Executive Summary

With the intent of improving maternal and child health, the Nuru Kenya (NK) Healthcare Program (HC) works with Nuru farmer households to adopt ten healthy behaviors. The chosen health promotion behaviors have been proven to decrease unnecessary disease and death, particularly for mothers and young children. Nuru Monitoring and Evaluation (M&E) supports this work by conducting annual reviews of progress toward the program's impact goal to address the following evaluation question: *What is the impact of the Nuru Kenya Healthcare Program on Nuru farmer households?*

Overall, data show that the Nuru intervention group adopted more healthy behaviors than the non-Nuru comparison group. The Nuru intervention group has a consistent 3 year trend in improving the overall level of healthy behavior adoption and maintenance. Nuru households who participated in more than a year of healthcare services have higher healthy behavior adoption rates than those new to the Healthcare Program. Consistent with 2015 data, we continue to see that farmer households adopt more healthy behaviors the longer they participate in the Nuru Healthcare Program.

Recommendations for NK M&E and HC to consider as a result of these findings are as follows:

1. Continue to focus on behavior change as data trends show that Nuru households are consistently improving in adopting healthy behaviors, and they are adopting more healthy behaviors than the comparison group.
2. Focus on the lowest performing behaviors like appropriate handwashing with soap.
3. Concentrate on infant nutrition at Nuru in both immediate breastfeeding, which has higher adoption levels in the non-Nuru group, and appropriate complementary feeding for children 7 - 23 months, which presented low behavior adoption across all groups.
4. As healthy behavior adoption rate continue to increase, NI should research global and national benchmarks. In addition, NK will establish indicators and targets for when a community is ready to graduate from NK HC based on both local, regional and national data.

2016 will be the last year for the Nuru Healthcare Program's community health worker household visit model. In 2017, Nuru Kenya will launch the cooperative care group healthcare graduation model. This care group based model will look toward the same goal with some changes in delivery of services aimed at integrating with the other Nuru impact programs and toward future sustainability. This report provides data trends that the healthcare team can use to learn from the the past 4 years, as the same behavior change and tailored interpersonal communication methodology will be used going forward.

Nuru Healthcare Program

The Nuru Kenya (NK) Healthcare (HC) Program household visit model was launched in 2012 in Kuria West, Migori County, Kenya. The goal of NK HC is to work with Nuru farmer households to increase the adoption and maintenance of healthy behaviors that have been identified to improve maternal and child health in order to reduce preventable death and disease.

The Nuru HC Program utilizes evidence from the World Health Organization,[1] which identifies the need to focus on maternal and child health (MCH). USAID's best practice findings on how to efficiently and effectively improve MCH through behavior change also guides the healthcare program implementation.[2] The tailored interpersonal communication approach involves employing observation and in-depth discussions to understand the specific needs of each household and where they fall in the stages of change continuum. Furthermore, a monthly home visit from an NK HC field officer provides Nuru households with access to healthcare services through referrals and affordable commodities such as chlorine based water treatment and soap.

Objective

This report serves as an impact assessment for the 2016 Nuru Healthcare home visit model. This is the 4th year of household visit model impact evaluation data, and the results will be presented over time. This report is the final impact assessment for the NK HC household visit model in Kuria West. The available data on the adoption of healthy behaviors is used to inform program progress and its monitoring and evaluation for data driven decision making.

NK Healthcare impact is assessed by measuring the adoption rate in three areas:

- Safe Pregnancy and Childbirth
- Safe Water, Sanitation and Malaria Prevention
- Healthcare Healthy Behaviors

Nuru M&E supports this work by conducting an annual review of progress toward the program's impact goal to address the evaluation question: *What is the impact of the Nuru Kenya Healthcare Program on Nuru farmer households?*[3] This paper will address this question through a scorecard methodology presenting the results of the 2016 evaluation data findings.

