EVALUATION

Impact Evaluation of Malawi's Organized Network of Services for Everyone's (ONSE) Health Project

Baseline Report

July 2018

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ABSTRACT

Background: MEASURE Evaluation is conducting an impact evaluation of the Organized Network of Services for Everyone's (ONSE) Health project, in Malawi. ONSE aims to reduce maternal, newborn, and child morbidity and mortality.

Aims: The primary goal of the impact evaluation is to estimate the extent to which the ONSE project has impacted health outcomes.

Methods: The impact evaluation uses a quasi-experimental approach in three ONSE and three non-ONSE districts. The end line survey will use a difference-in-differences (DID) approach to estimate the causal impact of the ONSE project on changes in health and facility outcomes. Baseline data were collected from April to July 2017 from 7,929 households and 139 health facilities.

Results and Conclusions: Skilled antenatal care (ANC) attendance and skilled birth attendance were almost universal. One-half of pregnant women received the recommended four or more ANC visits during their pregnancy. Knowledge of key maternal and newborn danger signs was very low. The availability of services for family planning, ANC, and basic obstetric care was very high. Readiness to provide services was more varied. Obstetrics was the area with the lowest general readiness of all service types. Assisted vaginal delivery and removal of retained products were the two signal functions of basic emergency obstetric and newborn care (BEmONC) provided by the lowest percentage of health facilities and hospitals. The end line survey will provide follow-up data on these indicators and will measure change over the project period.

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Baseline Report

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Cover: Young mother in Malawi. Photo: © 2008 Lisa Basalla, courtesy of Photoshare

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ABBREVIATIONS

ACT	artemisinin combination therapy
ANC	antenatal care
ANC 4+	four or more ANC visits during pregnancy
ARI	acute respiratory infection
BEmONC	basic emergency obstetric and newborn care
CDCS	Country Development Cooperation Strategy
CEmONC	comprehensive emergency obstetric and newborn care
CHAM	Christian Health Association of Malawi
CSR	Centre for Social Research
DHIS 2	District Health Information System Version 2
DHMT	District Health Management Team
DHS	Demographic and Health Survey
DID	difference-in-differences
EA	enumeration area
FHP	family health package
FP	family planning
HSS	health systems strengthening
IE	impact evaluation
IMCI	integrated management of childhood illnesses
IMPAC	integrated management of pregnancy and childbirth
IPT	intermittent prevention treatment
IPTp	intermittent prevention treatment during pregnancy
ITN	insecticide treated net
IUD	intrauterine device
MCPR	modern contraceptive prevalence rate
MDG	Millennium Development Goal
MES	MDG Endline Survey
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MNCH	maternal, neonatal, and child health
ONSE	Organized Network of Services for Everyone
ORS	oral rehydration salts
PNC	postnatal care
RDT	rapid diagnostic test
RH	reproductive health
RMNCH	reproductive, maternal, newborn, and child health
SARA	Service Availability and Readiness Assessment
SBCC	strategic behavior change communication
SPA	Service Provision Assessment
SSDI	Support for Service Delivery Integration

USAID	United States Agency for International Development
WASH	water, sanitation, and hygiene
WHO	World Health Organization
WRA	women of reproductive age

EXECUTIVE SUMMARY

Introduction

Led by the University of North Carolina at Chapel Hill, MEASURE Evaluation is conducting an impact evaluation of the Malawi Organized Network of Services for Everyone's (ONSE) Health project. ONSE is implemented by Management Sciences for Health with support from the United States Agency for International Development (USAID) Malawi Mission. ONSE aims to reduce maternal, newborn, and child morbidity and mortality by improving access to, the quality of, and demand for priority health services.

Of interest to the impact evaluation is ONSE's "smart approach" to capacity building and problem solving. "Smart" capacity building involves the co-development of capacity building plans with District Health Management Teams (DHMTs) to identify district-specific capacity building needs related to the provision of health services. An example of "smart" problem solving is the use of locally collected data by DHMTs to identify health priorities and develop solutions to problems identified.

Background

Malawi is one of the few countries in sub-Saharan Africa to achieve Millennium Development Goal (MDG) 4 for child survival, which aimed to reduce the under-five mortality rate by two-thirds between 1990 and 2015. Nevertheless, neonatal, infant, and under-five mortality rates remain high. The major causes of infant and child death in Malawi are pneumonia, malaria, diarrhea, HIV/AIDS, and malnutrition. Malaria is endemic in Malawi and accounts for more than 40 percent of all hospitalizations for children under five (National Statistics Office [Malawi] and ICF, 2017.).

There are several other factors that contribute to high under-five mortality rates. Only one-half of all Malawian children ages 12 to 23 months have received all age-appropriate vaccinations, and only one in 10 children ages 24 to 35 months have received all age-appropriate vaccinations. Nearly four in 10 (37 percent) children under five are stunted, an indication of chronic undernutrition. Water and sanitation-related diseases are also a leading cause of death for children under five (National Statistics Office [Malawi] and ICF, 2017).

Although nine in 10 births in Malawi occur in health facilities, maternal mortality in Malawi remains high at 439 deaths per 100,000 live births, and one-half of women do not receive a postnatal checkup within 41 days of delivery. The main causes of maternal mortality are postpartum hemorrhage, eclampsia, and sepsis. Malawi has made progress in family planning/reproductive health (FP/RH), with about six in 10 married women ages 15 to 49 using a modern method of FP (National Statistics Office [Malawi] and ICF, 2017).

Impact Evaluation Research Questions and Methods

The ONSE impact evaluation aims to answer three primary research questions:

- What is the impact of the ONSE project on changes in health and facility outcomes compared with changes in these outcomes in districts that did not receive the ONSE project?

- How was "smart" capacity building and problem solving operationalized in each district?
- What is the impact of ONSE's community engagement and mobilization activities in communities where this intervention was implemented compared with communities that did not receive this intervention?

The evaluation employs a quasi-experimental design in which pre- and post-differences in the outcomes of interest will be compared between project and comparison districts to measure the impact of ONSE (Table ES1). Project districts were purposively selected. They are Machinga, Nkhotakota, and Salima. Comparison districts were selected based on recent estimates of key health indicators. They are Mzimba, Ntchisi, and Nsanje. Data collection methods consisted of a baseline (2017) and end line (2021) quantitative household survey, a baseline and end line health facility assessment, implementation process monitoring (2018–2020), and an end line qualitative study.

In collaboration with a local research partner, the Centre for Social Research (CSR), MEASURE Evaluation collected baseline data from April 28 to June 30, 2017 on the intended health and facility outcomes of the ONSE project. This report presents the findings of the household and facility baseline surveys. A difference in differences (DID) analysis is planned for the impact evaluation at the time of the end line survey. Results of the evaluation will be used to inform future health programming in Malawi and will generate evidence on approaches that tailor project activities at the district level based on varying needs.

Table ES1. Primary and secondary outcomes of interest

Primary outcome areas **Source: Household survey**	**Secondary outcome areas** **Source: Facility survey**
• Antenatal care • Maternal health • Postnatal care (PNC) • FP • Care seeking for children under three • Patient satisfaction • Women's knowledge of key maternal and newborn warning/danger signs • Women's knowledge of symptoms and causes of key childhood illnesses • Beliefs about FP • Exposure to behavior change messaging	• General service availability • Availability and readiness to provide services for: ✓ FP ✓ Antenatal care (ANC) ✓ Basic obstetric and newborn care ✓ Comprehensive obstetric care ✓ Preventative and curative child health services ✓ Malaria services

Results

The household survey reached 7,929 households and 7,542 women of reproductive age (WRA) in three project and three comparison districts. A summary of key health indicators for ANC, birth attendance, PNC, and contraceptive use is provided in Table ES2. The receipt of skilled ANC and skilled birth attendance were almost universal in both the project and comparison domains. However, only about one-third of women received ANC in their first trimester and only one-half of pregnant women receive the recommended four or more ANC visits during their pregnancy.

The rate of postnatal checks was about two-thirds, with almost all of these women receiving PNC within two days of childbirth. The modern contraceptive prevalence rate was approximately 55 percent among WRA who are married or living with a man, and was approximately 46 percent among all WRA.

The household survey also asked women about key danger signs for specific maternal and child health issues to gauge their knowledge of priority topics for the Government of Malawi and in general. Knowledge was very low about most warning and danger signs during pregnancy, childbirth, and for newborn complications. Few women knew what types of issues to include in a birth plan, with the least frequently considered topic being who would care for the other children in the household during childbirth. Severe bleeding during pregnancy and childbirth were the only warning/danger signs reported by more than one-half of women surveyed. Only approximately one-third of women knew that difficulty breathing and high fever were serious danger signs for newborns.

The Government of Malawi's National Health Communications Strategy also calls for improving knowledge of key symptoms and causes of diarrhea, pneumonia, and malaria. Knowledge of symptoms and the cause of malaria were the most well-known of these three infectious diseases. Women reported that breathing problems (approximately 60 percent) and not dressing warmly enough (70 percent) were symptoms and causes of pneumonia, with almost no knowledge of other symptoms or causes. Approximately 40 percent of women in both domains knew that loose and watery stools for more than three days were a symptom of diarrhea. Knowledge of the causes of diarrhea was higher than that for pneumonia. Between 35 and 40 percent of the women in both domains reported lack of safe drinking water and food contamination as causes of diarrhea, and about one-fifth of women reported eating rotten food and not washing hands after defecation as other causes.

Table ES2. Summary of health outcomes

Health outcome	Project	Comparison	Total
ANC			
Skilled ANC	98.6	96.9	97.7
ANC visits in the first trimester	30.8	35.2	32.9
Four or more ANC visits during pregnancy	51.8	55.8	53.7
Number of live births in the past three years	1,801	1,598	3,399
Birth attendance			
Skilled birth attendance	93.5	94.7	94.1
Number of births in the past three years	1,801	1,598	3,399
PNC			
Women receiving postnatal health checks	63.7	65.1	64.3
Women receiving postnatal health check within two days of birth	61.1	59.3	60.3
Number of live births in the past two years	1,333	1,147	2,480
Contraceptive use			
Modern contraceptive prevalence rate among WRA who are married or living with a man	55.5	53.7	54.6
Number of WRA who are married or living with a man	2,522	2,178	5,240
Modern contraceptive prevalence rate among all women	45.6	45.8	45.7
Number of WRA who are married, living with a man, or unmarried and sexually active	3,582	3,576	7,158
Total number of WRA	**3,776**	**3,766**	**7,542**

The health facility survey was administered to all public and Christian Health Association of Malawi (CHAM) facilities in the project and comparison domains. The survey revealed high availability of services for FP, ANC, and basic obstetric care (more than 90 percent in almost all facilities). Readiness to provide services was more varied. The readiness to provide services indicators were low across most dimensions of the measure, including staffing and guidelines, medicines and commodities, diagnostics, and equipment. Staffing and guidelines were lacking in all areas, although FP readiness on this dimension reached more than 30 percent in the comparison domain. The availability of medicines and commodities varied by service type but was also low. Malaria and ANC were the two areas with the greatest availability of medicines and commodities, with 32 percent and 24 percent of the facilities, respectively, having all required items on the day of the visit. Although some facilities had the required resources to meet staffing and guidelines requirements for basic obstetric and newborn care, very few met other requirements for basic obstetric and newborn care or comprehensive care. Obstetrics was the area with the lowest general readiness of all service types.

Conclusions

The Malawi ONSE impact evaluation seeks to test the hypothesis that the interventions implemented by ONSE will improve health outcomes for women, newborns, and children in the project domain compared to the comparison domain.

The household survey conducted in 2017 as part of the Malawi ONSE impact evaluation establishes baseline indicators for household and women's background characteristics, primary outcomes, and exposure to project or similar interventions in both the project and comparison domains. The health facility survey, conducted at the same time as the household survey, establishes baseline estimates for secondary outcomes related to the availability of health services and facility readiness to provide specific services in both the project and comparison domains.

The baseline survey reveals important information about the project and comparison domains that will be considered during the end line impact analysis. First, about one-third of households in both domains reported receiving support from a related intervention in the 12 months leading up to the survey. Malaria was the most commonly reported area of support, followed by water, sanitation, and hygiene (WASH). More information will be sought regarding these projects and the potential of their activities to influence the ONSE project's outcomes. With this information, an appropriate strategy will be developed to control for any contamination resulting from outside interventions during the ONSE project.

Second, the surveys reveal important similarities and differences in households and facilities in the evaluation sample. Facility service availability and readiness were generally similar in project and comparison domains. Methodological techniques will be applied at end line, where necessary, to account for these differences.

Next Steps

End line data collection is planned for 2021. The same households will be interviewed at that time to evaluate the impact of ONSE on the health outcomes of interest in the project domain. The DID approach will be

used to compare pre- and post-intervention differences in outcomes between the project and comparison domains. Qualitative analysis will aim to describe and understand differences in how respondents in ONSE's project communities were exposed to its strategic behavior change communication (SBCC) campaign.

Ongoing implementation process monitoring will occur through the time of the end line survey. The monitoring will focus on how the "smart" approach was operationalized in the project domain and will seek to identify the pathways through which this approach affects project beneficiaries. Implementation process monitoring will also provide information about exposure to other activities that may affect the outcomes of the impact evaluation.

INTRODUCTION

Led by the University of North Carolina at Chapel Hill, MEASURE Evaluation is conducting an impact evaluation of the ONSE project. ONSE is implemented Management Sciences for Health[1] with support from the USAID Malawi Mission. ONSE aims to reduce maternal, newborn, and child morbidity and mortality by improving access to, the quality of, and demand for priority health services.

The ONSE impact evaluation employs a quasi-experimental design in which outcomes of interest are compared between project and comparison districts over time to measure the impact of ONSE. Data collection methods include a baseline (2017) and end line (2021) quantitative household survey, a baseline and end line health facility assessment, implementation process monitoring (2018–2020), and an end line qualitative study. In collaboration with the local research partner, CSR, MEASURE Evaluation collected baseline data from April 28 to June 30, 2017 on the intended health and facility outcomes of ONSE. This report presents the findings of the household and facility baseline surveys.

Background

Malawi is one of the few countries in sub-Saharan Africa to achieve MDG 4 for child survival, which aims to reduce the under-five mortality rate by two-thirds between 1990 and 2015. Nevertheless, neonatal, infant, and under-five mortality rates remain high at 27, 42, and 63 per 1,000 live births, respectively (National Statistics Office [Malawi] and ICF, 2017). The major causes of infant and child death in Malawi are pneumonia, malaria, diarrhea, HIV/AIDS, and malnutrition.

Nine in 10 births in Malawi occur in a health facility. The country has experienced significant gains in skilled assistance during delivery, which increased from 55 percent in 1992 to 90 percent in 2015–16. Nevertheless, maternal mortality in Malawi remains high, at 439 deaths per 100,000 live births. One-half of women do not receive a postnatal checkup within 41 days of delivery (National Statistics Office [Malawi] and ICF, 2017). The main causes of maternal mortality in Malawi are postpartum hemorrhage, eclampsia, and sepsis.

Malawi has also made progress in FP/RH. About six in 10 (58 percent) married women ages 15 to 49 use a modern method of FP. However, nearly one in five married women have an unmet need for FP, defined as the proportion of married women who want to delay or stop childbearing but are not using FP (National Statistics Office [Malawi] and ICF, 2017).

Only one-half of all Malawian children ages 12 to 23 months have received all age-appropriate vaccinations, and only one in 10 children ages 24 to 35 months have received all age-appropriate vaccinations. Nearly four in 10 (37 percent) children under five in Malawi are stunted, an indication of chronic undernutrition (National Statistics Office [Malawi] and ICF, 2017).

[1] Award number AID-612-C-17-00001, with award dates November 15, 2016 to November 15, 2021.

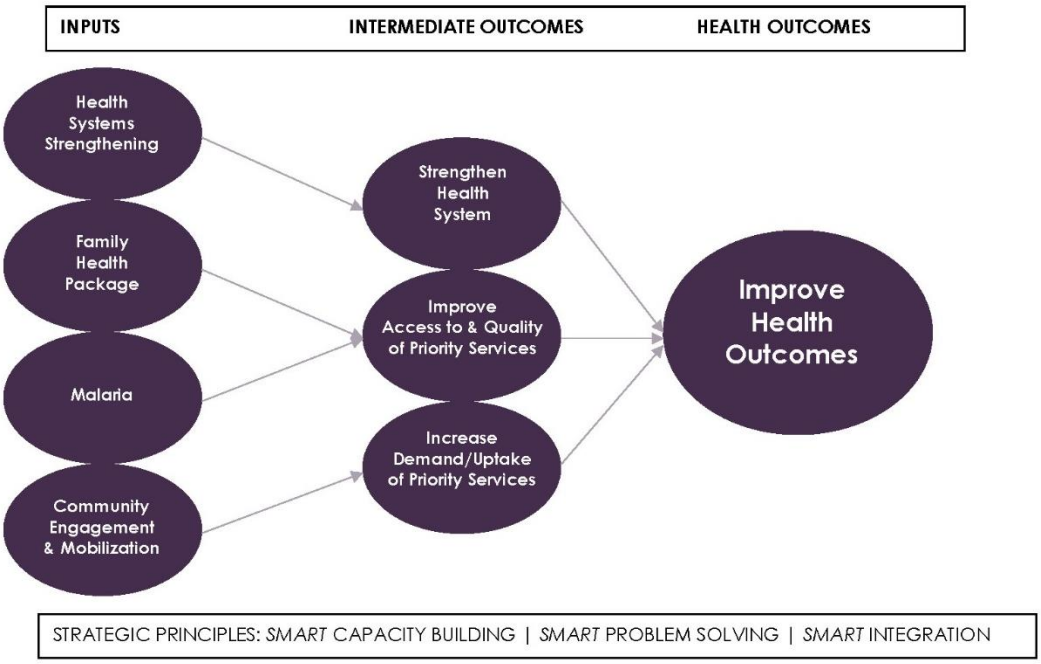
Malaria is endemic in Malawi, accounting for more than 40 percent of all hospitalizations of children under five. Use of insecticide treated nets to prevent malaria increased from 39 percent in 2010 to 43 percent in 2015–16 among children under five, and from 35 percent to 44 percent among pregnant women in the same period. In the two weeks before the 2015–16 Demographic and Heath Survey (DHS), 29 percent of children under five had fever, the primary symptom of malaria. Although treatment/advice was sought for two-thirds of these children, only one-half had blood taken for testing.

Water and sanitation-related diseases are also a leading cause of death for children under five. Approximately 85 percent of rural households in Malawi have access to an improved source of drinking water, whereas only one-half of all households use improved toilet facilities. According to the 2015–16 Malawi DHS, although a place for washing hands was observed in 83 percent of households, soap and water were observed in only 11 percent of handwashing locations. Another 26 percent of handwashing locations had just water.

The Malawi ONSE Project

The continued improvement in health outcomes and reductions in neonatal, infant, child, maternal morbidity, and mortality in Malawi will largely depend on improving access to and the quality of essential services and the supporting health system. The Malawi ONSE project is USAID/Malawi's flagship health program and focuses on these improvements. Working in 16 districts, ONSE will support more than 400 health facilities that provide essential health care services to over one-half of Malawi's population. The ONSE project theory of change is depicted in Figure 1.

Figure 1. Malawi ONSE theory of change



The goal of ONSE is to improve health outcomes, including maternal, newborn, and child survival and well-being in Malawi. The objectives of the project's targeted intermediate outcomes are:

- Increase access to priority health services for maternal, newborn, and child health (MNCH); FP/RH; malaria; and WASH.
- Improve the quality of priority health services.
- Strengthen the performance of health systems.
- Increase demand for priority health services.

Key interventions, or inputs, are:

- Health systems strengthening (HSS): HSS will be implemented in all 16 ONSE districts to improve the management and supervision of human resources for health, governance, policy implementation, and use of data for decision making at the district level.
- A family health package (FHP): The FHP is ONSE's service delivery component and will be implemented in 11 of the 16 project districts. The FHP focuses on improving access to and the quality of MNCH, FP/RH, and WASH services.
- Malaria services: Malaria services will be integrated with the FHP and will be provided in 10 of the 16 project districts based on need.

Table 1 presents the ONSE interventions, by district.

Table 1. ONSE interventions, by district

District	Intervention		
	HSS	FHP	Malaria
Balaka	•	•	•
Lilongwe	•	•	•
Machinga	•	•	•
Salima	•	•	•
Nkhotakota	•	•	•
Mulanje	•	•	
Kasungu	•	•	
Dowa	•	•	
Chitipa	•	•	
Karonga	•	•	
Zomba	•	•	
Mchinji	•		•
Chikwawa	•		•
Mangochi	•		•
Ntcheu	•		•
Nkhata Bay	•		•

"Smart" Capacity Building and Problem Solving

A strategic principle employed by ONSE is the "smart" approach, comprised of smart capacity building and smart problem solving. Smart capacity building entails the co-development of capacity building plans with DHMTs to identify district-specific capacity building needs in MNCH, FP/RH, and malaria. Smart capacity building relies on performance improvement methods and onsite mentoring of healthcare workers and DHMT members.

To help district health officials overcome challenges to improving health in their districts, ONSE also supports smart problem solving. One example of smart problem solving is the application of the District Health Program Improvement strategy, which helps district officials use locally collected data to identify health priorities and develop solutions to problems.

Community Engagement and Mobilization

A second strategic principle employed by ONSE is community engagement and mobilization to increase demand for and uptake of health services. ONSE's community engagement and mobilization strategy involves working with community organizations and stakeholders to promote SBCC messages to strengthen knowledge about healthy behaviors and reduce harmful practices, with a focus on underserved groups. ONSE will work in collaboration with the national behavior change communications project to support activities in ONSE project districts.

The ONSE Impact Evaluation

The hypothesis of the impact evaluation is that ONSE will improve health outcomes by improving the quality of and access to health services. At baseline, we expect health and facility indicators to be similar in project and comparison districts. After completion of the project (e.g., at end line), we expect to see more improvement in health and facility outcomes in project districts than in comparison districts. The evaluation is designed to understand how the projects' strategic approaches (i.e., smart capacity building, smart problem solving, and community engagement and mobilization) improve the effectiveness of project interventions.

The ONSE impact evaluation aims to answer three primary research questions:

1) What is the impact of the ONSE project on changes in health and facility outcomes compared with changes in these outcomes in districts that did not receive the ONSE project?
2) How was smart capacity building and problem solving operationalized in each district?
3) What is the impact of ONSE's community engagement and mobilization activities in communities where this intervention was implemented compared with communities that did not receive this intervention?

Results of the evaluation will be used to inform future health programming in Malawi and will generate evidence related to approaches that tailor project activities at the district level based on varying needs.

METHODS

The ONSE impact evaluation employs a quasi-experimental design in which pre- and post-differences in outcomes will be compared between project and comparison districts to measure the impact of ONSE. Data collection methods are a baseline (2017) and end line (2021) quantitative household survey, a baseline and end line health facility assessment, implementation process monitoring (2018–2020), and an end line qualitative study. Each data collection method is summarized below and is described in more detail in Appendix D. The purpose of the baseline survey is to generate estimates of key outcome measures before the start of the ONSE project. The survey also identifies key differences between the outcomes in the comparison and project domains selected for the evaluation. This report presents the results of the baseline survey.

Selection of Study Districts

Three ONSE intervention districts (Machinga, Nkhotakota, and Salima) were chosen as the evaluation study districts. Mzimba, Nsanje, and Ntchisi, which are not supported by USAID, were selected as comparison districts. Details about the selection process are provided in Appendix C.

Quantitative Household Survey

A household survey was developed to measure population-level outcomes of interest among both married and unmarried WRA, ages 15 to 49. The household survey has a household questionnaire and a woman's questionnaire, which were administered to all consenting WRA in selected households. The survey incorporated questions from the 2015–16 Malawi DHS drawn from the household questionnaire and woman's questionnaire modules on respondent background, reproduction, contraception, pregnancy and PNC, child health and nutrition, marriage and sexual activity, fertility preferences, husband's background, and woman's work. Additional modules were included on knowledge of maternal and newborn health, knowledge of child health, attitudes towards FP, and patient satisfaction.[2] The quantitative household survey was conducted at baseline in all study districts, with the goal of measuring health outcomes at the population level in each study group (i.e., project and comparison districts). A summary of modules used are provided in Table C1 in Appendix C. The household survey instrument can be found in Appendix D.

The household survey adopted a multi-stage cluster sampling design to obtain a random sample of households from the project and comparison districts. The two domains for sampling were project and comparison. Enumeration areas (EAs) were chosen randomly in each domain and then 30 households were chosen randomly in each EA (i.e., cluster). Forest reserves were excluded from these domains because they are not generally inhabited.

[2] Custom knowledge and attitude indicators were developed by the evaluation team based on the Malawi National Health Communication Strategy and MEASURE Evaluation FP/RH indicators. Custom patient satisfaction indicators were developed by the evaluation team using ONSE's Performance Management Plan.

The study design requires an adequate sample of women with a birth in the past three years to measure changes in the percentage who received four or more ANC visits during pregnancy (ANC 4+). The sample size estimate is powered to detect a 10.0 percentage point difference in ANC 4+ between project and comparison districts over the five-year project period. The estimated minimum number of households to detect that change is a sample size of 8,030 households, resulting in approximately 6,633 WRA among whom an estimated 3,245 women would have had with a birth in the past three years.[3,4] Information about the sampling frame and sampling weights is provided in Appendix C. The response rate for the household questionnaire was 98.6 percent in the project domain and 98.8 percent in the comparison domain. The response rate for the woman's questionnaire was 97.5 percent in the project domain and 96.4 percent in the comparison domain (Table C2 in Appendix C).

The primary outcomes of interest to the evaluation are population-level health outcomes. ANC 4+ was chosen as the main outcome due to its effect on ONSE's long-term outcomes of interest for both women and infants—maternal and neonatal mortality and morbidity (MEASURE Evaluation, n.d.). In addition to health outcomes, secondary facility-level outcomes were also included and are described in the health facility assessment section below. Table C4 in Appendix C presents the primary population-level outcomes of interest estimated from the household survey.

At baseline, population-level indicators for ANC, maternal health, PNC, and RH were calculated according to the *Guide to DHS Statistics*.[5] Some adjustments to recall times were made to accommodate the five-year duration of the ONSE project.

Quantitative data analysis was conducted in Stata 14.2 (Stata Corp LP). The analysis of household survey data in the baseline report was limited to basic descriptive frequencies and cross tabulations. Emphasis is placed on the estimates of indicators and household and women's characteristics in the project and comparison domains at baseline. Indicators are reported mainly as either percentages or means and are weighted using the sampling weights.

[3] Powered at 80 percent; alpha=0.05; design effect = 2.2. A 10 percentage point increase is projected from an estimated 49 percent among women with a birth in the past three years (National Statistics Office [Malawi] and ICF, 2017).

[4] It should be noted that the sample size calculations are approximations under the provided assumptions. The end line impact evaluation analysis will have components that increase the statistical power (e.g., individual covariates that reduce the unexplained variance) and some that may reduce it (e.g., unknown design effects), but they cannot be estimated with certainty in advance.

[5] See https://dhsprogram.com/publications/publication-dhsg1-dhs-questionnaires-and-manuals.cfm.

Health Facility Assessment

A health facility assessment tool was developed to measure facility-level outcomes of interest. Although the facility outcomes are of secondary interest, they are critical outcomes along the casual pathway to improved health. The health facility survey was administered at all public dispensaries, health centers, and hospitals,[6] and at all CHAM health facilities[7] in both project and comparison domains.

The health facility assessment tool incorporated select questions from the Service Availability and Readiness Assessment (SARA)[8] related to general service availability and specific service availability and readiness for the following topics of interest: FP; maternal health services, including ANC, normal delivery, cesarean delivery, and basic and comprehensive emergency obstetric and newborn care; preventative and curative child health services; and malaria services. The facility assessment tool can be found in Appendix D.

The heath facility sample consisted of a census of district hospitals, health centers, and dispensaries in the six study districts. All CHAM facilities were also assessed. A list of facilities was obtained from the Ministry of Health and was updated during meetings with district health officers in each district. The response rate was 100 percent in all districts, resulting in a total sample of 139 health facilities (Table C3 in Appendix C).

Improvements in access to and the quality of facility services contribute to improvements in health. Therefore, the impact evaluation includes measures of facility service availability and readiness as critical intermediate outcomes in the casual pathway to improving health. Table C5 in Appendix C provides a summary of facility-level outcomes derived from the SARA in project and comparison domains for the impact evaluation at baseline.

Baseline health facility indicators were calculated according to the *SARA Reference Manual*[9] and modified based on the needs of the evaluation stakeholders. SARA items that were not included in the Malawi national guidelines were omitted from the indicators and some additional questions were added. Stata 14.2 was used to analyze the facility data to generate descriptive frequencies and statistics according to the reference manual and specific requests of USAID/Malawi.

Details about training for and implementation of the household and facility surveys can be found in Appendix E.

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[6] One central hospital and all military facilities were excluded from the facility sample.

[7] CHAM health facilities are privately run facilities and comprise the largest network of nongovernmental healthcare facilities in Malawi.

[8] See http://www.who.int/healthinfo/systems/sara_introduction/en//.

[9] See http://www.who.int/healthinfo/systems/SARA_Reference_Manual_Chapter2.pdf?ua=1.

Strengths and Limitations

This evaluation provides for triangulation of data from several sources, including longitudinal data collection in households and facilities. This will allow for comparison of indicators in and across facilities and households over the course of the project and will strengthen the analyses for all research questions.

There is some potential for unobserved factors between groups to bias the impact evaluation results. The DID approach is a rigorous quasi-experimental design that controls for observed and unobserved differences between project and comparison domains that are constant over time. Unobserved differences are assumed to be time-invariant, and thus, the DID approach does not account for any time-varying unobserved differences between the project and comparison domains.

Implementation process monitoring data collection will collect additional information about potential shocks affecting the study groups differently and/or other outside factors that may influence the study's outcomes. A variation in Country Development Cooperation Strategy (CDCS) integration between USAID implementing partners in the project domain has the potential to generate additional improvements in the project domain above and beyond the activities of the ONSE project. The extent of and variation in this type of integration will be monitored at regular intervals and robustness checks may be used during the impact analysis, as needed, to account for CDCS integration-related activities.

RESULTS

HOUSEHOLD POPULATION AND HOUSING CHARACTERISTICS

Socioeconomic characteristics are important for understanding population-level health indicators and comparing the baseline status of project and comparison households. This section presents the demographics of the household population, by study domain, including the distribution of household members by age group and sex; household type and size; sex, age, and education level of household heads; and household wealth and possessions. Housing characteristics are also presented, by study domain.

Household Population

Age and Sex of Household Members

The percentage distribution of the household population by age group and sex is presented in Table 2. The distribution by sex and age group was similar in the project and comparison domains. Females comprised 51.6 percent of household members in both domains. Approximately one-half of household members in both domains were under age 15.

Table 2. Household population by age and sex (ONSE impact evaluation [IE] baseline, 2017)

Characteristics	Project			Comparison			Total study sample		N
Sex	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	
Sex	48.4	51.6	100.0	48.4	51.6	100.0	48.4	51.6	100.0
Number	9,025	9,736	18,761	9,072	9,659	18,731	18,097	19,395	37,492
Age							**Percent**		
<5	17.3	15.7	16.5	15.4	14.4	14.8	15.7		5,859
5-14	34.3	34.5	34.3	33.7	34.0	33.6	34.1		12,715
15-19	11.3	8.6	9.9	11.0	8.6	9.8	9.8		3,690
20-24	7.4	8.7	8.0	7.8	8.2	7.9	8.0		2,981
25-29	6.0	6.2	6.1	6.0	5.9	6.0	6.0		2,268
30-34	4.9	5.7	5.4	5.2	5.7	5.6	5.4		2,059
35-39	4.7	4.7	4.9	4.6	5.1	4.9	4.8		1,829
40-44	3.9	3.3	3.4	3.8	3.5	3.7	3.6		1,330
45-49	2.4	2.5	2.5	3.0	2.8	2.9	2.7		1,008
Age							**Percent**		
50-64	4.5	5.9	5.2	5.9	7.3	6.7	5.9		2,237
64+	3.4	4.3	3.9	3.7	4.5	4.2	4.0		1,516
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0		37,492
Age groups									
Under five	17.4	15.7	16.5	15.2	14.4	14.8	15.7		5,859
Adolescents[1]	27.0	25.8	26.5	27.0	26.5	26.6	26.6		9,955
10-14	15.8	17.3	16.6	16.0	17.9	17.0	16.8		6,265
15-19	11.3	8.5	9.9	11.0	8.6	9.8	9.9		3,690
WRA	-	39.7	-	-	39.8	-	-		15,165
N	**25.0**	**9,736**	**18,761**	**9,072**	**9,659**	**18,731**	**18,731**		**37,492**

[1]Adolescents include members ages 10 to 19 years of age.

Household Type and Size

The average household size was 4.7 members in the project and comparison domains, and the average number of WRA (1.0) was the same in both domains (Table 3).

The proportion of households in the lowest wealth quintile was higher in the project domain (26.3 percent) than in the comparison domain (20.2 percent). At the same time, the proportion of households in the highest wealth quintile was higher in the comparison domain (20.6 percent) than in the project domain (16.4 percent). Nearly 90 percent of households in the project domain resided in rural areas as compared to 96.3 percent of households in the comparison domain.

Table 3. Household by type, size, and select characteristics (ONSE IE baseline, 2017)

Characteristic	Project	Comparison	N
Household size			
Average household size	4.7	4.7	7,929
Average number of adults ages 18 to 64	1.9	2.0	7,929
Average number of elderly ages 65 and older	0.2	0.2	7,929
Average number of WRA	1.0	1.0	7,929
Average number of children under five	0.8	0.7	7,929
Wealth quintile			
Lowest	26.3	20.2	1,834
Second	21.8	19.4	1,599
Middle	18.5	19.8	1,528
Fourth	17.0	20.1	1,475
Highest	16.4	20.6	1,493
Total	100.0	100.0	7,929
District			
Machinga	38.9	-	1,841
Nkhotakota	25.8	-	1,120
Salima	35.3	-	1,001
Mzimba	-	66.4	2,671
Nsanje	-	14.3	586
Ntchisi	-	19.2	710
Total	100.0	100.0	7,929

Characteristic	Project	Comparison	N
Rurality			
Peri-urban	10.2	3.7	527
Rural	89.8	96.3	7,402
Total	100.0	100.0	7,929
N	**3,962**	**3,967**	**7,929**

Sex, Age, and Education of Household Heads

Tables 4 and 5 present findings related to the sex, age, and education of household heads. Although just under two-thirds of households in the project domain were male-headed, nearly 70 percent of comparison households were male-headed (Table 4). In both domains, the proportion of female-headed households decreased as the wealth of the household increased (Table 5).

The age distribution of household heads was similar in project and comparison domains (Table 4).

In both study domains, household heads most frequently reported that they had some primary education or had completed their primary education (59.5 percent in the project domain and 63.0 percent in the comparison domain) (Table 4). In the project domain, no education among household heads (21.6 percent) was more frequently reported than in the comparison domain, where only 12.5 percent of household heads had no education.

In both domains, the proportion of household heads with some secondary or higher education increased as the wealth quintile increased (Table 5).

Table 4. Sex, age, and education of household heads (ONSE IE baseline, 2017)

Characteristic	Project	Comparison	N
Sex of household head			
Male	65.7	69.8	5,379
Female	34.3	30.2	2,547
Total*	100	100	7,926
Age of household head			
0-14**	0.0	0.0	1
15-19	1.1	1.2	91
20-24	9.6	8.9	721
25-29	14.2	12.1	1,035
30-34	13.8	13.9	1,110
35-39	13.3	12.5	1,039
40-44	10.8	10.5	830
45-49	7.8	8.7	648
50-64	15.6	18.5	1,359
64+	13.8	13.7	1,092
Total	100.0	100.0	7,926
Education of household head			
No education	21.6	12.5	1,356
Some /completed primary	59.5	63.0	4,809
Some /completed secondary	15.7	21.0	1,479
More than secondary	3.1	3.5	282
Total	100.0	100.0	7,926
N	**3,961**	**3,965**	**7,926**

* Three households did not report head of household.

**One 13-year-old household head is represented

Table 5. Sex, age, and education of household heads by wealth quintile (ONSE IE baseline, 2017)

	Project					Comparison					
	Lowest quintile	Second quintile	Middle quintile	Fourth quintile	Highest quintile	Lowest quintile	Second quintile	Middle quintile	Fourth quintile	Highest quintile	N
Sex of household head											
Male	23.9	20.5	19.3	17.6	18.8	18.6	19.2	19.8	20.7	21.8	5,377
Female	30.7	24.3	17.1	15.9	12.0	23.7	19.9	19.9	18.7	17.9	2,546
Total*	26.2	21.8	18.5	17.0	16.4	20.2	19.4	19.8	20.1	20.6	7,923
Age of household head											
13-19	64.8	11.9	14.2	2.6	6.5	20.3	22.1	12.6	15.0	30.1	92
20-24	45.9	25.0	13.9	9.2	6.0	34.1	21.8	22.2	14.0	7.8	721
25-29	34.6	20.8	20.3	10.6	13.6	25.5	22.9	18.3	18.7	14.6	1,034
30-34	29.7	19.5	16.1	16.0	18.7	19.9	21.3	19.7	19.0	20.1	1,109
35-39	19.7	22.8	16.3	19.2	21.9	18.7	17.7	21.5	17.6	24.5	1,038
40-44	19.5	19.7	18.9	22.1	19.8	15.6	18.8	16.6	22.9	26.1	830
45-49	17.5	20.8	21.7	17.1	22.9	14.6	15.1	19.2	22.5	28.6	648
50-64	18.8	22.0	20.9	19.4	18.8	14.8	18.8	20.6	21.6	24.3	1,427
64+	22.3	24.9	20.0	22.6	10.1	23.0	18.0	20.3	23.4	15.4	1,024
Total	26.2	21.8	18.5	17.0	16.4	20.2	19.4	19.8	20.1	20.6	7,923
Education of household head											
No education	36.0	23.9	18.3	16.6	5.2	36.4	22.0	18.2	16.6	6.8	1,355
Some/completed primary	27.3	24.8	19.8	16.9	11.1	20.8	21.8	21.6	20.6	15.2	4,807

	Project					Comparison					
	Lowest quintile	Second quintile	Middle quintile	Fourth quintile	Highest quintile	Lowest quintile	Second quintile	Middle quintile	Fourth quintile	Highest quintile	N
Some/completed secondary	13.6	12.0	17.5	19.3	37.6	12.1	13.4	17.6	22.2	34.6	1,479
More than secondary	1.0	0.0	0.6	9.9	88.5	0.0	2.3	5.6	9.8	82.3	282
Total	26.2	21.8	18.5	17.0	16.4	20.2	19.4	19.8	20.1	20.6	7,923
N	**1,064**	**837**	**759**	**661**	**640**	**768**	**762**	**769**	**813**	**853**	**7,926**

* Three households did not report head of household and three households did not report wealth information.

