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Improving Access to Antenatal Care in Ngara, Tanzania Through Implementation of the Lady Health Worker Programme

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Abstract

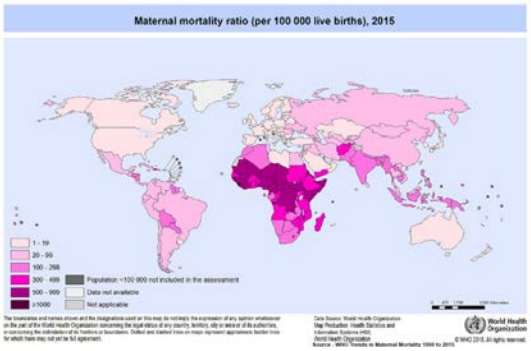
Maternal mortality is one of the greatest health disparities facing the world today. A disproportionate number of women who die from pregnancy-related complications live in developing countries: the average maternal mortality in developed nations is 12/100,000, compared to 239/100,000 in developing nations; this rate is even higher in several sub-Saharan African nations. Reasons for this disparity include a lack of providers, inaccessibility to care, and poor quality of treatment in developing nations. Women living in the sub-Saharan country of Tanzania face many of these barriers, and as a result the country's maternal mortality rate is 398/100,000. Antenatal care is an important method to improve birth outcomes and decrease maternal mortality. The Lady Health Worker Programme (LHWP) is a community-based intervention aimed at improving access to antenatal care in predominantly rural environments. The program trains local women to be community health care workers who are capable of providing preventative primary care in their communities. These women also help foster communication between the community and healthcare professionals. The LHWP will be implemented in three healthcare facilities in Ngara District, Tanzania. Thirty trained Lady Health Workers (LHWs) will be responsible for providing care to a total of 4500 households with reproductive-age women. Based on current data, the LHWP in Ngara anticipates reaching roughly 450 pregnant women per year. The program targets improved access to and early initiation of antenatal care, as well as recognition and referrals of pregnancy complications associated with maternal morbidity and mortality. LHWs will treat women in the district, recording their interactions in logbooks and submitting the data for analysis every six months to determine trends of the performance measures. These analyses, together with a comparison of outcomes before and after implementation, will determine the effectiveness of the LHWP. If successful, utilization of antenatal will improve in pregnant women of Ngara district, which will eventually decrease maternal mortality in the area.

Target Population and Need

Global Maternal Mortality

Maternal mortality—death due to pregnancy-related complications during or within 42 days of ending pregnancy—represents one of the greatest health disparities globally[1]. Many of the complications, such as high blood pressure, infections, diseases associated with HIV, and hemorrhaging are preventable and treatable with proper care[2]. However, not all women receive appropriate healthcare support[3]. Data indicate the disparity is largely related to the development of a country (**Figure 1**): 99% of all pregnancy-related deaths occur in developing nations, where a shortage of medical personnel, lack of access to treatment, and lower rates of women seeking antenatal care contribute to high rates of mortality[2,3,4]. In 2015, the maternal mortality rate (MMR) in developed nations was 12/100,000, while in less developed nations this rate was 239/100,000[2]. In sub-Saharan Africa, over 80% of countries had MMRs above 300/100,000[5].

Figure 1: Global Maternal Mortality Ratio, 2015



To address the disparity in maternal mortality, international organizations first implemented Millennium Development Goals (MDGs) and later Sustainable Development Goals (SDGs) to help improve outcomes. Although progress has been made, considerable inequalities remain[6].

Risk Factors for Maternal Mortality

One of the greatest risk factors of maternal mortality is a lack of access to antenatal care (ANC)[7,8]. Between 30-50% of maternal deaths worldwide are due to hypertension and

hemorrhage—direct complications of inadequate antenatal care[8]. ANC offers important interventions, such as immunizations, malaria prevention, management of potentially dangerous infections, prevention of transmission of HIV, and recognition and management of obstetric complications, including preeclampsia[8]. Moreover, ANC provides education regarding healthy behaviours and family planning and also promotes the use of skilled birth attendants[8]. Family planning education is beneficial for both mothers and expectant women as it teaches women the importance of adequate spacing between births and illustrates the numerous physical and mental health benefits for women and children associated with these spacings[8].

Whether a woman receives ANC during pregnancy often depends on her geographical location and socioeconomic status[7]. Women of lower economic means are less likely to receive care because they perceive cost of transportation and treatment to be a substantial barrier, whereas women living in urban areas with greater economic means are more likely to attend ANC visits[2,7]. Other barriers to ANC include availability and quality of healthcare services, cultural beliefs, lack of understanding of the benefit of care, and obstetric history[7]. In 2011, the World Health Organization (WHO) began to promote the consolidation of care to four appointments throughout pregnancy—known as focused antenatal care (fANC)—as evidence suggested this strategy was more effective in developing nations[8].

Preconception care is also a risk factor of maternal mortality: poor maternal health prior to pregnancy has negative impacts on both mother and child and contributes to maternal mortality[9]. An additional risk factor of maternal mortality is maternal age. Adolescents are at a high risk for complications and mortality because they often do not present for care[2]. Adolescent birth rates are often higher in less developed countries, which contributes to higher MMRs in these areas. Moreover, developing nations routinely have higher fertility rates than developed nations, signifying a higher potential for complications during pregnancy. In 2015, the global fertility rate was 2.5, ranging from 1.9 in North America to greater than 4.7 in Africa[10].

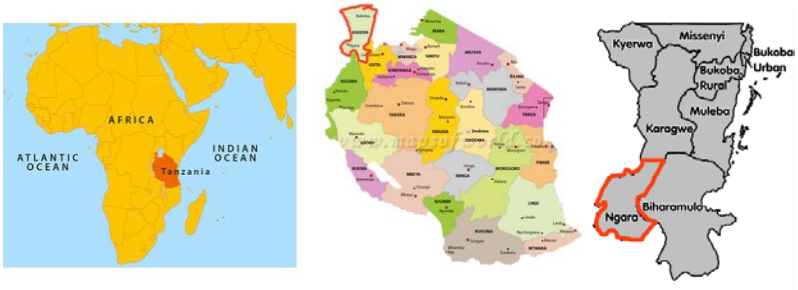
Tanzania Demographics and Maternal Mortality

The sub-Saharan country of Tanzania, a rural, impoverished nation, accurately depicts the many barriers to ANC faced by pregnant women in developing nations[7]. The largest and most populous country in East Africa, Tanzania's population is 44.9 million, with reproductive-aged women (ages 15-49) accounting for 47.3%[11,12]. The average maternal age for first-time births is 19.8 years[11]. The adolescent birth rate is 72.1/1000 and the country's fertility rate is 4.77[11,12,13]. Additionally, there are only 0.03 physicians per 1000 inhabitants[11,12]. These factors all contribute to the country's high maternal mortality rate: 398/100,000[11].