In 2017, Nuru Kenya will launch the cooperative care group healthcare graduation model. This care group based model will look toward the same goal with some changes in delivery of services aimed at integrating with the other Nuru impact programs and toward future sustainability.

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[1] WHO. Children: reducing mortality. Updated September 2013. Retrieved 2013 January 14 from http://www.who.int/mediacentre/factsheets/fs178/en/index.html

[2] USAID: Acting on the Call: Ending Preventable Child and Maternal Deaths, June 2014;Technical Approaches to Proven Interventions by USAID, Ensuring Healthy Behaviors p107-110. Retrieved 2017 January 17 from https://www.usaid.gov/sites/default/files/documents/1864/USAID_ActingOnTheCall_2014.pdf

[3] The evaluation survey is available upon request

Methodology

NK M&E administers an annual household survey of Nuru families (intervention group) and non-Nuru families (non-intervention comparison group) to evaluate the impact of NK HC. To ensure the quality of the data analyzed in this report, NK M&E built a system of checks and balances into the data entry process whereby each individual survey was reviewed three separate times before final entry.

Table 1: Survey timeline and sample sizes

Sample size (2016)	Households Surveyed (n)	No. of Children 0-23 Months	No. of Enumerators	Training Dates	Survey collection dates	Data entry and quality control
Nuru	449	252	40	July 4 - 8, 2016	July 11-Aug 12, 2016	July 12 - Aug 19, 2016
Non Nuru	465	358				

Scorecards

NK M&E and HC developed three scorecards (Appendix 1) to measure household health behaviors (Table 2). NK M&E's approach to counting the number of healthy behaviors a person engages in was modified from the Center for Disease Control and Prevention's methodology which shows that people live longer as they engage in a greater number of healthy behaviors.[4]

With the exception of handwashing[5], each healthy behavior is scored on a binary scale. In other words, there is a total possible score of 1 for each behavior successfully adopted. The 10 Healthy Behaviors Scorecard represents the summation of the other two scorecards.

Table 2: Nuru Healthcare Scorecards

10 Healthy Behaviors Scorecard	Safe Pregnancy and Childbirth Scorecard	Safe Water, Sanitation, and Malaria Prevention Scorecard
10 out of 10 healthy behaviors	6 out of 10 behaviors	4 out of 10 behaviors

For the Safe Pregnancy and Childbirth Scorecard, there are a total of six indicators representing the six healthy behaviors that are measured through a survey at the household level. Mothers of

[4] See https://www.cdc.gov/media/releases/2011/p0818_living_longer.html for further detail.
[5] For the handwashing indicator, calculations consider washing hands at three critical times: after defecation, before cooking and before eating. Therefore, each critical handwashing time has a possible score of 0.33, for a total score of one (.33+.33+.33) if all three times are positively identified by a household.

children ages 0-23 months were asked to respond to questions related to antenatal care visits, childbirth, immunization and nutrition for each of their children in this age bracket. At the individual behavior level, each child in the 0-23 month age group received a score of either 1 or 0 for indicators related to immediate and exclusive breastfeeding, antenatal visits, and childbirth. Full immunization status, however, only applied to children ages 9-23 months whereas appropriate complementary feeding scores could only be attributed to children between 7-23 months.

For the *aggregated* Safe Pregnancy and Childbirth Scorecard, each child was scored on a scale of 0-6 points based on the total number of related behaviors. In order to ensure that all children were evaluated by the maximum of 6 available points, children younger than nine months received a score of 1 for showing progress towards full immunization if they had been given the appropriate vaccines for their age; for otherwise, a score of 0. Concurrently, a score of 1 for appropriate complementary feeding was given to children who are six months and under and still exclusively breastfeeding; for otherwise, a score of 0. These adjustments allowed the scorecard to show the average of all individual scores for children on a 6 point scale.

