# 2018

# Maji Safi Group Report


**A Detailed Analysis of Maji Safi Group's Programs in 2018**

**Shirati, Rorya District, Tanzania**

## Maji Safi Group Overview

Maji Safi Group (MSG), "Clean Water Group" in Swahili, operates in the Rorya District of Tanzania, an area consisting of farmland and villages on the shores of Lake Victoria in the Mara Region. In the Rorya District, water is taken directly from unprotected sources that are contaminated with human, animal, and industrial waste. As a result, 99% of all drinking water is contaminated with dangerous levels of pathogens, which leads to high levels of water-related diseases and widespread waterborne and water-related outbreaks (Perel-Slater, 2011). According to Dr. Chirangi, Chief Medical Officer at the Shirati KMT District Hospital, 50% of illnesses in the Rorya District come from water-related and waterborne diseases, such as schistosomiasis, cholera, and dysentery. To combat this situation, MSG began as a project under the Shirati KMT District Hospital in May 2012 to implement prevention-focused programs that reduce the occurrence of waterborne diseases.

In July 2014, to ensure sustainability within the Tanzanian organization, Maji Safi Group became a Tanzanian Nonprofit Limited Liability Company. MSG builds and trains teams of local, mostly female, Community Health Educators (CHEs), who lead disease prevention outreach and interventions. MSG was founded with the goal of developing and implementing sustainable and effective programs through participatory methods, relying on our CHEs' expertise, community recommendations, and needs assessments. Currently, MSG effectively runs 14 community programs. Our CHEs engage residents through home visits, hospital-based programs, school groups, singing and dance groups, sports, and other community events (e.g. the local radio station, places of business, and local markets). These programs touch a wide spectrum of stakeholders, such as parents, teachers, healthcare providers, government leaders, and youths. Each MSG program was created to reduce the occurrence of preventable diseases that would otherwise continue to paralyze development. MSG does this by empowering women, youths, and vulnerable groups to be changemakers in terms of their community's public health. To reach this goal, MSG addresses the root causes of recurring preventable diseases through water, sanitation, and hygiene (WASH) and healthy lifestyle education.

MSG's organizational approach embodies Confucius' philosophy: "Tell me and I will forget. Show me and I may remember. Involve me and I will understand". MSG believes that by engaging communities with fun and interactive lessons on disease prevention, participants will have the knowledge and motivation to improve their water, sanitation, and hygiene (WASH) behaviors. Since May 2012, Maji Safi Group has helped local authorities fight four cholera outbreaks and has directly taught approximately 635,000 Mara Region residents WASH lessons and the importance of improving personal and community WASH behaviors.

| Maji Safi Group Facts | |
|---|---|
| **Country** | Tanzania |
| **Region** | Mara |
| **Approximate Population of Mara Region** | 1,700,000 Residents |
| **Districts MSG Works in and Their Approximate Populations** | Rorya District = 265,000 Residents<br>Musoma Rural = 208,000 Residents<br>Musoma Town = 135,000 Residents |
| **Year Established** | 2012 |
| **Organization Type** | Nonprofit LLC, incorporated in Tanzania July 1, 2014. |
| **"Maji Safi" is Swahili for** | "Clean Water" |
| **MSG Mission Statement** | To promote health and disease prevention in underserved and impoverished areas through holistic community empowerment and by working predominantly with local women and youth. |
| **Number of Programs** | 14 Programs |
| **Approximate number of Residents Reached through MSG Programs (2012-2018)** | 860,253 including repeat listeners of radio shows. |
| **Number of Community Health Educators** | 17 |

## Background Information on WASH-Related Diseases

Maji Safi Group (MSG) educates the community on the prevention of water-related diseases. Specifically, MSG teaches 16 different lessons on how to change WASH-related behaviors, so residents can protect themselves, their families, and their communities against contracting water-related diseases. While CHEs educate their communities on several types of water-related diseases, four diseases are monitored specifically throughout each program (schistosomiasis, amoebiasis, intestinal worms, and malaria).

Waterborne and water-related diseases can be transmitted through four different transmission routes (Choffnes & Mack, 2009). These four transmission routes are classified as waterborne, water-washed, water-based, and water-related insect vectors (Choffnes & Mack, 2009). Waterborne disease transmission occurs through ingestion of water that contains disease pathogens (Choffnes & Mack, 2009). The water-washed transmission route is through improper hygiene that results in oral contact with feces on hands or body (Choffnes & Mack, 2009). Skin contact with unsanitary water that contains aquatic hosts carrying pathogens is a water-based transmission path. Lastly, "water-related insect vectors" are through being bitten by an insect that breeds and lives near water (Choffnes & Mack, 2009, p. 16).

### *Schistosomiasis*

Schistosomiasis is a water-based parasitic disease that is transmitted through skin contact with freshwater snails that hold the eggs of the Schistosoma worm (Madinga, Linsuke, Mpabanzi, Meurs, Kanobana, Speybroeck, Lutumba, and Polman, 2015). This Neglected Topical Disease (NTD) is common in tropical and sub-tropical regions that have a high predominance of unsanitary conditions and unsafe water sources (Madinga et al., 2015). These unsanitary conditions are typically caused by the open defecation and urination of infected individuals into water sources in the region (Madinga et al., 2015). There are five types of schistosomiasis (CDC, 2012), but two that are most common: S. mansoni and S. haematobium (Madinga et al., 2015). S. mansoni eggs are excreted and diagnosed by examining fecal samples, while S. haematobium eggs are excreted and diagnosed through urine samples (CDC, 2012). Schistosomiasis can cause acute symptoms in an infected individual, including rashes, blood in urine or stool, headaches, and diarrhea (CDC, 2012). Without treatment, schistosomiasis can also result in anemia (Friedman J.F., Kanzaria, H.K., & McGarvey, S.T., 2005), cognitive delays (Jukes, Nokes, Alcock, Lambo, Kihamia, Ngorosho, Mbise, Lorri, Yona, Mwanri, Baddeley, Hall, Bundy & Partnership for Child Development, 2002), and stunting (Stephenson, Latham, & Ottesen, 2000).

### *Amoebiasis*

Amoebiasis is classified as a water-washed disease caused by the parasite Entamoeba histolytica (Stanley, 2003). Amoebiasis is common in underdeveloped countries located in the tropics that have poor sanitation and hygiene practices ("Amoebiasis", 2015). The disease spreads through ingesting fecal matter in food or water or from person-to-person ("Amoebiasis", 2015). For many individuals with amoebiasis, their bodies can resolve the illness without the individual experiencing any symptoms of the disease (Stanley, 2003). However, 10%-20% of infected individuals ("General Information", 2015) develop symptoms, which may include watery or bloody diarrhea or tenderness and pain in their abdomen (Stanley, 2003). For more severe cases, amoebiasis may cause an amoebic liver abscess, which could rupture through the diaphragm causing respiratory distress, as well as produce urinary tract problems, genital diseases, or even amoebic brain abscesses (Stanley, 2003).

### *Urinary Tract Infections (UTIs)*

Although a urinary tract infection (UTI) is not a water-related disease, it is one of the most common types of infections within the body (Mayo Clinic Staff, 2015) and appears in alarmingly high rates in underdeveloped countries where poor water and sanitation access is predominant (Mwaka, Mayanja-Kizza, Kigonya, and Kaddu-Mulindwa, 2011). UTIs are caused by a "microbial colonization" within the urinary system and can be both complicated and uncomplicated in nature (Mwaka et al., 2011, pp. 182). Complicated UTIs are caused when a "host illness" exists that enables the spread of the UTI to the individual, while an uncomplicated UTI is contracted without any underlying issues within the urinary tract (Mwaka et al., 2011, pp. 182). While some people remain asymptomatic, other people experience pain or a burning sensation when urinating, fever, and lower back pain or abdominal pressure (NIH, 2015). If UTIs are left untreated, they can cause permanent kidney damage or scarring as well as sepsis in a patient (Mayo Clinic Staff, 2015). Furthermore, UTIs can pose a dire threat for pregnant women. UTIs during pregnancy have been associated with an increased risk of "intrauterine growth restriction, pre-eclampsia, caesarean delivery and preterm deliveries" and can even result in child or maternal mortality (Hamdan, Ziad, Ali, & Adam, 2011, p. 2).

### *Intestinal Worms*

Intestinal worms or parasites, like amoebas, are common water-washed parasitic infections found in "hot and humid environments" among poor communities with low access to sanitation facilities, clean water, and adequate housing (Oliveira, Ferreira, Atouguia, Fortes, Guerra, & Centeno-Lima, 2015). Once again, many infected people are asymptomatic; however, of those that are not, the clinical symptoms are wide-ranging (Rice, Skull, Pearce, Mulholland, Davie and Carapetis, 2003). Symptoms range from mild gastrointestinal discomfort and weakness (Rice et al., 2003) to iron deficiency anemia, stunting or even death (Oliveira et al., 2015).

## MSG's 6-Year Impact

Over the six years we have now been in operation, we have learned so much and have reached thousands with our lifesaving WASH education. Each year, we learn from the past year and adjust programs, measurements, and curriculum to make an even more positive impact on the communities we teach, see Figure 1. Overall, including the radio program, we have cumulatively reached 860,253 residents and have directly taught 265,037 people WASH lessons, see Figure 2 and Figure 3.

Additionally, MSG continued to collect extensive information about disease rates during the 2018 Health Screening Program, and as they represent the fourth year in our longitudinal study, these rates are extremely important to assessing the overall impact MSG's lessons are having on WASH behaviors in the community.

Over four years of screenings, we have found a consistent pattern: People who have been exposed to MSG's WASH education are much healthier than those who have not received such education. Prevention is proving to save MSG program participants from continuously contracting WASH-related diseases. This year, it has also become apparent that those related to and/or interacting with program participants, whether through a family member or an entire school, benefit from the health education their connection is learning. Both family members and students from schools that have partnered with MSG for a long time had lower WASH disease rates. Figures 4-8 demonstrate how disease rates have varied over the years. The common trend we are seeing is that each consecutive year, current and past program participants have a lower disease rate than non-program participants (except for amoebiasis in 2015, schistosomiasis in urine in 2015, and UTI rates in 2015, 2016, and 2017). Overall, we are seeing that our lifesaving education is reaching thousands and helping their communities become more knowledgeable about WASH issues, which in turn improves their health.

*Figure 1: MSG's 6-Year Impact (2012-2018)*

| Program/ Activity | Number Reached August 2012 – August 2013 | Number Reached September 2013 – December 2014 | Number Reached January 2015 – December 2015 | Number Reached January 2016 – December 2016 | Number Reached January 2017 – December 2017 | Number Reached January 2018- December 2018 | Total Number Reached Per Program |
|---|---|---|---|---|---|---|---|
| **Home Visit** | 1,699 Family Members | 1,025 Family Members | 2,464 Family Members | 1,207 Family Members | 2,755 Family Members | 1,323 Family Members | 10,473 Family Members |
| **After School** | 3,808 Students | 1,243 Students | 931 Students | 1,588 Students | 2,575 Students | 405 Students | 10,550 Students |
| **Disease Prevention Center (DPC)** | 791 Visitors to DPC | 802 Visitors to DPC | 1,210 Visitors to DPC | 1,032 Visitors to DPC | 1,445 Visitors to DPC | 1,193 Visitors to DPC | 6,473 Visitors to DPC |
| **Singing and Dance Group (including performances)** | 756 Community Members | 1,048 Community Members | 1,746 Community Members | 3,250 Community Members | 7,858 Community Members | 4,015 Community Members | 18,673 Community Members |
| **Maji Safi Cup** | 2,032 Participants | 1,697 Participants | 4,170 Participants | 6,936 Participants | 8,054 Participants | 3,822 Participants | 26,711 Participants |
| **Outreach (events, market visits, stores and salons, restaurants)** | 1,907 Community Members | 6,521 Community Members | 8,827 Community Members | 7,699 Community Members | 7,278 Community Members | 13,022 Community Members | 45,254 Community Members |
| **Female Hygiene** | - | 1,282 Participants | 7,890 Participants | 2,342 Participants | 2,502 Participants | 4,876 Participants | 18,892 Participants |
| **Hotline*** | - | 1,326 Participants | 4,603 Participants | 1,467 Participants | 1,830 Participants | 1,513 Participants | 10,739 Participants |
| **Radio Show Listeners** | - | 31,500 Listeners | 49,000 Listeners | 98,000 Listeners | 231,000 Listeners | 185,200 Listeners | 594,700 Listeners |
| **Radio Show Callers** | | | | 206 Direct Callers | 254 Direct Callers | 144 Direct Callers | 604 Direct Callers |
| **Radio Show SMS Messages** | - | - | - | - | - | 372 SMS Messages | 372 SMS Messages |
| **Health Screenings** | - | - | 3,060 Screened | 5,160 Screened | 3,071 Screened | 6,911 Screened | 18,202 Screened |
| **Cholera Outreach** | - | - | 53,237 Participants | 41,593 Participants | - | - | 94,830 Participants |
| **Male Hygiene** | - | - | - | 348 Participants | 772 Participants | 2,485 Participants | 3,605 Participants |
| **Arborloo Toilet** | - | - | - | - | 175 Users | - | 175 Users |
| **Total reached each year (excluding Radio Show, but including callers)** | 10,993 Community Members | 14,944 Community Members | 88,138 Community Members | 72,622 Community Members | 38,569 Community Members | 39,565 Community Members | 265,037 Community Members |
| **Total reached each year (including Radio Show)** | **10,993 Community Members** | **46,444 Community Members** | **137,138 Community Members** | **170,828 Community Members** | **269,569 Community Members** | **225,281 Community Members** | **860,253 Community Members** |

**Notes:** *Hotline numbers indicate number of SMS messages sent/received and number of incoming and outgoing calls made.

**Radio Show is estimated to reach approximately 3,500 listeners per show aired at Rorya FM and 6,400 listeners per show aired at Sachita FM. This number may indicate repeat listeners as well.