After implementation of the WHO's evidence-based fANC, mortality rates began to decrease across Tanzania[14]. More than 94% of all pregnant Tanzanian women attended at least one antenatal care appointment[7,15]. However, this number dropped significantly for subsequent appointments, with only 43% of women attending all four fANC visits[7]. Additionally, fANC guidelines were not always available or followed in healthcare facilities throughout the country[16].

Recently, Ngara District (**Figure 2**), a predominantly rural area in northwest Kagera Region, has experienced an unanticipated increase in maternal mortality; its MMR is higher than the national average[12,14]. Regional health officials have implicated delayed establishment of care, an inadequate referral system, inadequate birth preparedness, distance and a lack of providers as reasons for this increase[14].

Figure 2: Location of Kagera Region and Ngara District, Tanzania



A 2004 survey by the District Rural Development Programme showed only 31% of households in Ngara lived within 30 minutes of a health facility; 51% of households lived greater than 60 minutes

from a facility[17]. Furthermore, nearly 60% of women surveyed acknowledged having a homebirth, with the majority of these births attended to by traditional birth attendants, not healthcare professionals[17]. Additionally, the perceived financial cost of medical care prevented many residents from receiving necessary treatments[17]. Ngara District has one of the highest poverty rates in the region, and household income is often used for other, more pressing concerns—such as food[17].

Resources to Decrease Maternal Mortality in Ngara, Tanzania

Ngara District lacks many necessary resources to provide adequate healthcare. The district is composed of ten wards, which vary widely in availability of healthcare and services[14]. Ngara Mjini, the district's capital and the most urban location, is home to the area's largest hospital—Murgwanza Hospital. This hospital often receives referrals from the surrounding wards and employs a limited number of specialists in addition to several nurses. A few wards staff smaller, functional hospitals; additionally, dispensaries are located throughout the district, though these are frequently unstaffed[14]. However, Ngara residents tend to avoid hospitals and clinics due to high cost and the perceived non-significance of the illness or ailment[17]. Instead, many rely on local *mgangas* (witch doctors) before seeking a more formalized approach to medical treatment.

Due to the continued lack of ANC utilization in the district, Murgwanza Hospital proposes partnering with two other district facilities and several community organizations to implement the Lady Health Workers Programme (LHWP) in Ngara, Tanzania in an effort to improve access to ANC and combat the district's high maternal mortality. This program has already been successfully piloted and expanded in rural environments across Pakistan. The LHWP trains women from the community to be community health workers capable of providing preventative care to their neighbours and has the potential to increase access to and adherence of antenatal care and improve outcomes of pregnancy. Because of its previous success in a similar setting, Murgwanza Hospital believes this program will be successful in improving ANC use and decreasing maternal mortality in Ngara district. The LHWP will be further described in the **Program Approach**.

Community Needs Assessment and Advisory Group Formation

In conjunction with Ngara District Health Officials, Murgwanza Hospital conducted a Needs Assessment throughout the district using both interviews with key community members and meetings with focus groups. Overwhelmingly, members of the district identified high rates of maternal mortality as having a significant, negative impact on society. Within the focus groups, community members' responses indicated the belief that substantial barriers to antenatal care contributed to this mortality. Satisfied that Murgwanza's proposed program aligned with the concerns of the district, a Community Advisory Group was formed to help oversee the planning, implementation, and success of the Lady Health Worker Programme in Ngara. The Advisory Group will work in conjunction with program staff to ensure adequate development and accurate implementation of the program. Furthermore, this group will act as a liaison between the Murgwanza program staff and the larger community, providing feedback on community concerns, informing the people of progress and results and verifying the continued support of the community.

To be successful, the intervention will rely on the participation of pregnant women throughout the district. Program staff is confident retention of pregnant women in the community will not be an issue: women will not be required to change their daily routines to participate in the program, nor will they be expected to pay for services provided. However, the proposed budget includes a small amount to be used as a financial incentive for participation, if necessary.

Potential Impact

Thirty women from the district will be trained as health workers—ten from each setting. Each Lady Health Worker (LHW) will then be responsible for 150 households. A household must have at least one reproductive age or currently pregnant woman to be included in the intervention. These households will be provided with education on family planning and preconception care. If a woman becomes pregnant, she will be recruited into the LHWP and will receive ANC. Using current data of the regional household composition, the proportion of women of reproductive age and the

pregnancy rate, the program estimates reaching roughly 450 pregnant women each year[12,17,18,19,20]. This number represents roughly 2% of the eligible population in the district[12,19,20]. Following the initial three-year period, Murgwanza Hospital hopes to continue its partnerships with the community and expand the LHWP to have a greater impact on health in the district.

By targeting pregnant women in the Ngara, program implementers hope to increase the number of ANC visits by women in the community, leading to safer pregnancies and lower rates of complications. Additionally, program implementers believe the LHW intervention will lead to increased understanding of family planning. Eventually, these outcomes will lead to sustained higher rates of ANC, decreased MMR and lower rates of pregnancy in the community.

Program Approach

Lady Health Workers Programme

In the early 1990s, high rates of poverty and a severe shortage of healthcare personnel contributed to very poor health outcomes throughout Pakistan[21,22]. In response, Pakistan's public health sector launched an ambitious program to improve access to healthcare and satisfy unmet health needs, reasoning that by improving the health of its citizens, people would have greater opportunities for employment and higher wages, which would eventually decrease poverty throughout the country[21,22]. Funded as a joint collaboration between the government of Pakistan and external donors, the Lady Health Workers Programme (LHWP) was meant to serve as a bridge between the healthcare sector and the mostly rural communities, providing both preventative and curative interventions[21,22]. The services provided by each LHW included health education, family planning, treatment of minor injuries and ailments, as well as maternal and child health procedures, such as antenatal care and immunizations[21].

The program identified and trained women from the community to be Lady Health Workers qualified to provide these healthcare services. Additionally, LHWs were trained to identify complex health issues—such as breech position during pregnancy—that required referrals to healthcare

facilities and would provide these referrals when necessary[21,22]. Eligibility criteria for LHWs were strict and included a recommendation from the community, at least eight years of schooling, a middle school pass, local residency, and being between the ages of 18-45[21,23]. Being married was preferable[21,23]. Candidates underwent extensive trainings to be able to provide adequate levels of care to the community. Trainings took place over 15 months: three months of in-class instruction, including videos and chart readings, followed by 12 months of field training, during which the women worked closely with health professionals, gaining experience treating common illnesses and learning signs of more serious diseases; candidates also returned to the classroom once a month to complete problem-based modules[21,22].

Once trainings were complete, the women lived within the community and provided necessary and appropriate care[22]. Each LHW was associated with a healthcare facility, where she received training, medical supplies and medications, supervision, and a monthly allowance[21,22]. Additionally, the health facility served as a referral center for complicated and high-risk cases, including many of the complications of pregnancy associated with maternal mortality[22].