For the Safe Water, Sanitation and Malaria Prevention Scorecard, 4 possible points can be achieved on the survey. The first two questions (regarding water source and treatment and latrine use) were asked of all households for a possible score of 2. These household scores were then averaged by each group surveyed. Next, the average percent adoption of handwashing (all households) and sleeping under long-lasting insecticide treated bed nets (LLIN) for all children under five were added to the scorecard for a total possible score of 4.

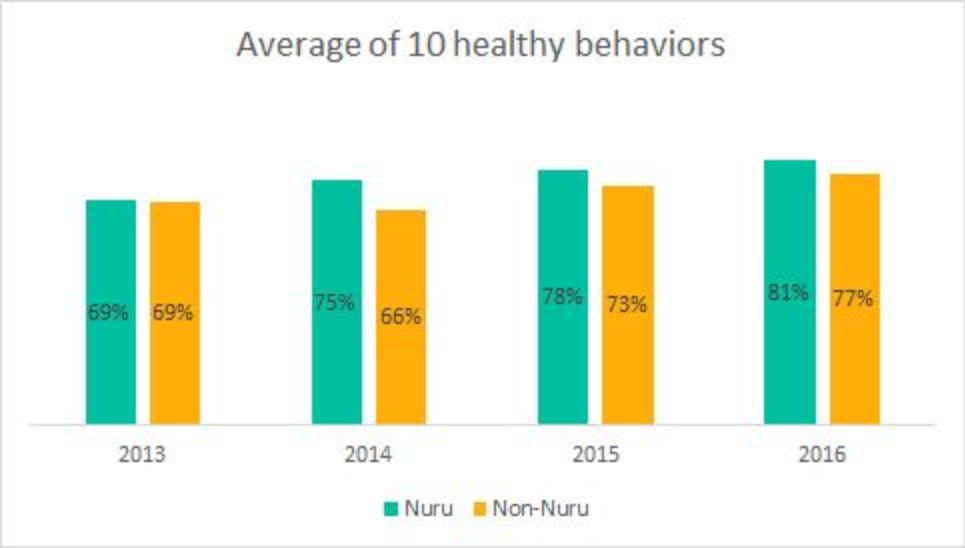
The analysis section that follows presents scorecard averages and incidence rates for the ten specific indicators. Where applicable, proportions tests for statistical significance were performed to denote statistical differences between the intervention and comparison groups.

Results

Ten Healthy Behaviors Scorecard

In 2016, Nuru households continued their upward adoption trends of healthy behaviors at an average of 4% since 2013 (Figure 1). Additionally, they maintained a higher level of healthy behaviors relative to the non-Nuru comparison group from 2014 through 2016. In contrast, non-Nuru households' average adoption rate was 2.6% with a dip between 2013 and 2014.

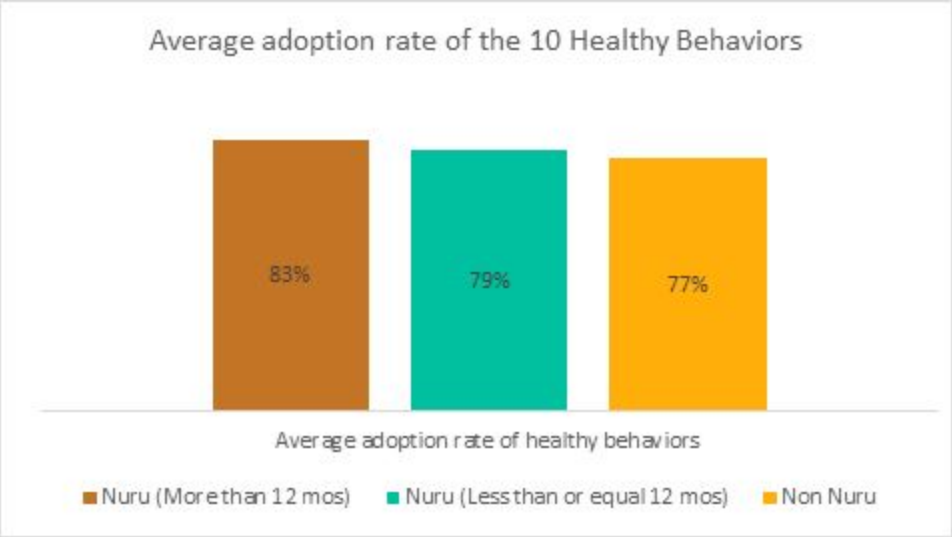
Figure 1: Average Adoption Rate of the Ten Healthy Behaviors 2013 - 2016



