2011 Lot Quality Assurance Sampling Survey in Liberia

2011 Lot Quality Assurance Sampling Survey in Liberia

MEASURE Evaluation is funded by the United States Agency for International Development (USAID) through Cooperative Agreement GHA-A-00-08-00003-00 and is implemented by the Carolina Population Center at the University of North Carolina at Chapel Hill, in partnership with Futures Group International, ICF Macro, John Snow, Inc., Management Sciences for Health, and Tulane University. The views expressed in this publication do not necessarily reflect the views of USAID or the United States government. TR-11-82 (September 2011).

Table of Contents

Acknowledgements

We acknowledge the strong administrative support and active participation of the Ministry of Health and Social Welfare (MOHSW), whose involvement was critical in the introduction and pilot testing of the lot quality assurance sampling (LQAS) methodology in Liberia. Our expression of gratitude is extended from the senior leaders in Monrovia to health officers and agents in four counties where surveys were conducted: Bomi, Bong, Lofa, and Nimba.

As well, we acknowledge the capable role of Subah Belleh Associates (SBA) in helping to organize, implement, and report on the four LQAS surveys simultaneously conducted in April 2011. Through the efforts of SBA, interviewers and data entry staff were recruited and managed throughout the period of field work and data processing. We are especially thankful for their support in ensuring that the findings from the field are of the best possible quality.

Acronyms

ACT	Artemisinin Combination Therapy
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Clinic
ARI	Acute Respiratory Infection
BCG	Bacillus Calmette-Guérin Vaccine
BPHS	Basic Package of Health Services
CHSWT	County Health and Social Welfare Team
DFID	U.K. Department for International Development
DHIS	District Health Information System
DPT3	Combined Diptheria, Pertussis, and Tetanus Vaccine (3 doses)
gCHV	General Community Health Volunteer
GDP	Gross Domestic Product
GER	Gross Enrollment Ration
GOL	Government of Liberia
HISP	Health Information Systems Program
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
IYCF	Infant and Young Child Feeding Guidelines
LDHS	Liberia Demographic and Health Survey
LLIN	Long-Lasting Insecticide Treated Bed Net
LMIS	Liberia Malaria Indicator Survey
LQAS	Lot Quality Assurance Sampling
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
MNCH	Maternal, Neonatal and Child Health
MOHSW	Ministry of Health and Social Welfare
NGO	Non-Governmental Organization
ORT	Oral Rehydration Therapy
PBC	Performance Based Contract
PHC	Primary Health Care
PPP	Purchasing Power Parity
PRS	Poverty Reduction Strategy
QA	Quality Assurance
RBHS	Rebuilding Basic Health Services
SA	Supervisory Area
SBA	Subeh Belleh Associates
TALC	Teaching Aids at Low Cost
TTM	Traditional Midwife
U5M	Under 5 Mortality
UNHCR	United Nations Refugee Agency
UNICEF	United Nations Childrens Fund
USAID	U.S. Agency for International Development
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

Section 1 Liberia Health Sector Context

1.1 GENERAL CONTEXT

Liberia is situated on the West coast of Africa, bounded by Guinea to the North, Cote D'Ivoire to the East, Sierra Leone to the South, and the Atlantic Ocean to the West. It is a relatively small nation, covering approximately 111,369 square kilometers and has a population of fewer than four million people. Liberia's terrain is characterized by mangrove swamps and beaches along the coast, leading into wooded hills and semi-deciduous shrub lands further inland, and dense tropical forests and plateaus in the interior.[1] Liberia contains 40 percent of West Africa's rain forest.[1] The climate is tropical with a wet season from mid-April to mid-October and a dry season from mid-October to mid-April. The average annual rainfall is 4,150 mm, and average temperature ranges from 22 to 27 degrees Celsius. The country is divided into 15 political sub-divisions, called counties: Bomi, Bong, Gbarpolu, Grand Bassa, Grand Cape Mount, Grand Gedeh, Grand Kru, Lofa, Margibi, Maryland, Montserrado, Nimba, Rivercess, River Gee and Sinoe. Monrovia is Liberia's largest city and serves as its administrative, commercial, and financial capital.

Table 1 Liberia Selected Statistics[2, 3, 4, 5]

Region	Western Africa
Land Area	111,369 sq. km
Date of Independence	July 26, 1847
Population (2008)	3.8 million
Population Density (2008)	34.1 persons/sq.km
Population Growth Rate (2005–2010)	4.1%
Urbanized Population (2009)	47%
Sex Ratio (2009)	98.8 men/100 women
Total Fertility Rate (2007)	5.2 children/woman; 7.2 in rural areas
Maternal Mortality (2008)	994 maternal deaths/1,000 live births
Average Household Size	5.2 persons
Infant Mortality (2007)	110 infant deaths/1,000 live births
Adult (15+) Literacy Rate (2009)	59.1%
Youth (15–24) Literacy Rate (2009)	75.6%
GDP per Capita (2008)	$218.70

[1] U.S. Department of State. (July 1, 2011). *Background Note: Liberia*. Retrieved from http://www.state.gov/r/pa/ei/bgn/6618.htm

[2] United Nations. *UN Data | Country Profile | Liberia*. Retrieved from http://data.un.org/CountryProfile.aspx?crName=Liberia#Social

[3] UNESCO. *UIS Statistics in Brief: Education (all levels) Profile Liberia*. Retrieved from http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=121&IF_Language=eng&BR_Country=4300&BR_Region=40540

[4] UNICEF. *At a Glance: Liberia*. Retrieved from http://www.unicef.org/infobycountry/liberia_statistics.html

[5] Government of Liberia (GOL).Demographic Health Survey 2007. Ministry of Health and Social Welfare: Monrovia, Liberia.

The Republic of Liberia declared independence on July 26, 1847, and in 1989, saw the beginnings of one of Africa's longest and bloodiest civil wars. This 14-year civil war ended in late 2003 with a comprehensive peace agreement signed by leaders from the Government of Liberia (GOL), rebel forces, political parties, and civil society. Following a 2-year transitional government, Liberia held its first free and fair elections in 2005, electing the first female head of state in Africa. Recognizing the urgent and immediate need for civil sector development, the GOL was able to garner substantial donor support of its new Poverty Reduction Strategy (PRS) at the June 2008 Liberia Poverty Reduction Forum in Berlin, Germany. The PRS aims to tackle issues of poverty, illiteracy, unemployment, and governance within Liberia and articulates the GOL's strategy to achieve "rapid, inclusive, and sustainable growth development." [1, 6]

1.2 DEMOGRAPHY

Liberia's population is estimated to be 3,786,764, with an annual population growth rate of approximately 2.7 percent.[2, 7] The percent of the population living in urban areas is 48, due to rapid urbanization over the last fifteen years, and influenced by greater security in urban centers during war times and greater access to jobs, services, and social gratification during peace time.[2]

According to the 2007 Liberia Demographic and Health Survey (LDHS), the population is 49 percent male and 51 percent female, giving a sex ratio of 95 males per 100 females. This ratio is higher (99 males per 100 females) in rural areas than in urban areas (90 males per 100 females). Liberia's population is young, with approximately 52 percent of the population under the age of 19. The relative youth of the population, combined with other factors such as high rates of teenage pregnancy (32 percent) and low levels of contraceptive prevalence (11.7 percent overall; 7 percent in rural areas) contribute to Liberia's high total fertility rate of 5.2 children per woman (7.5 in rural areas).[5]

1.3 EDUCATION

Education remains a major development challenge for Liberia. Further development of human capital will be essential to progress in other sectors. Adult literacy (for those 15 years or older) is 59.1 percent which is an improvement over the national average of 42.8 percent in 1994; however, it is still lower than the regional average for Sub-Saharan Africa (61.9 percent). Adult literacy was higher among males (63.7 percent) than among females (54.5 percent).[8]

This trend is reversed when analyzed for the country's youth (15 to 24 years old), among whom female literacy (80.9 percent) is higher than male literacy (70.4

[6] International Monetary Fund. *Poverty Reduction Strategy: Republic of Liberia*. Retrieved from http://www.imf.org/external/pubs/ft/scr/2008/cr08219.pdf

[7] Central Intelligence Agency. *The World Factbook: Liberia*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/li.html

[8] UNESCO. *UIS Statistics in Brief, Education Profile—Liberia*. Retrieved from http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=121&IF_Language=eng&BR_Country=4300&BR_Region=40540

percent), for a total average of 75.6 percent. The literacy figures for younger Liberians are better than the regional average (71.2 percent) and point towards improved educational indicators.[8]

The gross enrollment ratio (GER)[11] at primary school level for the period between 2005 and 2009 was 96 percent for males and 86 percent for females. Persistence to secondary school, however, is very low and the GER at secondary school drops to 36 percent and 27 percent for males and females, respectively.[9]

1.4 ECONOMY

Liberia is currently one of the poorest countries in the world with a per capita gross domestic product (GDP) of $218.70 in current USD.[2] However, the economy appears to be steadily improving, and economic growth (defined by percentage growth in real GDP) averaged 7.25 percent from 2006 to 2009.[10] The major sectors of the Liberian economy are mining, agriculture, forestry and services. Since the end of the war, there has been greater international acceptance of Liberia's major exports (timber, diamonds) in the wake of lifting of UN sanctions, which has improved the prospects of higher export income.

Despite overall growth, poverty and unemployment remain high, and (depending on source and definition) between 64 and 84 percent of the population live in extreme poverty, defined as less than $1.25 day.[8] Inflation, which was in the high double figures during the civil war, has remained low over the last few years—7.4 percent in 2009 and 5.8 percent in 2010.[8] A large number of Liberians remain unemployed, and the economy is highly dependent on a few sectors based on availability of natural resources.

Fiscal resources, while enhanced recently through foreign aid, remain limited. The ratio of tax to GDP is only 0.3 percent[8] which represents a major constraint on the GOL's ability to invest in infrastructure, health and education, and thus the GOL remains heavily donor dependent.

1.5 HEALTH SECTOR DEVELOPMENTS

Liberia faced numerous health challenges before the war. Before 1990, the country focused on curative and tertiary health care that had an urban bias. This meant that even though the major causes of morbidity were preventable and that the majority of the population lived in rural areas, the system was oriented towards curative services in cities, serving the minority of the population. And during this time period, only 33 percent of the population had access to health care within 10 km. The outcomes of this situation were high infant, child, and maternal mortality, and a low life expectancy.

[9] UNICEF. *At a Glance—Liberia*. Retrieved from http://www.unicef.org/infobycountry/liberia_statistics.html

[10] Government of Liberia (2010) *The state of food and nutrition security in Liberia*. Ministry of Agriculture: Monrovia, Liberia

Table 2 Selected Pre-War Health Statistics

Total Fertility Rate	6.5 children/woman
Women who marry before age 18	50%
Women who have first child before age 20	53.5%
Contraceptive use	8%
Infant mortality	144 deaths/1,000 live births
Child mortality	220 deaths/1,000 children under the age of 5
Percent of population living in urban areas	39%

Source: LDHS 1986

Just before the war, however, the Ministry of Health and Social Welfare (MOHSW) was making an effort to address issues of decentralization and provision of primary health care (PHC) services. Acknowledging a need to focus on preventative health care and seeking to empower its county health teams, the MOHSW adopted a Primary Health Care Strategy, based on the Alma-Ata Declaration.[11] With the support of the USAID-funded, Southeast Region Primary Health Care Project, the MOHSW developed a set of decentralization guidelines which have since become the basis for restructuring and strengthening the current county health team/health services system.

By the end of the civil war in 2003, Liberia's previously struggling health system had been devastated and suffered further setbacks and hardships. The conflict resulted in the collapse of the country's infrastructure and an inability of the government to provide basic services. Because of wartime destruction and looting, 242 of the 293 public health facilities that were operational before the war were deemed non-functional by the end of the war.[12] Many health care providers fled the country, leaving only 30 physicians to serve a population of 3 million,[12] and during the conflict humanitarian aid was focused in Monrovia, leaving a majority of the Liberian population with little or no access to health care.

In 2006, the GOL responded to the health challenges in Liberia by developing a National Health Policy and a National Health Plan. The National Health Plan (2007–2011) prioritized a Basic Package of Health Services (BPHS) and decentralization of management and implementation of programs to the fifteen counties. Its other priorities included infrastructure development, standardization of incentive structure for health care workers, and support for leadership and management training for supervisory personnel. To support the implementation of the health policy and plan, several donors established a Health Sector Pool Fund in 2008. Currently, 'The Pool Fund' has four main contributors: UNICEF, the United Nations Refugee Agency (UNHCR), the U.K. Department for International development (DFID), and Irish Aid.

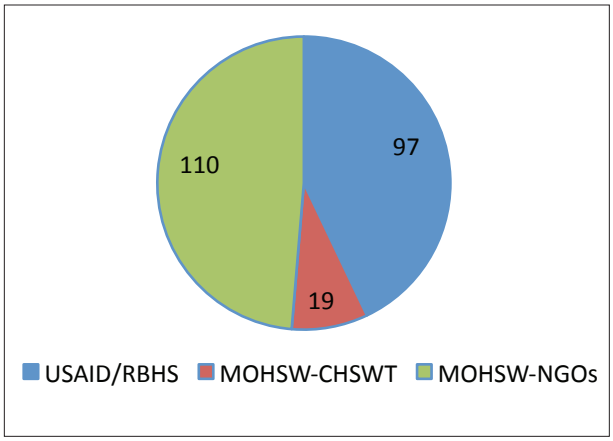
[11] Under WHO director Mahler of Denmark (1973-88) the goal of "Health for All" was proposed and was formally put forth in the 1978 WHO-UNICEF Alma-Ata Declaration. The Alma-Ata Declaration affirmed health as a fundamental human right and called for a transformation of conventional health care systems and for broad intersectoral collaboration and community organizing.

[12] Kruk et al. *Availability of essential health services in post-conflict Liberia*. Bulletin of the World Health Organization (2010). Retrieved from http://www.who.int/bulletin/volumes/88/7/09-071068/en/index.html

Given the huge need for continued and expanded health care access, particularly those services included in the BPHS, the MOHSW adopted a policy of performance-based contracting with nongovernmental organizations (NGOs) for health service delivery throughout the country. MOHSW used The Pool Fund to finance many of these performance-based contracts (PBCs) with technical support from the World Bank and the U.S. Agency for International Development (USAID). In November 2008, USAID launched its Rebuilding Basic Health Services (RBHS) project in support of the MOHSW's 2007–2011 National Health Plan and adapted a PBC model for Liberia. This five-year project is currently being implemented by JSI Research & Training Institute, Inc., in close collaboration with the MOHSW, and its specific objectives include: (1) strengthening and extending health services to clinics and communities through performance-based contracts to NGO partners; (2) strengthening Liberia's health system in the areas of human resource management, infrastructure, policy development, and monitoring and evaluation; and (3) preventing disease and promoting more healthful behaviors through behavior change communication and community mobilization.[13] The decentralized primary care approach of both USAID's RBHS Project and the MOHSW's Pool Fund PBCs focus on service delivery outcomes in the areas of family planning and reproductive health; maternal, neonatal, and child health (MNCH); malaria; HIV prevention; and water and sanitation.[13]

Contracting out to NGOs serves to provide efficiencies in the health care system and the necessary standardization of care, particularly needed in a post-conflict society like Liberia. The contracting of NGOs in the provision of health care is a means to facilitate the transition from relief to development by improving the management of, and collaboration with, the County Health and Social Welfare Teams (CHSWT)—responsible for managing health services in their respective counties. The capacity of CHSWTs is to be developed, in part, through performance-based contracts (PBC) with the NGOs. In addition to government and NGOs, there are also private and faith-based providers of health care.

Figure 1 **Facilities Covered by PBC**



Source: USAID/RBHS

[13] JSI. *Rebuilding Basic Health Services in Liberia (RBHS) Fact Sheet*. Retrieved from: http://www.jsi.com/JSIInternetProjects/InternetProjectFactSheet.cfm?dblProjDescID=3241

In order to effectively track progress, achievements, and challenges in service delivery as envisioned by the 2007 National Health Plan and all supporting mechanisms, the MOHSW developed a National Monitoring and Evaluation Policy and Strategy for the Health Sector in 2009. The Monitoring and Evaluation (M&E) Strategy provides the roadmap for measuring achievements of the 2007 National Health Policy and Plan—particularly the BPHS—and defines the data collection, management and dissemination processes. It also codifies the means by which the health sector will be monitored, reviewed and evaluated, including milestone, progress, outcome, and impact indicators.

1.6 GENERAL HEALTH STATUS INDICATORS

While there have been some improvements in the health sector since the end of the war, Liberia continues to face major health challenges. The infant mortality rate has decreased from 133 infant deaths per 1,000 live births in 2000 to 80 in 2009, and the Under-5 Mortality (U5M) dropped from 198 deaths per 1,000 in 2000 to 110 in 2009[14]; however, improvements have appeared to plateau, and Liberia is not on track to meet its Millennium Development Goal (MDG) of 64. The current maternal mortality rate of 994 per 100,000 represents an increase from 578 twenty years prior and is one of the highest in the world.[2] Additionally, access to health services remains poor, particularly in rural and generally inaccessible areas. While antenatal care defined as at least 4 visits is 66 percent, only 46 percent of births were delivered by skilled birth attendant (SBA).[14]

Malaria continues to be the leading cause of morbidity and mortality, followed by diarrhea and acute respiratory infections (ARI). Other preventable problems that are commonly found in Liberia include tuberculosis, sexually transmitted infections, worms, skin diseases, under-nutrition, and anemia. The national HIV prevalence is currently estimated at 2 percent, although there is some uncertainty about the numbers with the recent antenatal clinic (ANC) sentinel survey indicating an HIV prevalence of 5.4 percent.[14] Changes in the overall health situation are affected by limited human resources and infrastructure for health. In 2008 there were only 51 physicians in Liberia, a ratio of approximately 0.14 per 10,000.[14] Nearly 85 percent of Liberia's health infrastructure was destroyed during the war and rebuilding has been a major challenge. However, with the support of international partners, Liberia is working toward rehabilitating and rebuilding health infrastructure.

1.7 HEALTH SITUATION OF CHILDREN

1.7.1 Morbidity

As Table 3 shows, malaria and related conditions, diarrheal diseases, acute respiratory infections (including pneumonia), and neonatal conditions (bacterial infection, jaundice, etc.) are the leading causes of child morbidity in Liberia, as well as malnutrition and iron deficiency. Undernutrition affects mainly women and children, with stunting in Under-5s at 41.8 percent.

[14] World Health Organization (WHO). Global health Observatory Data Depository—Liberia. Retrieved at http://apps.who.int/gho data/?vid=12300&theme=country

Table 3 **Prevalence of Common Childhood Illnesses**

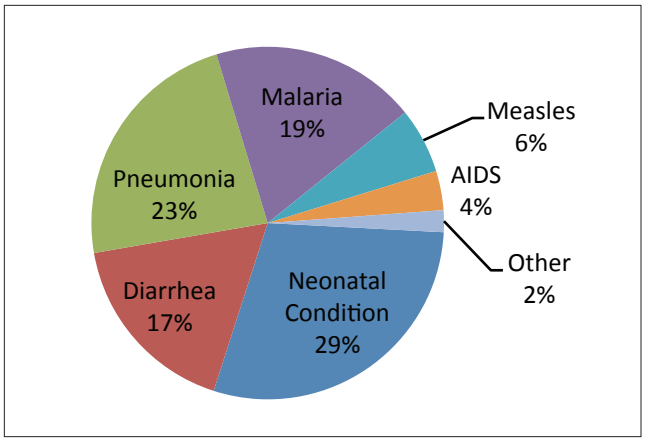
Indicator	Rate (%)
Malaria	32
Fever	50.1
Cough	43.2
Diarrhea	15.2
Stunted (6-59 month olds)	41.8

Sources: CFSNC, 2010[10]; MIS, 2010[15]

1.7.2 Mortality

As shown in the general health status of the population, while child mortality has fallen since 2003 (the end of the war), there are still 110 Under-5 deaths for every 1,000. Numerous factors account for these high child mortality rates. While malaria is the leading cause of child morbidity, deaths due to neonatal causes account for 29 percent of all Under-5 mortalities. The neonatal causes most associated with child mortality are prematurity, neonatal sepsis, neonatal tetanus and birth asphyxia, most of which can be attributed to poor access to emergency obstetric care.[16]

Figure 2 **Major Causes of Under-5 Mortality (% Attributable Mortality)**



Source: Government of Liberia (GOL)[16]

1.7.3 Prevention, Care, and Treatment of Common Conditions

Malaria is the most common health problem in Liberia. However, according to the 2009 Malaria Indicator Survey (LMIS), 49 percent of households own a mosquito net—a major improvement on the 30 percent of households reported by the 2007 Liberia Demographic and Health Survey (LDHS). Despite improved ownership of nets, the LMIS 2009 suggests that usage for children under 5 is low; only 27 percent of under-5s actually slept under a mosquito net the night before the survey was conducted. In terms of treatment, 67 percent of children who had fever within two weeks prior to the survey had taken a antimalarial drugs.[15]

[15] Government of Liberia (GOL). *Malaria Indicator Survey 2009*. Ministry of Health and Social Welfare: Monrovia, Liberia.

[16] Government of Liberia (GOL). *National Strategy for Child Survival in Liberia 2008-2011*. Ministry of Health and Social Welfare: Monrovia, Liberia.

With regard to ARI, caregivers sought treatment for 70 percent of under-5s who showed symptoms. Similarly, treatment was sought for 53 percent of children with diarrhea. In the case of vaccination, coverage rates for BCG, measles and DPT3 were reported at 86 percent, 95 percent, and 88 percent respectively for children 0–11 months. However, full immunization was achieved for only 39% of 12–23 month olds (LDHS 2007).[16]

Although improved since the war, access to safe drinking water and improved sanitation facilities is still unsatisfactory. Only 58 percent of Liberians have access to safe drinking water, and that figure drops to 40 percent in rural areas. Only 37 percent have access to sanitation facilities.[10]

The most notable areas of progress in child health services have been: increased use of oral rehydration therapy (ORT), increased ownership of mosquito nets, increased access to treatment for malaria within 24 hours, and more rapid health-seeking behavior. Improvements in access to treatment for malaria can be largely attributed to improved security and to the sustained policy of free access to basic health services at the point of delivery. Vitamin A supplementation has also increased, as has the management of severe (acute) malnutrition. Improved water and hygiene practices like hand washing are also showing a positive impact in reducing numbers of deaths due to diarrhea.

In 2008, under the GOL's BPHS, the MOHSW developed and introduced a health facility accreditation process which is beginning to demonstrate improved quality of care and services through feedback on process, facility and care improvements, and greater stakeholder involvement.[17]

1.7.4 Current Health Interventions, Programs and Packages

Table 4 presents a list of various health interventions introduced recently by the GOL through the MOHSW in partnership with international aid agencies and various NGOs. These interventions have been introduced in approximately 65 percent of operational health facilities and, combined with national programs, have resulted in measurable improvements across the health sector. Table 4 describes the package of health services and where interventions are implemented.

[17] Cleveland, et al. (2010). Introducing health facility accreditation in Liberia. Global Public Health, 6(3): 271-282. Retrieved at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3062234/?tool=pubmed

Table 4 Current Child Survival Interventions in Liberia

Package	Where
Antenatal Care	Bomi, Bong, Cape Mount, Gbarpolu, Lofa, Margibi, Maryland, Nimba and Sinoe
Basic Life Saving skills	Bomi, Bong, Cape Mount, Gbarpolu, Lofa, Margibi, Maryland, Nimba and Sinoe
FP Services	All 15 counties
Immunization	Bomi, Bong, Cape Mount, Gbarpolu, Grand Bassa, Lofa, Margibi, Maryland, Nimba and Sinoe.
Childbirth & Immediate. PNC Basic Life Saving skills	Bong, Nimba, Montserrado
Post Neonatal Care Prevention of Infections: Exposed to HIV/AIDS—CXT, ARV Prophylaxis	All 15 counties 5/15 Hospitals providing PMTCT services
Community Nutrition	Maryland, Lofa, Nimba, Bong and Montserrado
Immunization	All 15 Counties
HIV Testing & Counseling	71 testing site in all the Counties (LDHS 2007)
Growth Monitoring and Promotion	Lofa, Nimba, Montserrado
C-Management of Child Illness (diarrhea)	Cape Mount
IMCI-Malaria/HF level	15 counties have started (some degree)

Source: National Strategy for Child Survival in Liberia (2008–2011)[16]

1.8 HEALTH INFORMATION IN LIBERIA

Information on health outcomes of the Liberian population is vital to MOHSW planning and programming. While the health management information system (HMIS) in Liberia, like other aspects of the health care system, was desecrated during the civil war, the MOHSW prioritized its redevelopment and has recently launched the District Health Information System (DHIS) software for collecting and aggregating health statistics at the national level. According to the Health Information Systems Programme (HISP), "Liberia is using DHIS v1.4, and routine health data is submitted monthly to the central Ministry of Health and has been used for the development of the 10-year National Health Policy and Plan Situation Analysis 2011–2021". Data currently being collected is facility-level utilization data for a variety of public health services. The MOHSW is also using the DHIS to monitor and evaluate PBC indicators of NGOs, CHSWTs, and Global Fund recipients.[18]

While the incorporation of the DHIS into the greater HMIS has been a further development in Liberia's health sector, it is still limited by resource constraints within the sector. Without a sufficient number of trained personnel and adequate technology at health facilities, the DHIS is under-used and less efficient as a planning tool.

[18] PATH (2011). *The Health Information Programme: Final Report Submitted to the Norwegian Agency for Development and Cooperation*. Retrieved from: http://healthmetricsnetwork.info/vietnam/lib/exe/fetch.php?media=hisp_final_report_for_norad_20110331.pdf

1.9 LOT QUALITY ASSURANCE SAMPLING SURVEY IN LIBERIA

The MOHSW is in need of a timely and cost-effective method for gathering health outcome information at the county level to support both the central and county-level planning and decision-making processes. In order to fill this information gap USAID/Liberia and the MOHSW piloted an annual health behavior and health outcome monitoring system in 2011. They selected Lot Quality Assurance Sampling (LQAS) as the method for the pilot because LQAS does not require a large sample size and is less dependent on outside technical assistance. Based on a rapid survey platform, the objective of the LQAS pilot was to provide this data for programmatic decision making on key indicators at the national and county levels.

Section 2 Survey Methodology

LQAS is a relatively rapid and inexpensive approach to data collection, and is primarily used for M&E purposes. Used to empower program managers to evaluate program performance, the LQAS method enables these managers to assess whether program objectives and targets have been achieved within a specific unit of interest (a geographical area, a facility, an organization, or any other catchment area). The LQAS data collection method provides a viable alternative to traditional surveys. The method allows for smaller sample sizes than standard probability surveys, and the lower associated costs allow for more frequent sampling. In the LQAS application, the entire program area, or catchment area, is divided into meaningful sub-divisions, or "lots". Typically, the lot is defined as a program supervisory area, and the measure is binary (e.g., yes/no, or acceptable/not acceptable) for each indicator included in the study. For example, to determine the status of immunization coverage, "acceptability" is determined by whether the "lot" (supervisory area) is sufficiently close to the target for immunization coverage—yes/no. Information from each lot can then be agglomerated to provide a coverage estimate for the entire catchment area.