Program Success

Since initial implementation, several studies have indicated better health outcomes for both mothers and children throughout Pakistan; these outcomes are much more pronounced in areas treated by LHW[21,22]. In fact, cohorts treated by LHW have better health outcomes than national statistics[24]. Moreover, the Lady Health Workers Program has been successfully expanded to additional areas throughout Pakistan with similar results[21]. An extensive external review of the LHWP in 2002 by the Oxford Policy Management concluded that residents living in areas served by Lady Health Workers experienced better health indicators than the control population[24]. These health indicators included use of antenatal care and medical assistance at birth, family planning, preventative child health services and treatment of childhood diseases, and overall health knowledge[24]. Additionally, a 2006 study of LHW effectiveness in Punjab found much lower

maternal mortality rates in areas with LHWs, compared to the national average[22,23]. Researchers postulate that the program has been effective due to the unrestricted access LHWs have with the community, easing communication barriers between the community and healthcare systems[21].

Program Rationale for LHWP in Ngara, Tanzania

Community Health Workers (CHWs) have a sustained history of improving many aspects of health of their communities, including preventive interventions in maternal and child health, and have been shown to be effective in middle- and low-income nations[4,25]. Moreover, a report from Lesotho demonstrated that by strengthening human resource capital in the area, it was possible to increase the usage of antenatal care by women and improve the perception of facility-based births[26]. Female CHWs have also had success in Tanzania, effectively identifying pregnant women early and increasing ANC visits, ensuring these women received adequate care in pregnancy[25].

With health disparities, demographics, and a rural environment similar to Pakistan, the LHWP can be effectively translated to and implemented in Ngara District, Tanzania. Similar to Pakistan—where the few practicing healthcare professionals clustered in urban environments, leaving large proportions of rural populations without trained health officials—Tanzania suffers a countrywide shortage of trained healthcare staff[11,16,22]. Furthermore, the previous success of CHW maternal health programs in resource-poor areas of Tanzania indicates that a community-based intervention such as the LHWP can be successful in Ngara. Because Ngara residents avoid the doctor due to distance, time, cost, and a perception of insignificance, implementing a program that uses community members as a liaison between the participants and healthcare facilities accounts for the culture and lifestyle of the community members and actively works to ensure the basis of the intervention aligns with the community[17]. Additionally, the LHWP will function to offset the factors currently associated with the district's high MMR through increasing the number of providers, decreasing distance, improving access to care and the referral system, initiating early care, and educating women on birth preparations.

Program Planning

In anticipation of the LHWP intervention, staff at Murgwanza Hospital has outlined a timeline with a series of tasks and deadlines to be completed prior to implementation. During the planning period, staff and partners will meet weekly to report progress and ensure timely completion of duties. First, program staff will ensure the LHWP is feasible and culturally appropriate for Ngara. This will require an in-depth understanding of the original program and input from both the community and the Community Advisory Group. Program staff will implement focus groups with potential participants to discuss the cultural acceptability of all proposed activities of the LHWP. Suggestions from these women will be use to modify programs to ensure sustained participation and successful implementation of the LHWP.

Members of the Community Advisory Group were chosen based on their knowledge of and standing in the community, and will be relied upon to provide feedback of community needs and societal norms. The group includes both prominent men and women in Ngara, as the success of the LHWP depends on acceptance by the whole community. Tanzania is predominantly a patriarchal society and it is important that men in the community feel involved and support the work of LHWs. Including women who work in healthcare and other community settings throughout Ngara is also necessary, as these women can advocate for the female participants and LHWs. The Community Advisory Group is more fully described in **Partnerships and Collaboration.** A detailed list of members, their role, and rationale for inclusion is provided in **Table 1.**

The Community Advisory Group will play an important role during the planning phase to help ensure program information and activities are age appropriate, inclusive, culturally and linguistically appropriate and contain medically accurate information. For example, one responsibility of Lady Health Workers will be to educate women about family planning and contraception—topics not frequently discussed in Ngara due to cultural norms. The diversity of the Advisory Group will be instrumental in providing suggestions and techniques to program staff on

how to approach and discuss this medical information in a culturally sensitive manner. Moreover, program personnel will be able to use this culturally appropriate medical information to check for program fidelity during implementation. Staff will monitor LHWs and Facility Supervisors to ensure they are adequately presenting the appropriate information in accordance with the program.

Table 1: Community Advisory Board Members

Member	Community Role	Rationale
Hon. Deo	Member of Parliament	Gather additional community and government support; advocate for program sustainability
Dr. Mallya	Head Physician-Rulenge	Provide expertise on implementation aspects of the program and can provide solutions to implementation challenges
Ms. Theresa	Head Nurse-Rulenge	Act as a main support liaison for LHWs, advocating on their behalf to program personnel and helping to find solutions to difficulties LHWs might come across
Mm. Caritas	District Minister of Education	Provide insight into the secondary school science curriculum, helping to ensure all materials are educationally appropriate
Mm. Helen	Local Politician	Act as a bridge between the program and the community; can provide insight into community needs
Fr. John Bosco	Director, Catholic Diocese	Help garner support of the community, disseminate information about the program
Mr. Musa	Elder of Muslim community	Provide insight into Muslim culture in Ngara, and cultural acceptability of program
Ms. Winnie	Director of NGOs, Anglican Diocese	Advocate for participants and LHWs and necessity of certain program aspects
Ms. Kalla	Director, Womencraft	Provide a wealth of knowledge about the challenges of women in the district and will be able to discuss the effectiveness of certain aspects of the program
Mr. Beyanga	District Elder	Respected individual used to gain support of key community members
Mr. Jackson	Village Chairman	Liaison with local communities, acting as their advocate and confirming needs of the people

The Program Manager, together with the Curriculum and Training Director and input received from the Advisory Group, will adapt the training modules used in Pakistan to meet the needs of the community while maintaining fidelity to the original program. For continuity, the

Curriculum Director and two training support staff will be responsible for performing the classroom trainings. During this planning stage, the Program Manager will also confirm the housing situation at Murgwanza Hospital for the LHW candidates during the training period.

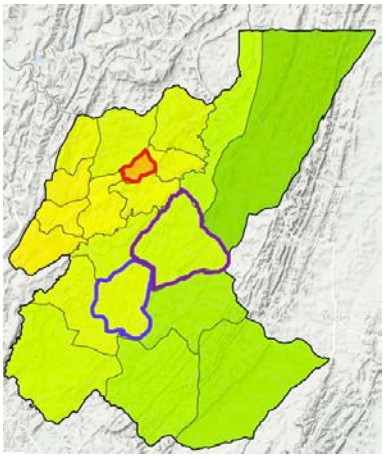
Program personnel will also meet with village elders and ward leaders at local gatherings, engaging with the larger community. These meetings will be useful in disseminating information regarding the program, gathering supporting and preparing the community for the introduction of the Lady Health Workers in the wards. The LHWP has decided to partner with the local radio station, Radio Kwizera, for dissemination and to reach a large proportion of the district. The Program Manager will also meet with Headmasters and staff of local secondary schools, explaining the purpose of the program, eligibility requirements for the women and asking for nominations of recent graduates who fit the criteria.