*Figure 2: Cumulative Number of Total Number of Program Participants Reached*

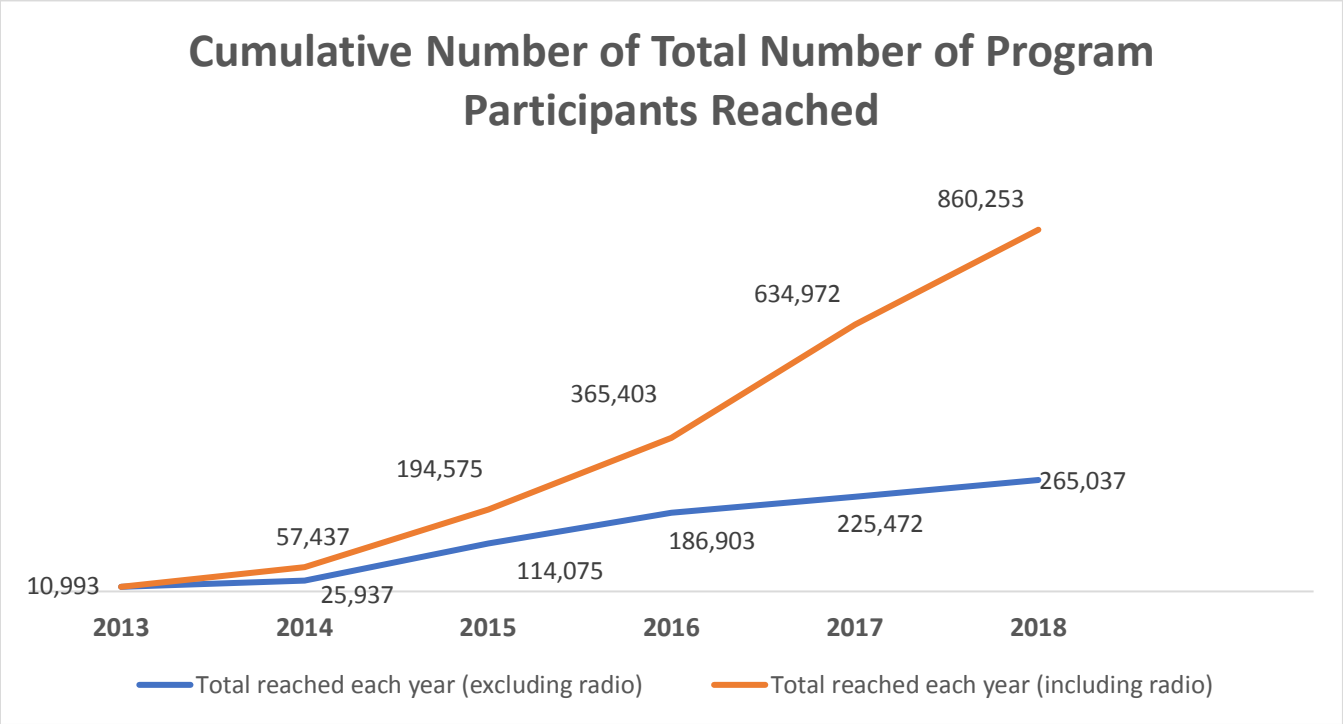



*Figure 3: Cumulative Number of Program Participants by Program*

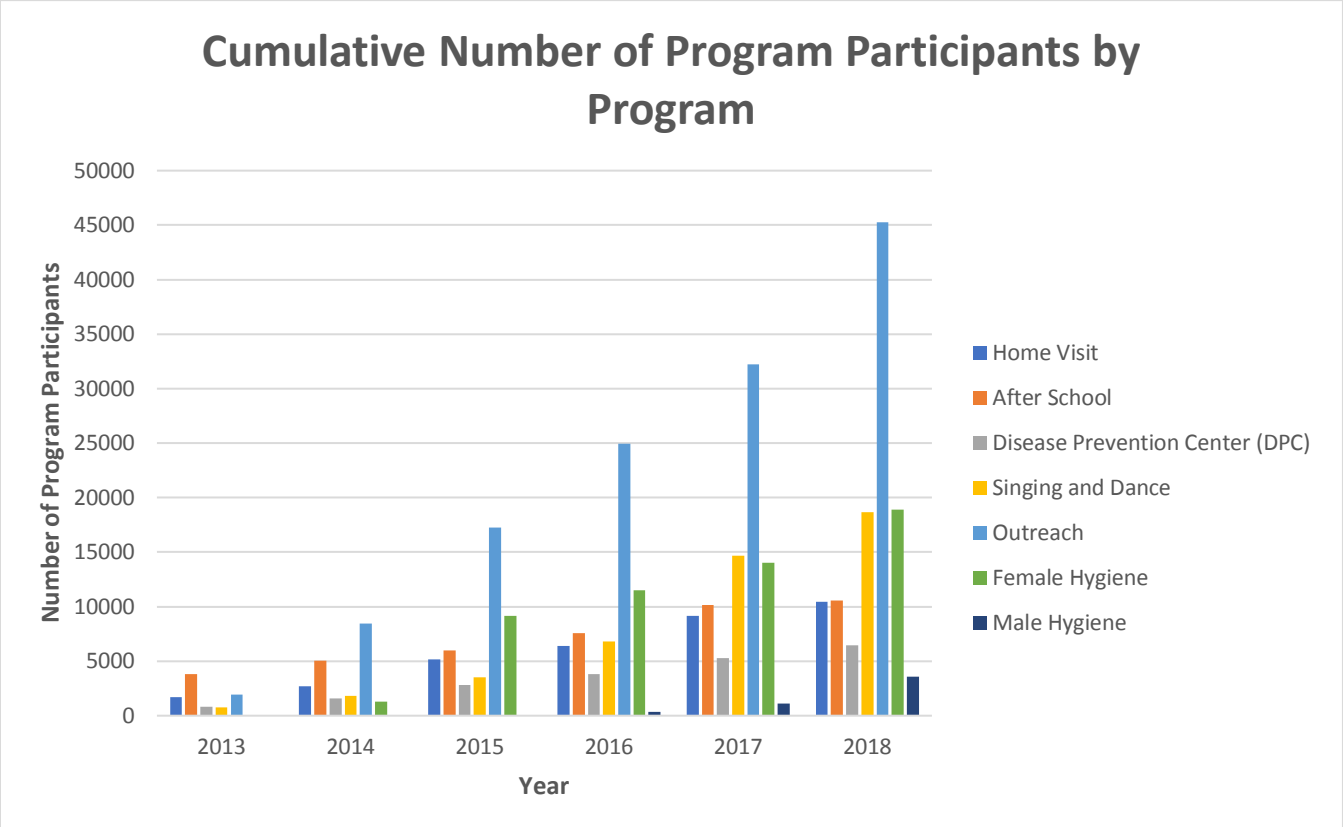
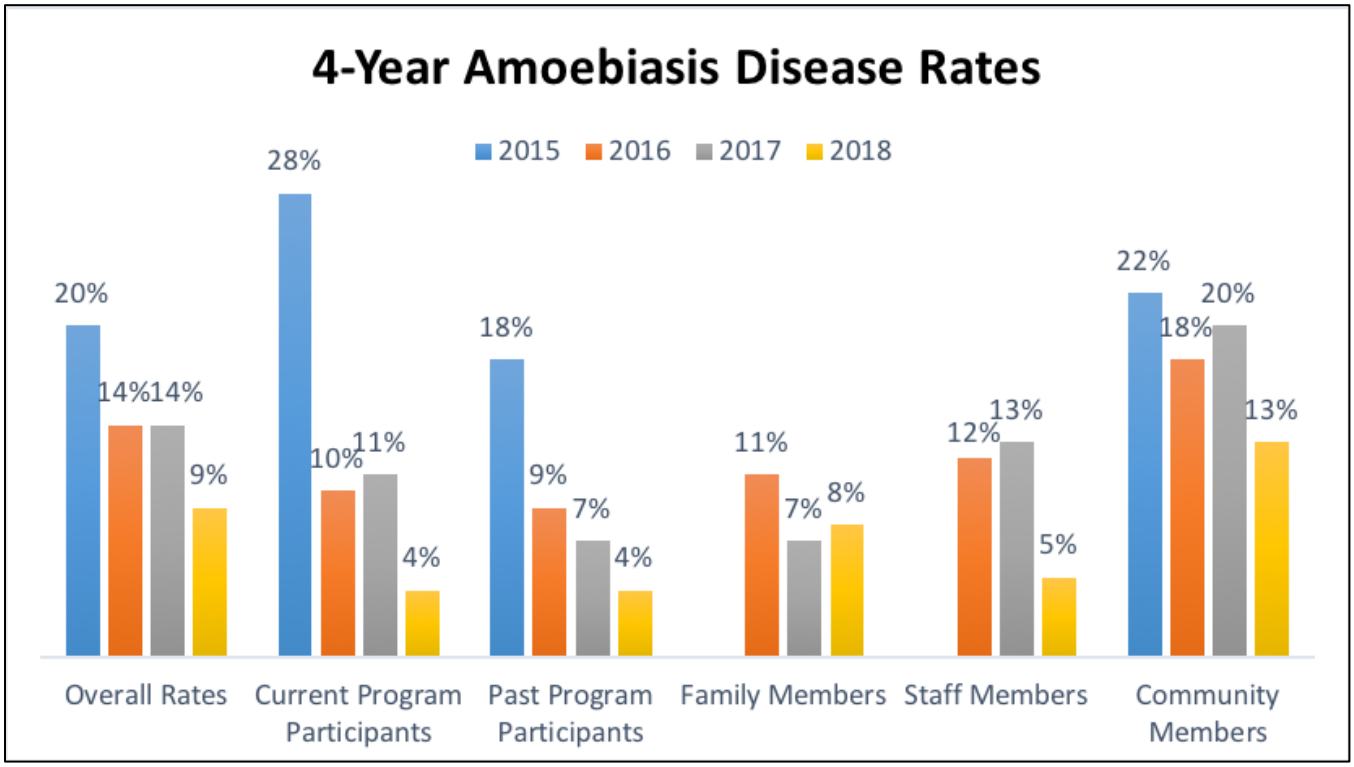
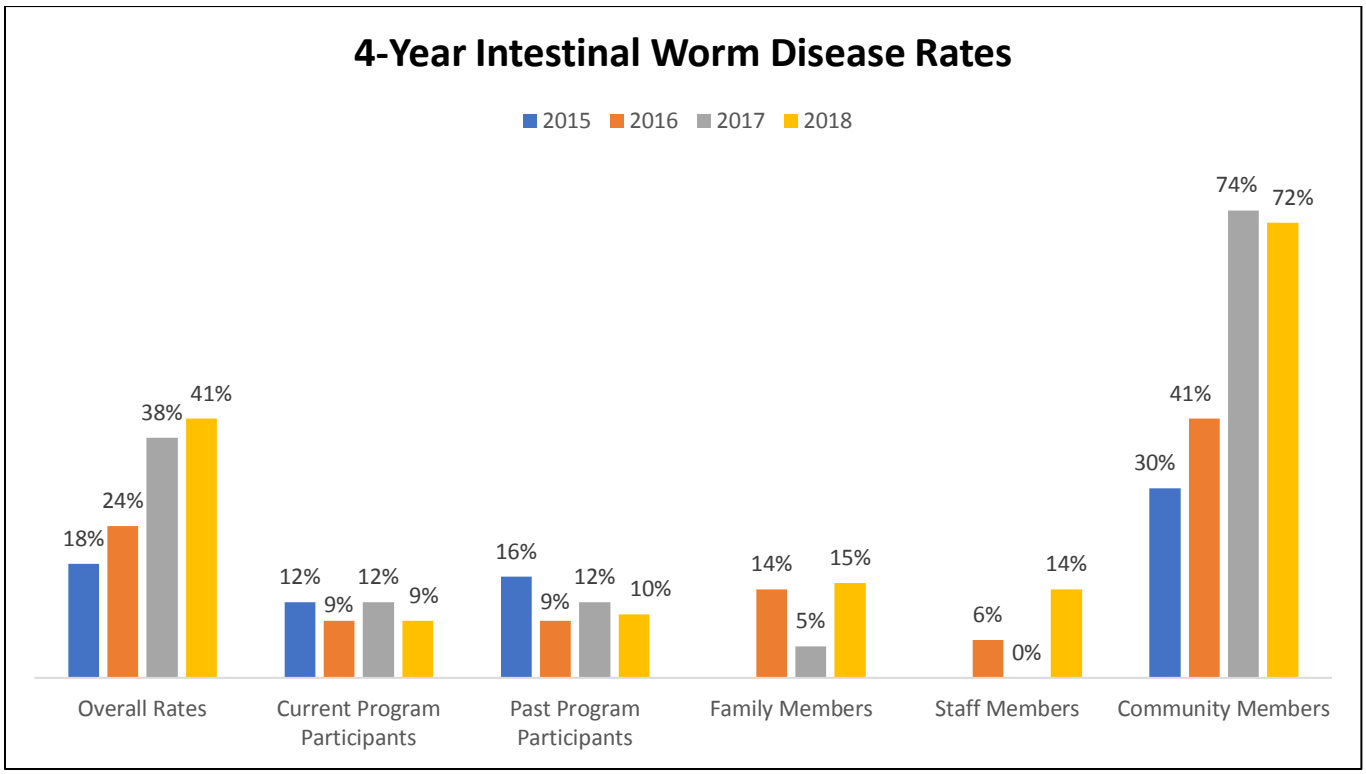


*Figure 4: 4-Year Amoebiasis Disease Rates*



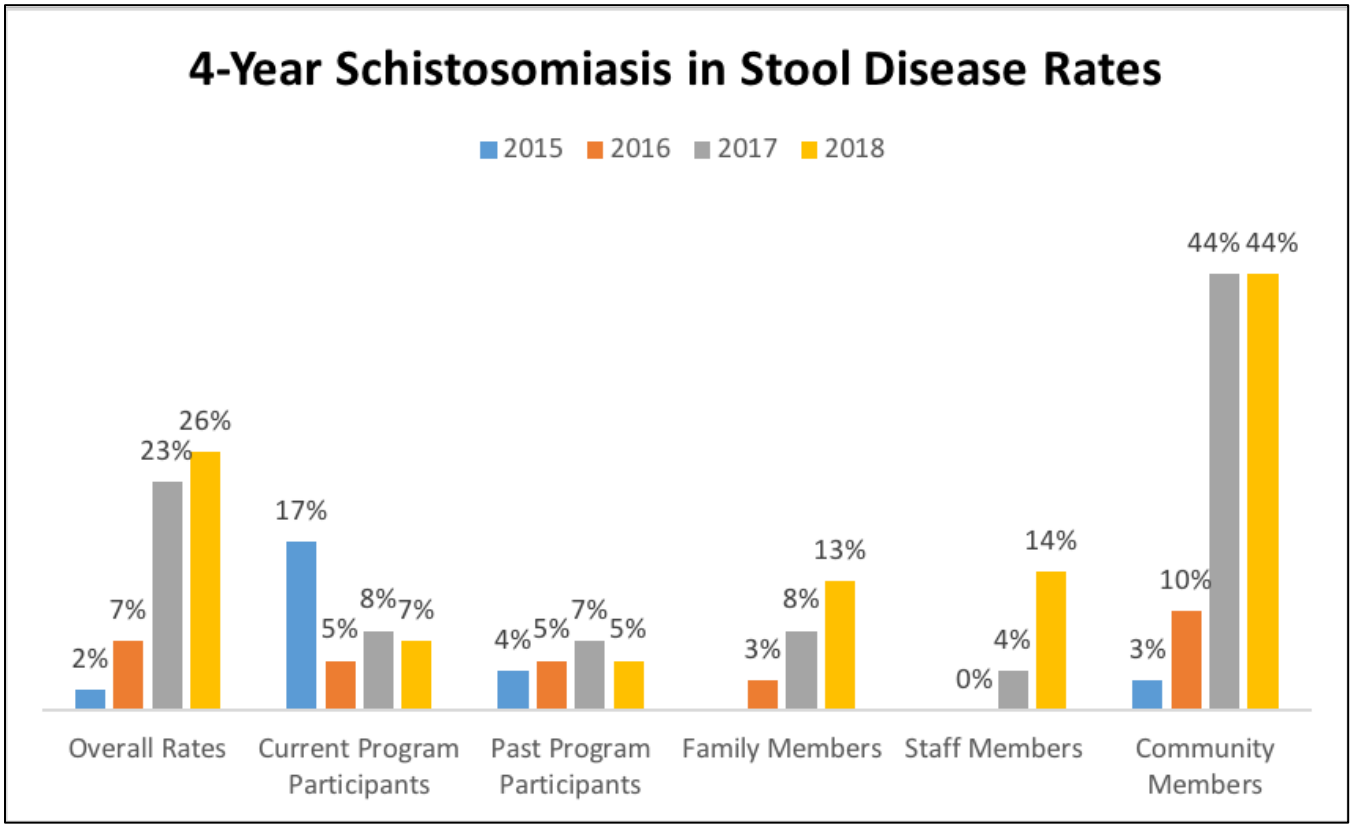

**Note: Family members and staff members were not tested in 2015. (Community Members = Non-program participants).*

*Figure 5: 4-Year Intestinal Worm Disease Rates*



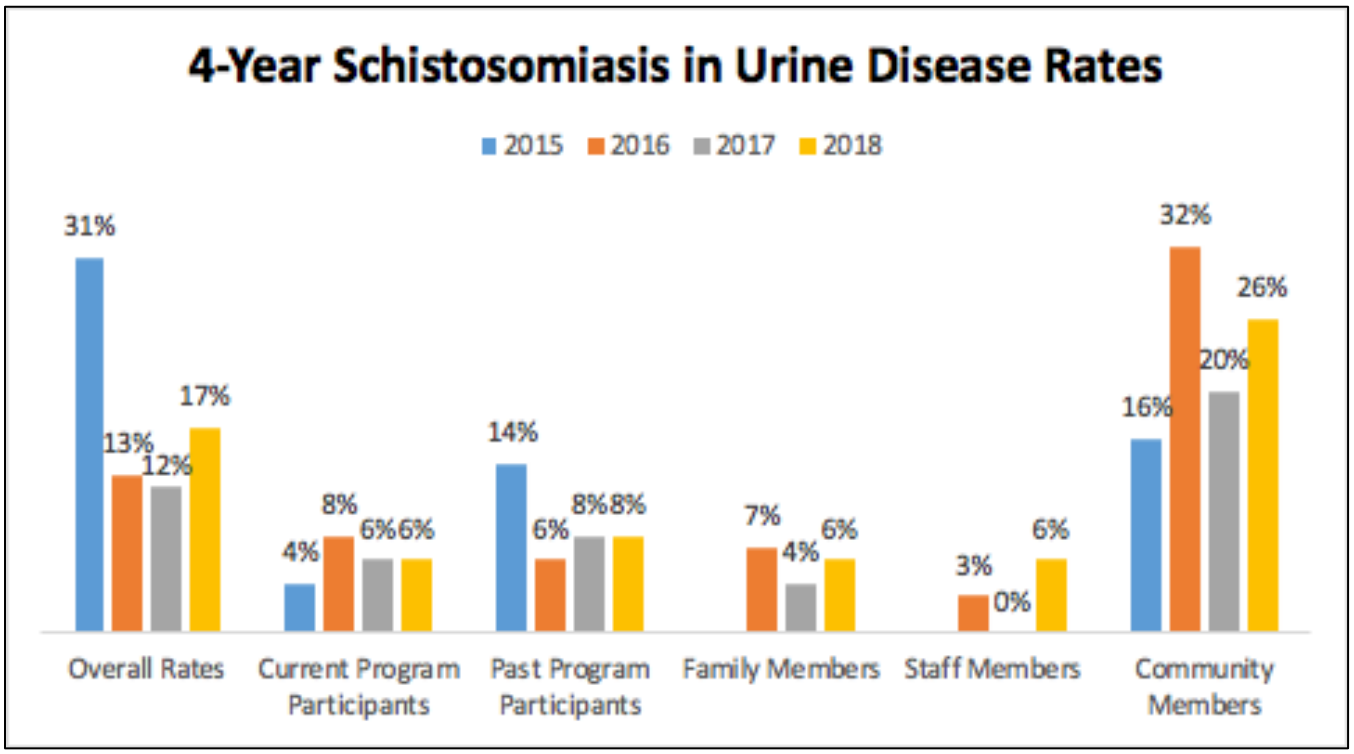

**Note: Family members and staff members were not tested in 2015. (Community Members = Non-program participants).*

*Figure 6: 4-Year Schistosomiasis in Stool Disease Rates*




**Note: Family members and staff members were not tested in 2015. (Community Members = Non-program participants).*

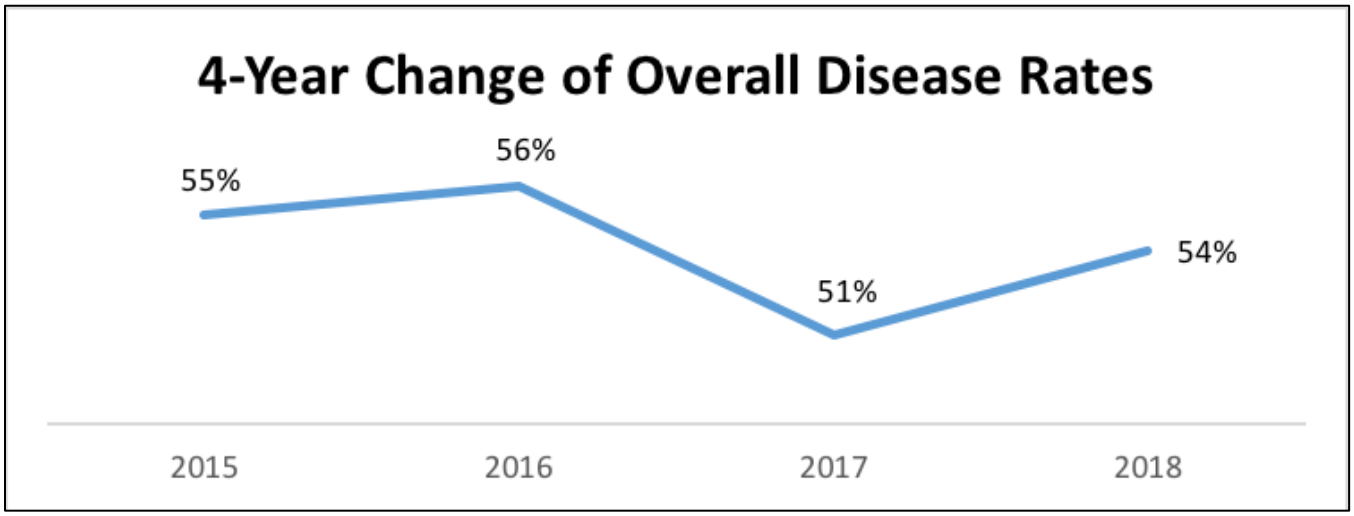
*Figure 7: 4-Year Schistosomiasis in Urine Disease Rates*




**Note: Family members and staff members were not tested in 2015. (Community Members = Non-program participants).*

When looking at the four-year change in overall disease rates (i.e. calculating the percentage of those screened who have one or more diseases), there is a slight increase in overall disease rates between 2017 and 2018. This was to be expected as MSG expanded the Health Screening Program into new communities and schools that had not received any MSG education or intervention in the past (i.e. participants in these new areas had not received MSG's WASH lessons prior to being screened). This overall increase in disease rates is indicated in Figure 8.

*Figure 8: 4-Year Trend of Overall Disease Rates*




## 2018 Overview

In 2018, Maji Safi Group Tanzania accomplished many goals with the financial assistance from Maji Safi Group USA, LUSH Charity Pot, First Foundation, INTERTEAM, Beyond our Borders, Friends of Tanzania, the Posner Center, the Tanzanian government, and other generous donors. MSG continued to first and foremost invest in its Community Health Educator (CHE) Program by providing continuous education and ensuring the WASH lessons provided to the community were up-to-date and properly understood. MSG focused on providing its staff with proper benefits and invested in their lives and the lives of their families. MSG also hired a new Program Manager and Accountant to become a more efficiently run organization.

Overall, MSG reached over 225,000 community members, including MSG radio show listeners, event spectators, and announcement listeners. When only looking at the lessons taught directly (one-on-one teaching), CHEs reached almost 40,000 Mara Region community members with lifesaving WASH education.

MSG continued to maintain and increase organizational partnerships during 2018. Our major past partners included TAWASANET (Tanzania Water and Sanitation Network), TAFIRI (Tanzania Fisheries Research Institute), INTERTEAM, the City of Zurich, First Foundation, village and district councils, regional and district level governments, the Shirati KMT District Hospital, Washington University in St. Louis, the WHO, the University of Dar es Salaam, Lund University and the LUSH Foundation. Our new partners included the Posner Center for International Development, Africa School Assistance Program (ASAP), Rustic Pathways, Anuflo Industries, Tanzania Menstrual Hygiene Management Coalition, and the Mortenson Center at CU Boulder.

MSG continued to maintain its existing programs and focused on creating sustainable change among program participants. Our participatory model has gained acceptance in the community, and our monitoring and evaluation results indicate that Shirati community members are changing their WASH behaviors and becoming healthier. This is seen especially with MSG

program participants and participants' families who have worked with MSG throughout the years. The rest of this report gives a detailed analysis of each program explaining the program's reach, successes, and opportunities for improvement.

## 1. Community Health Educator Program

Maji Safi Group employs full-time Community Health Educators (CHEs), also known as *Mabalozi wa Maji*, to promote proper water, sanitation, and hygiene (WASH) practices. MSG trains and certifies CHEs to teach disease prevention methods, such as correctly filtering and treating water, cleaning and preparing food, thoroughly washing hands, and practicing proper menstrual hygiene management. CHEs are the face of Maji Safi Group in the Mara Region – they are responsible for facilitating and leading all of MSG's interventions, and, as they speak the local language and understand their community's history and culture, they are a highly effective group in terms of initiating WASH behavior change.

Hiring Shirati residents also provides employment opportunities and builds local capacity. In addition, as women typically are key changemakers in development, 82% of MSG's CHEs are female. Quality employment with social security and health insurance benefits improves the health of their families and ensures that their children can stay in school. When MSG employees invest in healthy practices in their homes and obtain financial stability for their families, they are further empowered to be WASH leaders and role models in their communities.

MSG continued working with 17 CHEs in 2018. Beginning in September, one of these CHEs was sponsored by Chelsea Hackett to attend an institute of higher learning to improve her education and increase her professional skills within MSG. She attended Buhare Community Development Training Institute for a one-year Community Development course. Two other CHEs who had been sponsored in 2017 to attend the KMT Shirati Nursing School for a one-year Community Development course graduated in October and returned to MSG as full-time employees ready to utilize the new skills they had learned during the previous year.

Every year, CHEs go through evaluations where the management retests their WASH knowledge. The WASH assessments are comprised of a written and an oral exam. The oral exam helps management assess how CHEs teach WASH information in the field. In 2018, we administered an oral WASH evaluation exam in August. The average WASH knowledge score amongst the CHEs was 88%. This average is encouraging as we strive to have all CHEs perform at 85% or higher during examinations.

## 2. Learning Tools

MSG spreads WASH and disease prevention awareness through various mediums. Wall murals, painted by local artists, provide a constant reminder of WASH best practices. These paintings visually demonstrate disease prevention techniques, such as washing your hands properly, brushing your teeth, and using the toilet. In conjunction with other MSG outreach programs, these murals are easily accessible and long-lasting learning tools for the entire community.