It is important to clarify that the LQAS approach is not intended to measure incremental change over time. It is designed to assess whether a target has been "met" or "not met" in a designated program supervisory area. The small sample size required to provide the binary (met/not met, acceptable/unacceptable) estimates is a key feature of LQAS. However, the small sample size means that 90 percent confidence intervals around point estimates will be wide, such that changes in these point estimates do not register as statistically significant unless they are very large (e.g., 40–50 percent increase or decrease). For example, it is possible that an area with an initially poor performance may improve dramatically over time, and yet still fail to meet the set target level of performance. In other words, these incremental improvements will not be evident in the LQAS performance measures (target met/not met) until the 'target' threshold is crossed.

Section 3 LQAS Application in Liberia

3.1 STAGE 1: IDENTIFICATION OF CATCHMENT AREAS AND LOTS

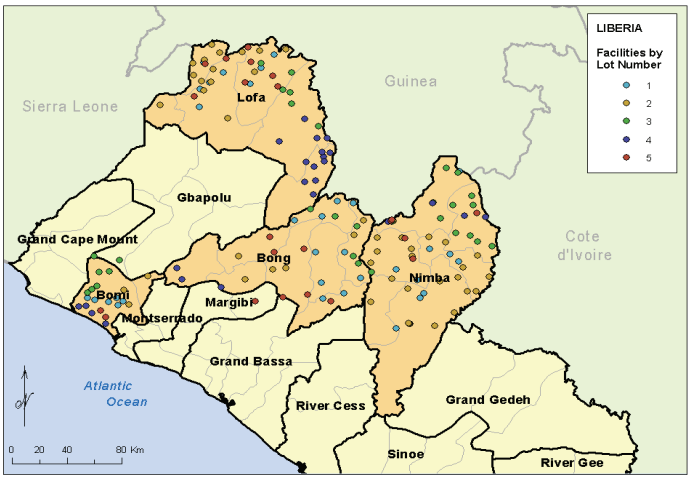
In Liberia, USAID and MOHSW selected four counties as catchment areas for the LQAS pilot. The counties of the North Central region—Bong, Lofa and Nimba—contain one-third of the population of Liberia, have a potential for strong CHSWT leadership, and are home to existing and planned training institutions. Therefore these counties represent the likelihood and promise to become model counties for prevention and health care practice, laying the groundwork for replication and scale up to other counties in the future. In addition to these three North Central counties, USAID and MOHSW included Bomi County, where the MOHSW (through the Pool Fund) is piloting an approach to contracting-in service delivery. In Bomi, the CHSWT is directly responsible for service delivery at 25 health facilities, and by including the community catchment areas around these facilities in the 2011 LQAS pilot, USAID and MOHSW hoped to generate useful performance data on this contracting-in approach.

LQAS methodology requires well defined, programmatically meaningful "lots" (also known as "supervision areas") for the collection, analysis and interpretation of data.

In Liberia, the designated "lots," or supervision areas (SA), were defined by the aggregation of facility catchment areas for the RBHS project, Pool Fund PBCs, and European Union-supported projects within each of the 4 counties. Using programmatic administrative areas as the lots, or supervision areas, affixes responsibility on each donor/implementing partner pair to make programmatic decisions in response to measured health outcomes. For each of the four counties selected for LQAS implementation, 5 supervisory areas were chosen. Selecting at least 5 supervisory areas per county ensured that the aggregate sample size per county-based performance area meets the classic LQAS "gold-standard" of at least 95 (5 × 19) completed interviews per aggregate performance area. In this application, the aggregate performance area was the county-based geographic area/region encompassed by combined selected supervisory areas within that county. Details of the history and statistics behind this method have been discussed elsewhere.[19]

[19] Lemeshow, S. and Taber, S. (1991). Lot Quality Assurance Sampling: Single and double Sampling Plans. World Health Statistics Quarterly 44, 115-132.

Figure 3 **Map of Catchment and Supervision Areas**



3.2 STAGE 2: INDICATOR SELECTION AND TARGET POPULATIONS

At a stakeholder meeting on January 26, 2011, participants decided that the LQAS-based outcome monitoring survey would cover six program areas: (1) water, sanitation and hygiene; (2) immunization and child health; (3) nutrition; (4) malaria; (5) maternal health; and (6) family planning. Key stakeholders selected 26 indicators for the 2011 survey based on criteria such as programmatic relevance and viability of inclusion given the structure of LQAS. As a result, the following sub-groups were included in the study:

» women of reproductive age (15–49 years);
» children aged 0–59 months; and
» children aged 0–59 months that had in the previous 2 weeks a diarrheal episode; a febrile episode; and/or cough and difficulty breathing

3.3 STAGE 3: SAMPLING FRAME

Population data from the 2008 Population and Housing Census of Liberia was obtained for these counties and used in the development of the sampling frame.

Table 5 **Sample Size Liberia LQAS**

County	# of Supervisory Areas	# of Interviews per SA	Total Interviews per SA
Bomi	5	19	95
Bong	5	19	95
Lofa	5	19	95
Nimba	5	19	95
LQAS Total	**20**		**380**

The preceding table shows that a separate LQAS was performed in each of 4 counties. For each LQAS, all indicators included in the study had the same sample size (i.e., within a supervision area, each indicator has a denominator of 19 which is enough observation to provide the acceptable/unacceptable determination for that indicator). A decision rule was used to determine whether a supervisory area's

performance was acceptable or unacceptable based on the indicator's average for the county. By combining the five supervisory areas for a county, the denominator was 95 (5 × 19), and this larger sample size made it possible to calculate a coverage estimate at the county level.

3.4 STAGE 4: SELECTING HOUSEHOLDS

A simple random sample of 19 sample points was chosen within each supervisory area, and a detailed protocol was developed to select the interview starting point. At the household identified as the starting point, interviewers determined the number of sub-groups represented within the household. The interviewer then proceeded to the household directly to the left (or to the nearest household) to continue completing sub-sections of the questionnaire. Called "parallel sampling," this approach is unique to LQAS and ensures that each indicator has the same number in the denominator regardless of household composition at the identified starting point.

3.5 EXPECTED LQAS RESULTS

- An average coverage estimate for each indicator for the county-based performance area/region.[20] The coverage estimates will have a precision less than or equal to +/– 10%, and the aggregate measure will be weighted by supervisory population size.
- A "yes" or "no" answer to whether the supervisory area is within an acceptable range of the specified performance benchmarks (i.e. targets) in each of the selected supervisory areas within a county. Alternatively, whether the supervisory area is within an acceptable range of the "average coverage" for the county-based performance area, as determined by the decision rule for average coverage.

[20] County-based performance area/region is defined as the total area covered by the five or more selected supervisory areas.

Section 4 Overview of Training

4.1 LQAS FUNDAMENTALS

MEASURE Evaluation conducted a training workshop on the LQAS methodology and its intended application in the 4 counties between March 28 and April 1, 2011. The training was facilitated by Scott McKeown with assistance from Stirling Cummings and Fauzia Tariq. Subah Belleh Associates (SBA) identified training participants based on previous use of interviewers and survey position applicants. Some training participants had survey experience and others did not. In total, 32 trainees participated in the workshop, including 6 MOHSW staff and 3 SBA staff. For fundamentals training in the LQAS methodology, MEASURE Evaluation adapted a handbook for to the Liberia context from Valadez J, Weiss W, Leburg C, Davis R. *Assessing Community Health Programs: A Participant's Manual and Workbook: Using LQAS for Baseline Surveys and Regular Monitoring*. London: Teaching Aids at Low Cost (TALC); 2003. This adapted handbook, "Outcome Monitoring using LQAS in Four Counties of Liberia" covered the sections related to the use of LQAS for monitoring of health services and modified the maps and names of counties, substituted terms as necessary and deleted some non-essential materials (e.g., marble exercises for teaching random sampling).

Table 6 Training Agenda Which Covered the Materials from the Workbook

Day	Morning	Afternoon
March 28, 2011	Opening and introductions Uses of surveys Random sampling Using LQAS	Identifying interview locations/communities Selecting starting and subsequent households Selecting respondents
March 29, 2011	Household composition scenarios Review survey questionnaires	Review survey questionnaires continued
March 30, 2011	Interviewing techniques Exercise in interviewing	Improving interviewing skills Review field protocol
March 31, 2011	Field pre-test	Field pre-test
April 1, 2011	Debrief from Pre-Test Questions Lessons Learned	Review of County Maps Plotting of Communities

In addition to the training materials from the workbook, trainers spent a significant portion of the week reviewing, practicing and revising the draft questionnaires that had been produced. Originally based on questionnaires developed for other similar studies, these questionnaires were subsequently modified after discussions with USAID, the MOHSW and implementing partners. During the LQAS workshop, participants practiced administering the questionnaires, both in the classroom and in the field (pre-test). Participants provided key insights into how to phrase specific questions to improve both their comprehension and their acceptability to respondents. As mentioned previously, trainers and interviewers pre-tested

the survey questionnaires in the field (Kakata, 1.5 hours outside of Monrovia) as part of the overall training, and based on feedback from the pre-test, further revisions were made. Trainers reviewed these revisions with the participants the day following the field test, and the final version of the questionnaires was provided to interviewers the following week prior to the beginning of field data collection. The final versions of the questionnaires are included at the end of this report. Other documents developed and reviewed with participants included (1) introduction letter signed by the Deputy Assistant Minister for Vital Statistics; (2) face sheet for questionnaire packets to help track questionnaire completion in communities; (3) interviewer introductory explanation to interviewee and informed consent; (4) list of Liberia historical events to help establish birth dates when not recorded; (5) copy of random number table to help in selecting starting households; and (6) visual aids of commonly used contraceptives, maternal and child nutritional supplements and malaria medication.

4.2 DATA ENTRY TRAINING

Data Entry Clerks used CSPro software to enter the LQAS survey data into an electronic database. CSPro is a free, downloadable, suite of applications that facilitates data entry, manipulation, editing and tabulation. Though the software is simple to use and requires little training for data entry operators, value was added by not only training participants in performing data entry, but also instructing the participants on how to create CSPro data entry systems. MEASURE Evaluation led this CSPro programming and data entry training at SBA Offices from April 4 to 6, 2011. Eleven participants were introduced to programming CSPro data entry applications and trained to do the LQAS data entry. Participants included 3 MOHSW staff from the central level who attended the LQAS training of the previous week and 8 others. Specifically, the training curriculum included:

» an overview of the CSPro suite of applications and their potential uses
» how to create a simple data entry application from a questionnaire
» testing and troubleshooting the data entry system
» performing data entry
» exporting data from CSPro to Microsoft Excel
» simple analysis of exported data

During the training, attendees created their own CSPro data entry application of Questionnaire 1—completed during the field test of the LQAS (March 31, 2011, Kakata)—and then they entered data from the completed questionnaires. Once the data were entered, they were instructed on how to export the data into a spreadsheet program for analysis.

Section 5 Recruitment of Data Collectors

MEASURE Evaluation and SBA shortlisted and screened potential field data collectors a week prior to the commencement of the data collectors' training. More persons (28) than the 20 needed for the field work were recruited for training, allowing SBA to select the "best" qualified persons as well as have stand-by replacements in situations of last-minute withdrawals of persons selected. In addition to the data collectors recruited by SBA, several MOHSW staff participated—mainly M&E officers from the 4 counties. Their inclusion was designed to ensure the participation of and ownership by the CHSWT in the implementation of the survey. Thirty-nine percent of those recruited for training were females, compared to 61 percent males.

5.1 SELECTION AND TEAM FORMATION

Following the training of interviewers and supervisors, SBA made a final selection of 20 persons for the 4 survey locations. The criteria for selection were (1) participants' understanding of the survey instruments and the LQAS procedures, and (2) the applications of said understanding during the pre-testing exercise. MEASURE Evaluation and SBA observed participants throughout the training and monitored them during the field testing to identify those who most met the set criteria. SBA assigned general grades, and those with the best performance made the final list of field staff used in the survey.

Section 6 Field Work

6.1 SURVEY INSTRUMENT

The survey instrument consisted of a main questionnaire and eight sub-questionnaires, with target respondents being women of reproductive age (15–49 years old) with children under 5.

6.1.1 Questionnaire (main)

1. Women of reproductive age with child 0–59 months old

6.1.2 Questionnaires (sub)

2. Women of reproductive age not currently using modern contraception
3. Women of reproductive age with child 0–5 months old
4. Women of reproductive age with a child 6–23 months old
5. Women of reproductive age with a child 0–23 months old
6. Women of reproductive age with a child 12–23 months old
7. Women of reproductive age with child 0–59 months old who in past 2 weeks had a diarrheal episode
8. Women of reproductive age with child 0–59 months old who in past 2 weeks had a febrile episode
9. Women of reproductive age with child 0–59 months old who in past 2 weeks had cough and difficulty breathing

Each form was pre-label because the survey instrument consisted of 9 separate one- or two-page questionnaire forms in a set. A 2-digit code for each of the counties (03, 06, 21, 33, respectively) was assigned, and a running list of 7-digit number series was added to the county code so this string of digits could serve as a unique identifier for each sample point and the specific set of questionnaires administered there. Transcription of these numeric identifiers on the front page of each questionnaire was done by hand, the accuracy of which was cross-checked. Data collectors also wrote the names of the county and community of each sample point on the front page to facilitate differentiation among the sets of forms. Finally, MEASURE Evaluation and SBA reviewed the series of different questionnaire forms to ensure that each set was properly assembled and then packaged them for each survey team. Such assiduous attention to detail ensured that teams accounted for survey instruments prior to the beginning of LQAS field work on April 10, 2011.

6.2 FIELD WORK: SURVEY PLANNING

During training, MEASURE Evaluation and SBA informed the field supervisors of the 95 sample points to be covered in each county assigned to them. The field supervisors were required to develop an itinerary that was cost-efficient and considerate of the impending rainy season. SBA obtained county maps from the Liberia Institute for Statistics and Geo-Information Services (LISGIS) which served as a valuable reference while in the field.

6.3 FIELD WORK: SURVEY SUBJECT SELECTION

MEASURE Evaluation and SBA instructed both supervisors and field interviewers in random selection techniques for use in two circumstances prior to the start of survey work. For the case where a sample point would be a location with more than 30 households, the field interviewer was required to meet with local leaders in order to ascertain how the residents themselves geographically subdivide their community. The construction of a schematic map facilitated this process when field work was conducted in a city, town, neighborhood or large villages. The sections that were identified in this way were then enumerated, after which a random number was assigned to allow for one of the sections, similarly numbered, to be impartially chosen.

The determination of which household to begin the field survey, occurred at every sample point. First, field supervisors selected a random number and spun a bottle or stick at the central area of a small community or the randomly selected section of a larger one. The field interviewer walked in the direction of the pointing end, counting off residences passed by on the right side until arriving at the random-numbered residence. The requirement that the survey respondent be a women of reproductive age as well as a mother of at least one child under 5 may have disallowed a subject to be drawn from that chosen home in certain instances. There was also the possibility that an eligible interviewee would not be at home nor expected to return within a reasonable time frame. In either case, the interviewer approached the next house on the right side until an appropriate respondent was found.

The set of nine questionnaires prepared for each sample point did not necessitate the recruitment of nine eligible women, since multiple questionnaires could be administered to the same respondent ("parallel sampling") if the respondent's child's current age or health complaint fit in more than one category. For example, a woman with a child aged 16 months who would be recruited as the respondent for the main questionnaire would also be eligible to be interviewed for the sub-questionnaires of mothers with children aged 0–23 months, 6–23 months, and 12–23 months; furthermore, if her child had been sick during the previous two months with fever, diarrhea, or cough with difficulty breathing, the related sub-questionnaire could be administered as well.

However, MEASURE Evaluation did impose certain restrictions in the application of parallel sampling for this LQAS survey. A mother who had more than one child in the different age categories of relevance—a newborn and a four year old, for example—could not be asked questions for both children; the field interviewer had to choose one or the other child as the reference for which sub-questionnaires are to be used. Additionally, a woman reporting that her child had suffered from more than one of the above named ailments within the past-two-weeks period was not asked questions from more than one of the illness-related sub-questionnaires. It should be noted that this latter restriction was imposed only after the first few days of survey work, when it became evident that field interviewers could not easily distinguish instances when a child had truly suffered two separate episodes of sickness from one that had presented multiple symptoms.

Practical experience from the field also highlighted another problem related to interpretation. Interviewers who documented that women who answered the main questionnaire were current non-users of a modern form of contraception would then administer the "replacement" sub-questionnaire to the same women, dealing with women not using modern contraception. Despite repeated clarifications that there was need for two different women to serve as respondents for the main questionnaire and this particular sub-questionnaire, confusion remained for almost two weeks. What mitigated this problem was the need of the survey to have just one "replacement" women per lot/supervision area, not per sample point. Moreover, the low percentage of women to be interviewed who had described themselves as current users of modern family planning made field data analysis almost moot, given the low sensitivity of LQAS to indicators of very high or low prevalence.

6.4 FIELD WORK: QUALITY ASSURANCE OF FIELD SURVEY WORK

Trainers emphasized the importance of completeness, accuracy, and legibility of responses recorded on the survey forms during training and reinforced this message among those selected to serve as field interviewers. For practical reasons, omissions and corrections to documentation were best handled by supervisors, before the field interviewers left the site. Depending on distances, road conditions, and travel times, field interviewers were able to complete either one or two sample points daily.

As the next line of reviewers, MEASURE Evaluation provided additional quality assurance training and guidance for field supervisors to ensure that all survey forms received proper, impartial inspection shortly after their administration. With 4 field interviewers under the guidance of each county team field supervisor, each field supervisor had up to eight sets of questionnaires to review everyday. Expectations that this review process would occur once a county survey team had regrouped at the end of each day were unrealistic, especially when the field supervisor did interviews as well, usually in the most remote and difficult survey locations. Moreover, the very limited availability of electricity in selected communities inhibited a consistent schedule of night-time reviews; nonetheless, a large majority of completed questionnaires were reviewed by field supervisors.

In anticipation of the need for a dedicated team of survey reviewers, a Quality Assurance (QA) Team functioned concurrently with the interview teams in the field. A Senior Researcher from SBA was joined by two Research Associates from MEASURE Evaluation to form this QA Team. The Team visited each county survey team once weekly. With coordination of rendezvous locations through cell phone calls (despite some variability in telecommunications coverage), the QA Team members each paired up with a field interviewer from a county survey team at a different sample point in order to observe field implementation of protocols for

» random selection of community sub-divisions,
» random selection of survey respondents, and
» interviewee recruitment.

Once the day's field work was completed, the QA Team and county survey team members regrouped to thoroughly review all completed questionnaires and

discuss quality assurance issues with each field interviewer. Concerns with the administration and documentation of questionnaires were raised and corrected during these sessions. The QA Team required that some survey forms be completely redone at the sample point due to irreconcilable error, such as the incorrect use of a child-age-defined sub-questionnaire due to miscalculations. In a few instances, it was not feasible to return to the sample point because of its remoteness, a replacement sample was randomly selected. Another quality assurance issue mentioned above that was resolved during these sessions was the discontinued practice of interviewing a mother with more than just one of the child illness-related sub-questionnaires.

The QA Team discovered that some of the interviewers tended to keep a notebook for recording survey responses before they were transcribed onto the questionnaire forms themselves; when questioned about this duplicative practice, the interviewers mentioned their desire to submit completed survey forms that are cleanly written. This regard for neatness even extended to the practice of swapping out messily completed pages of the questionnaire forms with clean, replacement pages. The QA team instructed interviewers to stop both these practices as there was concern that there could be transcription errors and that replacement pages could be inserted in the wrong set of questionnaires, or that they could fall out and be misplaced.

Following review, the QA team kept completed forms and returned them to the data entry staff in Monrovia. Liberia's highway system and the geographic location of Bomi in relation to the other three counties required passing through Monrovia. Therefore, the LQAS survey benefitted from the weekly drop-off of completed forms.

In each succeeding week, the QA team found fewer instances of missing information or illogical responses in the survey questionnaires, and any errors found were usually correctible and not overly detrimental to survey data quality. Furthermore, the rate of occurrence of "unacceptable" questionnaires requiring complete replacement decreased over time, suggesting that the interview teams were adhering more closely to the study protocol.

The QA Team covered over 2,500 miles during the three weeks of field activity and completed the review of the remaining questionnaires from each team in Monrovia. The inventory of questionnaires that had been data entered was cross-checked in order to confirm that survey documentation for all 380 sample points was accounted for. Thereafter, questionnaires were sorted by county and by their unique, pre-coded identifier numbers.

Table 7 **LQAS Survey Team Performance Charts**

County	Total Done	Total Acceptable	% Acceptable	Total NOT Acceptable	% NOT Acceptable
Week 1 (April 11–16, 2011) Questionnaires					
Bomi	0	0		0	
Bong	31	24	77.4	7	22.6
Lofa	26	23	88.5	3	11.5
Nimba	0	0		0	
Total	57	47	82.5	10	17.5
Week 2 (April 18–23, 2011)					
Bomi	90	83	92.2	7	7.8
Bong	43	41	95.3	2	4.7
Lofa	44	43	97.7	1	2.3
Nimba*	51	43	84.3	8	15.7
Total	228	210	92.1	18	7.9
** late receipt of interviews done during weeks 1 and 2*					
Week 3 (April 24–27, 2011)					
Bomi	12	12	100.0	0	0.0
Bong	32	30	93.8	2	6.3
Lofa	31	29	93.5	2	6.5
Nimba	54	52	96.3	2	3.7
Total	129	123	95.3	6	4.7
Weeks 1–3 (April 11–27, 2011) Questionnaires					
Bomi	102	95	93.1	7	6.9
Bong	106	95	89.7	11	10.4
Lofa	101	95	94.1	6	5.9
Nimba	105	95	90.5	10	9.5
Total	414	380	91.8	34	8.2
# includes surveys re-done when respondent had been incorrectly chosen for interview during weeks 1, 2, and 3					

Section 7 Data Processing for Liberia LQAS Survey

MEASURE Evaluation and SBA recruited 10 individuals, including staff from the MOHSW, for training to undertake the data entry tasks under the Liberia LQAS Survey. The main criterion for selection was understanding the data entry software and the survey instruments. Individuals who demonstrated understanding through accuracy, speed, and experience were selected. Out of the 10 persons trained, 4 declined the opportunity to be selected, while the 4 entry clerks needed were drawn from the remaining 6 persons trained (see Appendix 2).

As mentioned earlier, data-entry clerks used CSPro software. Data gathered was cross checked for validity and accuracy, verified by the data manager and, where applicable, other members of the survey team. To ensure the accuracy of the data entry exercise, 2 rounds of entry were completed for each of the survey instruments. with the initial round of data entry beginning April 18 and running until May 1, 2011. In order to reduce the number of keystroke errors and improve the quality of the final dataset the data were entered a second time from May 15 to 19, 2011 and compared to the initial entry with differences being reconciled. The initial data cleaning efforts took place in Monrovia, at SBA Offices, with further cleaning taking place at the MEASURE Evaluation office in Chapel Hill, North Carolina. The data was exported from CSPro and analyzed using SAS statistical software (Version 9.2).

Section 8 Indicators and Definitions

The LQAS collected data on (1) water, sanitation and hygiene; (2) immunization and child health; (3) nutrition; (4) malaria; (5) maternal health; and (6) family planning which resulted in the tabulation of twenty-six indicators for each county. The presence of children of a specific age group in the household directed the use of the survey instrument that collected information on certain indicators. The age groups, indicators and corresponding health domains are presented below.

Table 8 LQAS Survey Indicators and Definitions

Category 1—Indicators Based on Children Aged 0–23 Months.	
Child Nutrition	Mothers of children 0–23 months who initiated breastfeeding immediately after delivery
Malaria	Mother received second dose of IPT during last pregnancy
Maternal Health	Mothers of children 0–23 months attending at least four ANC visits during last pregnancy
	Mothers of children 0–23 months attending the first ANC visit during the first trimester of last pregnancy
	Mothers of children 0–23 months whose births were attended by SBA
	Mothers receiving adequate iron and folic acid tablets during last pregnancy
	Mothers receiving two TT or booster during last pregnancy
	Mothers receiving Vitamin A within eight weeks after delivery
Category 2—Indicators Based on Children Aged 0–5 Months	
Child Nutrition	Children 0–5 months who were exclusively breastfed during the last 24 hours
Immunization and Child Health	Mothers of children 0–59 months who can produce a child health card
Water, Hygiene and Sanitation	Mothers of children 0–59 months who washed their hands with soap at least two times in last 24 hours
Category 3—Indicators Based on Children Aged 6–23 Months	
Child Nutrition	Children 6–23 months fed age-appropriate food during the last 24 hours
Category 4—Indicators Based on Children Aged 12–23 Months	
Immunization and Child Health	Children 12–23 months fully immunized before 12 months
	Children 12–23 months receiving DPT3/Pentavalent-3 vaccination before 12 months

Category 5—Indicators Based on Children Aged 0–59 Months	
Child Nutrition	Children 6–59 months who received Vitamin A supplementation within last 6 months
Family Planning	Women 15–49 not using a modern method but would like to be
	Women 15–49 using a modern method of FP
Malaria	Children 0–59 months living in a households with at least one LLIN
	Children 0–59 months who slept under an LLIN the previous night
	Children 0–59 months with a febrile episode who received ACT treatment within 24 hours
Treatment of Childhood Disease	Children 0–59 months with a febrile episode taken to an appropriate health care provider
	Children 0–59 months with cough and fast and/or difficult breathing taken to an appropriate health care provider
	Children 0–59 months with cough and/or difficult breathing receiving antibiotics from appropriate health care provider
Water, Hygiene and Sanitation	Children 0–59 months living in households with access to improved sanitation
	Children 0–59 months who live in a households with soap for hand washing
	Children 0–59 months with diarrhea who received oral rehydration solution and zinc

Section 9 County and Lot Results

The findings of the 2011 LQAS Surveys are presented in this chapter in the order they were presented in the previous chapter. Two important types of information are reported for each indicator: (1) the county-level estimate or "Coverage" and (2) results on whether the lots within a countymet or exceeded targets.

For the analysis of these indicators pre-existing targets were not used. Targets were calculated based upon the average number of correct responses for each lot within a county and then rounded down, which is reflected, along with the corresponding percentage,[21] in the "Decision Rule" column of the reported results. This approach allows each county to have an individual target. Another characteristic of using the county average is that the decision rule may be met by approximately half of its supervision areas, with the remainder not meeting the decision rule. Given the uniformity of lot results produced by this method (i.e., 2 to 3 lots out of 5 will meet the decision rule in most cases) a different way of evaluating lot performance had to be devised, and this analysis is presented in Section 10.

[21] This percentage comes from the LQAS decision rules table.