Nuru households who received Nuru healthcare services for over a year adopted more healthy behaviors than those who are new to the Nuru Healthcare Program and those in the non-Nuru comparison group (Figure 2). Behavior change takes time, so it is expected that households who are new to the Healthcare Program will not adopt as many healthy behaviors as those who have been working toward the healthy behaviors over a longer time.

The Nuru healthcare team applies evaluation data to improve the services they offer to Nuru Farmer families over time. These services includes helping families identify and overcome barriers to healthy behaviors, as well as understand the cost benefit analysis of disease prevention. In 2014, for example, latrine use was identified in the annual impact assessment report as a behavior that should be focused on to improve uptake of latrine use. Internal targets for increased latrine use were created and supported by refresher trainings. In 2014, latrine use was at 57%, in 2015 it was 69%, and in 2016 was 80%. The continuous monitoring data and exchange of information among field officers working at the household level allowed for adjustments during the year and progress was confirmed in the annual impact assessments from the M&E team.

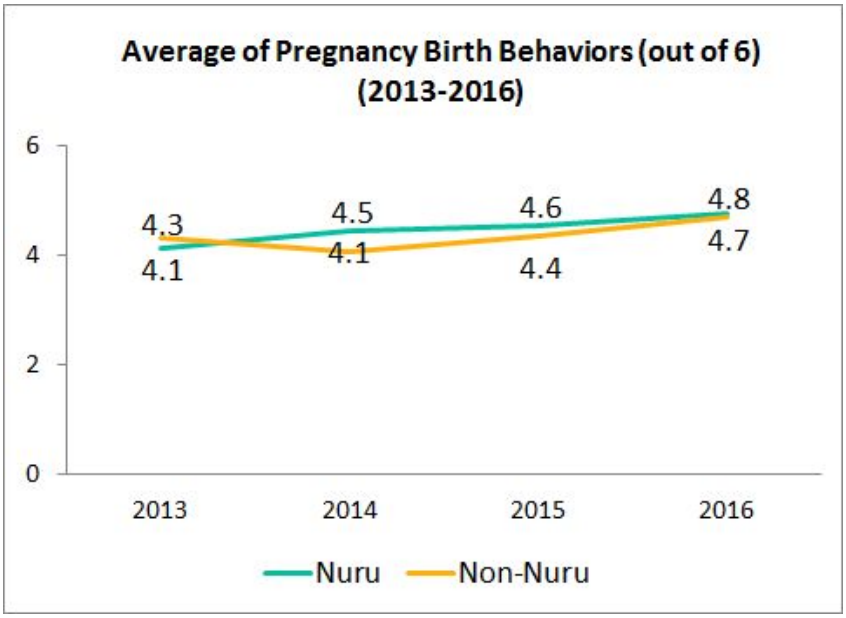
Figure 2: 2016 Average Adoption Rate of the Ten Healthy Behaviors by Length of Participation



Results Scorecard 1: Safe Pregnancy and Childbirth

In general, the Nuru group has shown a positive trend over time improving adoption of safe pregnancy and childbirth behaviors (Figure 3). The non-Nuru group's healthy behavior maintenance has fluctuated over time, but also shows a positive trend in recent years.