Program staff believes that the initial dissemination and explanation will engage women to be involved in the program. There will be no specific recruitment: a participant will be any pregnant woman in the intervention area who consents to having a LHW in her home. Moreover, program implementers are confident that the rapport with the LHW will serve as reinforcement to remain in the program. Similar to the original program, Murgwanza Hospital believe the unrestricted access by LHWs and their ability to break down barriers will ensure program success. If participation becomes an issue, program implementers will offer a small financial incentive to participants, which have been used in similar CHW interventions[27].

Prior to the introduction of LHWs into the district, the Program Manager will meet with staff in each proposed setting, discussing facility and individual roles and responsibilities, and fielding questions and concerns of staff members. The proposed facility partners and their local communities have all identified low rates of ANC and high MMRs as a significant burden on society and are willing to enact the intervention in an effort to improve health outcomes in the area.

Figure 3 indicates the location of each proposed site: healthcare facilities in the wards of Ngara Mjini (outlined in red), Rulenge (blue), and Nyakisasa (purple).

Figure 3: Ward Locations within Ngara District



Source: DE Data, 2012

While the three wards have similar population demographics, they differ in population densities. Ngara Mjini has the highest population density and is classified as a mixed-urban ward; Nyakisasa has the lowest population density and is the most rural of the three settings. **Table 2** compares the total population and female proportion in each intervention ward, illustrating the similarities between each location.

Table 2: Population Breakdown in Proposed Intervention Locations

	Total Population	**Female Population**	**Percent of Total**
Ngara Mjini	20,968	11,164	53.2
Rulenge	17,313	9,061	52.3
Nyakisasa	19,211	9,941	51.7

Source: DE Data, 2012

Setting #1

Murgwanza Hospital in Ngara Mjini is the first location for the LHW intervention. Lady Health Workers in this ward will be associated with and supervised by the assistant head physician of Murgwanza Hospital. As the main referral hospital in the district, Murgwanza Hospital often receives complicated pregnancy cases. Healthcare personnel at the hospital believe that investing in and training native community workers will provide women in the area with more continuous

care, which will ultimately decrease the patient burden on the hospital and its staff. Hospital management will collaborate with leadership of other area facilities in order to better serve the population by increasing access to healthcare and eventually decreasing the morbidities and mortalities associated with high-risk pregnancies.

Setting #2

The Rulenge Hospital in the rural ward of Rulenge is the second intervention location. Lady Health Workers in Rulenge will be associated with and supervised by the head physician at the Rulenge Hospital. Rulenge Hospital frequently serves women from remote locations across Rulenge and surrounding wards. However, its staff is small and complicated, high-risk cases are frequently referred to Murgwanza Hospital in Ngara Mjini. Rulenge Hospital can provide support and resources to the LHWs and will work with its affiliated diocese to implement the program. By including community health workers in Rulenge, professionals at the hospital believe more women will receive proper antenatal care and will require fewer hospitalizations and referrals.

Setting #3

The third location is the Kashinga Dispensary in the ward of Nyakisasa. Lady Health Workers will be associated with and supervised by the clinician of the dispensary. While a first line of treatment for minor ailments and injuries, the dispensary is not equipped to handle complicated cases and refers patients to Rulenge Hospital. Beyond an existing infrastructure, the dispensary has few resources and will rely on community partnerships, including with village elders, to support the implementation of the program. As the most rural area, the local clinician and community agree that improving access to care will help support the overall health of the area and believe the program is providing a much-needed benefit.

Program Adaptations

A few minor adaptations will be made to the LHW program. The initial eligibility criteria will be adapted to fit the Tanzanian school system: women who are Form Four leavers and who

have obtained a certificate of completion will be eligible to become a Lady Health Worker. Additionally, whether a woman is married or not will not be weighted heavily in Ngara. Program staff believes that regardless of marital status, employing women will help improve their status in the community and also provide them opportunity and financial stability. Finally, the scope of the intervention will be much more narrow: whereas LHWs in rural Pakistan focused on both maternal and child health, the initial program in Ngara, Tanzania will focus on solely providing access to maternal care in an effort to reduce maternal mortality in the area. Therefore, the training curriculum and duration will be shorter than the original program.

Program Implementation

Program personnel expect preliminary planning and preparation to take three months. After initial development, the LHWP will begin with the training of LHW candidates. Community members and school officials will nominate eligible women, who will be selected and approved by the Program Manager and Advisory Group. The Advisory Group will then assist the Program Manager in compiling two lists of women: (1) candidates to be trained immediately and (2) alternates who may be called upon, should an initial candidate drop out of the program. Once recruited, the women will be trained at the Murgwanza Hospital School of Nursing. This will ensure all LHWs receive the same caliber training before beginning their role as health workers in the community. Classroom trainings in Murgwanza will take place five days a week, for three months. Program staff will make unscheduled visits to these classroom trainings to monitor the proficiency of implementation. The training modules will teach women about maternal care, techniques to disseminate health behaviour education throughout the community, and complications associated with pregnancy, along with how to recognize these. Additionally, women will be instructed on how to foster a safe, supportive, and non-judgmental environment in which to provide care. Performance will be measured through the administration of bi-monthly examinations. The LHW trainees will be provided housing and a stipend for food and transportation. Upon completion of

classroom trainings, LHWs will undergo six months of field training in their respective wards. During this time, the women will gain hands-on experience treating patients and will build relationships with the households and families they will be serving. Field training will consist of eight-hour shifts, rotating through different departments of hospitals and areas of the community. On the last Friday of each month, the women will return to the Murgwanza campus for a daylong exercise in problem-based modules. Performance during field training will be measured by both supervisor evaluations and proficient completion of the problem-based modules.

Upon successful completion of training, candidates will receive a certificate of completion and will return to their homes. To ensure readiness of the program, the LHWP will employ a one-month pilot period. Initially, only three LHWs will begin work in each setting. This pilot period will allow for correction of any problems that might arise prior to initiating the entire intervention, as well as ensure the quality of implementation. It is important that the pilot take place in every setting, as each may have unique problems. Both LHWs and Facility Supervisors will note successes and challenges and this information will be relayed to the Program Manager. After review, program management will make amendments to the program they deem necessary to ensure quality.