9.1 CATEGORY 1: INDICATORS BASED ON CHILDREN AGED 0-23 MONTHS.

9.1.1 Mothers of Children 0–23 Months Who Initiated Breastfeeding Immediately After Delivery

Infant and young child feeding (IYCF) guidelines recommend that mothers exclusively breast-feed their babies until 6 months of age as this practice reduces infant morbidity and mortality. IYCF guidelines also recommend supplemental feeding combined with age-appropriate, nourishing foods during the weaning period following 6 months. The message of exclusive breastfeeding infants up to 6 months has gained ground in Liberia over the last 5 years. The 2011 LQAS estimated levels in Nimba, Lofa, Bong and Bomi to be 93, 90, 87 and 77 percent, respectively, which represents a significant increase from the 2007 LDHS data of only 26 percent.

Another breastfeeding indicator shows different results; however, Table 9 presents the survey findings of immediate breastfeeding of the newborn (within 1 hour of delivery). Although this is considered a best practice by health providers, a lower-than-expected percentage of mothers reported engaging in immediate breastfeeding. The lowest percentage was found to be in households surveyed in Bomi province (40 percent), and the greatest was found in Nimba (71 percent). Sixty-seven percent of mothers surveyed in Bong and Lofa reported having engaged in immediate breastfeeding following the delivery of their last child.

Table 9 Mothers of Children 0–23 Months Who Initiated Breastfeeding Immediately After Delivery

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	40 (29–51)	19	7 (50%)	A	10	Yes
				B	10	Yes
				C	6	No
				D	5	No
				E	6	No
Bong	67 (56–78)	19	12 (75%)	A	13	Yes
				B	13	Yes
				C	12	Yes
				D	10	No
				E	14	Yes
Lofa	67 (56–78)	19	13 (80%)	A	14	Yes
				B	10	No
				C	14	Yes
				D	15	Yes
				E	13	Yes
Nimba	71 (61–81)	19	13 (80%)	A	12	No
				B	15	Yes
				C	13	Yes
				D	12	No
				E	13	Yes

9.1.2 Mother Received Second Dose of IPT During Last Pregnancy

The 2009 LMIS reported a baseline estimate for Intermittent Preventive Treatment of malaria in pregnancy, or IPT, of 45 percent, which was exceeded by all counties surveyed. Lofa had the highest coverage of 72 percent, followed by 69 percent in Bomi, 55 percent in Nimba and 53 percent in Bong.

Table 10 Mother Received Second Dose of IPT During Last Pregnancy

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	69 (58–80)	19	12 (75%)	A	13	Yes
				B	12	Yes
				D	14	Yes
				E	10	No
		17	11 (75%)	C	13	Yes
Bong	53 (41–64)	19	11 (70%)	A	10	No
				B	12	Yes
		18	11 (70%)	E	8	No
		17	10 (70%)	C	11	Yes
				D	7	No
Lofa	72 (62–82)	19	14 (85%)	A	13	No
				B	15	Yes
				C	16	Yes
				D	10	No
				E	15	Yes
Nimba	55 (44–66)	19	11 (70%)	A	12	Yes
				B	8	No
				C	15	Yes
				D	6	No
				E	13	Yes

9.1.3 Mothers of Children 0–23 Months Attending At Least Four ANC Visits During Last Pregnancy

Early and regular antenatal care is an important determinant of safe childbirth. It is the only means for medical personnel to identify pregnancies with elevated risk and provide interventions to improve pregnancy outcomes. Mothers of children less than 2 years of age reported a high percentage of at least 4 antenatal care visits during their last pregnancy. Bomi respondents reported the greatest percentage of 77 percent, followed by Lofa (72 percent), Bong (62 percent) and Nimba (59 percent).

Table 11 Mothers of Children 0–23 Months Attending at Least Four ANC Visits During Last Pregnancy

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	77 (66–87)	19	16 (95%)	A	15	No
				C	14	No
				D	15	No
				E	18	Yes
		18	16 (95%)	B	13	No
Bong	62 (51–73)	19	11 (70%)	B	14	Yes
				C	11	Yes
				D	10	No
				E	9	No
		18	11 (70%)	A	12	Yes
Lofa	72 (62–82)	19	13 (80%)	A	15	Yes
				B	14	Yes
				C	12	No
				E	12	No
		18	12 (80%)	D	12	Yes
Nimba	59 (48–71)	19	11 (70%)	A	10	No
				E	12	Yes
		18	11 (70%)	B	11	Yes
				D	9	No
		17	10 (70%)	C	11	Yes

9.1.4 Mothers of Children 0–23 Months Attending the First ANC Visit During the First Trimester of Last Pregnancy

Despite the high percentage of women attending 4 ANC visits, many mothers in Liberia do not access ANC services during the first trimester of their pregnancy. A high of 69 percent of mothers in Bomi utilized ANC services, while the lowest utilization of ANC services was in Lofa, at 48 percent. When these results are reviewed against the indicator of 4 ANC visits (presented above), there appears to be a delay among pregnant women past their first trimester in accessing ANC services and no apparent association between the two indicators (e.g., a women who has had 4 antenatal visits is not more likely to have had her first visit during her first trimester).[22]

Table 12 Mothers of Children 0–23 Months Attending the First ANC Visit During the First Trimester of Last Pregnancy

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	69 (57–80)	19	14 (85%)	A	13	No
				C	11	No
				D	16	Yes
				E	17	Yes
		18	13 (85%)	B	13	Yes
Bong	59 (47–70)	19	12 (75%)	A	10	No
				B	12	Yes
				C	16	Yes
				D	8	No
				E	13	Yes
Lofa	48 (37–60)	19	9 (60%)	A	10	Yes
				B	8	No
				C	11	Yes
				D	12	Yes
				E	5	No
Nimba	67 (56–78)	19	13 (80%)	A	13	Yes
				B	11	No
				C	15	Yes
				D	15	Yes
				E	12	No

[22] A chi-square (p-value=0.475) test was performed on the women's indicator values of to verify this.

9.1.5 Mothers of Children 0–23 Months Whose Births Were Attended by SBA

In Liberia a large proportion of births take place outside of a medical facility and without a skilled birth attendant (SBA) being present. Of the women surveyed for the 2007 LDHS, 46 percent reported a skilled provider was present at their last birth. Four years later, the results from the LQAS indicated a high of 70 percent (Lofa) of births taking place in the presence of an SBA and a low estimate at 56 percent (Bomi).

Table 13 Mothers of Children 0–23 Months Whose Births Were Attended by SBA

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	56 (45–67)	19	10 (65%)	A	7	No
				B	8	No
				C	14	Yes
				D	10	Yes
				E	11	Yes
Bong	6 (55–76)	19	13 (80%)	A	13	Yes
				B	13	Yes
				C	17	Yes
				D	9	No
				E	12	No
Lofa	70 (60–80)	19	13 (80%)	A	14	Yes
				B	11	No
				C	16	Yes
				E	11	No
		18	12 (80%)	D	16	Yes
Nimba	65 (54–76)	19	12 (75%)	A	12	Yes
				B	13	Yes
				C	14	Yes
				D	11	No
				E	9	No

9.1.6 Mothers Receiving Adequate Iron and Folic Acid Tablets During Last Pregnancy

Iron and folic acid supplements reduce the risk of anemia during pregnancy and birth defects. The percentage of mothers receiving the supplements varied greatly between the four counties. The greatest percentage of mothers reported having had the iron and folic acid was in Bomi at 71 percent, and the lowest was reported in Nimba at 20 percent. Slightly over half of the respondents in Bong and Lofa counties reported receiving supplements.

Table 14 Mothers Receiving Adequate Iron and Folic Acid Tablets During Last Pregnancy

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	71 (60–82)	19	14 (85%)	B	13	No
				C	12	No
				E	16	Yes
		18	13 (85%)	D	13	Yes
		17	13 (85%)	A	15	Yes
Bong	56 (45–68)	19	11 (70%)	C	12	Yes
				E	9	No
		18	11 (70%)	A	10	No
				B	13	Yes
		17	10 (70%)	D	7	No
Lofa	55 (43–66)	19	11 (70%)	B	9	No
				C	14	Yes
				E	9	No
		18	11 (70%)	A	12	Yes
				D	8	No
Nimba	20 (11–29)	19	5 (40%)	C	5	Yes
				D	5	Yes
				E	4	No
		18	5(40%)	A	5	Yes
				B	2	No

9.1.7 Mothers Receiving Two TT or Booster During Last Pregnancy

Tetanus toxoid vaccines for women reduces the risk of neonatal tetanus. The survey explored whether mothers had received either two TT vaccinations or a single tetanus booster injection during the last pregnancy. Coverage ranged from a high of 86 percent in Lofa to a low of 51 percent in Bong. Bomi and Nimba counties had 77 and 71 percent coverage, respectively.

Table 15 Mothers Receiving Two TT or Booster During Last Pregnancy

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	77 (67–87)	19	15 (90%)	E	15	Yes
		18	14 (90%)	C	15	Yes
		17	14 (90%)	B	11	No
		16	13 (90%)	A	13	Yes
				D	12	No
Bong	51 (39–64)	17	8 (60%)	B	7	No
				D	8	Yes
		16	8 (60%)	A	9	Yes
		15	7 (60%)	E	8	Yes
		14	7 (60%)	C	10	Yes
Lofa	86 (78–95)	18	16 (95%)	A	16	Yes
				C	16	Yes
		17	15 (95%)	B	15	Yes
		16	14 (95%)	E	16	Yes
		15	13 (95%)	D	10	No
Nimba	71 (59–82)	18	14 (90%)	C	14	Yes
		16	13 (90%)	A	10	No
		15	12 (90%)	B	10	No
				E	12	Yes
		14	11 (90%)	D	10	No

9.1.8 Mothers Receiving Vitamin A Within Eight Weeks After Delivery

Adequate nutrition has healthy consequences for mothers, as well as their children. Vitamin A supplements are one method of ensuring both mothers and breastfeeding children receive sufficient amounts of the micronutrient. Mothers were asked if they had received Vitamin A within eight weeks after the delivery of their last child and shown a picture of the supplement. Coverage was highest in Lofa at 78 percent, followed by Bomi (75 percent), and Nimba (74 percent). Bong had the lowest coverage at 63 percent.

Table 16 Mothers Receiving Vitamin A Within Eight Weeks After Delivery

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	75 (65–85)	19	14 (85%)	A	12	No
				B	13	No
				C	16	Yes
				E	15	Yes
		18	13 (85%)	D	13	Yes
Bong	63 (52–73)	19	12 (75%)	A	14	Yes
				B	13	Yes
				C	13	Yes
				E	9	No
		18	11 (75%)	D	8	No
Lofa	78 (68–87)	19	14 (85%)	A	16	Yes
				B	15	Yes
				C	13	No
				D	15	Yes
				E	12	No
Nimba	74 (63–84)	19	14 (85%)	A	14	Yes
				B	14	Yes
				C	16	Yes
				D	11	No
				E	13	No

9.2 CATEGORY 2: INDICATORS BASED ON CHILDREN AGED 0–5 MONTHS

9.2.1 Children 0–5 Months Who Were Exclusively Breastfed During the Last 24 Hours

Exclusive breastfeeding is recommended for all children less than 6 months of age (see further discussion in 9.1.1). Mothers with children between 0 to 5 months of age were asked if they had exclusively breastfed their children in the previous 24 hours. Table 17 shows that 93 percent of respondents' exclusively breastfed their 0 to 5 month babies in Nimba, followed by 90 percent in Lofa, 87 percent in Bong and 77 percent in Bomi.

Table 17

Children 0–5 Months Who Were Exclusively Breastfed During the Last 24 Hours

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	77 (67–87)	19	15 (90%)	A	15	Yes
				B	17	Yes
				C	12	No
				D	18	Yes
				E	15	Yes
Bong	87 (80–95)	19	16 (95%)	A	17	Yes
				B	16	Yes
				C	16	Yes
				D	15	No
				E	18	Yes
Lofa	90 (83–97)	19	16 (95%)	A	18	Yes
				B	17	Yes
				C	15	No
				D	17	Yes
				E	17	Yes
Nimba	93 (88–99)	19	16 (95%)	A	19	Yes
				B	18	Yes
				C	18	Yes
				D	14	No
				E	18	Yes

9.2.2 Mothers of Children 0–59 Months That Can Produce a Child Health Card

The child health card in Liberia serves as a record of a child's birth data, growth monitoring, health visits and immunizations. The field staff verified whether mothers could produce a physical copy of the card. In Lofa, 97 percent of the mothers interviewed possessed a card for their child, followed by Bomi at 86 percent. In Bong and Nimba 69 percent and 66 percent, respectively, of the mothers interviewed could produce the child health card.

An updated version of the child health card has been put into use in the four counties. However, field staff discovered that the majority of mothers possessed the previous version of the health card. Other problems that the field staff observed included improperly completed cards and omitted immunization dates. Most noteworthy of the omissions was the absence of birth weight information even for children delivered at a facility.

Table 18 Mothers of Children 0–59 Months That Can Produce a Child Health Card

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	86 (77–94)	19	16 (95%)	A	16	Yes
				B	16	Yes
				C	16	Yes
				D	17	Yes
		18	16 (95%)	E	17	Yes
Bong	69 (59–80)	19	13 (80%)	A	13	Yes
				B	14	Yes
				C	15	Yes
				D	9	No
				E	15	Yes
Lofa	97 (93–100)	19	16 (95%)	A	18	Yes
				B	19	Yes
				C	19	Yes
				D	17	Yes
				E	19	Yes
Nimba	66 (56–77)	19	12 (75%)	A	8	No
				B	14	Yes
				C	12	Yes
				D	14	Yes
				E	14	Yes

9.2.3 Mothers of Children 0–59 Months That Washed Their Hands With Soap At Least Two Times In Last 24 Hours

Mothers of children less than 5 years of age were asked which situations they had washed their hands with soap and water in the previous 24 hours. Their responses were ticked off when they matched those from a detailed list on the questionnaire. A correct response indicated the mother had mentioned at least 2 situations in which they had washed their hands with soap. Eighty-two and 80 percent of the respondents from Nimba and Lofa, respectively, reported correct responses. In both Bomi and Bong 69 percent of mothers indicated they had washed their hands in the previous 24 hours.

Table 19 Mothers of Children 0–59 Months That Washed Their Hands With Soap At Least Two Times In Last 24 Hours

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	69 (58–80)	19	13 (80%)	A	15	Yes
				B	12	No
				C	13	Yes
				D	12	No
				E	14	Yes
Bong	69 (59–80)	19	13 (80%)	A	13	Yes
				B	13	Yes
				C	15	Yes
				D	12	No
				E	14	Yes
Lofa	80 (71–88)	19	15 (90%)	A	13	No
				B	17	Yes
				C	13	No
				D	16	Yes
				E	15	Yes
Nimba	82 (74–89)	19	15 (90%)	A	12	No
				B	18	Yes
				C	13	No
				D	16	Yes
				E	16	Yes

9.3 CATEGORY 3: INDICATORS BASED ON CHILDREN AGED 6–23 MONTHS

9.3.1 Children 6–23 Months Fed Age-Appropriate Food During the Last 24 Hours

Mothers of children 6–23 months of age were asked what foods they had fed their children in the previous 24 hours and their responses were ticked off from a detailed list of nutritious foods on the questionnaire. Any food from the list that was mentioned was considered a correct response. In Lofa, which was the highest, 74 percent of the respondents' children received age appropriate food. In both Bong and Nimba, 66 percent of respondents' children received appropriate food. In Bomi, the lowest, 54 percent of the children of mothers interviewed received appropriate food during the previous 24 hours.

Table 20 Children 6–23 Months Fed Age-Appropriate Food During the Last 24 Hours

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	54 (43–66)	19	11 (70%)	A	12	Yes
				B	9	No
				C	9	No
				D	14	Yes
				E	13	Yes
Bong	66 (56–76)	19	12 (75%)	A	15	Yes
				B	9	No
				C	13	Yes
				D	13	Yes
				E	12	Yes
Lofa	74 (64–83)	19	14 (85%)	A	14	Yes
				B	15	Yes
				C	12	No
				D	13	No
				E	14	Yes
Nimba	66 (55–77)	19	13 (80%)	A	12	No
				B	10	No
				D	15	Yes
				E	16	Yes
		18	12 (80%)	C	14	Yes

9.4 CATEGORY 4: INDICATORS BASED ON CHILDREN AGED 12–23 MONTHS

9.4.1 Children 12–23 Months Fully Immunized Before 12 Months

Mothers of children 12 to 23 months were asked if their child had received all immunizations before the 1st birthday. These immunizations included BCG, Pentavalent 3, measles, polio, and yellow fever. Though most immunizations were reported on the child's health card, verbal verification of immunization by the mother was counted as a correct response. High rates of coverage were observed in Lofa, Bomi and Nimba, ranging from 86 to 91 percent. Bong County, at 56 percent, had the lowest coverage.

Table 21 Children 12–23 Months Fully Immunized Before 12 Months

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	90 (84–95)	19	16 (95%)	A	16	Yes
				B	15	No
				C	19	Yes
				D	17	Yes
				E	16	Yes
Bong	56 (45–68)	19	12 (75%)	A	13	Yes
				B	10	No
				C	12	Yes
		17	11 (75%)	E	8	No
		16	10 (75%)	D	6	No
Lofa	91 (86–97)	19	15 (90%)	C	15	Yes
		18	14 (90%)	D	15	Yes
				E	16	Yes
		17	14 (90%)	B	16	Yes
		16	13 (90%)	A	16	Yes
Nimba	86 (78–94)	19	16 (95%)	B	17	Yes
				E	14	No
		18	16 (95%)	A	16	Yes
				D	16	Yes
		16	14 (95%)	C	13	No

9.4.2 Children 12–23 Months Receiving DPT3/Pentavalent-3 vVaccination Before 12 Months

Mothers of children12 to 23 months were also asked whether their child had received specific immunizations such as DPT3/Pentavalent 3. Coverage was estimated to be high in Bomi, Lofa and Nimba, ranging from 86 to 93 percent. The lowest coverage of 64 percent was observed in Bong County.

Table 22 Children 12–23 Months Receiving DPT3/Pentavalent-3 vVaccination Before 12 Months

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	93 (87–99)	19	16 (95%)	A	18	Yes
				B	16	Yes
				C	18	Yes
				D	19	Yes
				E	19	Yes
Bong	64 (53–76)	19	13 (80%)	A	13	Yes
				C	13	Yes
		18	12 (80%)	B	11	No
		17	12 (80%)	E	10	No
		16	11 (80%)	D	10	No
Lofa	90 (84–96)	19	12 (75%)	C	12	Yes
		18	11 (75%)	A	17	Yes
				B	17	Yes
				D	16	Yes
				E	17	Yes
Nimba	86 (77–95)	19	15 (90%)	B	15	Yes
				E	15	Yes
		18	14 (90%)	A	17	Yes
		17	14 (90%)	C	16	Yes
		16	13 (90%)	D	15	Yes

9.5 CATEGORY 5: INDICATORS BASED ON CHILDREN AGED 0–59 MONTHS

9.5.1 Children 6–59 Months Who Received Vitamin A Supplementation Within Last 6 Months

There is a direct link between Vitamin A deficiency and child mortality and morbidity, and in a national effort to reduce U5M and morbidity in Liberia, the MOHSW makes Vitamin A available through several different channels including health facilities and retail outlets. Women of children under 5 were asked if their child had received Vitamin A supplements within the last 6 months. The highest percentage was found in Lofa County, with nearly complete coverage at 97 percent. This was followed by Bomi and Nimba with 80 and 73 percent coverage, respectively. Bong County had the lowest coverage at 67 percent.

Table 23 Children 6–59 Months Who Received Vitamin A Supplementation Within Last 6 Months

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	80 (70–89)	19	15 (90%)	A	13	No
				B	16	Yes
				C	15	Yes
				D	17	Yes
		18	14 (90%)	E	15	Yes
Bong	67 (56–79)	18	12 (80%)	A	13	Yes
				C	11	No
				E	11	No
		17	12 (80%)	B	12	Yes
		15	10 (80%)	D	9	No
Lofa	97 (94–100)	19	16 (95%)	A	19	Yes
				B	19	Yes
				C	16	Yes
				D	17	Yes
				E	19	Yes
Nimba	73 (63–84)	19	14 (85%)	A	11	No
				B	13	No
				C	16	Yes
				D	17	Yes
				E	14	Yes

9.5.2 Women 15–49 Using a Modern Method of Family Planning

The 2007 LDHS estimated the use of modern contraceptives in Liberia to be 11.7 percent (7.1 in rural areas), and the 2011 LQAS also showed similarly low levels of contraceptive use among women 15–49 years of age with children under 5. The highest estimates were from Bomi and Lofa Counties, at 18 and 14 percent, respectively. This was followed by Bong at 10 percent. Nimba had the lowest level of coverage at less than 1 percent. Because of the low family planning coverage in Nimba (< 10 percent) it was not possible to determine a decision rule.

Table 24 Women 15–49 Using a Modern Method of Family Planning

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	18 (8–27)	19	3 (30%)	A	3	Yes
				B	2	No
				C	4	Yes
				D	3	Yes
		18	2 (30%)	E	5	Yes
Bong	10 (4–17)	19	2 (25%)	A	1	No
				B	3	Yes
				C	5	Yes
				D	1	No
				E	2	Yes
Lofa	14 (6–21)	19	2 (25%)	A	4	Yes
				B	1	No
				C	2	Yes
				E	2	Yes
		17	2 (25%)	D	4	Yes
Nimba	1 (0–2)	19	*	A	0	NA
				B	0	NA
				C	0	NA
				D	0	NA
				E	1	NA

**Not estimable because level is less than 10 percent*

9.5.3 Women 15–49 Not Using a Modern Method of Family Planning, But Would Like To Be

Though women's use of modern family planning methods is low in Liberia, there is a large percentage of non-users of reproductive age who desire to use a modern method. The two highest estimates of unmet desire for modern family planning were in Bomi and Bong at 85 and 83 percent, respectively. Lofa and Nimba were lower at 71 and 64 percent, respectively.

Table 25 Women 15–49 Not Using a Modern Method of Family Planning, But Would Like To Be

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	85 (77–94)	17	14 (90%)	B	14	Yes
		16	13 (90%)	A	12	No
				D	12	No
		15	12 (90%)	C	14	Yes
		14	11 (90%)	E	13	Yes
Bong	83 (74–92)	18	14 (90%)	A	15	Yes
				D	13	No
		16	13 (90%)	B	14	Yes
				E	14	Yes
		14	11 (90%)	C	12	Yes
Lofa	71–(59–82)	18	12 (80%)	B	12	Yes
		17	12 (80%)	C	12	Yes
				E	14	Yes
		15	10 (80%)	A	11	Yes
				D	10	Yes
Nimba	64 (53–76)	19	13 (80%)	A	11	No
				B	12	No
				C	13	Yes
				D	14	Yes
		18	12 (80%)	E	11	No

9.5.4 Children 0–59 Months Living In a Household With At Least One LLIN

Women with children under 5 were asked if there was at least one Long-Lasting Insecticide Treated Bed Net (LLIN) being used in their household. The presence of the net, being properly installed and in good condition, was verified by physical inspection by the survey team. Lofa had the highest estimated LLIN coverage at 58 percent, followed by Nimba at 56 percent and Bomi at 51 percent. The lowest estimated coverage was 45 percent in Bong County.

Table 26 Children 0–59 Months Living In a Household With At Least One LLIN

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	51 (40–62)	19	8 (55%)	A	7	No
				B	7	No
				C	14	Yes
				D	8	Yes
				E	5	No
Bong	45 (35–56)	19	9 (60%)	A	5	No
				B	9	Yes
				C	8	No
				D	11	Yes
				E	13	Yes
Lofa	58 (47–69)	19	11 (70%)	A	12	Yes
				B	8	No
				C	8	No
				D	15	Yes
				E	14	Yes
Nimba	56 (45–68)	19	12 (75%)	A	12	Yes
				B	8	No
				C	13	Yes
				D	11	No
				E	14	Yes

9.5.5 Children 0–59 Months Who Slept Under an LLIN the Previous Night

After determining whether the household had a owned an LLIN, the interviewer asked the respondent if her child had slept under the LLIN the previous night. Coverage estimates ranged from 15 to 28 percent, with Nimba having the highest and Bong, the lowest.

Table 27 Children 0–59 Months Who Slept Under an LLIN the Previous Night

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	21 (11–30)	19	3 (30%)	A	3	Yes
				B	2	No
				C	6	Yes
				D	4	Yes
				E	2	No
Bong	15 (8–23)	19	3 (30%)	A	1	No
				B	3	Yes
				C	1	No
				D	4	Yes
				E	6	Yes
Lofa	21 (12–30)	19	4 (35%)	A	4	Yes
				B	3	No
				C	4	Yes
				D	3	No
				E	8	Yes
Nimba	28 (18–38)	19	7 (50%)	A	6	No
				B	5	No
				D	7	Yes
				E	8	Yes
		18	7 (50%)	C	3	No

9.5.6 Children 0–59 Months With a Febrile Episode Taken To an Appropriate Health Care Provider

Malaria is a leading cause of death among children under 5 in Sub-Saharan Africa. Due to the rapid onset of the disease, it is important that caregivers take children with a fever to a health provider immediately for diagnosis and treatment. Mothers of children under 5 were asked if their child had suffered a fever in the previous two weeks. Of those mothers whose child had had a fever, they were asked if the child had been taken to an appropriate health provider within the first 24 hours of their symptoms. Appropriate health care providers included doctors, nurses, physician assistants, and general community health volunteers (gCHVs). Coverage ranged from a low of 76 percent in Nimba to high of 94 percent in Lofa.

Table 28 Children 0–59 Months With a Febrile Episode Taken To an Appropriate Health Care Provider

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	82 (73–91)	19	16 (95%)	A	17	Yes
				B	16	Yes
				C	15	No
				D	17	Yes
		18	16 (95%)	E	12	No
Bong	81 (72–90)	19	16 (95%)	B	17	Yes
				C	16	Yes
				D	13	No
				E	18	Yes
		18	16 (95%)	A	13	No
Lofa	94 (89–99)	19	16 (95%)	A	19	Yes
				C	16	Yes
				D	16	Yes
				E	19	Yes
		18	16 (95%)	B	17	Yes
Nimba	76 (66–86)	19	15 (90%)	A	13	No
				B	14	No
				C	15	Yes
				E	16	Yes
		18	14 (90%)	D	15	Yes

9.5.7 Children 0–59 Months With a Febrile Episode Who Received ACT Treatment Within 24 Hours

If a child had experienced a fever the mother was asked if the child had received artemisinin combination therapy (ACT). Of children who had experienced a fever in Lofa, 52 percent received ACT. In Nimba and Bomi, 31 and 22 percent of children with a fever were treated within the first 24 hours of their symptoms. Bong County had the lowest estimates at 2 percent. It was not possible to set targets based upon a decision rule for Bong because fewer than 10 percent of children with a fever were treated with ACT. It should be noted that this indicator differs from other surveys in that the denominator used in the calculation is not based upon children who had medically diagnosed cases of malaria. Rather, the denominator is based upon children who experienced a febrile episode.