Household Possessions

More than 30 percent of households in both study domains had radios (Table 6). Approximately one-half of households in the project domain and 57.9 percent in the comparison domain reported ownership of a mobile phone.

Bicycles were the most common form of transport owned by households in both study domains. However, a larger proportion of households in the project domain (43.3 percent) reported ownership of a bicycle as compared with households in the comparison domain (29.9 percent).

Land ownership was more frequently reported by comparison households (90.6 percent) than project households (85.2 percent). Similarly, ownership of livestock was more commonly reported by comparison households (60.0 percent) than project domain households (51.7 percent).

Table 6. Household possessions (ONSE IE baseline, 2017)

Possession	Project	Comparison
Household effects		
Torch	84.8	80.3
Mobile phone	50.3	57.9
Radio	30.8	33.4
Bed with mattress	20.6	22.9
Sofa set	7.8	13.3
Television	7.5	9.3
Wrist watch	7.2	6.8
Paraffin lamp (not Koloboyi)	5.1	4.9
Koloboyi	4.1	2.8
Refrigerator	3.7	2.5
Computer	1.6	1.6
Means of transport		
Bicycle	43.3	29.9
Motorcycle or motor scooter	2.8	2.9
Animal drawn cart	0.6	4.7
Car or truck	0.9	1.4
Boat or motor	0.2	0.1
Ownership of agricultural land		
Has land	85.2	90.6

Possession	Project	Comparison
No land	14.8	9.4
Total	100.0	100.0
Ownership of farm animals		
Has livestock[1]	51.7	60.0
No livestock	48.3	40.0
Total	100.0	100.0
N	**3,962**	**3,967**

[1] Livestock includes milk cows, bulls, other cattle, horses, donkeys, mules, goats, sheep, pigs, chicken, and other poultry.

Housing Characteristics

Electricity was reported by 11.0 percent of project households and 15.4 percent of comparison households (Table 7). In the project domain, 80.4 percent of households had an earth/sand floor, and 19.0 percent had a cement floor. In the comparison domain, 73.0 percent of households had an earth/sand floor, and 26.6 percent had a cement floor.

Households in the comparison domain more frequently reported three or more sleeping rooms compared with those in the project domain (35.2 percent and 30.6 percent, respectively), and were also more likely to report a separate building for cooking than those in the project domain (73.7 percent and 54.7 percent, respectively). Project households (41.8 percent) were more likely to cook outdoors than comparison households (23.5 percent). Wood was the main source of cooking fuel in both project (82.1 percent) and comparison (92.1 percent) households.

Table 7. Housing characteristics (ONSE IE baseline, 2017)

Characteristic	Project	Comparison	N
Electricity			
Yes	11.0	15.4	1,108
No	89.0	84.6	6,821
Total	100.0	100.0	7,929
Type of Floor			
Earth/sand	80.4	73.0	6,046
Cement	19.0	26.6	1,837
Dung	0.4	0.3	31
Other	0.3	0.1	15
Total	100.0	100.0	7,929
Number of rooms for sleeping			
No sleeping room	0.0	0.1	8
1 sleeping room	29.0	24.9	2,114
2 sleeping rooms	40.3	39.7	3,174
3 or more sleeping rooms	30.6	35.2	2,633
Total	100.0	100.0	7,929
Main cooking location			
In a separate building	54.7	73.6	5,112
Outdoors	41.7	23.5	2,556
In the house	3.4	2.6	245
Other/no food cooked in household	0.1	0.3	16
Total	100.0	100.0	7,929
Main source of cooking fuel			
Wood	82.1	92.1	6,836
Charcoal	16.4	7.2	1,012
Straw/shrubs/grass/agricultural crop	0.9	0.1	30
Electricity	0.6	0.5	44
No food cooked in household	0.1	0.1	7
Total	100.0	100.0	7,929
N	**3,962**	**3,967**	**7,929**

Water and Sanitation Characteristics

A slightly higher proportion of comparison households (90.8 percent) reported drinking water from an improved source compared with project households (87.8 percent) (Table 8). The most common improved water source in both domains was a borehole, reported by 65.8 percent of project households and 76.9 percent of comparison households that reported use of an improved source. Just under one-third of project households reported treating their drinking water; of these, 85.6 percent used an appropriate method. Only 22.0 percent of comparison households reported treating their drinking water; of these, 79.9 percent used an appropriate method.

Improved toilet facilities were reported by 47.7 percent of project households and 47.1 percent of comparison households. Pit latrines with slabs were the most commonly reported type of improved facility, reported by 75.1 percent of project households and 84.2 percent of comparison households that had improved sanitation.

Table 8. Water and sanitation (ONSE IE baseline 2017)

	Project	Comparison	N
Main source of drinking water			
Percentage of households with improved drinking water source			
Improved water source	87.8	90.8	7,023
Non-improved water source	12.2	9.2	906
Total	100.0	100.0	7,929
Improved source			
Piped into dwelling/yard/neighbor	7.3	5.7	532
Public standpipe	7.3	5.4	451
Protected well / springs	7.2	2.45	352
Tube well/borehole	65.8	76.9	5,667
Protected spring/rainwater/bottled water	0.2	0.3	21
Total improved sources	3,432	3,591	7,023
Unimproved source			
Unprotected well/springs	8.8	6.1	637
Surface water/rain	3.2	3.1	262
Other	0.2	0.0	7
Total unimproved sources	530	376	906

	Project	Comparison	N
Household treatment of drinking water			
Do not treat water	68.6	78.0	5,873
Treat water	31.4	22.0	2,056
Total	100.0	100.0	7,929
Of households that treat drinking water, treatment method used			
Boil	28.3	33.4	642
Add bleach/chlorine	54.3	44.7	1,007
Strain through a cloth	2.9	1.6	55
Use water filter (ceramic, sand, other filter)	0.2	0.2	4
Let it stand and settle	7.5	5.9	131
Other	7.0	14.2	217
Total	100.0	100.0	2,056
Of households that treat drinking water, percentage using an appropriate method[1]			
Inappropriate water treatment method	14.4	20.1	348
Appropriate water treatment method	85.6	79.9	1,708
Total	100.0	100.0	2,056
Households using appropriate drinking water treatment method among all households[1]			
No treatment or inappropriate water treatment method	73.2	82.4	6,221
Appropriate water treatment method	26.8	17.6	1,708
Total	100.0	100.0	7,929
Toilet facility			
Improved toilet facilities	47.7	47.1	3,827
Non-improved toilet facilities	52.3	52.9	4,102
Total	100.0	100.0	7,929
Of those using improved toilet facility, type:			
Flush to piped sewer system	2.0	0.0	36
Flush to septic tank	1.3	0.9	84
Flush to pit latrine	0.1	0.1	9
Flush, don't know where	0.1	0.0	3
Ventilated improved pit latrine	0.3	0.6	34
Pit latrine with slab	75.1	84.2	6,451

	Project	Comparison	N
Composting toilet	0.1	0.0	6
Of those using non-improved toilet facility, type:			
Pit latrine without slab/open pit	13.5	6.7	739
Hanging toilet/hanging latrine	0.0	0.0	1
No facility/bush/field	7.6	7.4	566
Total	100.0	100.0	7,929
Toilet use			
For household members only	56.3	50.9	4,284
Other households use toilet of this household	36.7	41.8	3,107
No toilet facility	7.0	7.3	538
Total	100.0	100.0	7929
N	**3,962**	**3,967**	**7,929**

[1] Appropriate water treatment methods are boiling, bleaching, filtering, and solar disinfection.

Assistance Provided to Households

Households were asked whether they were receiving or had received support or assistance from a health project or program (e.g., government, nongovernmental organizations, faith-based organizations) in the past twelve months. Just over one-third of households in both study domains reported receiving health-related support/assistance (Table 9). Of those households that had received assistance, assistance/support related to malaria was most commonly reported (68.0 percent of project households and 74.6 percent of comparison households that received any type of support). WASH services were the next most commonly reported type of assistance received (14.7 percent of project households and 12.1 percent of comparison households that received any type of assistance).

Table 9. Health-related assistance/support provided to households (ONSE IE baseline, 2017)

	Project	Comparison	N
Household received assistance in past 12 months			
Yes	36.9	35.6	2,888
No	63.1	64.4	5,041
Total	100.0	100.0	7,929
Of households that received assistance, type of assistance received			
Malaria services	68.0	74.6	2,031
WASH services	14.7	12.1	363
Nutrition services	9.4	7.7	266
Maternal and child health services	4.1	3.6	125
FP services	1.6	1.4	61
Other	2.1	0.6	42
Total	100.0	100.0	2,888
N	**1,434**	**1,454**	**2,888**

CHARACTERISTICS OF WOMEN OF REPRODUCTIVE AGE

This section presents the demographic and socioeconomic characteristics of WRA: age group, number of children, education, literacy, and exposure to mass media. It also presents results on women's satisfaction with health services received for themselves or their child(ren) in the past three months.

Characteristics of WRA

Tables 10 and 11 provide information on the age, number of children, education, and wealth of households where WRA resided. The age distribution of WRA was similar in the project and comparison domains, with more than 40 percent of women respondents ages 15 to 24 in both study domains (Table 10). Approximately 80 percent of WRA in both domains had living children, with about one-quarter of WRA reporting that they had two to three living children. In the project domain, 42.4 percent of WRA gave birth in the past three years, as did 47.2 percent of WRA in the comparison domain.

WRA in the project domain (13.0 percent) were more likely to have no education compared with WRA in the comparison domain (6.4 percent). Attainment of some primary education or completion of primary education was similar across domains, with 71.1 percent of project WRA and 72.0 percent of comparison WRA reporting that they had some/completed primary education. A larger proportion of comparison WRA (20.2 percent) had some/completed secondary education as compared with the project WRA (14.6 percent). The proportion of literate[10] women was higher in the comparison domain (77.1 percent) than in the project domain (64.0 percent).

In both domains, younger women were more likely to have attended school and have higher educational attainment (Table 11). For example, in the project domain, only 3.7 percent of 15 to 19-year-olds had no education, while 14.4 percent had some/completed secondary education. By contrast, 38.3 percent of 45 to 49-year-olds had no education, whereas only 2.8 percent had some/completed secondary education.

In both domains, the proportion of women with higher levels of educational attainment increased with household wealth (Table 11). For example, in the lowest wealth quintile, 19.0 percent of project WRA had no education, 77.0 percent had some/completed primary education, 4.0 percent had some/completed secondary education, and none had more than secondary education. By contrast, in the highest wealth quintile, 3.2 percent of project WRA had no education, 52.7 percent had some/completed primary education, 37.3 percent had some/completed secondary education, and 6.8 percent had more than secondary education.

[10] WRA with secondary education were assumed to be literate. Other respondents were given a sentence to read and were considered literate if they could read all or part of the sentence.

Table 10. Characteristics of WRAs (ONSE IE baseline, 2017)

Characteristic	Project	Comparison	N
Age groups			
15-19	20.9	21.1	1,586
20-24	21.8	20.7	1,605
25-29	15.8	15.1	1,170
30-34	14.4	14.4	1,106
35-39	12.2	12.9	954
40-44	8.3	9.1	631
45-49	6.4	6.8	490
Total	100.0	100.0	7,542
Gave birth in past three years			
No	57.6	52.8	4,143
Yes	42.4	47.2	3,399
Total	100.0	100.0	7,542
Number of living children			
No living children	20.6	21.1	1,558
1 child	14.3	15.1	1,136
2-3 children	24.9	26.6	1,946
4-5 children	19.2	20.6	1,532
6 or more children	21.0	16.7	1,370
Highest grade of education completed			
No formal schooling	13.0	6.4	733
Standard 1-4	31.1	16.0	1,748
Standard 5-8	40.0	56.0	3,620
Secondary 1-2	7.6	12.3	755
Secondary 3-4	7.0	7.9	576
University or above	1.4	1.3	110
Total	100.0	100.0	7,542
Literacy			
Literate	64.0	77.1	5,327
Illiterate	36.0	22.9	2,215
Total	100.0	100.0	7,542

Characteristic	Project	Comparison	N
Wealth quintile			
Lowest	23.7	17.7	1,561
Second	20.3	18.0	1,430
Middle	18.3	20.1	1,436
Fourth	17.6	21.3	1,458
Highest	20.0	22.9	1,652
Total	100.0	100.0	7,542[1]
District			
Machinga	35.5	--	1,649
Nkhotakota	27.6	--	1,143
Salima	36.9	--	984
Mzimba	--	67.8	2,589
Nsanje	--	12.5	488
Ntchisi	--	19.7	689
Total	100.0	100.0	7,542
N	**3,776**	**3,766**	**7,542**

[1] Five women were from households that did not have wealth information

Table 11. Education of WRA by age, wealth, and district (ONSE IE baseline, 2017)

	Project					Comparison					
	No education	Some/ completed primary education	Some/ completed secondary education	More than secondary education	Total	No education	Some/ completed primary education	Some/ completed secondary education	More than secondary education	Total	N
Age											
15-19	3.7	81.9	14.4	0.0	100.0	0.6	78.6	20.5	0.2	100.0	1,586
20-24	4.7	73.2	20.3	1.8	100.0	2.0	64.0	32.5	1.5	100.0	1,605
25-29	9.6	71.1	16.5	2.7	100.0	4.5	66.7	26.5	2.4	100.0	1,170
30-34	13.6	71.5	13.0	1.9	100.0	6.5	76.2	14.9	2.4	100.0	1,106
35-39	20.0	65.9	13.3	0.8	100.0	11.4	73.3	14.8	0.6	100.0	954
40-44	33.4	56.2	9.1	1.3	100.0	14.7	72.6	10.1	2.6	100.0	631
45-49	38.3	57.2	2.8	1.7	100.0	20.7	75.6	3.1	0.6	100.0	490
Total	13.0	71.1	14.5	1.4	100.0	6.3	72.0	20.2	1.4	100.0	7,542
Wealth quintile											
Lowest	19.0	77.0	4.0	0.0	100.0	10.6	80.6	8.8	0.0	100.0	1,561
Second	13.3	81.1	5.7	0.0	100.0	7.4	80.7	11.8	0.2	100.0	1,430
Middle	14.3	74.0	11.7	0.0	100.0	7.1	75.5	16.8	0.6	100.0	1,436
Fourth	14.3	69.5	15.8	0.4	100.0	5.7	70.6	23.4	0.3	100.0	1,458
Highest	3.2	52.7	37.3	6.8	100.0	2.2	56.9	35.6	5.2	100.0	1,652
Total*	13.0	71.1	14.5	1.4	100.0	6.3	72.0	20.2	1.4	100.0	7,537
District											
Machinga	14.7	74.6	9.7	1.0	100.0	--	--	--	--	100.0	1,649

	Project					Comparison					
	No education	Some/ completed primary education	Some/ completed secondary education	More than secondary education	Total	No education	Some/ completed primary education	Some/ completed secondary education	More than secondary education	Total	N
Nkhotakota	6.5	71.1	21.0	1.5	100.0	--	--	--	--	100.0	1,143
Salima	16.2	67.7	14.3	1.8	100.0	--	--	--	--	100.0	984
Mzimba	--	--	--	0.0	100.0	2.8	73.0	22.7	1.5	100.0	2,589
Nsanje	--	--	--	0.0	100.0	20.8	64.7	13.9	0.6	100.0	488
Ntchisi	--	--	--	0.0	100.0	9.4	73.3	15.7	1.7	100.0	689
Total	13.0	71.1	14.5	1.4	100.0	6.3	72.0	20.2	1.4	100.0	7,542
N	**480**	**2,684**	**556**	**56**	**3,776**	**246**	**2,684**	**775**	**61**	**3,766**	**7,542**

*Five WRA were from households that did not report wealth information.

Exposure to Mass Media

The most common form of media exposure among WRA was radio. In the project domain, 43.4 percent of WRA reported listening to the radio at least once per week, as did 41.5 percent of WRA in the comparison domain (Table 12). About one-half of WRA in both domains (45.1 percent of project WRA and 50.1 percent of comparison WRA) reported that they did not access newspaper, television, or radio on a weekly basis. The proportion of women listening to the radio at least once per week was constant across age groups in both domains.

For all three forms of media (newspaper, radio, and television), the proportion of women accessing each media at least once per week increased with educational attainment in both domains. For example, in the project domain, only 28.9 percent of the women with no education listened to the radio at least once a week, whereas 41.2 percent of those with some/completed primary education, 63.4 percent with some/completed secondary education, and 78.0 percent of those with more than secondary education did so.

Similarly, listening to the radio at least once per week increased with household wealth. For example, in the project domain, only 22.0 percent of the women in the lowest wealth quintile listened to the radio at least once a week, whereas 43.4 percent of those in the middle quintile, and 75.9 percent of those in the highest quintile did so.

Table 12. Percentage of WRA who were exposed to specific media on a weekly basis (ONSE IE baseline, 2017)

	Project					Comparison					
	Read newspaper at least once/ week[1]	Watched television at least once/ week	Listened to the radio at least once/ week	Accessed all three media at least once/ week	Accessed none of the three media once/ week	Read newspaper at least once/ week[1]	Watched television at least once/ week	Listened to radio at least once/ week	Accessed all three media at least once/ week	Accessed none of the three media once/ week	N
Age											
15–19	12.3	10.8	41.7	2.6	45.5	12.5	10.8	40.1	1.7	48.9	1,586
20–24	13.4	10.4	46.3	3.9	44.9	9.1	9.4	43.9	2.4	49.9	1,605
25–29	12.6	10.9	45.7	3.5	41.8	9.0	8.5	41.2	2.1	51.7	1,170
30–34	9.4	8.1	42.9	2.7	46.3	7.3	9.2	40.3	3.0	53.3	1,106
35–39	10.2	9.0	43.8	1.8	45.8	8.7	10.9	42.2	2.9	48	954
40–44	9.4	7.7	41.9	1.3	47.8	8.2	10.8	41.8	3.4	49.4	631
45–49	9.0	6.2	35.1	2.3	46	6.3	12.1	39.6	1.1	49.6	490
Educational attainment											
No education	0.0	2.7	28.9	0.0	74.3	7.4	3.0	29.9	0.0	53.0	726
Some/ completed primary	8.6	5.8	41.2	1.1	51.1	6.2	7.3	37.9	1.0	55.5	5,368
Some/ completed secondary	18.0	29.0	63.4	7.5	28.0	16.4	18.8	55.6	5.2	38.0	1,331
More than secondary	51.6	64.0	78.0	36.9	11.1	37.2	58.0	75.2	25.8	13.4	117
Wealth quintile*											
Lowest	4.8	1.9	22.0	0.3	69.6	5.7	2.0	22.8	0.2	70.7	1,561
Second	8.2	2.6	32.2	0.1	61.2	6.5	2.5	27.6	0.5	67.3	1,430

	Project					Comparison					
	Read newspaper at least once/ week[1]	Watched television at least once/ week	Listened to the radio at least once/ week	Accessed all three media at least once/ week	Accessed none of the three media once/ week	Read newspaper at least once/ week[1]	Watched television at least once/ week	Listened to radio at least once/ week	Accessed all three media at least once/ week	Accessed none of the three media once/ week	N
Middle	7.1	3.7	43.4	0.5	52.6	7.2	3.5	33.7	0.5	60.1	1,436
Fourth	11.2	6.9	48.1	1.9	43.4	8.3	4.2	47	0.9	47.8	1,458
Highest	21.7	33.4	75.9	9.6	14.4	15.5	33.3	68.5	7.6	23.6	1,652
District											
Machinga	10.6	7.1	41.9	2.5	48.1	--	--	--	--	--	1,649
Nkhotakota	10.7	14.1	50.6	3.4	38.2	--	--	--	--	--	1,143
Salima	13.4	8.4	39.3	2.7	48.4	--	--	--	--	--	984
Mzimba	--	--	--	--	--	8.3	11.7	42	2.2	49.7	2,589
Nsanje	--	--	--	--	--	12.5	7.3	40	2.6	48.8	488
Ntchisi	--	--	--	--	--	12.0	6.0	40.6	2.9	52.6	689
Total	11.6	9.5	43.4	2.8	45.1	9.4	10.1	41.5	2.4	50.1	7,542
N	**2,418**	**3,772**				**2,906**	**3,765**				**7,542**

[1]Only asked of literate women.

*Five WRA were from households that did not report wealth information

Exposure to *Moyo ndi mpamba, Usamalireni!*

Moyo ndi mpamba: Usamalireni! ("Life is precious/capital: take care of it!") is a SBCC campaign launched in 2013, implemented by the Support for Service Delivery Integration (SSDI)-Communication project, which connects wellness to prosperity. ONSE will be conducting community-level activities in support of this campaign and messaging. WRA were asked whether they had heard the slogan *Moyo ndi Mpamba: Usamalireni!* in the past 12 months. In the project domain, 88.0 percent of WRA recalled hearing the slogan as compared with only 75.7 percent of WRA in the comparison domain (Table 13).

Table 13. Exposure to Moyo ndi mpamba, Usamalireni! (ONSE IE baseline, 2017)

Heard the slogan *Moyo ndi mpamba, Usamalireni!* in the past 12 months	Project	Comparison	N
Yes	88.0	75.7	6,200
No	12.0	23.9	1,323
Don't know	0.1	0.4	19
Total	100.0	100.0	7,542
N	**3,776**	**3,766**	**7,542**

Satisfaction with Health Services

Women were asked a series of questions about their satisfaction with health services received for themselves or their children in the past three months. Just under two-thirds of women reported that they had visited a health facility in the past three months in both the project and comparison domains (Table 14).

Among those who had visited a facility, approximately 60 percent in both domains were very satisfied with the time they waited to see a healthcare provider, whereas about 12 percent were very dissatisfied with their wait time.

Nearly three-quarters of respondents in both domains were very satisfied with their ability to discuss their problem with the healthcare provider and with the explanation they received about their problem or treatment. Only about 4 percent in both domains were very dissatisfied in this regard. Nearly 80 percent of the women in both domains were also very satisfied with the audio and visual privacy at the health facility, whereas less than 4 percent were very dissatisfied.

In both domains, nearly 70 percent of the women were very satisfied with the availability of medicines, approximately 60 percent were very satisfied with service hours, and more than 75 percent were very satisfied with facility cleanliness. Approximately 72 percent were very satisfied with their overall treatment by staff.

Women in the project domain (36.1 percent) more frequently reported paying a fee for service than women in the comparison domain (27.4 percent). Among those who paid a fee, women in the project domain (65.7 percent) more frequently reported that they were very satisfied with the cost of services than women in the comparison domain (59.3 percent). Women in the comparison domain (12.4 percent) were more likely to report that they were very dissatisfied with the cost of services than women in the project domain (8.4 percent).

Table 14. Satisfaction with health services among WRA (ONSE IE baseline, 2017)

	Project	Comparison	N
In the past 3 months, visited a health facility for care for self or child			
Yes	64.7	62.2	4,740
Among those who visited a facility:			
Extent satisfied with the time waited to see a provider			
Very satisfied	58.4	63.1	2,904
Somewhat satisfied	16.1	14.3	701
Neither	1.3	0.9	51
Somewhat dissatisfied	10.6	10.1	477
Very dissatisfied	13.6	11.7	607
Total	100.0	100.0	4,740
Extent satisfied with the ability to discuss problem with provider			
Very satisfied	73.4	75.2	3,532
Somewhat satisfied	16.1	15.6	723
Neither	1.3	0.8	53
Somewhat dissatisfied	5.1	4.5	224
Very dissatisfied	4.2	3.9	208
Total	100.0	100.0	4,740
Extent satisfied with explanation received about problem or treatment			
Very satisfied	74.5	74.1	3,521
Somewhat satisfied	15.6	15.4	724
Neither	0.8	0.8	42
Somewhat dissatisfied	4.7	5.4	229
Very dissatisfied	4.4	4.3	224
Total	100.0	100.0	4,740

	Project	Comparison	N
Extent satisfied with the audio and visual privacy			
Very satisfied	77.5	80.6	3,766
Somewhat satisfied	14.0	12.8	609
Neither	1.6	0.7	57
Somewhat dissatisfied	3.3	3.1	152
Very dissatisfied	3.6	2.8	156
Total	100.0	100.0	4,740
Extent satisfied with the availability of medicines			
Very satisfied	68.0	70.2	3,283
Somewhat satisfied	15.1	12.3	642
Neither	1.4	1.1	61
Somewhat dissatisfied	7.9	8.0	364
Very dissatisfied	7.7	8.4	390
Total	100.0	100.0	4,740
Extent satisfied with the facility service hours			
Very satisfied	60.3	62.9	2,966
Somewhat satisfied	19.2	18.9	873
Neither	1.6	1.3	67
Somewhat dissatisfied	9.6	8.4	413
Very dissatisfied	9.4	8.6	421
Total	100.0	100.0	4,740
Extent satisfied with the facility cleanliness			
Very satisfied	78.2	77.0	3,696
Somewhat satisfied	12.3	13.4	595
Neither	1.2	0.5	43
Somewhat dissatisfied	4.1	5.0	213
Very dissatisfied	4.2	4.2	193
Total	100.0	100.0	4,740
Extent satisfied with the overall staff treatment			
Very satisfied	71.4	73.1	3,431
Somewhat satisfied	18.2	17.1	817

	Project	Comparison	N
Neither	1.1	1.0	60
Somewhat dissatisfied	5.2	4,7	230
Very dissatisfied	4.1	4.1	202
Total	100.0	100.0	4,740
Paid a fee			
Service was free	63.9	72.6	3,225
Paid fee	36.1	27.4	1,515
Total	100.0	100.0	4,740
Among those who paid a fee, extent satisfied with any cost associated with treatment			
Very satisfied	65.7	59.3	977
Somewhat satisfied	14.5	12.8	197
Neither	3.4	4.8	62
Somewhat dissatisfied	8.0	10.8	130
Very dissatisfied	8.4	12.4	149
Total	100.0	100.0	1,515
N	**2,427**	**2,313**	**4,740**

FAMILY PLANNING

This section presents information on current use of FP methods and beliefs about FP.

Current Use of Family Planning

Among all WRA, 48.2 percent reported current use of any method of FP in both the project and comparison domains (Table 15). Among married WRA, just under 58 percent in both domains reported using any method of FP. Approximately 46 percent of all WRA and 55 percent of married WRA reported using a modern method.

The most commonly reported method was injectables. A larger percentage of women in the project domain reported using injectables than in the comparison domain. Injectable use was reported by 49.2 percent of all WRA and 51.4 percent of all married WRA in the project domain, and by 40.2 percent of all WRA and 41.1 percent of all married WRA in the comparison domain. Implants were the second most commonly reported method in both domains and were more popular among women in the comparison domain (25.5 percent of all WRA and 26.0 percent of married WRA in the comparison domain as compared with 18.3 percent of all WRA and 18.6 percent of married WRA in the project domain, respectively).

Table 15. Current use of contraception among WRA (ONSE IE baseline, 2017)

	Project	Comparison	N	Project	Comparison	N
FP method	**All WRA[1]**			**Married WRA[2]**		
Any method	48.2	48.2	7,158	57.7	57.9	5,240
Any modern method	45.6	45.8	7,158	55.5	53.7	5,240
Injectables	49.2	40.2	1,537	51.4	41.1	1,391
Implant	18.3	25.5	786	18.6	26.0	699
Female sterilization	13.7	13.4	453	15.1	13.9	421
Male condom	9.8	8.1	297	5.2	5.6	166
Pill	2.5	5.2	131	2.7	5.6	128
Other traditional method	1.7	0.7	39	1.9	0.8	38
Intrauterine device (IUD)	1.5	1.9	61	1.6	2.1	56
Lactational amenorrhea method	1.2	0.8	31	1.3	0.8	28
Withdrawal	1.0	3.1	76	1.2	3.2	73
Rhythm method	0.6	0.8	25	0.5	0.9	21
Male sterilization	0.2	0.0	1	0.2	-	1
Standard days method	0.2	0.2	9	0.2	0.2	8

	Project	Comparison	N	Project	Comparison	N
FP method	**All WRA[1]**			**Married WRA[2]**		
Female condom	0.1	0.0	1	0.0	-	-
Other modern method	0.1	0.0	2	0.1	-	1
Emergency contraception	0.0	0.1	1	0.0	0.1	1
Total	100.0	100.0	3,450	100.0	100.0	3,032
N	**3,582**	**3,576**	**7,158**	**2,522**	**2,718**	**5,240**

[1] All women with potential need for contraception, i.e., married or sexually active unmarried women.

[2] Includes women who are married or living with a man.

Table 16 presents results related to contraceptive use among married or sexually active women who were not pregnant and who did not desire more children. Contraceptive use among these women was reported by 61.1 percent in the project domain and 58.3 percent in the comparison domain. Contraceptive use by married or sexually active women who were not pregnant and who did not desire more children was reported by a higher proportion of women with no education in the comparison domain than in the project domain (61.5 percent and 51.6 percent, respectively). There was little difference in the proportion of married or sexually active women who were not pregnant and who did not desire more children using contraception with regard to wealth quintile in the comparison domain. In the project domain, only 56.1 percent of the women in the lowest quintile reported contraceptive use, whereas 67.7 percent of the women in the highest quintile reported the same.

Table 16. Contraceptive use among married or sexually active women who were not pregnant and who did not desire more children (ONSE IE baseline, 2017)

	Project		Comparison	
Characteristics	**Contraceptive use**	**N**	**Contraceptive use**	**N**
Age groups				
15-19	23.0	21	19.7	24
20-24	72.4	73	62.7	72
25-29	72.5	146	67.7	130
30-34	68.5	221	67.0	234
35-39	66.1	237	61.3	281
40-44	54.2	149	50.4	187
45-49	33.2	121	44.6	150
Total	61.1	968	58.3	1,078

Characteristics	Project		Comparison	
	Contraceptive use	N	Contraceptive use	N
Educational attainment				
No education	51.6	213	61.5	114
Some/completed primary	63.2	638	57.3	805
Some/completed secondary	68.6	105	60.2	144
More than secondary	60.6	12	73.7	15
Total	61.1	968	58.3	1,078
Wealth quintile				
Lowest	56.1	219	60.7	155
Second	61.6	187	59.1	199
Middle	63.0	198	55.9	210
Fourth	56.7	167	57.8	246
Highest	67.7	196	58.8	268
Total	61.1	967	58.3	1,078
District				
Machinga	67.3	417	--	--
Nkhotakota	56.9	268	--	--
Salima	58.4	283	--	--
Mzimba	--	--	55.0	797
Nsanje	--	--	68.9	99
Ntchisi	--	--	66.5	182
Total	**61.1**	**968**	**58.3**	**1,078**

Table 17 presents results related to FP counseling among current users of modern methods ages 15 to 49 who started the last episode of contraceptive use in the three years before the survey (excluding sterilized women). The provision of information about side effects and other methods was similar in project and comparison domains, with about 60 percent of women receiving information about side effects and 70 percent of women receiving information about other methods. A higher percentage of middle-aged and more educated women received information than did women in other groups.

Table 17. Informed choice among current users of modern methods ages 15 to 49 who started the last episode of contraceptive use in the three years before the survey (ONSE IE baseline, 2017)

	Project			Comparison		
	Possible side effects/ problems	What to do if side effects/ problems occurred	Other contraceptive methods	Possible side effects/ problems	What to do if side effects/ problems occurred	Other contraceptive methods
Age group						
15–19	39.3	34.6	46.4	48.7	45.2	52.9
20–24	55.8	55.6	68.0	64.0	61.7	72.3
25–29	62.5	58.8	73.3	59.7	63.5	71.7
30–34	68.0	67.5	77.8	63.9	64.3	78.8
35–39	69.3	65.4	78.9	62.7	60.6	75.4
40–44	62.4	64.4	67.6	53.3	51.0	71.9
45–49	56.1	50.1	62.1	59.2	60.8	79.1
Total	67.2	63.0	66.6	57.7	58.4	81.0
Educational attainment						
No education	67.2	63.0	66.6	57.7	58.4	81.0
Some/completed primary	60.8	58.5	71.2	61.8	61.5	71.0
Some/completed secondary	43.5	44.0	62.1	57.6	56.6	72.1
More than secondary	65.1	67.7	60.6	55.9	52.4	69.6
Total	67.2	63.0	66.6	57.7	58.4	81.0
Wealth quintile						
Lowest	62.2	61.8	72.2	60.1	58.6	70.9
Second	60.7	56.2	70.8	64.9	62.2	74.2
Middle	60.0	61.7	71.5	62.3	63.9	76.8
Fourth	49.4	47.4	58.8	58.7	60.1	70.1
Highest	60.9	55.2	70.2	56.8	55.6	65.8
Total	67.2	63.0	66.6	57.7	58.4	81.0

	Project			Comparison		
	Possible side effects/ problems	What to do if side effects/ problems occurred	Other contraceptive methods	Possible side effects/ problems	What to do if side effects/ problems occurred	Other contraceptive methods
District						
Machinga	66.5	67.0	76.0	--	--	
Nkhotakota	56.6	53.0	66.0	--	--	
Salima	52.0	48.0	63.3	--	--	
Mzimba	--	--		63.9	63.8	71.6
Nsanje	--	--		65.9	63.5	77.8
Ntchisi	--	--		47.2	47.3	68.2
Total	59.1	57.1	69.2	60.6	60.2	71.8
N	1,162	1,162	1,162	1,165	1,165	1,165

Beliefs about Family Planning

WRA were asked to indicate their agreement with eight statements about FP drawn from the National Health Communication Strategy, 2015–2020 and the *Moyo ndi mpamba: Usamalireni!* media campaign. Table 18 reports the percentage of WRA who believed that each statement was "completely true."

For all eights statements, a somewhat higher percentage of women in the comparison domain than in the project domain reported that the statements were "completely true."

In both domains, approximately 90 percent or more of women completely agreed with the statement, "There are family planning methods available at the clinic for everybody." Approximately 80 percent or more of the women in both domains completely agreed with six additional statements:

- "Planning the family is the responsibility of both men and women."
- "Getting pregnant before you are 18 puts your health and that of the baby in danger."
- "Long-acting family planning methods help to conveniently space pregnancies."
- "Family planning should be used by husbands and wives for the health of the entire family."
- "Becoming pregnant after 40 years of age can be dangerous to your health."
- "Talking openly and honestly to your children about the consequences of unprotected sex is important."

Approximately 70 percent or more of women believed that the statement "Long-term and permanent family planning methods provide safe and healthy ways to temporarily or permanently stop having children" was completely true. The remaining statement, "Family planning methods are safe," was reported to be completely true by only 52.9 percent of project women and 54.7 percent of comparison women.

In both domains, younger women, ages 15 to 19, were less likely to believe the statements were completely true than women in other age groups.

In both domains, women with more than secondary education (as compared with women with less education) were more likely to believe each of the statements was completely true, except for the statement, "Family planning methods are safe." Women with more than secondary education were the least likely to believe that this statement was completely true. In the comparison domain, women with more than secondary education were also less likely to report that they believed the statement, "Long-term and permanent family planning methods provide safe and healthy ways to temporarily or permanently stop having children" was completely true.