Our skilled Community Arts Coordinator (CAC) and our INTERTEAM Development Worker accomplished many tasks this year. Our CAC, a commissioned artist, completed painting four murals at Katuru and Tai Secondary Schools and Sota and Majengo Primary Schools. These murals depicted various ways to manage menstrual hygiene and proper behaviors to ensure that water, sanitation, and hygiene practices are upheld. Along with murals, the CAC worked hard throughout the year to help each program create banners and educational handouts.

The INTERTEAM Development Worker assisted with capacity building on our management team, specifically with our Program Manager. She also worked hard to ensure that our Learning Tools booklets were up to date with current data for use in our many programs. The menstrual cup pilot study we conducted in partnership with Lund University and the

University of Dar es Salaam was finalized in 2018, as was an educational film that Lund University created to document the study.

## 3. Home Visit Program

The Home Visit Program was MSG's first program, started in August 2012. From the beginning, teaching female heads of households, families, and vulnerable groups about WASH and disease prevention via one-on-one lessons at their homes has been a priority. The goal of this program is to teach community members how to improve their WASH behaviors in their home environments. During the non-farming dry season, CHEs conduct home visits with local families. During their first visit, the CHEs conduct intake assessments of the families' current WASH and health situation. Two hour-long WASH lessons are then provided to the families based on their specific WASH needs. The number of visits is also based on these needs. Once the CHEs finish teaching the MSG curriculum, they conduct a post assessment with the families to measure their WASH behavioral changes. Post assessments are conducted within two months of the first set of WASH lessons and/or followed up by calling participants on the MSG Hotline.

In 2018, MSG CHEs visited 180 families through the Home Visit Program to provide a series of one-on-one lessons at their homes. While the lessons were taught primarily to female heads of households, the education we provided benefitted entire families. MSG reached 1,323 people in 180 families. We found that the average family has seven members. This year, MSG focused on reaching fewer families with more intensive education and instruction on how to protect their water supply instead of reaching a higher number of families, but spending less time educating them. This proved beneficial to the families, as they were able to receive more education through longer teaching sessions.

*Figure 9: Home Visit Participants' Location*

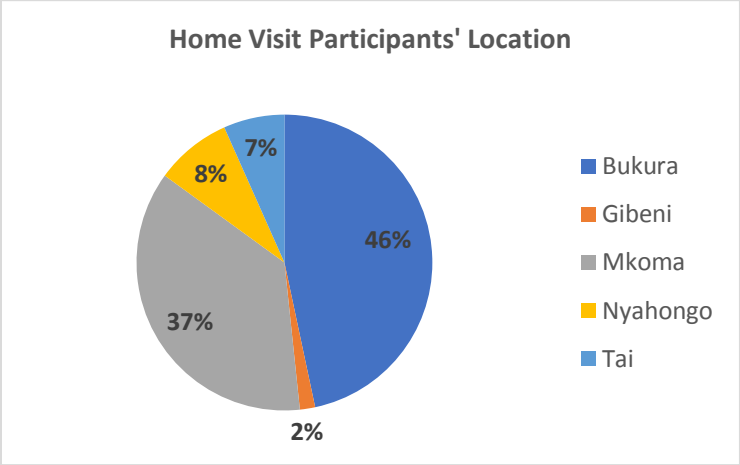



*Figure 10: Percentage of Home Visit Participants' Gender*

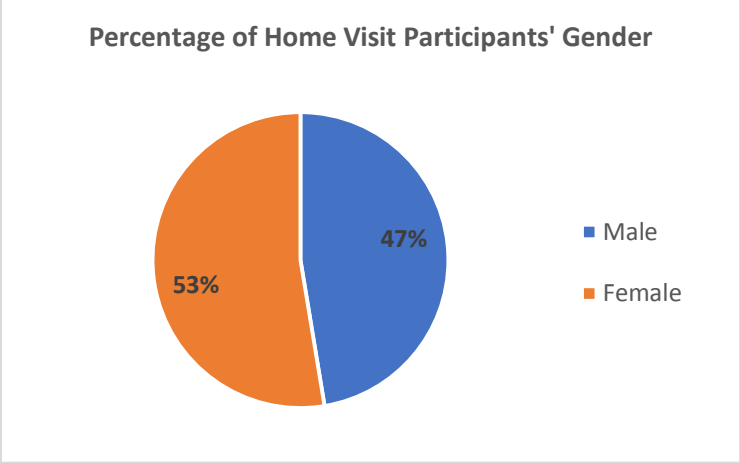


*Figure 11: Percentage of Home Visit Participants' Ages*

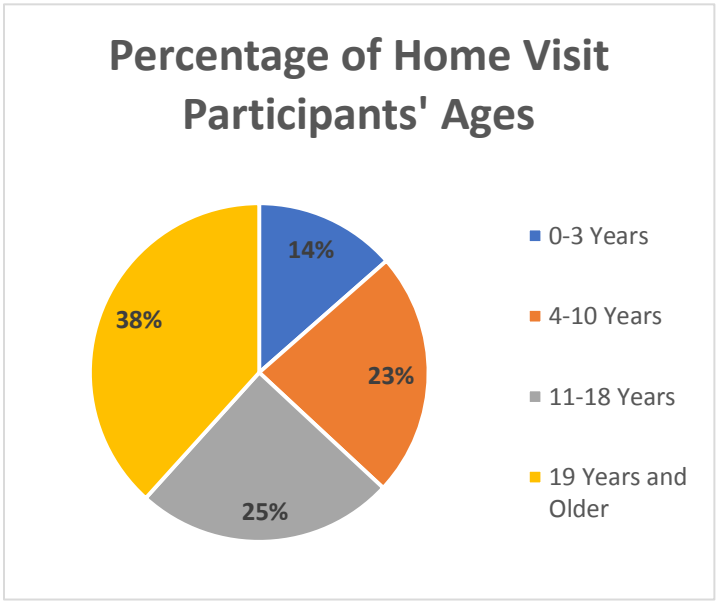



*Figure 12: Home Visit Participants' Professions*

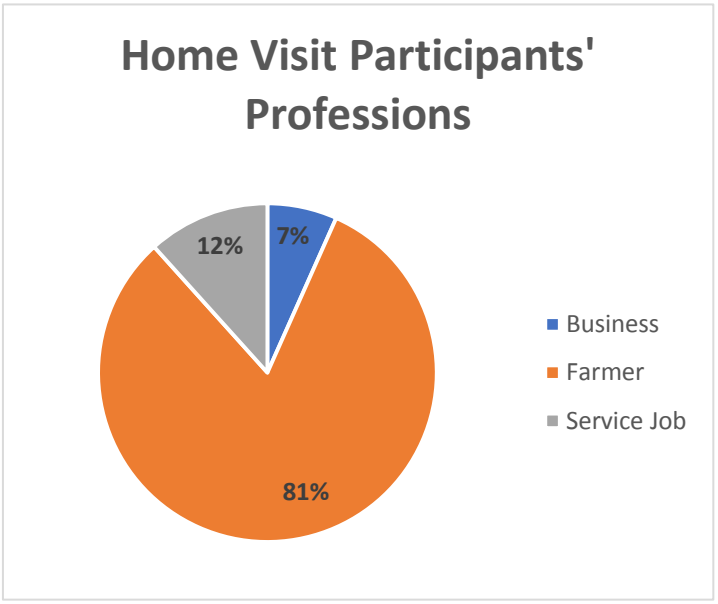



*Figure 13: Home Visit Participants' Sources of Water*

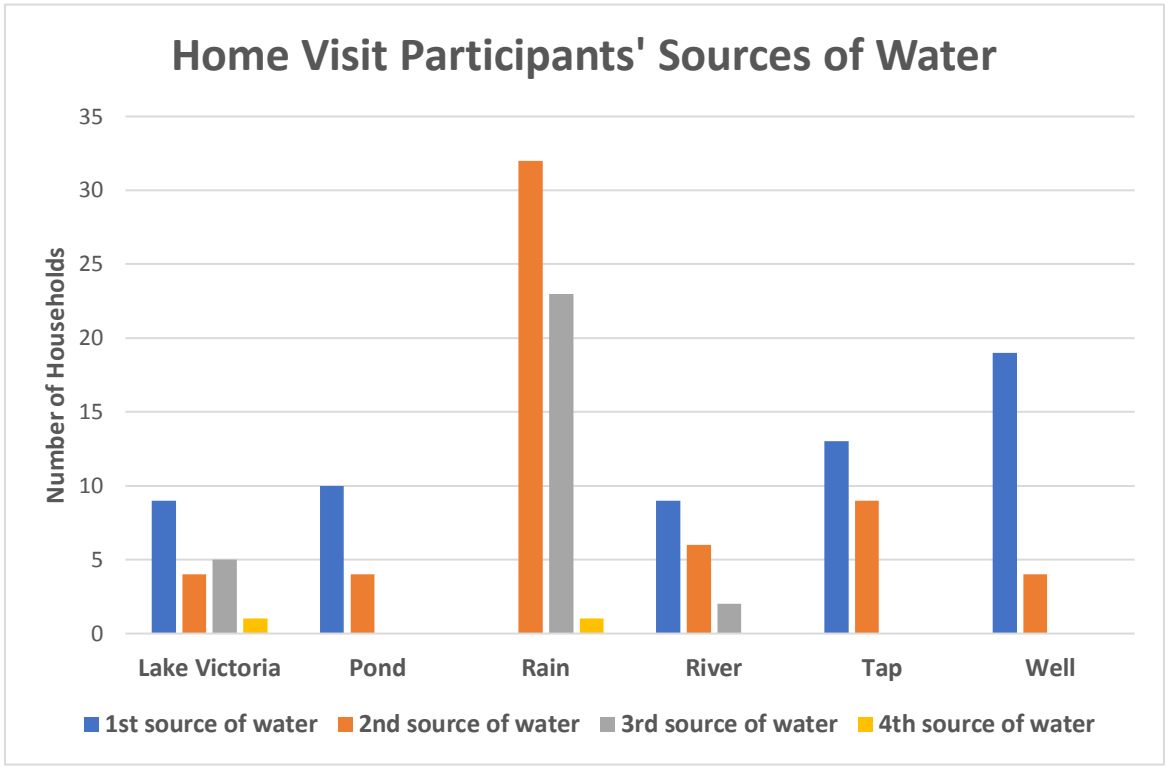


*Figure 14: Water Treatment Methods of Home Visit Participants*

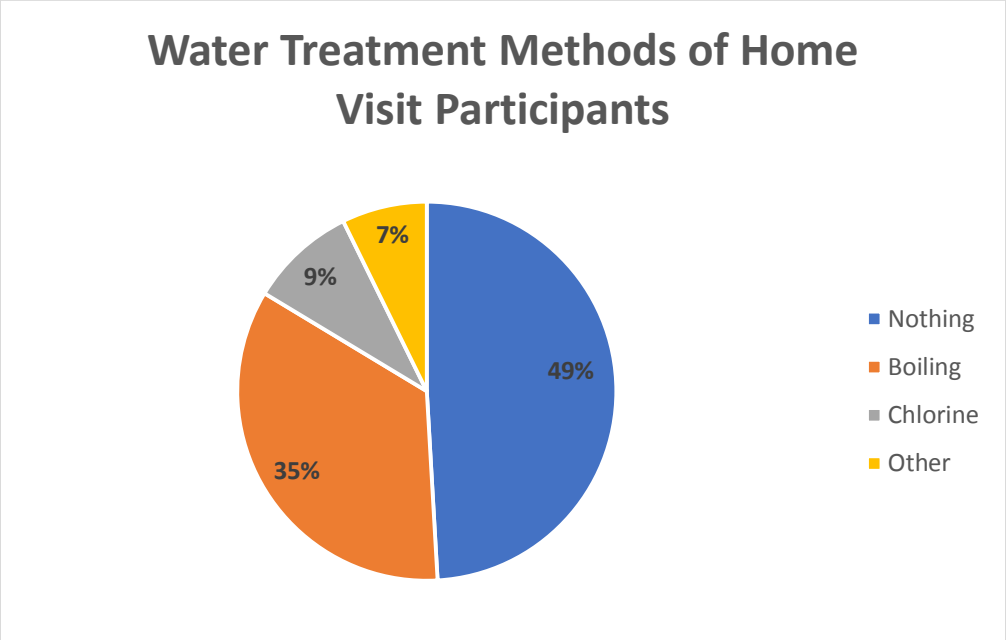
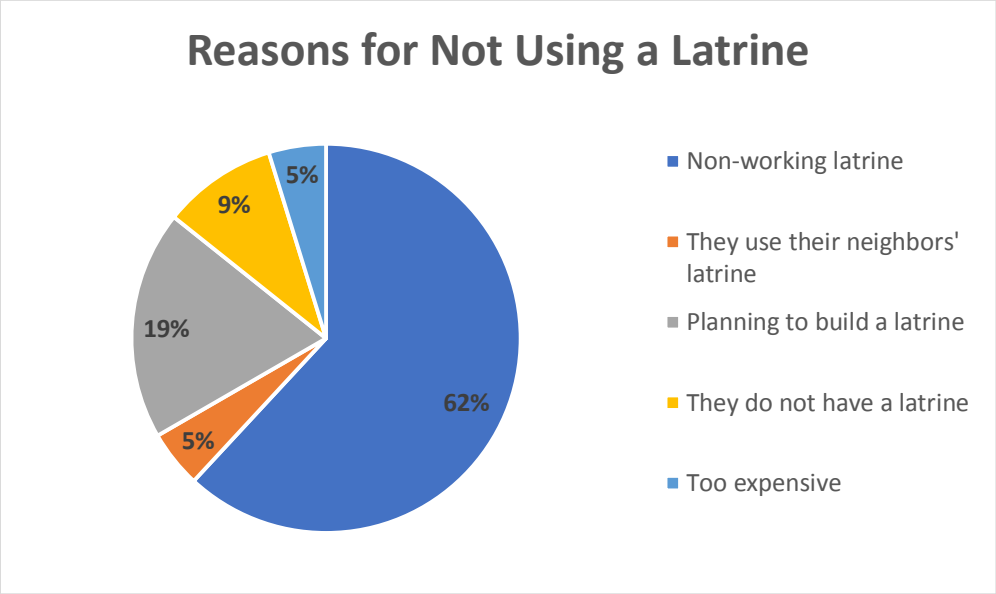



*Figure 15: Reasons for Not Using a Latrine*




These WASH behavioral changes are key to changing the health of a community. While MSG has seen significant changes in Home Visit Program participants, the true indicator of change is health. Each year, MSG measures the community's health through our Health Screening Program. Figure 16 shows results from Home Visit Program participants. Data indicate that Home Visit Program participants have a lower disease prevalence rate in most WASH-related diseases (amoebiasis, intestinal worms, schistosomiasis in stool and urine, and malaria). These results are similar to the Health Screening results of previous years.

*Figure 16: Home Visit Program Participants' Health Screening Disease Rates*

| Health Screening Rates | Number screened | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive (2018)** | 6,911 | 9% | 41% | 26% | 17% | 28% |
| **Home Visit Program Participants (2018)** | 253 | 5% | 7% | 5% | 5% | 13% |
| **Home Visit Program Participants (2017)** | 239 | 11% | 10% | 3% | 8% | - |
| **Home Visit Program Participants (2016)** | 164 | 13% | 8% | 3% | 7% | - |
| **Non-Program Participants (2018)** | 3,599 | 13% | 72% | 44% | 26% | 42% |

### *Home Visit Discussion*

In 2018, nearly half of all Home Visit Program participants were located in Bukura, located a fair distance from Lake Victoria, and the effects can be seen in figure 13, as the first source of water was found to be wells, followed by rainwater. Forty-nine percent of Home Visit participants reported that they did not treat their water, followed by 35% who reported boiling their water as their first choice of purification (Figure 14). This highlights a strong need for further education as nearly half of the participants used their water without treating it, yet the most common water collection methods include using various receptacles to fetch and store water. This increases the likelihood of water contamination. Additionally, most families who reported not using a latrine stated they did not do so because they had a non-working latrine in their homes (62%), followed by planning to build a latrine in their homes (19%). See Figure 15. Those who had non-working latrines expressed their intentions to build a new one, but they were hindered by lack of financial means.

The Home Visit Program continues to be an important and impactful MSG program. Program participants continuously say that MSG's education has helped their families change their WASH behaviors and protect their families from waterborne and water-related diseases. We saw families start filtering and treating their water, build latrines and stop open defecation, start using soap, and start washing their hands at critical times. The real impact of the Home Visit Program was reflected in the health screening rates, which indicated that those who participated in the Home Visit Program had a lower disease prevalence rate for amoebas, intestinal worms, schistosomiasis and malaria than non-program participants without MSG education. It is encouraging to see the data reflect an improvement in the families'

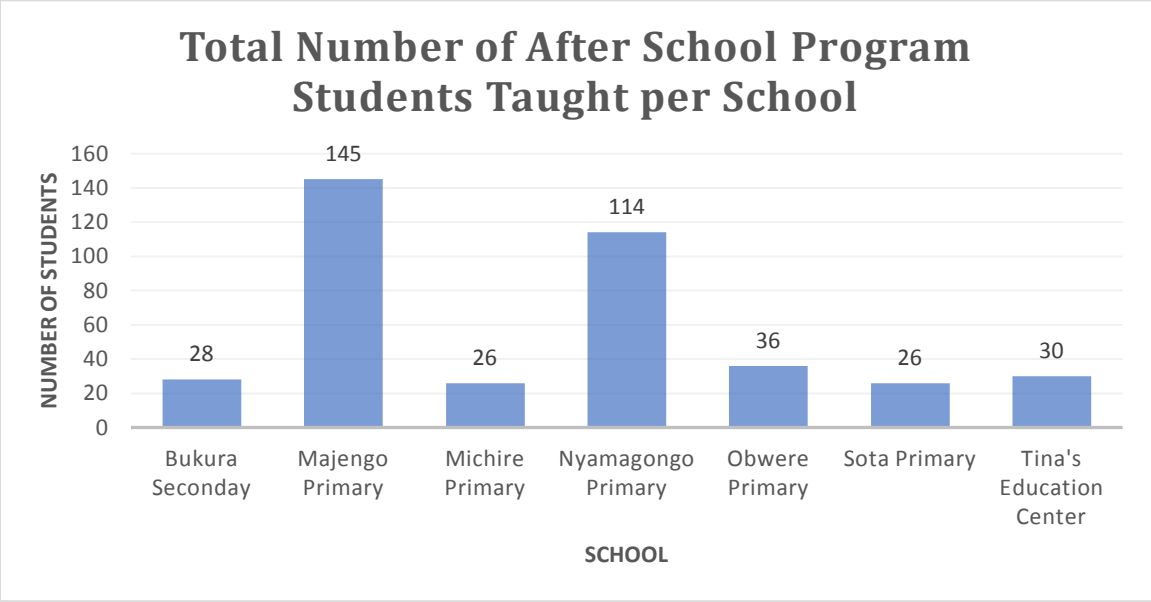
WASH behaviors in response to the core MSG WASH lessons about water treatment, hand washing during critical times, and latrine use.

## 4. After School Program

The After School Program started in 2012 and is one of MSG's original programs. The goal of this program is to teach children about proper WASH behaviors and disease prevention, while also allowing them to have a creative, fun experience. By learning how to care properly for their own health, students stay healthy, remain in school, and can therefore achieve their full potential. Using the students' creative, artistic, and critical thinking skills, CHEs teach disease prevention education about topics such as waterborne and water-related diseases, proper water treatment, sanitation, hygiene practices, and the fecal-oral disease cycle. MSG also donates handwashing stations to enable proper WASH techniques at schools.

Since starting this program in 2012, MSG has taught in 14 primary schools, reaching 10,550 students. In 2015, the District Education Officer granted MSG permission to work in all 126 primary schools in the Rorya District. It is our goal to work in as many primary schools as we can, so we can continue to spread this important, life-changing WASH education. In 2018, MSG focused on providing MSG education to seven schools: five government primary schools (Majengo Primary School, Michire Primary School, Nyamagongo Primary School, Obwere Primary School, and Sota Primary School), one private primary school (Tina's Education Center), and one government secondary school (Bukura Secondary School). See Figure 17 for the breakdown of the number of students taught per school.

