Kwitanda Community Health Project Evaluation Report 2015

VillageReach
Starting at the Last Mile

VillageReach is a global health innovator that develops, tests, implements and scales new solutions to critical health system challenges in low-resource environments, with an emphasis on strengthening the "last mile" of healthcare delivery.

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Acronyms

AEHO:	Agricultural Extension Health Officers
ANC:	Antenatal Care
CHF:	Community Health Facilitator
DHS:	Demographic and Health Survey
HSA:	Health Surveillance Assistant
KCHP:	Kwitanda Community Health Program
LA:	Lufemantrine + Arthemeter
MNH:	Maternal and Neonatal Health
MRDT:	Malaria Rapid Diagnostic Test
PNC:	Postnatal care
RMNCH:	Reproductive, Maternal, Newborn and Child Health

Executive Summary

From 2014 to 2015, VillageReach continued to implement programs in Kwitanda catchment area. These programs are aimed at strengthening health systems within the catchment area, ensuring that services were being delivered to the very last mile. Antenatal care (ANC) services are one such example, with over 600 women attending one of VillageReach's outreach ANC clinics and over 1000 deliveries being captured by VillageReach health workers.

Yet, the remoteness of the locations in which we work continues to provide challenges and opportunities. Transportation conditions remain a factor that we must be proactive in maintaining: for example, we faced challenges in transporting the ANC Outreach team to remote locations, and in ensuring that women in need of prenatal, postnatal, and obstetric care travel for hours, often on foot, could reach necessary care. However, with Kwitanda Health Center located centrally in the catchment area, the potential construction of a maternity wing in the health center can supplement VillageReach's cadre of high quality maternal and neonatal care initiatives, and provide women in the community with a safe and proximate alternative for giving birth.

We also implemented incentive programs aimed at encouraging positive antenatal behavior among Kwitanda community members. The solar lantern incentive addresses the finding that every month into a pregnancy decreases the likelihood of a woman seeking out antenatal care, which also highlights the need to encourage earlier action in antenatal care. Kwitanda community members have recognized the value of having solar lanterns, especially with the limited access to lighting and electricity in many of Kwitanda's villages. A community-wide effort is needed to ensure that services are reaching those most in need, and strengthening relationships with community health workers and village leaders could improve the coverage of VillageReach's programs.

Village clinics and the nutrition program saw us continue to delve deep into the community to improve the health system down to the last mile. With 19 Health Surveillance Assistants operating mobile village clinics, we continued to collect vital information and identified needs among village clinics. We tested digital data collecting tools among village clinics, which provided vital lessons in incorporating technological interventions in remote community health care settings. We continue to look for innovative and local solutions to medicine stock-outs and for capacity-building opportunities for community health workers. The HSAs also assisted in implementing the nutrition program, which community members recognized as a way to enrich their diets and curb malnutrition. The food security concerns in the region highlight the importance of the initiative, which could be improved through more comprehensive data tracking, diversification of food sources, and an implementing partner.

Introduction

Program Description

In 2008, VillageReach introduced the Kwitanda Community Health Project (KCHP) within the Kwitanda catchment area of Balaka District, located in the southern region of Malawi, with the goal of reducing malaria and diarrhea specifically. Over time, the goal of the project evolved beyond disease incidence and focused on strengthening the health system in Kwitanda at the community and health center levels through health worker training and health program support. In 2014, VillageReach refined its scope of work within Kwitanda, focusing on outcomes dedicated to reducing maternal, neonatal, and child morbidity and mortality. The three priority outcomes and the corresponding objectives of the program are to:

1. Reduce maternal, neonatal, and infant morbidity and mortality, through:
    a. Increasing access to and use of reproductive, maternal and neonatal health facility-based services including ANC, postnatal care, emergency care, and facility-based deliveries.
    b. Increasing access to and use of reproductive, maternal and neonatal health community and home-based services and care practices.
2. Reduce child morbidity and mortality, through:
    a. Increasing access to and utilization of health services for children under-five with a specific focus on timely diagnosis and treatment of common childhood conditions such as malaria, diarrhea, acute respiratory infection, and malnutrition.
    b. Increase knowledge and use of proven preventive interventions at the community and household levels including improved water and sanitation, sleeping under ITNs, and improved nutritional practices.
3. Improve the availability and use of information for decision making, through:
    a. Continuing to develop and improve on data collection mechanisms and data management practices.

Maternal Health Landscape in Kwitanda

Table 1 shows maternal and child health indicators for Balaka district and the national average for Malawi. Without data at the level of Kwitanda catchment area, the comparison below shows Balaka as a proxy for Kwitanda, as Kwitanda sits at the center of Balaka district. The maternal and child health indicators reflect the programs that VillageReach conduct in Kwitanda and as such the types of data that VillageReach collects. As shown in table 1, Balaka has a higher fertility rate, higher teenage pregnancy rate, lower rate of antenatal care from a skilled attendant, and higher percentage of women not receiving postnatal checkups, than the national average. Conversely, for child health statistics, Balaka has a lower rate of low birth weight births, lower rate of children with ARI symptoms, and lower rate of diarrhea than the national average. As such, the need for support in Balaka is apparent, especially for maternal health. Furthermore, figure 1 shows that more women in Balaka tend to wait longer to receive a postnatal checkup, or does not get a checkup at all, in comparison to Lilongwe and the national average.

VillageReach's programs in Kwitanda aim to improve these maternal and child health conditions by strengthening the systems that delivering quality care to people living in remote locations. One such example is the ANC Outreach initiative of three satellite sites where nurses provide antenatal care to women in remote areas in Kwitanda. To encourage uptake of other maternal health services in Kwitanda, VillageReach provides solar lantern incentives targeted to increase ANC attendance, facility deliveries and post-natal checkups.

Table 1. Maternal and Child Health Indicators.

Maternal Health	Balaka	National
Fertility		
Fertility rate	6.0	5.7
Percentage of women age 15-49 currently pregnant	9.2%	9.0%
Teenage pregnancy		
Percentage of women age 15-19 who have had a live birth	26.9%	20.1%
Antenatal care		
Percentage women age 15-49 receiving antenatal care from a skilled attendant	92.1%	94.7%
Postnatal care		
Percentage of women who did not receive postnatal checkup	52.9%	47.6%
Child Health		
Birth weight		
Percentage of births with birth weight less than 2.5kg	11.0%	12.3%
Acute respiratory Illness		
Percentage of children under 5 with symptoms of ARI	3.4%	6.8%
Diarrhea		
Percentage of children under 5 reported to have had diarrhea in the two weeks preceding the survey	13.4%	17.5%
Malaria		
Percentage of children under 5 reported to have had a fever in the two weeks preceding the survey and took antimalarial drugs	83%	87.9%
Percentage of children under 5 who took Lumefantrine + Artemether (LA)	35.8%	36.2%

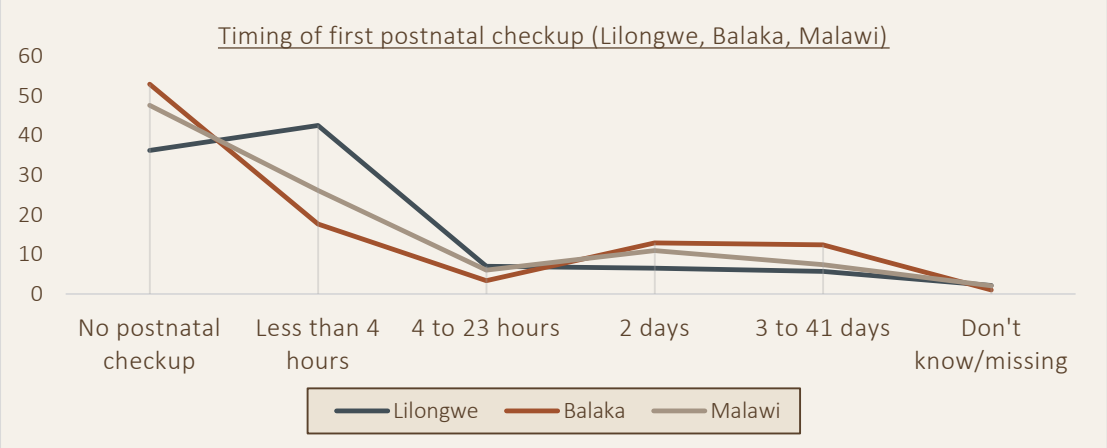


Figure 1: Timing of first postnatal checkup by district (source: Malawi DHS 2010 Report)

Past Program Evaluations

The 2014 evaluation found an increase in preventative behaviors such as ownership and use of mosquito nets, and access to clean drinking water, but not an associated decrease in disease incidence. ARI was also found to be a common occurrence among children under five and there was an unmet need for family planning in the community. Furthermore, there was an increase in the proportion of women attending four ANC visits, giving birth in a facility, and attending postnatal care, from 2012. The findings from 2014 can be found in table 2.

Table 2. Results from 2014 evaluation.

Indicator	2010 N (%)	2011 N (%)	2012 N (%)	2014 N (%)
Malaria				
Proportion of individuals with malaria	(30)	581/2298 (26)	473/2416 (20)*	878/2443 (36)*
Household net ownership *Households with at least one net*	(74)	(82)	(71)*	(87)*
Mosquito net use *Individuals who sleep under a bed net*	(50)	(57)	(44)*	(74)*
Diarrhea				
Proportion of individuals with diarrhea	(12)	(6)	(5)	(9)*
Proportion of households reporting clean drinking water	(91)	(86)	(88)*	(98)*
Household use of a latrine	N/A	(72)	(80)*	(86)*
Acute Respiratory Infection (Under-5s)				
Proportion of children under-5 with a cough in the last 3 months				(64)[+]
Family Planning				
Proportion of women who would like to use family planning *Among those not currently using family planning*				(85)[++]
Maternal & Neonatal Health				
Proportion of births at a health facility			(45)	(88)*

** denotes significance level: 1% level*
[+] denotes 95% confidence interval: 0.59, 0.68
[++] denotes 95% confidence interval: 0.73, 0.92

2015 Program Evaluation Objectives

The main purpose of the 2015 Kwitanda evaluation was to assess the program process and the implementation of the various initiatives in the KCHP. With the monthly update on dashboard indicators, impact monitoring and evaluation is ongoing through the use of VillageReach's Maternal and Neonatal Health Register that tracks health status and service utilization among pregnant women residing in Kwitanda. The evaluation is a formative assessment aimed to provide internal recommendations on improving the implementation of the program.

Data were collected for the 2015 evaluation over a period of three months from August to October. The evaluation was carried out with the assistance of the Kwitanda Program Team: Monitoring and Evaluation Officer, Community Health Facilitators, Malawi Country Director, Program Manager, Program Associate, and Research Assistant.

Due to the extensive and regular nature of current data collection practices, the 2015 annual evaluation focused on assessing the processes of the Kwitanda project initiatives. Specifically, the evaluation had two primary objectives:

1. Evaluate the accessibility and level of utilization of projection initiatives by community members (***service utilization and coverage***)
2. Evaluate the effectiveness of project initiatives in delivering RMNCH services (***implementation***) and identify opportunities for improvement

Research Questions

The 2015 evaluation will focus on answering the following research questions, with ***Service Utilization*** and ***Implementation*** representing the two primary research points.

1. Service utilization and coverage:
    - Do community members have adequate access to services? Are they satisfied with the quality of service being provided? Measured by:
        i. Duration of wait time
        ii. Duration of visit
        iii. Satisfaction with treatment
        iv. Satisfaction with service
2. Implementation:
    - Where are the bottlenecks in the service delivery process?
        i. What is preventing staff from effectively delivering services?
        ii. Are some services being used more than others?
    - Are projects being implemented as intended? Are projects making good progress towards the achievement of predefined objectives?
        i. Improvement on prior year's performance
    - How do participation rates differ from the previous period?
    - How do service delivery rates differ from the previous period?
    - Are program sites located in strategically adequate positions?
        i. Mode of transport to get to site
        ii. Duration of travel to get to site
        iii. Barriers to getting to site
    - How do people know about services? Are current outreach efforts sufficient?
        i. How client heard of service
        ii. Has client told other people about service

Methodology

Due to the unique nature of the combination of interventions in the KHCP, identifying and testing the program against counterfactuals for all the interventions was logistically and financially unfeasible. As such, theory-based approaches were employed to assess progress towards intended program goals, and we employed a quantitative and qualitative mixed-methods approach to collect data.

The specific program interventions we assessed were as follows:

- Antenatal Care (ANC) services at Kwitanda Health Center (*ANC Kwitanda*) and ANC outreach services (*ANC Outreach*)
- Maternity Ward
- Solar Lantern incentive program
- Village Clinics

- D-Tree and digital tools
- Nutrition program

We decided to examine these specific interventions as ANC services were experiencing low uptake and the solar lantern being implemented the previous year had not yet been assessed. The maternity ward was a need that had been identified by health workers and VillageReach staff in the year prior to the evaluation, and the evaluation sought to collect further insight from the community level about the level of need. The nutrition program had changed scope and were running activities that were different from previous years. The impact of the support we were providing for the program was unclear. The village clinics were experiencing regular stock-outs and with HSAs implementing health services in remote areas, we aimed to evaluate ways in which could support efforts to strengthen the health system in rural Malawi.