Table 29 Children 0–59 Months With a Febrile Episode Who Received ACT Treatment Within 24 Hours

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	22 (12–32)	19	4 (35%)	A	5	Yes
				B	3	No
				C	5	Yes
				D	3	No
				E	3	No
Bong	2 (0–5)	19	*	A	0	NA
				B	0	NA
				C	0	NA
				D	0	NA
				E	2	NA
Lofa	52 (41–63)	19	10 (65%)	A	12	Yes
				B	8	No
				C	11	Yes
				D	8	No
				E	12	Yes
Nimba	31 (20–42)	19	6 (45%)	A	5	No
				B	8	Yes
				C	3	No
				D	3	No
				E	9	Yes

**Not estimable because level is less than 10 percent*

9.5.8 Children 0–59 Months With Cough and Fast and/or Difficult Breathing Taken To an Appropriate Health Care Provider

Acute respiratory infection (ARI) is another leading cause of death and morbidity among children under 5 in Liberia. Caregivers are advised to take children suffering from respiratory distress to a health provider immediately for diagnosis and treatment. Mothers of children under 5 were asked if their child had experienced cough or difficulty in breathing in the previous two weeks, and if so, what course of action was taken. Of children with difficulty breathing, 87 percent in Lofa, 80 percent in Bomi, 79 percent in Nimba and 68 percent in Bong were taken to an appropriate health care provider within the first 24 hours of their symptoms.

Table 30 Children 0–59 Months With Cough and Fast and/or Difficult Breathing Taken To an Appropriate Health Care Provider

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	80 (70–90)	19	16 (95%)	B	15	No
				C	14	No
				D	18	Yes
				E	17	Yes
		18	16 (95%)	A	15	No
Bong	68 (58–79)	19	14 (85%)	A	11	No
				B	13	No
				C	15	Yes
				D	13	No
				E	16	Yes
Lofa	87 (80–94)	19	16 (95%)	A	17	Yes
				D	13	No
				E	17	Yes
		18	16 (95%)	B	17	Yes
		17	15 (95%)	C	15	Yes
Nimba	79 (70–89)	19	16 (95%)	A	14	No
				B	15	No
				D	16	Yes
				E	17	Yes
		17	15 (95%)	C	13	No

9.5.9 Children 0–59 Months With Cough and/or Difficult Breathing Receiving Antibiotics From an Appropriate Health Care Provider

If a child had experienced a cough or difficulty breathing the mother was then asked if the child had received antibiotics. Of children who had experienced respiratory distress, 80 percent were given antibiotics in Lofa, 50 percent in Bomi, 47 percent in Nimba, and 44 percent in Bong. As with all the child disease indicators from the LQAS, the denominator used in the calculation was not based upon children who had medically diagnosed cases of ARI. Rather, the denominator was based upon children who experienced a respiratory distress.

Table 31 Children 0–59 Months With Cough and/or Difficult Breathing Receiving Antibiotics From an Appropriate Health Care Provider

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	50 (38–62)	19	10 (65%)	A	10	Yes
				B	9	No
				C	9	No
				D	10	Yes
				E	11	Yes
Bong	44 (34–55)	19	9 (60%)	A	6	No
				B	9	Yes
				C	12	Yes
				D	6	No
				E	13	Yes
Lofa	80 (72–89)	19	15 (90%)	A	16	Yes
				B	17	Yes
				D	11	No
				E	17	Yes
		18	14 (90%)	C	12	No
Nimba	47 (36–59)	19	10 (65%)	A	11	Yes
				B	8	No
				C	8	No
				D	8	No
				E	13	Yes

9.5.10 Children 0–59 Months Living In Households With Access To Improved Sanitation

The 2011 LQAS defined access to improved sanitation as households with: (1) access to a flush toilet (using either municipal water supply or bucket for rinsing), and (2) covered latrine, VIP latrine or access to a covered community latrine. Estimates ranged from a low of 44 percent in Bong to a high of 80 percent in Lofa.

Table 32 Children 0–59 Months Living In Households With Access To Improved Sanitation

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	50 (38–62)	19	10 (65%)	A	10	Yes
				B	9	No
				C	9	No
				D	10	Yes
				E	11	Yes
Bong	44 (34–55)	19	9 (60%)	A	6	No
				B	9	Yes
				C	12	Yes
				D	6	No
				E	13	Yes
Lofa	80 (72–89)	19	15 (90%)	A	16	Yes
				B	17	Yes
				D	11	No
				E	17	Yes
		18	14 (90%)	C	12	No
Nimba	47 (36–59)	19	10 (65%)	A	11	Yes
				B	8	No
				C	8	No
				D	8	No
				E	13	Yes

9.5.11 Children 0–59 Months Who Live In a Household With Soap For Hand Washing

Women of children under 5 were asked if there was soap available in the household for hand washing, which was then verified by the survey team. Over 80 percent of the households surveyed had soap for hand washing, ranging from 81 percent in Bong to 95 percent in Nimba.

Table 33 Children 0–59 Months Who Live In a Household With Soap For Hand Washing

County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	88 (81–96)	19	16 (95%)	A	16	Yes
				B	16	Yes
				E	15	No
		18	16 (95%)	C	17	Yes
				D	17	Yes
Bong	81 (72–90)	19	15 (90%)	A	16	Yes
				B	13	No
				D	14	No
				E	18	Yes
		18	14 (90%)	C	16	Yes
Lofa	82 74–90)	19	15 (90%)	A	14	No
				B	17	Yes
				C	13	No
				D	17	Yes
				E	15	Yes
Nimba	95 (91–99)	19	16 (95%)	A	17	Yes
				B	19	Yes
				C	17	Yes
				D	18	Yes
				E	19	Yes

9.5.12 Children 0–59 Months With Diarrhea Who Received Oral Rehydration Solution and Zinc

Another leading health concern for children under 5 in Liberia are diarrheal diseases. A commercial preparation of Oral Rehydration Solution (ORS) is considered a first-line treatment of dehydration resulting from diarrheal fluid loss. Mothers of children who had experienced a diarrheal episode in the previous 2 weeks were asked if they had treated their children with the commercial preparation of ORS containing zinc. Of those who answered affirmatively, 60 percent in Bomi, 53 percent in Lofa, 34 percent in Nimba, and 30 percent in Bong reported having used ORS to treat the child's diarrhea.

Table 34 Children 0–59 Months With Diarrhea Who Received Oral Rehydration Solution and Zinc

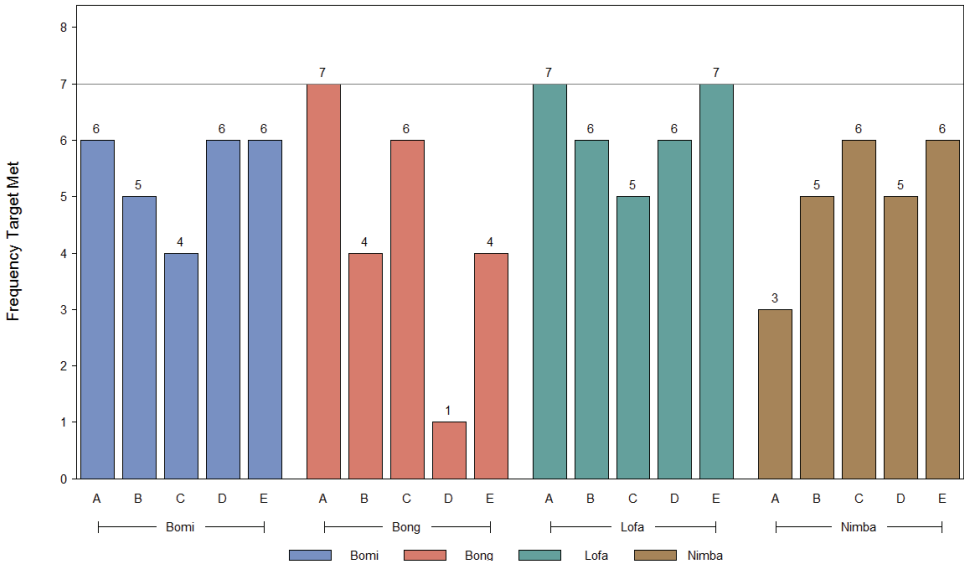
County	Coverage (CI) %	Sample Size	Decision Rule	Lot	Correct Responses	Meets Decision Rule?
Bomi	60 (48–71)	19	11 (70%)	A	11	Yes
				B	13	Yes
				C	11	Yes
				D	7	No
				E	13	Yes
Bong	30 (20–41)	19	6 (45%)	A	4	No
				B	7	Yes
				C	6	Yes
				D	5	No
				E	8	Yes
Lofa	53 (43–64)	19	10 (65%)	A	15	Yes
				B	7	No
				C	10	Yes
				D	8	No
				E	11	Yes
Nimba	34 (23–45)	19	7 (50%)	A	4	No
				B	7	Yes
				C	5	No
				D	7	Yes
				E	11	Yes

Section 10 Lot-Level Results by Indicator Domain

Scores of performance were calculated from lot results. These were based upon whether a lot within a county had an acceptable number of correct answers which met or exceeded the county average for that indicator. If the indicator for the lot was scored "acceptable" it was given a value of "1." "Not acceptable" results were given a value of "0". The final score was the sum of these results. The scores were a composite of health outcome indicators from the 6 different program areas: (1) water, sanitation and hygiene; (2) immunization and child health; (3) child nutrition; (4) malaria; (5) maternal health; and (6) family planning.

A perfect lot score, as denoted by the horizontal line in Figure 4, for child health and nutrition was 7. Observed scores ranged from 1 to 7. The lowest was from Lot D in Bong County, followed by Lot A in Nimba County. Perfect scores were observed in Lot A, Bong county and Lots A and E in Lofa County. Bong County had the lowest average score (4.4) and Lofa County had the highest (6.2).

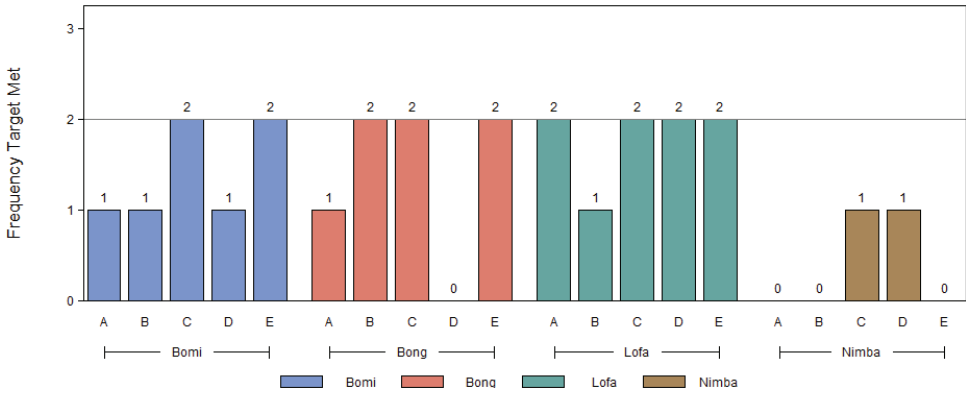
Figure 4 **Child Health and Nutrition Scores by Supervision Area**



A perfect score (all targets met) is denoted by a horizontal line. A perfect score for an individual supervision area would be 7
County averages were used to set targets

As there were only 2 indicators for family planning, a perfect score was 2 (Figure 5). FP scores for lots ranged from 0 to 2. The lowest scores of 0 were found in Nimba Lots A, B and E, and Bong Lot D. Perfect scores were found in Bomi (Lots C and E), Bong (Lots B and C) and Lofa (Lots A, C, D and E). The highest score was found in Lofa (1.8) and the lowest was found in Nimba (0.4).

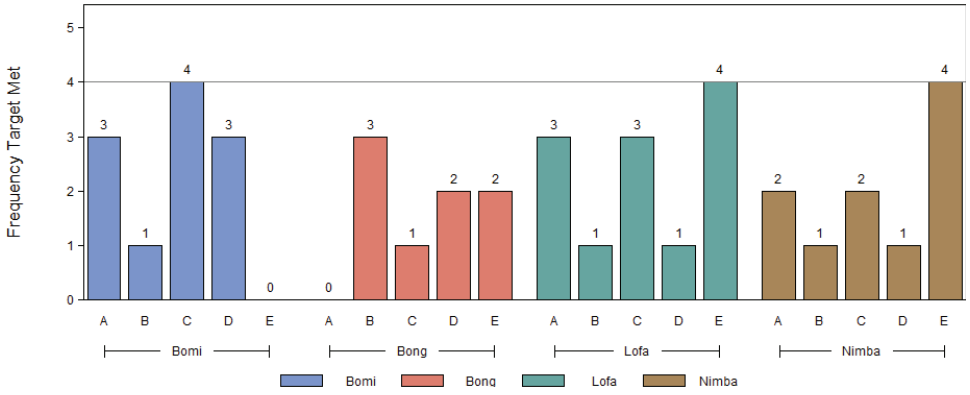
Figure 5 **Family Planning Scores by Supervision Area**



A perfect score (all targets met) is denoted by a horizontal line. A perfect score for an individual supervision area would be 2
County averages were used to set targets

The maximum possible score for malaria was 4 (Figure 6). The lowest scores of 0 were observed in Lot E, Bomi County and lot A, Bong County. Perfect scores were observed in Lot C, Bomi County; Lot E, Lofa County and Lot E, Nimba County. Lofa County had the highest average malaria score at 2.4, while Nimba had the lowest average malaria score at 0.4.

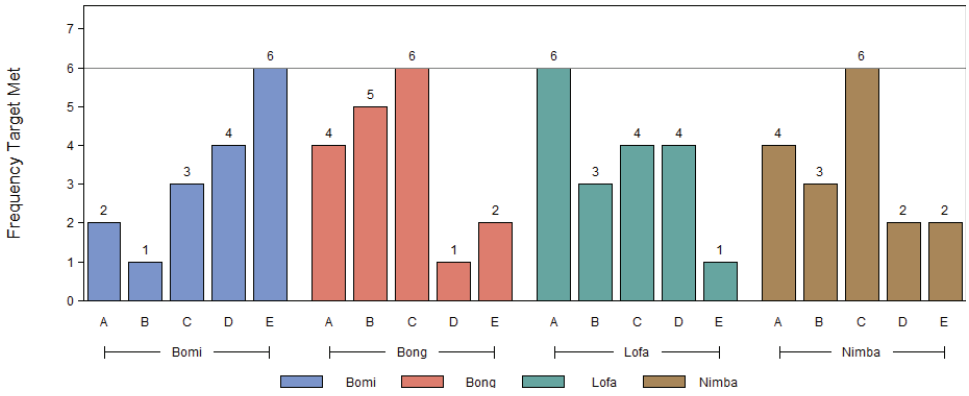
Figure 6 **Malaria Scores by Supervision Area**



A perfect score (all targets met) is denoted by a horizontal line. A perfect score for an individual supervision area would be 4
County averages were used to set targets

A perfect maternal health score was 6, as denoted by the horizontal line in Figure 7. All lots had a score of at least 1. The lowest lot-level scores were observed in Lot B, Bomi; Lot D, Bong and Lot E, Lofa. Each county had 1 lot with a perfect score: Lot E, Bomi; Lot C, Bong; Lot A, Lofa and Lot C, Nimba. Average maternal health scores for each county ranged from 3.2 in Bomi to 3.6 in Bong and Lofa.

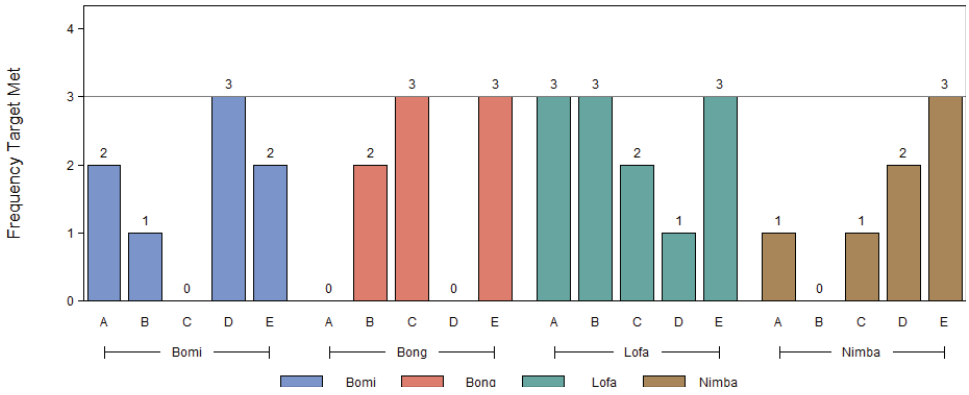
Figure 7 **Maternal Health Scores by Supervision Area**



A perfect score (all targets met) is denoted by a horizontal line. A perfect score for an individual supervision area would be 6
County averages were used to set targets

A perfect score for the treatment of childhood diseases was 3. The lowest scores of 0 were observed in Bomi (Lot C), Bong (Lots A and D) and Nimba (Lot B). Perfect treatment of childhood disease scores were observed in all counties, with a higher number of perfect scores among lots observed in Bong (2 out of 5 lots) and Lofa (3 out of 5 lots). The highest average score was from Lofa (2.4) and the lowest average score was from Nimba (1.4).

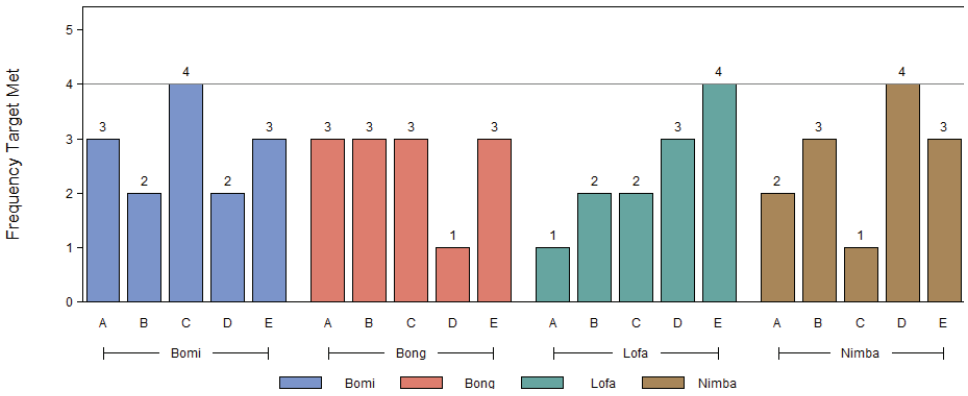
Figure 8 **Treatment of Childhood Disease Scores by Supervision Area**



A perfect score (all targets met) is denoted by a horizontal line. A perfect score for an individual supervision area would be 3
County averages were used to set targets

The highest possible score from the water, sanitation and hygiene indicators was 4. All survey lots had at least a score of 1. The lowest scores were observed in Lot D, Bong; Lot A, Lofa and Lot C, Nimba. Perfect scores were observed in Lot C, Bomi; Lot E, Lofa and Lot D, Nimba. The highest average score was 2.8 (Bomi) and the lowest was 2.4 (Lofa).

Figure 8 **Water, Sanitation and Hygiene Scores by Supervision Area**



A perfect score (all targets met) is denoted by a horizontal line. A perfect score for an individual supervision area would be 4
County averages were used to set targets

Section 11 National and County Meetings

The value of LQAS is its usefulness at the local level for decision making. MEASURE Evaluation decided that along with the national dissemination, county level dissemination meeting would also be held so that county level stakeholders could engage with the data and, where appropriate, initiate processes to review existing programs in light of the findings. Thirty-five key stakeholders participated in the national dissemination meeting on June 23, 2011 in Monrovia, and 72 participants mostly from the CHSWTs participated in county dissemination meetings in Bomi, Nimba, Lofa, and Bong on June 24, 27, 28, and 29. The following outlines some of the response and reflections of participants during the meetings.

11.1 MATERNAL HEALTH: WOMEN REPORTING FOUR OR MORE ANC VISITS

» The reported finding of women making at least 4 antenatal clinic (ANC) visits during their last pregnancy was seen as unexpectedly high. Participants noted at the national dissemination that it might be helpful to know the reasons for these visitations. For example, was the woman sick or did she just come for regular screening? Participants suggested that the next iteration of the study should confirm ANC visitations and services received through review of health cards of pregnant women.

» Participants in Bomi County acknowledged the work done to encourage mothers to return for ANC visits (77 percent reported at least 4 visits during their last pregnancy). Currently, pregnant women on their first visit get a 'baby kit' and receive follow-up and outreach; meeting participants suggested a voucher system to promote even greater numbers of women attending at least 4 ANC visits.

» In discussing the results for mothers of children 0–23 months attending at least 4 ANC visits during their last pregnancy (59 percent), participants in Nimba County noted that interviewers should have been alerted to differentiate between visits reported by expectant mothers to a health facility and to a trained traditional midwife (TTM) (or an older female relation) to have her 'belly checked.' A common practice is for women to go to a clinic to confirm her pregnancy but then have her pregnancy monitored by non-health workers.

» Participants in Lofa County accepted as reasonable the reported finding that 72 percent of women made at least four ANC visits during their last pregnancy. They alluded to the county's efforts to train TTMs in recognizing conditions for which pregnant women should be taken to a health facility.

» Participants in Bong County noted that the estimate for first ANC visits (59 percent) is surprisingly lower than the minimum four ANC visits indicators (62 percent). They also added that mothers tend to schedule these visits but do not always follow through due to lack of travel fare or choice in using a local TTMs. They noted that traditional midwives who have received formal training usually accompany expectant mothers to ANC visits, learn of the danger signs associated with their pregnancies, and provide follow-up care to these women in their community.

11.2 WATER SANITATION AND HYGIENE: ACCESS TO IMPROVED SANITATION

» Access to improved sanitation continues to be a serious problem in Bomi County (31 percent). The participants thought that this reported estimate seemed too high, and noted that when communal facilities have been built, community members do not maintain them properly.

» Participants in Lofa County agreed with the reported estimate on access to improved sanitation (4 percent), and noted that many people, even in the capital city of Voinjama, do not have access to communal latrines.

» Participants in Bong County considered the estimates for improved sanitation access (11 percent) and for hand washing with soap at least twice daily (69 percent) too low. They made reference to Oxfam's work in building communal latrines and handwashing stations in the county.

11.3 MALARIA: OWNERSHIP AND USE OF LLIN

» It was noted at the national dissemination that there was divergence with the 2011 LQAS survey and RBHS project performance data concerning the use of LLIN. RBHS recorded LLIN use at 70–80 percent over five quarters of program data, 2010–2011.

» Participants in Bomi County agreed with the 21 percent reported estimate of children under 5 who slept under an LLIN the previous night and suggested that common complaints about the LLINs—such as trapping body heat, unpleasant odor, and skin reaction to its chemical treatment—diminish its use.

» Participants in Bong County acknowledged that the estimate for children under 5 sleeping under a LLIN the previous night (15 percent) was probably accurate. They discussed whether the approach to LLIN distribution itself was flawed, with only one having been given out to each household.[23] They saw value from a study that would more fully explore actual utilization and any socio-cultural barriers.

[23] Its important to note that the National Malaria Control Program guidelines stipulate that 1 LLIN be given to each sleeping space, up to 3 per household (Gwenigale, 2010).

11.4 NUTRITION: IMMEDIATE AND EXCLUSIVE BREASTFEEDING

» Participants noted at the national dissemination meeting the need to do more in the area of breastfeeding within the first hour of birth, given cultural beliefs that devalue colostrum for newborns. Additionally, it was mentioned that it was worth exploring programming in in Bomi County, since it performed better than other counties across most indicators.

» Participants in Bomi County admitted that they expected a higher reporting of exclusive breastfeeding (77 percent) and breastfeeding one hour after delivery (40 percent), because nurses in Bomi County ensure that breastfeeding is begun immediately after delivery.

» Participants in Nimba County thought that the reported practice of breastfeeding immediately after childbirth (71 percent) was rather low since SBAs are trained to promote this, although they acknowledged that there remain some traditional barriers against feeding newborns colostrum.

» Participants in Lofa County noted that the reported level of breastfeeding immediately after childbirth (67 percent) should improve following the current health education campaign.

11.5 FAMILY PLANNING: USE AND DESIRE TO USE MODERN FAMILY PLANNING METHODS

» Participants in Bomi County spoke of cultural and religious barriers to the use of modern family planning methods (18 percent reported as current users), but they suggested that age-related differences might be a factor, as younger women may have no interest in managing their fertility while wishing to start or continue having children. They also noted that only contraceptive pills and injections are currently available in the county, and there is no awareness of other methods.

» Participants in Bong County felt that the reported use of modern family planning methods in their county (10 percent) was too low given the introduction of community-based distribution of contraception, including injectables.

11.6 IMMUNIZATION AND CHILD HEALTH

» Participants in Bong County reasoned that the low percentage of children with DPT3/Pentavalent 3 vaccinations (64 percent), as documented on their health cards, is due to mothers' failure to bring the child's health card when making clinic visits.

» The extremely low reporting of ACT treatment for young children who had had a fever (2 percent) in Bong County elicited explanations of possible stockouts or the belief held by some of the drug's, dizziness-inducing side effect. If the latter were the case, this might have deterred mothers from administering ACT to their children, subsequent to a health facility visit, or from even taking their feverish children to a health provider.

» Stockouts may be responsible for the difference between children under 5 taken to an appropriate health provider for cough and difficulty breathing (79 percent) and those who received antibiotics for that complaint (47 percent) in Nimba County. The participants suggested adding an exploratory question of why children are not receiving antibiotics.

Section 12 Lessons Learned

12.1 INDICATORS

» It was clear that the indicator 'Percent of children age 0–23 months who are Low Birth Weight (< 2500 gms)' did not yield statistically significant results and its removal from the list of indicators for the next round of LQAS is recommended.

» Although the indicator 'Use of modern family planning methods' was not useful for the 2011 LQAS analysis at the lot level due to low prevalence, it was one of the more popular indicators at these national dissemination and county meetings because of county level estimates and because the MOHSW saw the estimate as a baseline measure for a national family planning campaign that was launched shortly after data collection was completed. The next round of data collection for this indicator would provide a good indicator of the effect of that campaign.

» Adding county-specific indicators and USAID crosscutting indicators might be useful in the next round of LQAS to increase ownership of the process by CHSWTs.

12.2 LOTS

It would be very useful to work with CHSWTs, local authorities, and implementing partners at the county level to construct the lots in the next round. The construction of lots during the pilot phase was conceptual for expediency to test the feasibility of the methodology. In the next round, alignment to existing health administration districts or other constructs will be discussed with county level stakeholders.

12.3 TARGETS

For the next round, county specific targets will be discussed with county level stakeholders. Where they exist they will be used as the threshold for the LQAS survey and where they do not exist CHSWTs will be encouraged to develop targets. These targets would be based on 2-year operational plans aligned to the MOHSW's new 2011–2021 National Health and Social Welfare Plan.

References

1. U.S. Department of State. (July 1, 2011). *Background Note: Liberia*. Retrieved from http://www.state.gov/r/pa/ei/bgn/6618.htm.

2. United Nations. *UN Data | Country Profile | Liberia.* Retrieved from http://data.un.org/CountryProfile.aspx?crName=Liberia#Social.

3. UNESCO. *UIS Statistics in Brief: Education (all levels) Profile Liberia*. Retrieved from http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=121&IF_Language=eng&BR_Country=4300&BR_Region=40540.

