaigns have been successful in educating community members of the advantages of vaccinations, making them an appealing intervention for community members. According to district and community health workers, many services currently offered in health centers are not utilized by women due to their lack of comprehension of the importance of the service. As mentioned earlier, some mothers expressed concern in their ability to retain information given to them in a single day for several services. Community members suggested CHWs have the responsibility to educate the population on disease awareness and prevention. All groups also stressed the importance of educating the community, especially mothers, to understand why they are getting vaccinated and for what disease. They trust their CHWs and believe the health worker knows what is best for them and willing to accept what services they provide and the advice they give.

> *Now if the activities are separated, I would be able to understand the effectiveness of the services I am receiving, but if the activities are integrated, I would not be able to understand which service was good for me. –FGD MOTHERS*

Support to separate health services from RI came primarily from FGDs with fathers, suggesting basic services outside of immunizations should be offered daily, in addition to being offered on vaccination days. Some fathers supported small activities to be integrated with vaccinations, but many were opposed due to wait time and capacity of the health worker being able to carry out so many services. They additionally would like to see increased education and information distributed in an effort to improve the quality of services offered. Men were also concerned with a woman's ability to retain information received at health visits. They believe with too many services integrated, women would have difficulty going from station to station and lack understanding of what services are being offered.

Some men also suggested offering one day for vaccinations and one day for all other services offered within the week.

> *Personally, I think that preparing porridge coupled with vaccinations, there will be a lot of people, risking to pose a problem because women understand better when there are less people. Especially if they are coupled with other things, you are constantly waiting for the next service and it will be difficult for the woman to follow and understand. –FF*

5.1.11 Making Integration Decisions

The decision to begin integrating services with routine immunizations was not well known among the district and community health workers interviewed. All district EPI coordinators confirmed community health centers have the autonomy to deliver services in a manner that meets the needs of their communities, provided they have the resources available to deliver such services. Therefore, integration decision making and planning occur at the community health center level.

> *I think it [integration] is normal because vaccinations, ANC, and post-natal consultations all go together in our objectives. If you participate in outreach, there are child vaccinations and vaccinations for pregnant women, so you may as well put them [ANC and RI] together. So if a woman comes to get vaccinated, if she comes on the correct date. For example, today the 18th, we are doing vaccinations, so if she is coming for her next tetanus shot she will also need her second ANC, so why not put the two activities together? –DI IDI*

6.0 DISCUSSION

In order for successful program implementation, it is critical to understand community demands and preferences for various services and integrated delivery, in addition to assessing the potential impact on the community and health programs to ensure all services are delivered in a manner that meets the needs of the population, is within human resource capacity, and aligns with the policies at the national level. Integration should be implemented to ensure the addition of health services will not negatively impact the EPI programme, but will work to strengthen both the intervention and RI.

Integration is common practice among the health facilities in the observed communities of Bamako, Kayes and Sikasso. Vaccinations and integrated services are widely accepted and benefits are understood by most health workers and communities. Community members recognize such services improve the health of their children and have acknowledged the difference in child health and reduction of vaccine preventable diseases with increased coverage over time.

This research shows that health facility supervisors do not expect vaccinators (specifically) to provide a number of health services, but are only designated to administer vaccines, and vitamin A when available. It appears the heaviest burden is carried by midwives and other health workers, as they are expected to carry out a larger number of tasks.

Health worker and community perceptions of immunizations are overall favorable. Community health workers confirm that integration helps sustain services that could not otherwise stand alone (e.g. child growth monitoring); but are able to benefit from the

wide reach of vaccinations to increase utilization and awareness of the benefits of the service.

In all regions, it was confirmed vaccinations are the primary reason women visit the health center, reinforcing the use of RI as a suggested platform for integrated activities. Community health workers cautioned that despite the benefits of incentives like ITNs, the motivation to have a child vaccinated is getting lost in the desire to receive an incentive; therefore suggesting education of the benefits of integrated services and vaccines should be strengthened and reinforced with the introduction of new interventions.

Despite the positive acceptance of integrated services, there are still many concerns mentioned by both health workers and communities. Access to services was a concern by community health workers because of their inability to consistently sustain outreach services for hard to reach populations, primarily due to resource availability and health worker capacity. Even with outreach services, the interventions offered are significantly limited in comparison to those offered at fixed health centers, perpetuating inequities between those with access to health care and those without.