Limitations

Data were collected by VillageReach staff which may increase desirability bias among respondents. Interviews, surveys, and focus group discussions

The sample was a convenience sample and possibly not representative.

Sources of Data

We used the following methods to collect the data:

- Semi-structured interviews
- Unstructured interviews
- Focus group discussions
- Observations
- Surveys
- Maternal and Child Health Register Data
- Data from Malawi's demographic and health survey

See Appendix A for further details on evaluation methodology. The Maternal and Child Health Register data are collected on a monthly basis and stored on a VillageReach database.

Evaluation Guide

Results of the evaluation are organized in separate sections according to project:

1. Antenatal Care (ANC),
2. Maternity Ward Assessment;
3. Solar Lantern Incentive,
4. Village Clinic, and
5. Nutrition Program

Each section will provide a background to the program, the evaluation results, and any resulting recommendations or challenges.

1. Antenatal Care in Kwitanda

In 2014, of the pregnant women who delivered, 63% attended at least four ANC visits; an increase from 48% the year before (Kwitanda Annual Evaluation 2014). In 2015, VillageReach and the Ministry of Health offered antenatal care services in four different locations within the Kwitanda catchment area: Kwitanda Health Center; Dziwe; Mpembedza; and Kambwiri. The Kwitanda Health Center is managed and operated by the Ministry of Health; Dziwe, Mpembedza and Kambwiri are villages where VillageReach operates satellite temporary facilities for ANC services. A total 779 clients visited ANC services at Kwitanda or one of the ANC Outreach sites in between August of 2014 and August of 2015 (MNH Register). Table 3 below shows the attendance statistics at each ANC site since August 2014.

Table 3. Total number of clients seeking ANC services, by location.

		ANC Location				
	Registered	**Kwitanda**	**Dziwe**	**Kambwiri**	**Mpembedza**	**Total**
2014	**August**	128	35	27	14	204
	September	22	5	9	3	39
	October	28	7	3	9	47
	November	50	5	3	2	60
	December	44	5	3	3	55
2015	**January**	12	2	1	2	17
	February	46	7	4	0	57
	March	27	5	3	7	42
	April	39	8	6	0	53
	May	38	15	5	6	64
	June	20	9	8	3	40
	July	31	7	6	5	49
	August	33	17	0	2	52
	Total	**518**	**127**	**78**	**56**	**779**

Background: ANC Outreach

Background: With the central Kwitanda Health Center (KHC) as the only location in the catchment area that provided ANC services, ANC Outreach was implemented to reduce travel barriers for women residing in the outer areas of Kwitanda seeking ANC services. Nurses from the KHC's ANC services conduct additional outreach services three days per week in three different villages (Dziwe, Mpembedza and Kambwiri). VillageReach provides assistance in repairing the motorcycles that transport nurses (and the HIV testing and counselling worker) from KHC to the outreach sites, and provides per diems for those nurses on outreach days. In addition to ANC services, the nurses provide postnatal care services, and family planning counselling for clients. However, in cases

Picture 1: ANC Outreach site (Mpembedza)

where clients come in for services that fall outside of ANC, PNC, and family planning, nurses would refer them to Kwitanda Health Center, Balaka District Hospital or Liwonde Health Center. Balaka District Hospital and Liwonde Health Center are larger health facilities located in more densely populated areas, such as Balaka township; the clients would typically choose which health facility to go to, depending on proximity. Examples of services for which nurses would refer clients include heavy bleeding, eclampsia, and anemia.

The two ANC nurses rotate to staff the three different ANC Outreach locations. The schedule below shows their weekly procedure.

Village	M	T	W	Th	F
Kambwiri (2 shifts if both nurses are available)		8am to 2pm 12 to 3.30pm			
Dziwe			9am to 2pm		
Mpembedza					9am to 2pm

Evaluation Goal: Assess whether the ANC Outreach services are operating as intended and identify factors that impact utilization of ANC Outreach services.

Methodology: Structured exit interviews with ANC clients, and one-on-one semi-structured interviews with ANC Outreach nurse. A total of 27 women attending ANC services were interviewed: 14 located at Dziwe and Mpembedza; 13 at the Kwitanda Health Center. Monthly data sourced from various client registers (Ministry of Health, and VillageReach) and Malawi Ministry of Health databases supplemented client and nurse interviews.

Results 1: Service Utilization and Coverage Findings

Table 4 shows results from exit interviews (some figures may not sum to 100 due to rounding):

Table 4. Results from ANC client interviews

	Kwitanda (n=13)	ANC Outreach (n=14)
Purpose of visit		
One of 4 ANC visits[1]	53.9%	100%
Other[2]	46.2%	-
Attended ANC?		
Yes	84.6%	64.3%
No	15.4%	35.7%
Location of previous ANC visit		
Kwitanda Health Center	63.6%	-
ANC Outreach	27.3%	77.8%
Other	9.1%	22.2%
No. of ANC Visits		
1	9.1%	11.1%
2	36.4%	44.4%
3	45.5%	33.3%

[1] http://www.who.int/pmnch/media/publications/aonsectionIII_2.pdf
[2] Other includes: seeking advice; experiencing a problem; to receive medicine.

4	9.1%	11.1%
Reason for attending at location over alternative		
Closer to home	46.2%	100%
Good reputation	7.7%	-
ANC at other location not running	38.5%	-
Recommended ANC?		
Yes	69.2%	57.1%
No	30.8%	42.9%
How they found out about ANC		
Nurse/HSA	30.8%	28.6%
Community member	15.4%	21.4%
Relative or friend	46.2%	50%
Past experience	7.7%	-
Duration to get to clinic		
Less than 10 minutes	-	7.1%
Between 10 and 30 minutes	46.2%	28.6%
More than 30 minutes	53.9%	64.3%
Wait time at clinic		
Less than 10 minutes	38.5%	35.7%
Between 10 and 30 minutes	15.4%	14.3%
More than 30 minutes	46.1%	50%
Duration of visit		
Less than 5 minutes	23.1%	35.7%
Between 5 and 10 minutes	46.2%	64.3%
More than 10 minutes	30.8%	-
Treatments received		
Malaria Prophylaxis	84.6%	28.6%
Albendazole	30.8%	14.3%
Iron	61.5%	64.3%
ITN	23.1%	7.1%
TTV	61.5%	-
Services received		
Birth Planning	53.9%	64.3%
HIV Testing	46.2%	14.3%
Test for Danger Signs	61.5%	7.1%
Area of improvement		
Wait times	38.5% (n=5)	53.3% (n=8)
Space could be bigger	7.7% (n=1)	13.3% (n=2)
Better medicine stock	7.7%	13.3%
Toilets	7.7%	-
Maternity	7.7%	-
There should be at least two nurses	7.7%	-

Summary

Conducting one-on-one interviews with the clients provided an in-depth look into the processes by which pregnant women in Kwitanda experience ANC Outreach services. Some of the key findings are as follows:

Picture 2: ANC Outreach supplies (Dziwe)

- Just under half (13/27) of all ANC clients stated that one area of improvement they would like to see is in the wait times. Other areas of improvement that both ANC Kwitanda and ANC Outreach clients would like to see are: bigger space and better medicine stock. Clients at ANC Kwitanda specifically identified that having more than one nurse and having a toilet available were potential areas of improvement.
- Women hear of ANC services from varied sources for both the ANC Outreach sites and the Kwitanda Health Center. In both cases, relatives and health workers (nurses and HSAs) were more common sources of information about ANC services than general members of the community. Only five out of 27 (19%) of the clients heard about ANC services through a community member, which provides space for further involvement from Village Health Committees and Village Heads in sensitizing community members to attend ANC services.
- When asked about their purpose of visit, all clients at ANC outreach stated that it was for a routine visit, whereas at ANC Kwitanda, it was about half the clients (54%) who were there for a routine scheduled checkup. The other half were at ANC Kwitanda as they were experiencing a problem or were seeking advice.

  As such, it is possible that clients use ANC Outreach for routine checkups and for consultative purposes, whereas ANC Kwitanda attracts clients for more treatment-based purposes. While this may be expected due to ANC Kwitanda having greater access to more staffing and other health resources, it highlights the possibility for ANC Outreach to be equipped with supplies that will allow the nurse to treat patients who may need services beyond counselling.

    - Clients at ANC Kwitanda reported that they had attended more ANC sessions, and so were more likely to be further along in their pregnancy than ANC Outreach patients, as is shown in figure 2.

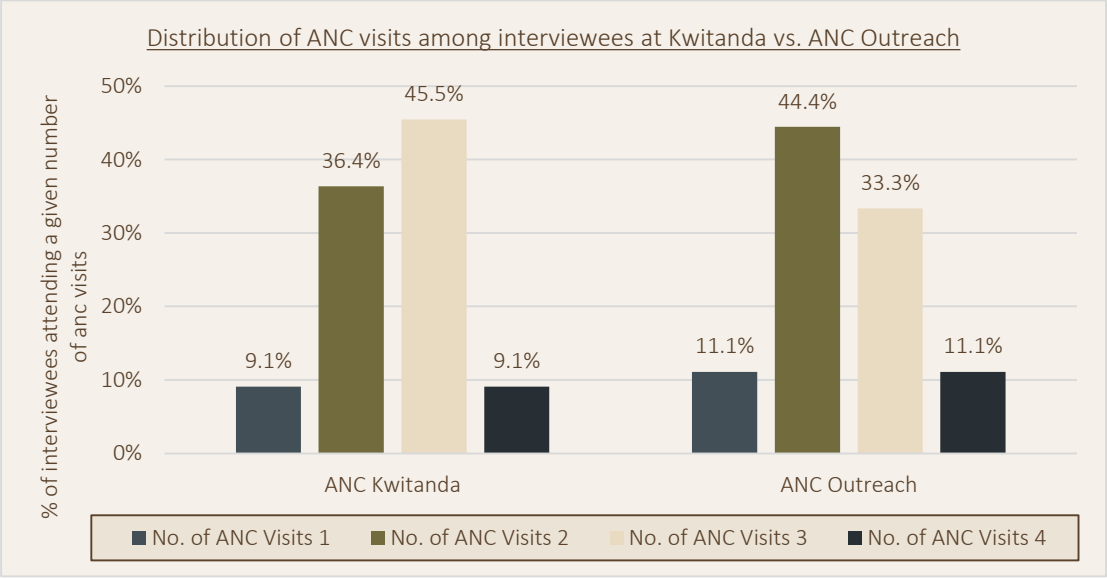


Figure 2: Number of ANC visits among interviewees

Results 2: Implementation Findings

The following are the key results from the interview with the ANC nurse:

- The ANC Outreach team comprises of the ANC nurse, an assistant who supports HIV testing and counselling, and the motorcycle driver. With this current team, and the smaller demand for services at ANC Outreach, the ANC nurse reported that no further staff support was needed for the Outreach services. The presence of three ANC sites was also considered to be sufficient for the Kwitanda catchment area.
- The ANC nurse interviewed also stated that she would like to be able to treat patients with conditions such as eclampsia and heavy bleeding. While eclampsia typically requires tests and a possible delivery, bleeding can be treated in different ways, depending on severity.
- The ANC Outreach nurse reported cases of running out of stock on various supplies: iron tablets, albendazole, insecticide-treated nets (ITN). In such cases, the nurse would contact the Kwitanda Health Center to restock supplies. Receiving supplies from the health center is not typically problematic, unless the Kwitanda Health Center itself has a stock-out.
- Other factors impacting service delivery at the ANC Outreach sites were: nurses waiting for motorcycle repairs (more on this below) and clients arriving late to ANC. These delays are exacerbated during the rainy season when road conditions make travel to and from the ANC Outreach sites difficult – for both nurses and clients.

Results 3: Data from MNH Registers

MNH Registers are used by the HSAs to keep data on clients from village clinics. This data includes information on the number of ANC visits that clients make before delivery. Figure 3 shows the frequency of ANC visits by all clients of ANC Kwitanda and ANC Outreach from August 2014 to December 2015 (all clients whose reported EDD, or estimated date of delivery, is after 2015 has been dropped from the analysis). Clients at ANC Outreach and ANC Kwitanda exhibit similar patterns in ANC attendance, in that most clients attend either one or four ANC sessions. At ANC Kwitanda, for example, 253 clients out of the total 830 clients (30.5%) only had one ANC visit during their pregnancy, and 328 clients (39.5%) went to the recommended four ANC visits. Alternatively put, if 10 clients attend their first ANC visit for their pregnancy, **three** will likely not come back, **four** will likely attend the remaining three, and the remaining three will attend either two, three or five ANC sessions (proportions are roughly similar for ANC Outreach).