*Figure 17: Total Number of After School Program Students Taught per School*




In the seven schools we continuously visited, CHEs taught 405 students, a marked decrease from the 1,807 students taught in 2017. In 2017, MSG aimed to teach as many students as possible in as many schools as possible. However, it was identified that large classroom sizes were distracting; students in smaller-sized classrooms performed better and had higher levels of knowledge retention. Therefore, MSG began shifting from teaching entire schools to establishing Health

Clubs at schools. After interested students had been identified at each school with the help of teachers, parents were notified. MSG then hosted a club-opening ceremony where WASH-related supplies (handwashing buckets, soap, water storage containers, chlorine tablets, etc.) were presented, and the purpose of the School Health Club was explained to the teachers, parents, and the selected students. The School Health Clubs are responsible for buying and replenishing WASH supplies.

MSG Health Clubs have 40 students or fewer per school. Students selected to be in the Health Club work together with their teachers, parents, and school committees to ensure that the knowledge they are learning from MSG continues to be passed on to the rest of the school. As shown in Figure 17, Majengo and Nyamagongo Primary Schools had a higher number of students than the other schools. More students were initially taught in those two schools, then later in the year, Health Clubs were formed, and the number of students decreased.

We learned that students retain more WASH knowledge and score higher on their WASH exams if the student-teacher ratio is decreased. As shown in Figure 18, students from School Health Clubs had a higher test score average than students in the regular After School Program, where the classes often had more than 75 students. Teaching through school Health Clubs provided the students with more appropriate learning conditions in which more attention could be given to each student, and there was less distraction from having too many students in one classroom. At the end of the year, each school celebrated a successful year of learning with MSG. This celebration included school staff, parents, and students. Each student received WASH supplies, such as basins, buckets, jugs, and soap.

*Figure 18: WASH Test Comparison*

| School Type | Average Test Score | Average Test Score Tanzanian Letter Grade | Highest Test Score | Lowest Test Score |
|---|---|---|---|---|
| **All Health Clubs** | 72% | B-Very Good | 97% | 49% |
| **All Regular After School Programs** | 30% | F-Fail | 55% | 15% |
| **Bukura Health Club** | 51% | D-Average | 97% | 11% |
| **Majengo Health Club** | 53% | D-Average | 88% | 31% |
| **Michire Health Club** | 66% | C-Good | 95% | 40% |
| **Nyamagongo Health Club** | 93% | A-Excellent | 100% | 83% |
| **Obwere Health Club** | 83% | A-Excellent | 100% | 52% |
| **Sota Health Club** | 78% | B-Very Good | 97% | 58% |
| **Tina's Health Club** | 82% | A-Excellent | 100% | 65% |
| **Majengo Regular After School Program** | 22% | F-Failure | 45% | 11% |
| **Nyamagongo Regular After School Program** | 38% | S-Satisfactory | 64% | 19% |

**Note: Test scores were calculated on the Tanzanian scale that has lower passing qualifications than in the US.*

In 2018, MSG continued to measure disease rates for After School Program participants through health screenings. As shown in Figure 19, After School Program participants had a lower disease prevalence rate than those who had never received MSG education.

*Figure 19: After School Program Participants' Health Screening Disease Rates*

| Health Screening Rates | Number screened | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive (2018)** | 6,911 | 9% | 41% | 26% | 17% | 28% |
| **After School Program Participants (2018)** | 985 | 4% | 9% | 7% | 5% | 15% |
| **After School Program Participants (2017)** | 402 | 7% | 8% | 4% | 6% | - |
| **After School Program Participants (2016)** | 1,638 | 8% | 7% | 4% | 7% | - |
| **Non-Program Participants (2018)** | 3,599 | 13% | 72% | 44% | 26% | 42% |

## *After School Discussion*

The After School Program continues to be an important program for children, adolescents, teachers, and their families. In 2018, opening new School Health Clubs helped the students retain WASH knowledge better and be better prepared to continue teaching future students WASH education once MSG leaves a school. It is recommended to continue opening School Health Clubs in the future to help the students and teachers take ownership of their WASH knowledge and School Health Club. The smaller the class size, the more WASH education is retained by the students. Opening School Health Clubs was a priority in 2018 to ensure sustainability of the program in schools and to allow MSG to teach at new schools. Teachers, students, and parents were able to take ownership of their newly gained WASH knowledge and continue passing the knowledge on to future students. Additionally, the health screening data indicate that MSG program participants have a lower disease prevalence rate even when the education was from previous years. Even though MSG taught fewer students at participating schools, the Health Club members were successful in continuing to teach schoolmates about water-related disease prevention and health education. This resulted in students at those schools having lower disease prevalence rates than students at schools where MSG had not yet taught. These results are similar to the Health Screening results of previous years.

## 5. Singing and Dance Program

The Singing and Dance Program started in 2012, which makes it one of MSG's oldest programs. Its goal is to use creative activities, such as songs, skits, and dances to learn and teach WASH lessons. Each lesson includes a song, dance, skit, art project or poem. Using creative and fun activities helps children remember these important WASH lessons. Ages of program participants ranged from 5-15.

In 2018, the Singing and Dance Program taught 49 participants who attended regular classes weekly. Several other participants attended classes irregularly, but they have not been included in this number. The Singing and Dance Group consists of two groups: older students (ages 11-15) and younger students (ages 5-10). Every Monday, the younger students had an opportunity to meet, learn about WASH, and sing and dance with children in their age group. The older students met every Thursday, and they focused on skits and peer-to-peer teaching. All students from both age groups were invited to participate in Singing and Dance on Wednesdays. Most students participated in this group; however, some felt more comfortable coming to only their age-group classes. This program met throughout the year. On average, each group met four times a month for nine months.

The Singing and Dance Program participants are tested on their WASH knowledge twice a year. This test is similar to the After School Program participant evaluation. Since the Singing and Dance students continuously participate in the Singing and Dance Program, their test scores showed a high understanding of WASH knowledge, which is MSG's internal goal.

In 2018, the Singing and Dance participants performed four times in front of a total of 4,015 community members. A detailed account of each performance is listed below.

- Rorya's Got Talent (Rorya Wanavipaji): MSG hosted its fourth annual talent competition, which attracted 3,236 community members over three events. The first event was the audition, followed by a performance by the semi-finalists and then the finalists. Each semi-finalist and finalist had to demonstrate an original talent and a talent that taught WASH-related issues. The Singing and Dance Group performed songs and dances about WASH issues during the first two events.
- Maji Safi Cup Final: In August, the Singing and Dance Group partnered with the Maji Safi Cup Program and performed original songs and dances during the boys' soccer final, which attracted 518 people.
- Parents' Event: In October, the Singing and Dance Group held a Parents' Event in which the program participants showcased what they had been learning from MSG throughout the year. They showcased their knowledge through performing skits and songs to 153 attendees.
- End-of-the-year Celebration: To close the year, the Singing and Dance Group held a party to celebrate the participants' accomplishments for the year. It was a great opportunity to perform songs and dances in front of the participants' parents. This event attracted 108 people, primarily participants and their parents.

### Health Screening Results

According to the results from the annual health screening campaign, the Singing and Dance Program had a lower prevalence rate of all waterborne and water-related diseases tested for than community members without MSG education (Figure 20). This shows us that the Singing and Dance Program is extremely effective in helping program participants and their families prevent WASH diseases.

*Figure 20: Disease Rates among Singing and Dance Program Participants*

| Health Screening Rates | Number screened | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive (2018)** | 6,911 | 9% | 41% | 26% | 17% | 28% |
| **Singing and Dance Participants (2018)** | 86 | 4% | 4% | 8% | 0% | 4% |
| **Singing and Dance Participants (2017)** | 84 | 0% | 8% | 1% | 2% | - |
| **Singing and Dance Participants (2016)** | 88 | 9% | 5% | 5% | 6% | - |
| **Non-Program Participants: (2017)** | 3,599 | 13% | 72% | 44% | 26% | 42% |

### *Singing and Dance Discussion*

The Singing and Dance Group was very successful in 2018. We were able to continue creating more age-appropriate lessons for both younger and older students, as well as perform at various community events. Because the Singing and Dance Program did not perform in as many community events as in 2017, the overall number of community members reached was lower this year. However, we did see that program participants are healthier than their peers who are not in an MSG program, and Health Screening results for 2018 were identical to the results of previous health screening years. Through the Singing and Dance Program, educational skits, songs, and dances were used to educate young children about water-related diseases and how to prevent contracting them. Along with test scores that showed the children retaining health education knowledge, the lower disease prevalence rates demonstrate that MSG's disease prevention and health education are effective amongst young children.

## 6. Disease Prevention Centers

Our first Disease Prevention Center (DPC) started in 2012 at the Shirati KMT District Hospital, which makes it one of MSG's original programs. The goal of this program is to provide disease prevention education in hospital and health clinic settings. MSG has a long-standing partnership with the Shirati KMT District Hospital and has continued to work with the hospital's visitor center. This year, we continued working with the Shirati KMT District Hospital and three other health centers: Masonga Dispensary, Rao Hospital, and Ngasaro Clinic. The DPC Program provides health education in the form of demonstrations of proper hygienic behaviors, oral lessons, written materials, and interactive worksheets that the visitors keep as a reminder of the lesson. Education is given to patients, people visiting patients, and hospital staff. Visitors to the DPCs learn about disease transmission, avoiding diseases in the future, and why preventing disease is more economical than treating disease. After disease prevention lessons, the participants are asked questions to monitor their

demographics, knowledge of WASH, and familiarity with MSG. This program reaches people from far away because the Shirati KMT District Hospital is where patients from the entire Rorya District and beyond receive treatment.

### *DPC Demographics*

In 2018, the DPCs were open for 151 days, and 1,193 people visited. On average, the CHEs saw 8 people per day. This number would vary depending on the prevention center, ranging from one person to 29 people.

*Figure 21: Gender of DPC Participants*

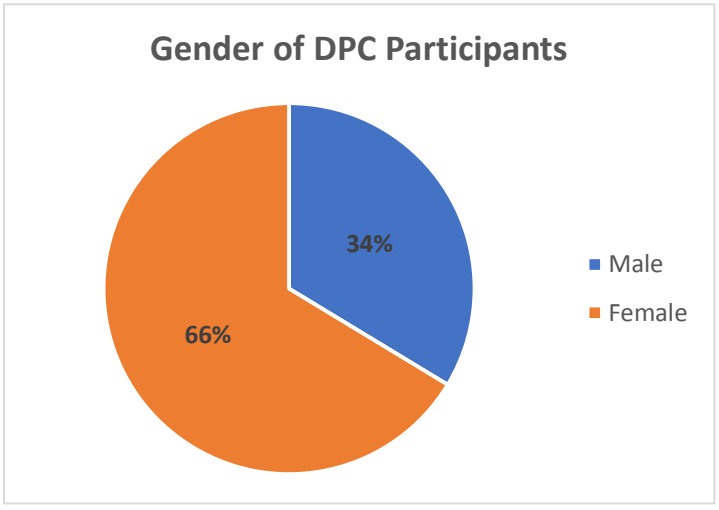
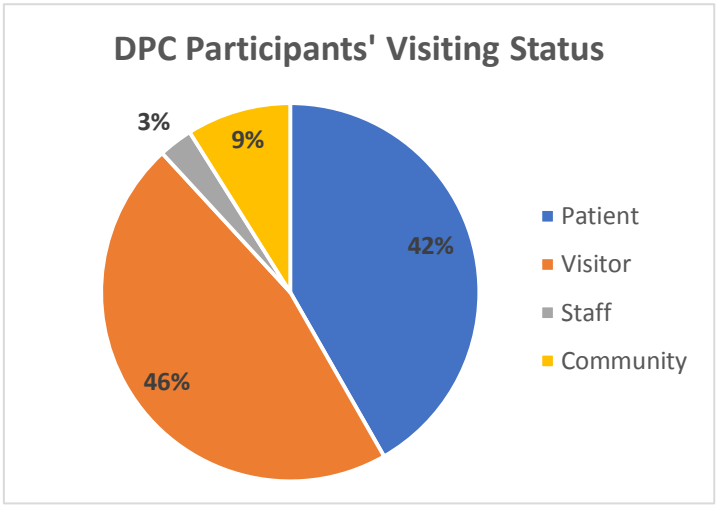



*Figure 22: DPC Participants' Visiting Status*




Participants are asked five questions when they visit a DPC: 1. Have they heard of MSG before? 2. Have they participated in an MSG program? 3. Do they treat their water before use? 4. Do they know where to get WASH products? 5. Do they have someone in the household under the age of three who has had diarrhea within the past two weeks? The garnered information enables MSG to track DPC participants and what is needed to improve public health and behavior patterns in the Shirati community.

### *DPC Questions:*

**1. Have they heard of MSG before?**

*Figure 23: DPC Participants' Familiarity with MSG*

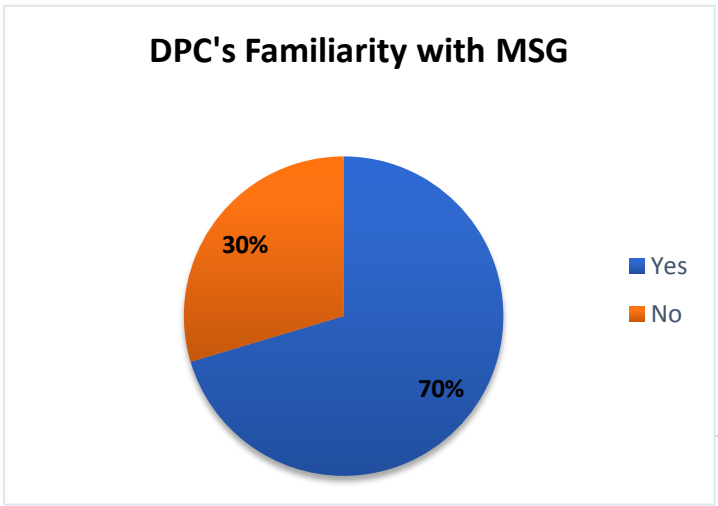
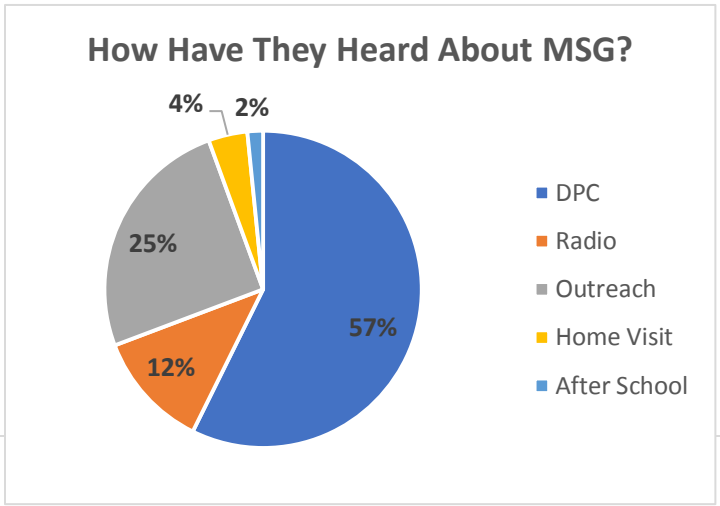



*Figure 24: How DPC participants Have Heard about MSG*



**2. Have they participated in an MSG Program before?**

*Figure 25: DPC Visitor Participation in other MSG Programs*

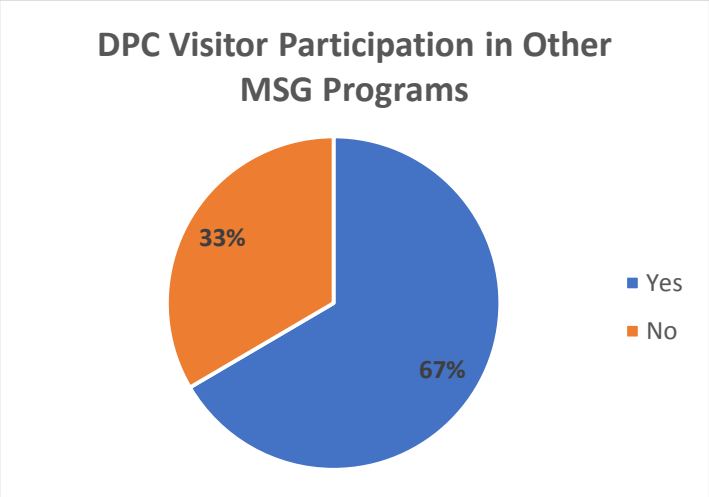
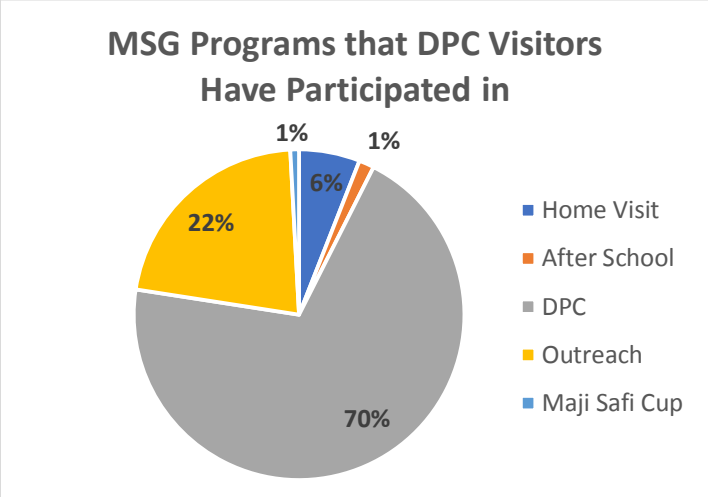



*Figure 26: MSG Programs that DPC Visitors Have Participated in*




**3. Do they treat their water before they use it?**

*Figure 27: Do DPC Participants Treat their Water before They Use It?*

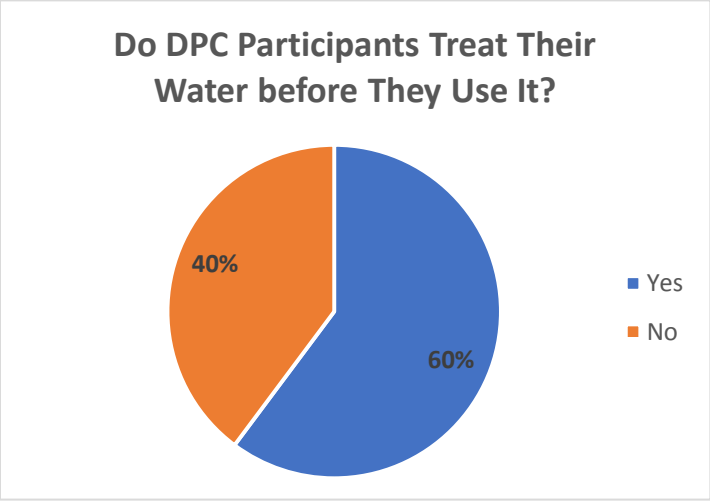
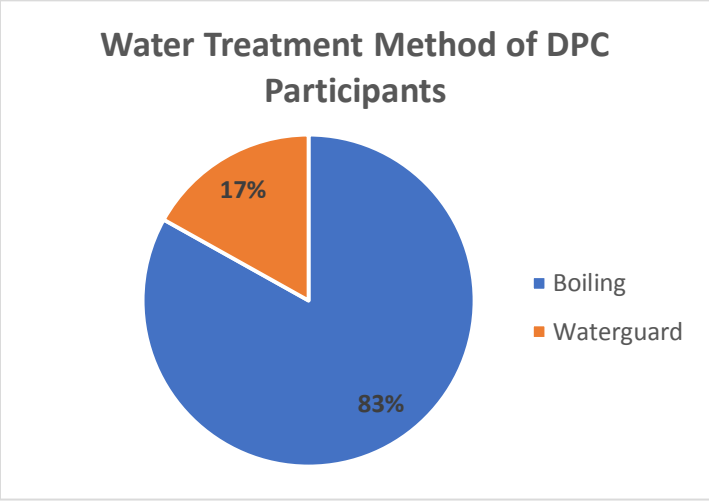
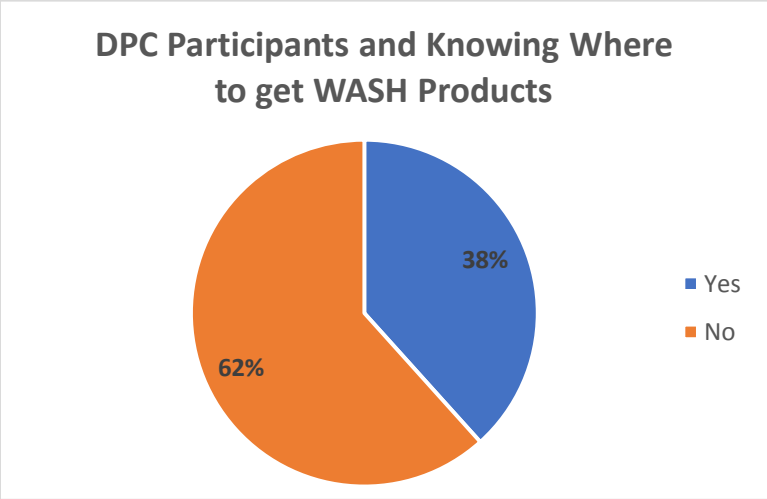



*Figure 28: Water Treatment Methods of DPC Participants*



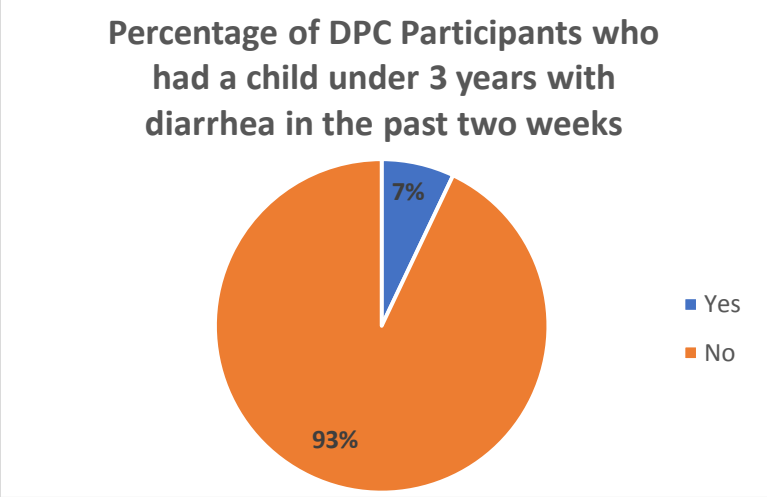
**4. Do they know where to get WASH-related products?**

*Figure 29: DPC Participants and Knowing Where to Get WASH Products*




**5. Do they have someone living with them under the age of three who had diarrhea in the past two weeks?**

*Figure 30: Percentage of DPC participants who had a child under 3 years with diarrhea in the past two weeks*




### *DPC Discussion*

In 2018, the DPC Program was a success. Seventy percent of DPC participants were familiar with MSG (Figure 23), and 67% had participated in MSG programs (Figure 25). DPC participants were most likely to have participated in MSG's Outreach Program (22%) and Home Visit Program (6%) (Figure 26). It is also important to note that 70% of DPC participants had previously participated in the DPC Program (Figure 26). More than half of the participants reported treating their water before using it (Figure 27) with 83% reporting boiling as their water treatment method (Figure 28). More than half (62%)

of DPC Participants did not know where to get WASH products, such as chlorine tablets, buckets with lids and taps, and ceramic water filters (Figure 29). All participants were informed that these products are available for purchase from the MSG office, and chlorine tablets are available for purchase at the DPC on days MSG is on site. Figure 30 shows that seven percent of participants had a child under three years of age who had had diarrhea within the past two weeks. These participants received further education on how to ensure their water collection and storage methods were safe and free of contamination, how to practice proper handwashing techniques, and when to seek medical assistance to prevent dehydration.