Inconsistent supply of intervention materials resulting in stock-out was a concern for health workers and community members because health workers recognized the impact it has on retention and maintaining mothers trust; while mothers become easily discouraged returning to the health facility several times for vaccinations, only for the child to miss their vaccination date, if they get vaccinated at all. District and community health

workers stressed the need to establish a system to maintain supply and prevent stock-out with additional services in order to best maintain services and trust with mothers.

Service delivery and human resource issues were topics addressed repeatedly and can be considered the greatest concerns around integration. Health workers confirmed being required to provide additional services to what they already do could negatively impact the quality of their work. Adding additional interventions while keeping the same number of health workers runs the risk of sacrificing quality service delivery and potentially the effectiveness of the intervention.

Supervision and training is also an important aspect to consider, especially as the health workers interviewed received minimal supervision, most had not seen a supervisor within the previous six months to one year, and had received very little training. The data indicate community understanding of services is low, which could be a reflection on the way the services are being delivered , suggesting health workers either do not have time to provide proper education, or they are not trained to properly inform their patients.

Currently, wait times for vaccinations are long and mothers anticipate spending the day at the health center to have their child vaccinated. There is concern from all groups that additional health services will increase this wait time. An adequate number of health workers to deliver the services provided are important to efficiently provide integrated services. An efficient patient flow is necessary for a successful integration program, while offering minimal wait time to mothers. Such a flow keeps women moving,

receiving services, health prevention information, with minimal wait time and leaving the health center early enough to prepare lunch for her family. The only concern women expressed with such a structure is the feeling of being told to go from station to station, receiving a multitude of information concerning her child's health without having the ability to absorb the information provided and consequently not retaining important information. Despite enthusiasm for many services provided at once, considerations should be given to comprehension and retention of information by mothers. Exit interviews with mothers confirmed a large proportion of information provided was not retained.

Preferred services by health workers included child growth monitoring to improve nutrition and family planning. Meanwhile, mothers indicate services that are quick with high impact, resulting in little behavior change on the part of the caregiver. This highlights several issues: the lack of education or comprehension mothers are receiving to understand the important of growth monitoring and family planning; the limited time mothers have to invest in behavior change like improved feeding practices; and the disconnect of what health workers consider priorities as opposed to what mothers consider priorities. A mother knows improved feeding practices are good for the health of her child, but there are issues of time and resources that she may not have to address such an issue. This further confirms Atun's argument that less complicated interventions have a quicker uptake than those that include behavior change or more complicated delivery.[19]

Family Planning and HIV/AIDS are difficult issues to address during vaccination days as a result of stigma and lack of understanding. Health workers and communities agree educational discussions should be given concerning these topics, but actual interventions should be considered on different days. Vaccination days are also well attended with little privacy, which would further discourage women from utilizing these services. There was some concern the stigma of Family Planning and HIV/AIDS could transfer to vaccinations. It is also recognized that HIV/AIDS has a special support structure and important communication messages that need to be consistent and understood by the CHW; providing services during immunizations could hinder this.

Despite attempting to achieve regional, cultural, and economic variation among regions in Mali, the study was limited to take place in a sub-set of three regions in relative close proximity to regional capitals. Due to time and resource constraints, in addition to political instability, research was prevented from being performed in the northern part of Mali, which is significantly different from the participating regions. The study was only able to conduct a single focus group in a rural village that was at a reasonable distance from a health center. Data from this focus group concerning access to services was useful in understanding challenges with outreach services and worth exploring further. During our observations in Kayes, a mass ITN distribution campaign was taking place; therefore, ITNs were likely seen observed on a larger scale than would normally take place.

7.0 PUBLIC HEALTH IMPLICATIONS

As an integrated delivery structure becomes increasingly implemented in resource poor settings, it is necessary that programs coordinate in their planning and resource allocation to ensure efficient delivery of health interventions that are specific to community needs and disease burden. The sustainability and success of implementation will depend on the acceptance of community and health workers; in addition to the ease of use so that health is benefiting, awareness is increasing, and wait times are not increasing. It is important to understand their needs and the stigma surrounding specific interventions to understand how to best implement what interventions in the planning process. This research shows interventions considered essential at the national level are not necessarily considered as such at the local level. Positive and negative perceptions are important toward understanding interventions being implemented in a culturally appropriate manner to attain utilization by communities.