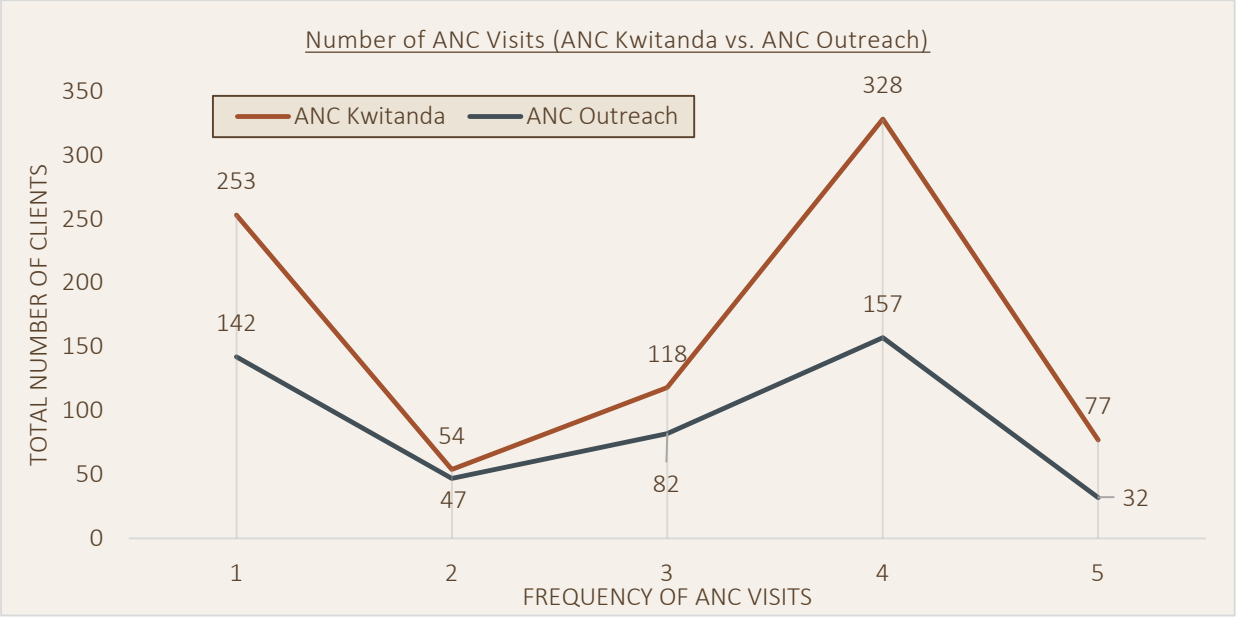


Figure 3: Number of ANC visits from all clients

The findings in figure 3 show that the first ANC visit for pregnant women plays an instrumental role in whether they follow through with the remaining three ANC sessions. The majority of ANC clients attend ANC either one or four times, which indicates that upon the first ANC visit, most clients will not return for any more ANC visits, or will continue through to the fourth ANC before delivery.

Further analysis of maternal health behaviors

Using logistic regression analysis, we found significant correlates of whether a client is likely to complete all four ANC sessions and at least one PNC session. The regression output table is shown below in table 5:

Table 5. Logistic regression results	(1)	(2)
Y = 1 if completed 4 ANC & ≥1 PNC	*Logit* Coef.	*Ave. marginal effects*
Family planning counselling	6.084**	0.312**
	(1.078)	(0.044)
Months of pregnancy when ANC started	-0.579*	-0.030**
	(0.175)	(0.010)
Number of pregnancies	0.167	0.009
	(0.622)	(0.03)
Number of live births	-0.188	-0.010
	(0.629)	(0.032)
Attending ANC Outreach	-0.709	-0.036
	(0.720)	(0.036)
β_0	-4.363	
	(1.283)	
*Asterisks denote significance level: **1%, *5%*		

Interpretation of parameter estimates

Picture 3: ANC "Static" clinic at Kwitanda Health Center

- Receiving family planning counselling is estimated to significantly increase the likelihood of an average client attending four ANC sessions and at least one PNC session by 31.2% ($p<0.01$). However, it is important to note that in many cases, family planning counselling is provided at ANC services and PNC services, which could explain the high correlation.
- On average, one additional month into a pregnancy when an average client begins ANC is estimated to significantly decrease the probability of attending four ANC sessions and at least one PNC session by 3% ($p<0.01$). This means that the odds of a woman attending four ANC and at least one PNC session is lowered by 1.77 (almost double the odds) with an additional month of their pregnancy.
- A client having experience prior pregnancies and/or live births seems to have no statistically significant effect on if they are likely to attend four ANC visits and at least one PNC. Similarly, (not shown in the table), age had no significant effect.

Results 4: Maternal and Neonatal Health

The following are results from data collected and analyzed from the MNH supplemental registers.

a. ANC Attendance

Figure 4 shows the percentage of women who attended at least four ANC sessions out of all women who delivered a baby that month (bars), compared to the average number of ANC visits. As mentioned above, a drop in the percentage attending four ANC visits is observed in May 2015. However, the average number of ANC visits remains static from the previous month, which indicates that the source of the drop may be due to issues in data collection, rather than reduced health behaviors within Kwitanda. However, with the data being collected over a long period of time and with women attending various ANC sessions over any given 9-month period, any further conclusions would prove challenging.

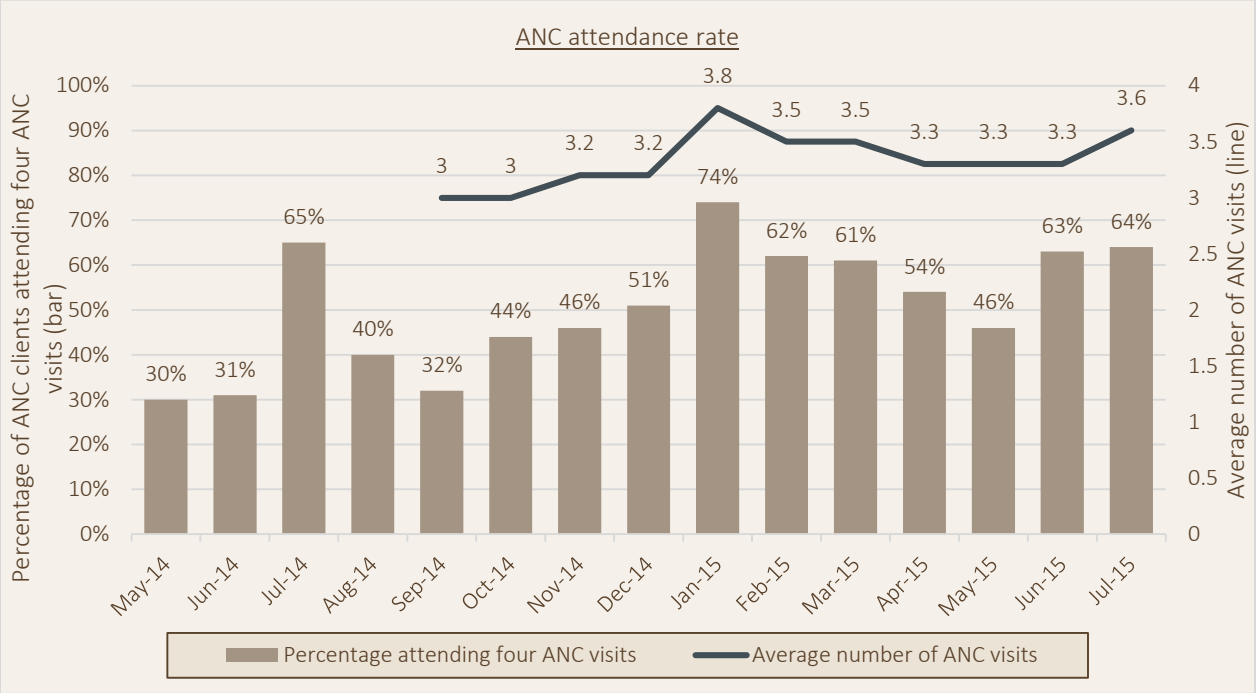


Figure 4: ANC attendance rate

b. ANC vs. PNC attendance

Figure 5 shows the percentage of clients attending four ANC visits compared to the percentage of clients attending postnatal care within two weeks of delivery (of women who delivered that month). PNC attendance has consistently seen higher proportions than ANC, which is somewhat expected as it requires the participant to fulfill one behavior, as opposed to four. The correlation between ANC and PNC is 0.59 (from August 2014 onwards), which means that there is a positive (or upward) relationship between ANC and PNC attendance. In other words, ANC and PNC attendance have steadily increased as can be shown by the linear trend lines[3].

[3] Produced by Microsoft Excel's linear trend calculations

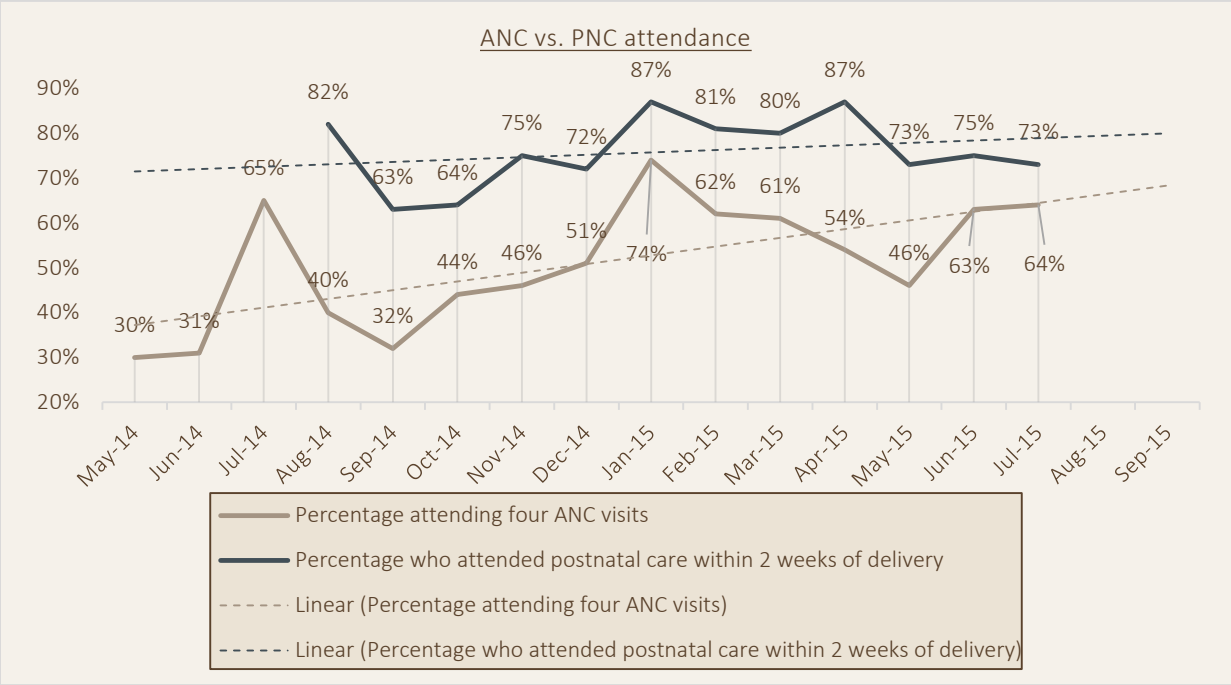


Figure 5: ANC vs. PNC attendance

c. ANC attendance and women receiving full package of maternal health services

Figure 6 shows the percentage of women who delivered in a given month who were able to attend four ANC sessions. This is compared to the percentage of women receiving the full package of maternal health services of those that delivered. The trend over the space of 13 months is very similar for the two measures.

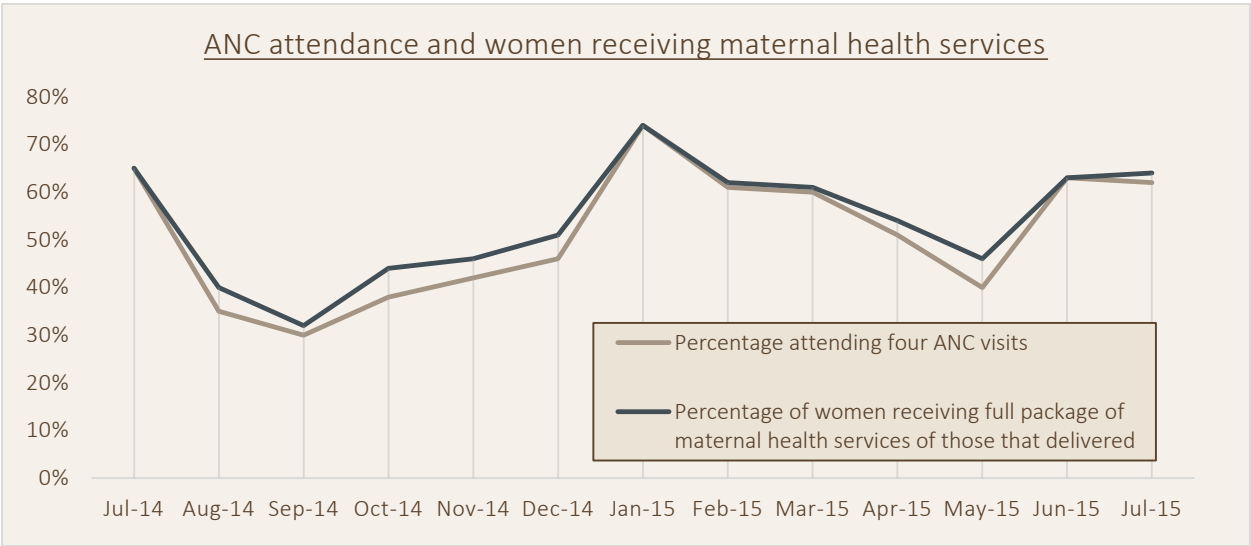


Figure 6: ANC attendance and women receiving maternal health services

See Appendix B for the May 2014 to July 2015 dashboard data.