4. UNICEF. *At a Glance: Liberia*. Retrieved from http://www.unicef.org/infobycountry/liberia_statistics.html.

5. Government of Liberia (GOL).Demographic Health Survey 2007. Ministry of Health and Social Welfare: Monrovia, Liberia.

6. International Monetary Fund. *Poverty Reduction Strategy: Republic of Liberia*. Retrieved from http://www.imf.org/external/pubs/ft/scr/2008/cr08219.pdf.

7. Central Intelligence Agency. The World Factbook: Liberia. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/li.html

8. UNESCO. *UIS Statistics in Brief, Education Profile—Liberia*. Retrieved from http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=121&IF_Language=eng&BR_Country=4300&BR_Region=40540.

9. World Bank. *Data by country—Liberia*. Retrieved from http://data.worldbank.org/country/liberia.

10. Government of Liberia (2010) *The state of food and nutrition security in Liberia.* Ministry of Agriculture: Monrovia, Liberia.

11. Kruk et al. *Availability of essential health services in post-conflict Liberia*. Bulletin of the World Health Organization (2010). Retrieved from http://www.who.int/bulletin/volumes/88/7/09-071068/en/index.html.

12. JSI. *Rebuilding Basic Health Services in Liberia (RBHS) Fact Sheet*. Retrieved from: http://www.jsi.com/JSIInternetProjects/InternetProjectFactSheet.cfm?dblProjDescID=3241.

13. World Health Organization (WHO). *Global health Observatory Data Depository—Liberia*. Retrieved at http://apps.who.int/ghodata/?vid=12300&theme=country.

14. Government of Liberia (GOL). *Malaria Indicator Survey 2009*. Ministry of Health and Social Welfare: Monrovia, Liberia.

15. Government of Liberia (GOL). *National Strategy for Child Survival in Liberia 2008-2011*. Ministry of Health and Social Welfare: Monrovia, Liberia.

16. Cleveland, et al. (2010). Introducing health facility accreditation in Liberia. *Global Public Health*, 6(3): 271–282. Retrieved at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3062234/?tool=pubmed.

17. PATH (2011). *The Health Information Programme: Final Report Submitted to the Norwegian Agency for Development and Cooperation*. Retrieved from: http://healthmetricsnetwork.info/vietnam/lib/exe/fetch.php?media=hisp_final_report_for_norad_20110331.pdf.

18. Gwenigale, W (2010). *Progress in Reaching Universal Coverage of Long Lasting Insecticide Treated Mosquito Net (LLIN) Ownership and Utilization in Liberia by December 31, 2010*. Monrovia, Liberia. Ministry of Health and Social Welfare.

Appendix 1 Participant's Manual and Workbook

Outcome Monitoring using LQAS in Four Counties of Liberia

Participant Manual and Workbook

Adapted from Teaching-aids At Low Cost (TALC), St Albans (UK),
Publication originally made possible through support provided by the Bureau for Global Health, U.S. Agency for International Development

TABLE OF CONTENTS

Participant Manual and Workbook: Outcome Monitoring using LQAS in Four Counties of Liberia

MODULE TWO: Where will we be conducting the survey? **Page**

MODULE THREE: Whom should I interview?

MODULE ONE

Why should I do a survey and why should I use the LQAS method?

Session 1: Introducing Participants and the LQAS Methodology

Session 2: Uses of Surveys

Session 3: Random Sampling

Session 4: Using LQAS Sampling for Surveys

Getting to Know Each Other

1. Tell us a little about yourself:

- **What work are you currently doing?**
- **What is your interest in doing this survey?**
- **What kind of experience, if any, do you have with surveys?**
- **What else do you want your survey colleagues to know about you?**

"LQAS"?

Lot

Quality

Assurance

Sampling

Where *does LQAS come from?*

- **Originally used in industry to assess industrial batch production**
- **Adapted and can be used as a monitoring and management aid for integrated public health programs**
- **Sample "lots" out of what is produced (not individual items)**
- **Count number that are of agreed upon quality and those that are not**
- **Based on desired level of quality, decide if overall lot achieves that level or not**

Module One
Session 1
Overhead 2

Purpose of the LQAS Workshop

- **Train interviewers in LQAS methodology for conducting surveys to collect data for health services and program monitoring.**

- **Train program staff in how to analyze data from LQAS to identify priorities for improving program coverage.**

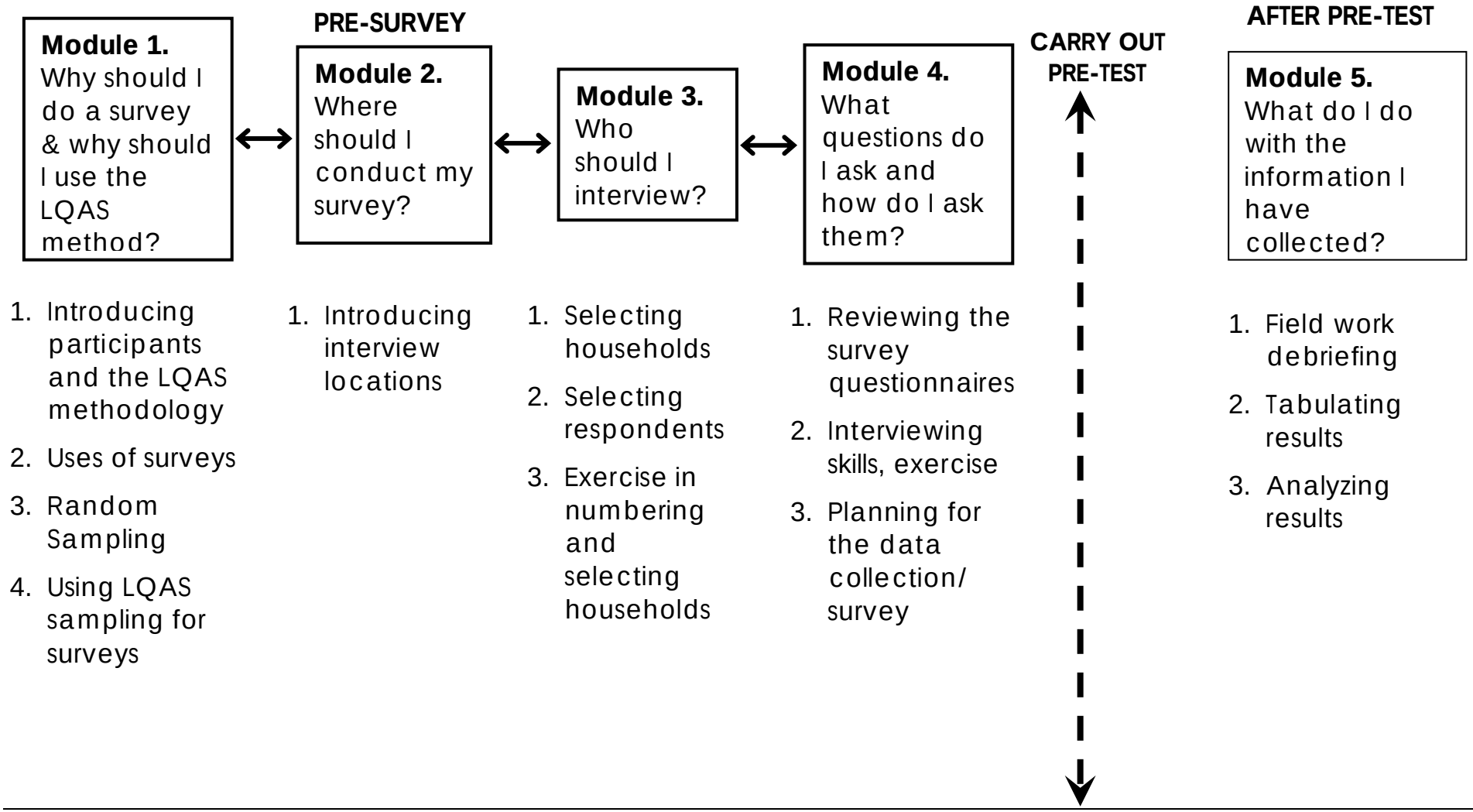
Module One
Session 1
Overhead 3

Skills to Be Learned

- **LQAS Sampling Methods**
- **Interviewing Techniques**
- **Data Tabulation and Analysis for Program Improvement (separate training)**

Module One
Session 1
Overhead 4

Overview of the LQAS Training



Module One
Session 1
Overhead 5

Agenda for Modules 1-4: Sampling and Data Collection Workshop

Day 1

Morning

Opening and Introductions
Uses of Surveys
Random Sampling
Using LQAS

Afternoon

Using LQAS continued
Identifying Interview Locations – communities
Selecting Households

Day 2

Morning

Selecting Respondents
Household composition scenarios

Afternoon

Review Survey Questionnaires

Day 3

Morning

Review Survey Questionnaires cont.
Interviewing Techniques

Afternoon

Exercise in Interviewing

Day 4

Morning

Review and Discuss Field Practical
Improving Interviewing Skills
Develop Plans for Data Collection

Afternoon

Field pre-test

Agenda for Module 5 (Monitoring and Evaluation): Tabulation and Data Analysis Workshop

Day 1

Morning

- Opening and Welcome Back
- Pre-Test Debriefing
- Lessons Learned During the Data Collection
- Agreement on Qualified Responses on Questionnaires
- How to Use the Tabulation Tables

Afternoon

- Calculating Average Coverage and its Importance
- Reviewing Performance Benchmarks for the Project
- Two Exercises: Using the Tabulation Tables
- Begin Tabulation in Stages

Day 2

Morning

- Continue Tabulation in Stages

Afternoon

- Continue Tabulation in Stages

Day 3

Morning

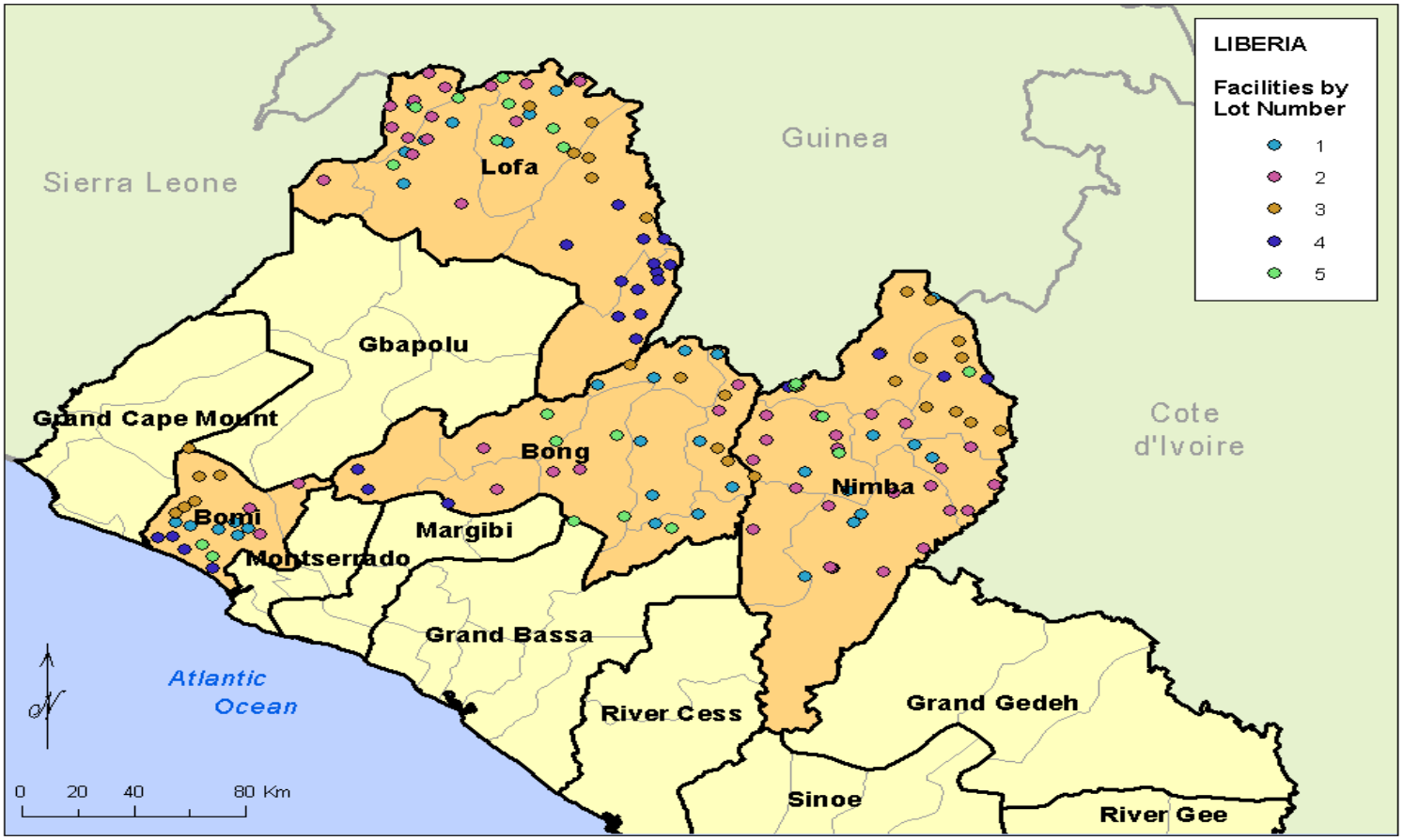
- Continue Tabulation in Stages

Afternoon

- Continue Tabulation in Stages
- How to Analyze LQAS Data and Identify Priorities Using Average Coverage and Performance Benchmarks
- Preparing a Monitoring and/or Evaluation Report
- Next Steps and the Future

Module One
Session 1
Overhead 6

Defining Catchment Area and Lots/Supervision Areas



Each County is treated as a separate LQAS survey

For each LQAS the County is divided up into 5 Lots or <u>Supervision Areas (SA)</u>

The sum total of the five lots or SAs represents the <u>Catchment Area</u> for that survey

Module One
Session 2
Overhead 7

What is Coverage?

An important use of surveys is to measure coverage.

- **What is health services or program coverage?**

- **Why is it important to know about coverage?**

What LQAS surveys Can Show You

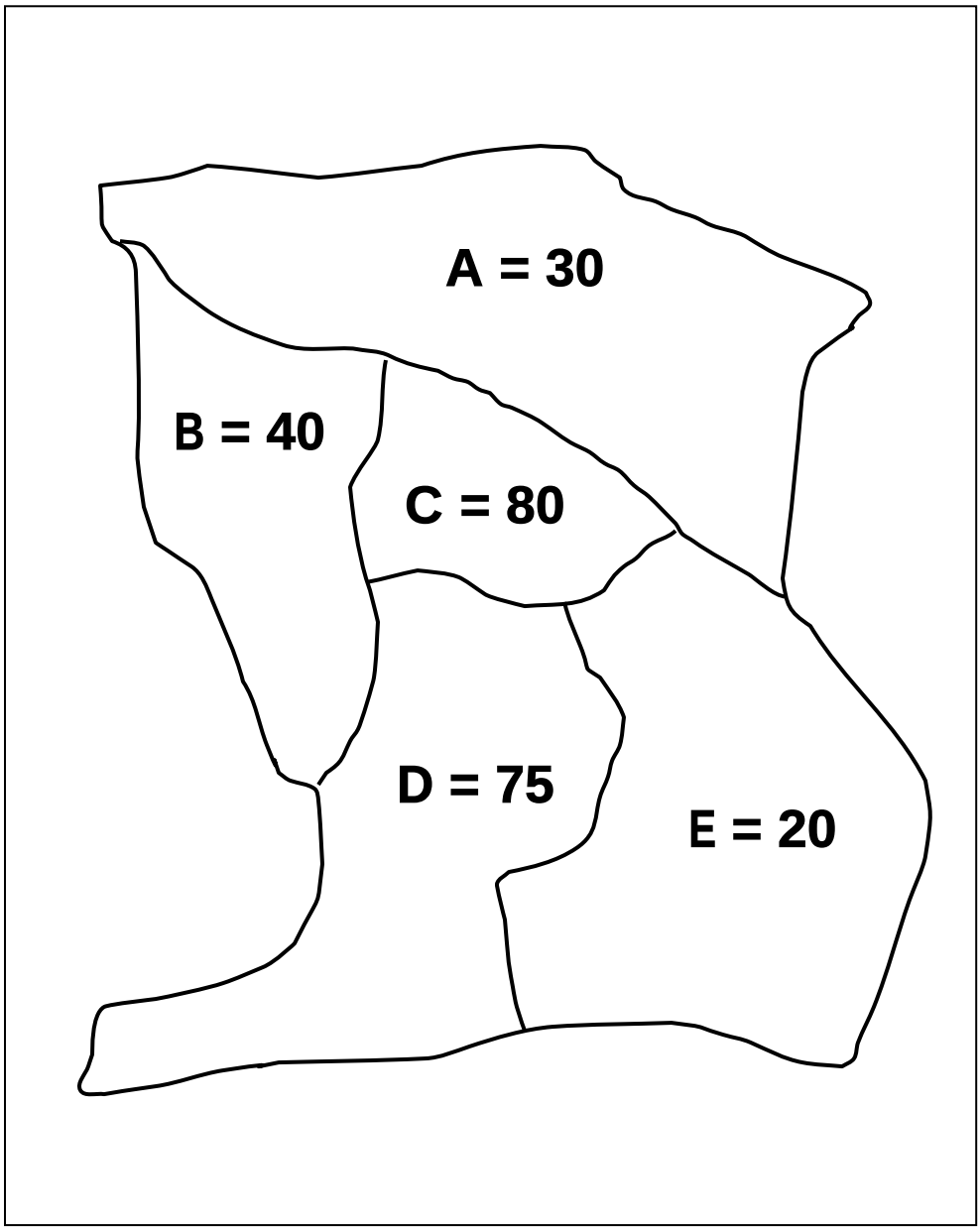
LQAS surveys can help you identify estimated levels of coverage of the health program area as a whole, AND if there are:

- ***large*** **differences in coverage regarding health knowledge and practices among Lots/SAs**

- ***little*** **difference in coverage regarding health knowledge and practices among Lots/SAs**

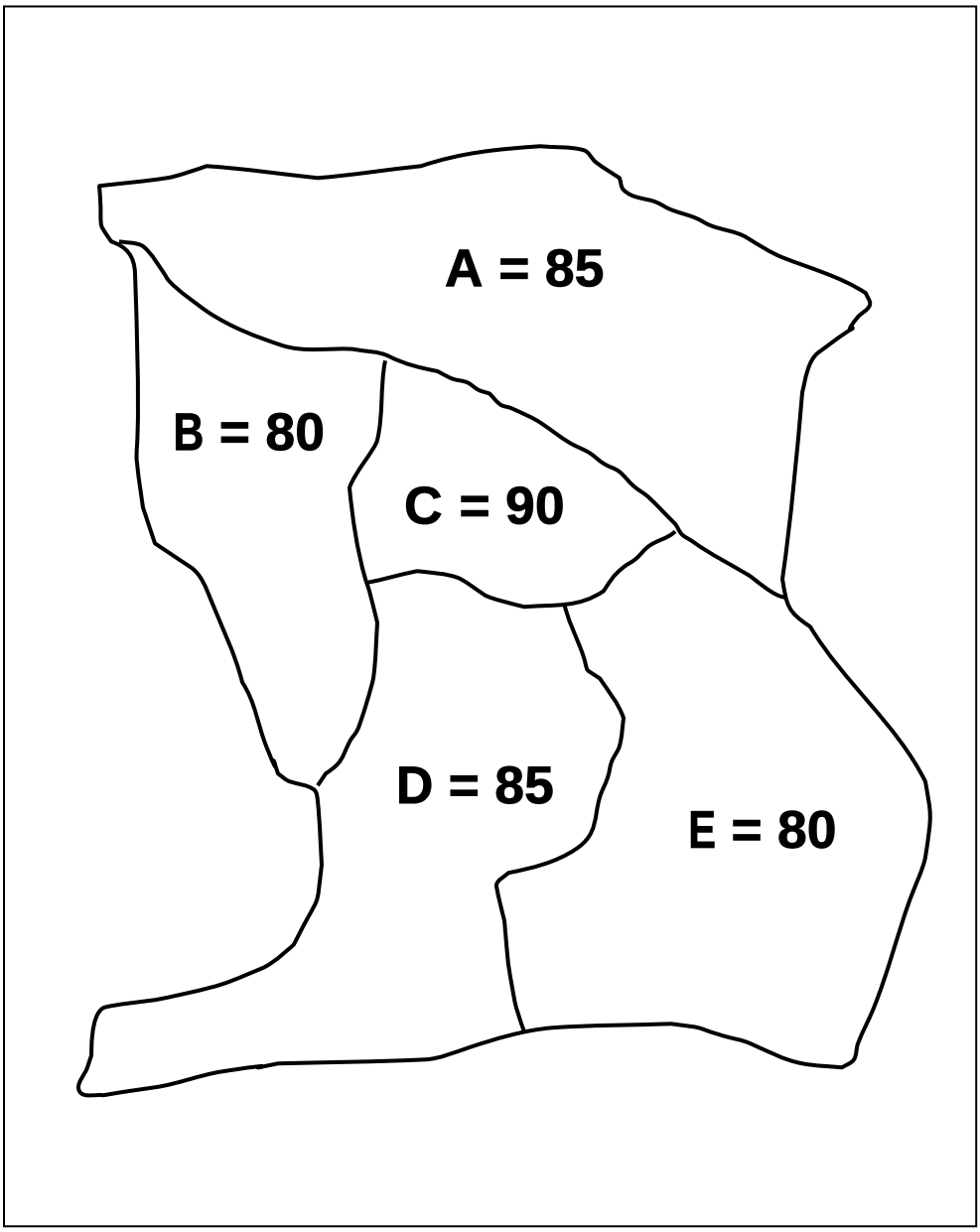
Module One
Session 2
Overhead 9

HEALTH PROGRAM: Scenario One (1)
Lots/Supervision Areas: A - E
Indicator: Percentage of children (12-23 months) who were fully immunized before 12 months.



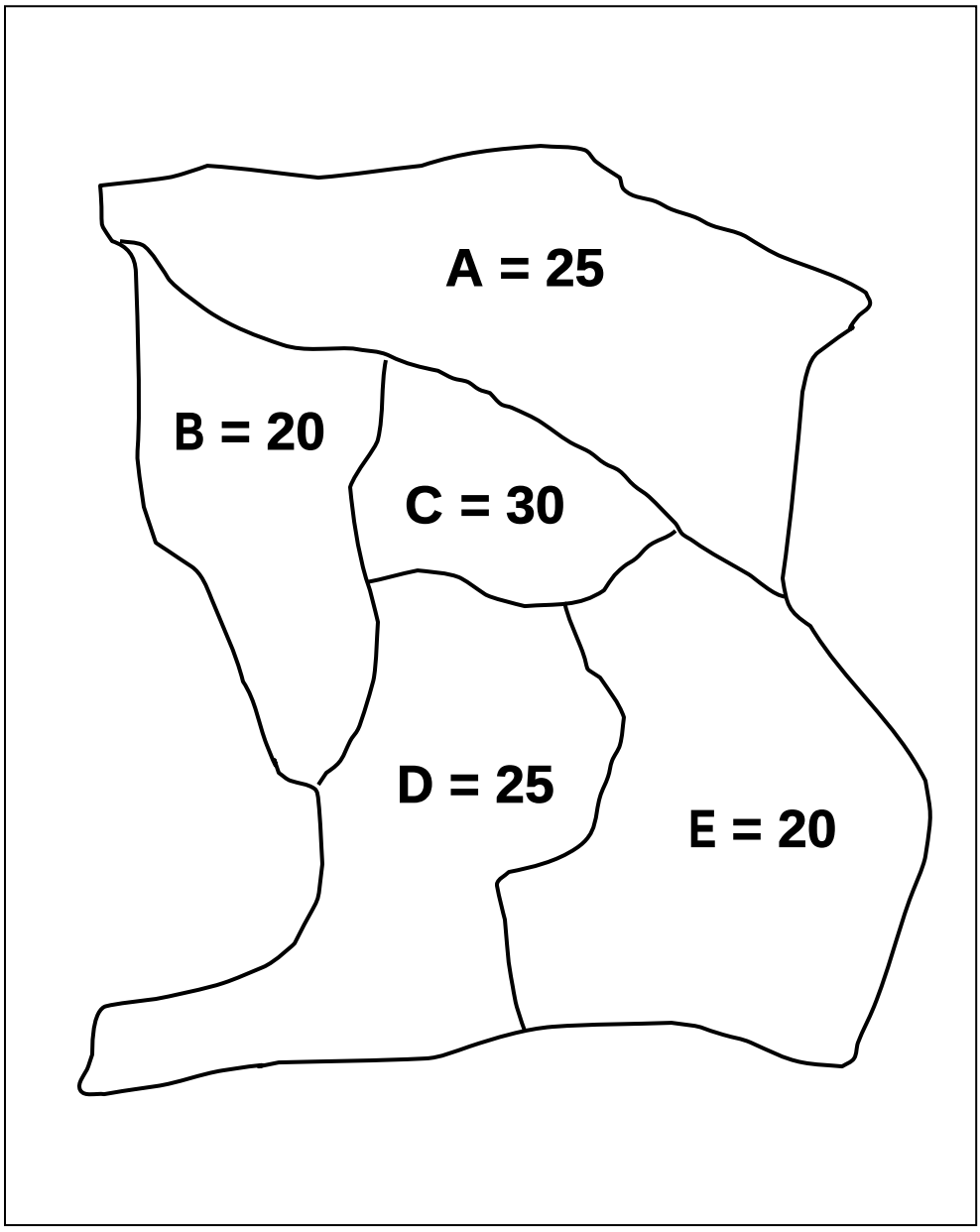
Module One
Session 2
Overhead 10

HEALTH PROGRAM: Scenario Two (2)
Lots/Supervision Areas: A - E
Indicator: Percentage of children (12-23 months) who were fully immunized before 12 months.



Module One
Session 2
Overhead 11

HEALTH PROGRAM: Scenario Three (3)
Lots/Supervision Areas: A - E
Indicator: Percentage of children (12-23 months) who were fully immunized before 12 months.



Module One
Session 2
Overhead 12

Using Survey Data

Indicator: Percentage of children (12-23 months) who were fully immunized before 12 months

Possible Scenarios			
Supervision Area	**Scenario One (1) True Coverage (%)**	**Scenario Two (2) True Coverage (%)**	**Scenario Three (3) True Coverage (%)**
A	**30**	**85**	**25**
B	**40**	**80**	**20**
C	**80**	**90**	**30**
D	**75**	**85**	**25**
E	**20**	**80**	**20**

Analysis:

Look only at the true coverage figures within your assigned scenario (1, 2 or 3):

1. Discuss for a few minutes the differences in coverage among the 5 Lots/Supervision Areas *within your scenario*:
   - What is the difference in coverage among the 5 Lots/Supervision Areas?
   - How different is this? Very different? Little difference?