8.0 RECOMMENDATIONS

When considering what to integrate and how to integrate, community and health worker perceptions should be considered to inform the process of most effectively allocating resources that meet the needs of target communities. Special consideration should be given to hard to reach populations through expanding outreach services to ensure fair and equitable distribution of services.

Quality of service delivery and the absorptive capacity of human resources are important when considering how many interventions to introduce and how they will be delivered. The number of services to integrate and how to integrate need to be carefully examined when considering the quality of service delivery and providing enough time for mothers to absorb and comprehend the information received during their visits. Health worker staff should be trained not only in service delivery, but also in how to effectively communicate the health intervention messages to increase understanding of disease prevention.

Reporting materials also need to be stream lined to allow for a more efficient reporting structure; in addition to reducing the amount of time health workers spend filling in the same information in multiple reporting forms; which can also contribute to accurate reporting of information for monitoring and evaluation purposes.

HIV/AIDS and Family Planning services should not be integrated with routine immunizations based on community concerns of misunderstanding and stigma surrounding these interventions that could potentially transfer to other interventions, including routine immunizations. These services are important and essential for those who need them, but they need to be delivered in a manner that will effectively facilitate uptake. HIV/AIDS and Family Planning service delivery should be carefully considered in a way that keeps these services available to those who need them and would like to utilize them. For example, they could be offered everyday and be accessible to anyone coming to the health center for a consultation.

Limiting services to a single day that can also easily be offered on other visits will undoubtedly result in missed opportunities for vaccines and other interventions. If an integrated delivery structure seeks to move toward primary health care, the services should be advertised as available everyday upon request, but offered in mass on vaccination days. A hybrid could result in reduced missed opportunities and increased coverage of all services.

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10.0 APPENDICES

10.1 Verbal Informed Consent Script: Service providers

Date: CSCOM: Data code:

Hello, my name is _____and I am part of a research study being conducted by WHO and CDC. We've come here today to talk with you about integrating health care services. Specifically, we are interested in hearing your thoughts about integration services delivered at the same time as routine immunizations.

If you agree to be in this study, you will be interviewed at a private location by an interviewer not affiliated with the Mali immunization program. This interview will take approximately 45 minutes of your time. We would like to audio-tape this interview so that we can be sure to remember your answers. This audio-tape will be kept in a locked location and will not be shared with anyone outside of the assessment team.

There are no direct benefits to you from participating in this study. However, the information we gather may help improve health services in Mali.

There are no physical risks to your participation in this study. However, you may be asked a question that makes you uncomfortable. If you agree to participate, you can always choose not to answer any question that makes you uncomfortable. You can also stop the interview at any time.

Your participation is completely voluntary. If you chose not to participate in this study, your employment will not be affected in any way.

We will do everything we can to make sure that the information you tell us remains confidential. We will not collect your name, so there will be no way for anyone to link what you said during the interview directly to you. Any information shared will be presented in such a way that your answers will be kept confidential.

Please know that there are no correct answers to these questions. We are interested in your thoughts and opinions with the aim to improve services.

If you have any questions related to: 1) your rights; 2) a research-related injury; and/or 3) the research study itself please contact XXXX.

Do you have any questions about what we are asking you to do? Do you agree to take part in this interview?

If yes then read: Please say, "I agree to be in the study."

If no then read: Thank you for your time.

10.2 Interviews at National Level

Interviews to be conducted with: National Immunization Program, WHO, staff from departments of integrated services (e.g., malaria, family planning)

1. Please tell us a little about yourself. (position, how came to this job)
2. Please tell us about your country's experiences with integration. Probes:
    a. How do you define integration?
    b. What programs are integrated?
    c. How was it decided what to integrate – what criteria were considered (or did you always do things this way)?
    d. Who/what level makes integration decisions?
    e. Is there an official policy regarding integration? Does it involve collaboration with external funders?
    f. Does the degree of integration vary depending on the type of clinic, e.g., NGOs?
3. How were the logistics of adding integrated services handled? Were new staff added? How were they trained?
4. Are integrated services the same at clinics as at mobile/outreach services?
5. What do you see as the advantages and limitations of the integration programs? (Probes: in terms of efficiency, burden on staff, benefits to patients, vertical program funding.)
6. What particular challenges with integrated services have you encountered along the way? Were you able to address those challenges? How?
7. What would you like to see your integration programs look like in the future? (Probes: which services should be added? Should any be taken away? Are there other areas for improvement [e.g., could reporting and monitoring be streamlined]? What kinds of integration would you like to see happening here?)
8. Based on your country's experiences, do you have any recommendations for countries that are just now embarking on integration?
9. What would you like us to find out about your integration programs?