Recommendations: ANC Outreach

1. Make more services available at the ANC Outreach sites to attract more clients

   The total number of clients attending ANC Outreach is expectedly lower than those attending ANC Kwitanda. To improve ANC Outreach utilization, however, some services offered at ANC Kwitanda can be either newly offered or more heavily promoted at ANC Outreach. VillageReach can look to increase provision of **malaria prophylaxis**, **tetanus toxoid vaccine**, **HIV testing**, and **test for pregnancy danger signs** – all services that are in higher demand at ANC Kwitanda. In addition, training on Malaria Rapid Diagnostic Testing has been requested by the ANC nurse, which would further build the capacity of all ANC services.

2. Adjust the existing incentives to encourage the second ANC visit (at both ANC Outreach and ANC Kwitanda)

   The decline in attendance after a client's first ANC session (34% for ANC Kwitanda; 37% for ANC Outreach) is higher than the decline in attendance after a client's second or third ANC session. A concerted effort to encourage clients to attend the second ANC session is therefore recommended. The criteria for the current monetary incentive scheme to encourage HSAs to track women's progress through pregnancy, as well as the incentive of solar lanterns (see section 3 for further details) to encourage women to fulfil certain activities (4 ANC, delivery in-facility, and 2 PNC), can be modified to specifically target women to attend their second ANC session.

3. Improve communication between ANC nurse and community

   In order to improve coverage rates of ANC services, the mode of outreach and communication at the community level should be expanded. The involvement of community leaders, such as village headsmen, could be key in conveying the importance of ANC to community members. Currently, ANC participants hear about services through informal channels (friends, family, other community members), which highlights the opportunity for community leaders and HSAs to spread information about Outreach ANC and ANC Kwitanda through their networks.

4. Leverage HSAs' position in the community to share information on ANC services

   Some of the HSAs who run village clinics operate in the same villages that fall under the ANC Outreach sites' catchment zone. As such, HSAs can use their village clinics (and under-5 clinics) to inform clients about the ANC services running in Kwitanda. One option to track this data is to incorporate a field in the MNH register about whether the patient knows about ANC Kwitanda, or ANC Outreach.

5. Develop community marketing or mobilizations strategies for ANC services

   Other methods of increasing outreach among the communities in Kwitanda include building relations and through existing structures. For example, VillageReach can collaborate with churches and mosques to increase awareness of ANC services.

6. Geospatial analysis

With high numbers of people living in Kwitanda receiving ANC services outside of Kwitanda (Figure 6), it is recommended to assess how many people who are geographically closer to Kwitanda HC and ANC Outreach but still attend ANC in other locations, then identify the factors that influence them to not go to ANC Kwitanda. This can be done through GIS analysis of distance between households and health centers.

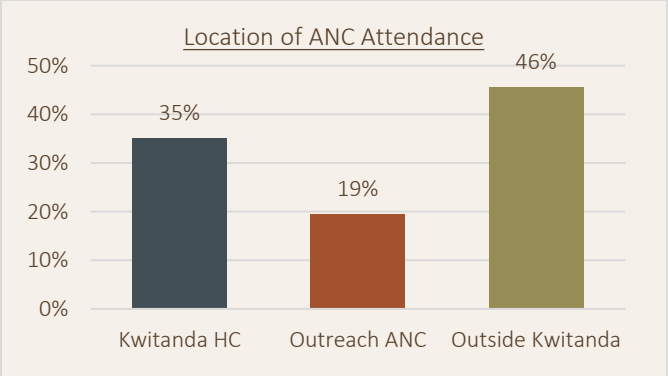


Figure 7: Location of ANC attendance

7. Identify a way to replace the motorcycle ambulance

As elaborated below, ANC Outreach is dependent on the motorcycle ambulance being functional. As such, the purchase of a new motorcycle is recommended as the current motorcycle undergoes frequent repairs which prevents ANC Outreach from being implemented on a regular basis. Furthermore, the motorcycle ambulance is used as an ambulance for the community to provide emergency transport for community members to get to the health center. Prolonged uncertainty about the motorcycle's usability threatens the health and safety of community members. The focus section below provides further insight into the challenges faced by the Kwitanda community as a result of the motorcycle ambulance not functioning.

8. Increase family planning activities

As such, in order to increase the chances of a client completing four ANC and at least one PNC (which will likely improve maternal and neonatal health outcomes) it is recommended that both ANC nurses and HSAs conduct – or at least recommend or refer the client to – family planning counselling.

9. Maintain efforts to identify women earlier in their pregnancy

The further into a pregnancy a woman is, the less likely they will be to complete four ANC and at least one PNC. Just one month can have statistically significant impact on a woman's likelihood of attending the recommended pre- and post-natal care services. This highlights the importance of ANC Outreach and HSAs' activities in actively identifying pregnant women in their catchment areas, and sensitizing community members about the importance of attending at least four ANC and one PNC session.

FOCUS: ANC Outreach Transportation - Motorcycle Ambulance

Picture 4: Motorcycle Ambulance at Kwitanda

The motorcycle ambulance (picture 4) is used to transport patients in emergency situations to Kwitanda Health Center. In addition, along with the driver, the motorcycle ambulance takes the ANC nurse and an HIV testing and counselling (HTC) worker to the ANC Outreach site. During my field visit, however, the motorcycle ambulance had not been functional for the past three weeks. Instead, VillageReach used the project vehicle (when available) to transport the ANC Outreach team to the ANC Outreach sites. When VillageReach was not able to provide transport, the ANC nurse would contact the HSA in the village where they would operate the ANC Outreach services to inform clients that the ANC team would not be able to make it that day. If the HSA was not available, however, the nurse would have no means of contacting the clients waiting for ANC services. For example, on the particular day that I conducted a field visit, all Kwitanda staff (including ANC nurses and HSAs) were at the Kwitanda Health Center for a meeting led by the District Health Officer. Clients waiting for ANC Outreach services had no way of knowing if ANC services would be running that day.

The motorcycle driver reported that the motorcycle needs to be serviced about once a month, with the most recent service requiring replacement of pistons. The motorcycle needing repairs (picture 5) on such a frequent basis has had an effect on the utilization of ANC Outreach services. Five clients surveyed at ANC Kwitanda reported that they had come to the Kwitanda Health Center for ANC because ANC Outreach had not been running for the past three weeks (ANC Outreach clinics held in previous months (up to a possible 12): July (5), August (9), September (8)).

Picture 5: Motorcycle ambulance receiving repairs

Effects

ANC Outreach was created to fill ANC service delivery gaps in Kwitanda. The absence of this important service fails to meet the goal of reducing access barriers for women living in the remote areas of Kwitanda served by the ANC Outreach sites. Critically, the inconsistent service delivery threatens pregnant women's fulfillment of the recommended four ANC visits, which is a proven intervention for improving maternal and neonatal health outcomes.

2. Maternity Ward Needs Assessment

Background

In 2007, there was a national ban on traditional birth attendants (TBA) in Malawi (which was effectively reversed in 2010, but the extent of the implementation of the law is unclear[4]). The ban in 2010 meant that all women had to deliver in a facility, including those living in remote areas, such as Kwitanda. However, Kwitanda Health Center does not have a maternity wing, with the closest facilities located outside of the Kwitanda catchment area. Women who were interviewed reported traveling to facilities in Liwonde, Utali, Balaka, among others, to deliver babies, often having to travel by foot, or by bicycle to these facilities.

Methodology: Structured interviews (27) were conducted with ANC clients. In addition, three focus groups were conducted with five to six women each, to assess if and what obstetric services were in shortage.

Results

Through focus group discussions and structured interviews, responses were collected from over 40 participants. Table 6 contains results from the interviews:

Table 6. Structured Interview Responses

Location of last delivery	
Hospital	78.6%
Clinic	14.3%
Other (TBA)	7.1%
Transport to delivery location	
Bicycle (as passenger)	92.9%
On foot	7.1%
Duration of stay at hospital/clinic	
Less than one day	14.3%
Between 24 and 48 hours	57.1%
Longer than 48 hours	28.6%
Desired services for next pregnancy	
Transport to delivery location	7.1%
Birth planning package	35.7%
Option to stay overnight	28.6%
Neonatal care	7.1%
None listed	21.4%

For the clients who were not on their first pregnancy (14 out of 27), all but one reported that they delivered at a hospital or a clinic (one delivered with a traditional birth attendant) and all but one reported that the mode of transport they took was as a passenger on a bicycle (one went to a hospital on foot). Two of the clients stayed at the delivery location for less than one day, eight stayed between 24 and 48 hours, with

[4] http://www.ipsnews.net/2011/03/malawi-uncertainty-over-role-for-traditional-birth-attendants/

four staying longer than 48 hours, thought it was unclear if they had stayed the duration due to arriving early for their delivery or if they stayed longer due to complications. For their upcoming delivery, desired services were: counselling on family planning; an option to stay overnight; receiving neonatal care; birth planning packages; and transport to delivery location.

Since April 2014, 93% of women in Kwitanda have delivered in facilities (946 out of 1020), which means that 7% of women are not delivering in facilities (MNH Register). In order to close this gap, VillageReach is exploring options to provide Kwitanda community members with safe alternatives to unassisted deliveries. Kwitanda presently has no specialized delivery facilities in place, and with the government's national ban on the use of traditional birth attendants in 2011, pregnant women in Kwitanda are short of safe and proximate options.

Challenges of delivering in a facility outside Kwitanda

Stigma: Women get discouraged from going to deliver in neighboring districts because of stigma: they believe that staff in the facilities fear that resources are being spent on people outside of the health facility's district. This problem, however, does not seem to apply to ANC services, as many report attending ANC outside of ANC Kwitanda and ANC Outreach in Kwitanda (in July, 46% of clients reported attending ANC outside of the Kwitanda catchment area). However, it is possible that many of these clients were attending ANC services outside of Kwitanda in order to reduce this stigma, and the presence of a maternity ward in Kwitanda would mitigate these issues, as the ANC nurses in Kwitanda (who also conduct ANC Outreach) could encourage women to go to Kwitanda Health Center for their upcoming delivery.

Negative treatment at facility: Some clients reported receiving negative treatment from nurses at the delivery location such as not being attended to or being shouted at, while one participant in a focus group discussion described how she had not received the necessary stamp in her health passport, and was subsequently stopped at the hospital gates while leaving, as the security guard questioned her about her and her newborn baby, suspicious that due to lack of verifying information in her health passport, that she was stealing the baby.

Financial problems: Delivering in a facility means that the woman must have sufficient funds to afford a birthing kit, which includes a basin, sponge, blade, and chitenge (fabric wrap), as well as enough food to sustain themselves over the delivery period. Several women in focus group discussions and interviews stated that giving birth in a facility put them and their family in financial difficulty. Furthermore, leaving the household in order to deliver at a facility often meant that there were children being left at home. In order to ensure they were being taken care of, some women stated that their husbands took time off work to stay at home during the delivery to take of the other children, resulting in a significant reduction of monthly household income.

Delivering on the way to location: At least one woman in the focus group discussion reported having to deliver her baby on the way to the hospital, and also anecdotally mentioned several others who had experienced the same thing. With parts of Kwitanda catchment area at least 30 minutes away by car to the nearest health facility with a maternity wing, not arriving in time to a health facility is a real concern.

Recommendations: Maternity Ward

Due to the remote location of Kwitanda catchment area and the limitations listed above, the recommendation from the evaluation is to pursue a strategy to build a maternity wing with the assistance of local partners. With a company such as NBBJ, or MASS Design Group, VillageReach can look to construct a maternity wing in the existing Kwitanda health center compound. However, without the input and participation of local partners or authorities, the community will not be able to take ownership over the management and maintenance of the maternity wing, and as such should be involved in the planning process.

3. Solar Lantern Incentives

Background

In an effort to increase the proportion of women receiving recommended services during pregnancy and childbirth, VillageReach instituted a solar lantern incentive scheme (picture 6). Pregnant women are eligible to receive a small, solar-powered lantern if they complete all of the following behaviors: attend at least 4 ANC visits, deliver in a health facility, and complete 2 PNC (post-natal care) visits. Women are formally informed of the program by their HSAs and ANC nurses, while VillageReach's Community Health Facilitators (CHFs) coordinate the distribution of the lanterns (picture 7).