Even though there are still individuals who do not treat their water, do not know where to buy WASH-related products, and have children under the age of three who have diarrhea, MSG program participants are much better informed and have healthier families than those who have never received MSG education. As we continue to expand to more health facilities, it will be interesting to compare the health of the participants at the different disease prevention centers. Each hospital and/or clinic reaches a different demographic group, and future data will help us see if our education is being used in all participating clinics, or if educational changes need to be tailored to the specific clinics.

## 7. Maji Safi Cup Program

The Maji Safi Cup Program started in June 2013 and consists of month-long sport tournaments (soccer for boys/netball or volleyball for girls) where local school teams compete for the Maji Safi Cup title. Before each game, teams must attend a one-hour lesson about WASH and disease prevention. Combining athletics and education promotes overall wellness and makes lessons more memorable and thus more effective. The winners of a Maji Safi Cup are awarded WASH supplies for their school. Although only one team is crowned as champions, all tournament participants benefit from team building, pre-game lessons, and a small gift relevant to their lessons (e.g. school supplies and sanitary pads). In 2018, MSG hosted two Maji Safi Cups: one girls' netball tournament and one boys' soccer tournament. These tournaments reached a total of 3,822 community members with 13 matches. On average, 273 people came to each match. See Figure 31.

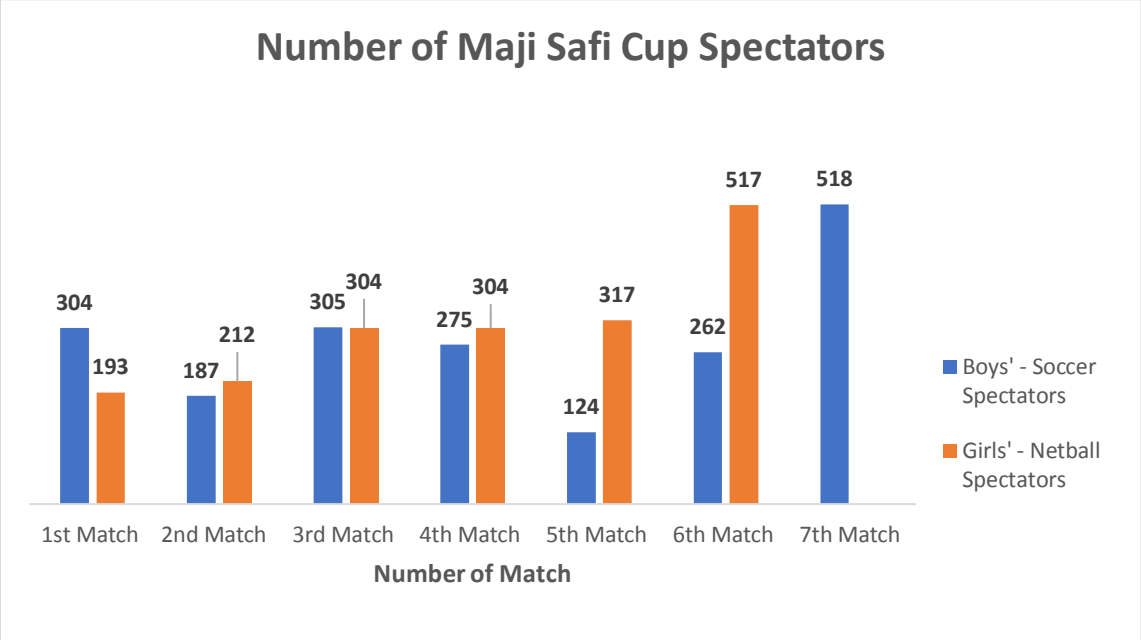
### *Boys' Soccer Maji Safi Cup*

The first Maji Safi Cup tournament this year was hosted in July 2018 and was a boys' soccer tournament between Katuru Secondary School and Raranya Secondary School. Lessons focused on personal hygiene and respect for girls and women. There were seven games played, which reached 1,975 community members. The final match alone attracted 518 spectators. On average, the games attracted 282 community members per match. See Figure 31.

### *Women's Netball Maji Safi Cup*

The second Maji Safi Cup tournament this year was hosted in September 2018 and was a female netball tournament between different classes from Bukura Secondary School. The lessons focused on female hygiene and Menstral Hygiene Management. There were six games played, that reached a total of 1,847 people. During the final match, 517 community members attended to celebrate the teams. On average, 308 community members attended each match. See Figure 31.

*Figure 31: Number of Maji Safi Cup Spectators*




## Health Screening Results

This year was the second time we have included Maji Safi Cup Program participants in the Health Screening Program. According to the results from the annual health screening campaign, we were able to screen 95 Maji Safi Cup Program participants.

*Figure 32: Maji Safi Cup Health Screening Results*

| Health Screening Rates | Number screened | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 6,911 | 9% | 41% | 26% | 17% | 28% |
| **Maji Safi Cup Program Participants (2018)** | 95 | 6% | 3% | 6% | 2% | 7% |
| **Maji Safi Cup Program Participants (2017)** | 199 | 8% | 7% | 9% | 9% | - |
| **Non-Program Participants** | 3,599 | 13% | 72% | 44% | 26% | 42% |

### *Maji Safi Cup Discussion*

This year, both Maji Safi Cup tournaments were successful. We believe partnering with one secondary school at a time, as was done during the Girls' Netball tournament at Bukura Secondary School, was successful as it encourages classmates to attend the events and learn WASH lessons. Partnering with one school at a time also ensures that students in the entire school benefit from the prizes, such as handwashing stations. However, it limits the attendance from community members who come to participate because competition is only between classmates in one school, instead of between two schools. We also found that providing education about WASH through hosting Maji Safi Cups does help participants contract fewer water-related diseases. The Maji Safi Cup Program participants had lower prevalence rate of all waterborne and water-related diseases tested for than community members without MSG education (Figure 32). This shows us that the Maji Safi Cup Program is extremely effective in helping program participants and their families prevent contracting WASH diseases. Maji Safi Cup Program participants should continue to participate in MSG's Health Screenings to continue measuring this program's success.

## 8. Hotline

The Hotline Program started in October 2013. This program is a way for the community to contact MSG through our hotline numbers to learn about water, sanitation, hygiene, disease prevention, and health. Additionally, it is a way for MSG to teach participants in hard-to-reach places. The hotline number is given to participants if they do not have time to talk in person during other programs such as Outreach, Disease Prevention Center, and radio shows. This program also aims to reach men in the community, as they often do not have time to talk during the Home Visit or Outreach Programs.

In 2018, we reached 274 people through 825 phone calls. Callers came from several locations in Tanzania. Most callers called from the nearby wards or wards that our Outreach Program had previously visited. WASH-related SMS messages were sent 688 times. In total, MSG gave out 1,513 WASH-related lessons in the form of a phone call or text message.

*Figure 33: Hotline Participants' Gender*

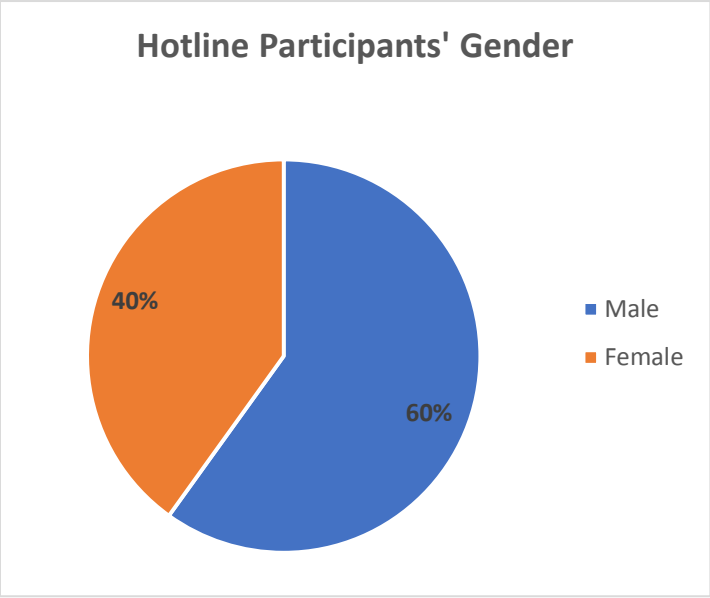
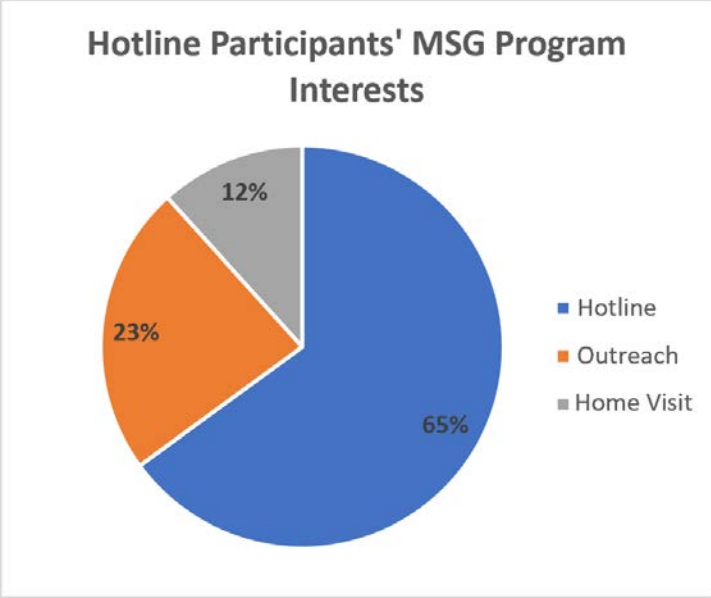



*Figure 34: Hotline Participants' MSG Program Interests*



### *Hotline Discussion*

The MSG Hotline is a great option for those who live far away or have short WASH-related questions. This year, CHEs implemented a new system in which program participants were called a total of three times and sent up to three SMS/text messages. Most Hotline Program participants were interested in learning more about the Hotline Program as they recognized that it was a convenient way to receive WASH education regardless of their location, followed by interest in the Outreach Program and Home Visit Program (Figure 34). Callers interested in the Home Visit Program were listed in a file to potentially be visited by a CHE at a later time.

## 9. Outreach

There are many ways to teach WASH education to the community. Our Outreach Program started in 2012, and its goal is to teach the local community about WASH practices through a variety of local outreach methods, including event days and market outreach as well as visiting groups, shops, salons, and restaurants in the Mara Region. This program has developed over time to reach more community members and to respond to community crises, such as cholera outbreaks. Outreach continues to directly reach the most people and has the largest direct scope of all MSG programs. In 2018, our Outreach Program reached a total of 45,254 participants.

### *Market Days*

Throughout the year, CHEs visit markets located in the Rorya District. Market days are either half or full days of work, depending on the size of the market and the location. Education topics include water treatment (i.e. boiling water, using chlorine tablets, etc.), the fecal-oral disease cycle, and preventing WASH-related diseases, including cholera. The CHEs also use this time to sell chlorine tablets and oral rehydration solution. These products are sold at a subsidized price to make them more accessible to the community. On average, about 30 people received education during a market day. In total, we visited 61 market locations over 108 days, reaching approximately 3,198 people. Of the 61 locations visited, 25 were visited five or more times.

### *Salons and Shops*

In 2018, MSG visited local salons and shops to teach local business owners how to protect their customers, how to keep their environment clean, and how to provide better customer service. For 33 days, CHEs taught and re-taught store and salon owners about WASH. Overall, CHEs taught 125 WASH lessons to store owners and 49 lessons to salon owners – for a total of 174 lessons. One hundred and forty-five establishments were taught once, twenty-two were taught twice, six were taught three times, and one was taught four times. After each lesson, the CHEs ranked each store and salon with 4 being the highest level of understanding and 1 being the lowest. Later in the year, the CHEs visited the store and salon owners and tested them on their WASH knowledge. They received certificates at the Award Celebration for Restaurants, Salons, and Shop Owners if they received a score of 70% or higher.

### *Restaurants*

Each year, MSG visits local restaurants. In 2018, CHES taught 60 local restaurant owners predominantly in Kanga and Minigo (See Figure 35). Our CHEs evaluate local restaurants to gain a better understanding of their cleanliness and safety for their customers. If the restaurant managers want to participate, they receive MSG lessons on how to improve the environmental and food safety of their restaurant. Providing restaurant owners with WASH education empowers them to change their behaviors and provide a place that is safer and healthier for them and their customers. These restaurants we evaluated at the end of the year.

We were able to gather information about the restaurants. Since the majority of restaurant owners used water from Lake Victoria (an unprotected and heavily contaminated water source) when cooking and cleaning, as well as for hand washing, it was very important for the CHEs to teach them about water treatment (Figure 36). Figure 37 shows that these restaurant owners indeed needed WASH education. Nearly all restaurant participants reported that they treated their drinking water (93%) – through boiling (79%), chlorine (18%), or other treatment (3%). A high number of restaurant participants washed their hands before food preparation (93%), before eating (86%), and after defecating (89%), but these numbers are still alarming as hands should be washed 100% at these critical times. Most restaurants had a place for hand washing (91%); however, only 75% treated their handwashing water, and 14% did not have soap at their handwashing stations. The MSG Community Health Educators assessing the restaurants reported that 12% of the restaurants were observed to have many flies. Fourteen percent of restaurant participants reported keeping their food overnight, which is hazardous if not properly and hygienically stored. Additionally, only a little over half of the participants (58%) reported washing dishes with soap and water, and 19% did not have a latrine for their customers to use.

*Figure 35: Locations of the Restaurants*

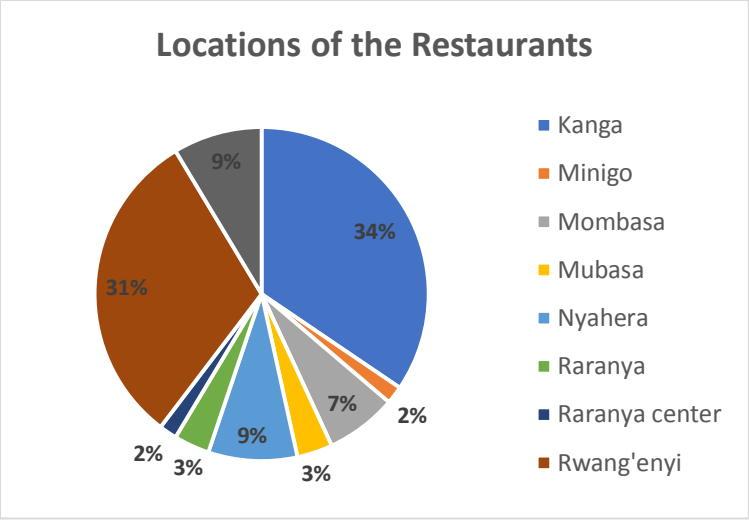



*Figure 36: Restaurant Water Source*

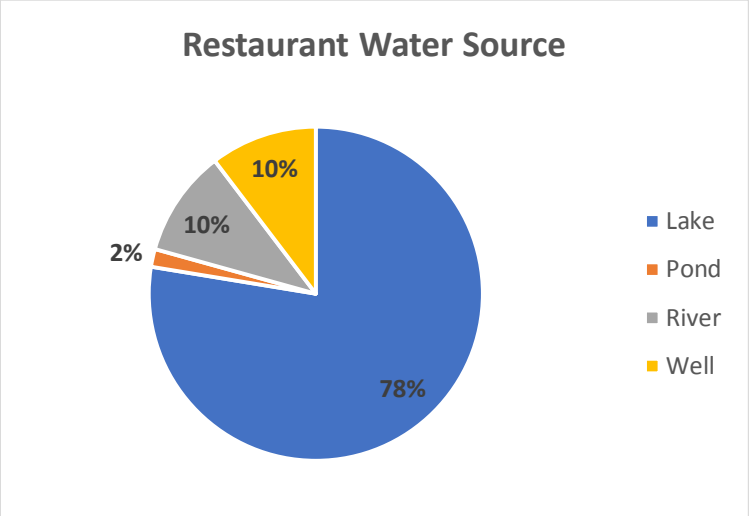



*Figure 37: Overall Analysis of 2018 New Restaurants*

| Question | Answer | Percentage |
|---|---|---|
| **1. Do they filter their drinking water?** | Yes | 93% |
| | No | 7% |
| **2. How do they treat their drinking water?** | Boiling | 79% |
| | Chlorine | 18% |
| | Other treatment | 3% |
| **4. When do they wash their hands?** | Before food preparation | 93% |
| | Before eating | 86% |
| | After defecation | 89% |
| | Do not wash hands | 0% |
| **5. Does their restaurant have a place for hand washing?** | Yes | 91% |
| | No | 9% |
| **6. Do they treat their handwashing water** | Yes | 75% |
| | No | 25% |
| **7. Do they have soap at their handwashing station** | Yes | 86% |
| | No | 14% |
| **8. Are there many flies in the restaurant? *** | Yes | 12% |
| | No | 88% |
| **9. Do they keep their food overnight?** | Yes | 14% |
| | No | 86% |
| **10. Do they wash dishes with soap and water?** | Yes | 58% |
| | No | 42% |
| **11. Does their restaurant have a latrine?** | Yes | 81% |
| | No | 19% |

*This assessment is subjective, decided by the CHEs.