After the pilot period, all LHWs will work six days a week, as is customary in the country. Each will initially make contact with 150 households in her area, introducing herself, confirming the presence of a woman of reproductive age in the household, and determining the number of household members. At each household, LHWs will determine whether members have previously heard of the program, thus ascertaining the extent of initial dissemination. LHWs will continue with their duties throughout the duration of the LHWP, recording the number of pregnant women reached, ages, and complications that required referrals to facilities in their logbook. Every two weeks, LHWs will meet with their supervisor to ensure proper oversight, present their logbooks, receive any resources needed, and collect their salary.

During this time, the Program Manager will continually travel between sites, monitoring the execution of the program through checks of completed logbooks and discussion of LHW performance with Facility Supervisors. The Program Manager will also meet with LHWs, confirming that the Supervisors are performing their responsibilities adequately. This continual monitoring is important to ensure quality and fidelity of the program. Should any issues of program fidelity arise, program staff and the Community Advisory Group will work to find a resolution—including the use of performance-based incentives[26].

The data gathered in logbooks by LHWs will be compiled and analysed on a continual basis to measure program performance and determine trends in health outcomes. This information will also be used to identify any gaps in the program that need to be resolved. These results will be reported to the supervisors, LHWs, and Community Advisory Group, who will in turn, disseminate the program effect to the community through local meetings and radio broadcasting. A full list of activities and anticipated outcomes is provided as a Logic Model in **Appendix A.** A Gantt Chart, showing a complete schedule for LHWP planning and implementation, is included as **Appendix B.**

Program Sustainability

Murgwanza Hospital hopes to sustain the program beyond the initial funding in order to continue serving pregnant women and positively impacting health outcomes in the district. The program proposes sustainability through working with an existing NGO in the district, together with the local Ministry of Health. There are several international NGOs in Ngara, including UNHCR and USAID. Expatriates, missionaries, and former volunteers have also created local NGOs aimed at improving disparities and social issues throughout the area. Additionally, several international faith-based aid organizations are associated with churches in the area. LHWP staff plans to introduce themselves to these NGOs and explain the purpose of the intervention during the planning phase of the LHWP, garnering additional community support. During implementation, the Program Manager will inform these organizations of results of the program and improvements

within the community. By showing self-sufficiency and prudent spending, Murgwanza Hospital believes it will be able to secure external funding through NGO sponsorship before completion of the initial grant in order to continue providing quality care to the community.

Potential Challenges

Program management has identified several potential challenges to success and has set in place strategies to overcome these issues. It is possible that it will be difficult to convince eligible women to be LHWs, due to a lack of interest to undergo more schooling or a lack of family support. To overcome this potential setback, program implementers will work with the Advisory Group to disseminate information regarding the purpose of the LHWP early in the planning period, placing particular emphasis on the independence and financial stability.

Two specific challenges may arise with regards to training: ensuring the fidelity of the trainings and finding dependable training professionals. As previously mentioned, Ngara's training curriculum will be based off of the original training modules and the Curriculum Director will be involved in both the production and instruction of the modules. Program management will employ local health professionals, who are familiar with the area and less likely to leave mid-program.

It is also possible that the Lady Health Workers will face several challenges, including disrespect and condescension by male health care supervisors. To prevent these issues, program personnel will work with supervisors in each facility to foster collaboration and cooperation and provide trainings of inclusivity and harassment. Supervisors will also be involved with field training; this will promote teamwork and ease the transition of the LHW into her work site.

Performance Measures and Evaluation

Study Design

To measure the effectiveness of the LHWP, the intervention will employ a nonequivalent group, pre-test/post-test study design. This quasi-experimental design compares two non-

equivalent groups: the experimental group receiving the intervention, and a separate group with similar characteristics not receiving the intervention—acting as a control group. As the purpose is to reach all pregnant women at each location, there will be no randomization of participants in the LHWP. Thus, a non-equivalent group from a separate ward within the district will act as a control group. For the proposed LHWP, three wards will act as "controls"—Bukiriro, Kabanga, and Kanazi. While there is a potential risk for differential selection and unique differences between the control and intervention wards, district-level analysis indicates all wards are similar (**Table 3**) and evaluators are confident the lack of randomization will not affect evaluation measurements. These similarities will help ensure program results are not biased.

Using this design, program staff will be able to compare usage of antenatal care in the target wards with similar wards not involved in the program, prior to and following completion of the intervention. The pre- and post-tests (a survey of health indicators that will be measured throughout the program) will also allow program evaluators to determine whether an effect occurred only in the targeted wards or in all six wards. If a difference were only seen in the wards receiving the intervention, this would support the effectiveness of the LHWP.

Table 3: Comparison of Control and Intervention Wards

Ward	Total Population	Female Population	Female % of Total
Intervention			
Ngara Mjini	20,968	11,164	53.2
Rulenge	17,313	9,061	52.3
Nyakisasa	19,211	9,941	51.7
Control			
Bukiriro	19,875	10,435	52.5
Kabanga	22,010	11,569	52.6
Kanazi	17,937	9,424	52.5

Source: DE Data, 2012

This type of study design can be implemented at low cost, making it ideal for Ngara. It should be noted that the LHWP will accrue a slight additional cost due to the training and payment of surveyors collecting pre-and post-intervention data.

Performance Measures

The goal of Murgwanza's proposed program is to improve utilization rates of antenatal care in Ngara, Tanzania. Sustained high levels of ANC usage by women will decrease maternal mortality in the district. The effectiveness of the LHWP will be evaluated through the continual collection and analysis of data of several performance measures. Oxford Policy Management, the evaluators of the original program, determined these measures to be significantly different from the control population and national data in the original LHWP in Pakistan. These measures include:

(1) The percentage of women receiving ANC, divided into (a) the number of women with at least one ANC visit and (b) the number of women who receive all four fANC visits

(2) The percentage of women presenting at facility for medical assistance at birth

(3) The knowledge of women in regards to family planning and contraceptive use

(4) The rate of MMR throughout the duration of the program

Additionally, the proposed program in Ngara will include a fifth measure not originally assessed:

(5) Whether women who received ANC for a pregnancy continue to ANC for subsequent pregnancies

While most of the measures are quantitative, performance measure (3) will require a survey of several questions to determine knowledge of family planning and contraception use, including[28]:

(1) From one menstrual period to the next, are there certain days when a woman is more likely to become pregnant?

    a. Answer Options: Yes/No/Don't Know

(2) Is this time just before her period begins, during her period, right after her period has ended, or halfway between two periods?

    a. Answer Options: Just Before/During/Right After/Halfway Between/Other

Examples of questions that will be used to assess knowledge of contraception include asking about whether a woman is familiar with different methods of contraception[28]. Such examples include:

(1) Pill: Women can take a pill everyday to avoid becoming pregnant

    a. Answer Options: Yes/No

(2) Condoms: Men can put a rubber sheath on their penis before sexual intercourse

    a. Answer Options: Yes/No

Data Collection and Analysis

Prior to program implementation, program personnel will work with the Ministry of Health and the Community Advisory Group to determine the policies and laws regarding data collection in the country and ensure the possibility of collecting pertinent data for the LHWP. These partners will discuss proper strategies to collect the necessary data while complying with Tanzanian laws.