Picture 6: Solar lantern

Data collected on the Maternal and Neonatal Health (MNH) Supplemental Register developed by VillageReach are used to determine eligibility for the solar lantern incentives. Each month, Robert Saiti, VillageReach's Monitoring and Evaluation Officer, informs HSAs about which women can receive the lanterns. The HSAs then inform the women to collect the lanterns from the CHFs at the Kwitanda Health Center or their ANC outreach site. When the CHFs distribute the solar lanterns, they check the women's health passports to ensure that the necessary activities have been accurately recorded and distribute the lanterns accordingly.

Evaluation Goal: Assess the service utilization of the solar lantern incentive and clients' perceptions of the incentive.

Methodology: Structured interviews of 60 women who use ANC services in Kwitanda were conducted (using a convenience sample of people who attend ANC services). In addition, three focus groups were conducted with five to six women each to discuss the solar lantern incentive program.

Picture 7: Solar lantern distribution at Dziwe

Results

Since the implementation of the solar lantern incentive program, 319 clients have been found to be eligible to receive a solar lantern. According to MNH Register records, 16 clients have received solar lanterns but following unstructured interviews with community health facilitators and observations in the field, this number appears highly understated. Following focus group discussions and interviews, we found that some clients are ineligible for the solar lantern incentives as their health passport did not contain the requisite information. Their health passport showed that they had either not attended four ANC sessions, not delivered in a facility, or did not attend two PNC sessions.

Clients who received lanterns heard about the solar lantern incentive through various sources: nurses during ANC sessions, HSAs at village clinics/under-5 clinics/home visits, and from friends and relatives. The point of time when they heard about the incentive was generally early, either before the client's pregnancy started or within the first trimester.

Some motivating factors to "enroll"[5] onto the incentive program as stated by focus group participants:

[5] As the solar lantern incentive program is based on the fulfillment of recommended antenatal practices, there is no formal "enrollment" process as such, and rather an understanding on the part of the client that completing a predefined set of activities results in the receipt of a solar lantern.

"Our husbands were advised to take part in assisting us in caring for the pregnancy"

"We were encouraged by our friends who had received the lanterns already"

"The solar lantern helps us during the night when going to the village clinic when the child falls sick"

Participants in the focus group described positive behavioral changes that were due to the incentive. In addition to women attending ANC earlier in their pregnancy and a further incentive for going for checkups, the involvement of the clients' husbands was a positive effect of the solar lantern incentive. As one participant said,

"Our husbands have learnt to accompany us to start the ANC and even escort us as we go for delivery at the health facilities"

Recipients used the lanterns on a daily basis, for activities ranging from cooking and caring for their baby, to navigating their way to the health center at night for emergencies. They reported that the lantern has assisted in saving of costs, as they no longer had to purchase paraffin for gas lamps, or batteries and flashlights, which was what they previously used for night time activities.

Other findings:

Falsification of health passport information:

According to a community member who was interviewed, due to the popularity of the solar lantern, some women who had given birth outside of a health facility would go to the facility after they had delivered, and bribed staff at the facility to fill in their health passport to show that they had given birth there. While no one has been charged, there have been suspicions among community members and village heads that some women have falsified information on their health passports.

Threat of theft or damage:

Of all the women from interviews and focus groups (total 10), two women were no longer using the lantern. In these cases, the women had either damaged the lantern by dropping it in the fire, or had it stolen.

Reconsideration of strict criteria:

There is no "consolation prize", as described by one of the HSAs. If a woman finds out about ANC services too late and is not able to attend all four required ANC visits, she is automatically not eligible for receiving a solar lantern; for example, completing three ANC visits, delivering in a facility, and completing both PNC visits yields no reward for the mother. Therefore, adjusting the incentive so that there is some return for completing at least 6 out of 7 activities may yield increased motivation and as a result, higher completion rates. Alternatively, disaggregating the behaviors by adding a smaller incentive for ANC and then providing a lantern for all 7 activities could prove effective in specifically increasing ANC service utilization.

Recommendations: Solar Lantern Incentive

1. Increase outreach efforts for informing community members about the incentive program:

   Of the 27 ANC clients interviewed, 14 were not on their first pregnancy, thus putting them in a group for having been eligible to receive a lantern for a previous pregnancy, unless they were pregnant prior to the implementation of the incentive program (November 2014). Of these 14, four had received solar lanterns, and did not include the women who were no longer using them. As such, utilizing HSAs and other methods of community outreach such as village heads is recommended.

2. Formalize documentation process:

   The MNH register is the primary source of information to determine eligibility for the solar lantern incentive. As such, VillageReach should keep more accurate and updated records in the register

about the number of clients who were eligible for and who subsequently received solar lanterns. Keeping track of this data will allow easier monitoring of distribution schedules and patterns.

3. Conduct further statistical analysis on solar lantern impact:

   With the solar lantern incentive having been implemented over a year ago, there is now enough data to analyze the impact that the incentive has had on whether women in Kwitanda are more likely to complete the recommended behaviors (four ANC, in-facility delivery, and two PNC). Due to multiple unobservable effects at the community-level that may affect behavior (such as village head's level of positive engagement or religious affiliation), a difference-in-difference estimator is recommended to analyze the effect of the intervention. However, in order to effectively employ this method of analysis, comprehensive data on the individuals who received lanterns is initially required.

4. Continue solar lantern incentive program in the interim, keeping the same conditions:

   As further analysis is conducted, the solar lantern incentive should be continued. We received positive feedback from the community about the value the lantern brings, and from the anecdotal evidence showing that many lanterns have been distributed since the inception of the program, VillageReach should look to keep the incentive. However, despite some feedback about the strictness of the conditions which women must follow to be eligible to receive lanterns, VillageReach should keep the same conditions in order to promote positive behavior during a woman's pregnancy.

4. Village Clinics

Background

A Village Clinic is community based and staffed by one HSA, equipped with a supply of medicines received from the Kwitanda Health Center. The HSAs work in remote areas of Kwitanda—sometimes in temporary structures or their homes— providing basic healthcare for children under the age of five according to Integrated Management of Childhood Illness (IMCI) protocols, specifically focusing on providing treatment for diarrhea, acute respiratory illnesses, and malaria.

Evaluation Goals: Assess village clinic service utilization, village clinic implementation and identify gaps in service delivery

Methodology: We conducted structured interviews (43) with caregivers of children under five who used village clinics and semi-structured key informant interviews (9) of HSAs who run village clinics. We asked them questions that were intended to help us identify where there were possible areas of improvement, and in which areas the village clinics were performing well. We also wanted to identify issues related to the HSAs' use of the *cIMCI* mobile phone application developed by D-tree International, and as such, we used the HSAs' rate of use of the app in order to draw a non-randomized sample. HSAs with low, medium and high reported usage rates were selected as interviewees.

Results

Table 7 shows the results from structured interviews with village clinic clients.

Table 7. Village clinic client interview results

How they heard of the village clinic	
From a community member	62.8%
From a friend	7%
From a relative	9.3%
HSA	20.9%
Travel duration	
Between 10 and 30 minutes	64.3%
More than 30 minutes	35.7%
Wait time at clinic	
Less than 10 minutes	48.8%
Between 10 and 30 minutes	18.6%
More than 30 minutes	32.6%
Duration of visit	
Less than 5 minutes	2.3%
Between 5 and 10 minutes	79.1%
More than 10 minutes	18.6%
Liked least about village clinic	

Lack of privacy	10.7%
Long wait time	14.3%
Shortage of medicine	53.6%
Other – unspecified	21.4%
Possible areas of improvement	
HSA capacity	21.6%
Infrastructure	8.1%
More community involvement	16.2%
Serve adults	10.8%
Supply	40.5%
Other	2.7%

Results from interviews with HSAs

There were some themes that emerged after interviewing nine different HSAs in Kwitanda. Listed below are some of the ways in which they stated that they could use more support in their activities:

1. Identify local solutions to supplement material shortages

   Every HSA interview reported that LA was the medicine that they ran out of most often. Other notable shortages of medicines included cotrimoxazole (two HSAs reported stock-outs). In addition to drugs, HSAs also reported other materials that would help them carry out their work more efficiently. Rain coats during the rainy season, additional equipment (such as spoons and other utensils to help in administering medicine), infrastructural improvements (tables, bicycle spare parts, shelter), and other medical supplies (such as to be able to treat wounds) were all suggested as material improvements.

2. Recruit volunteers to assist HSAs

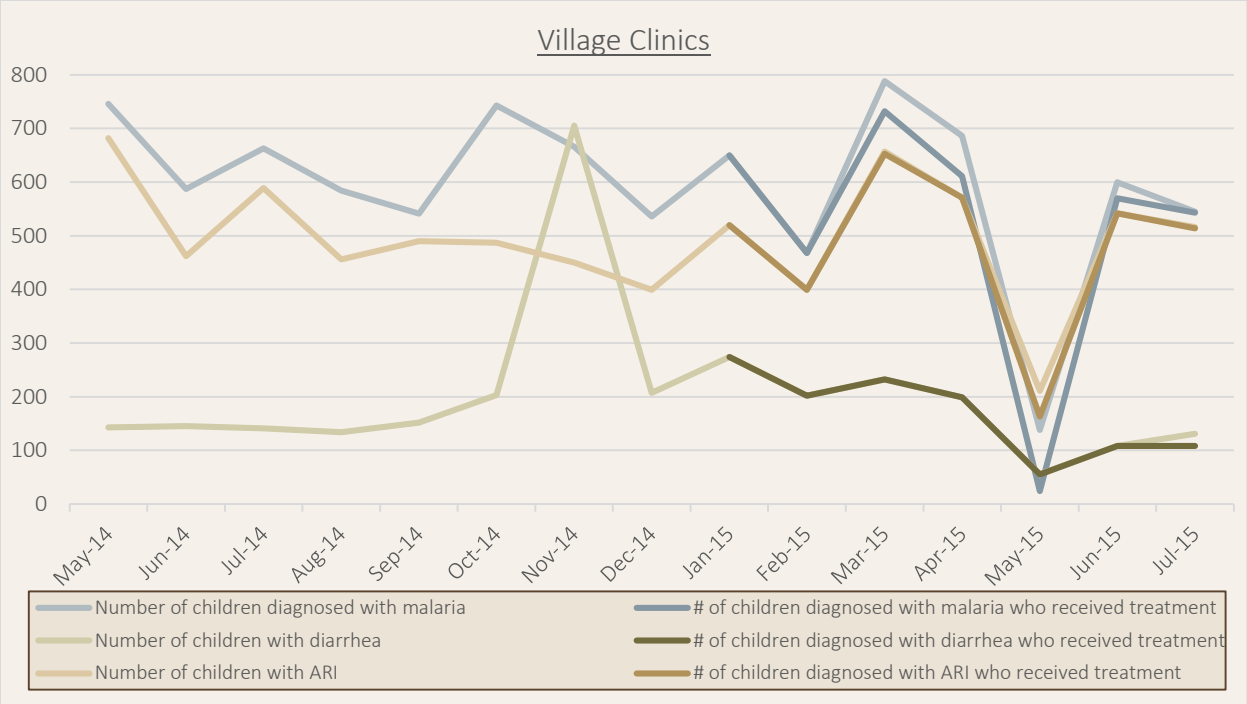
   Village clinics seemed to suffer from two different types of participation problems: there were either a large number of clients that was beyond their capacity, or there were many clients that came to the village clinics but were not eligible to be treated (out of age group, beyond HSAs' scope, etc.). As such, HSAs requested two different forms of support: assistance in the form of additional staff; and participation from community members in sensitizing clients about available services. Some HSAs have received support from volunteers at village clinics, but do suffer from their absence due to a high number of clients.

   Volunteers at village clinics could assist in informing community members about which days the clinic are open and on days they are cancelled. Otherwise, volunteers could escort patients at night and assist HSAs in getting water and holding children while they are being given the first dose of medicines and injections. Volunteers therefore could perform a double role of coping with the large capacity of clients and to assist in disseminating information about the village clinics.

Village Clinic Services

The chart below shows the number of children who were diagnosed with malaria, diarrhea and ARI. The largest gap between the number who were diagnosed and who received treatment was in May 2015 (114

who were identified as having malaria symptoms – usually this means fever – but did not receive treatment).



Recommendations: Village Clinics

All HSAs reported that they could use more support in their village clinics. There were three different categories under which the requests for support fell: training, medical supplies and other materials, and human resources.

1. Provide training for village clinics, and EPI (Expanded Programme on Immunization):

   With some of the HSAs not having been trained on village clinic practices since 2008, the need for a refresher training course was expressed by many HSAs interviewed. HSAs have looked to other HSAs when requiring assistance in writing reports and administering different medicines, and with the multiple forms of record-keeping that HSAs use on a daily basis, VillageReach could offer training opportunities for the HSAs on how to best operate a village clinic. Additionally, VillageReach should provide HSAs with a training on EPI best practices, especially in the context of low-resource settings, where informed knowledge on practices such as needle handling and sterilization is essential.