Table 18. Beliefs about FP, percentage of WRA who believed statements were completely true (ONSE IE baseline, 2017)

	FP methods are safe	Planning the family is the responsibility of both men and women	Getting pregnant before you are 18 puts your health and that of the baby in danger	Long-acting FP methods help to conveniently space pregnancy	FP should be used by husbands and wives for the health of the entire family	Long-term and permanent FP methods provide safe and healthy ways to temporarily or permanently stop having children	There are FP methods available at the clinic for everybody	Becoming pregnant after age 40 can be dangerous to your health	Talking openly and honestly to your children about the consequences of unprotected sex is important
Project									
Age									
15–19	43.1	81.1	84.7	72.1	82.6	58.1	83.5	69.7	83.4
20–24	53.9	92.4	91.3	89.0	93.6	72.1	95.9	81.6	88.9
25–29	54.7	92.3	91.1	89.8	94.6	75.4	96.3	90.5	91.1
30–34	63.8	94.0	90.8	91.8	95.9	80.0	97.1	91.1	93.6
35–39	59.5	92.6	91.5	90.1	95.8	79.4	97.3	91.0	93.7
40–44	58.7	88.5	94.1	89.8	95.3	80.7	94.4	93.0	93.9
45–49	60.1	94.9	94.7	88.6	96.2	77.1	94.9	93.3	95.1
Education									
No education	59.9	90.1	90.5	89.0	92.5	79.6	94.4	88.7	90.8
Some/completed primary	55.6	89.0	89.3	85.0	91.6	71.3	93.0	82.7	88.9
Some/completed secondary	47.1	94.4	94.3	89.0	95.5	72.7	94.7	89.5	95.2

	FP methods are safe	Planning the family is the responsibility of both men and women	Getting pregnant before you are 18 puts your health and that of the baby in danger	Long-acting FP methods help to conveniently space pregnancy	FP should be used by husbands and wives for the health of the entire family	Long-term and permanent FP methods provide safe and healthy ways to temporarily or permanently stop having children	There are FP methods available at the clinic for everybody	Becoming pregnant after age 40 can be dangerous to your health	Talking openly and honestly to your children about the consequences of unprotected sex is important
More than secondary	39.1	100.0	98.0	92.0	97.8	83.1	97.2	100.0	96.1
District									
Machinga	59.5	93.1	92.9	89.7	95.8	79.1	96.7	89.2	92.2
Nkhotakota	52.5	89.0	90.1	83.8	91.2	68.7	91.7	84.3	90.6
Salima	51.7	88.0	87.9	84.5	89.9	69.6	91.7	80.8	87.9
Total	**52.9**	**84.5**	**85.1**	**79.9**	**87.3**	**68.3**	**89.1**	**80.3**	**86.3**
Comparison									
Age									
15–19	38.5	67.8	76.1	59.3	71.7	46.7	70.3	60.9	77.0
20–24	56.1	88.8	84.4	82.4	89.3	70.4	93.0	83.4	87.5
25–29	56.9	91.9	90.0	90.0	94.8	76.9	96.5	84.0	89.7
30-34	53.2	90.2	88.0	87.1	93.9	75.1	94.8	86.2	90.9
35-39	57.9	86.9	88.4	83.2	90.1	73.9	91.9	85.7	89.5
40-44	61.4	87.8	89.1	86.8	90.4	75.4	94.8	88.5	88.4
45-49	57.6	86.0	86.9	83.3	89.8	75.2	94.3	89.0	85.8

	FP methods are safe	Planning the family is the responsibility of both men and women	Getting pregnant before you are 18 puts your health and that of the baby in danger	Long-acting FP methods help to conveniently space pregnancy	FP should be used by husbands and wives for the health of the entire family	Long-term and permanent FP methods provide safe and healthy ways to temporarily or permanently stop having children	There are FP methods available at the clinic for everybody	Becoming pregnant after age 40 can be dangerous to your health	Talking openly and honestly to your children about the consequences of unprotected sex is important
Education									
No education	63.4	84.5	85.3	85.6	88.3	76.5	93.5	84.1	87.6
Some/completed primary	52.8	82.5	83.5	78.6	85.7	68.4	87.6	78.5	84.1
Some/completed secondary	50.7	90.7	89.7	82.3	91.8	65.4	92.3	84.5	93.0
More than secondary	43.3	100.0	98.6	88.4	99.1	66.3	96.6	91.4	98.6
District									
Mzimba	53.1	85.3	85.1	80.3	87.7	68.5	89.0	81.1	85.7
Nsanje	50.7	83.8	83.3	78.5	86.0	64.7	86.6	77.1	84.9
Ntchisi	53.3	82.3	86.2	79.6	86.9	69.8	90.9	79.3	89.2
Total	**54.7**	**90.1**	**90.3**	**86.2**	**92.4**	**72.8**	**93.5**	**84.7**	**90.2**

MATERNAL HEALTH

Reducing maternal mortality and morbidity are central goals of the ONSE project. This section presents information on ANC and delivery care, and women's PNC for the 3,399 women who had live births in the three years preceding the survey.

Antenatal Care

Nearly all women (n=3,361) who had a birth in the past three years received ANC for their last birth. ANC was provided by a skilled provider (i.e., doctor, clinical officer, medical assistant, nurse, or midwife) for 98.6 percent of the women in the project domain and 96.9 percent of the women in the comparison domain (Table 19).

In the project domain, 52.6 percent and 26.4 percent of the women who had received ANC for their most recent birth in the past three years reported that they received care at a government health center or hospital, respectively. In the comparison domain, 57.0 percent and 20.4 percent of the women reported the same, respectively.

In both domains, approximately 48 percent of women who had received ANC for their most recent birth in the past three years reported that their first ANC visit occurred in their fourth or fifth month of pregnancy. Women in the comparison domain (35.2 percent) were somewhat more likely to have had their first ANC visit in their first three months of pregnancy than women in the project domain (30.8 percent). A larger proportion of the women in the comparison domain (55.8 percent) reported four or more ANC visits than women in the project domain (51.8 percent).

The most frequently reported component of ANC received was having a blood sample taken, reported by 95.1 percent of women in the project domain and 94.4 percent of women in the comparison domain. Having blood pressure taken and being given iron tablets or syrup was reported by more than 80 percent of women in both domains. The least commonly received component of ANC in both domains was having a urine sample taken, reported by approximately one-third of women who had ANC for their most recent birth in the past three years.

The World Health Organization (WHO) recommends intermittent preventive treatment of malaria in pregnancy (IPTp) at least three times during pregnancy for women in malaria endemic areas (WHO, 2012). Most women received treatment with sulfadoxine- pyrimethamine (SP)/Fansidar during their last pregnancy (87.5 percent of women in the project domain and 88.8 percent of women in the comparison domain) (Table 20). This treatment was provided almost universally during ANC visits. However, only 32.4 percent of women in the project domain and 33.5 percent in the comparison domain received the recommended minimum three doses of IPTp during their last pregnancy.

Table 19. Women's ANC in the past three years (ONSE IE baseline, 2017)

Received ANC at last birth	Project	Comparison	N
Yes	98.7	99.2	3,361
First ANC visit in the first trimester	30.8	35.2	1,119
Received 4+ ANC visits	51.8	55.8	1,796
ANC from skilled provider	98.6	96.9	3,287
No	1.3	0.8	38
Total	100.0	100.0	3,399
Care provider among those who received ANC at last birth			
Skilled provider			
Doctor/clinical officer/medical assistant	22.7	22.9	765
Nurse/midwife	75.9	74.0	2,522
Other provider			
Patient attendant	0.3	0.6	15
Health surveillance assistant	1.0	2.4	56
Traditional birth attendant	0.1	0.0	2
Other	0.0	0.1	1
Total	100.0	100.0	3,361
Location of ANC			
Her home/other home	0.1	0.0	2
Government hospital	26.4	20.4	792
Government health center	52.6	57.0	1,838
Government dispensary	4.8	2.2	119
Government health post	1.1	2.2	55
Public mobile clinic	1.2	2.5	62
Other public sector	0.8	0.5	23
CHAM hospital	2.5	6.6	149
CHAM health center	6.1	4.9	186
CHAM other facility	0.3	0.1	7
Private facility	2.4	1.3	64
Banja la Mtsogolo health center/other	1.6	2.2	64
Total	100.0	100.0	3,361

Received ANC at last birth	Project	Comparison	N
Timing of first ANC visit among those who received ANC at last birth			
> 4 months	30.8	35.2	1,119
4-5 months	47.8	48.8	1,618
6-7 months	20.2	15.1	518
8+ months	1.3	1.0	43
Total	100.0	100.0	3,361
Components of ANC received among those who received ANC at last birth			
Blood sample taken	95.1	94.4	3,185
Iron tablets or iron syrup	82.3	89.4	2,878
Blood pressure taken	81.1	82.8	2,753
Took drug for intestinal worms	50.2	48.1	1,654
Urine sample taken	31.0	33.0	1,073
Total	100.0	100.0	3,361
N	**1,801**	**1,598**	**3,399**

Table 20. Use of SP/Fansidar during last pregnancy in the past three years (ONSE IE baseline, 2017)

Use of SP/Fansidar during last pregnancy in past three years	Project	Comparison	N
Yes	87.5	88.8	2,948
No	12.5	11.2	395
Total	100.0	100.0	3,343
Number of times SP/Fansidar used among users			
Once	31.2	30.9	905
Twice	36.5	35.6	1,073
Three or more times	32.4	33.5	970
Total	100.0	100.0	2,948
Source of SP/Fansidar during last pregnancy			
ANC visit	99.1	99.7	2,930
Another facility visit	0.8	0.3	16
Other source	0.0	0.0	2
Total	**100.0**	**100.0**	**2,948**

Assistance during Delivery

Nearly all women (n=3,361) who had a birth in the past three years gave birth at a health facility (approximately 95 percent) for their most recent birth and were assisted by a skilled provider (approximately 94 percent) (Table 21).

Approximately 70 percent of women in both the project and comparison domains were assisted by a nurse or midwife, and approximately one-quarter were assisted by a doctor, clinical officer, or medical assistant. Approximately 80 percent of women in both domains who gave birth in the past three years delivered their last child at a government health center or hospital.

Table 21. Women's delivery care in the past three years (ONSE IE baseline, 2017)

Labor and delivery at last birth	Project	Comparison	N
Skilled birth attendant[1]	**93.5**	**94.7**	**3,199**
Doctor/clinical officer/medical assistant	23.5	26.6	808
Nurse/midwife	70.0	68.0	2,391
Other birth attendant			
Patient attendant	0.4	0.9	22
Traditional birth attendant	1.7	0.6	42
Relative/friend	2.9	2.2	86
Other	0.3	0.5	16
No one assisted	1.1	1.2	34
Total	100.0	100.0	3,399
Labor and delivery at last birth	**Project**	**Comparison**	**N**
Facility birth at last birth	**94.6**	**95.8**	**3,239**
Government hospital	39.0	33.9	1,169
Government health center	38.9	46.1	1,519
Government dispensary	2.6	1.7	68
Government health post/outreach	0.3	0.0	6
Other public sector	1.1	0.3	20
CHAM hospital	2.2	6.6	164
CHAM health center	5.3	3.8	157
CHAM other	0.2	0.4	9
Private hospital/clinic	1.3	0.6	33
Other private medical sector	0.5	0.2	9

Labor and delivery at last birth	Project	Comparison	N
Banja la Mtsogolo health center	3.2	2.1	85
Other location at last birth			
Her home	4.3	3.4	126
Other home	1.1	0.8	34
Total	100.0	100.0	3,399
N	**1,801**	**1,598**	**3,399**

[1]Includes women who received a check from a doctor, clinical officer, medical assistant, nurse, or midwife.

Postnatal Care

Approximately 67 percent of WRA who had a birth in the past two years at a health facility received PNC for their most recent birth (Table 22). Nearly all those who gave birth at a facility and received PNC got the PNC from a skilled provider—over 26 percent in both domains received care from a doctor/clinical officer/medical assistant, and approximately 70 percent received the care from a nurse/midwife.

More than 85 percent of newborns who were delivered at a facility received PNC (88.2 percent in project and 85.0 percent in comparison domains) (Table 23). Newborn PNC was delivered by skilled providers almost universally in both the project and comparison domains. Nurses/midwives provided PNC to approximately three-fourths of newborns delivered at a facility, whereas doctors/clinical officers/medical assistants provided PNC to approximately one-fourth of newborns delivered at a facility.

Table 24 presents information on the 177 women who gave birth in the past two years who did not deliver at a heath facility for their last birth. In the project domain, 48.7 percent of these women received PNC as compared with only 40.4 percent of women in the comparison domain. Among women who received PNC, 45.4 percent of women in the project domain and 40.4 percent in the comparison domain received PNC within two days. Among those who did not deliver at a facility, PNC was received from a skilled provider by 80.2 percent of women in the project domain and 93.2 percent of women in the comparison domain.

Among the few newborns not delivered at a facility, only 41.4 percent of newborns in the project domain, and 30.0 percent in the comparison domain received PNC (Table 25). PNC was provided by skilled providers for 79.3 percent of newborns in the project domain and 92.6 percent in the comparison domains.

Table 22. Women's PNC in the past two years among those who delivered at a health facility (ONSE IE baseline, 2017)

	Project	Comparison	N
Received PNC			
Received PNC	67.2	67.7	1,542
Did not receive PNC	32.8	32.3	761
Total	100.0	100.0	2,303
Time to PNC			
Within two days	62.5	60.3	1,396
3-41 days	4.7	7.3	146
Never/did not receive PNC	32.8	32.4	761
Total	100.0	100.0	2,303
PNC care provider			
Skilled provider[1]	97.6	96.8	1,501
Doctor/clinical officer/medical assistant	29.0	26.6	401
Nurse/midwife	68.6	70.2	1,100
Other provider	2.4	3.2	22
Patient attendant/health surveillance assistant	0.0	0.1	2
Traditional birth attendant/other	0.8	2.2	20
Don't know	1.6	0.9	19
Total	100.0	100.0	1,542
N	**1,228**	**1,075**	**2,303**

[1]Includes women who received a check from a doctor, clinical officer, medical assistant, nurse, or midwife.

Table 23. Table 23. Newborn PNC in the past two years among those who were delivered at a health facility (ONSE IE baseline, 2017)

	Project	Comparison	N
Received PNC			
Received PNC	88.2	85.0	1,957
Did not receive PNC	11.8	15.0	294
Total	100.0	100.0	2,251
Time to PNC			
Within two days	84.0	79.1	1,853
3-41 days	4.1	5.9	104
Never/did not receive PNC	11.8	15.0	294
Total	100.0	100.0	2,251
PNC care provider			
Skilled provider[1]	99.3	99.4	1,945
Doctor/clinical officer/medical assistant	25.0	25.5	466
Nurse/midwife	74.3	73.9	1,479
Other provider	0.7	0.7	12
Patient attendant/health surveillance assistant	0.3	0.2	5
Traditional birth attendant/other	0.4	0.5	7
Total	100.0	100.0	1,957
N	**1,196**	**1,055**	**2,251**

[1]Includes women who received a check from a doctor, clinical officer, medical assistant, nurse, or midwife.

Table 24. Women's PNC in the past two years among those who did not deliver at a health facility (ONSE IE baseline, 2017)

	Project	Comparison	N
Received PNC			
Received PNC	48.7	40.4	73
Did not receive PNC	51.3	59.6	104
Total	100.0	100.0	177
Time to PNC			
Within two days	45.5	40.4	69
3-41 days	3.2	0.0	4
Never/did not receive PNC	51.3	59.6	104
Total	100.0	100.0	177
PNC care provider			
Skilled provider[1]	80.2	93.2	62
Doctor/clinical officer/medical assistant	14.2	12.7	14
Nurse/midwife	66.0	80.5	48
Other provider	19.8	6.9	11
Patient attendant/health surveillance assistant	1.4	0.0	1
Traditional birth attendant/other	18.4	6.9	10
Total	100.0	100.0	73
N	**105**	**72**	**177**

[1]Includes women who received a check from a doctor, clinical officer, medical assistant, nurse, or midwife.

Table 25. Newborn PNC in the past two years among those who were not delivered at a health facility (ONSE IE baseline, 2017)

	Project	Comparison	N
Received PNC			
Received PNC	41.4	30.0	76
Did not receive PNC	58.6	70.0	155
Total	100.0	100.0	231
Time to PNC			
Within two days	37.3	30.0	69
3-41 days	4.1	0.0	7
Never/did not receive PNC	58.6	70.0	155
Total	100.0	100.0	231
PNC care provider			
Skilled provider[1]	79.3	92.6	63
Doctor/clinical officer/medical assistant	13.0	11.1	13
Nurse/midwife	66.3	81.5	50
Other provider			
Patient attendant/health surveillance assistant	17.9	5.0	11
Traditional birth attendant/other	2.8	2.4	2
Total	100.0	100.0	76
N	**139**	**92**	**231**

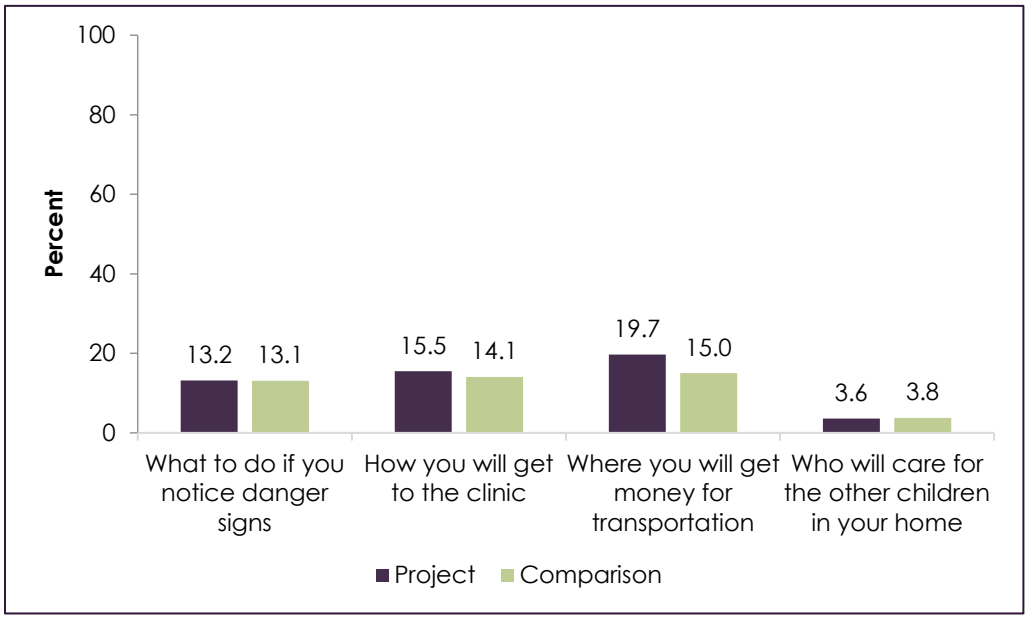
[1]Includes women who received a check from a doctor, clinical officer, medical assistant, nurse, or midwife.

Women's Knowledge about Pregnancy and Childbirth

The baseline survey tested women's knowledge about pregnancy, childbirth, and newborn danger signs that are targeted by the National Health Communication Strategy through a SBCC campaign.

One of the objectives of the SBCC campaign is to educate women about the types of information they should plan for before the birth of their child. Of the four items recommended for women's birth preparedness planning, the most frequently reported by women was where she would get money for transportation, although less than one-fifth of women reported this item (Figure 2). The item that women least commonly reported was that they should consider who will care for their other children when they are in labor.

Figure 2. Percentage of WRA who knew the four recommended components of birth preparedness planning (ONSE IE baseline, 2017)*



*Results for women with a birth in the past three years differed occasionally but not in any systematic way.

Figure 3 (and Tables A1 and A2 in Appendix A) present results on women's knowledge of the danger signs of pregnancy. About one-half of WRA identified vaginal bleeding as a serious warning/danger sign during pregnancy. The second most frequently reported warning sign for women in the project and comparison domains was swollen hands, feet, or face (29.1 percent and 25.4 percent, respectively). Between 10 to 20 percent of women in both domains reported vaginal discharge, high fever, and severe headache as warning signs during pregnancy. Less than 10 percent of women knew that difficulty breathing, fatigue, and pale hands or eyes were warning signs during pregnancy.

Figure 3. Percentage of WRA who identified serious warning/danger signs during pregnancy (ONSE IE baseline, 2017)

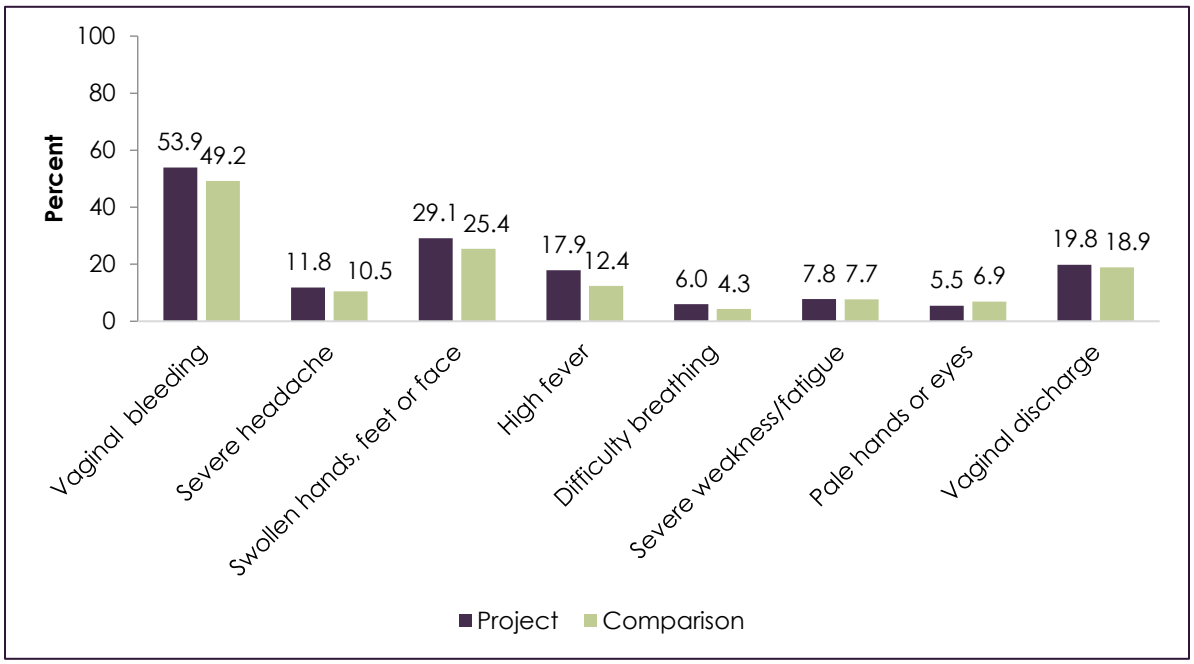
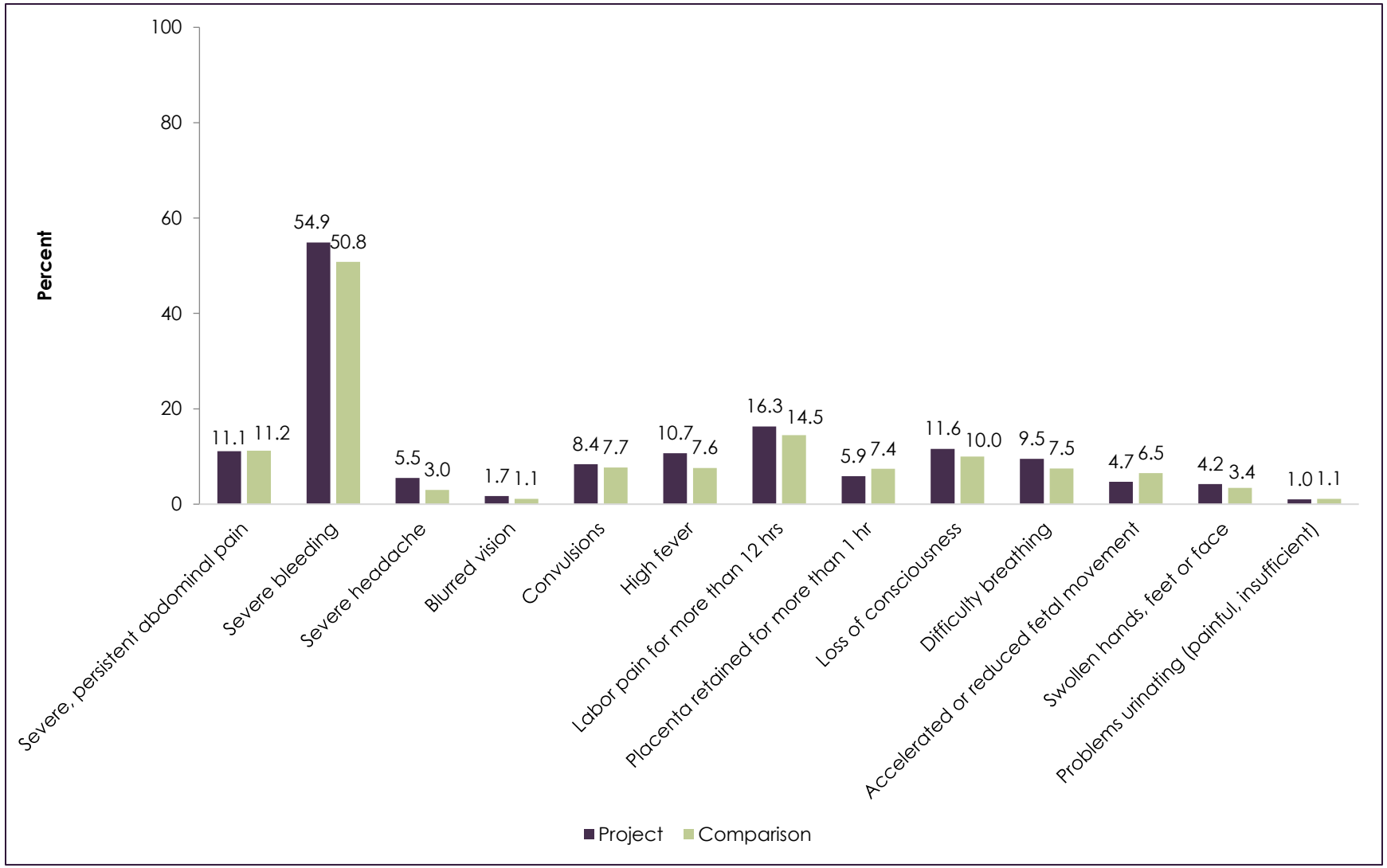


Figure 4 (and Tables A3 to A6 in Appendix A) present results on women's knowledge of danger signs during childbirth. Knowledge of severe bleeding as a serious warning sign during childbirth was 54.9 percent in the project domain and 50.8 percent in the comparison domain. The second most frequently reported warning sign during childbirth was prolonged labor (lasting more than 12 hours), with 16.3 percent and 14.5 percent of women knowing this fact in the project and comparison domains, respectively.

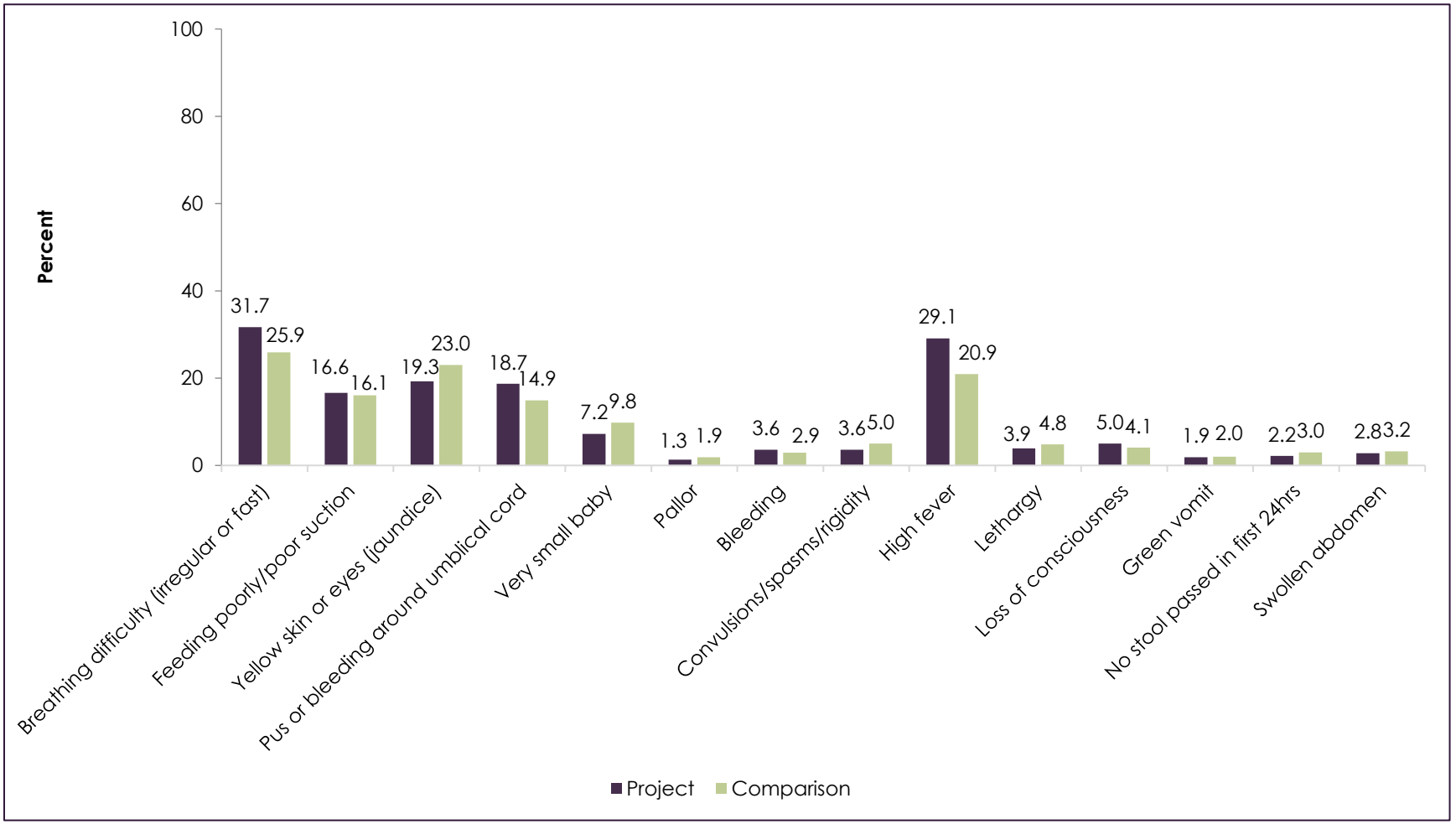
Figure 5 (and Tables A7 to A10 in Appendix A) present results on women's knowledge of danger signs of newborn complications. Women knew little about the warning signs of newborn complications. Difficulty breathing, high fever, jaundice, pus or bleeding around the umbilical cord, and poor feeding were the most frequently reported warning signs, although none of these danger signs were reported by even one-third of women. Bleeding, pallor, convulsions, lethargy, loss of consciousness, green vomit, no stool in the first 24 hours, and swollen abdomen were reported by five percent or less of women.

Figure 4. Percentage of WRA who identified serious warning/danger signs during childbirth (ONSE IE baseline, 2017)*



*Results for women with a birth in the past three years differed occasionally but not in any systematic way.

Figure 5. Percentage of WRA who identified serious warning/danger signs of newborn complications (ONSE IE baseline, 2017)*



*Results for women with a birth in the past three years differed occasionally but not in any systematic way.

CHILD HEALTH

This section presents information on breastfeeding and the use of health services for fever, acute respiratory infection (ARI), and diarrhea for children under three. Women's knowledge and beliefs about the symptoms and causes of malaria, pneumonia, and diarrhea are also presented.

Background Characteristics of Children Under Three

A total of 3,514 children under three years of age lived in the study households. The sex and age distribution (by months) of these children were similar across the project and comparison domains. A higher proportion of mothers were ages 20 to 24 (34.1 percent) in the comparison domain than in the project domain (29.7 percent) (Table 26).

Table 26. Characteristics of children under three years of age (ONSE IE baseline, 2017)

Characteristic	Project	Comparison	N
Sex			
Female	47.3	48.6	1,688
Male	52.7	51.4	1,826
Total	100.0	100.0	3,514
Age in months			
< 6	16.9	16.4	582
6-11	14.7	17.4	561
12-17	18.7	17.0	608
18-23	17.9	15.4	595
24-35	31.9	33.9	1,168
Total	100.0	100.0	3,514
Mother's age			
15-19	12.1	10.3	381
20-24	29.7	34.1	1,085
25-29	22.4	22.8	756
30-34	17.9	16.5	595
35-39	11.3	11.7	397
40-44	4.6	3.5	132

Characteristic	Project	Comparison	N
45-49	2.0	1.1	53
Total	100.0	100.0	3,399
District			
Machinga	--	38.6	873
Nkhotakota	--	24.6	510
Salima	--	36.8	483
Mzimba	64.2	--	1,077
Nsanje	15.2	--	256
Ntchisi	20.6	--	315
Total	100.0	100.0	3,514
N	**1,866**	**1,648**	**3,514**

Breastfeeding

In the project domain, 73.7 percent of mothers with children born in health facilities in the past two years reported that they were observed breastfeeding by a healthcare worker, as did 70.5 percent of mothers in the comparison domain (Table 27). More than 88.4 percent of mothers in the project domain also reported that they were counseled on breastfeeding by a healthcare worker, as did 86.6 percent of mothers in the comparison domain. Observation of breastfeeding increased as education of the mother increased. It also tended to increase as the wealth of the mother increased, except for mothers in the lowest quintile in the project domain.

Table 27. Breastfeeding observation and counseling among last births in facilities in the past two years (ONSE IE baseline, 2017)

Background characteristic	Observed		Counseled	
	Project	Comparison	Project	Comparison
Age group of the mother				
15-19	70.0	74.1	88.3	84.5
20-24	75.8	68.0	87.5	83.8
25-29	76.1	74.4	89.5	91.1
30-34	71.9	68.9	87.4	89.4
35-39	72.0	72.6	91.4	84.4
40-44	71.3	63.0	86.0	86.9
45-49	65.2	59.7	85.9	83.3
Educational attainment of the mother				
No education	64.8	66.6	81.4	86.7
Some/completed primary	74.5	68.9	88.8	85.8
Some/completed secondary	76.1	76.3	92.1	88.9
More than secondary	93.4	90.6	100.0	97.7
Wealth quintile of the mother				
Lowest	74.0	65.8	89.0	85.7
Second	68.4	68.1	86.1	83.3
Middle	72.9	71.7	87.7	86.9
Fourth	78.7	73.4	92.1	89.4
Highest	77.2	74.6	87.9	87.8

Background characteristic	Observed		Counseled	
	Project	Comparison	Project	Comparison
District				
Machinga	74.1	--	87.3	--
Nkhotakota	78.3	--	87.0	--
Salima	70.1	--	90.4	--
Mzimba	--	73.7	--	87.6
Nsanje	--	64.6	--	83.3
Ntchisi	--	64.9	--	85.9
Total	73.7	70.5	88.4	86.6
N	1,659	1,496	1,659	1,495

Approximately 45 percent of mothers who gave birth outside a health facility in the past two years in both study domains reported being observed breastfeeding by a healthcare worker (Table 28). Being counseled on breastfeeding by a healthcare worker was reported by 53.8 percent of mothers in the project domain and 58.0 percent in the comparison domain among women who gave birth outside a facility. Observation of breastfeeding increased as education of the mother increased. Observation of breastfeeding across the mothers' wealth quintiles varied in both the project and comparison domains.

Table 28. Breastfeeding observation and counseling among last births outside of health facilities in the past two years (ONSE IE Baseline, 2017)

Background characteristic	Observed		Counseled	
	Project	Comparison	Project	Comparison
Age group of the mother				
15-19	61.9	29.8	65.7	29.8
20-24	32.1	51.0	30.4	59.6
25-29	45.0	46.8	64.7	82.2
30-34	54.9	45.1	58.3	46.8
35-39	28.7	50.4	46.3	57.9
40-44	25.5	29.2	25.5	41.6
45-49	75.5	0.0	75.5	40.6

Background characteristic	Observed		Counseled	
	Project	Comparison	Project	Comparison
Educational attainment of the mother				
No education	42.8	21.6	44.5	25.5
Some/completed primary	42.0	43.4	52.1	58.4
Some/completed secondary	89.7	70.1	89.7	76.7
More than secondary		--	--	--
Wealth quintile of the mother				
Lowest	39.8	44.2	43.0	48.1
Second	36.2	44.2	43.4	53.3
Middle	61.3	42.7	65.8	58.9
Fourth	34.2	49.4	44.3	66.2
Highest	63.3	47.7	82.7	69.1
District				
Machinga	34.8	--	35.1	--
Nkhotakota	57.0	--	70.7	--
Salima	42.3	--	51.2	--
Mzimba	--	51.7	--	63.8
Nsanje	--	20.4	--	31.0
Ntchisi	--	42.1	--	60.8
Total	45.4	45.3	53.8	58.0
N	**142**	**102**	**142**	**102**

The percentage of children under three still being breastfed was approximately two-thirds in both domains (Table 29). More than 90 percent of children under one were still being breastfed. Among one-year-olds, 81.2 percent of children in the project domain and 85.4 percent in the comparison domain were still being breastfed, as compared with only 14.9 percent and 22.1 percent of two-year-olds, respectively. In general, breastfeeding was more commonly reported by younger women and women with less education.

Table 29. Percentage of children who were still being breastfed among last births in the past three years (ONSE IE Baseline, 2017)

Characteristics	Project		Comparison	
	Yes	N	Yes	N
Age of the child				
Under 1 year old	92.7	583	91.5	536
1 year old	81.2	639	85.4	506
2 years old	14.9	491	22.1	485
Total	66.4	1,713	67.6	1,527
Age of the mother				
15-19	74.2	211	79.7	170
20-24	64.0	556	65.4	529
25-29	60.2	396	65.3	360
30-34	69.9	312	57.3	282
35-39	58.4	211	69.6	186
40-44	63.1	79	64.2	52
45-49	33.7	36	33.5	18
Total	64.1	1,801	65.6	1,597
Educational attainment of the mother				
No education	64.6	233	71.8	95
Some/completed primary	64.3	1,341	67.4	1,178
Some/completed secondary	63.8	210	59.1	302
More than secondary	49.4	17	33.5	22
Total	64.1	1,801	65.6	1,597
Wealth quintile of the mother				
Lowest	65.2	572	70.8	349
Second	64.3	393	69.7	308
Middle	67.0	330	67.1	326
Fourth	58.3	249	63.5	326
Highest	63.9	256	54.5	288
Total	64.1	1,800	65.6	1,597
District				
Machinga	63.3	839	-	

Characteristics	Project		Comparison	
	Yes	N	Yes	N
Nkhotakota	63.7	502	-	
Salima	65.4	460	-	
Mzimba	-		66.1	1,049
Nsanje	-		64.4	258
Ntchisi	-		65.0	290
Total	**64.1**	**1,801**	**65.6**	**1,597**

Prevalence and Treatment of Fever, Acute Respiratory Infection, and Diarrhea

Malaria, ARI, and diarrhea are three common childhood illnesses that contribute to child mortality (WHO, n.d.). This section presents results on children under three who had fever (the primary symptom of malaria), symptoms of ARI (short, rapid breathing), or diarrhea in the two weeks before the survey.

Prevalence and Treatment of Fever

Fever in the past two weeks was reported for a larger proportion of children under three in the project domain (38.1 percent) than in the comparison domain (31.4 percent) (Table 30). In both domains, treatment was sought for approximately 80 percent of these children. Treatment was most commonly sought on the second day (52.8 percent and 60.4 percent of children under three in the project and comparison domains, respectively).

Among children for whom treatment was sought, approximately 94 percent of children in both domains were prescribed drugs. Acetaminophen/panadol/paracetamol were the most commonly prescribed drugs (70.7 percent of children in the project domain and 65.5 percent of children in the comparison domain). Antibiotics were also prescribed for 11.1 percent of children in the project domain and 17.8 percent of children in the comparison domain. Approximately six percent of children under three in both domains were prescribed an antimalarial.