2. Does coverage for the overall health program area appear HIGH, LOW, or MIXED?

3. What may be possible reasons for why, in your scenario, the health program area has this coverage?

4. What might you propose to do about immunizations in the health program area?

Module One
Session 2
Overhead 13

Uses of LQAS surveys

Identify health knowledge and practices with:

1. ***Large*** differences in coverage among Lots/SAs.

➔ Identify the low-coverage SAs to be able to:

- learn causes of low coverage.
- focus our efforts and resources on these SAs.
- improve coverage of the whole health program area by improving coverage in these SAs.

➔ Identify high-coverage SAs to be able to:

- study and learn what is working well**.**
- identify things that can be applied to other SAs.

2. ***Little*** difference in coverage among SAs.

➔ If coverage is generally high, consider shifting resources to improve other health knowledge and practices.

➔ If coverage is generally low:

- learn causes of low coverage.
- identify/study other health program areas to learn what is working well.
- identify things that can be applied in your own health program area.

Why do we need to sample?

Sampling allows you to use the "*few*" to describe the "*whole*," and this:

- **Saves time**

and

- **Saves money**

➢

Module One
Session 3
Overhead 15

Why a Random Sample?

- **Every sampling unit (e.g. household) has equal chance of being selected**

- **Reduces errors that are possible when selection is done by convenience**

- **Does not make assumptions about conditions in a particular area or for a particular respondent**

Random versus non-random sampling

- **Quality of results, the degree to which you can be confident of your results can be measured by statistics**
- **Statistics are dependent upon the characteristics of your population**
- **Random sampling of a population gives an equal probability of being selected to all parts of the population and avoids bias of non-random techniques**

In the field, non-random sampling can lead to mis-representation of the underlying population and it invalidates statistical support for results, so…

MAKE SURE YOU USE RANDOMIZATION TECHNIQUES WHEN SURVEYING!!!

What a Random Sample of 19 Can Tell Us

- **Good for deciding what are the higher-performing Lots/SAs to learn from**
- **Good for deciding what are the lower-performing Lots/SAs**
- **Good for differentiating knowledge/practices that have high coverage from those of low coverage**
- **Good for setting priorities among Lots/SAs with large differences in coverage**
- **Good for setting priorities among knowledge/practices within a Lot/SA**

➢

Module One
Session 4
Overhead 18

What a Random Sample of 19 Cannot Tell Us

- **Not good for calculating exact coverage in a lot (but can provide an estimate of coverage for an entire program by aggregating all lots)**

- **Not good for setting priorities among Lots/SAs that have little difference in coverage among them**

Why Use a Random Sample of 19?

- **For a range of coverage target and error levels, a sample of 19 provides an acceptable trade-off for making management decisions.**

- **When using LQAS to estimate whether or not a sample has achieved a certain threshold, samples moderately larger than 19 have practically the same statistical precision as a sample size of 19.**

Module One
Session 4
Overhead 20

LQAS Table: Decision Rules for Sample Sizes of 12-30 and Coverage Targets/Average of 10%-95%																		
Sample	**Average Coverage (Baselines) / Annual Coverage Target (Monitoring and Evaluation)**																	
Size*	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%
12	N/A	N/A	1	1	2	2	3	4	5	5	6	7	7	8	8	9	10	11
13	N/A	N/A	1	1	2	3	3	4	5	6	6	7	8	8	9	10	11	11
14	N/A	N/A	1	1	2	3	4	4	5	6	7	8	8	9	10	11	11	12
15	N/A	N/A	1	2	2	3	4	5	6	6	7	8	9	10	10	11	12	13
16	N/A	N/A	1	2	2	3	4	5	6	7	8	9	9	10	11	12	13	14
17	N/A	N/A	1	2	2	3	4	5	6	7	8	9	10	11	12	13	14	15
18	N/A	N/A	1	2	2	3	5	6	7	8	9	10	11	11	12	13	14	16
19	~~N/A~~	~~N/A~~	~~1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~	~~9~~	~~10~~	11	12	13	14	15	16
20	N/A	N/A	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17
21	N/A	N/A	1	2	3	4	5	6	8	9	10	11	12	13	14	16	17	18
22	N/A	N/A	1	2	3	4	5	7	8	9	10	12	13	14	15	16	18	19
23	N/A	N/A	1	2	3	4	6	7	8	10	11	12	13	14	16	17	18	20
24	N/A	N/A	1	2	3	4	6	7	9	10	11	13	14	15	16	18	19	21
25	N/A	1	2	2	4	5	6	8	9	10	12	13	14	16	17	18	20	21
26	N/A	1	2	3	4	5	6	8	9	11	12	14	15	16	18	19	21	22
27	N/A	1	2	3	4	5	7	8	10	11	13	14	15	17	18	20	21	23
28	N/A	1	2	3	4	5	7	8	10	12	13	15	16	18	19	21	22	24
29	N/A	1	2	3	4	5	7	9	10	12	13	15	17	18	20	21	23	25
30	N/A	1	2	3	4	5	7	9	11	12	14	16	17	19	20	22	24	26

N/A: *Not Applicable*, meaning LQAS can not be used in this assessment because the coverage is either too low or too high to assess an SA. This table assumes the lower threshold is 30 percentage points below the upper threshold.

: light-shaded cells indicate where *alpha* or *beta* errors are greater than or equal to 10%.

: dark-shaded cells indicate where *alpha* or *beta* errors are greater than15%.

Module One
Session 4
Overhead 21

Example: Five Lots/SAs & One Indicator

LOT/SUPERVISION AREA: A, B, C, D or E			
Indicator: Percentage of children (12-23 months) who were fully immunized before 12 months	**Number of Qualified Responses**	**Coverage Estimate = 65.3%**	**Equal to or Above Average? Yes or No**
Lot/Supervision Area A	**12**		**Yes**
Lot/Supervision Area B	**9**		**No**
Lot/Supervision Area C	**16**	**Decision Rule = 11**	**Yes**
Lot/Supervision Area D	**11**		**Yes**
Lot/Supervision Area E	**14**		**Yes**

1. Add Number of Qualified Responses in all SAs: 12 + 9 + 16 + 11 +14 = **62**
   Add all Samples' Sizes: 19 + 19 + 19+ 19 + 19 = **95**
   Coverage Estimate = Average Coverage = 62/95 = **65.3%** = **70%**
(Round upward to the nearest interval of 5 to find the Decision Rule)

2. Use table to find Decision Rule.

3. Is coverage in the Lots/SAs generally equal to or below average? Yes or No?

4. Can you identify the Lots/Supervision Areas that have relatively lower immunization performance?

5. If yes, which are they? If not, why can't you identify them?

MODULE TWO

Where should I conduct my survey?

Session 1: Identifying Interview Locations

Identifying Locations for Interviews

Step 1. List communities and total population.

Step 2. Calculate the cumulative population.

Step 3. Calculate the sampling interval.

Step 4. Choose a random number that is less than the sampling interval.

Step 5. Beginning with the random number, use the sampling interval to identify communities for the 19 sets of interviews.

Example: List of Communities and Total Population for a Lot/Supervision Area (Senjeh District, Bomi County)

Name of Community	Total Population
Matiah	13
Armah Konah	14
Ballay	14
Beafini	458
Bucbay	97
Bumah	14
Duwoe	7
Fahn Musa	9
Fallah-Foco	22
Gbadingla	100
Gbasormon	29
Gbonor	26
Gordee	5
Gugolor	10
Guwo	10
Jah Gballey	14
Kangba	53
Klay-Montue way	68
Kortee	42
Nathaniel	18
New Fahn	0
Old Fahn	16
Payroll	66
Quenkor	19
Tarweh	2
Weabai	47
Zarmeyan Town	219
Albert	37
Bugbay	213
Jarquay	26
Sayemonor	14
TOTAL	**1682**

Calculate the Cumulative Population

Name of Community	Total Population	Cumulative Population
Matiah	13	13
Armah Konah	14	27
Ballay	14	41
Beafini	458	499
Bucbay	97	596
Bumah	14	610
Duwoe	7	617
Fahn Musa	9	626
Fallah-Foco	22	648
Gbadingla	100	748
Gbasormon	29	777
Gbonor	26	803
Gordee	5	808
Gugolor	10	818
Guwo	10	828
Jah Gballey	14	842
Kangba	53	895
Klay-Montue way	68	963
Kortee	42	1005
Nathaniel	18	1023
New Fahn	0	1023
Old Fahn	16	1039
Payroll	66	1105
Quenkor	19	1124
Tarweh	2	1126
Weabai	47	1173
Zarmeyan Town	219	1392
Albert	37	1429
Bugbay	213	1642
Jarquay	26	1668
Sayemonor	14	1682
TOTAL	**1682**	

Calculate the Sampling Interval

Name of Community	Total Population	Cumulative Population
Matiah	13	13
Armah Konah	14	27
Ballay	14	41
Beafini	458	499
Bucbay	97	596
Bumah	14	610
Duwoe	7	617
Fahn Musa	9	626
Fallah-Foco	22	648
Gbadingla	100	748
Gbasormon	29	777
Gbonor	26	803
Gordee	5	808
Gugolor	10	818
Guwo	10	828
Jah Gballey	14	842
Kangba	53	895
Klay-Montue way	68	963
Kortee	42	1005
Nathaniel	18	1023
New Fahn	0	1023
Old Fahn	16	1039
Payroll	66	1105
Quenkor	19	1124
Tarweh	2	1126
Weabai	47	1173
Zarmeyan Town	219	1392
Albert	37	1429
Bugbay	213	1642
Jarquay	26	1668
Sayemonor	14	1682
TOTAL	**1682**	**--**

Sampling Interval = Tot. Cumulative Pop/19 sample lots = **?**

Example: Select a number from the Random Number Table (that is less than the Sampling Interval)

87172	43062	39719	10020	32722	86545	86985	04962	54546	23138	62135	55870	97083	67875
28900	50851	30543	89185	16747	95104	49852	26467	58869	79053	06894	23975	34902	23587
86248	71156	55044	13045	33161	95604	57876	23367	10768	78193	60477	70307	06498	48793
10531	51391	41884	69759	32741	70072	01902	96656	90584	59263	49995	27235	40055	20917
02481	90230	81978	39127	93335	74259	25856	52838	49847	69042	85964	78159	40374	49658
23988	13019	78830	17069	58267	69796	94329	34050	25622	55349	10403	93790	77631	74261
37137	47689	82466	24243	10756	54009	44053	74870	28352	66389	38729	80349	50509	56465
38230	82039	34158	90149	82948	60686	27962	39306	53826	47852	76144	38812	76939	03119
98745	08288	19108	84791	58470	59415	45456	44839	86274	25091	42809	56707	47169	95273
44653	58412	91751	14954	87949	81399	51105	29718	82780	11262	23712	99782	42829	26308
88386	66621	16648	19217	52375	05417	26136	05952	71958	25744	52021	20225	01377	47012
50660	58138	01695	69351	25445	20797	74079	60851	47634	36633	93999	96345	58484	12506
36732	74234	84240	46924	62744	39238	78397	60869	26426	55588	56963	59506	17293	45096
34187	78277	83678	34754	46616	45250	25291	04999	19717	60324	66915	03473	98329	82447
26095	98131	79362	39530	53870	87445	26277	90551	28604	39865	40686	05435	74511	69866
00067	74289	20706	74076	28206	36960	09231	82988	57062	35331	08212	68111	52199	05065
42104	26434	30953	15259	76676	63339	75664	23993	63538	34968	47655	44553	61982	13296
82580	46580	87292	23226	21865	60338	04115	33807	38395	98484	40387	69877	24910	13317
89266	14764	17681	68663	66030	12931	17372	35601	63805	55739	42705	30549	31697	33478
47100	92329	89435	69974	40783	52649	93444	41317	02749	19052	34647	92814	88046	34020
59566	26527	44706	85670	96223	36275	82013	82673	60955	62617	90214	24589	59715	57612
10946	24676	66513	56743	96911	89042	08263	70753	89045	39189	04306	06090	94515	17772
34013	69250	27977	84597	55192	65088	55739	35953	18533	39339	78037	32827	68269	69218
21606	11751	30073	71431	53569	27865	90215	34772	21779	11734	64313	49764	30816	56852
56620	92612	77157	90231	90144	29781	01683	52503	60080	73703	70080	80686	47379	33279
49238	90475	84356	87159	21222	40106	02671	52684	38514	68434	16407	58164	13341	48142
50738	21999	73539	51802	78179	27872	57937	29696	67783	29373	96563	74619	77099	17190
58761	21571	71692	19723	25088	10483	71430	47068	78378	80237	32113	09381	62931	29243
55335	71937	22025	33538	04648	74232	57839	62431	61835	04784	06732	34202	93497	72070
26515	31143	83795	78445	32869	31489	81587	90354	97672	70106	35008	37899	36246	97805
32625	36806	00082	26902	26250	28919	38054	49027	22209	42696	46980	17065	61288	30208
20311	96089	20141	30362	04980	32703	04202	91080	28660	89691	84660	73433	70169	11273
10941	73003	87930	85620	06956	38719	88711	61454	64076	13316	02203	54437	54306	78229
56982	46636	34070	30803	39095	80387	08971	25067	07377	70704	13629	68474	99229	05535
14661	10670	15811	00454	81124	46977	89983	48836	48182	17054	06344	24267	16686	21401
52760	78118	23277	29760	00099	97325	54762	43117	73199	19621	24599	11030	64809	35088
48874	20831	02286	73635	93771	54264	49801	22653	01524	84621	91023	64028	29278	15987
44817	77408	48447	25934	22912	43086	68126	92970	91833	26418	72454	97636	94593	07880
17896	79375	70883	70135	21589	51181	71969	32951	35036	17219	27357	96517	55307	84470
27166	22347	92146	92189	16301	15747	72837	59174	75024	39459	54910	95335	95013	47068
13665	30490	63583	73098	19976	03001	94645	40476	43617	85698	66512	42759	20973	98759
58644	73840	08103	97926	57340	63077	08114	10031	35668	21740	33787	44756	20527	65367
72570	36278	06602	56406	85679	85529	08576	50874	59706	01019	29980	56742	05356	04810
92041	68829	02163	59918	83041	71241	90678	79835	86324	13075	29913	99831	25688	53648
71240	74119	53090	23693	14007	90107	68804	54927	68964	26535	28184	21630	12362	67990

Module Two
Session 1
Overhead 6

Identify the Location of Each of the 19 Interviews in a Lot/Supervision Area: Worksheet

Random Number = 31 Sampling Interval = 88.52

LQAS No.	Calculation	Interview Location
1.	Random Number (RN) = Location Number 1	31
2.	RN + Sampling Interval = Location Number 2	31+88=119
3.	Interview Location Number 2 + Sampling Interval	119+88=207
4.	Interview Location Number 3 + Sampling Interval	207+88=295
5.	Interview Location Number 4 + Sampling Interval	295+88=383
6.	Interview Location Number 5 + Sampling Interval	383+88=471
7.	Interview Location Number 6 + Sampling Interval	471+88=559
8.	Interview Location Number 7 + Sampling Interval	559+88=647
9.	Interview Location Number 8 + Sampling Interval	647+88=735
10.	Interview Location Number 9 + Sampling Interval	735+88=823
11.	Interview Location Number 10 + Sampling Interval	823+88=911
12.	Interview Location Number 11 + Sampling Interval	911+88=999
13.	Interview Location Number 12 + Sampling Interval	999+88=1087
14.	Interview Location Number 13 + Sampling Interval	1087+88=1175
15.	Interview Location Number 14 + Sampling Interval	1175+88=1263
16.	Interview Location Number 15 + Sampling Interval	1263+88=1351
17.	Interview Location Number 16 + Sampling Interval	1351+88=1439
18.	Interview Location Number 17 + Sampling Interval	1439+88=1527
19.	Interview Location Number 18 + Sampling Interval	1527+88=1615

Module Two
Session 1
Overhead 7

LQAS Sampling Frame for a Lot/Supervision Area

Name of Community	Total Population	Cumulative Population	Interview Location Number	Number of Interviews
Matiah	13	13		
Armah Konah	14	27		
Ballay	14	41	31	**1**
Beafini	458	499	119,207,295,383, 471	**5**
Bucbay	97	596	559	**1**
Bumah	14	610		
Duwoe	7	617		
Fahn Musa	9	626		
Fallah-Foco	22	648	647	**1**
Gbadingla	100	748	735	**1**
Gbasormon	29	777		
Gbonor	26	803		
Gordee	5	808		
Gugolor	10	818		
Guwo	10	828	823	**1**
Jah Gballey	14	842		
Kangba	53	895		
Klay-Montue way	68	963	911	**1**
Kortee	42	1005	999	**1**
Nathaniel	18	1023		
New Fahn	0	1023		
Old Fahn	16	1039		
Payroll	66	1105	1087	**1**
Quenkor	19	1124		
Tarweh	2	1126		
Weabai	47	1173		
Zarmeyan Town	219	1392	1175,1263,1351	**3**
Albert	37	1429		
Bugbay	213	1642	1439,1527, 1615	**3**
Jarquay	26	1668		
Sayemonor	14	1682		
TOTAL	**1682**			**19**

MODULE THREE

Whom should I interview?

Session 1: Selecting Households

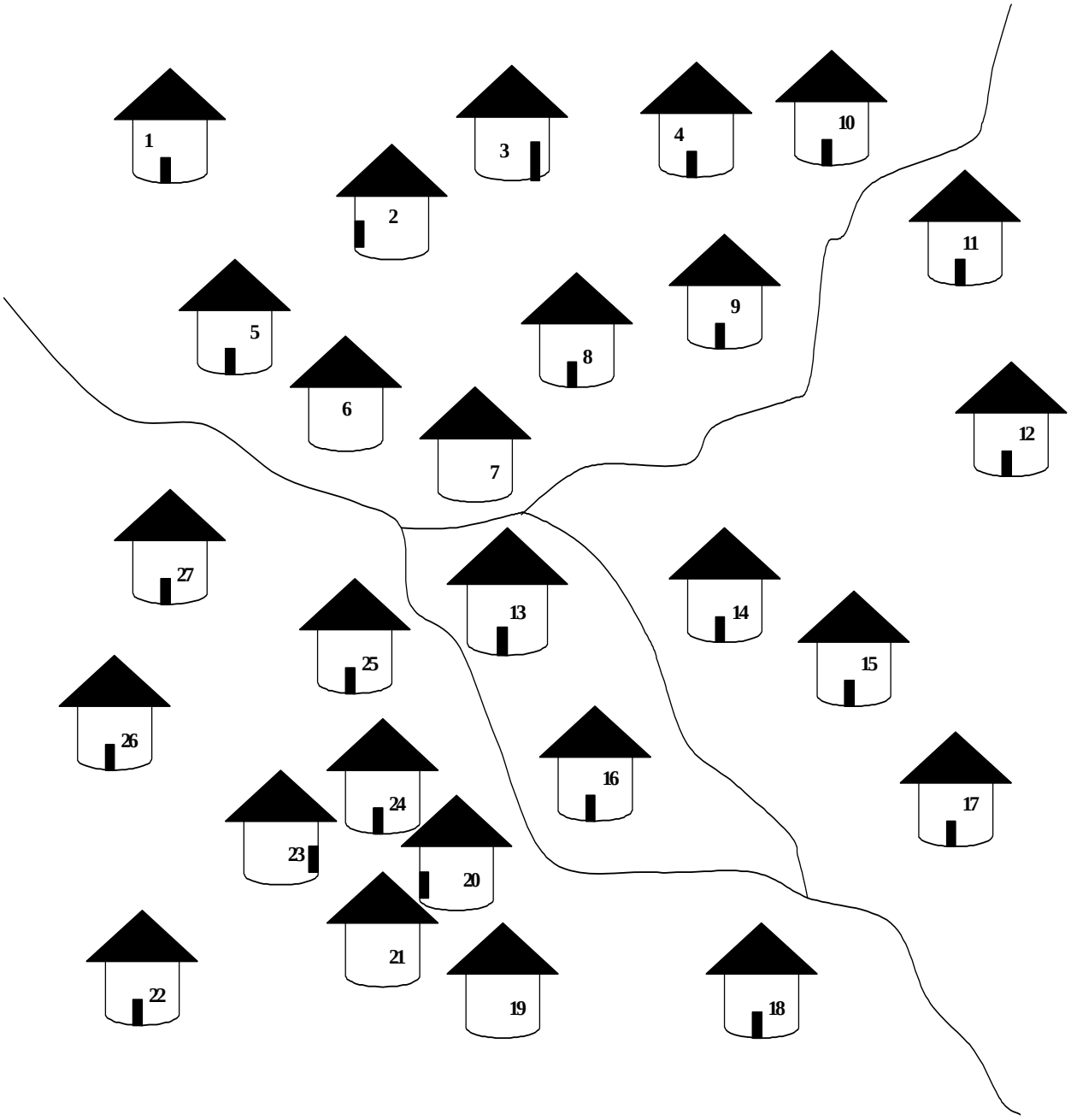
Session 2: Selecting Respondents

Module Three
Session 1
Overhead 1

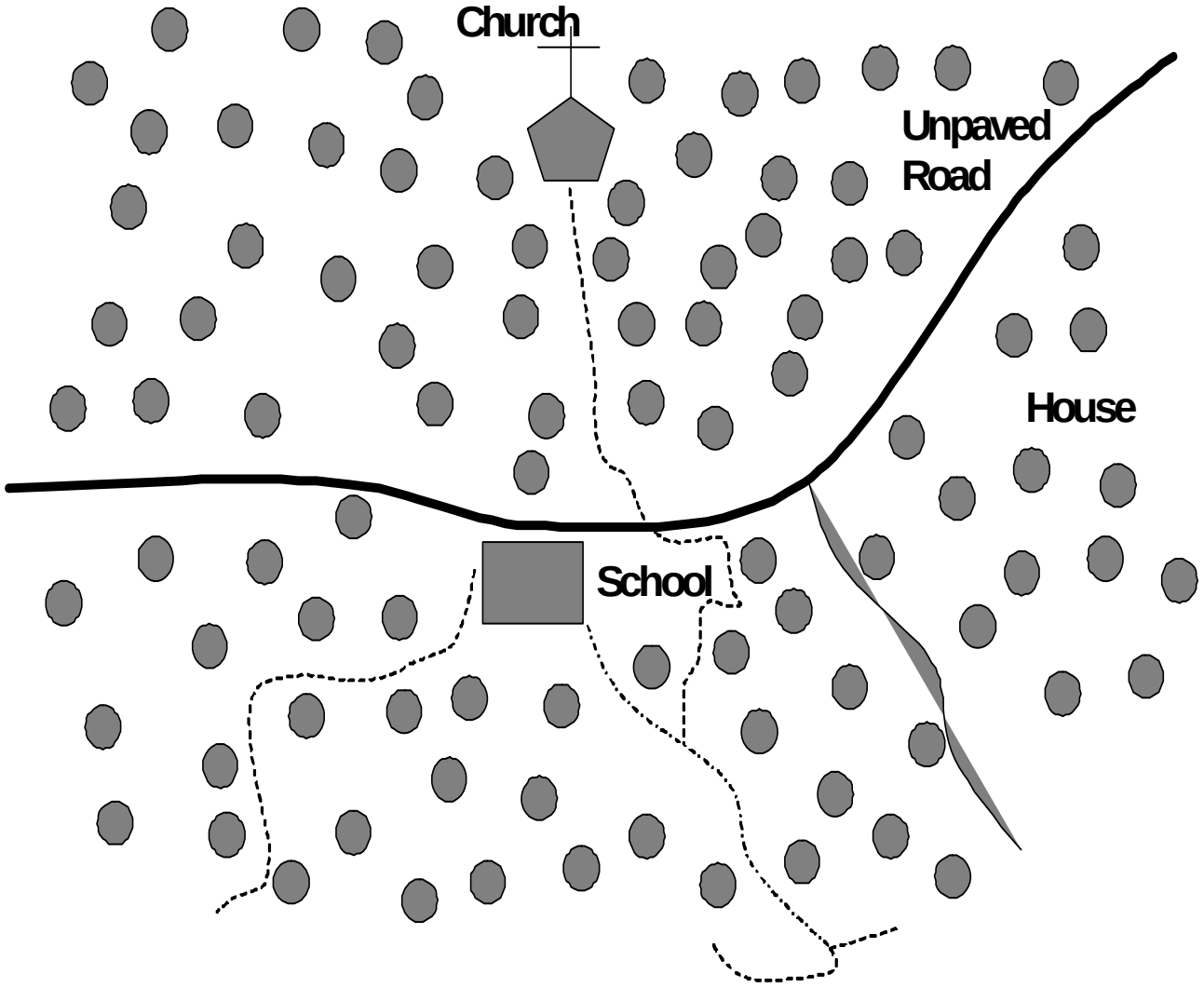
How to Identify First Household to Approach in each Randomly Selected Lot

IF:	THEN:
A complete household list is available (tax list, census, map)	Assign number to each house then select random number between 1 and number of households … Household corresponding to number selected is starting point!
If community size is "about" 30 households or less	Make household list or map with location of each household (use assistance of a key informant from community)… And then assign a number to each house and proceed as described above. Household corresponding to number selected is starting point! **OR, you can use the "spin-the-bottle" technique to randomly select direction and then count the number of houses along that axis, and randomly select a number corresponding to a house that will be your starting point**
If the community size is more than "about" 30 households	Subdivide community into 2-5 sections with about same number of households in each section. Select one section at random… …If section has more houses than you can easily count, subdivide into 2-5 sections again and select one at random. Do this until approximately 30 or fewer houses remain. …Make a house list or map with location of each household (use an assistant or key informant from your community). Then assign a number to each house and randomly select. **OR, you can use the "spin-the-bottle" technique to randomly select direction and then count the number of houses along that axis, and randomly select a number corresponding to a house that will be your starting point**

1st Example: Household List Not Available – Size 'About' 30

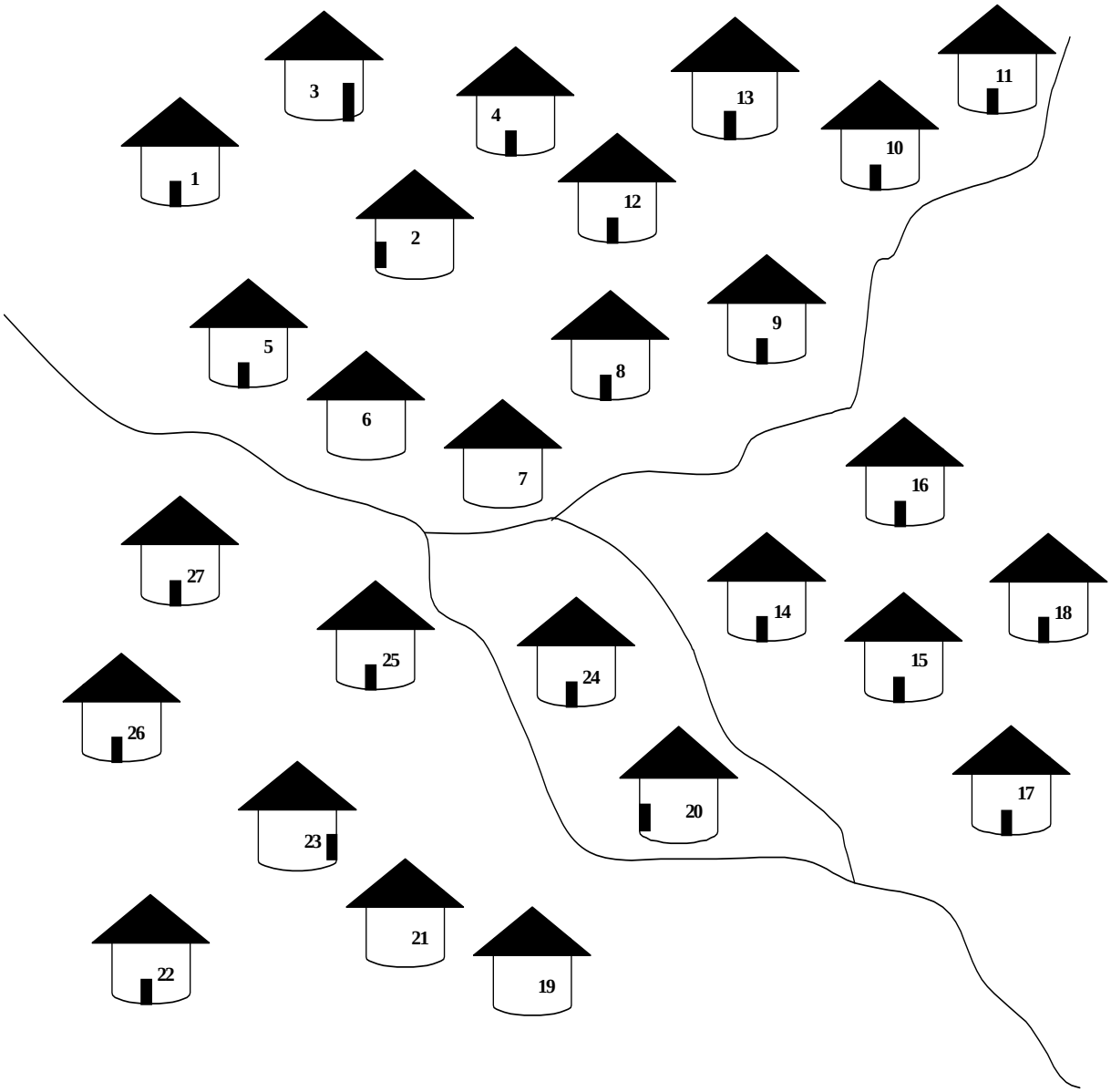


2nd Example: Household List Not Available – Size Greater Than 30



Module Three
Session 1
Overhead 4

3rd Example: Group of 27 Households Numbered for Random Selection of 1 Household



Rules for Identifying Respondents

If the type of respondent you are looking for:	Then:
Is at the household* you selected	Interview that person if she consents. *[Always make sure to determine if multiple questionnaires can be completed at the location]*
Does not live at the household you selected **OR…** Lives at that household **BUT** is absent and far away (more than 15 minutes away)	Go to the next-nearest household from the front entrance to the household you are at, and check at this "next-nearest" household… Continue this process until you find the respondent type you are looking for. [Hint: if 2 households are equally near, then choose the one with the closest door. Otherwise, "flip a coin."]
Lives at that household, is absent **BUT** is nearby (within 15 minutes)	Go find the respondent with the help of a guide from the community…. **IF** you cannot find the person in the next 15 minutes… **GO** to the next-nearest household from the front entrance of the household of the person you cannot find.