10. 3 Interviews at District Level (OPTIONAL)

Date: CSCOM: Data code:

Interviews to be conducted with: District Immunization Officer and staff from departments of integrated services (e.g., malaria, family planning)

1. Please tell us a little about yourself. (Probe: position, how came to this job)
2. How do you define integration?
3. Are services in this district provided in an integrated manner? **(If no, skip to Question 17)**

Integration site questions:

4. Please tell us about the integration programs that you offer in this district. Probes:
   a. What programs are integrated (e.g., services, planning, supervision)? Were new staff added? How were they trained? How do they work in practice?
   b. How long have the programs existed? Are the same integrated services offered on site as with mobile services/outreach? (i.e., in which 'location' is integration happening and should it be happening in the others?)
5. What particular challenges have you encountered along the way? Were you able to address those challenges? How?
6. Is there anything that has worked particularly well (innovations, etc.)?
7. Have you experienced any staff resistance to implementing the integrated programs? What is the basis of that resistance?
8. Were there new/additional resources needed to implement integration? Were there any challenges in this regard?
9. Did you work with partners in the process of implementing integration? How was the process?
10. Did you experience any community support or resistance to the integrated programs?
11. What do you see as the benefits (for both you and/or clients) of these integration programs?
12. Are there any drawbacks (for you and/or clients)?
13. Do you feel like you have adequate support to carry out these programs? If not, what do you need?
14. Are there any other programs/services you would like to see integrated in this district? Which ones? What factors would have to be addressed in order for that to happen (resources, resistance, etc.)?
15. Are there any integrated services you think would work better if separated? If so, please describe.

16. Would you recommend that other countries/districts implement similar integrated programs? What factors might you advise them to consider before doing so? **(Skip to final questions Q20)**

Questions for sites without integration:

17. What do you know about integration?
18. What would you think about implementing integration here? Any obstacles, challenges? (Probe: resources, resistance, etc)
19. What kinds of programs might be advantageous here?

Questions for all sites:

20. Are there any questions in particular that you would you like to see answered at the community level regarding integration?
21. Is there anything we haven't discussed that you would like to comment on at this time?

10.4 Interviews with nurses at the Health Facility Level

Date: CSCOM: Data code:

1. Please tell us a little about yourself. (Probe: position, how came to this job, do you speak the local language)
2. Please describe a typical workday for you.
3. What kinds of services do you provide in addition to EPI? (Probe: pneumo and rota treatment services)
4. How do you make decisions about which services to offer on which days?
5. What challenges have you faced with EPI services? (Probe: vaccine stockouts, health cards, etc.)
6. How do you define integration? (Probe: integrated service delivery)
7. Do you deliver services in an integrated manner? **(If no, skip to Question 23)**

Integration site questions:

8. Please tell us about the integration programs with which you have been involved. How long have you been providing integrated services here?
9. Describe to me how the integration works (step by step, do you have assistance, how long is spent on each service per client, etc)
10. What do you see as the benefits of these integration programs (for you and/or the clients)?
11. Are there any drawbacks (to you and/or the clients)?
12. What particular challenges have you encountered along the way? (Probe: transportation, training, accountability, effects on ability to do other work/immunizations, etc.) How did you handle those challenges? How were the problems addressed by your supervisors? What do you think should be/should have been done?
13. Is there anything that has worked particularly well? (Probe: Innovations in terms of how to carry out, promote, etc.?)
14. How does integration of these programs impact your workload and daily activities?
15. What impacts do you think integration has on the immunization program overall?
16. Do you feel like you have adequate support to carry out these programs? If not, what do you need?
17. How have the communities you work with responded to the integrated programs? Do they understand how it works? Any difficulties/resistance? Why? Was there a push from the community for integration? Any support that has been helpful?
18. What, if any, changes would you like to see in terms of how the integration program(s) is run?