Table 30. Prevalence and treatment of fever in children under three in the past two weeks (ONSE IE baseline, 2017)

	Project	Comparison	N
Child had fever			
Yes	38.1	31.4	1,196
No	61.9	68.6	2,318
Total	100.0	100.0	3,514
Sought treatment for fever			
Yes	78.8	81.2	948
No	21.2	18.8	248
Total	100.0	100.0	1,196
Days before treatment was sought			
Same day	10.8	10.7	111
2 days	52.8	60.4	513
3 days	23.5	20.3	218
4 or more days	12.9	8.7	106
Total	100.0	100.0	948
Among those who sought treatment for fever, prescribed drugs			
Yes	93.8	94.6	892
No	6.2	5.4	56
Total	100.0	100.0	948
Summary of drugs prescribed			
Acetaminophen/panadol/paracetamol	70.7	65.5	610
Antibiotics (pill/syrup, injection/intravenous)	11.1	17.8	133
Antimalarial	6.2	6.3	56
Aspirin/Cafenol	3.5	2.0	21
Ibuprofen	1.3	0.5	6
Other	6.0	5.4	49
Don't know	1.3	2.6	17
Total	100.0	100.0	892
Total	**1,866**	**1,648**	**3,514**

Prevalence and Treatment of Acute Respiratory Infection

Symptoms of ARI in the past two weeks were reported for 15.7 percent of children under three in the project domain and 17.6 percent of children under three in the comparison domain (Table 31). Treatment was sought for more than 86 percent of children in both domains. Among children for whom treatment was sought, 53.6 percent of children in the project domain and 66.5 percent in the comparison domain received treatment on the same day or the next day.

Drugs were prescribed for approximately 94 percent of children in both domains for whom treatment was sought. More than one-half of the children were prescribed aspirin/Cafenol. In the project domain, 21.7 percent of children were prescribed an antibiotic, as were 25.6 percent of children in the comparison domain.

Table 31. Prevalence and treatment of ARI in children under three in the past two weeks (ONSE IE baseline 2017)

	Project	Comparison	N
Child had symptoms of ARI			
Yes	15.7	17.6	579
No	84.3	82.4	2,935
Total	100.0	100.0	3,514
Sought treatment for ARI			
Yes	86.5	88.2	498
No	13.5	11.8	81
Total	100.0	100.0	579
Days before treatment was sought			
Same day	6.3	9.0	44
2 days	47.3	57.5	256
3 days	30.1	22.9	133
4 or more days	16.3	10.7	65
Total	100.0	100.0	498
Among those who sought treatment for ARI, prescribed drugs			
Yes	94.1	93.8	466
No	5.9	6.2	32
Total	100.0	100.0	498
Summary of drugs prescribed			
Acetaminophen/panadol/paracetamol	4.7	3.9	19
Antibiotics (pill/syrup, injection/intravenous)	21.7	25.6	107
Antimalarial	2.9	2.1	10
Aspirin/Cafenol	55.8	57.5	268
Ibuprofen	0.4	0.5	4
Other	13.4	7.1	45
Don't know	1.2	3.5	13
Total	100.0	100.0	466
Total	**1,866**	**1,648**	**3,514**

Prevalence and Treatment of Diarrhea

In the two weeks before the survey, 21.3 percent of children under three in the project domain and 23.7 percent in the comparison domain had diarrhea (Table 32). In both domains, treatment was sought for just over three-quarters of these children. Among children for whom treatment was sought in the project domain, 59.2 percent were treated with local fluids, 29.1 percent were treated with pre-packaged oral rehydration salts

(ORS) or government recommended ORS, and 35.3 percent were given zinc tabs. In the comparison domain, 71.5 percent were treated with local fluids, 27.4 percent were treated pre-packaged ORS or government recommended ORS, and 41.7 percent were given zinc tabs.

Table 32. Prevalence and treatment of diarrhea in children under three in the past two weeks (ONSE IE baseline, 2017)

	Project	Comparison	N
Child had diarrhea			
Yes	21.3	23.7	787
No	78.8	76.3	2,727
Total	100.0	100.0	3,514
Sought treatment for diarrhea from any source			
Yes	77.7	76.9	599
No	22.3	23.1	188
Total	100.0	100.0	787
Days before diarrhea treatment was sought			
Same day	5.5	5.9	35
2 days	29.7	31.7	180
3 days	16.6	14.2	93
4 or more days	48.2	48.3	291
Total	100.0	100.0	599
Of those who sought treatment, treatment prescribed[1]			
Local fluids	59.2	71.5	384
Pre-packaged ORS or government recommended ORS	29.1	27.4	169
Zinc tabs	35.3	41.7	234
Among those who did not seek treatment, treatment used[1]			
Local fluids	15.0	7.1	24
Pre-packaged ORS or government recommended ORS	15.8	9.7	25
Zinc tabs	10.6	8.1	16
N	**1,866**	**1,648**	**3,514**

[1]Multiple responses allowed.

Women's Knowledge about Common Infectious Diseases in Children

Knowledge of Symptoms and Causes of Malaria

Nearly 83 percent of women in the project domain and 76.7 percent of women in the comparison domain knew that fever was a sign of malaria and just under one-half of women knew that chills were also a sign of malaria (Figure 6). Headache and joint pain were also reported as symptoms of malaria by approximately one-third of women in both domains. The least reported symptom of malaria was poor appetite (Figure 6 and Tables A11 and A12 in Appendix A).

Figure 6. Percentage of WRA who knew the signs and symptoms of malaria (ONSE IE baseline, 2017)

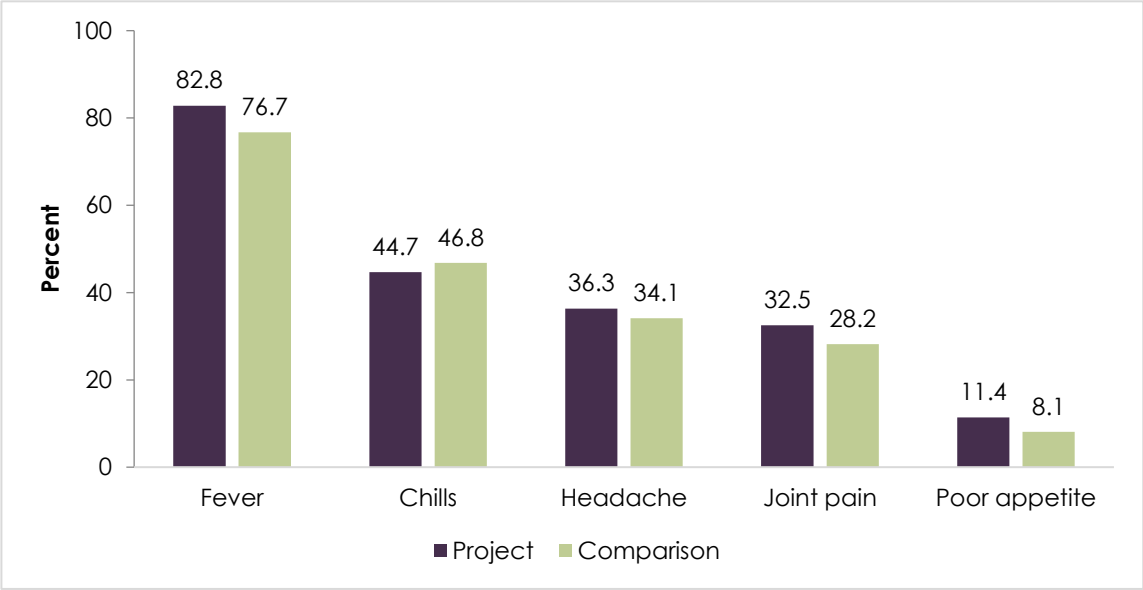


Table 33 shows the percentage of women who identified mosquitos as the cause of malaria in the project and comparison domains. Overall, approximately 80 percent of women in both domains knew that mosquitos cause malaria. The percentage of women who correctly identified mosquitos follows an upward gradient for both education and wealth; the smallest percentage of women who had this knowledge were in the least educated (67.5 percent) and lowest wealth quintile (70.4 percent) categories in the project domain.

Table 33. Percentage of WRA who correctly identified mosquitos as the cause of malaria (ONSE IE baseline, 2017)

	Project	Comparison	N
Age			
15-19	76.5	75.1	1,586
20-24	79.0	82.5	1,605
25-29	81.3	84.7	1,170
30-34	81.1	81.4	1,106
35-39	81.9	80.8	954
40-44	80.4	79.9	631
45-49	77.4	77.6	490
Education			
No education	67.5	71.6	726
Some/completed primary	78.0	77.8	5,368
Some/completed secondary	95.9	90.6	1,331
More than secondary	97.7	100.0	117
Wealth index*			
Lowest	70.4	78.6	1,561
Second	74.1	75.4	1,430
Middle	80.9	77.2	1,436
Fourth	86.8	81.3	1,458
Highest	88.2	87.3	1,652
District			
Machinga	78.4	--	1,649
Nkhotakota	83.7	--	1,143
Salima	77.4	--	984
Mzimba	--	80.5	2,589
Nsanje	--	77.3	488
Ntchisi	--	81.6	689
Total	79.5	80.3	7,542
N	**3,776**	**3,766**	**7,542**

*Five households are missing wealth information.

Knowledge of Symptoms and Causes of Pneumonia

The National Health Communications Strategy aims to increase knowledge about the four signs and symptoms and three causes of ARI and pneumonia. Almost 60 percent of the women in the project domain and 55 percent of the women in the comparison domain knew that fast, difficult, or noisy breathing was a sign of pneumonia (Figure 7). Knowledge that cough, lethargy, and refusal to eat or breastfeed were signs of pneumonia was low in both domains. A higher percentage of WRA in the project domain reported that not dressing warmly enough was a cause of pneumonia than in the comparison domain (69.9 percent and 61.3 percent, respectively) (Figure 8). In addition to Figures 7 and 8, see Tables A13 to A15 in Appendix A.

Knowledge of Symptoms and Causes of Diarrhea

About 40 percent of women in the project and comparison domains knew that loose and watery stool for more than three days was a sign of diarrhea (Figure 9). Knowledge of the causes of diarrhea was slightly better, with between 35 percent and 40 percent of women stating that lack of safe drinking water and lack of food protection against contamination could cause diarrhea (Figure 10). About one-fifth of women stated that eating rotten food, touching food without washing with soap and water, and not washing hands after defecation could cause diarrhea. In addition to Figures 9 and 10, see Tables A16 to A19 in Appendix A.

Figure 7. Percentage of WRA who knew the signs and symptoms of pneumonia (ONSE IE baseline, 2017)

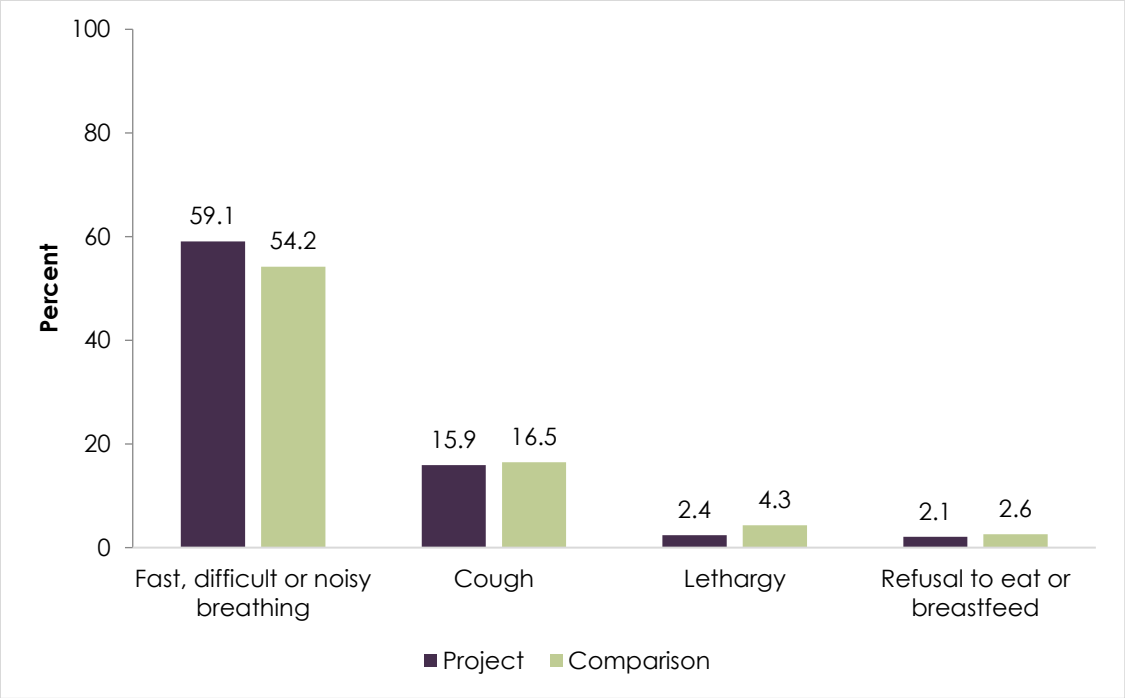


Figure 8. Percentage of WRA who knew the causes of pneumonia (ONSE IE baseline, 2017)

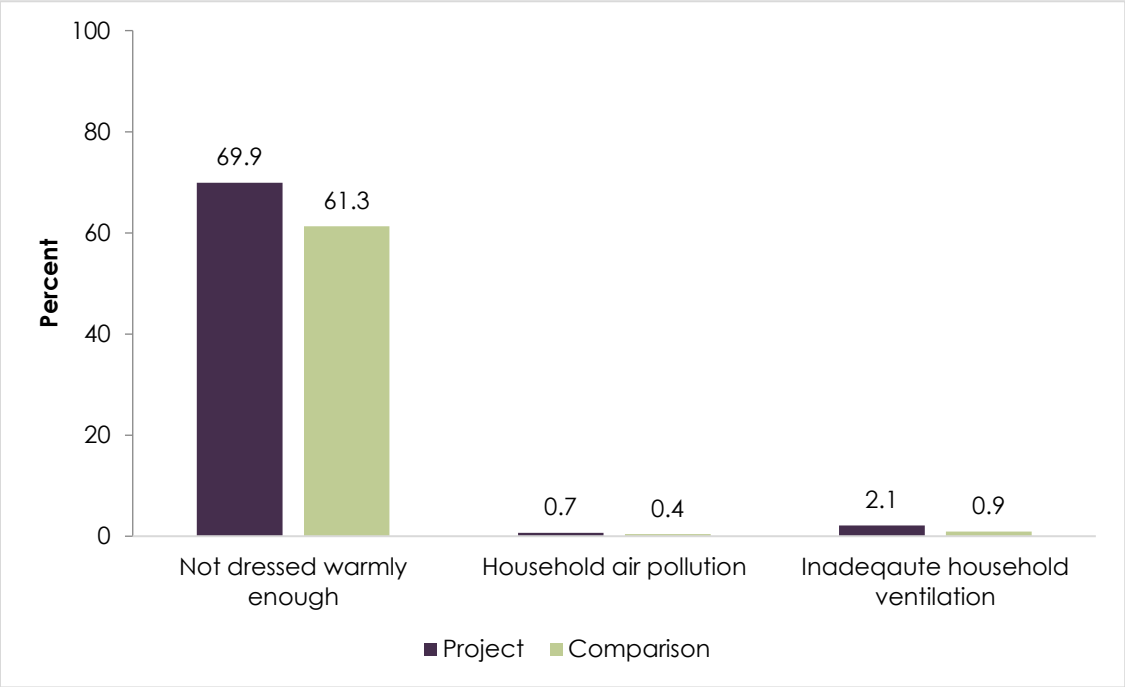


Figure 9. Percentage of WRA who knew the signs and symptoms of diarrhea (ONSE IE baseline, 2017)

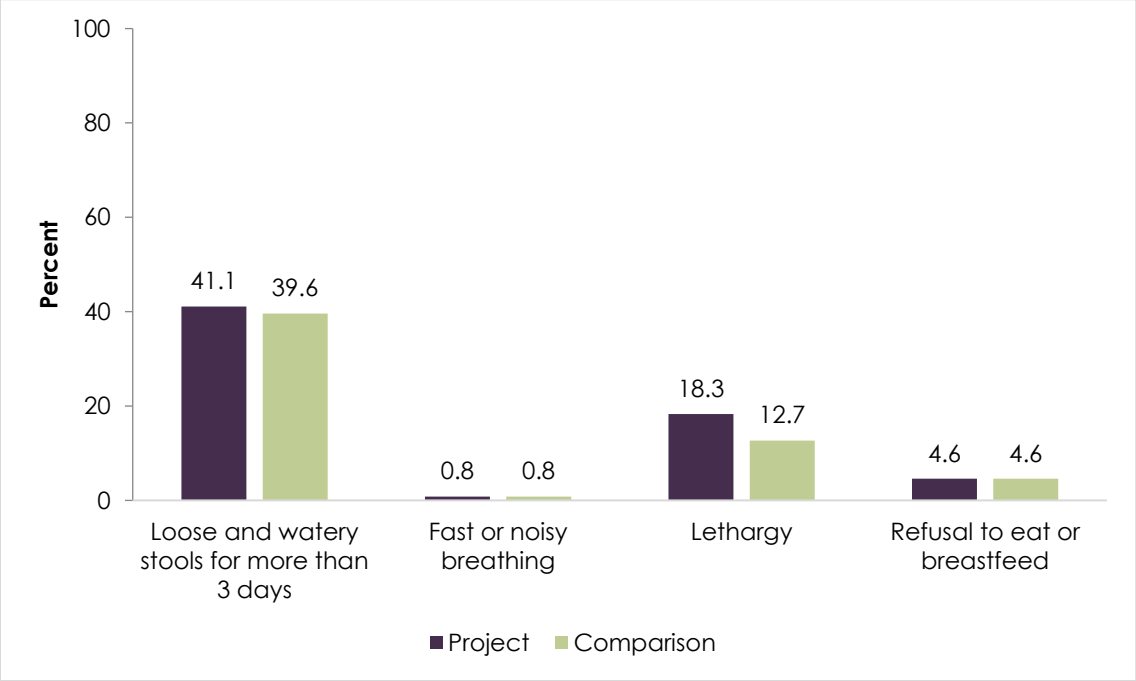
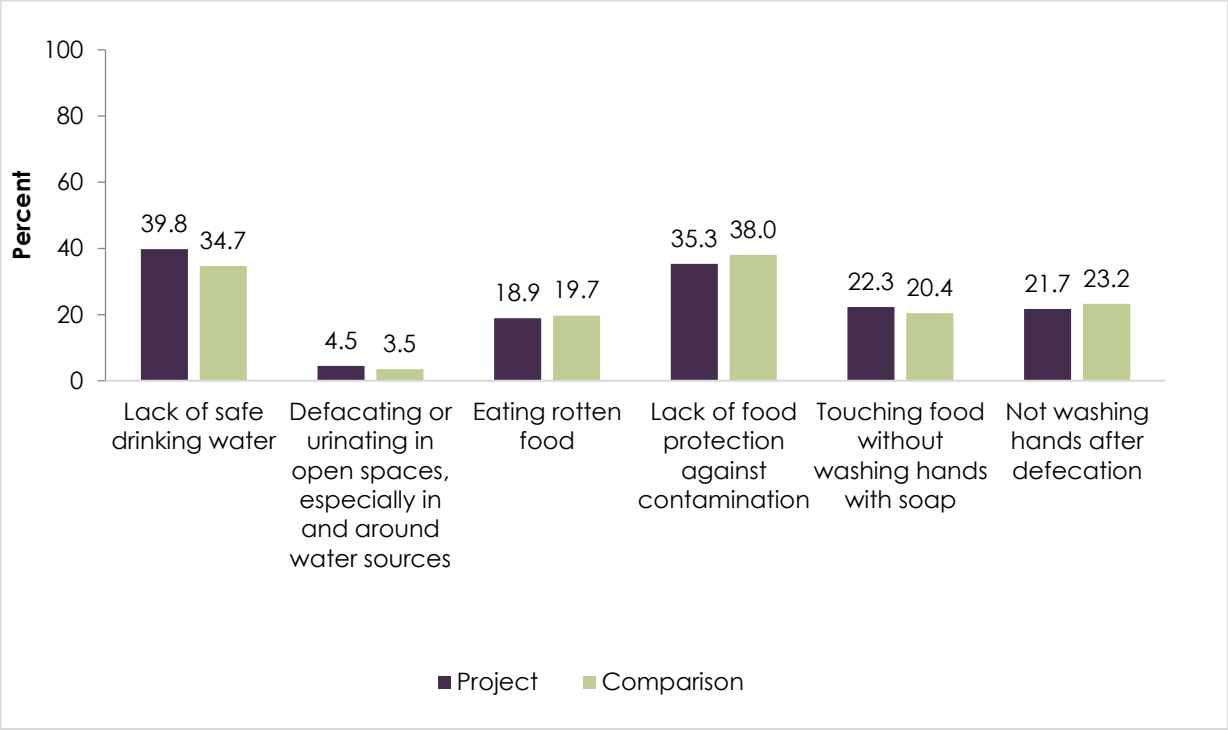


Figure 10. Percentage of WRA who knew the causes of diarrhea (ONSE IE baseline, 2017)



SERVICE AVAILABILITY AND READINESS ASSESSMENT

This section presents the service availability and readiness indicators for a census of public and CHAM hospitals, health centers, and dispensaries in the project and comparison domains. Indicators presented are those for basic services, FP, maternal health, child health, and malaria.

Characteristics of Health Facilities

The health facility sample was 139 facilities. Just under 80 percent were health centers, 13.0 percent were hospitals, and 7.9 percent were dispensaries (Table 34). Three-quarters were public facilities, and one-quarter were CHAM facilities. Project facilities comprised 39.6 percent of the sample, and comparison facilities comprised 60.4 percent. In addition to Table 34, see Table A20 in Appendix A.

Table 34. Characteristics of sampled health facilities (ONSE IE SARA survey, 2017)

Background characteristics	Percentage distribution of surveyed facilities	Number of facilities surveyed
Facility type		
Hospital	13.0	18
Health center	79.1	110
Dispensary	7.9	11
Total	100.0	139
Managing authority		
Government	74.8	104
CHAM	25.2	35
Total	100.0	139
District		
Machinga	15.1	21
Nkhotakota	14.4	20
Salima	10.1	14
Mzimba	41.0	57
Nsanje	10.1	14
Ntchisi	9.4	13
Total	100.0	139
Study domain		
Project	39.6	55
Comparison	60.4	84
Total	**100.0**	**139**

Basic Client Services and Amenities

The basic client services assessed were the availability of child curative care, child growth monitoring services, any modern methods of FP, and ANC services. All basic client services were offered by 89.1 percent of project facilities and 85.7 percent of comparison facilities (Table 35).

Basic amenities for client services consisted of regular electricity, an improved water source, visual and auditory privacy, a client latrine, communication equipment, a computer with Internet, and emergency transport. The results for the project and comparison domains were similar for several of the basic amenities examined. Approximately 70 percent had regular electricity, more than 92 percent had visual and audio privacy and a client latrine, and just under 20 percent had emergency transport (Table 36). A higher percentage of comparison facilities (32.1 percent) had an improved water source than project facilities (18.2 percent). On the other hand, a higher percentage of project facilities (69.1 percent) had communication equipment (phone or shortwave radio) than comparison facilities (53.6 percent). In addition, a somewhat higher percentage of project facilities (18.2 percent) than comparison facilities (14.3 percent) had a computer with Internet. In addition to Table 36, see Table A21 in Appendix A.

Table 35. Availability of basic client services (ONSE IE SARA survey, 2017)

Background characteristics	Child curative care	Child growth monitoring services	Any modern methods of FP	ANC services	All basic client services[1]	Number of facilities
Facility type						
Hospital	94.4	94.4	66.7	94.4	66.7	18
Health center	100.0	100.0	96.4	99.1	96.4	110
Dispensary	100.0	100.0	90.9	27.3	27.3	11
Total	99.3	99.3	92.1	92.8	87.1	139
Managing authority						
Government	99.0	99.0	99.0	92.3	92.3	104
CHAM	100.0	100.0	71.4	94.3	71.4	35
Total	99.3	99.3	92.1	92.8	87.1	139
District						
Machinga	100.0	100.0	90.5	90.5	81.0	21
Nkhotakota	100.0	100.0	100.0	95.0	95.0	20
Salima	100.0	100.0	92.9	100.0	92.9	14
Mzimba	98.2	98.2	91.2	91.2	86.0	57
Nsanje	100.0	100.0	85.7	100	85.7	14
Ntchisi	100.0	100.0	92.3	84.6	84.6	13
Total	99.3	99.3	92.1	92.8	87.1	139

Background characteristics	Child curative care	Child growth monitoring services	Any modern methods of FP	ANC services	All basic client services[1]	Number of facilities
Study domain						
Project	100.0	100.0	94.5	94.5	89.1	55
Comparison	98.8	98.8	90.5	91.7	85.7	84
Total	**99.3**	**99.3**	**92.1**	**92.8**	**87.1**	**139**

[1] Basic client services were child curative care, child growth monitoring services, any modern methods of FP, and ANC services.

Table 36. Availability of basic amenities for client services (ONSE IE SARA survey, 2017)

Background characteristics	Regular electricity	Improved water source	Visual and auditory privacy	Client latrine	Commu-nication equip-ment	Com-puter with Internet	Emer-gency trans-port	Number of facilities
Facility Type								
Hospital	88.9	5.6	88.9	94.4	88.9	72.2	83.3	18
Health center	65.5	27.3	97.3	93.6	57.3	7.3	8.2	110
Dispensary	81.8	54.5	90.9	90.9	36.4	9.1	18.2	11
Total	69.8	26.6	95.7	93.5	59.7	15.8	18.7	139
Managing authority								
Government	67.3	29.8	95.2	92.3	60.6	8.7	9.6	104
CHAM	77.1	17.1	97.1	97.1	57.1	37.1	45.7	35
Total	69.8	26.6	95.7	93.5	59.7	15.8	18.7	139
District								
Machinga	52.4	14.3	95.2	90.5	81.0	14.3	14.3	21
Nkhotakota	85.0	20.0	95.0	90.0	80.0	25.0	20.0	20
Salima	78.6	21.4	92.9	100.0	35.7	14.3	21.4	14
Mzimba	66.7	40.4	98.3	91.2	47.4	12.3	17.5	57
Nsanje	78.6	14.3	85.7	100.0	57.1	21.4	21.4	14
Ntchisi	69.2	15.4	100.0	100.0	76.9	15.4	23.1	13
Total	69.8	26.6	95.7	93.5	59.7	15.8	18.7	139
Study domain								
Project	70.9	18.2	94.5	92.7	69.1	18.2	18.2	55
Comparison	69.0	32.1	96.4	94.0	53.6	14.3	19.0	84
Total	**69.8**	**26.6**	**95.7**	**93.5**	**59.7**	**15.8**	**18.7**	**139**

Availability of Priority Medicines for Mothers and Children

Tables 37 and 38 (and Tables A22 and A23 in Appendix A) provide a snapshot of the percentage of facilities that had priority medicines, by medicine, for mothers and children on the day of the survey. There were variations, by facility type, in which medicines were available for women's and children's priority medicines. The least available medicines for mothers were ampicillin powder and cefixime capsules/tablets whereas the most available medicines were benzathine benzylpenicillin powder for injection, gentamicin, and oxytocin. The least available medicines for children were ampicillin powder for injection and paracetamol, and the most available medicines for children were gentamicin injection, artesunate rectal or injection dosage forms, and artemisinin combination therapy (ACT).

Table 37. Percentage of facilities with priority medicines for mothers (ONSE IE baseline, 2017)

Background characteristics	Oxytocin	Sodium chloride inj. solution	Calcium gluconate inj.	Magnesium sulphate inj.	Ampicillin powder (inj.)	Gentamicin injection	Metronidazole injection	Misoprostol	Azithromycin	Cefixime	Benzathine benzylpenicillin powder	Betamethasone/ Dexamethasone injection	Nifedipine	Hydralazine injection	Methyldopa tablet	N
Facility Type																
Hospital	89.5	73.7	27.8	89.5	57.9	94.7	77.8	50.0	66.7	11.1	94.7	78.9	72.2	83.3	83.3	18
Health center	93.6	70.9	--	74.5	6.4	98.2	--	--	--	--	100.0	18.2	--	--	--	110
Dispensary	30.0	50.0	--	10.0	0.0	70.0	--	--	--	--	70.0	10.0	--	--	--	11
Total	88.5	69.8	27.8	71.9	13.0	95.7	77.8	50.0	66.7	11.1	97.1	25.9	72.2	83.3	83.3	139
Managing authority																
Government	88.5	71.2	22.2	69.2	7.7	94.2	66.7	55.6	77.8	0.0	96.2	18.3	44.4	66.7	66.7	104
CHAM	88.6	65.7	33.3	80.0	28.6	100.0	88.9	44.4	55.6	22.2	100.0	48.6	100.0	100.0	100.0	35
Total	88.5	69.8	27.8	71.9	13.0	95.7	77.8	50.0	66.7	11.1	97.1	25.9	72.2	83.3	83.3	139
District																
Machinga	85.7	71.4	100.0	76.2	4.8	90.5	100.0	0.0	100.0	0.0	90.5	23.8	100.0	100.0	100.0	21
Nkhotakota	85.0	80.0	25.0	85.0	15.0	100.0	75.0	50.0	50.0	0.0	100.0	50.0	75.0	75.0	75.0	20
Salima	92.9	64.3	00.	85.7	35.7	100.0	100.0	100.0	100.0	0.0	100.0	21.4	0.0	100.0	100.0	14
Mzimba	87.7	71.9	37.5	57.9	8.8	94.7	62.5	37.5	50.0	12.5	96.5	22.8	62.5	75.0	75.0	57
Nsanje	100.0	50.0	0.0	85.7	21.4	92.9	100.0	66.7	100.0	33.3	100.0	21.4	100.0	100.0	100.0	14
Ntchisi	84.6	69.2	0.0	76.9	7.7	100.0	100.0	100.0	100.0	0.0	100.0	15.4	100.0	100.0	100.0	13
Total	88.5	69.8	27.8	71.9	13.0	95.7	77.8	50.0	66.7	11.1	97.1	25.9	72.2	83.3	83.3	139
Study domain																
Project	89.3	67.9	25.0	65.5	10.7	95.2	75.0	50.0	66.7	16.7	97.6	21.4	75.0	83.3	83.3	84
Comparison	87.3	72.7	33.3	81.8	16.4	96.4	83.3	50.0	66.7	0.0	96.4	32.7	66.7	83.3	83.3	55
Total	**88.5**	**69.8**	**27.8**	**71.9**	**13.0**	**95.7**	**77.8**	**50.0**	**66.7**	**11.1**	**97.1**	**25.9**	**72.2**	**83.3**	**83.3**	**139**

Table 38. Percentage of facilities with priority medicines for children (ONSE IE baseline, 2017)

Background characteristics	Amoxicillin	Ampicillin powder for injection	Ceftriaxone powder for injection	Gentamicin injection	Procaine benzylpenicillin powder for inj.	ORS	Zinc sulphate	ACT	Artesunate rectal or inj. forms	Vitamin A	Morphine granule, injection	Paracetamol	N
Facility Type													
Hospital	68.4	57.9	83.3	94.7	21.1	89.5	72.2	89.5	94.7	47.4	44.4	57.9	19
Health center	52.7	6.4	--	98.2	49.1	77.3	--	91.8	94.5	60.0	--	29.1	110
Dispensary	30.0	0.0	--	70.0	40.0	80.0	--	100.0	90.0	40.0	--	20.0	10
Total	53.2	13.0	83.3	95.7	44.6	79.1	72.2	92.1	94.2	56.8	44.4	32.4	139
Managing authority													
Government	44.2	7.7	66.7	94.2	44.2	80.8	66.7	95.2	95.2	56.7	55.6	17.3	104
CHAM	80.0	28.6	100.0	100.0	45.7	74.3	77.8	82.9	91.4	57.1	33.3	77.1	35
Total	53.2	13.0	83.3	95.7	44.6	79.1	72.2	92.1	94.2	56.8	44.4	32.4	139
District													
Machinga	33.3	4.8	100.0	90.5	52.4	38.1	100.0	95.2	90.5	42.9	100.0	33.3	21
Nkhotakota	45.0	15.0	75.0	100.0	30.0	90.0	50.0	95.0	100.0	50.0	2.05	20.0	20
Salima	42.9	35.7	100.0	100.0	42.9	92.9	100.0	92.9	92.9	28.6	100.0	35.7	14
Mzimba	61.4	8.8	75.0	94.7	40.4	82.5	75.0	87.7	91.2	73.7	37.5	26.3	57
Nsanje	71.4	21.4	100.0	92.9	57.1	85.7	66.7	100.0	100.0	42.9	33.3	64.3	14
Ntchisi	53.8	7.7	100.0	100.0	61.5	92.3	100.0	92.3	100.0	61.5	100.0	38.5	13
Total	53.2	13.0	83.3	95.7	44.6	79.1	72.2	92.1	94.2	56.8	44.4	32.4	139
Study domain													
Project	61.9	10.7	83.3	95.2	46.4	84.5	75.0	90.5	94.0	66.7	41.7	34.5	84
Comparison	40.0	16.4	83.3	96.4	41.8	70.9	66.7	94.5	94.5	41.8	50.0	29.1	55
Total	**53.2**	**13.0**	**83.3**	**95.7**	**44.6**	**79.1**	**72.2**	**92.1**	**94.2**	**56.8**	**44.4**	**32.4**	**139**

Family Planning Services

Of the facilities surveyed, approximately 95 percent of project facilities and 91 percent of comparison facilities offered FP services (data not shown). All these facilities offered modern methods of FP (Table 39). More than 98 percent of both project and comparison facilities offered injectables, and 100 percent of project facilities and 96.1 percent of comparison facilities offered male condoms. Pills were offered by 96.2 percent of project facilities and 88.2 percent of comparison facilities. Female condoms were offered by 92.3 percent of project facilities and 86.8 percent of comparison facilities. Implants were also offered by most facilities: 88.5 percent of project and 93.4 percent of comparison facilities. Cycle beads were available at approximately two-thirds of project facilities and one-half of comparison facilities. About one-third of facilities offered IUDs. Female sterilization was offered by 31.0 percent and 38.3 percent of project and comparison facilities, respectively. Male sterilization was the least common modern method available, offered by only 18.3 percent and 21.3 percent of project and comparison facilities, respectively. In addition to Table 39, see Table A24 in Appendix A.

Guidelines on FP were available at 92.3 percent and 94.7 percent of project and comparison facilities that offered FP services, respectively (Table 40). Just over 60 percent of project facilities and two-thirds of comparison facilities had at least one staff person trained in FP. A blood pressure apparatus was available at 84.6 percent and 78.9 percent of project and comparison facilities, respectively. Whereas 69.2 percent of project facilities had an examination light, only 42.1 percent of comparison facilities had this equipment.

Table 39. Availability of FP methods among facilities that provided FP services (ONSE IE SARA survey, 2017)

Background characteristics	Provision of the following modern methods[1]									Any modern method[4]	Number of facilities
	Pills[2]	Injectables[3]	Female condoms	Male condoms	IUD	Implant	Cycle beads	Male sterilization	Female sterilization		
Facility type											
Hospital	91.7	100.0	91.7	100.0	66.7	91.7	83.3	83.3	83.3	100.0	12
Health center	92.5	98.1	89.6	97.2	34.0	93.4	57.5	12.3	28.3	100.0	106
Dispensary	80.0	100.0	80.0	100.0	--	70.0	20.0	--	--	100.0	10
Total	91.4	98.4	89.1	97.7	37.3	91.4	57.0	19.5	33.9	100.0	128
Managing authority											
Government	91.3	99.0	90.3	97.1	41.9	93.2	56.3	19.4	35.5	100.0	103
CHAM	92.0	96.0	84.0	100.0	20.0	84.0	60.0	20.0	28.0	100.0	25
Total	91.4	98.4	89.1	97.7	37.3	91.4	57.0	19.5	33.9	100.0	128
District											
Machinga	100.0	94.7	100.0	100.0	31.3	94.7	79.0	12.5	31.3	100.0	19
Nkhotakota	95.0	100.0	90.0	100.0	50.0	95.0	60.0	38.9	50.0	100.0	20
Salima	92.3	100.0	84.6	100.0	15.4	69.2	53.9	7.7	30.8	100.0	13
Mzimba	86.5	100.0	88.5	96.2	47.9	96.2	51.9	18.8	31.3	100.0	52
Nsanje	91.7	91.7	75.0	100.0	16.7	100.0	58.3	16.7	16.7	100.0	12
Ntchisi	91.7	100.0	91.7	91.7	27.3	75.0	41.7	18.2	45.5	100.0	12
Total	91.4	98.4	89.1	97.7	37.3	91.4	57.0	19.5	33.9	100.0	128
Study domain											
Project	96.2	98.1	92.3	100.0	39.4	88.5	65.4	18.3	31.0	100.0	52
Comparison	88.2	98.7	86.8	96.1	34.0	93.4	51.3	21.3	38.3	100.0	76
Total	**91.4**	**98.4**	**89.1**	**97.7**	**37.3**	**91.4**	**57.0**	**19.5**	**33.9**	**100.0**	**128**

[1] Facility reported providing or prescribing the methods.
[2] Facility provided or prescribed estrogen progesterone oral contraceptive pills or progestin-only contraceptive pills.
[3] Facility provided or prescribed combined estrogen progesterone injectable contraceptives or progestin-only injectable contraceptives.
[4] Facility provided or prescribed clients with any of the following: contraceptive pills (combined or progestin-only), injectables (combined or progestin-only), implants, IUDs, male condoms, female condoms, cycle beads for standard days method, female sterilization (tubal ligation), or male sterilization (vasectomy).