2. Advocate for the expansion of mRDT in Malawi:

   Every HSA reported monthly stock-outs for LA (Artemether + Lufemantrine), an anti-malarial medication. As a result, HSAs must rely on symptoms manifested by the client on determining whether to prescribe LA to treat malaria, meaning HSAs typically distribute LA for any child showing signs of fever. Some HSAs stated that with mRDT training, they would be better equipped to provide the right treatment for diagnosed cases of malaria and will also be able to offset high rates of stock-out of LA. However, due to MoH's current policy against HSAs administering mRDT outside of a health center, it is recommended that VillageReach advocate for the expansion of mRDT in Malawi to include its use in village clinics. This would likely result in lower distribution of LA, while equipping community health workers with an additional skill.

3. Map stakeholder relationships in Kwitanda:

   A better partnership between the village clinics and the communities in which they operate is also a possible point of improvement. For example, one HSA mentioned the Community Care Management (CCM) committee and their potential role in increasing client participation in village clinics. The village head too has been instrumental in conducting outreach among the community and informing people about the village clinic's programs. However, not all HSAs report positive relationships, and developing these types of constructive partnerships with community members is key in ensuring community ownership of the program. Mapping these relationships will allow VillageReach to develop a structured overview of key stakeholders and key influencers in the communities.

5. D-Tree and Digital Tools

Background

VillageReach in partnership with D-Tree International (a technology health consultancy), developed a mobile application software *Mangologic* designed to assist facility-based health workers and health surveillance assistants (HSAs) in providing consistent, quality healthcare to clients in Kwitanda. *Mangologic* was a new intervention introduced to the KHCP in 2015 as a technology platform that could assist HSAs in decision-making when determining treatment options for clients, while also tracking health data on clients. From October 2014 to December 2015, VillageReach worked with D-Tree International to incorporate their cMNH and cIMCI protocols using mobile phones for use by HSAs during ANC and PNC visits.

Evaluation Goal: Assess the implementation of *Mangologic* and its effectiveness as an additional tool for HSAs to track client information.

Methodology: One-on-one semi-structured interviews were conducted with 8 HSAs working in the Kwitanda catchment area.

Results 1: Findings from interviews

Result on Usage

- Half of the HSAs interviewed (4/8) stated that they had used *Mangologic* with the last client that they met.
- Those who reported that they did not use *Mangologic* reported that it was due to the application not working at all, or stopping during use. One HSA reported it was due to a lack of battery power in their phone.

Benefits to HSAs' experience

- All HSAs reported that the application was helpful in their decision-making process, and provided very useful information in being able to better assist clients. The logical flow of the decision tree especially allowed for an easy process to follow.
- Two HSAs stated that the application was helpful in identifying returning clients and managing their case (for example, in looking at what danger signs the client had reported experiencing during the previous village clinic visit).
- One HSA mentioned that the portability of the phone was a desirable feature. Especially when considering the other forms of data collection and record keeping (MNH registers, supplemental registers, etc.) having a phone do all the record keeping eases the burden on case management.
- All HSAs stated that they trust the information that the application is providing, and administer the treatment that it recommends, provided there is sufficient stock of medicines and supplies. The information provided by *Mangologic* is the same as given through IMCI protocols.

Drawbacks to the application

- One of the main drawbacks to the application is the frequency at which it appears to stop/crash. Five of the eight HSAs interviewed reported that the application on at least one occasion stopped working while in use, displayed some kind of error, or was not able to launch at all.
- Two of the HSAs reported that answering all the questions in *Mangologic* for each client takes a lot of time. Especially if in addition to other registers, the completion of the required fields was time-consuming which could limit the maximum number of clients the HSAs can see in one session.

- One HSA reported that they, along with other HSAs experienced problems with airtime. Shortage of airtime for accessing 3G networks was a drawback for HSAs to be able to synchronize offline data and to be able to make updates. Furthermore, even with enough airtime, getting mobile phone reception proved a challenge for some HSAs. This affected their ability to synchronize data as well as make updates on *Mangologic* when they were available.
- One HSA reported that the ANC section of *Mangologic* was too long and required too many fields to be filled. It asks questions that are not applicable and there are questions that appear in other registers, which results in a duplication of effort.
- One HSA requested that *Mangologic* develop a more detailed and concise reporting mechanism, that allows for users to call up reports on clients.

Results 2: Findings from data analysis

The following are results from data collected by *Mangologic* and subsequently sent to VillageReach by D-Tree International.

Attrition rate: A prominent finding from the data was the attrition in HSAs' usage of the application. As shown in figure 8, the total number of clients registered into *Mangologic* dropped drastically from the period starting February (first full month of implementation) and ending in July 2015.

Different usage rates by category: "Client" visits (maternal registration) represented the highest number of client category entered into *Mangologic* over the six-month period. In February for example, 315 clients were entered into the application for maternal registration, while 0 clients were entered for "Outcome" (pregnancy outcome).

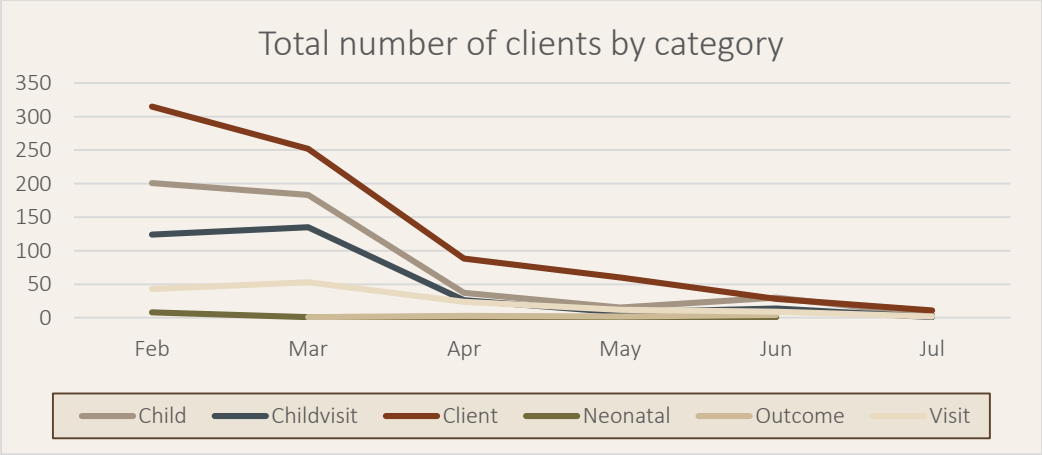


Figure 8: Total number of clients, by category

Recommendations: D-Tree and digital tools

While the implementation of Mangologic was a short-term contract, the findings from the evaluation do provide guidance on future iterations of digital data collection tools.

1. Monitor usage closely and follow up with users diligently over the first three days
   Attrition in the use of mobile phone applications has been documented before. The typical application loses 77% of its daily active users within the first 3 days after the install, and within 30 days, it has lost 90% of daily active users[6]. As such, the drop-off in usage rate of Mangologic among

[6] http://andrewchen.co/new-data-shows-why-losing-80-of-your-mobile-users-is-normal-and-that-the-best-apps-do-much-better/

HSAs is not an outlier among the mobile phone application sector. However, these findings indicate that in future iterations, the first few days following installation is a pivotal period in ensuring higher rates of continued use. Providing technical support that is readily accessible and close monitoring of usage among those first few days will likely help lower attrition rates.

2. Adapt tools to provide better client tracking and case management functionality

   The HSAs are health workers with varying degrees of experience in providing care based on observable symptoms and have also been trained in the same protocols that *Mangologic* uses to provide treatment recommendations. As such, the long-term utility of *Mangologic* is uncertain, as once HSAs learn and internalize the procedures, the application becomes redundant.

   However, the portability of tools such as smart phones has great potential to improve the experience of community health workers who currently rely on paper-based forms. Along with portability, the particular advantage that digital tools have is that they can track and manage clients who have visited, and subsequently allow users to compile periodic reports. The control over these data gives the user the ability to analyze and better understand how to measure and improve practices. Future technological interventions should take a similar user-centric approach to bridge the gap between data collection and service delivery.

6. Nutrition Program

Background

In 2015, VillageReach supported the nutritional care needs of malnourished children by providing processed food items such as plumpy nuts at three complementary feeding program sites (Kwitanda, Dziwe, and Mpembedza). The feeding program sites also involved cooking demonstrations and nutritional health education workshops. Cooking demonstrations typically had up to 80 community members attending, with content focused on how to incorporate more highly nutritious foods into their current diet, for example how to cook porridge with egg and moringa (picture 8).

Picture 8: Moringa leaves. These are ground up to produce the highly nutritious moringa flour

Children participating in the program were selected out of growth monitoring activities by CHFs and HSAs, and the children who were found to be underweight, according to their health passport, were registered into the program. Initially, pregnant women were measured on their mid upper arm circumference (MUAC) and were registered based on low measurements. However, due to the low number of pregnant mothers interested in participating, all pregnant women in the village were invited to attend the cooking lessons and be part of the demonstrations.

Three cohorts of women and young children participated in the program, each lasting three months. Participants graduated from the program based on mid upper arm circumference (MUAC) measurements taken at the beginning, middle and end of the program, used to determine sufficient weight gain. Nutrition education activities were facilitated by Agricultural Extension Health Officers (AEHOs), CHFs, and usually an HSA.

Evaluation Goal: Assess service utilization and impact on participants

Methodology: Two focus group discussions (with six participants each) with community members in locations near Dziwe and Mpembedza. The participants all attended the nutrition program's cooking demonstrations and feeding sessions in their communities.

Results

Outreach: Participants heard about the specifics of the nutrition program through the HSA that operates village clinics in their specific community. The Group Village Head convened a community meeting in the village where the HSA, CHFs and AEHO were able to provide further insight into the program, and determine eligibility of participants.

Accessibility: All participants in the focus groups stated that they reached the cooking demonstration location by foot. The cooking demonstrations however only took place in three different communities, and some participants reported traveling upward of two hours to get to the location.

Program structure and content: The duration of each session varied, depending largely on the types of foods that were being used in the cooking demonstrations; longer sessions were generally for larger meals involving beans and meat (up to five hours), while the shorter sessions were for porridge and other breakfast foods. Participants enjoyed learning about food groups and felt encouraged to learn about new ways to cook. For example, with the knowledge of using different ingredients such as eggs and groundnuts in porridge, one participant stated:

"My child was low in weight and could not eat a plate of porridge, but now they are able to finish all of it"

Impact: Participants in the focus groups reported positive health outcomes for their children (a total 71 pregnant women and 603 children under 5 graduated from the communal feeding program, meaning that they had sufficient weight gain), as well as a broader use of ingredients in their household. However, this was highly dependent on household finances. Sticking to the diet introduced to them in the cooking demonstrations proved challenging due to not being able to purchase the required ingredients.

Recommendations: Nutrition Program

1. Broaden range of nutrition topics

   In both focus group discussions, drinks as a nutritional source came up. Particularly, participants were interested in how to produce different types of juices, as well as soy milk. Soybean has been widely produced in the country since 1909[7]. Providing nutrition education participants with a diversified range of nutritional options from food and beverage sources more relevant to community needs will likely result in higher attendance of cooking demonstrations.

2. Adjust eligibility criteria for participants

   Some of the focus group participants indicated that they knew of other community members who were not able to attend, as they were neither pregnant women nor with a child under-5, but rather were women with young children above the age of 5, or were on anti-retroviral treatment, and as such may be in a high-need population for nutrition programs[8]. Given the community support for the program, VillageReach should advocate for and support the broadening of the target groups for the nutrition education sessions, especially in light of recent and projected famine conditions in Malawi, as shown in Picture 9.

3. Set up formal documentation process

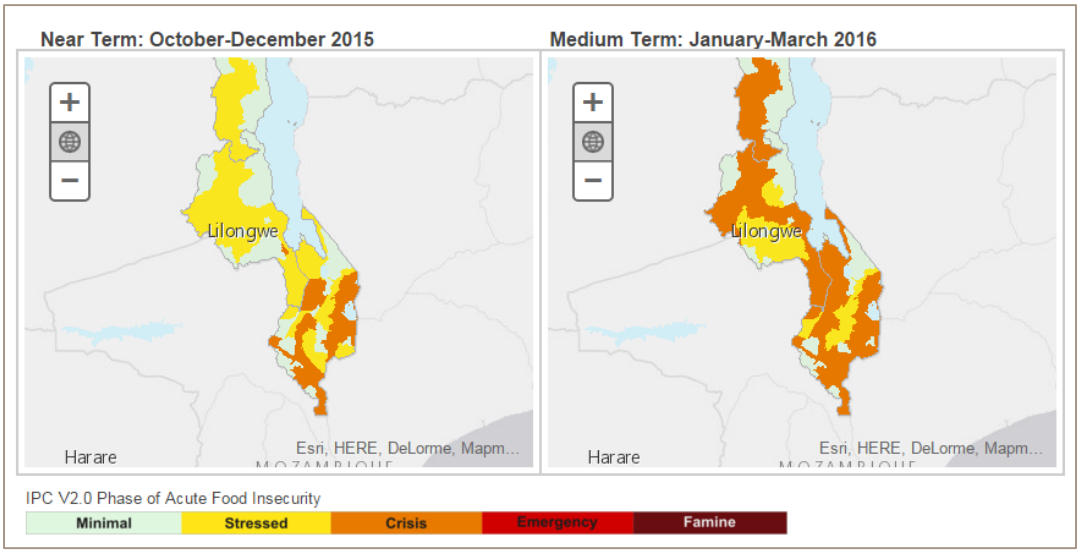
   A large challenge in trying to assess service utilization of the program was the lack of formal documentation on the details surrounding the program, including the stakeholders involved and a clear description of the activities required to achieve the intended objectives (logic model). VillageReach should develop a logic model, or a detailed work plan of the nutrition program for future iterations.