After MSG completed all the restaurant visits, restaurant owners were tested on their WASH knowledge, and certificates were given to those establishments that received a passing score. These certificates are then displayed, so customers can see the sanitary and hygienic conditions of the establishment. Prior to testing, restaurant owners were taught WASH lessons one to three times. In 2018, MSG evaluated 20 restaurants (taught in 2017 and 2018). These restaurants came from five different villages in the Rorya District: Rwang'enyi, Siko, Busanga, Manila, and Nyarombo. Each restaurant was evaluated with a WASH test and a physical cleanliness examination. The average test score was 79% with the highest test score being 100%, and 12 restaurants out of the 20 passed the cleanliness examination. Of those tested, MSG awarded everyone who scored 80% or higher on their test and demonstrated a high level of hygiene and sanitation practices with a certificate and a WASH-related gift. Gifts were distributed based on test scores and included handwashing buckets, waste bins, soap and WaterGuard (chlorine tablets).

### *Event Days*

Every year, MSG hosts community-wide events that are sometimes organized in cooperation with the government or other organizations. These events are a way to reach out to the community to teach about WASH-related issues that affect the community members' everyday lives. In 2018, MSG hosted five events not associated with other programs like Singing and Dance and Female Hygiene (these events are explained in their own program sections). These events directly reached 9,590 community members.

### *2018 Events*

- September 2018: Award Celebration for Restaurants, Salon, and Shop Owners: MSG recognized restaurant, salon, and shop owners that performed well on their WASH test and demonstrated behavioral changes. Fifty-eight participants were in attendance. Certificates were given out to all owners who received an 80% or higher on their tests (12 restaurants). The certificates may be displayed at the restaurants, salons, and shops to let future customers know that the establishments are clean, and the owners understand WASH education. Prizes, such as soap, chlorine tablets, and handwashing buckets, were given out to owners who had the highest test scores.
- October 2018: Global Handwashing Day (GHD) – Part One: Every year on October 15, MSG hosts a celebration of hand washing and its key role in preventing disease. This year, we taught 622 students at Nyamagongo Primary School the proper steps of handwashing.
- October 2018: Global Handwashing Day (GHD) – Part Two: This year was our fifth annual GHD event. We celebrated the end of the day in the village of Obwere on a busy market day and invited local government officials to join the celebration, attended by 1,190 participants.
- November 2018: World Toilet Day: MSG reached 220 community members on November 19 by hosting a celebration in the village of Nyambori. During this event, we honored 10 families that either built a new toilet or greatly improved their toilet after receiving MSG education. Local government officials were invited to the event and came from different villages to recognize the efforts made by their constituents. Additionally, CHEs performed skits about the importance of ending open defecation and introduced the Arborloo Toilet to the community.
- November 2018: Sanitation Week: MSG partnered with other organizations throughout Tanzania to educate about WASH through a week-long government-organized event in Dodoma. Our various education booklets were distributed to the 7,500 participants in attendance.

### *Outreach Discussion*

This year, MSG focused on expanding to new wards and villages to teach about WASH. Several days were committed to visiting markets and teaching store and restaurant owners. Through post-evaluation methods, we saw a high level of understanding among participants taught two or more times. By arming the community with disease prevention education, we saw communities become more prepared with good WASH practices to protect themselves and their

communities. Additionally, MSG participated in the week-long government-organized event in honor of Sanitation Week in which we were able to reach thousands of participants by teaching them and distributing our educational handouts on WASH.

## 10. Radio Show (Rorya FM & Sachita FM)

MSG has a partnership with Rorya FM, the local radio station in Shirati. This partnership allows MSG to host one-hour shows that educate the community about the importance of WASH and Menstrual Hygiene Management. The radio station estimates that each show reaches approximately 3,500 listeners. To expand our listenership, this year, MSG also partnered with a second radio show, Sachita FM, located in the nearby Tarime District. This radio station estimates that each show reaches approximately 6,400 listeners. At both radio stations, each show was recorded and subsequently repeated later during the week. In 2018, MSG aired 38 shows, indirectly reaching approximately 185,200 people (including repeat listeners). Figure 38 details the breakdown of lessons taught during each show. Our goal was to air shows each month, excluding Health Screening months, but in August 2018, the Rorya FM radio station closed due to technical issues. Therefore, we were only able to host shows at Sachita FM the remainder of the year.

Each show provides the community with the opportunity to call in or send an SMS/text message to ask questions and/or make comments for our CHEs to answer. Throughout the year, MSG had 144 callers and 372 people who sent SMS/text messages that were answered directly by the CHEs. The average number of callers per show was eight, and the average number of messages sent per show was 21.

*Figure 38: Rorya FM Shows in 2018*

| Date | Program | Radio Station | Number of Estimated Listeners | Topic | Number of calls | Number of SMS |
|---|---|---|---|---|---|---|
| 5/18/2018 | Female Hygiene | Rorya FM | 3,500 | Gender equality and right to an education | 16 | 36 |
| 6/22/2018 | Female Hygiene | Rorya FM | 3,500 | Menstrual Hygiene Management | 8 | 65 |
| 7/20/2018 | Female Hygiene | Rorya FM | 3,500 | Social behavior issues related to puberty | 10 | 19 |
| 8/3/2018 | Female Hygiene | Rorya FM | 3,500 | Menstrual Hygiene Management | 9 | 18 |
| 12/7/2018 | Female Hygiene | Sachita FM | 6,400 | Menstrual Hygiene Management | 8 | 27 |
| 5/25/2018 | Outreach | Rorya FM | 3,500 | Promotion of WASH products available for sale from MSG | 13 | 25 |
| 6/1/2018 | Outreach | Rorya FM | 3,500 | Schistosomiasis | 11 | 38 |
| 6/29/2018 | Outreach | Rorya FM | 3,500 | Open defecation in relation to water sources | 12 | 23 |
| 7/13/2018 | Outreach | Rorya FM | 3,500 | Water treatment methods | 10 | 22 |
| 7/27/2018 | Outreach | Rorya FM | 3,500 | Typhoid | 4 | 6 |
| 8/17/2018 | Outreach | Rorya FM | 3,500 | Amoebiasis | 16 | 4 |
| 10/5/2018 | Outreach | Sachita FM | 6,400 | Introduction of MSG | 0 | 12 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10/12/2018 | Outreach | Sachita FM | 6,400 | Implications of proper handwashing techniques | 1 | 16 |
| 10/19/2018 | Outreach | Sachita FM | 6,400 | Open defecation | 2 | 0 |
| 10/26/2018 | Outreach | Sachita FM | 6,400 | Water storage and treatment | 7 | 12 |
| 11/2/2018 | Outreach | Sachita FM | 6,400 | Food preparation and storage | 9 | 5 |
| 11/9/2018 | Outreach | Sachita FM | 6,400 | Schistosomiasis | 3 | 17 |
| 11/16/2018 | Outreach | Sachita FM | 6,400 | Personal hygiene; Fungus | 4 | 16 |
| 11/30/2018 | Outreach | Sachita FM | 6,400 | Malaria, Urinary Tract Infections | 1 | 11 |
| **Total Listeners** | | | **92,600** | **Total Calls Received** | **144** | - |
| **Total Listeners including repeat show** | | | **185,200** | **Total SMS Received** | - | **372** |

***Each show was repeated once during the same week, so each Rorya FM show reached 7,000 listeners, and each Sachita FM show reached 12,800.

### *Radio Show Discussion*

As the Radio Program continues to grow, the community continues to receive lessons and be exposed to important education. This year, MSG focused on expanding the reach of this program by collaborating with Sachita FM, which reaches even more listeners per show than Rorya FM. Both radio shows aired the MSG shows in the mornings instead of the afternoons, as many households listen to the radio while performing morning chores and tend to call the radio station with questions or send SMS messages more frequently in the morning than during other times of the day. However, due to Rorya FM closing in August, we were only able to continue airing radio shows at Sachita FM.

## 12. Female Hygiene Program

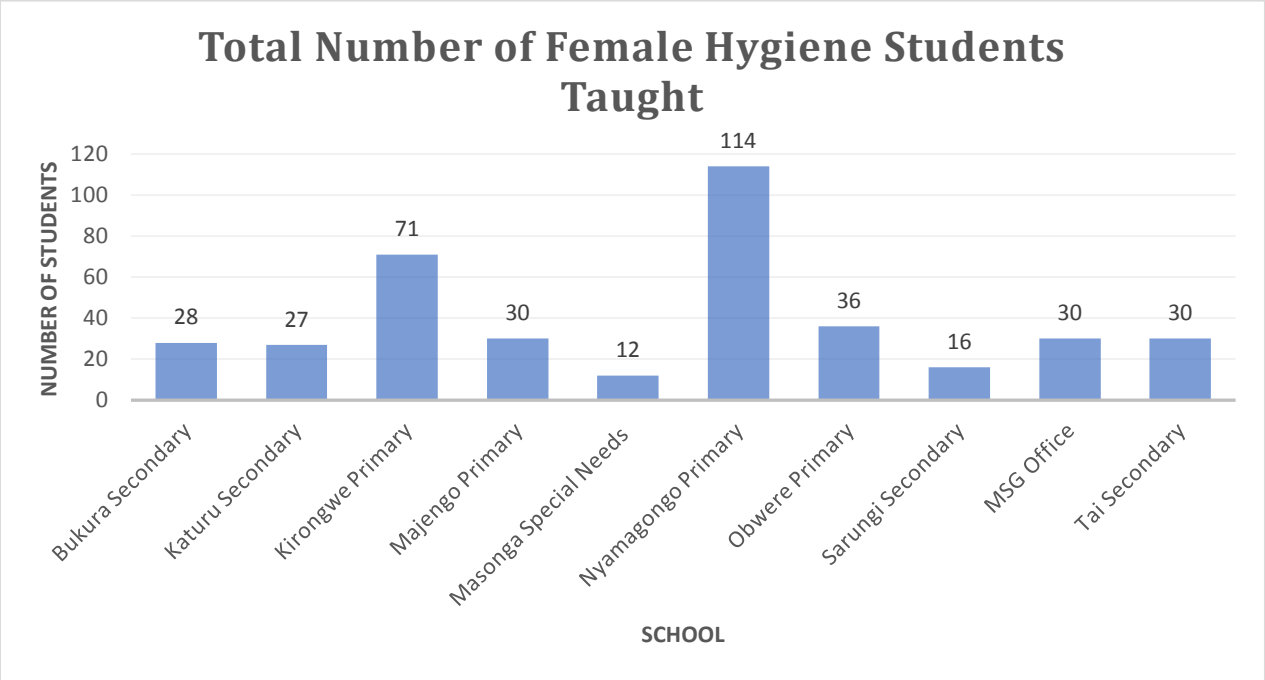
MSG started its Female Hygiene Program in November 2013 as a safe place for young women, 11-18 years old, to learn about Menstrual Hygiene Management (MHM), gain access to female WASH materials like sanitary pads, and be encouraged to stay in school. The overall objective of this program is to reduce school absences/dropouts related to menstruation by educating girls and young women about MHM and supporting them in their studies. This program increased significantly in 2016 with the help of a grant from INTERTEAM, the City of Zurich, and the City of Basel and has continued to grow in 2018 with their support.

The MSG Female Hygiene lessons were created through participatory methods in collaboration with Marni Sommer's *Grow and Know* curriculum, which was developed specifically for teaching MHM in Tanzania. Lessons equip participants with female health and hygiene knowledge to decrease their absences from school during menstruation and empower them to become community leaders. Throughout 2018, the Female Hygiene Program worked in four wards in ten schools (Bukura, Katuru, Tai, and Sarungi Secondary schools, Kirongwe, Majengo, Nyamagongo, and Obwere Primary Schools, as well as Masonga Special Needs School and at the MSG Office).

Overall, the Female Hygiene Program taught 394 students in primary and secondary schools. Female Hygiene Health Clubs were formed in all ten schools. Initially, large numbers of students were taught at Kirongwe and Nyamagongo Primary

Schools, but Health Clubs were formed at these schools later in the year to allow for teaching smaller groups of students who would continue to teach the rest of the school with assistance from teachers, parents, and the school committee.

*Figure 39: Number of Female Hygiene Program Participants per School*




To understand the young women we work with better, a survey of 395 primary and secondary school students was conducted to identify current attitudes and perceptions of Menstrual Hygiene Management (MHM). The aim of this survey was to identify students' attitudes towards menstruation and their relationship to school attendance.

Of the 395 primary and secondary school students surveyed, 59% reported that they had already begun menstruating. In total, 20% of girls had missed at least one day of school in the last six months, with 3% of girls having missed more than 10 days. Furthermore, 24% of those who had missed 1-3 days of school in the last six months were absent due to menstruation issues, such as lacking proper menstrual hygiene pads or cloths, fear of leaking blood while in school and in front of their peers, or not fully understanding that menstruation is a normal and natural process. This is a 5% decrease from the baseline survey, which was conducted in May 2017.

When asked about the effects of menstruation on school performance, more than one third of the girls stated that they find it difficult to concentrate on their studies during their monthly cycle. They reported that feeling pain (23%), being worried that blood would leak through their pads or cloths (15%), feeling scared to be around boys and men (5%), feeling dirty (2.5%), and feeling ashamed (0.5%) were all reasons that girls found it difficult to concentrate on their studies while menstruating.

### *Female Hygiene Program Events*

Throughout the year, the Female Hygiene Program hosts fun, educational community awareness events. This year, the Female Hygiene Program hosted eight events: International Women's Day, two Dining for Female Hygiene events, Miss/Mr. Maji Safi contest, International Day of the African Child, field trip to visit President Nyereye's house and museum, menstrual cup research ceremony, and a Female Hygiene Health Club opening event. Community members were invited to attend these events to learn about female hygiene and health issues through songs, dances, and skits.

- International Women's Day: On March 8, MSG collaborated with the local district government in a district-wide celebration of womanhood at the Rorya District Headquarters. Tents were set up in which the 1,000 attendees visited and learned more about how to get involved in the women's empowerment organizations in the region. MSG participated by performing a skit pertaining to the importance of teaching both genders about menstruation and other female hygiene topics. Reusable menstrual pads were also available for sale to community members.
- Dining for Female Hygiene: In May and November, the Female Hygiene Program hosted Dining for Female Hygiene events. The CHEs and program participants organized these special dinners for participants and their female guardians (mothers, grandmothers, aunts). During the events, female health and hygiene issues were discussed, new members were welcomed, and through songs, dances, and skits, the young women showcased what they had learned. This event hosted 70 and 116 participants, respectively.
- Miss/Mr. Maji Safi: This year, the Female Hygiene Program partnered with the Male Hygiene Program to conduct the annual Miss/Mr. Maji Safi event. The girls and boys from our Female and Male Hygiene Programs participated in this knowledge and confidence competition in front of 4,422 community members. It was a very successful event, which allowed 50 girls and boys to perform and compete in front of their peers and parents.
- International Day of the African Child: On June 16, MSG collaborated with the local district government to host a celebration to highlight our community's children on International Day of the African Child. Seven hundred and thirty-nine (739) community members joined the celebration and watched MSG Female Hygiene Program staff members teach about female hygiene topics through engaging dramas and skits.
- Mwalimu Nyerere Museum Center: In July, 19 program participants attended a field trip to visit the Mwalimu Nyerere Museum Center in Butiama, Tanzania, to learn about the history of Tanzania's first president.
- Menstrual Cup Research Ceremony: In 2017, MSG partnered with University of Dar es Salaam and Lund University to conduct research on the acceptance and sustainability of menstrual cups in rural Tanzania. In November 2018, the researchers from Lund University returned to share the results of the study. Two hundred and sixty-three participants attended the ceremony.
- Opening Katuru Health Club: Once a school is selected to be a Health Club in our Female Hygiene Program, an opening celebration is conducted. Each program participant invites a guardian to the event, and two teachers and the headmaster are also invited to participate. During this event, the Health Club is introduced, and WASH materials are given to the school to be maintained by the club.

### *Female Hygiene Health Screening Results*

Health screening results for the Female Hygiene Program participants indicate that when comparing all WASH-related diseases, program participants continue to have a lower disease prevalence rate than community members without MSG education (See Figure 40).

*Figure 40: Disease Rates among MSG Program Participants*

| Health Screening Rates | Number screened | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 6,911 | 9% | 41% | 26% | 17% | 28% |
| **Female Hygiene Program Participants who tested positive (2018)** | 753 | 4% | 7% | 4% | 6% | 11% |
| **Female Hygiene Program Participants who tested positive (2017)** | 459 | 6% | 8% | 7% | 5% | - |
| **Non-Program Participants who tested positive** | 3,599 | 13% | 72% | 44% | 26% | 42% |

### *Female Hygiene Discussion*

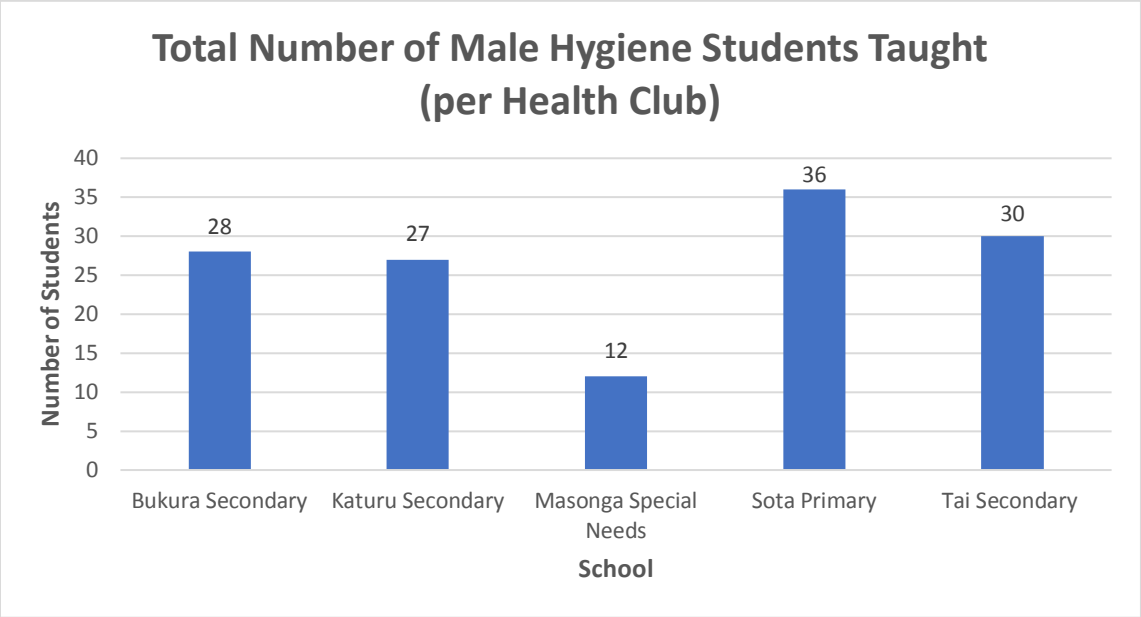
The Female Hygiene Program continues to grow and be one of our most popular programs. This year, we have expanded significantly, especially by forming Health Clubs at schools, which is a more sustainable method of reaching more schools and allowing the schoolteachers, students, and parents to take a lead in educating their pupils about female hygiene issues. In response to a suggestion from 2017, classroom sizes were significantly reduced to ensure that the students were retaining the education by learning in a more student-friendly environment that includes smaller classroom sizes and better student-to-teacher ratios to foster effective learning (similar to the After School and Male Hygiene Programs). Success of this initiative is also seen in the low disease prevalence rates of Female Hygiene Program participants compared to non-program participants. Similar to the After School Program, fewer students are now directly taught by the MSG staff through the formation of Health Clubs, but it is evident that the members of the Female Hygiene Health Clubs were successful in continuing to teach the rest of their schoolmates about water-related disease prevention and health education. This resulted in students having lower disease prevalence rates than students at schools in which MSG had not yet taught. These results are similar to the Health Screening results from previous years.

## 13. Male Hygiene Program

The Male Hygiene Program started in 2016 because the community and CHEs expressed interest in starting a counterpart program to the already active and highly popular Female Hygiene Program. After the piloted year proved to be a success, MSG officially added this program to the budget in 2017. This program provides young men and boys with education about male and female anatomy, puberty, changes in their bodies, personal hygiene, respect for women, and the importance of breaking the silence about menstruation. By involving both genders in the conversation, Male Hygiene Program participants are now becoming more aware and knowledgeable about menstrual hygiene management and female and male hygiene issues. As the young boys become men, they are able to support female peers and family members.

In 2018, the Male Hygiene Program operated at five schools (Bukura Secondary School, Katuru Secondary School, Masonga Special Needs School, Sota Primary School, and Tai Secondary School). Overall, the Male Hygiene Program taught 133 students through the formation of School Health Clubs. Some of these clubs were in collaboration with the Female Hygiene Program. Members of these Health Clubs were then responsible for passing on the education to the rest of their schoolmates (see Figure 41).