Table 40. Availability of guidelines, trained staff, and equipment for FP services (ONSE IE SARA

Background characteristics	Percentage of facilities offering any modern FP that had:				Number of facilities offering any modern FP methods
	Guidelines on FP	Staff trained in FP	Equipment		
			Blood pressure apparatus	Exam light	
Facility type					
Hospital	91.7	66.7	91.7	58.3	12
Health center	93.4	64.2	80.2	51.9	106
Dispensary	100.0	70.0	80.0	60.0	10
Total	93.8	64.8	81.3	53.1	128
Managing authority					
Government	93.2	67.0	77.7	47.6	103
CHAM	96.0	56.0	96.0	76.0	25
Total	93.8	64.8	81.3	53.1	128
District					
Machinga	84.2	73.7	78.9	73.7	19
Nkhotakota	100.0	50.0	100.0	80.0	20
Salima	92.3	61.5	69.2	46.2	13
Mzimba	96.2	69.2	82.7	46.2	52
Nsanje	91.7	50.0	75.0	41.7	12
Ntchisi	91.7	75.0	66.7	25.0	12
Total	93.8	64.8	81.3	53.1	128
Study domain					
Project	92.3	61.5	84.6	69.2	52
Comparison	94.7	67.1	78.9	42.1	76
Total	**93.8**	**64.8**	**81.3**	**53.1**	**128**

Maternal Health Services

Of the facilities surveyed, approximately 87 percent of project facilities and 88 percent of comparison facilities offered maternal health services (data not shown). ANC services were offered by 94.5 percent of project facilities and 91.7 percent of comparison facilities (Table 41). Normal delivery services were offered by approximately 95 percent of both project and comparison hospitals and health centers. Cesarean delivery was available at two-thirds of both project and comparison hospitals. A provider of delivery care was available onsite or on-call 24 hours per day at 70.6 percent of hospitals overall. In addition to Table 41, see Table A25 in Appendix A.

Table 42 presents information on signal functions critical to BEmONC and comprehensive emergency obstetric and newborn care (CEmONC) performed in the past 12 months. Signal functions for emergency obstetric and newborn care are the major interventions for averting maternal and neonatal mortalities. Parenteral administration of antibiotics and oxytocin and neonatal resuscitation with a bag and mask were performed by approximately 95 percent to 100 percent of hospitals and health centers in both domains in the past 12 months. More than 83 percent of hospitals and health facilities also performed parenteral administration of magnesium sulfate and blood transfusions. The least frequently performed signal function in the past 12 months was removal of retained products of conception (50.8 percent of hospitals and health centers).

Approximately one-half of project facilities that offered maternal health services had at least one staff member trained in integrated management of pregnancy and childbirth (IMPAC) and had guidelines for IMPAC on hand. Among comparison facilities, only 45.8 percent had staff trained on IMPAC and only 29.2 percent had guidelines on hand.

With regard to basic equipment for normal delivery at facilities that offered maternal health services, approximately 80 percent to 100 percent of both project and comparison facilities had five of nine recommended items: gloves, a partograph, a neonatal mask and bag, a suction apparatus, and a delivery pack (Table 43). More than 40 percent had an examination light, and approximately one-quarter of project facilities and one-third of comparison facilities had a manual vacuum extractor. Less commonly available delivery equipment were a vacuum aspirator or D&C kit (17.6 percent of project and 22.9 percent of comparison facilities) and emergency transport (17.6 percent of project and 18.8 percent of comparison facilities). In addition to Table 43, see Table A26 in Appendix A.

Table 41. Availability of maternal health services (ONSE IE SARA survey, 2017)

Background characteristics	Percentage of facilities offering:					Number of facilities	Provider of delivery care available onsite or on-call 24 hours per day	Number of facilities offering normal delivery services
	ANC	Normal delivery service	Caesarean delivery	ANC and normal delivery service	ANC, normal delivery, and Caesarean delivery			
Facility type								
Hospital	94.7	89.5	66.7	94.4	66.7	18	70.6	17
Health center	99.1	95.5	--	95.5	--	110	0.0	105
Dispensary	20.0	--	--	--	--	11	--	NA
Total	92.8	95.3	66.7	95.3	66.7	139	9.8	122
Managing authority								
Government	92.3	96.8	66.7	96.8	66.7	104	6.6	91
CHAM	94.3	91.2	66.7	91.2	66.7	35	19.4	31
Total	92.8	95.3	66.7	95.3	66.7	139	9.8	122
District								
Machinga	90.5	94.4	100.0	94.4	100.0	21	5.9	17
Nkhotakota	95.0	94.4	50.0	94.4	50.0	20	11.8	17
Salima	100.0	100.0	100.0	100.0	100.0	14	7.1	14
Mzimba	91.2	94.2	50.0	94.2	50.0	57	8.2	49
Nsanje	100.0	100.0	100.0	100.0	100.0	14	21.4	14
Ntchisi	84.6	91.7	100.0	91.7	100.0	13	9.1	11
Total	92.8	95.3	66.7	95.3	66.7	139	9.8	122
Study domain								
Project	94.5	96.0	66.7	96.0	66.7	55	8.3	48
Comparison	91.7	94.9	66.7	94.9	66.7	84	10.8	74
Total	**92.8**	**95.3**	**66.7**	**95.3**	**66.7**	**139**	**9.8**	**122**

Table 42. Signal functions of BEmONC and CEmONC performed in the past 12 months

	BEmONC							CEmONC		
	Parenteral administration									
	Antibiotics	Oxytocin	Magnesium sulphate	Assisted vaginal delivery	Manual removal of placenta	Removal of retained products of conception	Neonatal resuscitation with bag and mask	C-section	Blood transfusion	N
Facility type										
Hospital	100.0	100.0	94.1	94.1	88.2	94.1	100.0	70.6	88.2	17
Health center	94.3	99.0	81.9	53.3	70.5	43.8	98.1	--	--	105
Total	95.1	99.2	83.6	59.0	73.0	50.8	98.4	70.6	88.2	122
Managing authority										
Government	95.6	100.0	81.3	58.2	72.5	49.5	98.9	75.0	75.0	91
CHAM	93.5	96.8	90.3	61.3	74.2	54.8	96.8	66.7	100.0	31
Total	95.1	99.2	83.6	59.0	73.0	50.8	98.4	70.6	88.2	122
District										
Machinga	100.0	100.0	88.2	70.6	100.0	58.8	100.0	100.0	100.0	17
Nkhotakota	88.2	100.0	70.6	52.9	70.6	52.9	100.0	50.0	75.0	17
Salima	100.0	100.0	92.9	85.7	78.6	57.1	100.0	100.0	100.0	14
Mzimba	95.9	100.0	77.6	61.2	61.2	49.0	98.0	57.1	85.7	49
Nsanje	100.0	100.0	100.0	50.0	78.6	50.0	100.0	100.0	100.0	14
Ntchisi	81.8	90.9	90.9	18.2	72.7	36.4	90.9	100.0	100.0	11
Total	95.1	99.2	83.6	59.0	73.0	50.8	98.4	70.6	88.2	122
Study domain										
Project	94.6	98.6	83.8	52.7	66.2	47.3	97.3	72.7	90.9	74
Comparison	95.8	100.0	83.3	68.8	83.3	56.3	100.0	66.7	83.3	48
Total	**95.1**	**99.2**	**83.6**	**59.0**	**73.0**	**50.8**	**98.4**	**70.6**	**88.2**	**122**

Table 43. Availability of guidelines, trained staff, and equipment for delivery services (ONSE IE SARA survey, 2017)

Background characteristics	Percentage of facilities offering normal delivery service that had:											Number of facilities offering delivery services
			Equipment									
	Guide-lines on IMPAC	Staff trained in IMPAC	Emer-gency transport	Exam light	Delivery pack	Suction apparatus (mucus extractor)	Manual vacuum extractor	Vacuum aspirator or D&C kit	Neonatal bag and mask	Parto-graph	Gloves	
Facility type												
Hospital	64.7	88.2	88.2	52.9	100.0	88.2	94.1	58.8	94.1	100.0	100.0	17
Health center	36.2	41.9	6.7	41.9	80.0	91.4	19.0	13.3	90.5	90.5	100.0	105
Total	64.7	48.4	18.0	52.9	82.8	88.2	94.1	58.8	94.1	100.0	100.0	122
Managing authority												
Government	36.3	47.3	9.9	40.7	76.9	90.1	28.6	17.6	92.3	92.3	100.0	91
CHAM	51.6	51.6	41.9	51.6	100.0	93.5	32.3	25.8	87.1	90.3	100.0	31
Total	40.2	48.4	18.0	43.4	82.8	91.0	29.5	19.7	910	91.8	100.0	122
Districts												
Machinga	11.8	52.9	17.6	47.1	88.2	100.0	41.2	29.4	82.4	94.1	100.0	17
Nkhotakota	41.2	35.3	17.6	41.2	94.1	70.6	41.2	23.5	100.0	100.0	100.0	17
Salima	35.7	50.0	21.4	35.7	85.7	85.7	21.4	14.3	71.4	64.3	100.0	14
Mzimba	42.9	44.9	16.3	44.9	75.5	93.9	28.6	22.4	91.8	91.8	100.0	49
Nsanje	71.4	57.1	21.4	64.3	100.0	100.0	21.4	7.1	100.0	100.0	100.0	14
Ntchisi	36.4	63.6	18.2	18.2	63.6	90.9	18.2	9.1	100.0	100.0	100.0	11
Total	40.2	48.4	18.0	43.4	82.8	91.0	29.5	19.7	91.0	91.8	100.0	122

Background characteristics	Percentage of facilities offering normal delivery service that had:											Number of facilities offering delivery services
	Guide-lines on IMPAC	Staff trained in IMPAC	Equipment									
			Emer-gency transport	Exam light	Delivery pack	Suction apparatus (mucus extractor)	Manual vacuum extractor	Vacuum aspirator or D&C kit	Neonatal bag and mask	Parto-graph	Gloves	
Study domain												
Project	47.3	50.0	17.6	44.6	78.4	94.6	25.7	17.6	94.6	94.6	100.0	74
Comparison	29.2	45.8	18.8	41.7	89.6	85.4	35.4	22.9	85.4	87.5	100.0	48
Total	**40.2**	**48.4**	**18.0**	**43.4**	**82.8**	**91.0**	**29.5**	**19.7**	**91.0**	**91.8**	**100.0**	**122**

ANC at Facilities Offering Maternal Health Services

Of the facilities surveyed, 95 percent of project facilities and 92 percent of comparison facilities offered ANC services (data not shown). A higher percentage of comparison facilities had three essential medicines available for ANC than project facilities. Iron tablets, folic acid tablets, and tetanus toxoid vaccine were available at more than 93 percent of comparison facilities that offered ANC services (Table 44). Among project facilities that offered ANC services, 78.8 percent had iron tablets, 71.2 percent had folic acid tablets, and 88.5 percent had tetanus toxoid vaccine.

Table 45 provides information on basic infection control items at facilities that offered ANC services. Nearly all facilities had running water, latex gloves, and sharps containers. Between approximately 75 percent and 80 percent of facilities in both study domains also had soap. Only approximately 30 percent had a waste receptacle with a plastic bin liner. Alcohol-based hand disinfectant was available at 19.2 percent of project facilities and 40.3 percent of comparison facilities.

Table 46 (and Table A27 in Appendix A) provide information on malaria services at facilities that offered ANC. Whereas nearly one-half (46.2 percent) of project facilities had a staff person trained in intermittent prevention treatment (IPT), only 27.3 percent of comparison facilities had an IPT-trained staff person. Medicines and commodities for malaria prevention were more commonly available at comparison facilities than at project facilities. Whereas IPTp and insecticide treated nets (ITNs) were available at 59.7 percent and 85.7 percent of comparison facilities, respectively, they were only available at 48.1 percent and 69.2 percent of project facilities, respectively.

Table 44. Percentage of facilities offering ANC that had indicated medicines

Background characteristics	Percentage of facilities offering ANC that had indicated medicines				Number of facilities offering ANC
	Iron tablets	Folic acid tablets	Iron or folic acid tablets	Tetanus toxoid vaccine	
Facility type					
Hospital	100.0	100.0	100.0	88.2	17
Health center	88.1	81.7	89.0	95.4	109
Dispensary	100.0	100.0	100.0	100.0	3
Total	89.9	84.5	90.7	94.6	129
Managing authority					
Government	91.7	86.5	91.7	95.8	96
CHAM	84.8	78.8	87.9	90.9	33
Total	89.9	84.5	90.7	94.6	129
District					
Machinga	73.7	73.7	73.7	94.7	19
Nkhotakota	89.5	84.2	89.5	84.2	19
Salima	71.4	50.0	78.6	85.7	14
Mzimba	98.1	96.2	98.1	100.0	52
Nsanje	92.9	85.7	92.9	92.9	14
Ntchisi	100.0	90.9	100.0	100.0	11
Total	89.9	84.5	90.7	94.6	129
Study domain					
Project	78.8	71.2	80.8	88.5	52
Comparison	97.4	93.5	97.4	98.7	77
Total	**89.9**	**84.5**	**90.7**	**94.6**	**129**

Table 45. Availability of items for infection control during provision of ANC (ONSE IE SARA survey, 2017)

Background characteristics	Percentage of facilities offering ANC that had items for infection control								Number of facilities offering ANC
	Soap	Running water	Soap and running water	Alcohol-based hand disinfectant	Soap and running water or alcohol-based hand disinfectant	Latex gloves	Sharps container	Waste receptacle	
Facility type									
Hospital	94.1	100.0	94.1	70.6	94.1	100.0	94.1	41.2	17
Health center	74.3	98.2	74.3	25.7	78.0	100.0	99.1	28.4	109
Dispensary	66.7	66.7	66.7	33.3	66.7	100.0	100.0	33.3	3
Total	76.7	97.7	76.7	31.8	79.8	100.0	98.4	30.2	129
Managing authority									
Government	70.8	96.9	70.8	25.0	75.0	100.0	99.0	25.0	96
CHAM	93.9	100.0	93.9	51.5	93.9	100.0	97.0	45.5	33
Total	76.7	97.7	76.7	31.8	79.8	100.0	98.4	30.2	129
District									
Machinga	94.7	94.7	94.7	5.3	94.7	100.0	100.0	31.6	19
Nkhotakota	63.2	100.0	63.2	21.1	63.2	100.0	100.0	26.3	19
Salima	85.7	100.0	85.7	35.7	85.7	100.0	100.0	35.7	14
Mzimba	75.0	98.1	75.0	46.2	80.8	100.0	98.1	34.6	52
Nsanje	78.6	100.0	78.6	28.6	78.6	100.0	92.9	28.6	14
Ntchisi	63.6	90.9	63.6	27.3	72.7	100.0	100.0	9.1	11

Background characteristics	Percentage of facilities offering ANC that had items for infection control								Number of facilities offering ANC
	Soap	Running water	Soap and running water	Alcohol-based hand disinfectant	Soap and running water or alcohol-based hand disinfectant	Latex gloves	Sharps container	Waste receptacle	
Total	76.7	97.7	76.7	31.8	79.8	100.0	98.4	30.2	129
Study domain									
Project	80.8	98.1	80.8	19.2	80.8	100.0	100.0	30.8	52
Comparison	74.0	97.4	74.0	40.3	79.2	100.0	97.4	29.9	77
Total	**76.7**	**97.7**	**76.7**	**31.8**	**79.8**	**100.0**	**98.4**	**30.2**	**129**

Table 46. Availability of malaria services in facilities offering ANC (ONSE IE SARA survey, 2017)

Background characteristics	Percentage of ANC facilities offering malaria services	Staff trained in IPT	Medicines and commodities		Number of facilities offering ANC
			IPTp	ITNs	
Facility type					
Hospital	100.0	50.0	72.2	88.9	17
Health center	100.0	33.0	53.2	78.0	109
Dispensary	100.0	--	--	50.0	3
Total	100.0	34.9	55.0	79.0	129
Managing authority					
Government	100.0	29.2	54.2	77.1	96
CHAM	100.0	51.5	57.6	84.8	33
Total	100.0	34.9	55.0	79.1	129
District					
Machinga	100.0	42.1	15.8	78.9	19
Nkhotakota	100.0	47.4	57.9	57.9	19
Salima	100.0	50.0	78.6	71.4	14
Mzimba	100.0	23.1	71.2	82.7	52
Nsanje	100.0	35.7	35.7	92.9	14
Ntchisi	100.0	36.4	36.4	90.9	11
Total	100.0	34.9	55.0	79.1	129
Study domain					
Project	100.0	46.2	48.1	69.2	52
Comparison	100.0	27.3	59.7	85.7	77
Total	**100.0**	**34.9**	**55.0**	**79.1**	**129**

Child Health

Child health services were available at all facilities surveyed. Nearly all facilities in both domains offered outpatient curative care for sick children, diagnosis and/or treatment of child malnutrition, routine vitamin A supplementation, growth monitoring, and treatment of pneumonia and malaria in children (Table 47).

Guidelines for the integrated management of childhood illnesses (IMCI) and growth monitoring were present at a larger proportion of comparison facilities than project facilities (43.4 percent and 39.8 percent of comparison facilities, respectively, and only 36.4 percent and 29.1 percent of project facilities, respectively) (Table 48). Approximately 70 percent of both project and comparison facilities had at least one staff person trained in IMCI, and 55.4 percent of comparison facilities and 50.9 percent of project facilities had a staff person trained in growth monitoring, respectively.

More than 95 percent of facilities had a length of height board, and approximately 90 percent had an infant scale and stethoscope. More than 85 percent had a child scale, and approximately 80 percent had a thermometer. Just under two-thirds had a growth chart (Table 48).

Table 47. Availability of child health services (ONSE IE SARA survey, 2017)

Background characteristics	Percentage of facilities that offered:						Number of facilities
	Outpatient curative care for sick children	Diagnose and/or treat child malnutrition	Routine vitamin A supple-mentation	Growth monitoring	Treatment of pneumonia	Treatment of malaria in children	
Facility Type							
Hospital	94.4	94.4	94.4	94.4	94.4	94.4	18
Health center	100.0	100.0	96.4	100.0	99.1	99.1	110
Dispensary	100.0	100.0	100.0	100.0	90.9	90.9	11
Total	99.3	99.3	96.4	99.3	97.8	97.8	139
Managing authority							
Government	99.0	99.0	97.1	99.0	98.1	98.1	104
CHAM	100.0	100.0	94.3	100.0	97.1	97.1	35
Total	99.3	99.3	96.4	99.3	97.8	97.8	139
District							
Machinga	100.0	100.0	90.5	100.0	100.0	100.0	21
Nkhotakota	100.0	100.0	95.0	100.0	100.0	100.0	20
Salima	100.0	100.0	100.0	100.0	92.9	92.9	14
Mzimba	98.2	98.2	98.2	98.2	96.5	96.5	57
Nsanje	100.0	100.0	100.0	100.0	100.0	100.0	14
Ntchisi	100.0	100.0	92.3	100.0	100.0	100.0	13
Total	99.3	99.3	96.4	99.3	97.8	97.8	139

Background characteristics	Percentage of facilities that offered:						Number of facilities
	Outpatient curative care for sick children	Diagnose and/or treat child malnutrition	Routine vitamin A supple-mentation	Growth monitoring	Treatment of pneumonia	Treatment of malaria in children	
Study domain							
Project	100.0	100.0	94.5	100.0	98.2	98.2	55
Comparison	98.8	98.8	97.6	98.8	97.6	97.6	84
Total	**99.3**	**99.3**	**96.4**	**99.3**	**97.8**	**97.8**	**139**

Table 48. Availability of guidelines, trained staff, and equipment for child curative services (ONSE IE SARA survey, 2017)

Background characteristics	Among facilities offering curative care for sick children, percentage that had:										Number of facilities offering outpatient curative care for sick children
	Guidelines		Trained staff		Equipment						
	IMCI	Growth monitoring	IMCI	Growth monitoring	Child scale	Infant scale	Length of height board	Thermometer	Stethoscope	Growth chart	
Facility Type											
Hospital	41.2	41.2	76.5	52.9	94.1	100.0	94.1	88.2	88.2	70.6	17
Health center	40.0	33.6	70.0	52.7	85.5	95.5	96.4	79.1	89.1	62.7	110
Dispensary	45.5	45.5	63.6	63.6	90.9	36.4	100.0	63.6	81.8	72.7	11
Total	40.6	35.5	70.3	53.6	87.0	91.3	96.4	79.0	88.4	64.5	138
Managing authority											
Government	40.8	31.1	74.8	54.4	84.5	90.3	95.1	71.8	85.4	61.2	103
CHAM	40.0	48.6	57.1	51.4	94.3	94.3	100.0	100.0	97.1	74.3	35
Total	40.6	35.5	70.3	53.6	87.0	91.3	96.4	79.0	88.4	64.5	138
Project districts											
Machinga	23.8	14.3	66.7	38.1	76.2	90.5	100.0	81.0	85.7	61.9	21
Nkhotakota	50.0	35.0	60.0	50.0	95.0	90.0	100.0	80.0	100.0	60.0	20
Salima	35.7	42.9	85.7	71.4	85.7	100.0	92.9	78.6	78.6	78.6	14
Mzimba	46.4	37.5	76.8	50.0	87.5	89.3	96.4	82.1	89.3	62.5	56
Nsanje	35.7	42.9	64.3	42.9	100.0	100.0	92.9	57.1	85.7	71.4	14
Ntchisi	38.5	46.2	53.8	92.3	76.9	84.6	92.3	84.6	84.6	61.5	13
Total	40.6	35.5	70.3	53.6	87.0	91.3	96.4	79.0	88.4	64.5	138

Background characteristics	Among facilities offering curative care for sick children, percentage that had:										Number of facilities offering outpatient curative care for sick children
	Guidelines		Trained staff		Equipment						
	IMCI	Growth monitoring	IMCI	Growth monitoring	Child scale	Infant scale	Length of height board	Thermometer	Stethoscope	Growth chart	
Study domain											
Project	36.4	29.1	69.1	50.9	85.5	92.7	98.2	80.0	89.1	65.5	55
Comparison	43.4	39.8	71.1	55.4	88.0	90.4	95.2	78.3	88.0	63.9	83
Total	**40.6**	**35.5**	**70.3**	**53.6**	**87.0**	**91.3**	**96.4**	**79.0**	**88.4**	**64.5**	**138**

Malaria

Of the facilities surveyed, all project facilities and 98 percent of comparison facilities offered malaria services (Table 49). Whereas 40 percent of project facilities had guidelines for the treatment of malaria on hand, only 20.7 percent of comparison facilities had malaria guidelines. A higher proportion of project facilities (83.6 percent) than comparison facilities (65.9 percent) had a staff person trained on malaria diagnosis and/or treatment. Nearly all facilities had malaria rapid diagnostic tests (RDTs) among their diagnostics. Only 18.2 percent of project and 30.0 percent of comparison hospitals and health centers had malaria microscopy available. In addition to Table 49, see Table A28 in Appendix A.

Table 50 (and Table A29 in Appendix A) provide information on antimalarial medicines available at facilities. ACTs were available at 94.5 percent of project facilities and 91.5 percent of comparison facilities that offered malaria services. SP was the next most common antimalarial available, available at 45.5 percent of project facilities and 57.3 percent of comparison facilities. Oral quinine was available at 36.4 percent of project facilities and 29.3 percent of comparison facilities.

Table 49. Availability of malaria services, and guidelines, trained staff, and diagnostic capacity (ONSE IE SARA survey, 2017)

Background characteristics	Percentage of facilities that offered malaria diagnosis/ treatment	Number of facilities	Among facilities that offered malaria diagnosis/treatment services:					Number of facilities that offered malaria diagnosis/ treatment
			Guidelines	Trained staff	Diagnostics			
			Guidelines for diagnosis/ treatment of malaria	Staff trained in malaria diagnosis/ treatment	Malaria RDT	Malaria microscopy	Any malaria diagnostics	
Facility type								
Hospital	94.4	18	41.2	88.2	100.0	88.2	100.0	17
Health center	100.0	110	26.4	70.9	99.1	12.7	99.1	110
Dispensary	90.9	11	30.0	70.0	100.0	--	100.0	10
Total	98.6	139	28.5	73.0	99.3	22.8	99.3	137
Managing authority								
Government	98.1	104	24.5	69.6	100.0	17.2	100.0	102
CHAM	100.0	35	40.0	82.9	97.1	38.2	97.1	35
Total	98.6	139	28.5	73.0	99.3	22.8	99.3	137
District								
Machinga	100.0	21	42.9	85.7	95.2	44.4	95.2	21
Nkhotakota	100.0	20	35.0	85.0	100.0	16.7	100.0	20
Salima	100.0	14	42.9	78.6	100.0	28.6	100.0	14
Mzimba	96.5	57	18.2	70.9	100.0	17.7	100.0	55
Nsanje	100.0	14	28.6	50.0	100.0	21.4	100.0	14
Ntchisi	100.0	13	23.1	61.5	100.0	16.7	100.0	13
Total	98.6	139	28.5	73.0	99.3	22.8	99.3	137

Background characteristics	Percentage of facilities that offered malaria diagnosis/ treatment	Number of facilities	Among facilities that offered malaria diagnosis/treatment services:					Number of facilities that offered malaria diagnosis/ treatment
			Guidelines	Trained staff	Diagnostics			
			Guidelines for diagnosis/ treatment of malaria	Staff trained in malaria diagnosis/ treatment	Malaria RDT	Malaria microscopy	Any malaria diagnostics	
Study domain								
Project	100.0	55	40.0	83.6	98.2	18.2	98.2	55
Comparison	97.6	84	20.7	65.9	100.0	30.0	100.0	82
Total	**98.6**	**139**	**28.5**	**73.0**	**99.3**	**22.8**	**99.3**	**137**

Table 50. Availability of malaria medicines (ONSE IE SARA survey, 2017)

Background characteristics	ACTs	SP	Oral quinine	Number of facilities that offered malaria diagnosis and/or treatment services
Facility type				
Hospital	94.1	70.6	58.8	17
Health center	91.8	52.7	28.2	110
Dispensary	100.0	20.0	30.0	10
Total	92.7	52.6	32.1	137
Managing authority				
Government	96.1	52.0	19.6	102
CHAM	82.9	54.3	68.6	35
Total	92.7	52.6	32.1	137
District				
Machinga	95.2	14.3	14.3	21
Nkhotakota	95.0	55.0	40.0	20
Salima	92.9	78.6	64.3	14
Mzimba	89.1	67.3	29.1	55
Nsanje	100.0	35.7	35.7	14
Ntchisi	92.3	38.5	23.1	13
Total	92.7	52.6	32.1	137
Study domain				
Project	94.5	45.5	36.4	55
Comparison	91.5	57.3	29.3	82
Total	**92.7**	**52.6**	**32.1**	**137**

CONCLUSION

The Malawi ONSE impact evaluation seeks to test the hypothesis that the interventions implemented by ONSE will improve health outcomes for women and children in the project domain compared with the comparison domain.

The household survey conducted in 2017 as part of the Malawi ONSE impact evaluation establishes baseline indicators for household and women's background characteristics, primary outcomes, and exposure to project or similar interventions in both the project and comparison domains. The health facility survey, conducted at the same time as the household survey, establishes baseline estimates for secondary outcomes related to the availability of health services and facility readiness to provide specific services in the project and comparison domains. Similarities and differences in these indicators and outcomes across domains are summarized below.

Primary Outcomes

The ONSE project targets FP/RH, MNCH, and WASH outcomes in the project domain with the goal of decreasing maternal, newborn, and child morbidity and mortality. One or several indicators for each project area was chosen to measure achievement of this goal.

Family Planning

The use of FP was very similar in the project and comparison domains, with approximately 55 percent of married women and 46 percent of all WRA using a modern contraceptive method. Injectables and implants were by far the most popular methods. More women in the project domain used injectables than women in the comparison domain. The opposite was true of implants; more women in the comparison domain used implants than women in the project domain.

Maternal Health

The use of ANC services at baseline was high, with almost all women attending at least one ANC visit during their last pregnancy. Attendance by a skilled provider was almost universal in both domains. However, meeting the minimum four ANC visit recommendations during pregnancy was low overall, and lower in the project domain than in the comparison domain (51.8 percent and 55.8 percent, respectively). Attendance at ANC during the first trimester of pregnancy was even lower, with just under one-third of the women in both domains attending an ANC visit during that time. The ONSE project focuses on early attendance for and retention in ANC, which should drive the percentage of women attending ANC during the first trimester and the overall number of ANC visits upward.

The women surveyed almost universally delivered at health facilities with the attendance of skilled health professionals. Even so, only about two-thirds of the women received PNC. Approximately 60 percent of the women who gave birth received PNC within two days of birth. In sum, the majority of the women who received PNC received it in the recommended first two days after birth, but there is room for improvement with regard to the percentage of women receiving PNC.

Newborns delivered at health facilities received PNC at a higher rate than their mothers, about 88 percent and 85 percent in project and comparison domains, respectively. Newborns who were delivered outside of a facility received a postnatal check less often than their mothers.

Child Health

A moderate percentage of children had been ill in the two weeks preceding the survey. Fever was the most frequent ailment reported, followed by diarrhea. The rate of care seeking for these children was around 80 percent for fever and diarrhea and close to 90 percent for children with symptoms of ARI/pneumonia. Most parents sought care for their children within two to three days, although the majority of parents waited four or more days to seek care for diarrhea.

Patient Satisfaction

Women were very satisfied with most aspects of services provided during their last visit to a health facility. The greatest percentage of WRA reported being less than "very satisfied" with the time they waited to see a provider and the facility service hours. The greatest percentage of women were "very satisfied" with facility cleanliness and audio and visual privacy during their visit.

Women's Knowledge and Health Beliefs

Women's knowledge about danger signs in pregnancy and childbirth was generally very low, although a higher percentage of the women in the project domain had knowledge of select items. Women who had a birth in the past three years did not exhibit a consistent pattern of higher knowledge. In terms of birth planning, between 13 percent and 20 percent of women in both the project and comparison domains knew that they should plan for what to do if they noticed danger signs, how to get to the clinic, and where to get money for transportation. A higher percentage of women in the project domain knew to plan for transportation costs. Regarding danger signs during pregnancy, vaginal bleeding; swollen hands, feet, or face; and vaginal discharge were most frequently reported. A higher percentage of women in the project domain knew that swelling was a danger sign. Just over one-half of women in the comparison and project domains knew that severe bleeding was a danger sign during childbirth, with a higher percentage of women in the project domain knowing this fact (54.9 percent and 50.8 percent, respectively).

Knowledge about danger signs for newborns was also low in both domains. The most frequently reported danger signs in the project and comparison domains were breathing difficulty (31.7 percent and 25.9 percent, respectively) and high fever (29.1 percent and 20.9 percent, respectively).

Knowledge about symptoms and causes of childhood illnesses was somewhat higher than knowledge of danger signs and symptoms in pregnancy, childbirth, and for newborns with many differences across domains.

Secondary Outcomes

There was less variation across domains for the secondary facility-level outcomes of interest to the evaluation, derived from the SARA. Almost all facilities provided child curative care and child growth monitoring. A somewhat smaller percentage offered ANC and FP.

In terms of readiness to provide services, facilities fell short most frequently on the staffing and guidelines aspects of the index. The opposite was true with regard to basic obstetric and newborn care, although facilities did not meet the other requirements determined by WHO to consider a facility "ready" to provide those services.

Two-thirds of hospitals provided cesarean sections. A majority of these facilities had provided the seven signal functions of BEmONC in the past twelve months, with assisted vaginal delivery and removal of retained products of conception being the least frequently provided. Much support is needed in this area in terms of having guidelines, training, and especially emergency transportation.

The baseline estimates reveal few differences across project and comparison domain facilities. However, three differences were noted. Medicines and supplies for child health services were less available in the project domain, specifically ORS, amoxicillin, vitamin A, and zinc. The availability of ANC medicines and commodities was also lower in the project domain, specifically iron, folic acid, and ITNs (or vouchers for ITNs). Last, job aids and training for malaria services were more available in the project domain.

Comparability of Project and Comparison Domains

There is evidence that some key health outcomes differ between the project and comparison domains, including skilled ANC ($p=0.03$) and the number of women with four or more ANC visits ($p=0.01$). Although the prevalence of modern contraceptive use did not differ between domains, the method mix was different, specifically the use of injectables ($p=0.00$), implants ($p=0.00$), and oral contraceptives ($p=0.00$).

The use of a skilled birth attendant, PNC, and care seeking for fever did not differ by domain.

Health facilities were similar for almost all measured indicators, aside from supplies and commodities for child health and ANC, and for readiness to provide malaria services, specifically regarding staff and guidelines.

Despite the differences noted, the planned methodology (the DID approach) was used under the assumption that the project and comparison domains would not be similar for all characteristics at baseline. The characteristics that remain constant over time, whether different or the same at baseline, will be differenced out by the model. Key differences in project and comparison domains that may change over time will be explored in the end line analysis. One option that can be explored during the end line analysis is to test the robustness of the findings of the DID model by re-running it on a subset of project and comparison areas that are more similar in key characteristics.

Exposure to Other Interventions

To examine the potential for contamination of the project and comparison domains, respondents were asked about assistance/support received by their household and/or community over the past year. More than 30 percent of households in both domains reported receiving some type of support, with more than two-thirds of them receiving support for malaria. WASH support was also received by between 12 percent and 15 percent of households in both domains. Interventions related to FP and MNCH were less frequently reported.

It is also important to note that several of the study districts received support from the prior project, SSDI. Salima and Nkhotakota in the study domain, and Nsanje in the comparison domain all benefited from prior programming. This fact needs to be considered when interpreting the findings of the impact evaluation.

Implications for the Impact Evaluation

Complex interventions operating at some degree of scale in the real world raise several well-documented evaluation challenges, including the presence of other similar interventions implemented by other organizations. Our results suggest that a potential for contamination exists, primarily related to malaria outcomes. Interventions related to FP, MNCH, and WASH also present minimal risks and should be followed up and monitored.

Implementation process monitoring will collect information periodically about other projects operating in the study domains to ensure current knowledge of contamination risks. Of concern is any widespread exposure in both the project and comparison domains to programming relevant to the project interventions and outcomes of interest, for example, malaria programming. Analysis of this exposure and the type and timing of malaria programming will need to be accounted for in the end line analysis to explore its potential implications for the evaluation's findings. Ideally, exposure to other program activities at baseline would be negligent, but in practice, this is generally not realistic. Analysis of the small exposures to FP, MNCH, and WASH programming may also be included in the end line analysis to explore any potential implications for the evaluation's findings.

ONSE's community engagement and mobilization work will focus on the specific, self-identified needs in each community, and therefore, dissemination of information about these topics will not be universal. As this aspect of the project rolls out, indicators may be refined to accurately capture outcomes of the ONSE project's community activities. For interventions that are designed to tailor to the needs of specific subgroups (i.e., districts or communities) with differential activities and audiences, this flexibility is needed to measure the effects of the programming.

Last, two primary outcomes—the percentage of women receiving ANC and giving birth with a skilled provider—were already above 90 percent in the study population. It is likely that these indicators will not increase significantly during the evaluation period. However, related outcomes, such as the percentage of women who attend four or more ANC visits and the percentage of women who receive PNC within two days (forty-eight hours) of birth, show room for improvement.

Next Steps

End line data collection is planned for 2021. The same households will be interviewed at that time to evaluate the impact of ONSE on the health outcomes of interest in the project domain. The DID approach will be used to compare pre- and post-intervention differences in outcomes between the project and comparison domains. Qualitative analysis will aim to describe and understand differences in how respondents in ONSE's project communities were exposed to the SBCC campaign.

Ongoing implementation process monitoring will occur annually through the time of the end line survey. This monitoring will focus on how the "smart" approach was operationalized in the project domain and will seek to identify pathways through which this approach affects project beneficiaries. Implementation process monitoring will also provide information about exposure to other activities that may affect the outcomes of the impact evaluation.

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APPENDIX A. ADDITIONAL TABLES

Table A1. Percentage of WRA who correctly identified the warning/danger signs in pregnancy in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	Vaginal bleeding	Severe headache	Swollen hands, feet, or face	High fever	Difficulty breathing	Severe weakness/ fatigue	Pale hands or eyes	Vaginal discharge	N
Age									
15-19	24.3	7.0	21.5	8.3	3.2	4.7	2.8	10.2	790
20-24	52.8	12.1	27.8	18.6	5.7	8.4	5.6	21.9	836
25-29	60.5	13.0	34.7	19.7	6.6	9.7	6.3	24.6	598
30-34	69.3	11.5	34.0	23.2	7.3	8.2	4.7	23.8	554
35-39	69.8	15.8	31.5	21.9	7.1	8.1	5.6	19.4	469
40-44	60.4	15.1	33.2	22.0	7.3	9.1	10.2	16.8	295
45-49	65.5	11.9	23.4	18.4	8.1	7.7	7.1	26.8	234
Education									
No education	54.2	11.6	26.3	17.6	6.0	7.8	6.0	21.9	480
Some/completed primary	51.9	11.6	26.6	18.6	5.8	7.3	5.0	19.0	2,684
Some/completed secondary	62.5	13.1	42.1	14.4	6.8	9.4	6.3	21.5	556
More than secondary	66.5	10.7	43.3	24.0	11.6	15.2	15.6	18.3	56

Project	Vaginal bleeding	Severe headache	Swollen hands, feet, or face	High fever	Difficulty breathing	Severe weakness/ fatigue	Pale hands or eyes	Vaginal discharge	N
Wealth index*									
Lowest	48.7	10.4	24.2	16.1	6.8	8.5	5.0	21.1	917
Second	49.6	11.5	25.6	18.3	4.7	8.0	5.4	17.6	759
Middle	55.8	13.1	26.3	23.2	6.8	8.0	6.4	21.0	713
Fourth	57.3	11.2	34.8	17.3	7.0	6.0	5.3	21.5	631
Highest	60.2	12.9	36.1	15.7	4.9	8.1	5.4	17.8	752
District									
Machinga	46.2	12.8	26.3	20.3	3.5	8.6	5.8	18.7	1,649
Nkhotakota	65.7	11.7	36.5	18.2	5.2	6.5	5.9	20.2	1,143
Salima	52.6	10.9	26.2	15.5	9.1	7.9	4.9	20.5	984
Total	**53.9**	**11.8**	**29.1**	**17.9**	**6.0**	**7.8**	**5.5**	**19.8**	**3,776**

*Five households are missing wealth information.