Figure 3 : Safe Pregnancy and Childbirth Averages 2013-2016

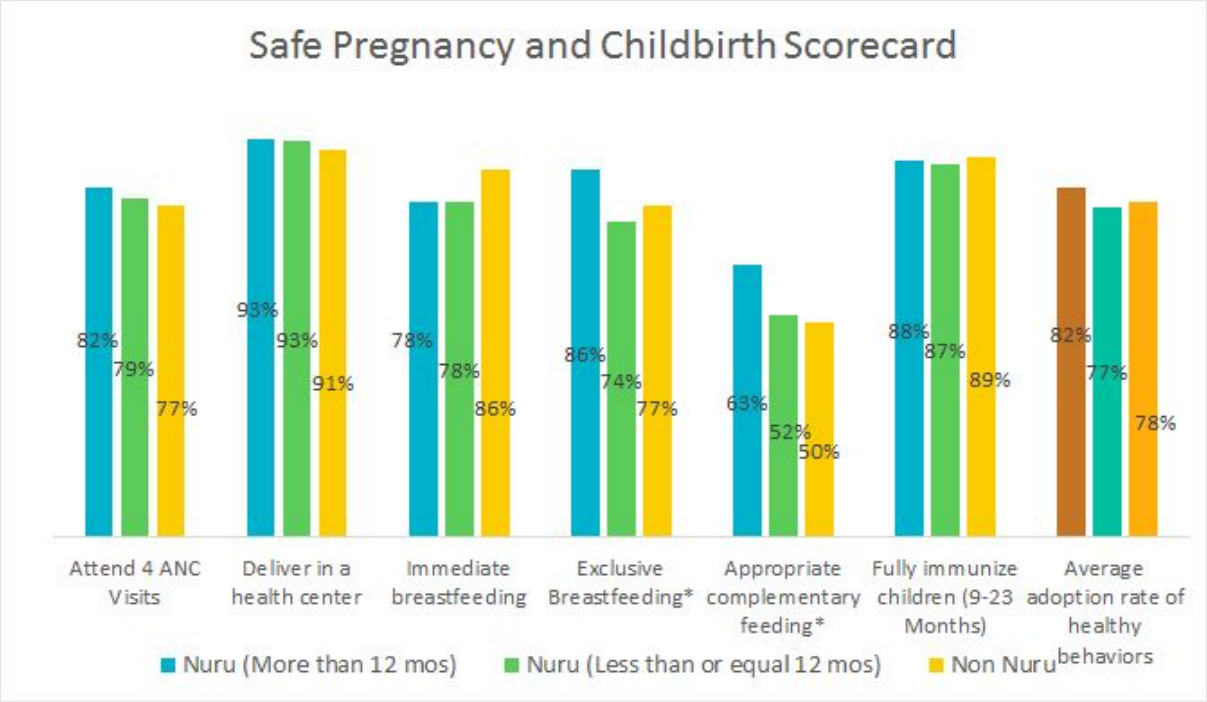


On average, the households who have worked with the Nuru Healthcare Program for a longer period of time have adopted higher levels of safe pregnancy healthy behaviors than the non-Nuru

households (Figure 4). Households who have been a part of the Nuru Healthcare Program for less than a year generally adopted slightly less safe pregnancy healthy behaviors than non-Nuru households.

Delivery in a health facility, a key indicator in MCH, had a positive trend over time in the Nuru intervention group as well as having a higher adoption rate than in the comparison group. In 2013, 54% of the Nuru group gave birth in a health facility, in 2014 it was 79%, in 2015 was 87%, and in 2016 was 93%. On the other hand, appropriate complementary feeding has been up and down across both the intervention and non-intervention groups over the years and is the most difficult behavior on this scorecard for all groups to adopt.