*Figure 41: Number of Male Hygiene Program Participants per School*




This year, the Male Hygiene Program participated in two events: Miss/Mr. Maji Safi and Dining for Male Hygiene. The Miss/Mr. Maji Safi event attracted 4,422 community members (some of whom were included in the overall number of program participants reached through the Female Hygiene Program). The Dining for Male Hygiene event taught 141 program participants and their guardians more about the lessons they are learning in this program.

### *Male Hygiene Health Screening Results*

According to Figure 42, Male Hygiene Program participants are healthier than people who do not participate in MSG's education. WASH-related disease prevalence rates were significantly lower for participants than for community members without MSG education.

*Figure 42: Disease Rates among MSG Program Participants*

| Health Screening Rates | Number screened | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 6,911 | 9% | 41% | 26% | 17% | 28% |
| **Male Hygiene Program Participants who tested positive (2018)** | 305 | 3% | 10% | 7% | 6% | 10% |
| **Male Hygiene Program Participants who tested positive (2017)** | 164 | 9% | 4% | 1% | 8% | - |
| **Non-Program Participants who tested positive** | 3,599 | 13% | 72% | 44% | 26% | 42% |

### *Male Hygiene Discussion*

As the Male Hygiene Program continues to expand, it is important that the program continues to provide quality education to young boys. This program continues to be of great interest to the community and has already proven to be successful. This year, like in the After School and Female Hygiene Programs, there was an increase in School Health Clubs formed as a more sustainable way of teaching students to ensure greater knowledge retention of Male Hygiene topics. Male Hygiene is one of our newest programs, but it has already become evident that Male Hygiene Program participants are healthier and contract water-related diseases less frequently than those not participating in our programs (Figure 42).

## 14. Health Screening Program

Maji Safi Group (MSG) provides comprehensive water, sanitation, and hygiene (WASH) education and programming to rural, underserved individuals and families in Shirati, Tanzania. MSG's model for promoting community-driven water, sanitation, and hygiene (WASH) education and disease prevention focuses on behavioral change; however, measuring such changes in the community is a challenge. In 2018, Maji Safi Group (MSG) conducted its fourth annual health screening campaign to test and treat MSG's current and potential program participants for schistosomiasis, amoebiasis, intestinal worms, and malaria. The purpose of the project was to alleviate the burden of the diseases, while also gathering data to establish a longitudinal study on disease prevalence rates in the Rorya District. Since 2015, MSG has been able to provide this health screening service to 18,402 Rorya District community members.

This year, MSG tested a group of 6,911 people comprised of community members with no MSG education and community members who were current or past program participants. For the fourth year in a row, disease rates revealed that MSG program participants who have been exposed to MSG's education have lower disease rates for schistosomiasis, amoebiasis, intestinal worms, and malaria than non-program participants with no exposure to MSG programs.

Additionally, overall disease rates continue to decrease in the communities that we are teaching in or have taught in, indicating that the community is getting healthier.

### *2015 Health Screenings Summary*

The first health screening campaign, conducted in 2015, was a means of detecting and treating WASH-related diseases in the different stages of MSG's WASH-education intervention. During the pilot year, we found that many students and participants were sick – 81 percent of those screened tested positive for one or more water-related diseases. We believe that a high prevalence of positive UTI tests partially influenced these high disease rates. MSG tested and educated 3,060 community members (including approximately 900 program participants) and treated 5,604 cases of water-related diseases. The screenings provided participants with an understanding of their WASH health situation, treatment if needed, and education to prevent future WASH-related diseases. Additionally, following the World Health Organization and the Tanzanian Ministry of Health's guidelines, all health screening participants received treatment for intestinal worms regardless of whether they tested positive or not. This mass treatment was conducted because the Rorya District is endemic for intestinal worms. Figure 43 shows the disease rates for each water-related disease we tested for.

*Figure 43: 2015 Health Screening Disease rates*

| 2015 Health Screening Rates | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | UTIs |
|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 20% | 18% | 2% | 31% | 70% |
| **New MSG Program participants who tested positive** | 28% | 12% | 17% | 4% | 66% |
| **MSG Program participants who tested positive** | 18% | 16% | 4% | 14% | 16% |
| **Non-MSG Program participants who tested positive** | 22% | 30% | 3% | 16% | 30% |

### *2016 Health Screening Summary*

In 2016, Maji Safi Group (MSG) conducted its second annual health screening campaign, testing 5,060 people. The participant sample included MSG program participants, their guardians, local community members, students, and fishermen as a means of evaluating the effectiveness of our programs and the overall health situation in the Rorya District. MSG screened for malaria, schistosomiasis, amoebiasis, intestinal worms and urinary tract infections (UTIs). Overall, disease rates showed that MSG program participants who have been exposed to MSG education typically have a lower WASH-related disease prevalence rate (i.e. schistosomiasis, amoebiasis, and intestinal worms) than non-program participants with no exposure to MSG programs. Data also suggested that MSG should reevaluate its education about UTIs and add malaria lessons to its education. Figure 44 indicates the disease rates for each water-related disease we tested for.

*Figure 44: 2016 Health Screening Disease Rates*

| 2016 Health Screening Rates | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | UTIs | Malaria |
|---|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 14% | 24% | 7% | 13% | 51% | 22% |
| **Percentage of current participants who tested positive** | 10% | 9% | 5% | 8% | 53% | 23% |
| **Percentage of past participants who tested positive** | 9% | 9% | 5% | 6% | 49% | 16% |
| **Percentage of family members of program participants who tested positive** | 11% | 14% | 3% | 7% | 53% | 21% |
| **Percentage of staff members who tested positive** | 12% | 6% | 0% | 3% | 53% | 11% |
| **Percentage of community members who tested positive** | 18% | 41% | 10% | 21% | 49% | 23% |

### *2017 Health Screening Summary*

In 2017, MSG screened and treated 3,071 program and non-program participants. However, five forms were missing from the final count, so analysis was only conducted for 3,066 participants. The participant sample included MSG program participants, their guardians, non-program participants, and secondary school students. Primary school students were not screened this year due to a concurrent mass treatment campaign implemented by the Tanzanian government at all primary schools. MSG chose not to screen and treat primary school students to avoid double treatment. It was found that 51% of the 2017 health screening participants tested positive for one or more water-related diseases. Compared to the 2015 and 2016 health screening results, this is a 4% and 5% decrease, respectively. When looking at program participants' disease rates in comparison to non-program participants, the results continued to indicate that those exposed to MSG's education typically had lower disease prevalence rates than those not yet exposed to MSG's education. Data also suggested that MSG should add malaria lessons to its education. Figure 45 indicates the disease rates for each water-related disease we tested for in 2017.

*Figure 45: 2017 Health Screening Disease Rates*

| 2017 Health Screening Rates | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria* |
|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 14% | 38% | 23% | 12% | 6% |
| **Percentage of current program participants who tested positive** | 11% | 12% | 8% | 6% | 4% |
| **Percentage of past program participants who tested positive** | 7% | 12% | 7% | 8% | 4% |
| **Percentage of family members of program participants who tested positive** | 7% | 5% | 8% | 4% | 2% |
| **Percentage of staff members who tested positive** | 13% | 0% | 4% | 0% | 7% |
| **Percentage of non-program participants who tested positive** | 20% | 74% | 44% | 20% | 6% |

*Note: Only selected community members and Singing and Dance participants and their family members were tested for malaria. Only 400 malaria tests were given.

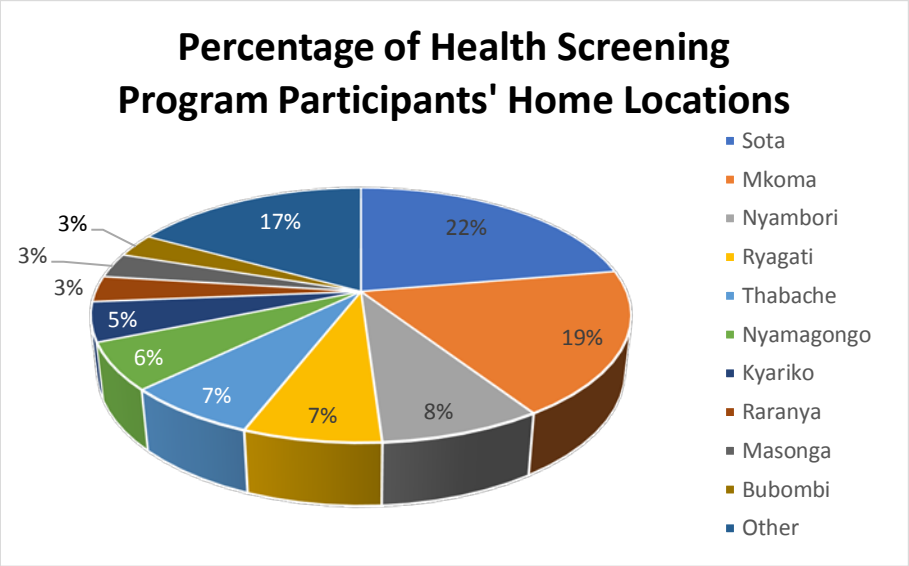
## 2018 Health Screening Results

### *2018 Demographics*

In 2018, the MSG Health Screening Program was once again very well received among participants and community members. Overall, MSG screened and treated 6,911 program and non-program participants. The screenings took place over 19 days between March 16, 2018 and April 27, 2018. On average, MSG screened and treated 364 people per day with a range of 144 to 559 participants per day.

Of those tested, 49% were male, and 51% were female. The youngest person tested was two months old, and the oldest person tested was 96 years old. The screenings took place in several different locations: the MSG office, Tina's Pre and Primary School, Sota Primary School, Majengo Primary School, Katuru Secondary School, Raranya Secondary School, Tai Secondary School, Bukura Secondary School, Sarungi Secondary School, and the Ryagati, Nyambori, and Thabache communities. The majority of those screened came from the village of Sota (22%), Mkoma (19%), followed by Other (17%), which consists of various locations in the Mara Region, then Nyambori (8%), Ryagati (7%), Thabache (7%), Nyamagongo (6%), Kyariko (5%), Raranya (3%), Masonga (3%), and Bubombi (3%), as indicated in Figure 46.

*Figure 46: Percentage Breakdown of Health Screening Program Participants' Home Locations*




## *Overall 2018 Results*

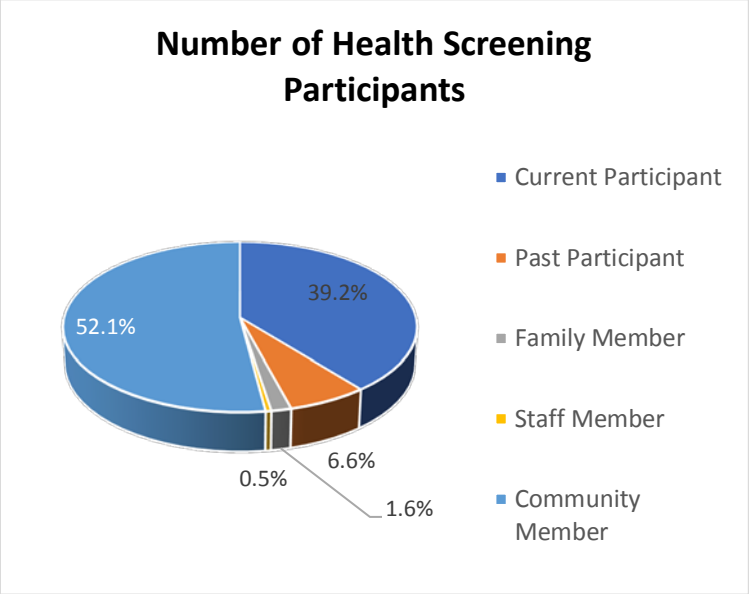
For the 2018 health screening campaign, MSG used the same health-screening questionnaire that was used in 2016 and 2017 to ensure that rates could be compared longitudinally. It was found that 54% of the 2018 health screening participants tested positive for one or more water-related diseases (amoebiasis, intestinal worms, schistosomiasis in stool, schistosomiasis in urine, and malaria). Compared to the 2015 health screening results, this is a 1% decrease in overall disease rates, but an increase in overall disease rates between 2017 and 2018. This was to be expected, as MSG expanded the Health Screening Campaign into new communities and schools that had not yet received any MSG education or intervention (i.e. participants in these new areas had not received MSG's WASH lessons prior to being screened).

When looking at program participants' disease rates in comparison to those of non-program participants, the results continually indicate that those exposed to MSG's education typically had a lower disease prevalence rate. Participant status was categorized in five ways: current program participant (involved in an MSG program within the year), past program participant (involved in an MSG program a year or longer ago), family member (a current or past program participant's family member), staff (an MSG staff member), and non-program participant (community member in pie chart). The breakdown of the health screening participants' status is indicated in Figure 47 and Figure 48.

*Figure 47: Health Screening Participant Status*

| Participant Status | Current Participant | Past Participant | Family Member | Staff Member | Non-program participant | Overall Total |
|---|---|---|---|---|---|---|
| **Number of Health Screening Participants** | 2,710 | 456 | 114 | 32 | 3,599 | **6,911** |

*Figure 48: Percentage Breakdown of Type of Health Screening Participants*




As indicated in Figure 49, there is a significant difference between disease rates among MSG program participants (current and past) and non-program participants. The gap between program participants and non-program participants is larger than in any of our previous years. These percentages indicate that community members with no exposure to MSG programs or education have a higher percentage of amoebiasis (9% higher), intestinal worms (62%-63% higher), schistosomiasis in stool (37%-39% higher), schistosomiasis in urine (18%-20% higher), and malaria (28% higher) than current and past MSG program participants.

These results lead us to believe that those who participate in Maji Safi Group's programs (currently or in the past) have a better understanding of WASH knowledge and can better prevent WASH-related diseases, such as amoebiasis, intestinal worms, schistosomiasis, and malaria, than community members who have not had access to MSG education via programs.

The disease rate trends of those who have been exposed to MSG programs compared to those of non-program participants also hold for family members of MSG program participants and staff members. There are higher amoebiasis, intestinal worm, schistosomiasis, and malaria rates among non-program participants than among family members of program participants and MSG staff. We conclude that staff and family members have lower WASH-disease rates because they are exposed to MSG education. As Figure 49 indicates, exposure to MSG education has a significant impact on disease rates.

*Figure 49: 2018 Health Screening Disease Rates*

| 2018 Health Screening Rates | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 9% | 41% | 26% | 17% | 28% |
| **Percentage of current program participants who tested positive** | 4% | 9% | 7% | 6% | 14% |
| **Percentage of past program participants who tested positive** | 4% | 10% | 5% | 8% | 14% |
| **Percentage of family members of program participants who tested positive** | 8% | 15% | 13% | 6% | 14% |
| **Percentage of staff members who tested positive** | 5% | 14% | 14% | 6% | 6% |
| **Percentage of non-program participants who tested positive** | 13% | 72% | 44% | 26% | 42% |

We also wanted to know if the frequency of MSG lessons had an impact on disease rates. Therefore, we asked health-screening participants how many times they had participated in an MSG WASH lesson. Categories to choose from included: never (they have never had a direct WASH lesson from a CHE), 1-3 times (they have had 1-3 WASH lessons from a CHE), four times (they have had four WASH lessons from a CHE), and $5^{+}$ (they have had five or more WASH lessons from a CHE). We chose these frequencies because we always aim to give at least four lessons in several of our programs (Home Visit, Female Hygiene, Male Hygiene, Singing and Dance, Maji Safi Cup, and After School). Figure 50 and Figure 51 show the breakdown and percentages of the health screening participants who had received MSG's education. Figure 52 indicates that those who never had MSG education prior to being screened had the highest disease prevalence rates. Additionally, the more MSG lessons participants had received, the lower their disease prevalence rates for the common water-related diseases were. These results (Figure 52) demonstrate the correlation between exposure to MSG education and disease prevalence rates. This figure also shows that it is best to have four, five, or more lessons from MSG, as having at least four lessons lowers WASH disease prevalence rates among program participants.

*Figure 50: 2018 Number of MSG Lessons Received by Health Screening Participants*

| Number of Lessons Received | No Lessons | 1-3 Lessons | 4 Lessons | $5^{+}$ Lessons | Total |
|---|---|---|---|---|---|
| Number of Health Screening Participants | 3,727 | 995 | 212 | 1,977 | **6,911** |

*Figure 51: 2018 Percentage of MSG Lessons Received by Health Screening Participants*

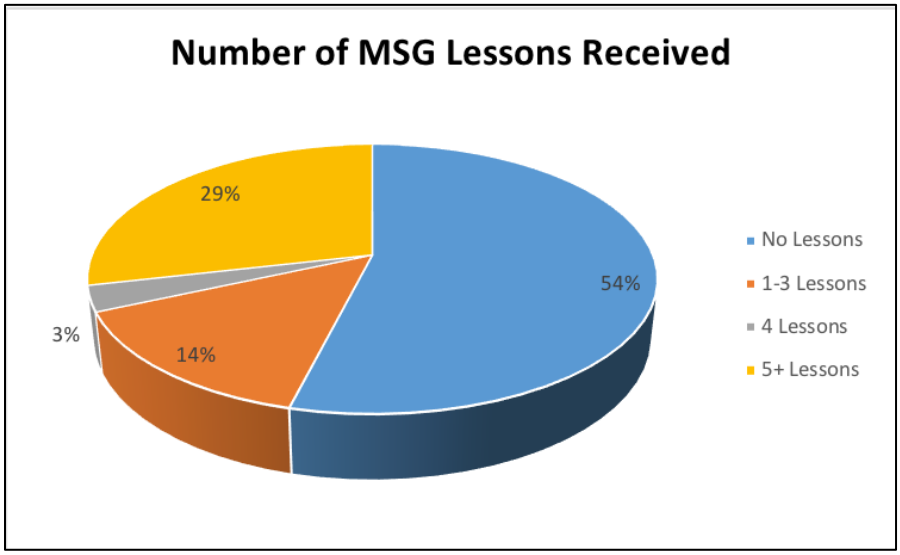



*Figure 52: 2018 Health Screening Disease Rates as They Relate to Level of MSG Participation*

| 2018 Health Screening Rates | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 9% | 41% | 26% | 17% | 28% |
| **Percentage of health screening participants who have received no MSG lessons and tested positive** | 12% | 70% | 43% | 26% | 41% |
| **Percentage of health screening participants who have received 1-3 MSG lessons and tested positive** | 8% | 14% | 10% | 11% | 17% |
| **Percentage of health screening participants who have received 4 MSG lessons and tested positive** | 2% | 10% | 8% | 5% | 13% |
| **Percentage of health screening participants who have received $5^{+}$ MSG lessons and tested positive** | 3% | 6% | 5% | 4% | 13% |

### *Maji Safi Group Program Disease Rates*

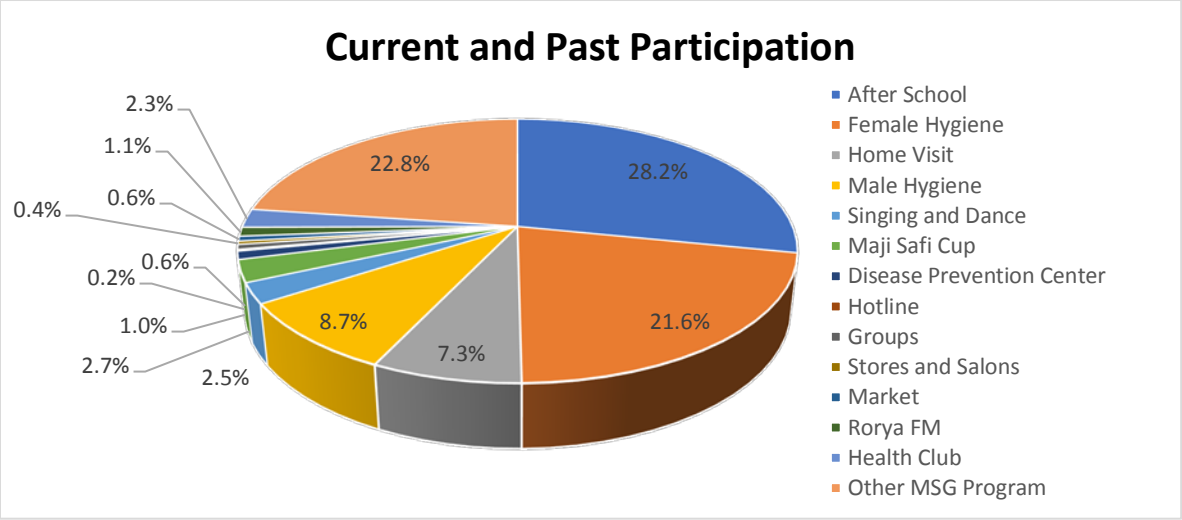
MSG tested 3,489 current and past program participants, which made up 50% of all those tested in 2018. MSG programs in which participants engaged included After School, Female Hygiene, Male Hygiene, Singing and Dance, Home Visit, Maji Safi Cup, Disease Prevention Center, Hotline, Outreach with groups, Outreach with stores and salons, Market outreach,

Radio show, School Health Clubs, and Other, such as Emergency Outreach or Health Screenings. It is important to note that 285 health screening participants partake (or partook) in more than one MSG program. This number indicates that they are currently in more than one MSG program or have participated in a program in the past and are currently participating in another program. As indicated in Figure 53 and Figure 54, the majority of program participants (past and current) came from After School (28.2%), Outreach Programs, including Groups, Stores and Salons, Market, Rorya FM, and Other MSG Programs (25.5%), then Female Hygiene (21.6%), followed by Male Hygiene (8.7%), Home Visit (7.3%), Maji Safi Cup (2.7%), Singing and Dance (2.5%), Health Clubs (2.3%), Disease Prevention Center (1.0%) and Hotline (0.2%).