At the beginning of the LHWP implementation, trained Surveyors will perform the pre-test: a survey of health indicators at every participating household in the intervention locations. This survey will provide baseline levels of antenatal care and measurements for the other performance measures. This will provide the program personnel, local wards, and healthcare professionals with more complete data on the demographics of the community. A Surveyor will ask every reproductive-aged woman whether she is nulligravida or has previously been pregnant. For women who have previously been pregnant, the Surveyor will determine whether or not they previously received antenatal care. This survey will be performed at the same number of houses in each control ward for comparison throughout the program.

Data to measure performance will be collected and recorded continuously throughout the program by the Lady Health Workers and analysed by data technicians. The LHWs will note each interaction with the community and record data by hand in their logbooks. This data will include pregnancies, use of ANC (women who accept ANC and how many visits they attend), number and location of births, and causes of deaths for women of childbearing age. Data for birth locations will be cross-referenced with records from the health facilities. These logbooks will be inspected for completeness every two weeks by the Facility Supervisor and will be submitted every six months to

the Facility Supervisor. The Program Manager will collect these logbooks and provide them to the Data Technician, who will then enter data in a spreadsheet and analyse the trends for each measure. An analysis report will be given to the Program Manager and Principal Investigator, who will study and discuss the results. Using this information, the PM and PI will determine whether or not quality improvements need to be implemented, depending on the data trends seen. If the Program Manager and Principal Investigator determine that changes are required, they will meet with the Community Advisory Group, Facility Supervisor, and LHWs to discuss these changes and how to enact them.

Implementation Evaluation

Program staff will perform both formative and process evaluation continually in order to manage the implementation of the program and to assess successes, challenges, and lessons learned. During the planning phases of the program, the Program Manager will meet weekly with support staff, the Community Advisory Board, and local leaders to assess progress and ensure planning is proceeded in a timely manner. The Program Manager will record memos of each meeting, detailing what was discussed and accomplished, what issues need to be rectified and how to go about any correction. The Program Manager will keep and review these memos on a monthly basis as a way of checking for continued progress throughout the planning period. These memos will also show what aspects of the planning were successful, what needed modifications, and reasons why a certain task did not get accomplished. This information will be important when attempting to expand the program across Ngara district. Additionally, program staff, together with the Community Advisory Group, will assess each proposed activity to determine its value to the LHWP. These activities and their materials will also be evaluated for their appropriateness for Ngara.

Frequent monitoring will be used as means of measuring process evaluation. Monitoring will include both general monitoring of program implementation and monitoring the performance

of the staff. It is important to monitor program activities to ensure accurate implementation. This will be accomplished through unannounced visits at both the training and healthcare facilities. This will help ensure all staff members continue to perform their responsibilities sufficiently throughout the program duration. It is also necessary to monitor performance of the LHW candidates, to be certain they will be able to fulfill their responsibilities and contribute to the success of the program. The Program Manager will also accompany LHWs on their home visits, as an additional method of monitoring program implementation. This will allow the Program Manager to assess the quality of LHWs performance. Additionally, this frequent interaction between the LHWs, Facility Supervisors, and the Program Manager will foster accessibility; the PM will be able to gather information based on observation and verbal feedback from program implementers.

It is also important for participants of the program to provide feedback as well. Women in the intervention will be encouraged to frequently participate in satisfaction surveys. Surveyors will travel to each household and record verbal responses to a satisfaction survey. Survey results will be given to the Program Manager, who will use the information to ensure continued quality of program implementation.

Lady Health Workers will also be involved in the evaluation process. It is possible that LHWs will run into challenges while performing their jobs within the community, such as pregnant women who are reluctant to participate, unavailable, or who refuse to be a part of the program. Lady Health Workers will be trained to perform several steps to determine reasons for this and to record this information and report it to both their Facility Supervisor and the Program Manager. If a LHW finds a woman to be out in the fields when she calls, she will make a note and return at a later time to collect the required information and perform a quick check up of the woman's health. Moreover, if a woman becomes pregnant and refuses antenatal care, the Lady Health Worker will make a note of this and attempt to learn the rationale behind the refusal. Keeping track of information such as this will help data analysis determine whether this is an outlier or whether

there is some more entrenched issue. This information will also be necessary for potential adaptations during the program duration.

Outcome Evaluation

Upon completion of the initial intervention duration, it will be important to determine whether the goals and objectives of the program were met. This evaluation will be performed in the final month of implementation. The same initial survey (post-test) will be performed in all six wards and the aggregate data will be compared against the pre-test surveys to determine any significant differences, which will help conclude whether or not the program met its objectives. Furthermore, comparison with control wards will allow program evaluators to determine whether any perceived trends are due to the intervention or an external change of culture or social norms. For example, if there is an increased uptake of antenatal care in Ngara, control areas, and nationally, it is less likely that the change seen in Ngara is due to solely to the intervention.

The stated goal is to improve utilization rates of antenatal care in Ngara, Tanzania with the overall outcome of reducing the rate of maternal mortality in the region. It is probable that data will only show a difference for ANC rates, as three years is a short time period to show a significant decrease in the long-term outcome of maternal mortality. To determine any significant effects of the program, the PI and PM have decided that an increase of 10% in ANC use by pregnant women in Ngara will be considered a successful intervention. Additionally, program staff believes that Performance Measure (5) will be useful in determining the internal sustainability of the program: if women continue to use antenatal care for subsequent pregnancies throughout the duration of the program, this may indicate a change in behaviour, or an increase use of ANC—both of which are stated performance measures of the LHWP.

The overall analysis upon the completion of the program will be beneficial in determining whether or not the program improves antenatal care and health outcomes for pregnant women in Ngara Mjini, Rulenge, and Nyakisasa wards of Ngara District. If data indicates success, program

evaluators will look into the feasibility of expanding the program across the district, through partnerships with area NGOs and additional local healthcare facilities.

Capacity and Experience

Previous Experience

Murgwanza Hospital is the most well established hospital in Ngara, with years of experience treating patients and improving health outcomes in the area. It is also the largest hospital in the district, and has extensive experience implementing programs aimed at improving access to healthcare and reducing health disparities. Hospital leadership is aware of the needs within the community and works together with the community to produce better health, in accordance with its mission, "To Provide Accessible and Quality Healthcare". Additionally, Murgwanza Hospital has and enforces a policy of non-discrimination and provides services to all members of the community, regardless of age, disability, sex, sexual orientation, gender identity, race, national origin or religion. Most Murgwanza Hospital employees are local, accounting for low staff turnover and the ability to best understand the community needs. Its experience, capability, and desire to serve the community makes Murgwanza Hospital the most capable organization in the district to implement a public health intervention such as the LHWP in order to positively impact women in the community.