Table A2. Percentage of WRA who correctly identified the warning/danger signs in pregnancy in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	Vaginal bleeding	Severe headache	Swollen hands, feet, or face	High fever	Difficulty breathing	Severe weakness/ fatigue	Pale hands or eyes	Vaginal discharge	N
Age									
15-19	18.5	5.2	12.8	6.0	1.8	4.1	2.2	6.2	796
20-24	49.3	10.4	27.0	12.3	5.2	7.1	4.2	18.2	769
25-29	58.9	11.4	31.9	15.0	3.3	8.4	7.4	26.1	572
30-34	61.4	12.8	27.9	16.8	5.1	8.9	9.9	22.6	552
35-39	63.0	12.1	31.1	15.8	4.9	9.0	10.0	24.8	485
40-44	60.4	14.3	28.9	13.9	6.2	11.0	12.5	21.3	336
45-49	55.7	12.9	24.8	9.4	5.7	9.6	8.5	22.9	256
Education									
No education	56.0	12.5	16.8	11.6	5.9	8.7	8.4	22.2	246
Some/completed primary	47.2	10.1	24.5	12.0	4.2	7.8	6.4	18.4	2,684
Some/completed secondary	52.3	11.2	30.0	13.2	4.1	7.3	6.9	19.5	775
More than secondary	73.3	16.9	46.5	25.8	2.7	5.3	23.8	22.4	61
Wealth index*									
Lowest	47.0	7.7	22.5	14.5	3.8	8.7	5.4	20.8	644
Second	45.6	11.4	24.2	13.3	5.2	9.0	6.1	16.5	671

Comparison	Vaginal bleeding	Severe headache	Swollen hands, feet, or face	High fever	Difficulty breathing	Severe weakness/ fatigue	Pale hands or eyes	Vaginal discharge	N
Middle	48.3	11.2	24.6	12.0	4.1	7.3	8.0	17.3	723
Fourth	52.2	10.8	24.3	9.5	4.1	6.4	5.1	19.0	827
Highest	51.8	11.2	30.4	13.2	4.2	7.4	9.3	20.7	900
District									
Mzimba	48.2	12.1	26.6	13.1	4.2	7.9	7.7	18.8	2,589
Nsanje	49.9	10.7	16.6	8.2	6.7	6.9	2.0	22.0	488
Ntchisi	52.1	5.0	26.7	12.9	3.2	7.4	7.0	17.4	689
Total	**49.2**	**10.5**	**25.4**	**12.4**	**4.3**	**7.7**	**6.9**	**18.9**	**3,766**

*One household is missing wealth information

Table A3. Percentage of WRA who correctly identified the warning/danger signs of maternal complications during childbirth in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	Abdominal pain	Severe bleeding	Severe headache	Blurred vision	Convulsions	High fever	Labor pain 12+ hours	Placenta retained	Loss of conscious-ness	Difficulty breathing	Changes in fetal movement	Swollen hands, feet or face	Problems urinating	N
Age														
15-19	5.5	25.1	3.2	0.3	3.8	5.4	9.0	2.0	6.1	4.8	1.9	2.6	0.5	790
20-24	13.2	53.4	5.3	1.0	7.8	8.7	14.8	3.5	9.9	9.2	3.9	2.6	0.9	836
25-29	12.5	61.8	6.1	2.2	9.7	14.6	19.8	7.7	14.1	9.6	6.5	5.6	1.1	598
30-34	12.5	68.6	5.7	1.9	10.2	12.8	18.7	8.7	14.6	11.8	6.0	4.8	0.7	554
35-39	11.9	67.7	6.6	2.6	12.2	12.6	18.0	7.7	15.8	11.8	5.7	4.9	1.4	469
40-44	10.2	68.1	6.7	2.4	10.3	13.2	18.3	9.7	11.4	10.6	7.6	6.6	1.1	295
45-49	15.4	67.2	8.5	4.6	8.4	13.8	25.0	7.3	15.1	15.1	3.3	5.3	2.0	234
Education														
No education	12.8	53.5	6.2	3.1	8.0	12.5	18.4	6.5	9.4	8.2	4.7	5.7	1.2	480
Some/completed primary	11.4	53.4	5.1	1.6	8.3	10.6	16.3	6.0	11.9	9.4	4.9	4.3	1.0	2,684
Some/completed secondary	8.3	61.2	6.7	1.3	9.0	9.7	12.8	5.0	11.5	11.0	3.6	2.5	1.0	556
More than secondary	8.0	75.9	7.6	0.0	11.0	12.7	30.3	2.3	18.3	15.2	4.4	1.7	0.0	56
Wealth index*														
Lowest	13.4	50.0	5.0	1.6	9.3	8.8	15.3	7.7	11.3	9.7	4.7	3.7	0.9	917
Second	11.6	52.3	5.1	2.8	10.8	10.6	15.2	5.3	10.0	7.5	4.2	4.0	1.1	759
Middle	12.1	56.0	5.4	2.0	6.6	10.8	19.1	5.9	10.4	10.5	5.6	4.1	1.4	713
Fourth	10.5	55.1	5.5	0.6	6.6	13.0	17.3	5.4	14.5	13.0	4.6	5.1	0.9	631

Project	Abdominal pain	Severe bleeding	Severe headache	Blurred vision	Convulsions	High fever	Labor pain 12+ hours	Placenta retained	Loss of conscious-ness	Difficulty breathing	Changes in fetal movement	Swollen hands, feet or face	Problems urinating	N
Highest	7.6	62.1	6.6	1.4	8.1	11.1	14.9	4.7	12.4	7.6	4.3	4.2	0.7	752
District														
Machinga	11.7	49.6	3.3	1.2	6.5	9.7	17.0	7.2	9.4	7.5	7.2	4.9	1.3	1,649
Nkhotakota	8.6	63.0	7.8	1.6	10.1	12.7	13.8	5.0	15.4	9.8	4.6	4.4	0.8	1,143
Salima	12.5	53.9	5.9	2.3	8.4	10.2	17.5	5.2	10.9	11.3	2.3	3.3	0.8	984
Total	**11.1**	**54.9**	**5.5**	**1.7**	**8.4**	**10.7**	**16.3**	**5.9**	**11.6**	**9.5**	**4.7**	**4.2**	**1.0**	**3,776**

*Four households are missing wealth information.

Table A4. Percentage of WRA who correctly identified the warning/danger signs of maternal complications during childbirth in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	Abdominal pain	Severe bleeding	Severe headache	Blurred vision	Convulsions	High fever	Labor pain 12+ hours	Placenta retained	Loss of conscious-ness	Difficulty breathing	Changes in fetal movement	Swollen hands, feet or face	Problems urinating	N
Age														
15-19	5.5	19.5	1.5	0.4	2.4	3.6	5.6	1.7	3.9	4.0	1.1	1.9	0.5	796
20-24	12.5	47.1	2.5	1.7	7.6	7.7	13.4	7.5	9.2	8.1	6.1	3.1	1.2	769
25-29	12.4	61.4	2.5	2.0	10.2	8.7	18.8	9.3	11.0	7.0	8.2	4.3	1.7	572
30-34	12.7	65.7	4.4	1.2	10.8	8.3	16.8	9.5	15.0	8.4	7.6	4.8	0.6	552
35-39	14.8	64.7	4.2	0.9	9.4	8.7	17.5	9.1	12.5	10.4	9.3	4.0	2.0	485

Comparison	Abdominal pain	Severe bleeding	Severe headache	Blurred vision	Convulsions	High fever	Labor pain 12+ hours	Placenta retained	Loss of conscious-ness	Difficulty breathing	Changes in fetal movement	Swollen hands, feet or face	Problems urinating	N
40-44	9.8	66.6	3.2	0.6	7.6	9.1	17.8	11.4	11.3	8.6	11.5	3.4	1.2	336
45-49	14.4	56.8	5.1	0.2	9.1	11.6	21.0	7.8	12.1	9.4	6.8	3.4	1.1	256
Education														
No education	15.1	55.3	2.8	0.7	5.5	8.4	11.0	5.8	11.2	10.5	9.5	5.0	2.0	246
Some/completed primary	11.7	49.9	3.2	1.2	8.0	7.6	14.7	7.9	9.8	7.1	6.2	3.2	1.2	2,684
Some/completed secondary	8.8	50.5	2.6	0.9	6.8	6.8	13.8	6.0	9.7	7.5	6.1	3.6	0.8	775
More than secondary	6.3	79.1	2.0	0.0	15.9	12.7	27.9	11.8	19.2	16.1	15.7	5.8	0.0	61
Wealth index*														
Lowest	11.2	49.1	1.9	1.1	7.4	7.4	12.8	6.4	10.2	8.9	6.2	4.4	1.5	644
Second	12.8	47.7	3.2	1.1	7.0	8.6	13.8	6.7	9.6	8.2	7.4	2.5	1.2	671
Middle	13.8	50.6	3.9	1.4	7.2	7.7	15.1	7.7	9.4	5.9	5.7	2.5	1.2	723
Fourth	9.0	50.8	3.0	0.9	7.9	6.1	15.7	9.3	8.9	7.1	5.7	4.1	1.3	827
Highest	9.9	54.7	2.9	1.0	8.6	8.3	14.6	6.7	11.7	7.9	7.5	3.6	0.6	900
District														
Mzimba	12.0	51.3	3.6	1.1	7.4	8.3	15.4	7.8	9.3	7.5	5.9	3.8	0.9	2,589
Nsanje	12.0	51.3	1.0	1.5	6.3	5.8	8.4	4.0	7.1	8.7	4.7	2.5	3.0	488
Ntchisi	8.3	48.5	2.1	0.8	9.5	6.2	15.3	8.2	14.0	7.0	9.8	2.9	0.7	689
Total	**11.2**	**50.8**	**3.0**	**1.1**	**7.7**	**7.6**	**14.5**	**7.4**	**10.0**	**7.5**	**6.5**	**3.4**	**1.1**	**3,766**

*One household is missing wealth information

Table A5. Percentage of WRA with a birth in the past three years who correctly identified the warning/danger signs of maternal complications during childbirth in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	Abdominal pain	Severe bleeding	Severe headache	Blurred vision	Convulsions	High fever	Labor pain 12+ hours	Placenta retained	Loss of conscious-ness	Difficulty breathing	Changes in fetal movement	Swollen hands, feet or face	Problems urinating	N
Age														
15-19	15.6	44.2	7.4	1.1	9.7	11.9	17.5	5.6	11.6	9.4	4.3	4.3	1.9	211
20-24	14.0	56.5	5.1	1.1	8.8	10.7	17.7	4.5	11.6	9.3	4.5	2.8	1.4	556
25-29	12.6	62.4	5.5	2.1	9.9	14.8	19.3	9.1	14.2	8.8	6.5	6.4	0.8	396
30-34	13.7	67.7	4.7	0.5	11.6	12.1	17.2	8.7	15.4	13.6	6.4	4.8	0.6	312
35-39	14.0	71.4	6.0	2.1	7.2	10.0	19.7	4.0	17.5	11.9	5.2	5.3	2.2	211
40-44	10.6	70.0	7.6	2.9	13.2	12.0	22.9	12.3	10.4	7.4	6.2	8.5	0.0	79
45-49	15.4	71.0	4.9	0.0	6.6	21.5	19.4	3.5	9.1	6.0	3.2	6.4	8.6	36
Education														
No education	15.7	56.7	4.2	1.9	7.8	10.3	20.3	7.8	7.2	4.9	4.3	7.9	0.3	233
Some/completed primary	13.6	60.1	5.4	1.2	9.7	12.1	18.9	6.5	14.1	10.8	5.9	4.6	1.6	1,341
Some/completed secondary	11.8	69.6	8.1	2.2	10.9	14.7	12.6	6.9	13.5	10.8	3.6	3.0	0.9	210
More than secondary	16.7	80.4	11.2	0.0	16.9	19.1	28.9	2.3	38.9	16.7	4.0	0.0	0.0	17
Wealth index*														
Lowest	16.8	54.4	6.3	1.4	11.1	10.4	17.0	9.3	12.7	10.5	5.4	4.2	1.2	572
Second	13.6	60.9	4.8	2.2	11.1	13.0	16.9	6.7	11.2	8.0	5.3	3.1	1.2	393
Middle	15.9	60.6	4.7	0.9	6.4	9.6	24.1	6.3	9.7	10.0	7.0	6.7	2.3	330
Fourth	11.3	59.3	6.3	1.0	5.5	13.7	21.4	4.3	16.4	12.0	5.6	6.4	1.1	249

Project	Abdominal pain	Severe bleeding	Severe headache	Blurred vision	Convulsions	High fever	Labor pain 12+ hours	Placenta retained	Loss of conscious-ness	Difficulty breathing	Changes in fetal movement	Swollen hands, feet or face	Problems urinating	N
Highest	7.1	76.6	5.8	1.3	12.4	16.7	14.1	4.1	19.8	10.6	3.3	4.6	1.1	256
District														
Machinga	14.3	52.6	3.8	1.1	7.6	11.8	19.0	7.7	10.8	7.8	8.9	5.9	1.7	839
Nkhotakota	9.0	72.9	7.0	1.0	13.3	14.9	13.9	5.1	20.5	11.3	4.3	4.2	0.7	502
Salima	16.3	61.2	6.6	2.0	9.2	10.8	21.1	6.8	11.2	11.7	2.5	4.1	1.4	460
Total	**13.7**	**60.9**	**5.6**	**1.4**	**9.6**	**12.2**	**18.5**	**6.7**	**13.4**	**10.1**	**5.4**	**4.8**	**1.4**	**1,801**

*One household is missing wealth information

Table A6. Percentage of WRA with a birth in the past three years who correctly identified the warning/danger signs of maternal complications during childbirth in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	Abdominal pain	Severe bleeding	Severe headache	Blurred vision	Convulsions	High fever	Labor pain 12+ hours	Placenta retained	Loss of conscious-ness	Difficulty breathing	Changes in fetal movement	Swollen hands, feet or face	Problems urinating	N
Age														
15-19	13.1	47.7	4.8	0.9	3.5	7.3	15.0	3.2	7.0	9.5	2.3	1.9	1.5	170
20-24	14.0	51.0	2.7	2.1	9.0	7.7	14.3	8.8	10.9	8.3	7.0	3.2	1.2	529
25-29	13.0	63.1	3.0	2.6	11.0	10.2	20.3	10.7	11.8	7.5	9.5	5.0	2.5	360
30-34	11.6	64.3	2.7	1.5	11.5	7.5	14.8	7.8	16.0	7.2	6.3	3.4	1.3	282
35-39	14.9	64.2	4.3	1.4	12.1	7.5	17.1	8.2	9.4	10.0	9.7	3.4	2.1	186

Comparison	Abdominal pain	Severe bleeding	Severe headache	Blurred vision	Convulsions	High fever	Labor pain 12+ hours	Placenta retained	Loss of consciousness	Difficulty breathing	Changes in fetal movement	Swollen hands, feet or face	Problems urinating	N
40-44	10.1	58.5	5.2	0.0	5.5	8.1	13.1	3.7	12.3	12.2	7.5	2.1	0.7	52
45-49	0.0	55.9	16.1	3.2	9.6	11.8	25.0	6.2	0.0	11.5	4.9	15.3	0.0	18
Education														
No education	14.5	53.8	2.9	1.9	4.6	8.4	7.8	8.5	7.1	9.8	11.1	6.8	3.4	95
Some/completed primary	13.5	57.0	3.6	2.0	9.5	8.6	16.2	8.6	11.4	7.8	7.1	3.5	1.4	1,178
Some/completed secondary	11.4	58.6	2.8	1.5	10.0	6.5	18.3	6.2	11.7	10.0	6.8	2.5	1.9	302
More than secondary	10.0	83.0	5.2	0.0	27.5	10.1	26.2	15.7	22.1	13.7	12.2	8.7	0.0	22
Wealth index*														
Lowest	12.2	53.9	2.6	2.0	7.6	6.7	14.3	8.6	11.9	9.1	7.4	4.0	2.1	349
Second	13.4	53.1	2.4	1.7	9.7	9.3	13.2	7.8	9.9	8.5	10.3	1.6	1.6	308
Middle	17.1	58.0	4.6	1.6	9.6	9.3	17.9	8.7	9.2	6.7	6.5	2.4	1.9	326
Fourth	9.4	60.8	4.9	2.2	9.7	6.8	17.8	8.6	12.9	8.1	5.5	5.6	1.8	326
Highest	13.5	62.5	2.5	1.9	11.7	9.6	18.5	7.1	12.8	10.0	7.1	4.5	0.5	288
District														
Mzimba	14.2	58.5	4.1	2.0	9.1	9.8	17.9	8.6	10.4	8.6	6.5	3.9	1.2	1,049
Nsanje	14.2	57.7	0.3	2.1	6.5	5.4	7.8	3.3	5.9	9.0	4.5	3.5	4.9	258
Ntchisi	8.6	53.7	3.9	1.2	13.4	5.4	17.5	11.0	18.8	7.5	12.2	2.9	0.3	290
Total	**13.1**	**57.5**	**3.4**	**1.9**	**9.5**	**8.2**	**16.2**	**8.2**	**11.3**	**8.4**	**7.3**	**3.6**	**1.6**	**1,597**

Table A7. Percentage of WRA who correctly identified the warning/danger signs of complications for newborns in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	Breathing difficulty	Feeding poorly	Yellow skin eyes	Pus or bleeding	Very small baby	Pallor	Bleeding	Convulsions /spasms	High fever	Lethargy	Loss of consciousn	Green vomit	No stool passed	Swollen abdomen	N
Age															
15-19	17.7	8.1	6.8	5.2	5.5	0.6	1.9	1.8	15.3	1.4	2.1	1.5	1.0	0.7	796
20-24	29.3	17.8	17.3	14.3	6.7	1.5	4.0	2.9	31.5	5.2	4.6	1.8	2.1	2.2	769
25-29	36.9	21.0	21.6	26.9	7.8	1.2	2.7	2.7	32.0	2.7	4.5	3.3	3.2	3.6	572
30-34	39.7	20.1	24.7	21.8	9.3	1.0	4.1	4.8	33.0	4.3	7.9	2.2	1.0	2.9	552
35-39	34.8	16.4	27.0	25.2	5.5	2.3	4.4	6.5	35.7	4.4	5.8	1.1	3.8	4.4	485
40-44	38.8	18.8	26.6	30.4	7.4	1.5	5.0	4.8	32.3	5.0	6.5	2.0	2.7	3.1	336
45-49	40.0	19.2	25.3	23.6	10.8	1.2	5.1	4.6	33.9	6.8	7.6	1.0	2.3	5.9	256
Education															
No education	36.3	17.4	21.9	22.7	7.7	2.7	3.4	3.3	27.9	5.4	5.2	3.0	1.1	4.6	246
Some/completed primary	30.1	15.9	18.3	18.9	7.0	1.1	3.5	3.6	29.4	3.5	5.0	1.7	2.0	2.7	2,684
Some/completed secondary	35.1	19.1	21.1	14.2	6.8	1.0	4.1	3.8	29.0	3.9	5.2	1.7	4.1	1.6	775
More than secondary	38.2	20.1	32.9	21.1	15.4	0.0	3.8	9.1	30.3	4.6	2.1	3.2	0.0	2.1	61
Wealth index*															
Lowest	31.1	16.2	18.0	16.8	7.3	2.0	4.0	3.1	28.8	2.5	4.8	1.1	1.3	2.0	644
Second	31.8	16.2	19.1	17.4	7.9	0.6	2.8	5.1	28.5	3.5	4.8	1.5	2.9	4.0	671
Middle	31.2	15.3	18.3	22.4	5.7	1.2	4.2	3.2	29.5	4.8	6.2	1.9	1.8	3.3	723

Project	Breathing difficulty	Feeding poorly	Yellow skin eyes	Pus or bleeding	Very small baby	Pallor	Bleeding	Convulsions /spasms	High fever	Lethargy	Loss of consciousn	Green vomit	No stool passed	Swollen abdomen	N
Fourth	31.6	16.4	20.6	21.5	8.0	1.5	2.7	4.2	28.0	4.1	5.9	3.5	2.8	3.5	827
Highest	33.2	18.9	21.1	16.7	6.9	1.0	4.1	2.7	31.0	4.8	3.7	1.8	2.2	1.5	900
District															
Mzimba	29.0	17.2	13.6	23.1	8.8	1.6	2.0	3.3	29.6	2.6	3.7	2.0	2.2	1.7	2,589
Nsanje	31.0	19.5	24.9	22.0	7.8	0.9	5.9	3.2	25.6	4.8	3.8	1.9	2.4	1.5	488
Ntchisi	34.9	13.8	20.7	12.1	5.0	1.3	3.4	4.3	31.4	4.3	7.2	1.8	2.0	4.8	689
Total	**31.7**	**16.6**	**19.3**	**18.7**	**7.2**	**1.3**	**3.6**	**3.6**	**29.1**	**3.9**	**5.0**	**1.9**	**2.2**	**2.8**	**3,766**

Table A8. Percentage of WRA who correctly identified the warning/danger signs of complications for newborns in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	Breathing difficulty	Feeding poorly	Yellow skin eyes	Pus or bleeding	Very small baby	Pallor	Bleeding	Convulsions /spasms	High fever	Lethargy	Loss of conscious-ness	Green vomit	No stool passed	Swollen abdomen	N
Age															
15-19	11.3	6.1	6.5	6.0	6.9	0.4	1.2	1.8	11.1	1.9	2.2	1.1	1.1	1.7	796
20-24	27.1	15.1	21.3	12.3	8.3	1.9	2.9	2.3	20.4	4.4	2.5	2.0	2.4	3.1	769
25-29	29.0	22.0	25.2	18.5	9.4	3.2	2.5	6.7	31.5	6.2	4.1	3.0	5.3	2.7	572
30-34	30.8	21.1	30.4	18.3	11.5	1.9	3.2	6.4	27.4	6.2	5.3	2.0	3.3	3.4	552
35-39	34.8	18.3	31.8	19.8	10.3	2.0	4.5	6.1	21.6	5.9	3.8	2.3	3.9	4.8	485
40-44	28.0	20.8	31.4	21.3	14.7	1.9	5.0	8.9	19.0	6.7	6.4	1.5	4.1	2.4	336
45-49	30.5	15.3	31.6	17.7	13.1	3.5	2.6	9.2	17.4	4.1	9.3	3.1	2.3	6.6	256
Education															
No education	32.0	12.4	27.8	14.7	8.1	1.8	4.5	5.4	22.2	1.8	6.8	1.8	2.8	1.7	246
Some/completed primary	24.6	15.4	22.6	15.2	9.6	2.0	2.8	5.3	21.1	5.1	3.6	2.1	2.9	3.5	2,684
Some/completed secondary	28.4	18.9	22.2	13.5	10.8	1.7	2.6	3.8	19.0	4.1	4.3	1.6	2.8	2.4	775
More than secondary	29.2	22.8	35.8	21.4	12.5	0.9	2.3	7.3	33.7	10.2	13.8	6.3	14.4	3.0	61
Wealth index*															
Lowest	24.9	13.6	23.8	16.3	9.1	2.2	2.6	5.1	21.9	4.7	2.5	1.7	3.5	3.7	644
Second	22.9	12.5	23.7	13.8	9.4	2.1	2.3	4.7	23.0	4.1	3.8	2.4	2.3	3.4	671
Middle	25.4	17.4	21.4	14.6	8.2	1.9	2.6	3.6	20.4	4.1	5.0	2.3	3.0	3.9	723

Comparison	Breathing difficulty	Feeding poorly	Yellow skin eyes	Pus or bleeding	Very small baby	Pallor	Bleeding	Convulsions /spasms	High fever	Lethargy	Loss of conscious-ness	Green vomit	No stool passed	Swollen abdomen	N
Fourth	25.9	17.7	23.0	16.1	10.6	2.2	3.6	4.6	21.0	4.6	3.9	2.3	2.9	1.8	827
Highest	29.4	18.1	23.2	13.7	11.3	1.3	3.1	6.8	19.1	6.1	4.9	1.6	3.3	3.3	900
District															
Mzimba	24.6	17.9	22.5	15.1	10.8	1.7	2.9	4.4	22.3	5.1	4.0	2.2	2.8	3.4	2,589
Nsanje	26.7	11.0	18.8	13.7	7.3	1.7	5.3	1.9	20.3	4.2	4.6	2.2	2.5	1.6	488
Ntchisi	29.7	13.0	27.6	14.8	7.8	2.6	1.4	9.0	16.6	4.0	4.0	1.3	4.3	3.5	689
Total	**25.9**	**16.1**	**23.0**	**14.9**	**9.8**	**1.9**	**2.9**	**5.0**	**20.9**	**4.8**	**4.1**	**2.0**	**3.0**	**3.2**	**3,766**

Table A9. Percentage of WRA with a birth in the past three years who correctly identified the warning/danger signs of complications for newborns in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	Breathing difficulty	Feeding poorly	Yellow skin eyes	Pus or bleeding	Very small baby	Pallor	Bleeding	Convulsions/ spasms	High fever	Lethargy	Loss of consciousnes	Green vomit	No stool passed	Swollen abdomen	N
Age															
15-19	36.3	17.5	15.6	11.5	9.9	1.6	1.1	5.6	24.9	4.2	3.0	3.3	1.1	0.6	211
20-24	31.3	19.4	19.6	18.7	6.7	1.6	5.1	3.5	34.5	4.6	5.2	1.8	3.0	2.4	556
25-29	35.9	20.6	22.1	28.3	7.6	1.0	2.6	2.8	31	1.8	3.9	3.5	3.4	4.3	396
30-34	40.1	16.9	26.5	23.1	10.0	0.9	5.6	5.8	36.4	4.1	7.6	2.5	1.0	3.1	312
35-39	34.9	17.9	26.7	26.6	4.9	1.5	5.4	6.3	38.4	2.4	7.5	1.3	4.0	4.6	211
40-44	38.6	19.2	25.5	40.2	3.3	1.8	2.0	7.8	31.5	4.5	6.6	3.8	2.2	3.3	79
45-49	27.9	16.0	29.8	23.6	23.1	3.5	8.5	0.0	39.5	2.1	3.4	1.5	0.0	4.6	36
Education															
No education	36.6	19.1	24.4	26.5	8.6	2.1	4.6	3.3	28.7	3.9	5.1	5.1	0.0	4.5	233
Some/completed primary	34.6	18.6	20.9	22.4	7.9	1.4	4.2	4.4	33.3	3.6	5.3	2.2	2.6	2.9	1,341
Some/completed secondary	37.1	19.2	26.1	19.2	6.4	0.7	3.6	4.4	37.2	2.0	6.5	1.8	5.2	2.6	210
More than secondary	36.6	17.5	42.6	38.8	13.2	0.0	0.0	22.3	47.2	11.2	3.8	0.0	0.0	0.0	17
Wealth index*															
Lowest	34.3	20.6	20.2	19.3	9.3	2.4	5.3	3.8	30.3	2.6	5.3	1.6	1.7	2.4	572
Second	33.3	16.5	22.3	20.5	8.5	0.7	3.2	6.0	33.6	4.3	4.9	2.8	4	4.1	393

Project	Breathing difficulty	Feeding poorly	Yellow skin eyes	Pus or bleeding	Very small baby	Pallor	Bleeding	Convulsions/ spasms	High fever	Lethargy	Loss of consciousnes	Green vomit	No stool passed	Swollen abdomen	N
Middle	34.2	19.2	20.7	26.5	5.6	0.4	3.5	3.7	34.6	3.5	5.2	2.1	3.1	3.9	330
Fourth	38.6	17.0	24.0	25.8	8.4	1.7	3.8	5.2	29.4	3.6	6.8	4.7	2.7	3.0	249
Highest	37.7	19.5	26.1	25.5	6.3	1.2	4.3	3.6	41.5	4.4	5.0	2.3	1.1	1.7	256
District															
Mzimba	34.3	19.4	14	27.4	10	1.7	2.9	4.3	33	2.6	3.6	2.7	2.5	2.1	839
Nsanje	34.1	22.1	29.5	24.4	9.3	1.0	8.3	4.4	30.5	3.7	6.4	1.8	2.7	1.8	502
Ntchisi	36.8	15.7	25.6	16.6	4.6	1.3	2.4	4.7	35.5	4.3	6.5	2.9	2.4	4.9	460
Total	**35.2**	**18.7**	**22.2**	**22.7**	**7.9**	**1.4**	**4.1**	**4.4**	**33.3**	**3.5**	**5.4**	**2.5**	**2.5**	**3.1**	**1,801**

Table A10. Percentage of WRA with a birth in the past three years who correctly identified the warning/danger signs of complications for newborns in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	Breathing difficulty	Feeding poorly	Yellow skin eyes	Pus or bleeding	Very small baby	Pallor	Bleeding	Convulsions/ spasms	High fever	Lethargy	Loss of conscious-ness	Green vomit	No stool passed	Swollen abdomen	N
Age															
15-19	21.1	15.2	17.8	16.5	8.9	1.2	3.0	4.3	26.2	3.1	4.6	2.0	1.9	3.7	170
20-24	28.3	16.8	22.4	14.7	8.5	1.5	3.4	2.7	22.6	4.4	2.7	2.1	2.6	3.5	529
25-29	30.3	24.3	23.6	19.4	8.6	3.9	2.7	7.4	34.7	6.8	3.3	2.8	6.8	3.3	360
30-34	26.2	21.3	25.5	18.6	8.8	2.2	0.6	5.1	32	6.3	6.5	1.6	4.6	2	282
35-39	31.8	17.5	29.4	25.6	9.8	3.4	5.0	4.9	25.7	5.6	2.2	2.5	3.3	1.9	186
40-44	30.3	20.4	24.3	20.5	20.9	2.1	4.5	3.4	14.3	1.2	4.1	0.0	8.6	2.9	52
45-49	38.1	10.7	36.6	27.3	11.8	00	0.0	16.6	25.4	5.1	15.6	0.0	0.0	17.8	18
Education															
No education	37.4	8.6	28.5	14	9.2	3.2	3.4	4.1	22.9	0.0	7.6	2.2	5.4	2.8	95
Some/completed primary	27.1	17.5	22.4	18.4	9.1	2.1	2.9	4.8	28.5	5.8	3.5	2	3.5	3.2	1,178
Some/completed secondary	30.8	28.3	26.2	17.3	9.9	3.4	2.9	4.5	23.7	3.7	2.9	1.9	5.2	3.2	302
More than secondary	16.5	32.3	45.6	37.4	6.8	0.0	0.0	12.4	39.3	16.9	15.2	13.9	13.9	0.0	22
Wealth index*															
Lowest	26.0	15.8	23.5	20.0	8.3	2.5	2.8	3.7	28.7	4.7	2.7	1.6	5.0	4.1	349
Second	26.3	13.5	24.0	14.2	10.6	3.0	1.4	3.3	26.2	5.5	3.5	3.9	2.6	4.4	308

Comparison	Breathing difficulty	Feeding poorly	Yellow skin eyes	Pus or bleeding	Very small baby	Pallor	Bleeding	Convulsions/ spasms	High fever	Lethargy	Loss of conscious-ness	Green vomit	No stool passed	Swollen abdomen	N
Middle	29.9	21.5	22.6	17.0	4.9	2.3	3.4	3.9	29.1	4.7	5.6	1.6	4.2	3.4	326
Fourth	27.8	21.5	27.3	20.5	11.2	1.9	3.7	4.9	26.2	5.5	4.2	2.0	3.7	1.6	326
Highest	32.1	24.9	21.1	18.9	11.6	2	3.1	8.8	26.3	5.6	2.8	1.7	4.9	2.1	288
District															
Mzimba	25.6	22.4	23.8	18.2	10.7	1.9	2.8	4.8	29.1	5.2	3.3	2.2	4.0	3.2	1,049
Nsanje	29.4	11.8	20.2	16.6	6.3	2.0	6.0	2.2	25.4	5.3	6.2	2.0	2.0	2.7	258
Ntchisi	36.1	14.8	26.6	19.3	6.8	4.0	0.7	6.9	23.3	4.9	3.4	2.3	5.9	3.3	290
Total	**28.3**	**19.2**	**23.8**	**18.2**	**9.2**	**2.4**	**2.9**	**4.8**	**27.4**	**5.2**	**3.8**	**2.2**	**4.1**	**3.2**	**1,597**

Table A11. Percentage of WRA who correctly identified the symptoms of malaria in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	Fever	Chills	Headache	Joint pain	Poor appetite	N
Age						
15-19	69.4	46.1	37.2	34.6	9.2	790
20-24	84.1	43.0	34.9	32.8	10.9	836
25-29	88.8	43.2	37.3	31.2	11.9	598
30-34	88.9	46.5	33.7	29.5	11.4	554
35-39	85.3	45.3	36.1	29.3	13.2	469
40-44	86.4	46.1	39.9	36.2	12.0	295
45-49	84.6	43.0	37.0	36.3	14.9	234
Education						
No education	83.2	43.0	34.7	31.8	11.1	480
Some/completed primary	82.7	44.8	34.3	31.1	11.2	2,684
Some/completed secondary	82.3	46.5	45.9	39.7	12.5	556
More than secondary	92.5	39.6	49.5	37.9	13.4	56
Wealth index*						
Lowest	82.5	43.8	35.0	32.2	11.0	917
Second	83.1	41.6	31.6	27.7	10.4	759
Middle	82.0	48.7	36.8	32.1	14.3	713
Fourth	82.6	46.0	37.6	34.6	13.5	631
Highest	83.9	44.4	40.8	36.2	8.5	752
District						
Machinga	77.5	59.1	32.8	27.5	7.8	1,649

Project	Fever	Chills	Headache	Joint pain	Poor appetite	N
Nkhotakota	87.3	42.0	41.3	36.1	10.0	1,143
Salima	84.6	32.9	35.9	34.7	16.0	984
Total	**82.8**	**44.7**	**36.3**	**32.5**	**11.4**	**3,776**

Table A12. Percentage of WRA who correctly identified the symptoms of malaria in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	Fever	Chills	Headache	Joint pain	Poor appetite	N
Age						
15-19	61.4	46.7	35.6	29.6	5.2	796
20-24	77.0	43.5	32.2	28.5	8.0	769
25-29	84.0	43.5	32.2	26.8	7.5	572
30-34	85.0	46.7	37.5	26.0	10.0	552
35-39	82.8	45.1	31.9	26.8	9.2	485
40-44	79.0	54.8	37.0	28.1	10.9	336
45-49	75.4	56.8	31.9	33.2	9.1	256
Education						
No education	80.5	33.3	35.4	30.5	6.1	246
Some/completed primary	75.9	46.5	32.6	26.6	7.6	2,684
Some/completed secondary	78.2	51.6	36.8	32.0	9.1	775
More than secondary	82.3	53.9	64.3	45.7	27.9	61
Wealth index*						
Lowest	82.5	43.8	35.0	32.2	11.0	917

Comparison	Fever	Chills	Headache	Joint pain	Poor appetite	N
Second	83.1	41.6	31.6	27.7	10.4	759
Middle	82.0	48.7	36.8	32.1	14.3	713
Fourth	82.6	46.0	37.6	34.6	13.5	631
Highest	83.9	44.4	40.8	36.2	8.5	752
District						
Mzimba	75.3	51.9	35.6	28.6	9.4	2,589
Nsanje	73.3	37.5	46.9	32.2	7.5	488
Ntchisi	83.7	34.9	20.7	24.2	4.2	689
Total	**76.7**	**46.8**	**34.1**	**28.2**	**8.1**	**3,766**

Table A13. Percentage of WRA who correctly identified the signs and symptoms of pneumonia in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	Fast, difficult, or noisy breathing	Cough	Lethargy	Refusal to eat or breastfeed	N
Age					
15-19	27.4	6.8	2.0	0.5	796
20-24	54.8	14.9	2.3	2.8	769
25-29	66.4	18.2	1.8	1.7	572
30-34	72.9	21.3	3.6	2.5	552
35-39	75.2	18.2	2.7	3.4	485
40-44	74.2	19.9	2.8	2.2	336
45-49	77.9	22.4	2.0	1.9	256
Education					
No education	64.4	19.2	1.8	1.6	246
Some/completed primary	57.4	14.7	2.4	2.0	2,684
Some/completed secondary	62.7	19.3	3.0	2.6	775
More than secondary	61.1	15.9	1.9	5.5	61
Wealth index*					
Lowest	57.7	17.2	1.5	1.6	644
Second	57.3	13.4	3.5	2.9	671
Middle	59.2	16.8	2.9	1.2	723
Fourth	63.3	17.2	2.2	2.0	827
Highest	59.2	15.2	2.1	2.7	900
District					
Machinga	49.8	11.4	2.1	2.4	2,589
Nkhotakota	63.2	15.8	3.3	2.5	488
Salima	65.1	20.4	2.4	1.5	689
Total	**59.1**	**15.9**	**2.4**	**2.1**	**3,766**

Table A14. Percentage of WRA who correctly identified the signs and symptoms of pneumonia in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	Fast, difficult, or noisy breathing	Cough	Lethargy	Refusal to eat or breastfeed	N
Age					
15-19	23.8	8.5	3.6	1.3	796
20-24	51.4	14.8	4.7	2.4	769
25-29	58.9	16.4	4.7	4.1	572
30-34	66.0	19.3	4.9	4.5	552
35-39	71.1	19.9	4.9	2.3	485
40-44	70.8	21.6	2.9	2.1	336
45-49	68.0	27.9	3.6	1.7	256
Education					
No education	66.5	24.7	6.0	4.0	246
Some/completed primary	54.1	16.6	4.3	2.7	2,684
Some/completed secondary	49.5	12.7	3.8	2.2	775
More than secondary	72.0	29.7	2.4	1.8	61
Wealth index*					
Lowest	59.0	16.1	3.9	2.2	917
Second	53.2	18.0	5.0	3.9	759
Middle	51.5	17.3	4.0	2.4	713
Fourth	55.1	14.6	4.8	2.2	631
Highest	52.9	16.8	3.8	2.6	752
District					
Mzimba	46.9	16.1	4.1	2.7	2,589
Nsanje	65.3	25.9	6.3	1.2	488
Ntchisi	72.3	12.1	3.8	3.5	689
Total	**54.2**	**16.5**	**4.3**	**2.6**	**3,766**

Table A15. Percentage of WRA who correctly identified the causes of pneumonia, by background characteristics (ONSE IE baseline, 2017)