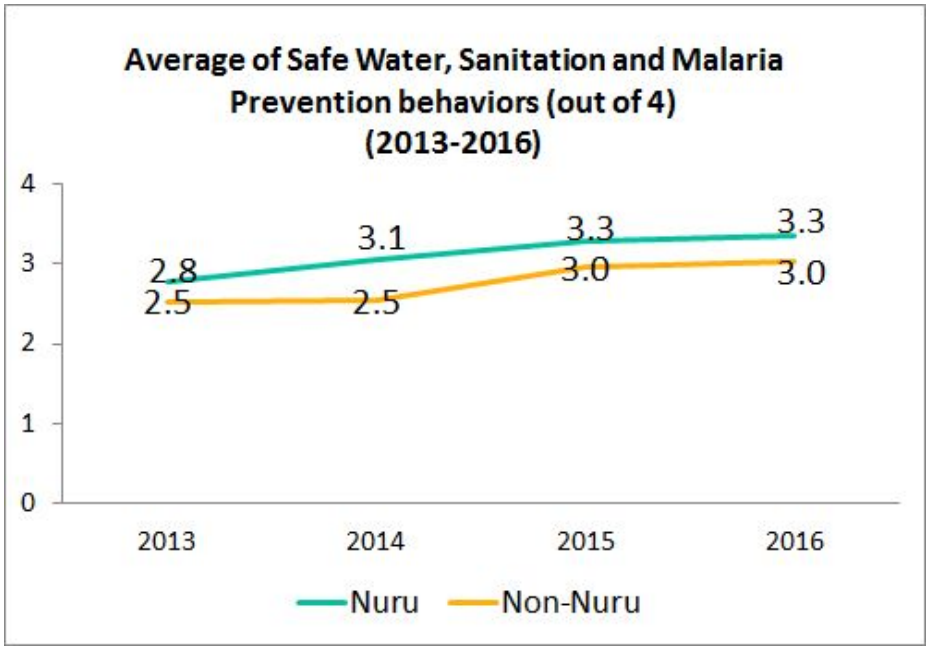
Figure 4: Safe Pregnancy and Childbirth Averages 2016



Results Scorecard 2: Safe Water, Sanitation and Malaria Prevention

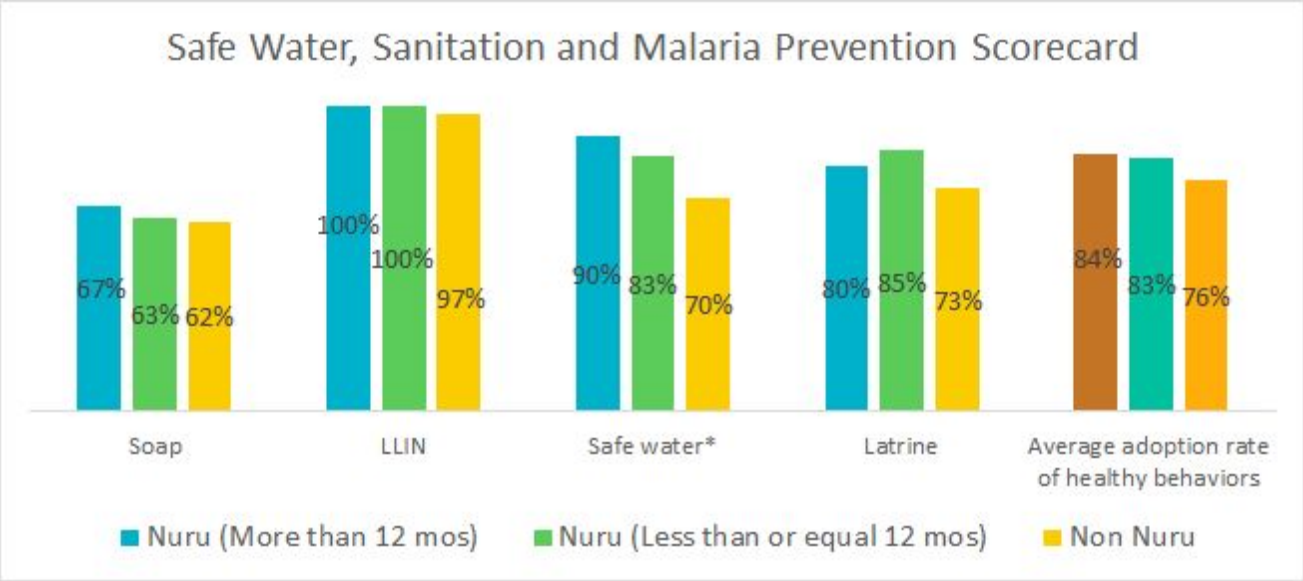
Scorecard 2 outlines indicators related to safe water, sanitation, and malaria prevention at the household level. The Nuru intervention group has consistently had higher healthy behavior adoption in this scorecard than the non-Nuru group from 2013-2016 (Figure 5). In 2016, both the Nuru and non-Nuru groups maintained the same average level of healthy behaviors as in 2015, including: drinking clean water, sleeping under a mosquito net, washing hands with soap, and using a latrine.