From its association with the Anglican Diocese, the hospital has experience in receiving and allocating funds to improve its facilities and the services it provides. In an effort to fulfill its mission to the people, Murgwanza Hospital recently completed construction of a "waiting area", a dorm-like building for women to stay in during their final days of pregnancy. This service is meant to provide access to care for pregnant women as they wait to give birth. Additionally, Murgwanza Hospital has created a mobile clinic: a physician and nurses travel to remote locations of the ward once a month. Rulenge Hospital has also initiated a similar program; as such, both locations have previous knowledge of implementing programs within the community. Hospital personnel at both locations

have experience providing home care and can provide insight into different aspects of this type of intervention, such as difficulties faced when trying to travel during the rainy season.

Existing Infrastructure

Each proposed intervention location has an existing, functional health facility that will be used to implement the program. These facilities are equipped to act as a referral center for complicated cases and will function as a "base" for LHWs. Additionally, each facility is currently staffed by healthcare professionals who will act as supervisors for the Lady Health Workers. These healthcare personnel have extensive experience working within the community and can provide support and reassurance to the women. Finally, the district has an existing health education facility: the Murgwanza School of Nursing, which will be use during LHW training.

The LHWP will also use the infrastructure of its community partnerships. Existing partnerships with religious organizations are important to garner the support of the community. A new collaboration with the local radio station will be an extremely beneficial method to disseminate information to the community. By using the available infrastructure, Murgwanza Hospital will be able to effectively implement an important health program with relative ease.

Partnerships and Collaboration

Key Stakeholders

LHWP management has identified many stakeholders in the program who have indicated their support for the program: Ngara District Ministry of Health; Murgwanza Hospital; healthcare workers, churches, politicians, and the general population. At the healthcare level, hospital and clinical staff have a vested interest in improving ANC access in the community—serving the communities means helping to improve health and reduce disparities. Senior staff at each intervention location and the district Ministry of Health has voiced their support and their intent to aid in the planning and implementation aspects. Local churches frequently care for orphans; thus,

religious groups have agreed to lend support through encouraging pregnant women to participate in the program and also disseminate information about the progress seen throughout the intervention. Politicians are keen to support the LHW and see it succeed, as they believe this will translate into reelection during subsequent campaigns. The general population in Ngara has embraced the proposed LHWP, as they believe it means improved health for the community.

Community Advisory Group

In order to successfully implement this program, a diverse Community Advisory Group (**Table 1—Program Approach**) was established to represent the interests of the community. Members include healthcare personnel, a Minister of Health, religious leaders, a Minister of Education, village elders and a local politician, the district Member of Parliament, and the director of a local women's NGO. This group will work together with the Murgwanza Hospital program to provide a comprehensive understanding of the community and ensures that all aspects of the program are considered. They will provide knowledge and expertise of the healthcare system, education system, and culture. Group members will be available for consultation and will meet with program staff bi-monthly to assess progress. Furthermore, the Advisory Group will endorse the program throughout the community, garnering continued support. Ensuring that the community is aware of the program will increase the likelihood of participation in and success of the program.

Partners for Implementation

For successful implementation, Murgwanza Hospital will partner with both local institutions and individual community members. The first of these partnerships—with healthcare facilities throughout the district—has been previously established, and will exist at both the institutional and individual levels. Healthcare professionals will provide support through education and medical resources. Nurse practitioners will also provide social support to the LHWs

through encouragement and sharing similar professional experiences. These professionals have extensive experience working with the target population and can thus provide great insight to the Lady Health Workers.

The program will also partner with local schools to pursue potential candidates and to provide incentive for young women to complete their schooling. This partnership will be helpful when tailoring the training programs to the needs of Ngara: knowing the strength of the science curriculum in secondary school will help the Program Manager and training coordinators modify the training modules for the candidates. Moreover, female students close to finishing their studies and contemplating options for their future may consider a career as a LHW. Partnering with schools in this manner may also increase knowledge about the program throughout the community, as students discuss the LHWP with their peers who are no longer in school.

While not directly involved in implementation, the LHWP will also partner with the local radio station, Radio Kwizera, in order to disseminate information regarding the progress and results of the program. Using this platform will be an effective way to inform a large proportion of the population in the district, as it is the most used medium in Ngara district.

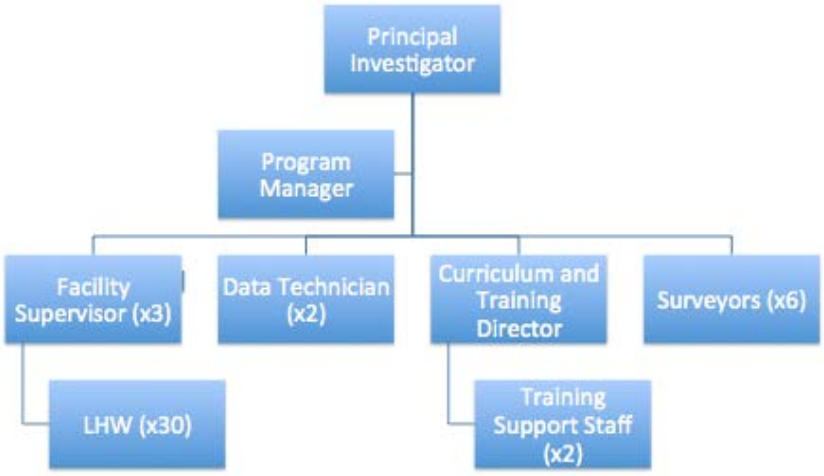
All program partners have committed their support to successful implementation of the Lady Health Worker Programme. Furthermore, each proposed partner provides expertise and will help ensure the program is successful and the utilization of ANC in Ngara increases.

Program Management

Staff Members and Roles

Several staff members will be employed throughout the program duration (**Figure 4***)*. As much as possible, the Lady Health Worker Program will employ local personnel to improve retention and to ensure cultural understanding and accurate implementation of the LHWP.

Figure 4: LHWP Staff Members



The **Principal Investigator** will be the head physician of Murgwanza Hospital. The PI will be in charge of overseeing the program throughout its planning and implementation, maintaining partnerships with the community, and making final decisions regarding any changes to be made during implementation. As a full-time physician, the PI will already have his normal workload; thus, the majority of the delivery of the intervention and the day-to-day operations will be managed by the **Program Manager**—a staff member with extensive knowledge of the community, the healthcare system, and public health. The PM will be experienced in the planning and implementation of public health interventions; additionally, this individual will be detail-oriented and capable of writing monthly reports regarding the status of the program. The Program Manager will work to ensure the goals and objectives of the program are met, keeping the PI involved and aware of any difficulties that may arise. She will frequently travel between the three implementation sites in order to ensure program fidelity and determine any gaps between planning and implementation, relaying this information to the Principal Investigator.