*Figure 53: Number of Current and Past MSG Program Participants*

| Program | Number of Current and Past Program Participants | Percentage |
|---|---|---|
| **Home Visit** | 253 | 7.3% |
| **Female Hygiene** | 753 | 21.6% |
| **After School** | 985 | 28.2% |
| **Male Hygiene** | 305 | 8.7% |
| **Singing and Dance** | 86 | 2.5% |
| **Maji Safi Cup** | 95 | 2.7% |
| **Health Clubs** | 81 | 2.3% |
| **Disease Prevention Center** | 35 | 1.0% |
| **Hotline** | 7 | 0.2% |
| **Groups** | 21 | 0.6% |
| **Stores and Salons** | 16 | 0.4% |
| **Market** | 20 | 0.6% |
| **Rorya FM** | 38 | 1.1% |
| **Other MSG Program (includes participation in previous year(s) of MSG's Health Screening Program)** | 794 | 22.8% |
| **Total** | **3,489** | **100%** |

*Figure 54: Percentage of MSG Program Participation*



According to Figure 55, nearly all MSG program participants had lower WASH disease prevalence rates than community members who had not had any exposure to MSG programs: amoebiasis (1%-13% lower – aside from Hotline and Rorya FM which were 1%-8% higher), intestinal worms (51%-72% lower), schistosomiasis in stool (21%-44% lower), schistosomiasis in urine (18%-26% lower – aside from Hotline which was 3% higher), and malaria (13%-42% lower). Disease rates among the program participants also varied. Amoebiasis rates ranged from 0% positive in Groups and Stores and Salons to 21% positive in Rorya FM. Intestinal worm rates ranged from 0% positive in the Hotline and Market programs to 35% positive in Disease Prevention Center. Schistosomiasis in stool rates ranged from 0% positive in Hotline and Market to 23% in Disease Prevention Center. Schistosomiasis in urine rates ranged from 0% in the Singing and Dance, Disease Prevention Center, Groups, and Stores and Salons to 29% in Hotline. Malaria rates ranged from 0% positive in Groups, Stores and Salons, and Market to 29% positive in Hotline. It should be noted that while the second column of Figure 55 indicates the number of individuals screened from each program, not all of these individuals were able to produce a urine, stool, or blood sample during the screening. Thus, the percentages in Figure 55 only include individuals who were able to produce the required sample for the test.

*Figure 55: Disease Rates among MSG Program Participants*

| Health Screening Rates | Number screened | Amoebiasis | Intestinal Worms | Schistosomiasis in Stool | Schistosomiasis in Urine | Malaria |
|---|---|---|---|---|---|---|
| **Overall percentage of health screening participants who tested positive** | 6,911 | 9% | 41% | 26% | 17% | 28% |
| **Home Visit** | 253 | 5% | 7% | 5% | 5% | 13% |
| **Female Hygiene** | 753 | 4% | 7% | 4% | 6% | 11% |
| **After School** | 985 | 4% | 9% | 7% | 5% | 15% |
| **Male Hygiene** | 305 | 3% | 10% | 7% | 6% | 10% |
| **Singing and Dance** | 86 | 4% | 4% | 8% | 0% | 4% |
| **Maji Safi Cup** | 95 | 6% | 3% | 6% | 2% | 7% |
| **Disease Prevention Center** | 35 | 12% | 35% | 23% | 0% | 26% |
| **Hotline** | 7 | 14% | 0% | 0% | 29% | 29% |
| **Groups** | 21 | 0% | 11% | 6% | 0% | 0% |
| **Stores and Salons** | 16 | 0% | 8% | 8% | 0% | 0% |
| **Market** | 20 | 12% | 0% | 0% | 5% | 0% |
| **Rorya FM** | 38 | 21% | 21% | 12% | 8% | 5% |
| **Health Club** | 81 | 1% | 4% | 5% | 1% | 9% |
| **Other MSG Programs (health screenings, emergency outreach)** | 794 | 5% | 8% | 6% | 7% | 15% |
| **Non-Program Participants** | 3,599 | 13% | 72% | 44% | 26% | 42% |

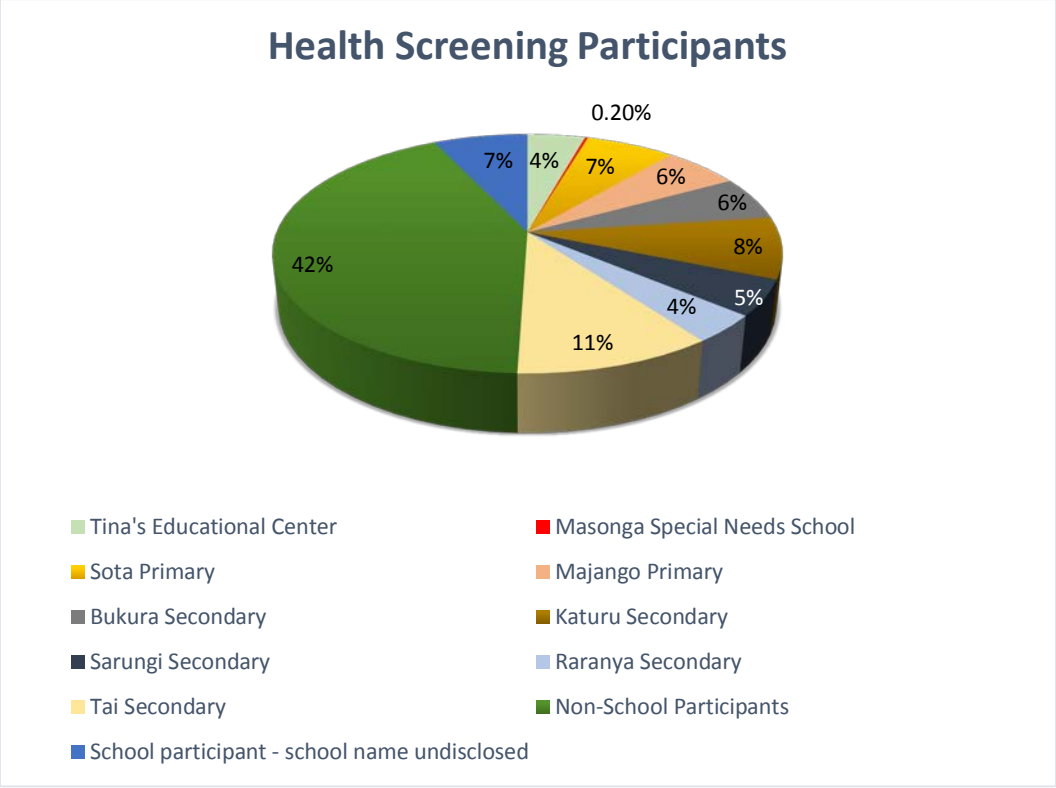
## School Results

MSG was able to collaborate with nine schools during the 2018 Health Screening Program. Figure 56 – Figure 58 indicate the number and percentage of students screened this year and the class breakdown. Screening and treatment took place at five secondary schools and four primary schools. Some of these schools had previously participated in our Health Screening campaign, but this was the first year for MSG to screen and treat at Masonga Special Needs School, Majengo Primary School, Bukura Secondary School, and Raranya Secondary School.

*Figure 56: Health Screening Participation at Schools*

| School Name | Number of Health Screening Participants | Percentage of School Participation in Overall Health Screening Campaign |
|---|---|---|
| **Tina's Educational Center** | 301 | 3.8% |
| **Masonga Special Needs School** | 14 | 0.2% |
| **Sota Primary** | 463 | 7% |
| **Majengo Primary** | 398 | 6% |
| **Bukura Secondary** | 409 | 6% |
| **Katuru Secondary** | 573 | 8% |
| **Sarungi Secondary** | 333 | 5% |
| **Raranya Secondary** | 263 | 4% |
| **Tai Secondary** | 738 | 11% |
| **School participant – school name undisclosed** | 491 | 7% |
| **Non-School participants** | 2,928 | 42% |
| **Total** | **6,911** | **100%** |

*Figure 57: Pie Chart of Health Screening Participation at Schools*



Data from 82 school students was not included in Figure 58 as they did not disclose which class they were in.

*Figure 58: Chart of School and Class Breakdown*

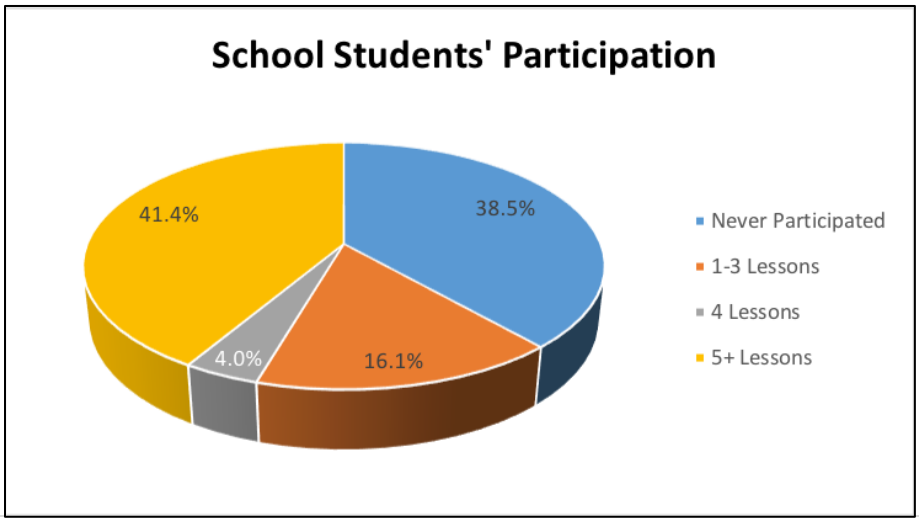
| School Name | Pre-K | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Form 1 | Form 2 | Form 3 | Form 4 | Teacher | Parent | Overall number screened |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tina's Educational Center** | 40 | 23 | 27 | 30 | 35 | 49 | 40 | 33 | 0 | 0 | 0 | 0 | 1 | 0 | **278** |
| **Masonga Special Needs School** | 0 | 0 | 6 | 5 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | **14** |
| **Sota Primary** | 5 | 28 | 66 | 43 | 61 | 93 | 73 | 74 | 0 | 0 | 0 | 0 | 0 | 2 | **445** |
| **Majengo Primary** | 6 | 67 | 46 | 61 | 42 | 54 | 47 | 59 | 0 | 0 | 0 | 0 | 0 | 3 | **385** |
| **Bukura Secondary** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 188 | 113 | 62 | 40 | 0 | 0 | **403** |
| **Katuru Secondary** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 181 | 198 | 129 | 52 | 0 | 0 | **560** |
| **Sarungi Secondary** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 139 | 94 | 56 | 42 | 1 | 0 | **332** |
| **Raranya Secondary** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 85 | 80 | 73 | 21 | 0 | 0 | **259** |
| **Tai Secondary** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 245 | 245 | 138 | 106 | 0 | 0 | **734** |
| **Total** | **51** | **118** | **145** | **139** | **138** | **196** | **160** | **169** | **838** | **730** | **458** | **261** | **2** | **5** | **3,410** |

When looking at the data from the MSG program participants, we also looked at MSG participation levels, broken up into four levels: non-program participants, have completed 1-3 lessons with MSG, have completed 4 lessons with MSG, and have completed 5 or more lessons with MSG. MSG is assigned class grades to teach during the After School, Male Hygiene and Female Hygiene Programs; therefore, some class levels have not yet received MSG education. Of those who were screened at a school, 62% (2,148 participants) participated in an MSG Program either as a past or current participant, and 38% (1,343 participants) have yet to receive MSG WASH education. Figure 59 and Figure 60 show a breakdown of the different schools, classes, and overall MSG participation level.

*Figure 59: MSG Participant Status per School*

| School Name | # Never participated | # Participated in 1-3 lessons | # Participated in 4 lessons | # Participated in $5^{+}$ lessons |
|---|---|---|---|---|
| **Tina's Educational Center** | 119 | 58 | 8 | 116 |
| **Masonga Special Needs School** | 0 | 0 | 0 | 14 |
| **Sota Primary** | 157 | 98 | 6 | 202 |
| **Majengo Primary** | 216 | 81 | 51 | 50 |
| **Bukura Secondary** | 375 | 3 | 0 | 31 |
| **Katuru Secondary** | 74 | 114 | 27 | 358 |
| **Sarungi Secondary** | 148 | 56 | 17 | 112 |
| **Raranya Secondary** | 93 | 46 | 6 | 118 |
| **Tai Secondary** | 161 | 105 | 25 | 447 |
| **Total** | **1,343** | **561** | **140** | **1,448** |

*Figure 60: Percentage of MSG Participant Status in Participating Secondary Schools*



### School Demographics

The 2018 Health Screening Program also looked at the age and gender demographics of the school students MSG works with. The results in Figure 61 show that despite having a higher percentage of females than males in primary school, the majority of secondary schools that were screened had a higher percentage of males than females. These rates represent the gender differences found in rural schools in Tanzania.

*Figure 61: School Participants' Average Age and Gender*

| School Name | Average Age | Percentage of Males | Percentage of Females |
|---|---|---|---|
| **Tina's Educational Center** | 11 | 48% | 52% |
| **Masonga Special Needs School** | 13 | 36% | 64% |
| **Sota Primary** | 13 | 49% | 51% |
| **Majengo Primary** | 11 | 48% | 52% |
| **Bukura Secondary** | 17 | 58% | 42% |
| **Katuru Secondary** | 16 | 48% | 52% |
| **Sarungi Secondary** | 18 | 57% | 43% |
| **Raranya Secondary** | 16 | 55% | 45% |
| **Tai Secondary** | 17 | 54% | 46% |

### School Disease Rate Analysis

During this health screening, the program participants were screened and tested for amoebiasis, intestinal worms, schistosomiasis in stool, schistosomiasis in urine, and malaria. Figure 62 shows an analysis of the program participants' water-related disease rates.

*Figure 62: Disease Rates per School*

| School Name | Number of Students Screened | Number of Years MSG has Taught at School | Percentage tested positive for Amoebiasis | Percentage tested positive for Intestinal Worms | Percentage tested positive for Schistosomiasis in Stool | Percentage tested positive for Schistosomiasis in Urine | Percentage tested positive for Malaria |
|---|---|---|---|---|---|---|---|
| **All Health Screening Participants** | 6,911 | - | 9% | 41% | 26% | 17% | 28% |
| **Tina's Educational Center** | 278 | 6 years | 7% | 35% | 26% | 16% | 25% |
| **Sota Primary** | 445 | 5 years | 6% | 25% | 15% | 9% | 29% |
| **Katuru Secondary School** | 560 | 2 years | 5% | 24% | 12% | 16% | 14% |
| **Tai Secondary School** | 734 | 2 years | 5% | 17% | 13% | 9% | 21% |
| **Sarungi Secondary School** | 332 | 1 year | 4% | 44% | 24% | 21% | 43% |
| **Raranya Secondary School** | 259 | Less than 1 year | 2% | 37% | 24% | 22% | 29% |
| **Majengo Primary** | 385 | Less than 1 year | 13% | 40% | 35% | 12% | 18% |
| **Masonga Special Needs School** | 14 | Less than 6 months | 0% | 20% | 0% | 8% | 36% |
| **Bukura Secondary** | 403 | 0 | 4% | 51% | 29% | 33% | 41% |

**Note: Please note that all percentages were based on only those who produced a stool and/or urine sample.*

Figure 62 illustrates disease prevalence rates within each school. We found that Majengo Primary students have the highest amoebiasis rates (13%) and schistosomiasis in stool rates (35%). Bukura Secondary students have the highest intestinal worm rates (51%) and schistosomiasis in urine rates (33%). Sarungi Secondary students have the highest malaria rates (43%). Overall, these statistics indicate that participants are generally healthier if they are being or have been exposed to Maji Safi Group's WASH education. Schools that have partnered with MSG in our school programs the longest, and thus have received our WASH education, tend to have healthier students (Tina's Educational Center, Sota Primary, Katuru Secondary). This can be attributed to the continued increase in knowledge provided by MSG regarding disease prevention of water-related infections. Likewise, schools that have not yet partnered with MSG in our school programs

have some of the highest disease rates, such as Bukura Secondary School. After the 2018 Health Screening Program was implemented, Bukura Secondary School partnered with MSG in our school program through the establishment of an MSG School Health Club. This club will continue teaching WASH and female and male hygiene lessons throughout the next school year. We anticipate lower disease prevalence rates in the 2019 Health Screening Program, as students will have had a full year to be educated on WASH disease prevention.

### *Health Screening Discussion*

During the 2018 Health Screening Program, Maji Safi Group (MSG) collected extensive information about disease rates in the Rorya District. These rates represent the fourth year in our longitudinal study and are important to assessing the overall impact MSG's lessons are having on WASH behaviors in the community.

Over four years, our results have remained consistent: People who have been exposed to MSG's WASH education are healthier than those who have not received such education. Prevention is proving to save MSG program participants from continuously contracting WASH-related diseases. Our Health Screening results continue to indicate that those related to and/or interacting with program participants, whether through a family member or an entire school, benefit from the health education their connection is learning. Both family members and students from schools that have partnered with MSG for a long time had lower WASH disease rates than community members who had not yet received WASH education from MSG. Figures 4-8 demonstrate how disease rates have varied over the years. The common trend we are seeing is that each consecutive year, current and past program participants have lower disease rates than non-program participants (except for amoebiasis in 2015 and schistosomiasis in stool in 2015). Additionally, current and past program participants have generally continued to have lower disease prevalence rates since 2015. This data maintains that MSG's WASH-related disease prevention education is effective in positively impacting and affecting the trajectory of community members' health status.

#### Recommendations for the Future

The 2018 Health Screening Campaign was very successful, but there is always room for improvement. MSG recommends the following for the 2019 Health Screening Campaign:

- Update health-screening questionnaire.
- Continue to collaborate with the local and district government regarding health screening dates and support to implement the program.
- Re-screen the communities and schools that were screened for the first time in 2018 to compare participants' disease prevalence rates before and after receiving MSG WASH-related disease prevention education.

#### 2018 Health Screening Conclusion

Health screening results measure WASH-disease prevalence rates of people who have received MSG WASH education and participated in programs and compare them to disease prevalence rates of new MSG program participants and potential program participants who have never participated in MSG programs. The results continuously prove that there is a lower prevalence of disease rates among program participants who have completed MSG's WASH lessons. In 2018, in collaboration with the local and district governments, MSG was able to screen 6,911 community members. Results indicated that MSG significantly improves the lives of program participants and community members who are exposed to

MSG education. It is our hope to continue our collaboration with the local and district governments in 2019 to further evaluate MSG programs and improve the lives of community members**.** Together, we can provide a clean bill of health coupled with community-driven education, which is a sustainable intervention model for decreasing WASH-related diseases in rural areas of Tanzania.

## Conclusion

With the financial support from our generous supporters, Maji Safi Group was able to directly teach over 39,500 people lifesaving WASH information in 2018. When we include the radio shows, we taught 225,281 people. We are pleased to see that Maji Safi Group continues to grow by expanding to new areas within the Rorya District. We are especially pleased with the health screening data that strongly indicate that MSG program participants continue to have lower disease prevalence rates than non-program participants without access to MSG's WASH education. We feel well prepared to enter 2019 with a strong management team and 17 Community Health Educators. We are confident that we can accomplish many of our upcoming goals. In 2019, it is our aim to continue expanding our WASH programs to other areas of the Rorya District and to keep demonstrating that Maji Safi Group's programs continue to be effective by maintaining our collaborative relationship with the government and the community. Additionally, we anticipate making an even larger decrease in waterborne and water-related diseases evident among MSG participants.