* Household = group of persons who share the same kitchen or hearth; or, a group of persons who eat from the same cooking pot.

Module Three
Session 2
Overhead 6

Household Composition Scenarios

♦ **Household #1**
- Mother 35 years with children 5 months old and 26 months old
- Sister of woman is 23 years old with child 14 months
- Grandmother is 50 years old

♦ **Household #2**
- Mother 48 years old with children 30 years, 27 years, 22 years and 18 years

♦ **Household #3**
- Abandoned house – owners absent

♦ **Household #4**
- Girl 8 years old
- 3-month-old baby
- Mother of 3-month-old in market, and she is the sister of the 8-year-old
- 6-month-old baby
- Mother of 6-month-old is dead; she was also the sister of the 8-year-old girl

♦ **Household #5**
- Man 65 years
- Man's wife 60 years
- 15-month-old baby
- Mother of 15-month-old visiting the capital city
- Father in city

♦ **Household #6**

- Father 45 years old
- One wife, 48 years old
- Daughter, 24 years and pregnant
- Children 19 months and 38 months. Mother reports that 19 month old has had a cough and fever in the past two weeks

♦ **Household #7**

- Mother of 9-year-old child is not home – child does not know when mother will be back
- 9-year-old child
- 8-month-old child of woman
- Grandmother is 55 years old

♦ **Household #8**

- Woman 45 living alone
- No children

♦ **Household #9**

- Woman 20 years old with child 6 months
- Sister of 20-year-old is 25 years old and has child 3 years old
- 3rd sister 30 years old with 13-month-old baby. She reports that her baby had a high fever in the past two weeks

♦ **Household #10**

- Mother 35 years old – pregnant
- Child of pregnant mother is 13 months old
- Neighbor woman is 35 years old
- Neighbor has a 10-month-old baby

♦ **Household #11**

- 4-month-old twin girls
- Mother of twins, 27 years old
- 40-year-old brother of mother
- 32-year-old wife of brother (of mother)

♦ **Household #12**

- New bride of 14 years with 2-month-old baby
- Her 19-year-old husband
- Mother-in-law 47 years

♦ **Household #13**

- Refugee woman from neighboring country with an 18 month-old
- Her sister, who immigrated when she was 39, about 12 years ago
- Sister has a 4 year-old

♦ **Household #14**
- Three sisters, one with a six-week-old baby, one with an 8-month-old and one who is childless.
- Husband of sister with 8-month-old is 24 years.

♦ **Household #15**
- Mother 18 – pregnant, has 4-month-old baby
- Father is working on the roof of the house

♦ **Household #16**
- 8-year-old boy
- His mother, 24 years, is cooking dinner
- His 32-year-old father is travelling outside the country

♦ **Household #17**
- Mother 18 years old with child 24 months, pregnant
- Father 26 years

♦ **Household #18**
- Abandoned house – owners absent

♦ **Household #19**
- Wife, 35 years old and pregnant
- Father 55 years old

♦ **Household #20**
- Wife, 19 with 8-month old baby
- Mother reports that baby has had diarrhea within the past two weeks
- Father is 30 years old and at a neighbor's house

MODULE FOUR

What questions do I ask and how should I ask them?

Session 1: Reviewing the Survey Questionnaires, One-by-One

Session 2: Interviewing Skills

Session 3: Planning for the Data Collection/Survey

Session 4: Field Pre-test

Module Four
Session 2
Overhead 1

Why Interviewing is Important

- **Sound programming decisions depend on reliable data,**

and

- **Reliable data depends on getting good information from local respondents,**

and

- **Getting good information from respondents depends on conducting effective interviews.**

Interview Etiquette

- **Dress appropriately.**
- **Present official document/certificate from organization or project if necessary. Get informed consent to conduct interview.**
- **Do not enter the house unless you are invited.**
- **If you remain outside, do not ask for a chair; sit on the porch, steps, etc.**
- **Tell people how long the questionnaire will take.**
- **Do not accept lunch (unless it would be rude to refuse).**
- **Thank interviewees at the end.**

Effective Interviewing Techniques

1. Introduce yourself, your organization, the purpose of the survey (show document or certificate if necessary) and get consent to conduct interview.

2. Maintain confidentiality:
   - Do not interview the respondent in the presence of others (unless he/she indicates otherwise).
   - Explain that all answers will be kept confidential.

3. Ask questions exactly as written or with minor changes that were agreed upon during the training.

4. Wait for a response; be silent, then probe.

5. If the respondent doesn't understand or the answer is unclear, ask the question again, making as few changes in wording as possible.

6. Do not suggest—by tone of voice, facial expression, or body language—the answer you want.

7. Do not ask leading questions, questions that signal the correct answer or that suggest the answer you would like.

8. Try not to react to answers in such a way as to show that you approve or disapprove.

9. If one answer is inconsistent with another, try to clear up the confusion – without leading the respondent to a certain answer.

10. Try to maintain a conversational tone of voice; don't make the interview seem like an interrogation.

11. Know the local words for sensitive/delicate topics.

12. Use neutral probes, (e.g.,"Anything more?")

Module Four
Session 3
Handout for each team

Survey Checklists

1. PRE-SURVEY CHECKLIST

Before the survey begins, be sure the following tasks have been completed:

1. Review the sampling frame before designing the plan for data collection. **DONE** ✓

2. For each lot: Count the questionnaires to be sure you have 19 sets of photocopies that include each of the 9 questionnaires for the respondent type and for each Lot/Supervision Areas.

   NOTE: One of the questionnaires in the questionnaire packet is the FP replacement questionnaire. This is *only to be used if the respondent of the main questionnaire answers yes to the question on current use of modern contraceptive method*. If the respondent answers no to this question, the replacement questionnaire should not be asked.

3. For each county: Count the questionnaires to be sure you have 5 sets of the 19 sets of photocopies (95 sets per county) that include each of the 9 questionnaires for the respondent type and for each Lot/Supervision Areas.

4. Fill-in identification information for the County and Lot for each of the 19 questionnaire packets in each of the 5 different lots in the county. In this way, questionnaire packets will be numbered 1 through 19 for each Lot/Supervision Area.

5. Review each one of the 19 questionnaire packets to make sure that they have the correct number of pages and they are securely stapled.

6. Verify questionnaires have no missing pages and are securely stapled together.

7. Review the materials checklist below. Be sure you have the following materials (if needed):

Materials Checklist

- ❑ 19 questionnaires for correct respondent + 2 extras
- ❑ Pencil
- ❑ Pencil sharpener
- ❑ Eraser
- ❑ Clipboard
- ❑ Day pack or bag to carry questionnaires and materials
- ❑ Random number tables
- ❑ Rules to select respondents in a household
- ❑ Raincoat
- ❑ Community maps or paper for making maps
- ❑ 'Questionnaire-specific' materials: flash cards for contraceptive products, anti-malarial (ACT), iron folate, Vit. A;

2. CHECKLIST FOR DATA COLLECTORS

After you are in the field, make sure participants complete the survey in the following manner:

1. If a community census is available, assign numbers to households and randomly select a starting household (and proceed as in step 6 below).
2. If no community census is available, update community maps if available, assigning numbers to all houses in the community before selecting starting household(s). If no map is available, divide community in sectors.
3. If the community is small, e.g., less than 30 houses, randomly select a starting household (using either random number if houses can be quickly numbered or using "spin the bottle" technique)
4. If the community is large, e.g., more than 30 houses, divide into sections (each section with a similar number of houses):
   - number each section;
   - randomly select one of the community sections; (example: if you have divided the community into 3 sections, select a random number between 1 and 3.)
   - go to the selected section to confirm size and layout of section; if the section is large, subdivide it into subsections and randomly select one (and repeat this process until you get a subsection with 30 or fewer houses);
   - either number on the map each house in the section or subsection selected and randomly select one house or use "spin the bottle" technique to identify a direction to proceed.
5. If it is very difficult to divide the community or a section of it into sections, then:
   - ask a respondent to take you to a place where exactly 50% of the houses are in front of you, 50% of the houses are behind you, 50% are to the right and 50% are to the left;
   - number these 4 sections;
   - choose one randomly;
   - go to that section and repeat the procedure until you can see a manageable number of houses. Count if expedient, "spin the bottle" if not;
   - select number or direction randomly;
6. Go to the selected house to begin interviewing.
7. After completing an interview and one or more questionnaires in the selected house, visit the closest house until all the 9 questionnaires for that sample point have been completed.

8. After completing all questionnaire types, select another starting household (or section and then household) at random if there is more than one sampling point in the community or continue to a new community.

Remember: For each questionnaire, randomly select a starting household and then go to the closest house until the interview is complete.

3. CHECKLIST FOR MANAGERS

The following is a checklist for program managers:

1. Review the data collection plan with each interviewer and supervisor.

2. Indicate the minimum number of interviews to be completed in one day.

3. During day 1 you can let data collectors work in pairs if you think this will increase their confidence.

4. Provide the technical and administrative support required by each interviewer (transport, lunch, etc.)

5. At the end of each day always review the questionnaires of each interviewer to ensure that they have been correctly filled out, are complete and consent for interview was acquired. Check for any missing information or responses, and missing pages.

6. Make necessary corrections to questionnaire and inform the interviewer of problems found. If information is missing, the interviewer should revisit the house to complete the questionnaire before going to another community.

7. Confirm that all questionnaires have been filled in for each Lot/Supervision Area and that no pages are missing. If your LQAS sample size is 19 then you should have 19 completed questionnaires.

8. Organize the questionnaires by County and by LQAS number (for example – from 1 to 19), according to the Lot/Supervision Area. For five Lots/Supervision Areas for Nimba, for example, you would organize the questionnaires as follows:

NIMBA COUNTY:
Folder 1: Respondent Type A, Area 1: 01 to 19
Folder 2: Respondent Type A, Area 2: 01 to 19
Folder 3: Respondent Type A, Area 3: 01 to 19
Folder 4: Respondent Type A, Area 4: 01 to 19
Folder 5: Respondent Type A, Area 5: 01 to 19

NB: Be sure to bring all the questionnaires to the tabulation workshop.

Process for Pre-Test

1. ***Meet with community leader.***

2. ***If possible either revise existing or quickly create a community map.***

3. ***Subdivide the community into sections of 30 or fewer households.***

4. ***Assign each section (each group of 30 or fewer households) either a number or a direction (for "spin the bottle" technique).***

5. ***Select a section using either a random number or a randomly selected direction.***

6. ***Perform steps 3 through 5 again if the selected section is still too large.***

7. ***Once a reasonably sized section is selected; pick a starting household using a Random Number Table.***

8. ***Identify the "next-nearest" household when necessary.***

Appendix 2 Names of Interviewers and Supervisors

Table 35 **Recruits**

	Name of Recruits	Community of Residence	Source	Sex
1.	Koboi B. Kadii	Paynesville	SBA pool	Male
2.	Venoria J. Crayton	New George Road	New to SBA	Female
3.	Vivian B. Dennis	ELWA	SBA pool	Female
4.	Annie Hardy-Metzger	Barnersville	SBA pool	Female
5.	Jim-Ngormoh A. Kamara	Duport Road	New to SBA	Male
6.	N. Varney Kiazolu	Old Road	New to SBA	Male
7.	E. Varmeh Konneh	21 Street, Riamah	MOHSW person	Male
8.	Emmanuel H. Pelham, II	72nd, Paynesville	MOHSW person	Male
9.	Mike L. Ishmael	Shoe Factory, Gardnersville	New to SBA	Male
10.	Edna K. Dolo	Old Matardi Estate	SBA pool	Female
11.	Sownie Baeyan	Paynesville	SBA pool	Female
12.	Yassah Yates	Congo Town	SBA pool	Female
13.	Tamia T. Morris	Congo Town	SBA pool	Female
14.	Rebecca K. Larblah	Paynesville	SBA pool	Female
15.	Alexander W. Blidi	Matadi Estate	MOHSW person	Male
16.	Miatta Jallah	Front Street	New to SBA	Female
17.	Chester A. Smith	New Georgia Estate	MOHSW person	Male
18.	Alfred Dalieh	Gardnersville	SBA pool	Male
19.	Nehemiah Sneh	Paynesville	SBA pool	Male
20.	Cooper Koryor	Chicken Soup Factory	SBA pool	Male
21.	Abigail T. Gbessagee	Lakpazee	New to SBA	Female
22.	Stephen S. Seah Jr.	Logan Town	MOHSW person	Male
23.	Forkpa Karmon	St. Paul Bridge	SBA Associate	Male
24.	Jemima Tendeh Collins	Police Academy, Paynesville	SBA Associate	Female
25.	Gust Nyanplu	Gbarnga, Bong County	MOHSW	Male
26.	Siafa Kokulo	Voinjama, Lofa County	MOHSW	Male
27.	Jonathan Tokpa	Sanniquellie, Nimba County	MOHSW	Male
28.	Willie Taweh	Tubmanburg, Bomi County	MOHSW	Male

Table 36 Profile of Selected Interviewers and Supervisors

Area of Assignment	Team Members	Team Position	Brief Profile
Nimba	Jonathan Togba	Supervisor	Monitoring & Evaluation Officer MOH
	Cooper Koryor	Enumerator	High School Graduate Has over 15 years of data collection experience
	Sonnie Beayan	Enumerator	BBA Economic & Accounting Has over 10 years of data collection experience
	Annie H. Metzger	Enumerator	BBA Economics & Accounting, Has 6 years of data collection experience
	Vivian Dennis	Enumerator	BBA Management & Accounting Has 3 years of data collection experience
Bong	Forkpa D. Karmon	Supervisor	Junior Student African Methodist Episcopal University Major: Public Administration Minor: Management Has 16 years of data collection experience
	Edna K. Dolo	Enumerator	Junior Student in Nursing Smythe Institute of Management & Technology Has over 4 years of data collection experience
	Abigail T. Gbassagee	Enumerator	Graduating Senior African Methodist Episcopal University Major: Public Administration Minor: Accounting
	Rebecca Lablah	Enumerator	High School Graduate Has over 14 years of data collection experience
	Nehmiah Sneh	Enumerator	AA Social Works Has 8 years of field data collection experience
Lofa	Jemima T. Collins	Supervisor	BA Sociology and Social Works Has over 13 years of data collection experience
	Jimmy N. Kamara	Enumerator	BA Sociology and Mass Communication
	Luopu Kesselly	Enumerator	High School Graduate Has 3 years of data collection experience
	Venoria Crayton	Enumerator	BA Sociology and English
	Saifa Kokulo	Enumerator	BBA Sociology; Monitoring and Evaluation Officer MOH

Area of Assignment	Team Members	Team Position	Brief Profile
Bomi County	Willie Taweh	Supervisor	Monitoring & Evaluation Officer MOH
	Yassah Yates	Enumerator	Junior Student United Methodist University Major: Sociology Minor: Public Administration Has over 5 years of data collection experience
	Alfred Dalieh	Enumerator	AA degree in Social Science Has 3 years of experience in data collection
	Koboi Kadii	Enumerator	High School Graduate AA Practical Statistic Has over 20 years of data collection experience
	Tamia Morris	Enumerator	Graduating Senior United Methodist University Major: Economic Minor: Management Has 5 years of data collection experience

Table 37 **Field Quality Control Team**

	Members	Origin	Location
1.	Scott Mckeown	MEASURE Evaluation	University of North Carolina, USA
2.	Sumo Zeze	Subah-Belleh Associates	Management Consultant Firm, Liberia
3.	Jack Hazerjian	MEASURE Evaluation	University of North Carolina, USA

Table 38 **Data Entry Team**

	Persons Trained	Source of Recruitment	Selection
1.	Konatee G. Morris	SBA	
2.	Stephen S. Sieh, Jr.	Ministry of Health	
3.	E. Vanneh Konneh	Ministry of Health	
4.	Mike L. Ishmael	SBA	Selected
5.	Anthony Konah	SBA	Selected
6.	Augstine Whymer	SBA	
7.	Emmanuel H. Pelham	Ministry of Health	
8.	Diamond Smith	SBA	Selected
9.	Susan Varney	SBA	Selected
10.	Alexander W. Blidi	Ministry of Health	

Appendix 3 Questionnaires

County / Lot :_____ / _____ **Community / Questionnaire # :**_____ / _____

1

LQAS Main Questionnaire: Mothers of Children Aged 0 to 59 Months (Children < 5 years)

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. Interview date: --------/---------/--------- (dd/mm/yyyy)
2. County name: ----------
3. Survey Lot: ----------
4. Community name: ----------
5. Interviewer's name: ----------
6. Supervisor's name: ----------

Interviewee Information

7. Mother's full name: ----------
8. Mother's age in years (completed years):----------

Instructions: If exact age not known, probe to identify calendar events that indicate the year.

9. Name of child (**NAME**):----------
10. Sex of child: MALE [ ] FEMALE [ ]
11. Child's birth date: -------- /---------- /---------- (dd/mm/yyyy)

Instructions: If exact date not known, probe to identify local or seasonal events so that month and year can be determined.

12. Age of child (in months completed):_____

Water, Sanitation and Hygiene

13. What is the MAIN source of drinking water for members of your household?

1. Creek/river/lake----------[ ]
2. Rainwater----------[ ]
3. Dug well with hand pump----------[ ]
4. Open well----------[ ]
5. Bottled water----------[ ]

88. Other (**specify**: _____) ----------[ ]

14. Do you do anything to this water before using it for drinking?
    1. Yes----------[ ]
    2. No----------[ ] ***Go to Q.16***

15. What do you do to prepare drinking water?
    1. Boiling----------[ ]
    2. Chlorination----------[ ]
    3. Filtration----------[ ]
    4. Sunlight/Water Guard----------[ ]
    88. Other (**specify**:_____)----------[ ]

16. What kind of toilet does your household use?
    1. Flush toilet ----------[ ]
    2. Pit latrine ----------[ ]
    3. Ventilated improved pit (VIP) latrine ----------[ ]
    4. Community latrines----------[ ]
    5. No facility/bush/field ----------[ ] ***Go to Q.18***
    88. Other (**specify**:_____)----------[ ]

17. ***Instructions: Ask to see the toilet facility that the household uses. Does the facility exist and is it used?***
    1. Yes----------[ ]
    2. No----------[ ]

18. When during the day do you wash your hands? ***Instructions: Record <u>all</u> mentioned. After first answer probe: "Is there any other time during the day?"***
    1. Never----------[ ] ***Go to Q.20***
    2. Before feeding children----------[ ]
    3. Before food preparation----------[ ]
    4. After going to toilet----------[ ]
    5. After attending to a child who has gone pupu----------[ ]
    6. Before eating----------[ ]
    88. Other (**specify**: _____)----------[ ]

19. What do you use to wash your hands?
    1. Water only ----------[ ]
    2. Soap and water----------[ ]
    88= Other (**specify**: _____)----------[ ]

<u>Malaria Prevention</u>

20. Do you have any bed nets in your house?
    1. Yes----------[ ]
    2. No ----------[ ] ***Go to Q.26***

21. Where did you get your bed net from?
    1. Health facility/community distribution ----------[ ]
    2. Purchased from the market----------[ ]
    88. Other (**specify**:_____)----------[ ]
    98. Don't know----------[ ]

22. Has your bed net either been received or treated within the past 5 years?
    1. Yes----------[ ]
    2. No----------[ ] **Go to Q. 26**

23. Did (**NAME**) sleep under a treated bed net last night?
    1. Yes----------[ ]
    2. No----------[ ]

24. ***Instructions: Ask to see the bed net that (NAME) sleeps under and inspect it for holes or visible tears. (NO HOLES/TEARS= GOOD CONDITION, HOLES AND/OR TEARS=DAMAGED)***
    1. Condition of bed net:
        1.1. Good Condition----------[ ]
        1.2. Damaged----------[ ]
    2. Not seen (no net)----------[ ]
    3. Mother refused net observation/inspection----------[ ]

25. When you were pregnant with (**NAME**) did you sleep under a treated bed net?
    1. Yes----------[ ]
    2. No----------[ ]

Health Monitoring & Nutrition

26. ***OBSERVE TO CONFIRM*** – Does the child have a health card?
    1. Yes----------[ ]
    2. No ----------[ ] ***Go to Q.28***

27. ***Instructions: Record (Name's) birthweight:*** _____

28. Did your child (**NAME**) receive Vitamin A like this during the last 6 months? ***(show picture of Vitamin A supplement)***
    1. Yes----------[ ]
    2. No----------[ ]
    98. Don't know ----------[ ]

Family Planning

29. Have you ever received counseling in family planning from a health care provider?
    1. Yes----------[ ]
    2. No ----------[ ]

30. Are you currently using a modern method of contraception?
Instructions: Show pictures of pills, condom, injectable, implant, IUD.
    1. Yes----------[ ] ***Go to Q.36***
    2. No----------[ ]

31. What is your main reason for not using a modern method of contraception?
    1. Don't know about them----------[ ]
    2. Experienced side effects----------[ ]
    3. Heard bad things----------[ ]
    4. Not easily available----------[ ]
    5. Expensive----------[ ]
    88. Other (**specify**:_____)----------[ ]
    98. Don't know----------[ ]

32. Do you want to have any more children?
    1. Yes----------[ ]
    2. No ----------[ ] ***Go to Q.35***

33. Would you like to wait a while before having more children?
    1. Yes ----------[ ]
    2. No ----------[ ] ***Go to Q.35***

34. How much time would you like to wait before having your next child?
    1. Less than 2 years----------[ ]
    2. 2 years or more----------[ ]

35. Would you like to be using family planning?
    1. Yes ----------[ ] **END THIS QUESTIONNAIRE**
    2. No ----------[ ] **END THIS QUESTIONNAIRE**

36. What is the main method you or your husband/partner are using now to avoid/postpone getting pregnant? ***Instructions: Multiple answers possible. If mother is not able to cite a method, read down list of methods, show her the photos and check affirmative answers.***

    1. Pill ----------[ ]
    2. Male condom----------[ ]
    3. Injectables ----------[ ]
    4. Implants----------[ ]
    5. IUD----------[ ]
    6. Female condom----------[ ]
    7. Emergency contraception ----------[ ]
    8. Female sterilization (Tubal ligation) ----------[ ]
    9. Male sterilization (Vasectomy)----------[ ]
    88. Other (**specify**): ----------[ ]
    98. Don't know----------[ ]

37. Do you want to have any more children?
    1. Yes----------[ ]
    2. No----------[ ] ***END THIS QUESTIONNAIRE***

38. Would you like to wait a while before having more children?
    1. Yes ----------[ ]
    2. No----------[ ] ***END THIS QUESTIONNAIRE***

39. How much time would you like to wait before your next birth?
    1. Within 2 years from now----------[ ]
    2. Over 2 years from now----------[ ]
    98. Don't know----------[ ]

<u>NOTE</u>: Remember to complete a separate "Sub-Questionnaire: Women Age 15 to 49 Not Currently Using Modern Contraceptives" with a woman in a different household before leaving community.

County / Lot :_____ / _____ **Community / Questionnaire # :**_____ / _____

2

Replacement Questionnaire: Women Age 15 to 49
Not Currently Using Modern Contraceptives

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. Interview date: --------/---------/--------- (dd/mm/yyyy)
2. County name: ----------
3. Survey Lot: ----------
4. Community name: ----------
5. Interviewer's name: ----------
6. Supervisor's name: ----------

Interviewee Information

7. Mother's full name: ----------

8. Mother's age in years (completed years):----------

Instructions: If exact age not known, probe to identify calendar events that indicate the year.

9. What is your main reason for not using a modern method of contraception?
1. Don't know about them----------[ ]
2. Experienced side effects----------[ ]
3. Heard bad things----------[ ]
4. Not easily available----------[ ]
5. Expensive----------[ ]
89. Other (**specify**:_____)----------[ ]
99. Don't know----------[ ]

10. Do you want to have any more children?
1. Yes----------[ ]
2. No ----------[ ] ***Skip to Q.13***

11. Would you like to wait a while before having more children?
1. Yes----------[ ]
2. No----------[ ]

12. How much time would you like to wait before your next birth?
1. Less than 2 years----------[ ]
2. 2 years or more----------[ ]

13. Have you ever received counseling in family planning from a health care provider?
1. Yes----------[ ]
2. No----------[ ]

Thank you!!!!