19. Were you asked for your opinions before the program was implemented? Were they incorporated? How?
20. What kind of training did you receive?
21. Are there any other programs/services you would like to see integrated in this district? Which ones? What factors would have to be addressed in order for that to happen (resources, resistance, etc.)?
22. Are there any programs/services that are currently integrated, that you think would work better if separated? Please describe.
23. Would you recommend that other countries/districts implement similar integrated programs? What factors might you advise them to consider before doing so? **(Skip to final questions, Q31)**

Questions for sites without integration:

24. What do you know about integration?
25. Do you have any experience with integration of services/goods delivery? (if don't know what it is, explain it)
26. What would you think about implementing integration here? Any obstacles, challenges? (Probe: resources, resistance, etc)
27. What kinds of programs might be advantageous here?
28. What services/goods do you think would be beneficial to the people you work with?
29. How do you foresee doing integration will affect your daily workload and activities?
30. Do you foresee any other challenges?
31. What benefits do you foresee?

Questions for all sites:

32. Who supervises you? How often? Do you receive feedback? And are you satisfied with the quality of supervision?
33. Are there any questions in particular that you would you like to see answered at the community level regarding integration?
34. Is there anything we haven't discussed that you would like to comment on at this time?

10.5 Verbal Informed Consent Script: In-depth Interviews/Exit-Interviews

Hello, my name is _____. I've come here today to talk with community members about improving health care services.

Specifically, we are interesting in hearing your thoughts about integrating other services with routine immunization services.

There are no direct benefits to you from participating. However, the information we gather may help improve health services in Mali.

There are no physical risks to your participation. However, you may be asked a question that makes you uncomfortable. If you agree to participate, you can always choose not to answer any question that makes you uncomfortable. You can also stop participating at any time.

Please know that there are no correct answers to these questions. We are interested in your thoughts and opinions to try to improve services.

We will not collect your name, so there will be no way for anyone to link what you said to you.

We will record this conversation, to help us remember what you each say.

Do you have any questions about what we are asking you to do?

Are you willing to help is today by answering our questions.

10.6 Interviews with Key Informants at Community Level (teachers, traditional health practitioners, religious and political figures) (OPTIONAL)

Date: CSCOM: Data code:

1. Introductions (position, etc)
2. Explain what integration is, what types of programs might be offered.
3. What do you know about the integration programs (i.e., the services/goods/informational messages that are received along with immunizations) offered at your local health facility?
4. Are there any particular benefits/drawbacks to integrated service delivery?
5. Did anyone ask you/the community what they thought of the idea of integration before they implemented it? Which, if any, of your opinions were taken into account?
6. Is there anything that might make the immunization program(s) better? What would you recommend? What other services do you think would benefit from integration? Are there some services that you think definitely should not be integrated? Do you think any existing integrated programs should be separated?
7. What other programs/services would you like to see offered?

10.7 Exit-Interviews with Mothers

Date: CSCOM: Data code:

Interviews with mothers of children less than one year of age

1. Why did you come to the CSCOM today?
2. Was your child vaccinated?
3. What other services did they receive today?
4. Age?
5. How many children do you have?
6. What is your profession?
7. Are you the first wife or how many?
8. What is your education level?
9. What are the challenges you face at the EPI clinic (Probe: availability of vaccines, health passports, distance, personnel, etc.)
10. What services are available at your health facility? Do you utilize all services that are available? If not, why not?
11. What can you tell me about the integration programs? (i.e., what services/goods/informational messages do you receive when you bring your children to get immunizations?) (Probe: are you happy with the current delivery of services? Would you prefer a different system?) **(If integration is offered, skip to 8)**

Questions for sites without integration:

12. Do you perceive that there might be any particular benefits/drawbacks/obstacles to integrated service delivery? (Probe: access, costs, community power structures/sanctions)

Questions for all groups:

13. What other services/products would you like to see offered in an integrated manner?
14. Is there anything important that we haven't talked about that you would like to bring up now?

10.8 Verbal Informed Consent Script: Focus Groups

Hello, our names are _____. We've come here today to talk with community members about improving health care services.