Background characteristics	Project				Comparison			
	Not dressed warmly enough	Household air pollution	Inadequate household ventilation	N	Not dressed warmly enough	Household air pollution	Inadequate household ventilation	N
Age								
15-19	48.2	0.1	0.7	790	38.3	0.4	0.5	796
20-24	70.6	1.1	1.6	836	61.4	0.4	1.0	769
25-29	71.9	1.3	3.1	598	68.1	0.3	1.7	572
30-34	79.6	0.7	3.2	554	68.9	0.5	0.3	552
35-39	79.8	0.5	1.6	469	72.1	0.1	0.9	485
40-44	79.8	0.3	2.6	295	69.8	0.2	1.1	336
45-49	79.8	1.0	3.6	234	69.0	0.8	0.4	256
Education								
No education	68.3	0.2	2.8	480	73.3	0.2	1.3	246
Some/completed primary	68.3	0.6	1.9	2,684	58.5	0.4	0.9	2,684
Some/completed secondary	77.6	1.3	2.2	556	66.0	0.4	0.8	775
More than secondary	85.9	7.7	3.0	56	83.0	0.0	0.0	61
Wealth index*								
Lowest	66.3	0.6	1.9	917	65.7	0.0	1.3	644
Second	67.4	0.2	1.3	759	58.3	0.1	0.6	671

Background characteristics	Project				Comparison			
	Not dressed warmly enough	Household air pollution	Inadequate household ventilation	N	Not dressed warmly enough	Household air pollution	Inadequate household ventilation	N
Middle	72.0	0.5	2.7	713	57.6	0.8	0.9	723
Fourth	70.3	0.7	3.3	631	63.0	0.3	1.0	827
Highest	74.3	1.6	1.5	752	61.9	0.5	0.5	900
District								
Machinga	69.6	0.4	1.8	1,649	--	--	--	--
Nkhotakota	71.1	1.5	2.2	1,143	--	--	--	--
Salima	69.3	0.4	2.2	984	--	--	--	--
Mzimba	--	--	--	--	53.3	0.4	0.6	2,589
Nsanje	--	--	--	--	83.2	0.2	1.6	488
Ntchisi	--	--	--	--	74.8	0.3	1.2	689
Total	**69.9**	**0.7**	**2.1**	**3,776**	**61.3**	**0.4**	**0.9**	**3,766**

Table A16. Percentage of WRA who correctly identified the signs and symptoms of diarrhea in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	3 or more loose/watery stools in 24 hours	Loose/watery stools for 3+ days	Fast or noisy breathing	Lethargy	Refusal to eat or breastfeed	N
Age						
15-19	58.6	36.7	0.3	17.1	2.5	790
20-24	69.5	38.8	0.8	17.3	4.0	836
25-29	69.6	42.7	0.3	18.1	5.4	598
30-34	72.5	43.1	1.6	17.8	6.5	554
35-39	73.4	42.7	0.9	19.8	4.8	469
40-44	67.1	46.5	0.9	21.2	5.1	295
45-49	74.3	44.5	1.2	20.6	6.5	234
Education						
No education	66.8	46.8	0.9	15.7	2.8	480
Some/completed primary	67.9	40.3	0.8	18.6	4.6	2,684
Some/completed secondary	70.4	39.2	0.4	19.4	6.4	556
More than secondary	78.6	47.9	5.3	14.1	7.5	56
Wealth index*						
Lowest	68.3	43.3	0.5	14.2	4.3	917
Second	66.2	40.1	0.9	16.7	4.1	759
Middle	69.8	41.4	1.1	20.7	4.8	713
Fourth	66.5	43.7	0.6	22.2	5.1	631
Highest	70.7	36.8	0.9	18.8	5.0	752

Project	3 or more loose/watery stools in 24 hours	Loose/watery stools for 3+ days	Fast or noisy breathing	Lethargy	Refusal to eat or breastfeed	N
District						
Machinga	70.1	35.2	0.5	18.3	4.3	1,649
Nkhotakota	68.0	37.7	0.7	19.2	5.4	1,143
Salima	66.7	49.3	1.1	17.7	4.4	984
Total	**68.3**	**41.1**	**0.8**	**18.3**	**4.6**	**3,776**

Table A17. Percentage of WRA who correctly identified the signs and symptoms of diarrhea in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	3 or more loose/watery stools in 24 hours	Loose/watery stools for 3+ days	Fast or noisy breathing	Lethargy	Refusal to eat or breastfeed	N
Age						
15-19	57.3	30.2	0.2	11.9	2.3	796
20-24	62.5	38.6	1.1	13.2	3.6	769
25-29	67.2	45.9	0.9	13.8	5.1	572
30-34	69.8	40.2	1.7	10.2	4.6	552
35-39	72.2	45.8	0.1	14.2	8.3	485
40-44	69.7	43.2	1.1	13.2	7.1	336
45-49	71.4	40.4	1.3	12.3	3.2	256

Comparison	3 or more loose/watery stools in 24 hours	Loose/watery stools for 3+ days	Fast or noisy breathing	Lethargy	Refusal to eat or breastfeed	N
Education						
No education	71.3	34.2	1.1	9.6	5.7	246
Some/completed primary	65.3	39.7	0.7	11.9	4.4	2,684
Some/completed secondary	64.9	40.4	0.8	15.4	4.7	775
More than secondary	71.6	45.6	6.0	25.3	6.6	61
Wealth index*						
Lowest	63.5	41.9	0.7	12.1	4.8	644
Second	65.1	37.6	0.2	13.2	3.9	671
Middle	66.5	38.3	0.8	11.1	4.2	723
Fourth	63.1	40.5	1.2	10.9	5.1	827
Highest	69.4	39.8	1.2	15.6	4.8	900
District						
Mzimba	2,589	40.5	0.9	12.2	4.5	2,589
Nsanje	488	36.5	1.0	12.9	3.3	488
Ntchisi	689	38.3	0.7	14.1	5.7	689
Total	**3,766**	**39.6**	**0.8**	**12.7**	**4.6**	**3,766**

Table A18. Percentage of WRA who correctly identified the causes of diarrhea in the project domain, by background characteristics (ONSE IE baseline, 2017)

Project	Lack of safe drinking water	Defecating/ urinating in open spaces	Eating rotten food	Lack of food protection against contamination	Touching food without washing hands with soap	Not washing hands after defecation	N
Age							
15-19	34.4	3.0	19.4	31.0	21.8	22.8	790
20-24	38.7	3.5	16.8	33.1	20.2	19.3	836
25-29	38.4	5.1	18.3	39.1	24.7	24.8	598
30-34	42.9	4.7	18.3	36.8	23.2	21.0	554
35-39	43.2	6.0	19.4	35.6	22.1	20.4	469
40-44	39.1	6.7	22.9	40.6	24.6	18.1	295
45-49	52.3	4.6	21.0	36.6	21.0	27.7	234
Education							
No education	38.3	4.8	14.7	30.4	21.3	18.0	480
Some/completed primary	38.3	4.4	18.4	33.2	21.2	21.8	2,684
Some/completed secondary	47.5	4.2	22.6	47.9	27.5	24.4	556
More than secondary	51.8	6.7	43.1	54.8	38.1	24.7	56
Wealth index*							
Lowest	39.4	4.4	16.6	28.3	17.8	20.6	917
Second	39.4	5.3	17.2	30.0	19.4	20.6	759
Middle	38.4	5.4	21.1	37.6	23.4	23.0	713
Fourth	39.1	4.0	19.1	39.9	26.8	22.0	631
Highest	42.6	3.5	21.2	42.7	25.5	22.9	752
District							
Machinga	35.7	5.2	15.1	35.5	23.6	21.2	1,649
Nkhotakota	49.2	3.7	18.9	32.6	19.2	19.8	1,143
Salima	36.7	4.3	22.5	37.1	23.4	23.7	984
Total	**39.8**	**4.5**	**18.9**	**35.3**	**22.3**	**21.7**	**3,776**

Table A19. Percentage of WRA who correctly identified the causes of diarrhea in the comparison domain, by background characteristics (ONSE IE baseline, 2017)

Comparison	Lack of safe drinking water	Defecating/ urinating in open spaces	Eating rotten food	Lack of food protection against contamination	Touching food without washing hands with soap	Not washing hands after defecation	N
Age							
15-19	26.9	2.4	17.2	29.1	17.0	19.5	796
20-24	32.0	3.0	16.2	33.0	18.8	22.3	769
25-29	36.6	3.0	21.0	40.1	24.2	23.3	572
30-34	38.7	3.2	19.7	43.4	24.2	28.8	552
35-39	42.4	4.0	23.3	42.6	19.1	24.0	485
40-44	35.0	4.8	23.1	44.8	22.1	25.3	336
45-49	40.0	7.1	24.1	47.5	19.2	20.7	256
Education							
No education	34.3	4.6	17.0	26.9	11.1	17.8	246
Some/completed primary	33.2	3.2	19.4	36.3	20.1	22.4	2,684
Some/completed secondary	38.2	4.5	21.5	46.5	22.5	26.2	775
More than secondary	68.1	0.0	22.3	54.6	42.6	44.5	61
Wealth index*							
Lowest	34.0	3.3	18.5	34.0	16.0	17.5	644
Second	29.9	3.2	18.7	33.4	15.8	19.5	671
Middle	33.0	4.1	18.5	33.9	22.4	23.1	723
Fourth	34.5	2.9	20.2	40.5	21.6	25.4	827
Highest	40.9	3.8	21.9	46.2	24.4	28.6	900
District							
Mzimba	35.5	3.4	20.5	39.0	22.0	24.0	2,589
Nsanje	34.5	5.8	19.5	32.7	17.5	19.0	488
Ntchisi	32.3	2.5	16.9	38.0	16.4	22.9	689
Total	**34.7**	**3.5**	**19.7**	**38.0**	**20.4**	**23.2**	**3,766**

Table A20. Characteristics of sampled health facilities (ONSE IE SARA survey, 2017)

Facility type	Percentage distribution of surveyed facilities	Number of facilities surveyed
Machinga		
Hospital	4.8	1
Health center	81.0	17
Dispensary	14.3	3
Total	100.0	21
Nkhotakota		
Hospital	20.0	4
Health center	70.0	14
Dispensary	10.0	2
Total	100.0	20
Salima		
Hospital	7.1	1
Health center	92.9	13
Dispensary	0.0	0
Total	100.0	14
Mzimba		
Hospital	14.0	8
Health center	77.2	44
Dispensary	8.8	5
Total	100.0	57
Nsanje		
Hospital	21.4	3
Health center	78.6	11
Dispensary	0.0	0
Total	100.0	14
Ntchisi		
Hospital	7.7	1
Health center	84.6	11
Dispensary	7.7	1
Total	100.0	13
Total	**100.0**	**139**

Table A21. Availability of basic amenities for client services (ONSE IE SARA survey, 2017)

Facility type	Regular electricity	Improved water source	Visual and auditory privacy	Client latrine	Communication equipment	Computer with Internet	Emergency transport	N
Machinga								
Hospital	100.0	0.0	100.0	100.0	100.0	100.0	100.0	1
Health center	47.1	5.9	100.0	88.2	76.5	11.8	11.8	17
Dispensary	66.7	66.7	66.7	100.0	100.0	0.0	0.0	3
Total	52.4	14.3	95.2	90.5	81.0	14.3	14.3	21
Nkhotakota								
Hospital	75.0	0.0	100.0	100.0	75.0	75.0	75.0	4
Health center	92.9	21.4	92.9	92.9	85.7	14.3	0.0	14
Dispensary	50.0	50.0	100.0	50.0	50.0	0.0	50.0	2
Total	85.0	20.0	95.0	90.0	80.0	25.0	20.0	20
Salima								
Hospital	100.0	0.0	100.0	100.0	100.0	100.0	100.0	1
Health center	76.9	23.1	92.3	100.0	30.8	7.7	15.4	13
Total	78.6	21.4	92.9	100.0	35.7	14.3	21.4	14
Mzimba								
Hospital	87.5	12.5	87.5	87.5	87.5	62.5	75.0	8
Health center	59.1	43.2	100.0	90.9	45.5	2.3	6.8	44
Dispensary	100.0	60.0	100.0	100.0	0.0	20.0	20.0	5
Total	66.7	40.4	98.2	91.2	47.4	12.3	17.5	57
Nsanje								
Hospital	100.0	0.0	66.7	100.0	100.0	66.7	100.0	3
Health center	72.7	18.2	90.9	100.0	45.5	9.1	0.0	11
Total	78.6	14.3	85.7	100.0	57.1	21.4	21.4	14
Ntchisi								
Hospital	100.0	0.0	100.0	100.0	100.0	100.0	100.0	1
Health center	63.6	18.2	100.0	100.0	81.8	9.1	18.2	11

Facility type	Regular electricity	Improved water source	Visual and auditory privacy	Client latrine	Communication equipment	Computer with Internet	Emergency transport	N
Dispensary	100.0	0.0	100.0	100.0	0.0	0.0	0.0	1
Total	69.2	15.4	100.0	100.0	76.9	15.4	23.1	13
Total	**69.8**	**26.6**	**95.7**	**93.5**	**59.7**	**15.8**	**18.7**	**139**

Table A22. Percentage of facilities with priority medicines for mothers (ONSE IE SARA survey, 2017)

Facility type	Oxytocin	Sodium chloride inj. solution	Calcium gluconate inj.	Magnesium sulphate inj.	Ampicillin powder (inj.)	Gentamicin injection	Metronidazole injection	Misoprostol	Azithromycin	Cefixime	Benzathine benzylpenicillin powder	Betamethasone/ dexamethasone injection	Nifedipine	Hydralazine injection	Methyldopa tablet	N
Machinga																
Hospital	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	1
Health center	94.1	76.5	-	88.2	0.0	100.0	-	-	-	-	100.0	23.5	-	-	-	17
Dispensary	33.3	33.3	-	0.0	0.0	33.3	-	-	-	-	33.3	0.0	-	-	-	3
Total	85.7	71.4	100.0	76.2	4.8	90.5	100.0	0.0	100.0	0.0	90.5	23.8	100.0	100.0	100.0	21
Salima																
Hospital	100.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	1
Health center	92.3	61.5	0.0	84.6	30.8	100.0	-	-	-	-	100.0	15.4	-	-	-	13
Total	92.9	64.3	0.0	85.7	35.7	100.0	100.0	100.0	100.0	0.0	100.0	21.4	0.0	100.0	100.0	14
Nkhotakota																
Hospital	100.0	100.0	25.0	100.0	50.0	100.0	75.0	50.0	50.0	0.0	100.0	75.0	75.0	75.0	75.0	4
Health center	85.7	71.4	-	85.7	7.1	100.0	-	-	-	-	100.0	42.9	-	-	-	14
Dispensary	50.0	100.0	-	50.0	0.0	100.0	-	-	-	-	100.0	50.0	-	-	-	2
Total	85.0	80.0	25.0	85.0	15.0	100.0	75.0	50.0	50.0	0.0	100.0	50.0	75.0	75.0	75.0	20

Facility type	Oxytocin	Sodium chloride inj. solution	Calcium gluconate inj.	Magnesium sulphate inj.	Ampicillin powder (inj.)	Gentamicin injection	Metronidazole injection	Misoprostol	Azithromycin	Cefixime	Benzathine benzylpenicillin powder	Betamethasone/ dexamethasone injection	Nifedipine	Hydralazine injection	Methyldopa tablet	N
Mzimba																
Hospital	87.5	75.0	37.5	87.5	37.5	87.5	62.5	37.5	50.0	12.5	87.5	62.5	62.5	75.0	75.0	8
Health center	95.5	75.0	-	59.1	4.6	97.7	-	-	-	-	100.0	15.9	-	-	-	44
Dispensary	20.0	40.0	-	0.0	0.0	80.0	-	-	-	-	80.0	20.0	-	-	-	5
Total	87.7	71.9	37.5	57.9	8.8	94.7	62.5	37.5	50.0	12.5	96.5	22.8	62.5	75.0	75.0	57
Nsanje																
Hospital	100.0	66.7	0.0	100.0	100.0	100.0	100.0	66.7	100.0	33.3	100.0	100.0	100.0	100.0	100.0	3
Health center	100.0	45.5	0.0	81.8	0.0	90.9	-	-	-	-	100.0	0.0	-	-	-	11
Total	100.0	50.0	0.0	85.7	21.4	92.9	100.0	66.7	100.0	33.3	100.0	21.4	100.0	100.0	100.0	14
Ntchisi																
Hospital	100.0	0.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	1
Health center	90.9	81.8	-	81.8	0.0	100.0	-	-	-	-	100.0	9.1	-	-	-	11
Dispensary	0.0	0.0	-	0.0	0.0	100.0	-	-	-	-	100.0	15.4	-	-	-	1
Total	84.6	69.2	0.0	76.9	7.7	100.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	13
Total	**88.5**	**69.8**	**27.8**	**71.9**	**13.0**	**95.7**	**77.8**	**50.0**	**66.7**	**11.1**	**97.1**	**25.9**	**72.2**	**83.3**	**83.3**	**139**

Table A23. Percentage of facilities with priority medicines for children (ONSE IE SARA survey, 2017)

Facility type	Amoxicillin	Ampicillin powder for injection	Ceftriaxone powder for injection	Gentamicin injection	Procaine benzylpenicillin powder for inj.	ORS	Zinc sulphate	ACT	Artesunate rectal or inj. forms	Vitamin A	Morphine granule, injection	Paracetamol	N
Machinga													
Hospital	100.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	1
Health center	35.3	0.0	-	100.0	58.8	35.3	-	94.1	88.2	41.2	-	41.2	17
Dispensary	0.0	0.0	-	33.3	33.3	33.3	-	100.0	100.0	33.3	-	0.0	3
Total	33.3	4.8	100.0	90.5	52.4	38.1	100.0	95.2	90.5	42.9	100.0	33.3	21
Nkhotakota													
Hospital	75.0	50.0	75.0	100.0	0.0	100.0	50.0	100.0	100.0	50.0	25.0	50.0	4
Health center	42.9	7.1	-	100.0	35.7	85.7	-	92.9	100.0	50.0	-	14.3	14
Dispensary	0.0	0.0	-	100.0	50.0	100.0	-	100.0	100.0	50.0	-	0.0	2
Total	45.0	15.0	75.0	100.0	30.0	90.0	50.0	95.0	100.0	50.0	25.0	20.0	20
Salima													
Hospital	0.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	0.0	100.0	0.0	1
Health center	46.2	30.8	-	100.0	46.2	92.3	-	92.3	92.3	30.8	-	38.5	13
Total	42.9	35.7	100.0	100.0	42.9	92.9	100.0	92.9	92.9	28.6	100.0	35.7	14
Mzimba													
Hospital	50.0	37.5	75.0	87.5	12.5	87.5	75.0	75.0	87.5	50.0	37.5	50.0	8
Health center	61.4	4.6	-	97.7	45.5	79.6	-	88.6	93.2	79.6	-	18.2	44

Facility type	Amoxicillin	Ampicillin powder for injection	Ceftriaxone powder for injection	Gentamicin injection	Procaine benzylpenicillin powder for inj.	ORS	Zinc sulphate	ACT	Artesunate rectal or inj. forms	Vitamin A	Morphine granule, injection	Paracetamol	N
Dispensary	80.0	0.0	-	80.0	40.0	100.0	-	100.0	80.0	60.0	-	60.0	5
Total	61.4	8.8	75.0	94.7	40.4	82.5	75.0	87.7	91.2	73.7	37.5	26.3	57
Nsanje													
Hospital	100.0	100.0	100.0	100.0	66.7	66.7	66.7	100.0	100.0	0.0	33.3	100.0	3
Health center	63.6	0.0	-	90.9	54.6	90.9	-	100.0	100.0	54.6	-	54.6	11
Total	71.4	21.4	100.0	92.9	57.1	85.7	66.7	100.0	100.0	42.9	33.3	64.3	14
Ntchisi													
Hospital	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1
Health center	54.6	0.0	-	100.0	63.6	90.9	-	90.9	100.0	63.6	-	36.4	11
Dispensary	0.0	0.0	-	100.0	0.0	100.0	-	100.0	100.0	0.0	-	0.0	1
Total	53.9	7.7	100.0	100.0	61.5	92.3	100.0	92.3	100.0	61.5	100.0	38.5	13
Total	53.2	13.0	83.3	95.7	44.6	79.1	72.2	92.1	94.2	56.8	44.4	32.4	139

Table A24. Availability of FP methods among facilities that provided FP services (ONSE IE SARA survey, 2017)

Facility type	Provision of the following modern methods:									Any modern method	Number of facilities
	Pills	Injec-tables	Female condoms	Male condoms	IUD	Implant	Cycle beads	Male steriliza-tion	Female steriliza-tion		
Machinga											
Hospital	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1
Health center	100.0	93.3	100.0	100.0	26.7	93.3	86.7	6.7	26.7	100.0	15
Dispensary	100.0	100.0	100.0	100.0	-	100.0	33.3	-	-	100.0	3
Total	100.0	94.7	100.0	100.0	31.3	94.7	79.0	12.5	31.3	100.0	19
Nkhotakota											
Hospital	75.0	100.0	100.0	100.0	25.0	75.0	75.0	50.0	50.0	100.0	4
Health center	100.0	100.0	85.7	100.0	57.1	100.0	57.1	35.7	50.0	100.0	14
Dispensary	100.0	100.0	100.0	100.0	-	100.0	50.0	-	-	100.0	2
Total	95.0	100.0	90.0	100.0	50.0	95.0	60.0	38.9	50.0	100.0	20
Salima											
Hospital	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1
Health center	91.7	100.0	83.3	100.0	8.3	66.7	50.0	0.0	25.0	100.0	12
Total	92.3	100.0	84.6	100.0	15.4	69.2	53.9	7.7	30.8	100.0	13
Mzimba											
Hospital	100.0	100.0	75.0	100.0	75.0	100.0	75.0	100.0	100.0	100.0	4
Health center	86.4	100.0	90.9	95.5	45.5	100.0	54.6	11.4	25.0	100.0	44
Dispensary	75.0	100.0	75.0	100.0	-	50.0	0.0	-		100.0	4
Total	86.5	100.0	88.5	96.2	47.9	96.2	51.9	18.8	31.3	100.0	52
Nsanje											
Hospital	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1
Health center	90.9	90.9	72.7	100.0	9.1	100.0	54.6	9.1	9.1	100.0	11
Total	91.7	91.7	75.0	100.0	16.7	100.0	58.3	16.7	16.7	100.0	12
Ntchisi											
Hospital	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1

Facility type	Provision of the following modern methods:									Any modern method	Number of facilities
	Pills	Injec-tables	Female condoms	Male condoms	IUD	Implant	Cycle beads	Male steriliza-tion	Female steriliza-tion		
Health center	100.0	100.0	100.0	90.0	20.0	80.0	40.0	10.0	40.0	100.0	10
Dispensary	0.0	100.0	0.0	100.0	-	0.0	0.0	-	-	100.0	1
Total	91.7	100.0	91.7	91.7	27.3	75.0	41.7	18.2	45.5	100.0	12
Total	**91.4**	**98.4**	**89.1**	**97.7**	**37.3**	**91.4**	**57.0**	**19.5**	**33.9**	**100.0**	**128**

Table A25. Availability of maternal health services (ONSE IE SARA survey, 2017)

Facility type	Percentage of facilities that offered:					Number of facilities	Provider of delivery care available onsite or on-call 24 hours per day	Number of facilities offering normal delivery services
	ANC	Normal delivery service	Caesarean delivery	ANC and normal delivery service	ANC, normal delivery, and Caesarean delivery			
Machinga								
Hospital	100.0	100.0	100.0	100.0	100.0	1	100.0	1
Health center	100.0	94.1	-	94.1	-	17	0.0	16
Dispensary	33.3	-	-	-	-	3	-	0
Total	90.5	94.4	100.0	94.4	100.0	21	5.9	17
Nkhotakota								
Hospital	100.0	100.0	50.0	100.0	50.0	4	50.0	4
Health center	100.0	92.9	-	92.9	-	14	0.0	13
Dispensary	50.0	-	-	-	-	2	-	0
Total	95.0	94.4	50.0	94.4	50.0	20	11.8	17

Facility type	Percentage of facilities that offered:					Number of facilities	Provider of delivery care available onsite or on-call 24 hours per day	Number of facilities offering normal delivery services
	ANC	Normal delivery service	Caesarean delivery	ANC and normal delivery service	ANC, normal delivery, and Caesarean delivery			
Salima								
Hospital	100.0	100.0	100.0	100.0	100.0	1	100.0	1
Health center	100.0	100.0	-	100.0	-	13	0.0	13
Total	100.0	100.0	100.0	100.0	100.0	14	7.1	14
Mzimba								
Hospital	87.5	87.5	50.0	87.5	50.0	8	57.1	7
Health center	100.0	95.5	-	95.5	-	44	0.0	42
Dispensary	20.0	-	-	-	-	5	-	0
Total	91.2	94.2	50.0	94.2	50.0	57	8.2	49
Nsanje								
Hospital	100.0	100.0	100.0	100.0	100.0	3	100.0	3
Health center	100.0	100.0	-	100.0	--	11	0.0	11
Total	100.0	100.0	100.0	100.0	100.0	14	21.4	14
Ntchisi								
Hospital	100.0	100.0	100.0	100.0	100.0	1	100.0	1
Health center	90.9	90.9	-	90.9	-	11	0.0	10
Dispensary	0.0	-	-	-	-	1	-	0
Total	84.6	91.7	100.0	91.7	100.0	13	9.1	11
Total	**92.8**	**95.3**	**66.7**	**95.3**	**66.7**	**139**	**9.8**	**122**

Table A26. Availability of guidelines, trained staff, and equipment for delivery services (ONSE IE SARA survey, 2017)

Facility type	Percentage of facilities offering normal delivery service that had:											Number of facilities offering delivery services
			Equipment									
	Guide-lines on IMPAC	Staff trained in IMPAC	Emer-gency transport	Exam light	Delivery pack	Suction apparatus (mucus extractor)	Manual vacuum extractor	Vacuum aspirator or D&C kit	Neonatal bag and mask	Parto-graph	Gloves	
Machinga												
Hospital	0.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1
Health center	12.5	50.0	12.5	50.0	87.5	100.0	37.5	25.0	81.3	93.8	100.0	16
Total	11.8	52.9	17.6	47.1	88.2	100.0	41.2	29.4	82.4	94.1	100.0	17
Nkhotakota												
Hospital	75.0	50.0	75.0	50.0	100.0	50.0	100.0	50.0	100.0	100.0	100.0	4
Health center	30.8	30.8	0.0	38.5	92.3	76.9	23.1	15.4	100.0	100.0	100.0	13
Total	41.2	35.3	17.6	41.2	94.1	70.6	41.2	23.5	100.0	100.0	100.0	17
Salima												
Hospital	0.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	1
Health center	38.5	46.2	15.4	30.8	84.6	84.6	15.4	7.7	69.2	61.5	100.0	13
Total	35.7	50.0	21.4	35.7	85.7	85.7	21.4	14.3	71.4	64.3	100.0	14
Mzimba												
Hospital	57.1	100.0	85.7	42.9	100.0	100.0	100.0	85.7	85.7	100.0	100.0	7
Health center	40.5	35.7	4.8	45.2	71.4	92.9	16.7	11.9	92.9	90.5	100.0	42
Total	42.9	44.9	16.3	44.9	75.5	93.9	28.6	22.5	91.8	91.8	100.0	49
Nsanje												
Hospital	100.0	100.0	100.0	100.0	100.0	100.0	66.7	0.0	100.0	100.0	100.0	3
Health center	63.6	45.5	0.0	54.6	100.0	100.0	9.1	9.1	100.0	100.0	100.0	11

Facility type	Percentage of facilities offering normal delivery service that had:											Number of facilities offering delivery services
			Equipment									
	Guide-lines on IMPAC	Staff trained in IMPAC	Emer-gency transport	Exam light	Delivery pack	Suction apparatus (mucus extractor)	Manual vacuum extractor	Vacuum aspirator or D&C kit	Neonatal bag and mask	Parto-graph	Gloves	
Total	71.4	57.1	21.4	64.3	100.0	100.0	21.4	7.1	100.0	100.0	100.0	14
Ntchisi												
Hospital	100.0	100.0	100.0	0.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0	1
Health center	30.0	60.0	10.0	20.0	60.0	90.0	10.0	10.0	100.0	100.0	100.0	10
Total	36.4	63.6	18.2	18.2	63.6	90.9	18.2	9.1	100.0	100.0	100.0	11
Total	**40.2**	**48.4**	**18.0**	**43.4**	**82.8**	**91.0**	**29.5**	**19.7**	**91.0**	**91.8**	**100.0**	**122**

Table A27. Availability of malaria services at facilities offering ANC (ONSE IE SARA survey, 2017)

Facility type	Percentage of ANC facilities offering malaria services	Staff trained in IPT	Medicines and commodities		Number of facilities offering ANC
			IPTp	ITNs	
Machinga					
Hospital	100.0	0.0	0.0	100.0	1
Health center	100.0	47.1	17.7	82.4	17
Dispensary	100.0	0.0	0.0	0.0	1
Total	100.0	42.1	15.8	78.9	19
Nkhotakota					
Hospital	100.0	50.0	50.0	75.0	4
Health center	100.0	50.0	64.3	50.0	14
Dispensary	100.0	0.0	0.0	100.0	1
Total	100.0	47.4	57.9	57.9	19
Salima					
Hospital	100.0	0.0	100.0	100.0	1
Health center	100.0	53.9	76.9	69.2	13
Total	100.0	50.0	78.6	71.4	14
Mzimba					
Hospital	100.0	71.4	85.7	100.0	7
Health center	100.0	15.9	68.2	81.8	44
Dispensary	100.0	0.0	100.0	0.0	1
Total	100.0	23.1	71.2	82.7	52
Nsanje					
Hospital	100.0	66.7	66.7	100.0	3
Health center	100.0	27.3	27.3	90.9	11
Total	100.0	35.7	35.7	92.9	14
Ntchisi					
Hospital	100.0	0.0	100.0	100.0	1
Health center	100.0	40.0	30.0	90.0	10
Total	100.0	36.4	36.4	90.9	11
Total	**100.0**	**34.9**	**55.0**	**79.1**	**129**

Table A28. Availability of malaria services and guidelines, trained staff, and diagnostic capacity (ONSE IE SARA survey, 2017)

Facility type	Percentage of facilities offering malaria diagnosis/ treatment	Number of facilities	Among facilities that offered malaria diagnosis/treatment services:					Number of facilities that offered malaria diagnosis/ treatment
			Guidelines	Trained staff	Diagnostics			
			Guidelines for diagnosis/ treatment of malaria	Staff trained in malaria diagnosis/ treatment	Malaria RDT	Malaria microscopy	Any malaria diagnostics	
Machinga								
Hospital	100.0	1	100.0	100.0	100.0	100.0	100.0	1
Health center	100.0	17	35.3	82.4	94.1	41.2	94.1	17
Dispensary	100.0	3	66.7	100.0	100.0	--	100.0	3
Total	100.0	21	42.9	85.7	95.2	44.4	95.2	21
Nkhotakota								
Hospital	100.0	4	25.0	75.0	100.0	75.0	100.0	4
Health center	100.0	14	42.9	92.9	100.0	0.0	100.0	14
Dispensary	100.0	2	0.0	50.0	100.0	--	100.0	2
Total	100.0	20	35.0	85.0	100.0	16.7	100.0	20
Salima								
Hospital	100.0	1	100.0	100.0	100.0	100.0	100.0	1
Health center	100.0	13	38.5	76.9	100.0	23.1	100.0	13
Total	100.0	14	42.9	78.6	100.0	28.6	100.0	14
Mzimba								
Hospital	87.5	7	28.6	85.7	100.0	85.7	100.0	7
Health center	100.0	44	15.9	68.2	100.0	6.8	100.0	44
Dispensary	80.0	4	25.0	75.0	100.0	--	100.0	4

Facility type	Percentage of facilities offering malaria diagnosis/ treatment	Number of facilities	Among facilities that offered malaria diagnosis/treatment services:					Number of facilities that offered malaria diagnosis/ treatment
			Guidelines	Trained staff	Diagnostics			
			Guidelines for diagnosis/ treatment of malaria	Staff trained in malaria diagnosis/ treatment	Malaria RDT	Malaria microscopy	Any malaria diagnostics	
Total	96.5	55	18.2	70.9	100.0	6	100.0	55
Nsanje								
Hospital	100.0	3	66.7	100.0	100.0	100.0	100.0	3
Health center	100.0	11	18.2	36.4	100.0	0.0	100.0	11
Total	100.0	14	28.6	50.0	100.0	21.4	100.0	14
Ntchisi								
Hospital	100.0	1	0.0	100.0	100.0	100.0	100.0	1
Health center	100.0	11	27.3	63.6	100.0	9.1	100.0	11
Dispensary	100.0	1	0.0	0.0	100.0	--	100.0	1
Total	100.0	13	23.1	61.5	100.0	16.7	100.0	13
Total	**98.6**	**139**	**28.5**	**73.0**	**99.3**	**21.2**	**99.3**	**137**

Table A29. Availability of malaria medicines (ONSE IE SARA survey, 2017)

Facility type	ACTs	SP	Oral quinine	Number of facilities that offered malaria diagnosis and/or treatment services
Machinga				
Hospital	100.0	0.0	0.0	1
Health center	94.1	17.7	17.7	17
Dispensary	100.0	0.0	0.0	3
Total	95.2	14.3	14.3	21
Nkhotakota				
Hospital	100.0	50.0	50.0	4
Health center	92.9	64.3	35.7	14
Dispensary	100.0	0.0	50.0	2
Total	95.0	55.0	40.0	20
Salima				
Hospital	100.0	100.0	100.0	1
Health center	92.3	76.9	61.5	13
Total	92.9	78.6	64.3	14
Mzimba				
Hospital	85.7	85.7	57.1	7
Health center	88.6	68.2	22.7	44
Dispensary	100.0	25.0	50.0	4
Total	89.1	67.3	29.1	55
Nsanje				
Hospital	100.0	66.7	66.7	3
Health center	100.0	27.3	27.3	11
Total	100.0	35.7	35.7	14
Ntchisi				
Hospital	100.0	100.0	100.0	1
Health center	90.9	27.3	18.2	11
Dispensary	100.0	100.0	0.0	1
Total	92.3	38.5	23.1	13
Total	**92.7**	**52.6**	**32.1**	**137**

APPENDIX B. KEY INDICATOR DATA SYNTHESIS

Malawi is rich with survey data sources that gather information on key FP/RH and MNCH outcomes. USAID/Malawi requested a compilation and synthesis of the estimates from different sources. This synthesis draws on data from several different sources. A brief summary of secondary sources of information is provided below.

Data Sources

District Health Information System, version 2 (DHIS 2)

A paper-based system is used in Malawi for recording data at health facilities and for reporting data from the facility to the district level. However, at the district level, the data are electronically captured into the DHIS 2. DHIS 2 contains data from all public and faith-based facilities (i.e., CHAM). DHIS 2 indicators are commonly used for performance monitoring, and several relevant indicators are presented from DHIS 2 that were derived from SSDI reports.

Malawi DHS, 2010 and 2015−2016

The DHS is a repeated cross-sectional survey conducted in many countries around the world with an average of five-year intervals between surveys. DHS surveys are weighted to produce national-level estimates and, for some key indicators, are also designed to produce district-level estimates. The 2010 Malawi DHS was implemented by the National Statistics Office which conducted interviews in 24,825 households and with 23,020 WRA. The 2015-16 Malawi DHS included interviews with 26,361 households and 24,562 WRA.

Malawi Malaria Indicator Survey (MIS), 2014 and 2017

The 2014 and 2017 MIS were conducted by the National Malaria Control Programme, with funding from The Global Fund and the President's Malaria Initiative, and support from ICF International. The two Malawi MIS are nationally representative surveys conducted to estimate malaria program coverage and to estimate malaria-related burden and anemia prevalence testing for children under five.

Malawi MDG Endline Survey (MES), 2014

The MES was conducted in 2014 by the National Statistics Office with support from UNICEF and the MDG as a part of the Multiple Indicator Cluster Surveys (MICS) program. MICS collect information on the status of women and children for policy use, research, and for measurement against the MDGs. The goal of this MES was to produce end line estimates for indicators that show progress of the attainment of the MDGs. Many indicators collected for the MDG end line in the MES are relevant for the ONSE project and impact evaluation.

Malawi Service Provision Assessment (SPA), 2013–2014

The Malawi SPA provides national and subnational information on the availability and quality of and readiness to provide services in all hospitals, health centers, dispensaries, maternities, clinics, and health posts in the country. Facilities from both public and private managing authorities were included, specifically government, CHAM, nongovernmental organizations, and private and faith-based organizations. The 2013–14 SPA reports on child health, FP, maternal and newborn health care (antenatal and delivery care), sexually transmitted infections, tuberculosis, and HIV/AIDS services, and also included interviews with health providers and clients. Observations of provider-client interactions were also conducted.

Support for Service Delivery Integration-Communications (SSDI-C), 2012 and 2016

The SSDI-C project conducted a cross-sectional baseline survey in 2012. This survey used a stratified random sample in 15 project and four control districts and interviewed 1,134 women and 1,099 men. The purpose of the survey was to generate baseline estimates for health outcomes and baseline indicator values for selected health practices, such as knowledge, self-efficacy, risk perceptions, and social normative perceptions. Results of interviews with females are used in this analysis to maintain comparability with the ONSE baseline survey and DHS woman's questionnaires from which many indicators are drawn.

SSDI-C also conducted a cross-sectional end line survey in 2016. The purpose of the end line survey was to estimate end line indicators and measures of change in selected health outcomes compared with outcomes at the beginning of the project. It had a similar design as the baseline survey with a stratified random sampling approach. 1,223 women were interviewed in the 15 intervention districts, which are included in the estimates below.

Support for Service Delivery Integration-Services (SSDI-S), 2016

The SSDI-S Endline Assessment Report provides results from facilities in the 15 SSDI-supported districts and five comparison districts from the Rapid Situational Analysis Questionnaire and a Client Exit Interview Questionnaire. The end line assessment collected data from 9 percent of public and CHAM hospitals and health centers in the survey's 20 districts to gather information on targeted integrated facility outcomes, such as the availability of supplies and commodities, the capacity of service providers, and clients' perception of services. District-level estimates are not available in the report.