County / Lot :_____ / _____ **Community / Questionnaire # :**_____ / _____

3

Sub-Questionnaire for Mothers of Children Aged 0 to 5 Months

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. Interview date: --------/---------/--------- (dd/mm/yyyy)
2. County name: ----------
3. Survey Lot: ----------
4. Community name: ----------
5. Interviewer's name: ----------
6. Supervisor's name: ----------

Interviewee Information

7. Mother's full name:----------
8. Mother's age in years (completed years):----------

Instructions: If exact age not known, probe to identify calendar events that indicate the year.

9. Name of child:----------
10. Sex of child: MALE [ ] FEMALE [ ]
11. Child's birth date: -------- /---------- /---------- (dd/mm/yyyy)
    Instructions: If exact date not known, probe to identify local or seasonal events so that month and year can be determined.
12. Age of child (in months completed):_____

Breast Feeding and Child Nutrition

13. Did you ever breast feed (**NAME**)?
    1. Yes ----------[ ]
    2. No----------[ ] ***Go to Q.16***
14. How long after birth did you **first** breast feed (**NAME**)?
    1. Immediately or within the first hour after delivery----------[ ]
    2. Within one to eight hours after delivery ----------[ ]
    3. More than eight hours after delivery ----------[ ]
15. Was (**NAME**) **only** breast fed during the last 24 hours?
    1. Yes----------[ ] ***Go to Q.17***
    2. No----------[ ]

16. What else did (**NAME**) drink yesterday during the day or at night? ***Instructions: Multiple answers possible. Wait for response and then probe by asking if they drank anything else during this time.***
    1. Nothing----------[ ]
    2. Plain water ----------[ ]
    3. Prepared infant formula ----------[ ]
    4. Any other milk such as tinned powder or fresh animal milk ----------[ ]
    5. Fruit juice----------[ ]
    6. Family porridge/broth/soup ----------[ ]
    7. Any other liquids (**specify**:_____)----------[ ]

Childhood Illnesses

17. Did (**NAME**) experience any of the following signs or symptoms in the past two weeks? ***Instructions: Read choices '1' to '3'. CHECK ALL THAT APPLY. Probe for symptoms described below.***
    1. Cough with difficulty breathing or cough with fever----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Cough
    2. Fever (only)----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Fever
    3. Diarrhea----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Diarrhea.

Notes for Interviewer:

- ***If child had cough with difficulty breathing or cough with fever, mark as cough and complete Sub-Questionnaire – Cough;***
- ***If child had fever ONLY during the illness episode, mark as fever and complete Sub-Questionnaire - Fever;***
- ***If child had <u>diarrhea</u> ONLY or <u>fever and diarrhea</u>, mark as diarrhea and complete Sub-Questionnaire - Diarrhea;***
- ***If child had <u>TWO OR MORE</u> of cough, diarrhea, fever as <u>DISTINCT illness episodes</u>, mark YES for each of the distinct illnesses and complete corresponding Sub-Questionnaires for those symptoms.***

Thank you!!!!

……

County / Lot :_____ / _____ **Community / Questionnaire # :**_____ / _____

4

Sub-Questionnaire for Mothers of Children Aged 6 to 23 Months

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. Interview date: --------/---------/--------- (dd/mm/yyyy)
2. County name: ----------
3. Survey Lot: ----------
4. Community name: ----------
5. Interviewer's name: ----------
6. Supervisor's name: ----------

Interviewee Information

7. Mother's full name**:**----------
8. Mother's age in years (completed years):----------
Instructions: If exact age not known, probe to identify calendar events that indicate the year.
9. Name of child:----------
10. Sex of child: MALE [ ] FEMALE [ ]
11. Child's birth date: -------- /---------- /---------- (dd/mm/yyyy)
Instructions: If exact date not known, probe to identify local or seasonal events so that month and year can be determined
12. Age of child (in months completed):_____

Breast Feeding and Child Nutrition

13. Do you currently breastfeed (**NAME**)?
    1. Yes ----------[ ]
    2. No----------[ ] ***Go to Q.16***
14. Did you breastfeed (**NAME**) in the last day and night?
    1. Yes----------[ ]
    2. No----------[ ] ***Go to Q.16***
15. How many times did you breastfeed (**NAME**) during the last day and night?
    Number of times child was breastfed: _____

16. What did (**NAME**) **drink** yesterday during the day and at night? ***Instructions: Multiple answers possible wait for the spontaneous response and then probe for additional answers.***
    1. Nothing----------[ ]
    2. Plain water ----------[ ]
    3. Any other milk such as tinned powder or fresh animal milk----------[ ]
    4. Fruit juice----------[ ]
    5. Porridge (of e.g. rice or plantain dust, eddoe dust)----------[ ]
    6. Any other liquids (**specify**:_____) ----------[ ]

17. What did (**NAME**) **eat** yesterday during this past day and night? (**Multiple answers possible, wait for the spontaneous response and then probe**)
    1. Nothing ----------[ ]
    2. Any food made from grains----------[ ]
    3. Pumpkin, carrots or sweet potatoes----------[ ]
    4. Any other food made from roots/tubers (e.g. potato, cassava or other local roots/tubers)----------[ ]
    5. Any green leafy vegetables ----------[ ]
    6. Mango, papaya or other local vitamin "A" rich fruit----------[ ]
    7. Any other fruit and vegetables (e.g. banana, oranges, tomatoes)----------[ ]
    8. Meat poultry, fish, or eggs----------[ ]
    9. Any foods made from legumes (e.g. beans or peanuts) ----------[ ]
    10. Yogurt/Curd----------[ ]
    11. Any food made with palm butter, cooked with palm oil----------[ ]
    12. Other (**specify**:_____) ----------[ ]

Childhood Illnesses

18. Did (**NAME**) experience any of the following signs or symptoms in the past two weeks? ***Instructions: Read choices '1' to '3'. CHECK ALL THAT APPLY. Probe for symptoms described below.***
    1. Cough with difficulty breathing or cough with fever----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Cough
    2. Fever (only)----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Fever
    3. Diarrhea- ----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Diarrhea

Notes for Interviewer:

- ***If child had cough and difficulty breathing or cough and fever, mark as cough and complete Sub-Questionnaire – Cough;***
- ***If child had fever ONLY during the illness episode, mark as fever and complete Sub-Questionnaire - Fever;***
- ***If child had diarrhea ONLY or fever and diarrhea, mark as diarrhea and complete Sub-Questionnaire - Diarrhea;***
- ***If child had TWO OR MORE of cough, diarrhea, fever as DISTINCT illness episodes, mark YES for each of the distinct illnesses and complete corresponding Sub-Questionnaires for those symptoms.***

Thank you!!!!

……

County / Lot :_____ / _____ **Community / Questionnaire # :**_____ / _____

5

Sub-Questionnaire for Mothers of Children Aged 12 to 23 Months

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. Interview date: --------/---------/--------- (dd/mm/yyyy)
2. County name: ----------
3. Survey Lot: ----------
4. Community name: ----------
5. Interviewer's name: ----------
6. Supervisor's name: ----------

Interviewee Information

7. Mother's full name:----------

Instructions: If exact age not known, probe to identify calendar events that indicate the year.

8. Mother's age in years (completed years):----------
9. Name of child:----------
10. Sex of child: MALE [ ] FEMALE [ ]
11. Child's birth date: -------- /---------- /---------- (dd/mm/yyyy)
    Instructions: If exact date not known, probe to identify local or seasonal events so that month and year can be determined.
12. Age of child (in months completed):_____

Immunization

13. Do you have a card where (**NAME's**) vaccination dates are written down? If yes, can you show me the card?
    1. Yes, card is seen----------[ ]
    2. No, either has no card or card not shown----------[ ]

14. Did (**NAME**) receive three Penta (Pentavalent) vaccinations before 1 year of age (12 months)?
Instructions: If an immunization card or other document is available, also copy the date for the immunizations requested in the space provided.

    1. Yes, verified on card----------[ ]

        Date of last Penta (Pentavalent) vaccination recorded: _ _ / _ _ /_ _ _ _
        (dd/mm/yyyy)

    2. Yes, mother/caretaker says so----------[ ]
    3. No, either not on card or mother/caretaker says no ----------[ ]

15. Did (**NAME**) receive <u>all</u> vaccinations to be fully vaccinated before 1 year of age (12 months)?
(***Interviewer can mention the vaccinations BCG, Penta 1,2,3, measles, polio, and yellow fever vaccination. Written or verbal proof of <u>all</u> of the vaccinations must be provided in order to mark 'Yes'.)***
    1. Yes, verified on card----------[ ]

        Date BCG recorded: _ _ / _ _ /_ _ _ _ (dd/mm/yyyy)

        Date Measles recorded: _ _ / _ _ /_ _ _ _ (dd/mm/yyyy)

    2. Yes, mother/caretaker says so----------[ ]
    3. No, either not all marked on card or mother/caretaker says no to one or more vaccination
    ----------[ ]

<u>Childhood Illnesses</u>

16. Did (**NAME**) experience any of the following signs or symptoms in the past two weeks?
Instructions: Read choices '1' to '3'. CHECK ALL THAT APPLY. Probe for symptoms described below.
    1. Cough with difficulty breathing or cough with fever ----------NO [ ] YES [ ]
    If YES, go to Sub-Questionnaire – Cough

    2. Fever (only)----------NO [ ] YES [ ]
    If YES, go to Sub-Questionnaire – Fever

    3. Diarrhea- ----------NO [ ] YES [ ]
    If YES, go to Sub-Questionnaire – Diarrhea

Notes for Interviewer:

- ***If child had cough <u>and</u> difficulty breathing or fever <u>and</u> cough, mark as cough and complete Sub-Questionnaire – Cough;***
- ***If child had fever ONLY during the illness episode, mark as fever and complete Sub-Questionnaire - Fever;***
- ***If child had <u>diarrhea</u> ONLY or <u>fever and diarrhea</u>, mark as diarrhea and complete Sub-Questionnaire - Diarrhea;***
- ***If child had <u>TWO OR MORE</u> of cough, diarrhea, fever as <u>DISTINCT illness episodes</u>, mark YES for each of the distinct illnesses and complete corresponding Sub-Questionnaires for those symptoms.***

Thank you!!!!

……

County / Lot :_____ / _____ **Community / Questionnaire # :**_____ / _____

6

Sub-Questionnaire for Mothers of Children Aged 0-23 Months

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. Interview date: --------/---------/--------- (dd/mm/yyyy)
2. County name: ----------
3. Survey Lot: ----------
4. Community name: ----------
5. Interviewer's name: ----------
6. Supervisor's name: ----------

Interviewee Information

7. Mother's full name:----------

8. Mother's age in years (completed years):----------
Instructions: If exact age not known, probe to identify calendar events that indicate the year.

9. Name of child:----------

10. Sex of child: MALE [ ] FEMALE [ ]

11. Child's birth date: -------- /---------- /---------- (dd/mm/yyyy)
Instructions: If exact date not known, probe to identify local or seasonal events so that month and year can be determined.

12. Age of child (in month's completed):_____

Breast Feeding

13. How long after birth did you **first** breast feed (**NAME**)?
    1. Immediately or within first hour after delivery ----------[ ]
    2. Within one to eight hours----------[ ]
    3. More than eight hours----------[ ]
    4. Did not breast feed----------[ ]

Prenatal Care & Early Post-Natal Care

14. While you were pregnant with (**NAME**), did you go to anyone for a check-up for this pregnancy?
    1. Yes ----------[ ]
    2. No----------[ ] ***Go to Q.18***

15. Who did you **mainly** go to see for check-ups during your pregnancy? ***Check only one.***
    1. Doctor ----------[ ]
    2. Nurse ----------[ ]
    3. Traditional birth attendant ----------[ ]
    4. Midwife----------[ ]
    5. Other (**specify**:_____) ----------[ ]

16. When you first went for a check-up, how many months was the pregnancy?
    Instructions: Ask to see "Be Better Card".
    1. Number of Months ( )----------[ ]
    98. Don't know----------[ ]

17. While you were pregnant with (**NAME**), how many total check-up visits did you have before birth? ***Instructions: Ask to see "Be Better Card".***
    1. Number of visits ( )----------[ ]
    98. Don't know----------[ ]

18. When you were pregnant with (**NAME**), did you take tablets like these (***show picture of SP tablets***) to protect you from malaria?
    1. Yes ----------[ ]
    2. No----------[ ] ***Go to Q.20***
    98. Don't know ----------[ ] ***Go to Q.20***

19. How many times did you take tablets like these (***show picture of SP tablets***) to protect you from malaria infection when you were pregnant with (**NAME**)?
    1. Number of times SP was taken during pregnancy_____ ----------[ ]
    98. Don't know----------[ ]

20. When you were pregnant with (**NAME**), did you take tablets like these (***show picture of Iron+Folic Acid tablets***) to strengthen your blood?
    1. Yes ----------[ ]
    2. No ----------[ ] ***Go to Q.22***
    98. Don't know----------[ ] ***Go to Q.22***

21. For how long did you take these tablets?
    1. Less than 6 months----------[ ]
    2. 6 months or more----------[ ]
    98. Don't know----------[ ]

22. When you were pregnant, **before you gave birth** to (**NAME**), did you receive an injection in the arm to prevent the baby from getting tetanus?
    1. Yes ----------[ ]
    2. No----------[ ] ***Go to Q.24***
    98. Don't know----------[ ] ***Go to Q.24***

23. When you were pregnant, **before you gave birth** to (**NAME**), how many times did you receive the tetanus injection?
    1. Number of times(_____)----------[ ]
    98. Don't know ----------[ ]

24. At any time **before being pregnant** with (**NAME**), did you receive any tetanus injections to protect you or an earlier pregnancy?
    1. Yes----------[ ]
    2. No----------[ ] ***Go to Q.26***
    98. Don't Know----------[ ] ***Go to Q.26***

25. **Before being pregnant** with (**NAME**), how many other times did you receive a tetanus injection?
    Number of times (_____) ----------[ ]
    98=Don't know----------[ ]

26. Where did you give birth to (**NAME**)?
    1. Clinic/Health center/Hospital ----------[ ]
    2. Your Home----------[ ]
    3. TBA House----------[ ]
    4. Birthing Center in community----------[ ]
    5. Other (**specify**: _____)----------[ ]

27. Who assisted you with (**NAME's**) delivery?
    Instructions: Probe for the type of person and record most qualified person of those mentioned. Mark only 1 choice
    1. Doctor----------[ ]
    2. Nurse/Midwife----------[ ]
    3. Physician's assistant----------[ ]
    4. Traditional midwife----------[ ]
    5. Family member (specify: _____)----------[ ]
    6. Other (**specify**: _____)----------[ ]

28. How much did (**NAME**) weigh at the time of birth (***verify record if exists***)?
    1. Less than 2.5 kg----------[ ]
    2. More than 2.5 kg----------[ ]
    98. Don't Know----------[ ]

29. Within the first two months after (**NAME**) was born, were you given Vitamin A? ***Show picture of Vitamin A tablets.***
    1. Yes----------[ ]
    2. No----------[ ]

Childhood Illnesses

30. Did (**NAME**) experience any of the following symptoms in the past two weeks?
    Instructions: Read choices '1' to '3'. CHECK ALL THAT APPLY. Probe for symptoms described below.
    1. Cough with troubled breathing or cough with fever ----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Cough

    2. Fever (only)----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Fever

    3. Diarrhea- ----------NO [ ] YES [ ]
       If YES, go to Sub-Questionnaire – Diarrhea

County / Lot :_____ / _____ **Community / Questionnaire # :_____ / _____**

Notes for Interviewer:

- ***If child had cough <u>and</u> troubled breathing or cough <u>and</u> fever, mark as cough and complete Sub-Questionnaire – Cough;***
- ***If child had fever ONLY during the illness episode, mark as fever and complete Sub-Questionnaire - Fever;***
- ***If child had <u>diarrhea</u> ONLY or <u>fever and diarrhea</u>, mark as diarrhea and complete Sub-Questionnaire - Diarrhea;***
- ***If child had <u>TWO OR MORE</u> of cough, diarrhea, fever as <u>DISTINCT illness episodes</u>, mark YES for each of the distinct illnesses and complete corresponding Sub-Questionnaires for those symptoms.***

Thank you!!!!

……

County / Lot :_____ / _____ **Community / Questionnaire # :**_____ / _____

7

Mothers of Children 0 to 59 months: Cough and Difficult Breathing or Cough and Fever in Last 2 Weeks

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. Interview date: --------/---------/--------- (dd/mm/yyyy)
2. County name: ----------
3. Survey Lot: ----------
4. Community name: ----------
5. Interviewer's name: ----------
6. Supervisor's name: ----------

Interviewee Information

7. Mother's full name: ----------
8. Mother's age in years (completed years):----------
Instructions: If exact age not known, probe to identify calendar events that indicate the year.
9. Name of child:----------
10. Sex of child: MALE [ ] FEMALE [ ]
11. Child's birth date: -------- /---------- /---------- (dd/mm/yyyy)
Instructions: If exact date not known, probe to identify local or seasonal events so that month and year can be determined.
12. Age of child (in months completed):_____

Acute Respiratory Infection

13. When (**NAME**) was sick with a cough and difficult breathing **or** a cough and fever in the last 2 weeks, did you seek treatment for the cough/troubled breathing/fever?
    1. Yes ----------[ ]
    2. No----------[ ] ***END THIS SUB-QUESTIONNAIRE***
14. How long did you wait before seeking care?
    1. Same day ----------[ ]
    2. Next day ----------[ ]
    3. Two days ----------[ ]
    4. Three or more days ----------[ ]
    98. Don't know ----------[ ]

15. Where did you first go for treatment? **(*CHECK ONLY ONE*)**
    1. Health facility (**specify name**:_____) ----------[ ]
    2. General Community Health Volunteer (gCHV) or Community health worker----------[ ]
    3. Pharmacy----------[ ]
    4. Private doctor----------[ ]
    5. Black baggers ----------[ ]
    6. Traditional Practitioner ----------[ ]
    7. Friend/Relative----------[ ]
    88. Other (**specify**:_____)----------[ ]

16. Which medicines were given to (**NAME**) for his/her cough with difficult breathing or fever?
Instructions: Tick ALL medicines that were given. If mother is unable to recall drug name(s), ask her to show the drug(s) to you. If she is unable to show you, mark 'Don't know'.
    1. Co-Trimoxazole (Septrin)----------[ ]
    2. Other antibiotic (**specify** if possible: _____) ----------[ ]
    3. Cough syrup----------[ ]
    4. Something for fever (aspirin or paracetamol)----------[ ]
    5. None ----------[ ]
    88. Other (**specify**:_____)----------[ ]
    98. Don't know----------[ ]

17. Was (**NAME**) referred for additional treatment?
    1. Yes ----------[ ]
    2. No----------[ ]
    98. Don't know ----------[ ]

Thank you!!!!

……

County / Lot :_____ / _____ **Community / Questionnaire # :**_____ / _____

8

Mothers of Children 0 to 59 months: With Diarrhea in Last 2 Weeks

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. **Interview date:** --------/---------/--------- **(dd/mm/yyyy)**
2. **County name:**----------
3. **Survey Lot:** ----------
4. **Community name:** ----------
5. **Interviewer's name:** ----------
6. **Supervisor's name:** ----------

Interviewee Information

7. **Mother's full name:** ----------
8. **Mother's age in years (completed years):**----------

Instructions: If exact age not known, probe to identify calendar events that indicate the year.

9. **Name of child:**----------
10. **Sex of child: MALE [ ] FEMALE [ ]**
11. **Child's birth date:** -------- /---------- /---------- **(dd/mm/yyyy)**

Instructions: If exact date not known, probe to identify local or seasonal events so that month and year can be determined.

12. **Age of child (in months completed):**_____

Treatment Given

13. When (**NAME**) had diarrhea in the last 2 weeks, did you seek treatment for the diarrhea?

1. Yes ----------[ ]
2. No----------[ ] **END THIS SUB-QUESTIONNAIRE**

14. How long did you wait before seeking care?

1. Same day----------[ ]
2. Next day----------[ ]
3. Two days ----------[ ]
4. Three or more days ----------[ ]
98. Don't know ----------[ ]

15. Where did you first go for treatment? **(CHECK ONLY ONE)**

1. Health facility (**specify name**:_____) ----------[ ]
2. General Community Health Volunteer (gCHV) or Community health worker----------[ ]
3. Pharmacy----------[ ]
4. Private doctor ----------[ ]
5. Black baggers----------[ ]
6. Traditional Practitioner----------[ ]
7. Friend/Relative ----------[ ]
88. Other (**specify**: _____):----------[ ]

16. When (**NAME**) had diarrhea in the last 2 weeks, what was given to treat the diarrhea? ***Multiple answers possible*. *Probe by asking if there was anything else given during the episode. MARK ALL RESPONSES.***

1. Nothing----------[ ]
2. Home preparation of ORS (*Running stomach medicine*) ----------[ ]
3. Commercial ORS packet ----------[ ]
4. Home remedies/ Herbal medicine----------[ ]
88. Other (**specify**:_____)----------[ ]

17. When (**NAME**) had diarrhea in the last 2 weeks, did you continue to feed the child?

1. Yes----------[ ]
2. No----------[ ]

18. Was (**NAME**) referred for additional treatment?

1. Yes ----------[ ]
2. No ----------[ ]
98. Don't know----------[ ]

Thank you!!!!

……

County / Lot :_____ / _____ Community / Questionnaire # :_____ / _____

9

Mothers of Children 0 to 59 months: With Fever in Last 2 Weeks

MOHSW/USAID/RBHS/MEASURE Evaluation

Interview Information

1. **Interview date:** --------/---------/--------- **(dd/mm/yyyy)**
2. **County name:** ----------
3. **Survey Lot:** ----------
4. **Community name:** ----------
5. **Interviewer's name:** ----------
6. **Supervisor's name:** ----------

Interviewee Information

7. **Mother's full name:**----------
8. **Mother's age in years (completed years):**----------

Instructions: If exact age not known, probe to identify calendar events that indicate the year.

9. **Name of child:**----------
10. **Sex of child: MALE [ ] FEMALE [ ]**
11. **Child's birth date:** -------- /---------- /---------- **(dd/mm/yyyy)**
    Instructions: If exact date not known, probe to identify local or seasonal events so that month and year can be determined.
12. **Age of child (in months completed):** _____

Fever (Malaria)

13. When (**NAME**) was ill with fever in the last two weeks, did you seek treatment for (**NAME's**) fever?

1. Yes----------[ ]
2. No----------[ ] ***END THIS SUB-QUESTIONNAIRE***

14. How long did you wait before seeking care?

1. Same day----------[ ]
2. Next day----------[ ]
3. Two days----------[ ]
4. Three or more days----------[ ]

98. Don't know----------[ ]

15. Where did you first go for treatment? (***CHECK ONLY ONE***)

1. Health facility (Specify name_____) ----------[ ]
2. General Community Health Volunteer (gCHV) or Community health worker----------[ ]
3. Pharmacy ----------[ ]
4. Private doctor ----------[ ]
5. Black baggers----------[ ]
6. Traditional Practitioner----------[ ]
7. Friend/Relative----------[ ]
88. Other (**specify**): ----------[ ]

16. Were any medicines given to (**NAME**) for his/her fever?

1. Yes----------[ ]
2. No----------[ ] ***END THIS SUB-QUESTIONNAIRE***

17. Was any test done before you were given medicine?

1. Yes----------[ ]
2. No----------[ ]

18. Which medicines were given to (**NAME**) for his/her fever?

Instructions: Tick all medicines that were given. If mother is unable to recall drug name(s), as her to show the drug(s) to you. If she is unable to show you, mark 'Don't know'.

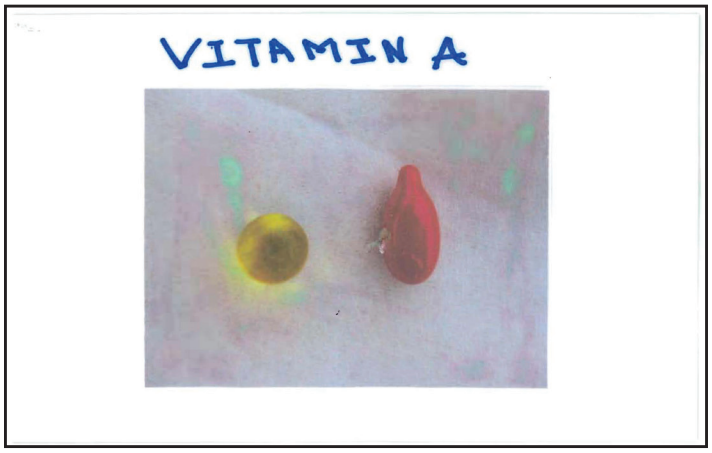
1= ACT (artemisinin-based combination therapy)----------[ ]
2=Chloroquine----------[ ]
3=Quinine----------[ ]
4= SP/Fansidar ----------[ ]
5=Aspirin ----------[ ]
6=Paracetamol ----------[ ]
7=Ibuprofen----------[ ]
88=Other (**specify**):----------[ ]
98**=** Don't Know----------[ ]

19. Was (**NAME**) referred for additional treatment?

1. Yes ----------[ ]
2. No----------[ ]
98. Don't know ----------[ ]

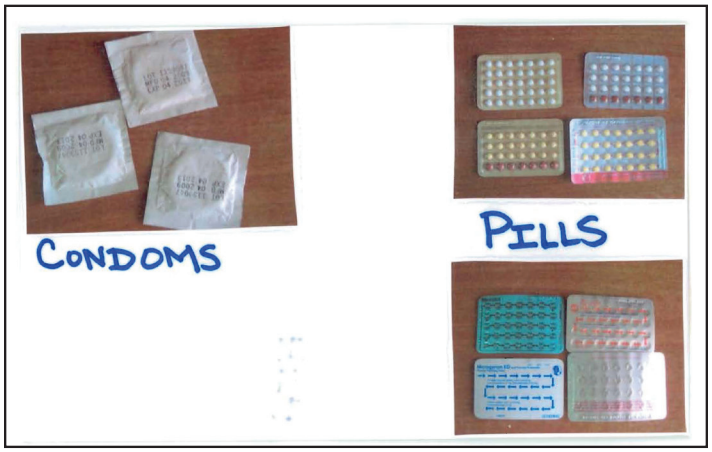
Thank you!!!!

Appendix 4 Flashcards Used as Questionnaire Aids



Vitamin A

Implant, Injectable, IUD



Condoms, Pills

Malaria (SP) Tablet

Female Condom, Emergency Contraceptive, Cycle Beads

Iron and Folic Acid Tablets

MEASURE Evaluation
Carolina Population Center
University of North Carolina at Chapel Hill
206 W. Franklin Street
Chapel Hill, NC 27516
www.cpc.unc.edu/measure

TR-11-82