Specifically, we are interesting in hearing your thoughts about integrating other services with routine immunization services.

There are no direct benefits to you from participating in this group. However, the information we gather may help improve health services in Mali.

There are no physical risks to your participation. However, you may be asked a question that makes you uncomfortable. If you agree to participate, you can always choose not to answer any question that makes you uncomfortable. You can also stop participating at any time.

Please know that there are no correct answers to these questions. We are interested in your thoughts and opinions to try to improve services.

We will not collect your name, so there will be no way for anyone to link what you said to you.

As a way of respecting everyone here's privacy, we ask that you do not tell others in your community what specific people say here today.

We will record this conversation, to help us remember what you each say.

Do you have any questions about what we are asking you to do?

Is there anyone who does not agree to participate and would prefer to leave the group?

10.9 Focus Groups at Community Level (mothers, fathers, paternal grandmothers)

Date: CSCOM: Data code:

Focus groups should be made up of 8-10 people each. The key interviews are with mothers of children less than one year of age. Additional optional focus groups include fathers and paternal grandmothers from homes with children less than one year of age.

1. For mothers only: Please describe what a typical day is like for you when you take your child to get immunizations. (Probe: step by step, what do before leave house, how get to wherever the services are offered, etc.)
2. For mothers only: What are the challenges you face at the EPI clinic (Probe: availability of vaccines, health passports, distance, personnel, etc.)
3. What services are available at your health facility? Do you utilize all services that are available? If not, why not?
4. What can you tell me about the integration programs? (i.e., what services/goods/informational messages do you receive when you bring your children to get immunizations?) **(If integration is not offered skip to question Q10)**

Sites with integration:

5. Are you required to have a health passport (or equivalent) to obtain services? Is so, does this document cost money to purchase?
6. Are you satisfied with the integration programs? Is there anything about them in particular that you like? That you dislike? Do they work? (i.e., are people able to take advantage of them?)
7. Does everyone in the community have access to the programs? If not, what prevents their access? (Probe: rules, costs, community power structures/sanctions?)
8. Did anyone ask the community what they thought of the idea of integration before they implemented it? Which, if any, of your opinions were taken into account?
9. Is there anything that might make the program(s) better? What would you recommend? **(Skip to final questions Q11)**

Questions for sites without integration:

10. Do you perceive that there might be any particular benefits/drawbacks/obstacles to integrated service delivery? (Probe: access, costs, community power structures/sanctions)

Questions for all groups:

11. What other services/products would you like to see offered in an integrated manner?
12. Is there anything important that we haven't talked about that you would like to bring up now?

10.10: Note Taker Form

# of Participants: **Urban / peri-urban / rural**

Date: **CSCOM:** **Data code:** **Note Taker:**

Seating Chart:

Notes:

Question	Response	Observations

FG Number	Age	# of children	Profession	Wife Number (#)	Education level
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

10.11 Focus Group Debriefing Form

Date:	Data Code:
Moderator:	Note-taker:

1. What are the main themes of this focus group?

2. Did any information contradict what you learned in previous focus groups?

3. What did participants say that was unclear or confusing to you?

4. What did you observe that would not be evident from reading a transcript of the discussion (e.g., group dynamics, individual behaviors, etc.)

5. What problems did you encounter (e.g., logistical behaviors of individuals, questions that were confusing, etc.)?

6. What issues will you follow up?

7. Does the note-taker have any suggestions for the moderator or vice versa?

10.12:Archival Information Sheet: Mali Comprehensive Integration Project						
Region:	Dates:					
Commune:	CSCOM Name:					
Data collection site code:						
Data Code	**Activity**	**No.**	**Given to Transcription**	**Transcribed**	**Completed**	**Comments**
	District					
	Health worker					
	HF form		NA	NA		
	Time motion – obs		NA	NA		
	Time motion – est		NA	NA		
	Time motion – probes		NA	NA		
	FDG Mother					
	FDG Mother Notes		NA	NA		
	FDG Mother Debrief		NA	NA		
	FDG Father					
	FDG Father Notes		NA	NA		
	FDG Father Debrief		NA	NA		
	FDG M-in-L					
	FDG M-in-L Notes		NA	NA		
	FDG M-in-L Debrief		NA	NA		
	Key informant					
	Exit interviews		NA			