Figure 5: Safe Water, Sanitation and Malaria Prevention Averages 2013-2016



The hand washing with soap behavior is the most challenging behavior for all groups to adopt in this scorecard. Sleeping under a mosquito net (LLIN) is the most highly adopted behavior for all groups, but the community still struggles with malaria. Malaria is a difficult indicator to track in Kuria since tests are not widely available in the rural areas. While use of LLIN is the standard measure, nets only protect people while they sleep and the indicator does not capture malaria infections in the waking hours. Drinking safe water is the behavior that most differentiates the Nuru and non-Nuru groups in this score card with a 20% difference in adoption of the behavior between households who have had more than a year of Nuru healthcare services and non-Nuru households (Figure 6). There is a statistically significant difference between the level of adoption of healthy behaviors for the Nuru and non-Nuru groups in 3 of the 4 indicators on this score card: sleeping under a mosquito net (LLIN), drinking safe water, and use of a latrine.

Figure 6: Safe Water, Sanitation and Malaria Prevention Averages 2016



Limitations

There are a few limitations to this impact study that should be acknowledged. First, the Nuru model intentionally layers on interventions. Agriculture, the lead program, forms the cooperative and guides member selection based on criteria like land ownership. This affects measuring Healthcare's impact in the following ways:

1. Target group. Sustaining the sample size of respondents from households with children 0 -59 months is challenging.
2. Comparison group. While the Nuru and Comparison groups have largely commensurate results, it is important to note that there is only one Comparison group for all four impact programs and it was chosen based on multiple variables; not just health outcomes. Overall, the two groups are comparable and for the purpose of measuring impact, Nuru will apply difference in difference in comparing the two groups when applicable.

Conclusions and Recommendations

The trends suggest that the Nuru Kenya Healthcare Program has been successful, over time, at supporting Nuru farmer families to make meaningful choices to consistently adopt health seeking behaviors. The 2016 data also shows that those families who have participated in the Nuru Healthcare Program for more than a year are generally practicing more healthy behaviors than those who are new to Nuru.

Rates of appropriate complementary feeding for children from 7 to 23 months old and washing hands with soap at all key times to prevent diarrheal diseases are the lowest in each score card, and are areas Nuru Healthcare team should increase focus.

This report is the capstone for the current household visit healthcare model in Kenya. The former healthcare design will be replaced by the cooperative care group model to improve sustainable capacity of farmer families. Training women to be healthy behavior change agents within their own households allows returning Nuru families in Kuria West to continue towards sustained healthy behaviors. As households approach 100% adoption rates, Nuru will look to consider at what point they can graduate from Nuru Healthcare services.

Healthcare, however, is nuanced. Some behavior maintenance may be left to the community while other life or death behaviors may require continued services until the adoption rates approach closer to 100%. As communities continue to improve their healthy behaviors, Nuru will create pathways to eventually graduate out of HC services. In 2017, Nuru will research global and nationally accepted levels of healthy behavior adoption rates in a community to try to establish when there are diminishing returns to full scale service provision. Next, HC will compare those national benchmarks against historical local data to design graduation indicators and targets for our families and set up a system to support an enabling environment for sustainable healthy behavior maintenance.