Key Outcome Areas

Key outcome areas for the ONSE project and IE are FP, maternal health, child health, water and sanitation, and malaria. Indicator summaries are listed below by outcome area. Malaria is a cross-cutting area that falls in maternal and child health. Malaria-related indicators are placed in those key outcome areas.

Family Planning

Modern contraceptive prevalence rates (MCPRs) for Malawi are available from several sources over time, including the Malawi DHS, SSDI end line survey, and ONSE IE baseline survey. Figure B1 shows the trend in the MCPR between 2010 and 2017. The trend is increasing over time through the 2015–16 Malawi DHS. The ONSE IE baseline MCPR estimate is lower than the latest Malawi DHS estimate (56 percent versus 58 percent, respectively). Reviewing the district-level estimates from the 2015–16 Malawi DHS reveals that the MCPRs in ONSE districts (46 percent in Machinga, 51 percent in Nkhotakota, and 53 percent in Salima) are much lower than the average Malawi DHS MCPR, providing some explanation for why the ONSE IE baseline MCPR aggregate estimate for those districts is lower than the Malawi DHS national-level estimate.

The trend in couple years of protection during the SSDI was also increasing, which is in line with an increasing MCPR (Figure B2).

Table B1 provides a comparison of FP method type from the Malawi DHS 2015–16 and the ONSE IE baseline districts. The percentage of use by method type is very similar in these two sources.

Figure B1. MCPR trend, 2010-2017

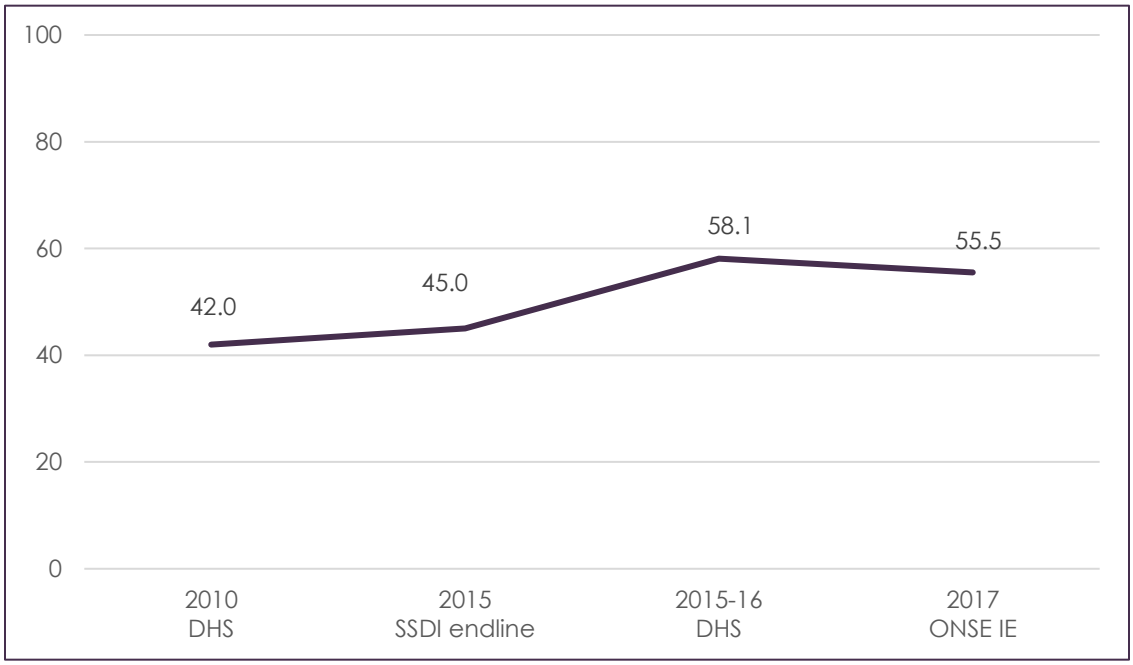
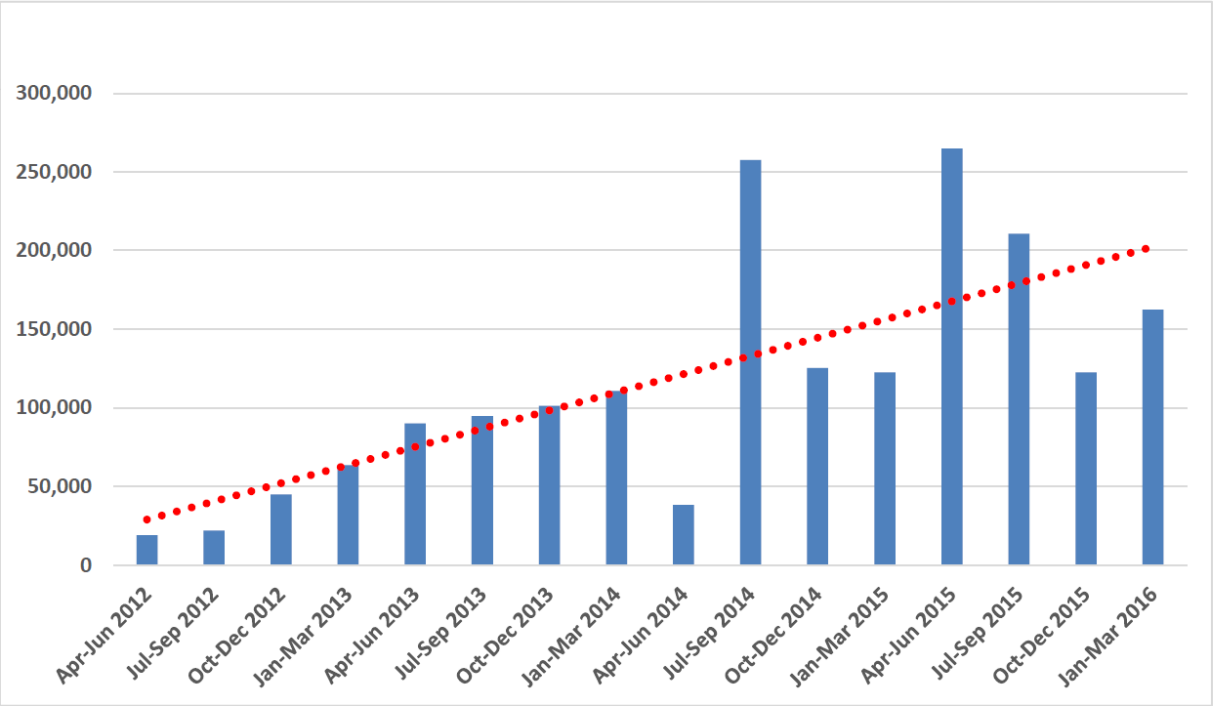


Figure B2. Couple years of protection in SSDI districts, April 2012–March 2016



Source: SSDI Endline Report

Table B1. Contraceptive method use, by type, 2015–2016 Malawi DHS and ONSE IE baseline, 2017

FP method	Malawi DHS 2015–2016	ONSE IE baseline 2017
Any modern method	58.1	55.5
Injectables	51.6	51.4
Implants	19.8	18.6
Female sterilization	18.8	15.1
Male condom	3.3	5.2
Pill	4.1	2.7
IUD	1.9	1.6
Male sterilization	0.2	0.2
Other modern method	0.3	0.1
Total	100.0	100.0
N	**16,130**	**2,522**

Maternal Health

Services

Table B2 provides a summary of maternal health services received during pregnancy, childbirth, and postpartum between 2010 and 2017.

Skilled ANC is high across all sources and hovers at around 95 percent for all years that data are available.

The 2015–16 Malawi DHS also provides district-level estimates of the percentage of women receiving ANC from a skilled provider during their last pregnancy. Pregnant women in Nkhotakota, Salima, and Machinga received skilled ANC at slightly higher rates than the national average according to the Malawi DHS: 96.4 percent in Nkhotakota, 97.5 percent in Salima, and 96.7 percent in Machinga.

The percentage of women who received four or more ANC visits during their last pregnancy does not show a pattern over time or across data sources.

The rate of skilled birth attendance shows an upward linear trend over time, from 71 percent in the 2010 Malawi DHS to 94 percent in the 2017 ONSE IE baseline survey.

The rates of PNC do not exhibit a consistent pattern between the 2014 MES and the 2017 ONSE IE baseline survey. The 2015–16 Malawi DHS reported rates of PNC for both women and newborns that are significantly lower than from the other sources.

Figure B3 shows the percentage of women receiving four or more ANC visits during SSDI, as calculated from service statistics (i.e., DHIS 2). These data show a slow upward trend from around 18 percent to 24

percent over the project period. The rate of women receiving four or more ANC visits, as shown by these facility data, is much lower than that reported by the women in household surveys.

ANC data in the Malawi DHIS 2 are considered to be very accurate when compared with facility registers (O'Hagan, et al., 2017). This means that facility data are being transferred accurately through the reporting system and into the electronic database. It is possible that not all ANC patients are recorded in the register, or that registers are misplaced or damaged (resulting in missing data), which could account for some of the differences between facility and household reports of ANC attendance. Women also have documentation of their ANC visits in their health passports, so one way to check completeness of the ANC facility registers would be to compare them with women's records. However, health passports also have limitations. They can become damaged, destroyed, or lost, and patients sometimes alter their health passport to hide health status or use of services (e.g., HIV status, use of FP), or have multiple health passports (Tough & Lihoma, 2017).

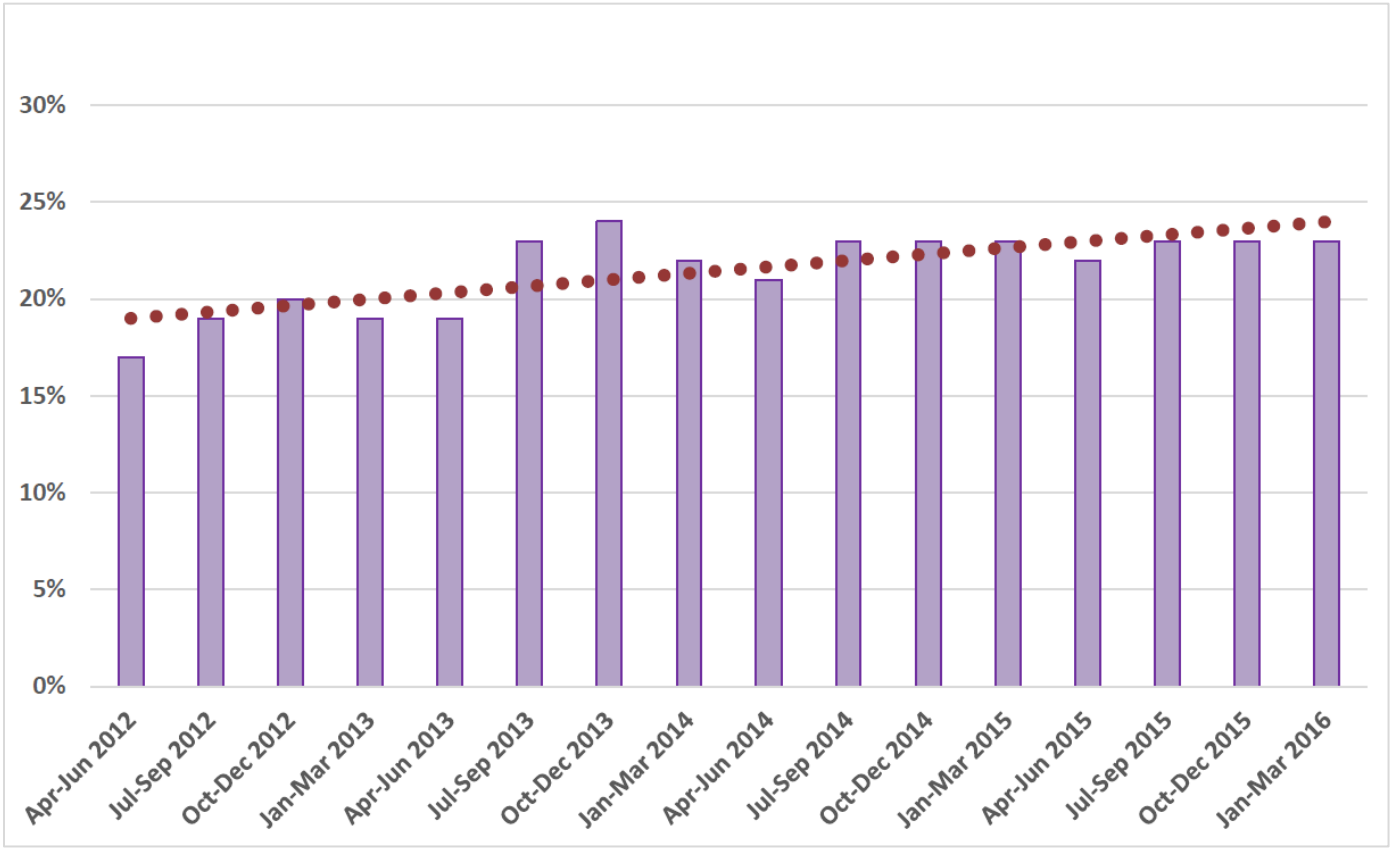
Household survey data, such as the MES and DHS, are known to systematically under- and/or overreport certain statistics based on the household report. In some cases, estimates may be underestimated due to recall bias. In other cases, the estimates may be overreported due to social desirability bias. There is no clear indication of which estimates of ANC are most correct in this case, but the likelihood is that the real rate of ANC is between the DHIS 2 estimates and the household survey estimates. This would occur if we expect that the DHIS 2 estimates are underreported and the household estimates are overreported.

Table B2. Percentage of women who received maternal health care services, 2012–2017 Malawi

Indicator	2010 Malawi DHS	2012 SSDI baseline	2014 MES	2014 MIS	2015–2016 Malawi DHS	2016 SSDI end line	2017 MIS	2017 ONSE IE baseline
Any ANC	-	98	-	-	98	83.0 - 90.0	-	99
Skilled ANC	95	-	96	-	95	-	-	99
ANC 4+	46	63	45	-	51	56	-	52
Skilled birth attendance	71	83	87	-	90	90	-	94
Any PNC woman (facility births)	-	-	75	-	45	-	-	67
Any PNC child (facility births)	-	-	81	-	63	-	-	88
Two+ doses of SP/Fansidar	-	-	-	64	-	-	76.7	69*
Three+ doses of SP/Fansidar	-	-	-	13	-	-	42.6	32

*The ONSE IE baseline indicator reports on the number of women receiving exactly two doses.

Figure B3. Percentage of women who attended four or more ANC visits in SSDI-supported facilities, April 2012–March 2016



Source: SSDI Endline Report

Availability of Maternal Health Medicines

The availability of select maternal health medicines is presented in Table B3. These indicators generally asked about the availability of medicines on the day of the survey and may not reflect general trends in the availability of medicines. Timing of the survey related to distribution of medicines by the Central Medical Stores may also influence the availability of drugs. There is no pattern of availability of medicines over time or across surveys. The medicines were available at the majority of facilities at all times, except for nifedipine in 2014, as report by the SPA.

Table B3. Availability of select medicines for maternal health, percentage of facilities with medicines available on the day of the survey

Medicines	2012 SSDI baseline	2014 SPA	2016 SSDI End line	2017 ONSE IE baseline
Oxytocin	89	95	84	89
Magnesium sulphate	62	85	79	66
Antihypertensives	93	-	91	-
Methyldopa	-	-	-	76
Nifedipine	-	17	-	73

Knowledge of Maternal Health Complications

The SSDI baseline and end line, and the ONSE IE baseline survey, asked women about danger signs during pregnancy and childbirth. In 2012, at the time of the SSDI baseline, under 20 percent of the women reported that vaginal bleeding was a danger sign in childbirth, whereas 45 percent of the women reported that swollen hands, feet, or face was a danger sign during pregnancy. The percentage of women reporting these symptoms as danger signs by the end of SSDI had increased. However, at the time of the ONSE IE baseline, these estimates were quite different. Knowledge of vaginal bleeding had increased whereas knowledge of swollen hands, feet, or face had decreased (Table B4).

Table B4. Percentage of women who reported vaginal bleeding or swollen hands, feet, or face as danger signs during pregnancy in SSDI-supported districts (2012 and 2016) and ONSE IE project districts (2017)

	Vaginal bleeding	Swollen hands, feet, or face
2012 SSDI baseline	18	45
2016 SSDI end line*	43-44	50-57
2017 ONSE IE baseline	534	29

*The SSDI end line report provided ranges for these indicators.

Care Seeking and Knowledge of Symptoms and Causes of Malaria and Diarrhea

Table B5 shows the percentage of children ill with fever and diarrhea who were sick in the past two weeks who had been taken for treatment. For all surveys except the ONSE IE baseline, the population of interest is children under five. For the ONSE IE baseline, the population of interest is children under three. The DHS surveys found that care was sought for approximately two-thirds of children with fever, whereas the SSDI baseline, MES, and ONSE IE baseline found that care was sought for approximately three-quarters of children. The MIS found that care was sought for just over one-half of children.

Table B5. Percentage of ill children in the past two weeks taken for treatment and women's knowledge of causes of illnesses

Indicator	2010 DHS	2012 SSDI baseline	2014 MES	2014 MIS	2016 SSDI end line	2015-16 DHS	2017 ONSE IE baseline
Care seeking for fever							
Care seeking for children with fever in the past 2 weeks	65	75	75	54	-	67	79
Knowledge of symptoms and causes of malaria							
Reported fever as a symptom of malaria	-	96	-	72	-	-	83
Reported mosquitoes as cause of malaria				82			80
Care seeking for diarrhea							
Treatment/advice sought for children with diarrhea in the past two weeks	62	-	67	-	-	66	78
Knowledge of causes of diarrhea							
Defecating/urinating in open spaces	-	40	-	-	76	-	5
Touching food without washing hands with soap	-	46	-	-	60	-	22
Not washing hands after defecation	-	68	-	-	68	-	23

Knowledge of fever as a symptom of malaria and mosquitoes as the cause of malaria were high across surveys.

Care seeking for diarrhea hovered at around two-thirds for all sources, except for the ONSE IE baseline survey, which found that 78 percent of children with diarrhea were taken for treatment. Although the DHS

and MES provide national-level estimates, the ONSE IE baseline survey covers only three districts where care seeking may differ from the national average.

Knowledge of the causes of diarrhea increased or remained constant from the SSDI baseline to end line surveys but was found to be much lower at the time of the ONSE IE baseline.

Availability of Child Health Medicines

Estimates of the availability of priority medicines for children are provided in the SSDI-S surveys, the 2014 SPA, and the ONSE IE baseline. The SPA and ONSE IE baseline estimates of the availability of medicines were generally lower than the SSDI-S baseline and end line estimates. However, these types of indicators generally asked about the availability of medicines on the day of the survey and may not reflect general trends in the availability of medicines. Timing of the survey related to distribution of medicines by the Central Medical Stores may also influence the availability of drugs (Table B6).

The availability of medicines was high during the 2012-2016 surveys, except for vitamin A in 2014. The ONSE IE baseline results are more varied. The availability of ORS and ACT was high but the availability of vitamin A, amoxicillin, and procaine benzylpenicillin was low, at between 45 percent and 57 percent.

Table B6. Availability of select priority medicines for children, percentage of facilities with medicines available on the day of the survey, Malawi 2012–2017

Medicine	2012 SSDI baseline	2014 SPA	2016 SSDI end line	2017 ONSE IE baseline
ORS	96	91	100	79
Vitamin A	79	43	83	57
First-line antimalarial	81	-	96	-
ACT	-	92	-	92
Oral antibiotics	99	-	100	-
Amoxicillin	-	81	-	53
Procaine benzylpenicillin	-	-	-	45

Water and Sanitation

Water and sanitation indicators are available in the Malawi DHS surveys, the MES, and the ONSE IE baseline survey (Table B7). Access to an improved source of water was fairly constant over time, with an increase of about 8 percentage points between 2010 and 2017.

Use of an appropriate method for treatment of water was also fairly consistent across sources.

Access to improved sanitation generally increased over time, although the 2015–16 Malawi DHS estimate is higher than both the 2014 MES and 2017 ONSE IE baseline survey. This could be because of the geographic range of the surveys; the Malawi DHS provides a national average, whereas the MES and ONSE IE baseline surveys were conducted in a subset of districts throughout Malawi. Improved sanitation lags behind improved source of water and could be improving at different rates throughout the country.

Table B7. Water and sanitation indicators from various sources, percentage of households that had improved source of water and sanitation, Malawi 2010–2017

Indicator	2010 DHS	2014 MES	2015–2016 DHS	2017 ONSE IE baseline
Improved source of water	79.7*	86.2	87.2	87.8
Appropriate treatment**	31.9	27.8	26.2	26.8
Improved sanitation	6.4	40.6	51.8	47.7
Number	24,825	26,713	26,361	3,962

*Urban, 92.6%, rural 77.1%

**Appropriate water treatment methods are boiling, bleaching, filtering, and solar disinfection.

APPENDIX C. METHODS SUPPLEMENT

Selection of Study Districts

The three ONSE intervention districts—Machinga, Nkhotakota, and Salima (Figure C1)—were chosen for inclusion in the study in collaboration with USAID/Malawi. These districts were selected because they are receiving the full package of ONSE interventions (i.e., FHP, HSS, and malaria). The goal of the evaluation is to determine the impact of ONSE by comparing districts receiving the full intervention package with districts not receiving ONSE.

Mzimba, Nsanje, and Ntchisi were chosen as comparison districts. To make a reliable comparison between project and comparison domains, a comparison domain should be carefully selected to optimize comparability with project domains before the project begins (i.e., at baseline). A data-driven approach was used to identify like comparison districts for the impact evaluation. Specifically, district-level statistics related to ONSE outcomes were used to create a database with data from the 2014 Malawi MDG end line survey. These statistics were imported into Stata and a linear probability model was fitted to predict selection into the ONSE project. These predicted probabilities for selection into the ONSE project were then compared in regions for ONSE and non-ONSE districts. Comparison districts were then chosen based on these fitted values, past participation in the preceding USAID health project (SSDI), and CDCS priority status.[11]

To validate the selection of comparison districts, the evaluation team also used data from the 2010 Malawi DHS. USAID/Malawi provided a geographic analysis of health statistics that mapped priority indicators using groupings. These groupings were converted into ranked categories as inputs into a count index for each district. The index value for each district was then compared for ONSE and non-ONSE districts to further validate that the selected project and comparison districts were broadly comparable.

Quantitative Household Survey Instrument

The quantitative survey instrument used modified the 2015–16 Malawi DHS survey instruments from the household and woman's questionnaires to gather characteristics and outcomes at two levels of interest:

1) Household questionnaires for all selected households
2) Woman's questionnaires for all WRA in the selected households

[11] The USAID Health, Population and Nutrition Project Appraisal Document Geographic Analysis using the 2010 DHS data was then used as a secondary source to assess the selections. The geographic analysis mapped priority indicators using groups (e.g., infant mortality rate >66, IMR<66) and these groupings were converted into ranked categories. From these ranked categories, a count index from the indicators was created. The index value for each district was then compared for ONSE and non-ONSE districts for selected evaluation districts as a second source of validation that the districts were broadly comparable.

The survey instruments were adapted and modified for the evaluation context. DHS translations of the Malawi DHS were used for the original DHS questions, and additional or modified items were translated by the CSR. The questionnaire modules are shown in Table C1.

Figure C1. Map of project and comparison districts

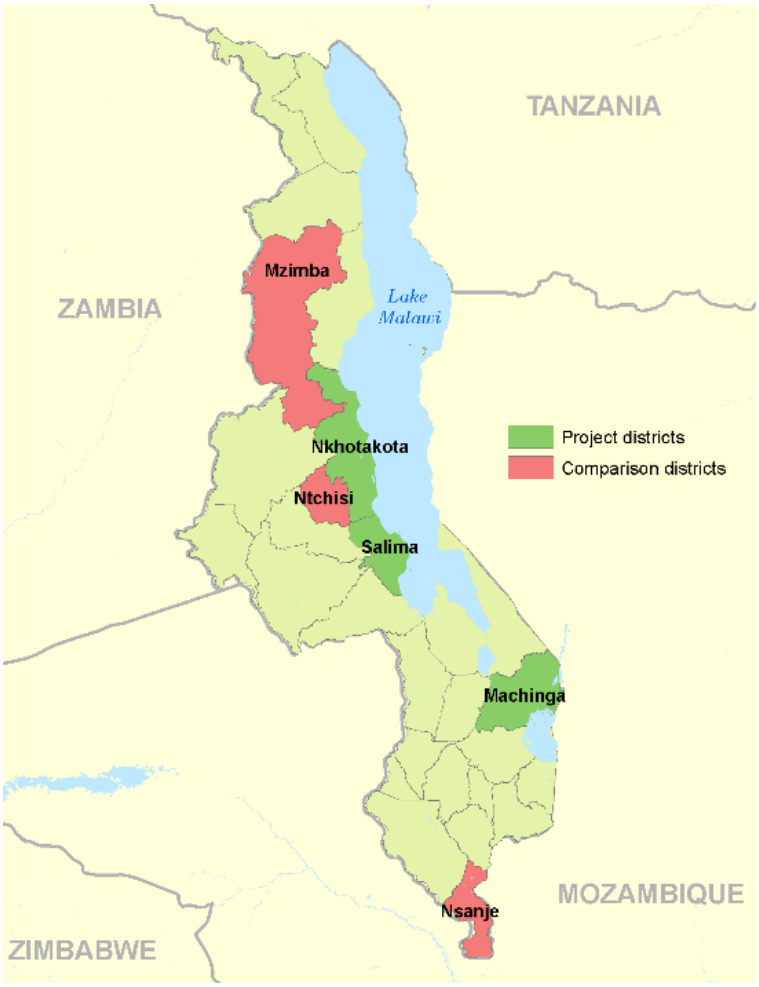


Table C1. DHS household survey modules selected for the ONSE baseline survey

Household questionnaire	Woman's questionnaire
• Household identification • Informed consent • Household roster and demographics • Dwelling characteristics • Household and community programs	• Identification of WRA • Woman's background • Reproduction • Contraception • Pregnancy and PNC • Knowledge of child health • Child health • Marriage and sexual activity • Fertility preferences • Husband's background and women's work • Patient satisfaction • Tracking

Sampling Frame

The baseline sampling frame used for the household survey was drawn from the frame of the Malawi Population and Housing Census, which was conducted in 2008. A total of 268 EAs were randomly selected for inclusion in the study with probability proportional to size: 134 in each study domain. In each EA, a household listing was conducted and then 30 households were randomly selected for inclusion in the study.[12]

Once selected, a household was then visited to conduct the survey. A household questionnaire was administered regardless of whether the household contained any eligible women—i.e., WRA. If the household contained WRA, all WRA were asked to complete the woman's questionnaires.

Baseline Sampling Weights

Sampling for the household survey was based on a stratified multi-stage sampling design. Design weights were calculated based on the separate sampling probabilities for each sampling stage.

[12] For the survey, a household was defined as a group of people who live together and eat from the same kitchen. If there were multiple wives and one husband living together and eating from the same kitchen, they were considered one household.

The first stage involved the selection of EAs in the project and comparison domains. The EAs were selected based on the probability proportional to the population size, as determined by the 2008 Malawi Population and Housing Census. The selection probability of i-th EA in domain h is:

$$p_{1hi} = \frac{a_h \times N_{hi}}{N_h}$$

Where

a_h: number of sample clusters selected in domain h,

N_{hi}: total number of households in the frame for the i-th sample cluster in domain h, and

N_h: total number of households in the frame in domain h.

The second stage involved a random selection of households from each selected EA. The selection probability of j-th households in EA i in domain h is:

$$P_{2hij} = \frac{b_{hi}}{N^*_{hi}}$$

Where

$b_{hi} =$ number of sampled households selected for the i-th sample cluster in domain h.

$N^*_{hi} =$ number of eligible households listed in the household listing for the i-th sample cluster in domain h.

The overall selection probability of each household in EA i of domain h is the product of the selection probabilities of the two stages:

$$P_{hij} = P_{1hi} \times P_{2hij} = \frac{a_h \times N_{hi}}{N_h} \times \frac{b_{hi}}{N^*_{hi}}$$

The design weight for each household in EA i of domain h is the inverse of its overall selection probability:

$$W_{hij} = \frac{1}{p_{hij}} = \frac{N_h \times N^*_{hi}}{a_h \times N_{hi} \times b_{hi}}$$

Design Weight of Women

All women were interviewed in each selected household. Therefore, the selection probability of a WRA equals the selection probability of her household multiplied by a cluster-level non-response adjustment for women, expressed as follows:

$$P_{hijf} = \frac{a_h \times N_{hi}}{N_h} \times \frac{b_{hi}}{N^*_{hi}} \times \frac{f_{hi}}{e_{hi}} = P_{hij}$$

Where

f_{hi} = number of women in the cluster b_{hi} who were interviewed

e_{hi} = number of women in the cluster who were eligible to be interviewed

The design weight for the woman j in EA i of domain h is the inverse of its overall selection probability:

$$W_{hijf} = \frac{1}{p_{hij}}$$

Sampling Weight

The sampling weight was calculated with the design weight corrected for unit non-response calculated at the level of the cluster as ratios of the number of interviewed units over the number of selected units, where units could be households or individual respondents.

The household sampling weight was calculated by dividing the household design weight by the household response rate. The individual sampling weight was calculated by dividing the individual design weight by the individual response rate.

Survey Response Rates

Tables C2 and C3 provide results of the household and facility survey response rates.

Table C2. Results of the household and women's interviews

Characteristics	Project	Comparison	N
Household interviews			
Number selected	4,020	4,017	8,037
Number not found/absent	54	43	97
Number refused/incomplete	4	6	10
Number interviewed	3,962	3,967	7,929
Response rate (%)	98.6	98.8	98.7
Interviews with WRA			

Characteristics	Project	Comparison	N
Number selected	3,872	3,908	7,780
Number refused/not found/incomplete	96	142	238
Number interviewed	3,776	3,766	7,542
Response rate (%)	97.5	96.4	96.9

Note: Response rate = number interviewed/number eligible.

Table C3. Health facility sample

District	Public facilities			CHAM	Total
	Hospitals	Health centers	Dispensaries		
Project					
Machinga	1	11	3	6	21
Nkhotakota	2	10	2	6	20
Salima	1	8	0	5	14
Comparison					
Mzimba	3	38	4	12	57
Nsanje	1	9	0	4	14
Ntchisi	1	9	1	2	13
Total	**9**	**85**	**10**	**35**	**139**

Summary of Evaluation Outcomes

Tables C4 and C5 provide a summary of primary and secondary evaluation outcomes.

Table C4. Primary population-level outcomes of interest

Category	Outcomes
Antenatal care	• Percentage of women of WRA who had a birth in the past three years who received ANC from skilled providers (such as doctors, medical officers, clinical officers, medical assistants, nurses, and midwives) at least once for their most recent birth* • Percentage of WRA who had a birth in the past three years who had an ANC visit in their first trimester for their most recent live birth • Percentage of WRA who had a birth in the past three years who had at least four ANC visits for their most recent live birth
Maternal health	• Percentage of live births in the last three years that were attended by a skilled provider (doctor, nurse, midwife, and auxiliary nurse/midwife) for their most recent birth*
Postnatal care	• Percentage of women with a postnatal checkup within two days of birth for their most recent live birth in the past two years
Reproductive health	• Modern contraceptive prevalence rate among WRA who are married or living with a man • Modern contraceptive rate among all WRA

Category	Outcomes
Care seeking for fever	• Percentage of children under five who had a fever in the two weeks preceding the survey for whom advice or treatment was sought from a health facility or provider
Patient satisfaction	• Percentage of WRA who visited a health facility in the last three months for themselves or their children who reported that they were "very satisfied" with: ✓ Time they waited to see a provider ✓ Ability to discuss problems or concerns with a provider ✓ Explanation they received about their problem or treatment ✓ Audio and visual privacy ✓ Availability of medicines at the facility ✓ Facility service hours Facility cleanliness
Maternal and newborn health knowledge	• Knowledge of information that should be included in birth planning • Knowledge of warning/danger signs of pregnancy • Knowledge of primary warning/danger signs of maternal complications during childbirth ✓ Knowledge of primary warning/danger signs of newborn complications
Child health knowledge	• Percentage of four signs and symptoms of diarrhea correctly identified by WRA • Percentage of six causes of diarrhea correctly identified by WRA • Percentage of four signs and symptoms of pneumonia correctly identified by WRA • Percentage of three causes of childhood pneumonia correctly identified by WRA • Percentage of WRA who correctly identified fever as a primary sign of malaria • Percentage of WRA who correctly identified mosquitos as the cause of malaria
Beliefs about FP	• Percentage of WRA who believe each statement is "completely true": ✓ FP methods are safe ✓ Planning the family is the responsibility of both men and women ✓ Getting pregnant before you are 18 puts your health and that of the baby in danger ✓ Long-acting FP methods help to conveniently space pregnancies ✓ FP should be used by husbands and wives for the health of the entire family ✓ Long-term and permanent FP methods provide safe and healthy ways to temporarily or permanently stop having children ✓ There are FP methods available at the clinic for everybody

Category	Outcomes
	✓ Becoming pregnant after 40 years of age can be dangerous to your health • Talking openly and honestly to your children about the consequences of unprotected sex is important
Exposure to messaging	▪ Percentage of WRA who recall hearing the slogan *Moyo ndi mpamba: Usamalireni!* in the last 12 months

*These indicators reached almost 100 percent at baseline and are not expected to increase significantly over the project period. We will track them as a component of downstream indicators.

Table C5. Secondary facility-level outcomes of interest

Category	Outcome
General service availability	• Basic amenities: mean score of seven items as a percentage • Basic equipment: mean score of six items as a percentage • Percentage of facilities with 15 priority medicines for mothers • Percentage of facilities with 12 priority medicines for children
Specific service availability	• Percentage of facilities offering specific services: ✓ FP ✓ Maternal health services, including ANC, normal delivery, caesarean delivery, and basic and comprehensive emergency obstetric and newborn care ✓ Preventative and curative child health services ✓ Malaria services
Family planning	• Percentage of facilities with all items: ✓ Staffing and guidelines ✓ Medicines and commodities ✓ Equipment
Maternal health	• Percentage of facilities with all items: ✓ Staffing and guidelines ✓ Medicines and commodities ✓ Diagnostics ✓ Equipment
Preventative and curative child health services	• Percentage of facilities with all items: ✓ Staffing and guidelines ✓ Medicines and commodities ✓ Equipment
Malaria services	• Percentage of facilities with all items: ✓ Staffing and guidelines ✓ Medicines and commodities ✓ Diagnostics

Evaluation Next Steps

The next step in the impact evaluation is implementation process monitoring (2018–2020). This will be followed by the end line household survey, health facility assessment, and impact analysis in 2021. A qualitative study is also planned at end line. Each of these activities is described below.

Implementation Process Monitoring

The evaluation team will conduct implementation process monitoring to understand how the "smart" capacity building and problem-solving approach were operationalized in the intervention districts of Machinga, Nkhotakota, and Salima, and how the approaches affected change in health and service delivery outcomes. This component will involve ongoing review of ONSE documents, such as workplans and progress reports, and annual key informant interviews with ONSE staff, DHMT members, and other stakeholders.

Impact Analysis

The primary objective of the evaluation is to quantify the impact of ONSE. After the end line household survey and health facility assessment are conducted, the evaluation team will quantify the impact of the intervention using the DID approach with household fixed effects. This section describes the methods for this analysis.

Because the ONSE project domain was purposively selected, a like comparison domain may be a challenge to identify. Use of the DID method in combination with the data-based selection process to identify the comparison domain helps to maximize the internal validity of the study. Although observed information was used to select a comparison domain, by design, the DID approach assumes that the domains are not the same at baseline. This method differences out observed and unobserved differences between the domains that remain constant over the project period, thus accounting for any time-invariant differences that exist after selection.

For the DID estimator to be valid, the parallel trend assumption must be met. The parallel trend assumption states that the outcomes trends in the comparison domain are a good approximation of what would have been observed in the project domain in the absence of the project. Alternatively stated, the average change in outcome for the project domain in the absence of the project equals the average change in outcome for the comparison domain.

Empirically, the DID estimator is specified as follows: for each outcome of interest Y, let $Y^1(t)$ represent the potential outcome, or outcome that would have been observed, under the ONSE project at time t, and let $t \in \{0, 0.5, 1\}$. $Y^1(0)$ represents the potential outcome under the ONSE project at baseline, and $Y^1(1)$ represents the potential outcome under the ONSE project at end line. Similarly, $Y^0(t)$ represents the potential outcome at time t without the ONSE project. Let A be an indicator of inclusion of the district in the ONSE project.

Parameter: The parameter of interest is the difference in the difference of outcomes before and after the intervention period with the ONSE project and without the ONSE project. Formally, the difference in

outcomes over the intervention period under the ONSE project can be written as $Y^1(1) - Y^1(0)$. The difference in outcomes over the intervention period without the ONSE program can be written $Y^0(1) - Y^0(0)$. The parameter of interest, the difference in differences, can then be written as $\delta_{DD} = [Y^1(1) - Y^1(0)] - [Y^0(1) - Y^0(0)]$. The expected value of δ_{DD} is the true effect of the intervention.

Estimation: Assuming that the trends observed at the comparison sites are proportional to trends that would have been observed at the intervention sites had they been comparison sites, $E[Y^0(1) - Y^0(0)]$ may be estimated as $E[Y(1) - Y(0)|A = 0]$, and one can estimate $E[Y^1(1) - Y^1(0)]$ as $E[Y(1) - Y(0)|A = 1]$. δ_{DD} can be equivalently estimated using a regression model for Y:

$$E(Y|A,t) = \beta_0 + \beta_1 A + \beta_2 t + \beta_3 A \times t$$

where β_3 is the impact of the intervention on outcome Y.

Estimates for β_3 will be generated for each outcome and reported to the Mission in the end line ONSE impact evaluation report.

End line Qualitative Study

In addition to the end line household survey and health facility assessment, an end line qualitative study will be developed to understand how ONSE's community engagement and mobilization activities increased the demand for and uptake of services. Qualitative findings will be integrated in the end line impact evaluation report.

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