4. Continue to implement nutrition-focused programs

   The current food insecurity situation in Malawi is between stressed and in crisis, according to the Famine Early Warning Systems Network (picture 9). As such, the importance of food and nutrition-related programs is clear. However, with other organizations in the region better equipped to implement programs to combat food security such as Emmanuel International, VillageReach should look to partner with these organizations. This would provide the Kwitanda community with better expertise on food security, while also strengthening relations within the NGO community in Malawi.

[7] http://www.icrisat.org/tropicallegumesII/pdfs/November-2013.pdf (11/24/2015)

[8] Raiten, Grinspoon and Arpadi (2005): Nutritional considerations in the use of ART in resource use of ART in resource-limited settings limited settings. World Health Organization, Department of Nutrition for Health and Development. http://www.who.int/nutrition/topics/Paper%20Number%206%20-%20Nutritional%20-%20ART.pdf



Picture 9: Food Insecurity in Malawi (source: Famine Early Warning Systems Network)

Evaluation Summary

The Kwitanda Community Health Project has experienced changes over the last year in efforts to expand VillageReach's activities in strengthening health systems down to the last mile. The annual evaluation for 2015 focused on assessing the processes that lead to VillageReach's delivery and monitoring of RMNCH services in Kwitanda, shifting focus from evaluating health outcomes among beneficiaries. With the monthly collection of data through the MNH register, regular evaluations of health outcomes and behaviors are ongoing, leaving open the possibility of conducting a comprehensive impact evaluation in the future.

The evaluation identified some barriers to service utilization, such as lack of community involvement in outreach efforts, wait times for services, and distance to reach services. In response, VillageReach will work with ANC nurses, HSAs, and community leaders to coordinate outreach and communication to the wider Kwitanda community about the services that VillageReach provides, while also collaborating with health workers to identify the most important training opportunities that will help them serve clients more effectively and efficiently.

Some challenges will require more long-term involvement, such as establishing a more streamlined monitoring and evaluation plan that will track key indicators without aggravating health workers' existing data collection activities. With new initiatives potentially emerging in the near future, such as the construction of a maternity wing at Kwitanda Health Center, on top of the continuation of initiatives, establishing monitoring mechanisms that are accessible and actionable is recommended. VillageReach can leverage data that are relevant and applicable to a larger scale in order to pursue positive policy changes, such as with the ability for health workers to conduct mRDT outside of health centers.

Continuing current initiatives will provide the Kwitanda community with access to essential services, but VillageReach should also look to engage with partners (public, private, and nonprofit sector) to collaborate towards a more effective implementation of programs. The nutrition program, for example, is a focus area where other organizations have recognized experience, which offers a potential for such collaboration.

Appendices

Appendix A – Structured interviews/surveys

Page	Tool
35 – 36	ANC Outreach structured interview
37 – 38	ANC Kwitanda structured interview
39	Village clinic structured interview

ANC OUTREACH INTERVIEW Today's Date (dd/mm/yy): _____ Data Collector's code _____ Survey location _____
Mother's Name_____ Name of Village_____ Name of GVH _____

SECTION 1. WOMEN WHO JUST VISITED AN ANC OUTREACH SITE. Complete this questionnaire for ***each*** woman who leaves the ANC Outreach clinic. Make sure to ask them for consent **before** they go in to see the nurse, as well as **after** they finish seeing the nurse. Also make sure to inform the ANC nurse that you will be conducting surveys on patients about their pregnancy

1. What was the purpose of your visit to the ANC Outreach clinic?	2. Have you attended any ANC services during this pregnancy?	3. Where did you attend ANC services?	4. Why did you choose to attend ANC services at that location?	5. How many times have you visited ANC services for this pregnancy?	6. Do you know about the ANC services at the Kwitanda Health Clinic?	7. Why did you choose to go to the ANC Outreach service today rather than the Kwitanda Health Clinic?
[_] One of 4 ANC visits [_] Seeking advice [_] Experiencing a problem [_] Other _____	[_] Yes [_] No (If "No", skip to question 6)	[_] Kwitanda HC [_] ANC Outreach _____ [_] Other Health Center _____	[_] Closer to home [_] Someone recommended it to me [_] It's the only one I know [_] Better service [_] Other _____	[_] This is my first time [_] 2 times [_] 3 times [_] 4 times [_] More than 4 times	[_] Yes [_] No (If no, skip to question 8)	[_] It's closer to home [_] It has a good reputation [_] Other _____

8. Have you recommended ANC Outreach services to anyone?	9. How did you hear about ANC Outreach?	10. How did you get to the clinic today?	11. How long did it take you to get to the clinic?	12. How long were you waiting for before you were seen by the nurse?	13. How long was your visit with the nurse?
[_] Yes *Who?*_____ [_] No	[_] From a relative [_] From a friend [_] From a community member [_] From a nurse/HSA [_] Other _____	[_] On foot [_] Bicycle (self) [_] Bicycle (as passenger) [_] By bicycle taxi [_] Other _____	[_] Less than 10 minutes [_] Between 10 and 30 minutes [_] More than 30 minutes	[_] Less than 10 minutes [_] Between 10 and 30 minutes [_] More than 30 minutes	[_] Less than 5 minutes [_] Between 5 and 10 minutes [_] More than 10 minutes

14. What about the ANC Outreach service could be improved?	15. Which of the following treatments did you receive?	16. Which of the following services did you receive?	17. Is this your first pregnancy?	18. Where did you have your most recent delivery?	19. What mode of transport did you use to go to the hospital/clinic to deliver your baby?	20. How long did you stay at the hospital/clinic?
[_] Wait times [_] Space could be bigger [_] Space could be more private [_] Better medicine stock [_] Other _____	[_] TTV [_] Malaria Prophylaxis [_] ITN [_] Iron [_] Albendazole [_] Other	[_] HIV testing [_] Test for danger signs [_] Birth planning [_] Other _____	[_] Yes *(If "Yes", skip to question 26)* [_] No	[_] Hospital [_] Clinic [_] On the way to the hospital/clinic [_] At home *(If at home, skip to question 24)* [_] Other _____ *(If other, skip to question 24)*	[_] On foot [_] Bicycle (cycled on my own) [_] Bicycle (family/friend took me) [_] Bicycle taxi [_] Motorcycle ambulance [_] Other	[_] Less than one day [_] Between 24 and 48 hours [_] Longer than 48 hours

21. What services did you receive for your delivery?	22. Why did you choose to go to the hospital or clinic?	23. What reason(s) did you have for not delivering in a hospital or clinic? *This question is only for those who did not deliver in a hospital/clinic*	24. What services would you like to receive for your upcoming delivery?	**Turn over to Section 2**
[_] Transport to delivery location [_] Transport from delivery location [_] Received medicine [_] Caesarean delivery [_] Neonatal care [_] Counselling on family planning [_] Counselling on neonatal health [_] Other _____	[_] It's safer [_] It's cleaner [_] Recommendation from _____ [_] It's closer to home [_] Other _____	[_] Too far [_] Too expensive [_] Not comfortable delivering with a doctor I didn't know [_] Did not have transportation [_] Had transportation but did not feel comfortable using it [_] Preferred home delivery for personal reasons [_] Other _____	[_] Option to stay overnight [_] Neonatal care [_] Counselling on family planning [_] Counselling on neonatal health [_] Other _____	

ANC OUTREACH INTERVIEW Today's Date (dd/mm/yy): _____ Data Collector's code _____ Survey location _____
Mother's Name_____ Name of Village_____ Name of GVH _____

SECTION 2: SOLAR LANTERNS. Complete this section of the questionnaire for all participants					
25. Do you have a solar lantern?	26. Do you know that you can receive a solar lantern at the end of your pregnancy if you complete some activities?	27. What do you need to do to receive a solar lantern?	***If the respondent did not correctly answer Q28, provide the correct answer:***	28. Do you think you will be able to complete these activities?	29. Why do you think you will not be able to complete these activities?
[__] Yes *(If yes, skip to question 31)* [__] No	[__] Yes *(If yes, proceed to Q28)* [__] No ***(If no, advise them to ask an HSA or an ANC nurse on their next visit. End survey)***	[__] Only 2 ANC visits [__] Only 4 ANC visits [__] Deliver in a facility [__] Deliver at home [__] Only 2 PNC visits [__] Only 4 PNC visits	**[__] 4 ANC visits** **[__] Delivery in facility** **[__] 2 PNC visit**	[__] Yes [__] No	[__] Distance to ANC is too far [__] There are too many activities to complete
30. Did you use the solar lantern last night?	31. How often do you use the lantern?	32. What reason(s) do you have for not using the lantern more often?			
[__] Yes [__] No	[__] Every day/night [__] Three or four times a week [__] Once or twice a week [__] Once or twice a month [__] Never	[__] It's broken [__] I don't need it [__] It's hard to use [__] Other _____			
Thank her for her time and remind that this survey and the information collected is confidential.					

KWITANDA HEALTH CLINIC ANC SURVEY Today's Date (dd/mm/yy): _____ Data Collector's code _____ Village #_____
Mother's Name_____ Name of Village_____ Name of GVH _____

SECTION 1. WOMEN WHO JUST VISITED ANC SERVICES AT KHC. Complete this questionnaire for ***each*** woman who has just received ANC services. Make sure to ask them for consent **before** they go in to see the nurse, as well as **after** they finish seeing the nurse. Also make sure to inform the ANC nurse that you will be conducting surveys on patients about their pregnancy

1. What was the purpose of your visit to the KHC's ANC services?	2. Have you attended any ANC services during this pregnancy?	3. Where did you attend ANC services?	4. Why did you choose to attend ANC services at that location?	5. How many times have you visited ANC services for this pregnancy?	6. Do you know about the ANC Outreach services?	7. Why did you choose to go to the Kwitanda Health Clinic today rather than the ANC Outreach service?
[__] One of 4 ANC visits [__] Seeking advice [__] Experiencing a problem [__] Other _____	[__] Yes [__] No (If "No", skip to question	[__] Kwitanda Health Clinic [__] ANC Outreach [__] Other Health Clinic _____	[__] Closer to home [__] Someone recommended it to me [__] It's the only one I know [__] Better service [__] Other _____	[__] This is my first time [__] 1 time [__] 2 times [__] 3 times [__] 4 times [__] More than 4 times	[__] Yes [__] No (If no, skip to question 8)	[__] It's closer to home [__] It has a good reputation [__] Other _____

8. Have you recommended KHC's ANC services to anyone?	9. How did you hear about KHC's ANC services?	10. How did you get to the health center today?	11. How long did it take you to get to the health center?	12. How long were you waiting for before you were seen by the nurse?	13. How long was your visit with the nurse?	14. What did you like about the ANC Service?
[__] Yes [__] No	[__] From a relative [__] From a friend [__] From a community member [__] From a nurse/HSA [__] Other _____	[__] On foot [__] By bicycle [__] By bicycle taxi [__] Other _____	[__] Less than 10 minutes [__] Between 10 and 30 minutes [__] More than 30 minutes	[__] Less than 10 minutes [__] Between 10 and 30 minutes [__] More than 30 minutes	[__] Less than 5 minutes [__] Between 5 and 10 minutes [__] More than 10 minutes	[__] Received the treatment I needed [__] Helpful nurses [__] Quick [__] Other _____

15. What about the ANC service could be improved?	16. Which of the following treatments did you receive?	17. Which of the following services did you receive?	18. Is this your first pregnancy?	19. Where did you have your most recent delivery?	20. What mode of transport did you use to go to the hospital/clinic to deliver your baby?	21. How long did you stay at the hospital/clinic?
[__] Wait times [__] Space could be bigger [__] Space could be more private [__] Better medicine stock [__] Other _____	[__] TTV [__] Malaria Prophylaxis [__] ITN [__] Iron [__] Albendazole [__] Other _____	[__] HIV testing [__] Test for danger signs [__] Birth planning [__] Other _____	[__] Yes *(If "Yes", skip to Section 2, Q27)* [__] No	[__] Hospital [__] Clinic [__] On the way to the hospital/clinic [__] At home *(If at home, skip to question 22)* [__] Other _____ *(If other, skip to question 22)*	[__] On foot [__] Bicycle (cycled on my own) [__] Bicycle (someone took me on their bicycle) [__] Motorcycle (on the back of a motorcycle) [__] Motorcycle ambulance [__] Other	[__] Less than one day [__] Between 24 and 48 hours [__] Longer than 48 hours