Recommendations for NK M&E and HC to consider as a result of these findings are as follows:

1. Continue the Healthcare Program behavior change and tailored interpersonal communication methodology as data trends show that Nuru households are consistently improving in adopting healthy behaviors, and they are adopting more healthy behaviors than the comparison group.
2. Focus on the lowest performing behaviors that are challenging in the local environment, like appropriate handwashing with soap, in which the adoption rate went down in both the intervention and comparison groups from 2015 levels.
3. Give more focus to infant nutrition at Nuru in both immediate breastfeeding, which has higher adoption levels in the non-Nuru group, and appropriate complementary feeding for children 7 - 23 months, which has low behavior adoption across all groups.
4. As healthy behavior adoption rate continue to increase, NI should research global and national benchmarks. In addition, NK will establish indicators and targets for when a community is ready to graduate from NK HC based on both local, regional and national data.

Appendix 1: Ten Healthy Behaviors of the Nuru Kenya Healthcare Program

Healthy Behavior	Evaluation Question	Indicator
1. Sleep under LLIN	Are children sleeping under mosquito nets to prevent malaria?	Percent of children ages 0-59 months who slept under a long-lasting insecticide-treated net (LLIN) the previous night
2. Drink safe water	Are households treating their drinking water appropriately, if need be?	Percent of households who drink water from a safe source and store it appropriately or percent of households households who treat their water effectively and store it safely
3. Wash hands with soap	Are caretakers washing hands at critical times to prevent illnesses?	Average percent of caretakers who wash their hands with soap and water after defecation and before cooking or eating
4. Use a latrine	Are individuals using a latrine to prevent illnesses?	Percent of individuals who always used an appropriate latrine in the last 24 hours for defecation
5. Provide appropriate complementary feeding	Are children eating a well-balanced, nutritious diet for their appropriate age group?	Percent of children 7-23 months whose mothers feed them a combination of grains, fruits/vegetables, dairy and legumes or meat
6. Immediate breastfeeding	Are mothers immediately breastfeeding their children after childbirth?	Percent of children 0-23 months whose mothers breastfed their child within one hour after birth
7. Exclusive breastfeeding	Are mothers continuing to exclusively breastfeed until children reach six months?	Percent of children 0-23 months whose mothers exclusively breastfed children from birth through 6 months of age
8. Attend four ANC visits	Are women attending ANC visits regularly for a healthy pregnancy?	Percent of children ages 0-23 months whose mothers had four or more antenatal care (ANC) visits when they were pregnant
9. Deliver in a health facility	Are mothers delivering in a health facility?	Percent of children ages 0-23 months whose mothers delivered their child in a

		health facility
10. Fully immunize children between 9-23 months	Are children fully immunized against preventable diseases?	Percent of children ages 9-23 months who received full immunization for polio, pneumococcal, Penta 5, BCG and measles

Appendix 2: 10 Healthy Behaviors

Behavior	Target Group during intervention period	Survey Age Group
Attend four ANC visits	Pregnant mothers	Mothers of children 0-23 months
Deliver in a health center	Pregnant mothers	Mothers of children 0-23 months
Immediate breastfeeding	Households with children 0-23 months	Mothers of children 0-23 months
Exclusive breastfeeding	Households with children 0-23 months	Mothers of children 0-23 months
Appropriate complementary feeding	Households with children 7-23 months	Mothers of children 0-23 months
Fully immunize children 9-23 months	Households with children 9-23 months	Mothers of children 0-23 months
Sleep under a long-lasting insecticide treated bed net (LLIN)	Households with children 0-59 months	Mothers of children 0-59 months
Use a latrine	All households	All households
Drink safe water	All households	All households
Wash hands with soap	All households	All households