22. What services did you receive for your delivery?	23. Why did you choose to go to the hospital or clinic?	24. What reason(s) did you have for not delivering in a hospital or clinic? *This question is only for those who did not deliver in a hospital or clinic*	25. What services would you like to receive for your upcoming delivery?	**Turn over to Section 2**
[__] Transport to delivery location [__] Transport from delivery location [__] Received medicine [__] Caesarean delivery [__] Neonatal care [__] Counselling on family planning [__] Counselling on neonatal health [__] Other _____	[__] It's safer [__] It's cleaner [__] Recommendation from _____ [__] It's closer to home [__] Other _____	[__] Too far [__] Too expensive [__] Not comfortable delivering with a doctor I didn't know [__] Did not have transportation [__] Had transportation but did not feel comfortable using it [__] Preferred home delivery for personal reasons [__] Other _____	[__] Option to stay overnight [__] Neonatal care [__] Counselling on family planning [__] Counselling on neonatal health [__] Other _____	

KWITANDA HEALTH CLINIC ANC SURVEY Today's Date (dd/mm/yy): _____ Data Collector's code _____ Village #_____
Mother's Name_____ Name of Village_____ Name of GVH _____

SECTION 2: SOLAR LANTERNS. Complete this section of the questionnaire for all participants					
26. Do you have a solar lantern?	27. Do you know that you can receive a solar lantern at the end of your pregnancy if you complete some activities?	28. Which of the following do you need to do to receive a solar lantern?	***If the respondent did not correctly answer Q30, provide the correct answer:***	29. Do you think you will be able to complete these activities?	30. Why do you think you will not be able to complete these activities?
[_] Yes *(If yes, skip to question 31)* [_] No	[_] Yes [_] No **(If no, advise them to visit and ask an HSA or an ANC nurse. End survey)**	[_] Only 2 ANC visits [_] Only 4 ANC visits [_] Deliver in a facility [_] Deliver at home [_] Only 2 PNC visits [_] Only 4 PNC visits	**[_] 4 ANC visits** **[_] Delivery in facility** **[_] 2 PNC visit**	[_] Yes [_] No	[_] Distance to ANC is too far [_] There are too many activities to complete
31. Did you use the solar lantern last night?	32. How often do you use the lantern?	33. What would you prefer to have received rather than a lantern?		How could your experience at the clinic have been better?	
[_] Yes [_] No	[_] Every day/night [_] Three or four times a week [_] Once or twice a week [_] Once or twice a month [_] Never				
Thank her for her time and remind that this survey and the information collected is confidential.					

VILLAGE CLINIC CLIENT INTERVIEW Today's Date (dd/mm/yy): _____ Data Collector's code _____ Village #_____
Name of Caregiver_____ Name of Village_____ Name of GVH _____

SECTION 1. CAREGIVERS WHO JUST VISITED A VILLAGE CLINIC. Complete this questionnaire for ***each*** caregiver who leaves the village clinic. Make sure to ask them for consent **before** they go in to see the HSA, as well as **after** they leave the clinic.

1. Mother's name (surname, given name):	2. What is the name of your youngest child?	3. How old is (*CHILD's NAME*)?	4. What was the purpose of your visit to the HSA?	5. How did you hear about the village clinic?	6. Is this your first visit to the village clinic?	7. What was the reason for your previous visit to the village clinic?
[_____ _____]	[_____]	[ ] days [ ] months [ ] years	[ ] Neonatal visit [ ] Child registration visit [ ] Child visit	[ ] From a relative [ ] From a friend [ ] From a community member [ ] Other _____	[ ] Yes *(If Yes, skip to Q9)* [ ] No (*If No, go to Q7)*	[ ] Neonatal visit [ ] Child registration visit [ ] Child visit

8. Have you told anyone about village clinic services?	9. Have you had medical treatment anywhere else?	10. Where did you receive medical treatment?	11. How did you get to the village clinic today?	12. How long did it take you to get to the village clinic?	13. How long were you waiting before you saw the HSA?
[ ] Yes *Who?* _____ [ ] No	[ ] Yes (*If Yes, go to Q10)* [ ] No *(If No, skip to Q11)*	[ ] Another clinic _____ [ ] District hospital [ ] Mobile/outreach clinic _____ [ ] Home care [ ] Other _____	[ ] On foot [ ] By bicycle (on my own) [ ] By bicycle (someone brought me here on their bicycle) [ ] Other _____	[ ] Less than 30 minutes [ ] 30 minutes to an hour [ ] Between one and two hours [ ] More than two hours	[ ] Less than 10 minutes [ ] Between 10 and 30 minutes [ ] Longer than 30 minutes

14. How long was your visit with the HSA?	15. Did you receive medication at the village clinic?	16. Why did you not receive medication at the village clinic?	17. Did your HSA use a mobile phone to help provide treatment during your visit?	18. How comfortable were you with your HSA using a phone during a medical visit?	19. Are you confident that the treatment you received was correct?
[ ] Less than 10 minutes [ ] Between 10 and 30 minutes [ ] Longer than 30 minutes	[ ] Yes *(If yes, skip to Q17)* [ ] No	[ ] I did not need any [ ] The clinic ran out of medication [ ] Other _____	[ ] Yes [ ] No *(If no, skip to Q19)* [ ] I don't know *(If you don't know, skip to Q19)*	[ ] Very comfortable [ ] I don't mind [ ] I prefer they don't	[ ] Yes [ ] No

20. What did you like least about the village clinic?	21. Before (*CHILD's NAME*) was born, did you go for antenatal care?	22. How many times did you attend antenatal care during that pregnancy?	23. Why were you not able to go to ANC four times?	24. Where did you attend antenatal care?	25. Did you know about Outreach ANC services?
[ ] Long wait time [ ] Shortage of medicine [ ] Lack of privacy [ ] Other _____	[ ] Yes [ ] No (*If no, skip to Q23)* [ ] Don't Know	[___] of times *(If <4, go to Q23. If >=4, skip to Q24)* [ ] Don't Know	[ ] Too far [ ] I didn't know I was supposed to [ ] Other _____	[ ] Outreach Clinic _____ *(If Outreach Clinic, skip to Q 29)* [ ] Health Centre or Hospital *Where?:*_____ [ ] Traditional Birth Attendant [ ] Other _____	[ ] Yes [ ] No

26. Where is the nearest ANC Outreach to you?	27. Is the nearest ANC outreach closer to your house than Kwitanda Health Center?		How could your experience at the village clinic have been better?
[ ] Mpembedza [ ] Dziwe [ ] Kambwiri	[ ] Yes [ ] No		

Thank her for her time and remind that this survey and the information collected is confidential.

Appendix B – dashboard indicators (May 2014 to July 2015)

Outcome 1: Reducing Maternal, Neonatal, and Infant Morbidity and Mortality

Maternal Services Indicators	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15
Antenatal Care (ANC)															
Total number of deliveries that month (N)	18	26	20	58	76	109	106	116	69	113	88	83	52	52	79
Percentage attending four ANC visits[1]	30%	31%	65%	40%	32%	44%	46%	51%	74%	62%	61%	54%	46%	63%	64%
Number attending four ANC visits	5	8	13	24	25	48	49	59	51	70	54	45	24	33	51
Average number of ANC visits[1]				N/A	3	3	3.2	3.2	3.8	3.5	3.5	3.3	3.3	3.3	3.6
Total number of outreach ANC clinics held[4]	7	9	12	9	9	9	12	7	4	9	12	11	12	12	5
Total number of women attending outreach ANC[4]									21	52	77	60	81	73	36
Number of new clients attending outreach ANC[4]									3	16	31	28	24	17	10
Number of new clients attending outreach ANC in 1st trimester[4]									1	6	10	11	16	13	5
Delivery Location															
Percentage of facility deliveries[1]	94%	96%	90%	95%	91%	89%	86%	97%	100%	97%	96%	93%	95%	98%	95%
Percentage of non-facility deliveries[1]	6%	4%	10%	5%	9%	11%	14%	3%	0%	4%	7%	5%	10%	2%	5%
Postnatal Care (PNC)															
Percentage who attended postnatal care within 2 weeks of delivery[1]				82%	63%	64%	75%	72%	87%	81%	80%	87%	73%	75%	73%
Total Maternal Services Uptake															
Percentage of women receiving full package of maternal health services of those that delivered (4 ANC visits, in-facility delivery & PNC) [1]	N/A	N/A	65%	35%	30%	38%	42%	46%	74%	61%	60%	51%	40%	63%	62%

Reducing Maternal, Neonatal, and Infant Morbidity and Mortality (contd.)

Indicator	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15
Among the women who delivered/reached the end of their pregnancy															
Number of teenage pregnancies (under 18)[1]									19	21	11	20	11	15	20
Percentage fully vaccinated against TTV[1]	48%	72%	95%	76%	80%	84%	86%	82%	88%	91%	77%	83%	75%	71%	82%
Percentage receiving at least 2 doses of malaria prophylaxis[1]	70%	77%	65%	71%	48%	53%	36%	34%	38%	42%	50%	53%	46%	52%	48%
Percentage given an insecticide treated net (ITN) [1]	0%	46%	75%	84%	71%	76%	77%	75%	77%	75%	81%	88%	85%	86%	78%
Percentage who received an HIV test during this pregnancy[1]	65%	65%	90%	90%	87%	95%	94%	95%	93%	95%	89%	95%	96%	96%	97%
Number who newly tested HIV-positive[5]	1	3	3	3	4	3	2	2	2	4	5	1	0	3	2
Percentage of women dispensed ARVs to later administer to their infants[5]	100%	100%	100%	66%	100%	100%	100%	100%	0%	0%	80%	0%	0%	0%	0%
Incentives															
Number of women receiving solar lanterns[2]								0	63	16	115	99	24	58	54
Deaths															
Number of maternal deaths[3]	0	0	0	3	0	1	0	0	0	0	1	1	0	0	0
Number of neonatal deaths[3]	2	0	0	4	2	4	4	1	0	0	2	2	3	1	0

Outcome 2: Reducing Child Morbidity and Mortality

Monthly Indicators	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15
Kwitanda Health Center Overview															
Number of children (2-59 months) seen this month[6]									981	871	582	965	637	721	613
Village Clinic Overview															
Number of functioning village clinics[7]	13	12	12	12	13	13	13	13	13	17	17	17	17	17	17
Number of children seen at village clinics[7]	1,603	1,227	1,422	1,213	1,237	1,493	1,864	1,186	1,499	1,113	1,731	1,488	434	1,307	1,230
Total number of children referred to the health center due presence of danger signs[7]	3	0	0	3	4	4	2	2	0	4	16	3	5	2	2
Total number of children referred to the health center due to presence of stockouts[7]								N/A	N/A	N/A	60	75	163	30	0
Total number of children with malaria referred due to stockout[7]								N/A	N/A	N/A	56	75	114	30	0
Total number of children with diarrhea referred due to stockout[7]								N/A	N/A	N/A	0	0	1	0	0
Total number of children with ARI referred due to stockout[7]								N/A	N/A	N/A	4	0	48	0	0

Outcome 2: Reducing Child Morbidity and Mortality

	Under-5 Indicators	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15
Malaria																
VILLAGE CLINIC	Number of children diagnosed with malaria[7]	746	587	663	584	541	743	666	536	650	468	788	686	138	600	545
	Total percentage of children diagnosed with malaria who received treatment[9]									100%	100%	93%	89%	17%	95%	99%
KWITANDA HEALTH CENTER	Total number of children tested for malaria[8]	13	25	151	100	156	191	205	191	380	171	582	505	235	217	54
	Total number of children diagnosed with malaria[8]	4	13	58	48	30	31	23	31	115	66	251	342	145	83	16
	Total percentage of children diagnosed with malaria who received treatment[9]	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Diarrhea																
VILLAGE CLINIC	Number of children with diarrhea[7]	143	145	141	134	152	203	705	207	274	202	232	199	56	108	131
	Total percentage of children diagnosed with diarrhea who received treatment[9]									100%	100%	100%	100%	98%	100%	100%
KHC	Number of children with diarrhea[6]	2	4	54	28	48	40	62	88	98	64	86	74	19	38	12
	Percentage treated for diarrhea with zinc[6]	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Percentage treated for diarrhea with ORS[6]	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Acute Respiratory Infection (ARI)																
VILLAGE CLINIC	Number of children with ARI[7]	682	462	589	456	490	487	450	399	520	399	657	571	211	542	516
	Total percentage of children diagnosed with ARI who received treatment[9]									100%	100%	99%	100%	77%	100%	99%
KHC	Number of children with ARI[6]	16	23	14	121	169	194	232	296	298	94	120	249	253	174	82
	Percentage of children diagnosed with ARI who received treatment[6]								100%	100%	100%	100%	100%	100%	100%	100%