A **Curriculum and Training Coordinator** will modify the training modules from the original program. This Coordinator will work with instructors from the Murgwanza Nursing School and local school partners to develop appropriate techniques to implement this program. Once

training modifications are complete and eligible candidates are chosen, two additional **Training Support Staff** will be hired to assist in the classroom instruction.

Lady Health Workers will comprise the largest staff component. Once they complete trainings and begin work in the community, the LHW's role will be to provide care, support, and education to pregnant women. They will record their interactions with the members of the community in order to know the numbers of pregnant women receiving antenatal care, as well as other performance measures. This data will be provided to two hired **Data Technicians** whose primary task will be to analyse the effectiveness of the program. These data personnel will report their findings to the Program Manager, who will review the findings to determine the functioning of the program. Six **Surveyors** will be trained and employed to perform the pre- and post-tests; these Surveyors will also collect participant satisfaction data.

Additional support staff will also play a role in the intervention. Three **Facility Supervisors** will oversee the work performed by the Lady Health Workers, meeting every two weeks to ensure the LHWs are performing tasks sufficiently, have sufficient resources, and to provide the women their salary. If the LHWs have any concerns or problems, the Facility Supervisors will report this information to the Program Manager.

Staff Retention

Working with district health professionals who already work and live in the community will help keep turnaround to a minimum. The Curriculum and Training Coordinator, and Training Support Staff will all be chosen from district organizations. Moreover, the Lady Health Workers are local community members who are unlikely to leave the area; the incentive of a continued salary will be an important factor for retention as there are few other options for money in the district.

A challenge to staff retention may be the Data Technician position. This job requires advanced training and it is likely that the program will have to hire individuals from outside the district. Murgwanza Hospital plans to work with the Ministry of Health, located in Dar es Salaam, to

contract two Ministry employees. These individuals will only travel to Ngara every six months for two weeks in order to collect the raw data and transpose it to spreadsheets. Once they complete this task, they will return to the city to complete analysis.

Monitoring

In order to monitor the completion of the LHWP, the Program Manager will follow the task list set out by the PI; this will allow for achievement during each phase of the program and ensure tasks and activities are being performed in a timely manner. It will be important to monitor both planning and implementation, as program success relies on both of these aspects. The PM will attend classroom trainings to ensure modules are being taught efficiently and will frequently travel to partner healthcare facilities to assess how the program is progressing. The Program Manager will also attend random home visits with the LHWs to check the quality of execution. Additionally, logbooks will continually be checked and collected to measure success of the LHWP.

Continual analysis of the performance measures data throughout the program will help program staff determine the effectiveness of the program. It will also be important to monitor satisfaction with the program, as higher levels will translate to greater sustainability of the program. Successful monitoring of the program will ensure the LHWP is implemented correctly in Ngara, Tanzania and achieves its goals of improving ANC in the district.

Conclusion

In conclusion, the implementation of the Lady Health Worker Programme in Ngara, Tanzania can improve access to and utilization of ANC through strong local partnerships and training of local women to provide effective maternal services. If effective, this program will improve several health outcomes in the district and decrease maternal mortality and will be expanded throughout the district to reach more women, ultimately helping to reduce this global disparity.

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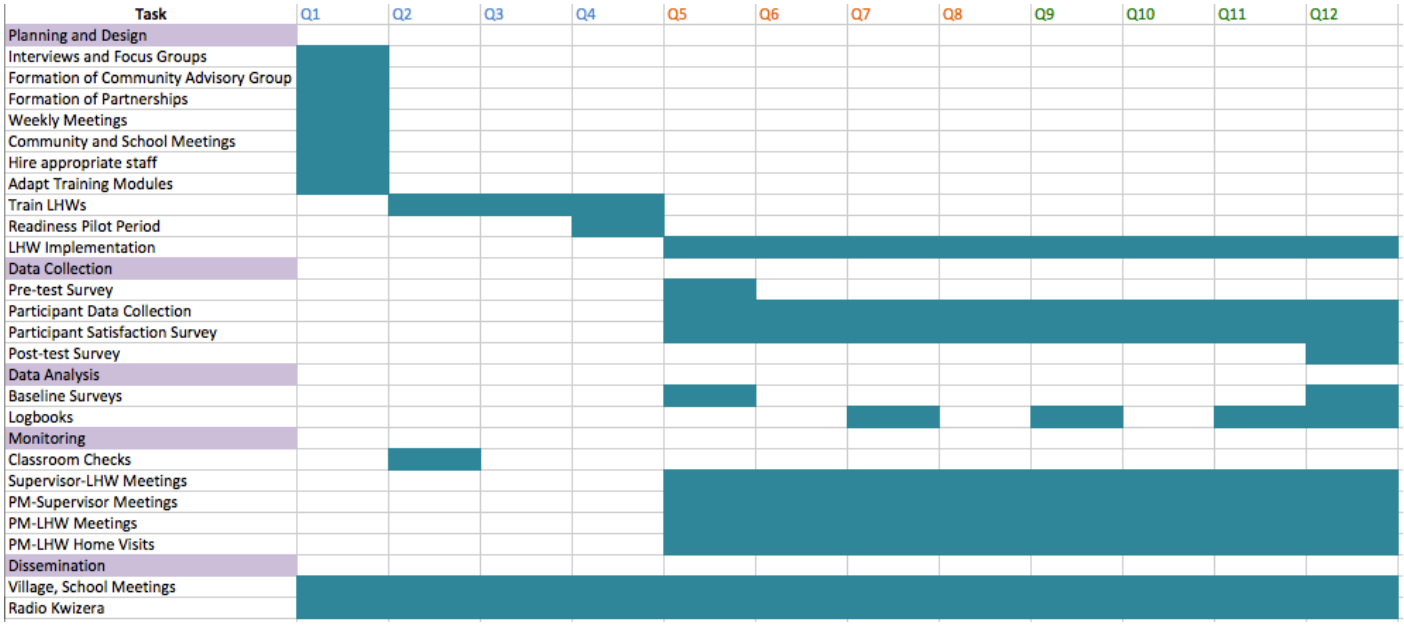
Appendix A: Logic Model

Inputs	Activities	Outputs	Outcomes – Impact: Short	Outcomes – Impact: Long
Staff	Recruit and train LHW	Increased number of health providers	Improved health education	Decrease MMR
Time	Go into villages to provide maternal care	Increase ANC access	Bridge between community and healthcare system	Decrease fertility rate
Grant Money	Provide education about safe births	Increase utilization of ANC	Increased facility-assisted births	Improved child health outcomes → Decreased neonatal/infant mortality → Decreased LBW → Decrease of stunting/malnutrition
Equipment and Supplies	Give referrals for high risk cases	Increased knowledge of family planning	Decreased maternal deaths	
Partnerships				Decreased MTCT of HIV
Evidence Based LHWP				
Community Advisory Board				

Appendix B: Gantt Chart



Appendix C: Budget Narrative and Justification

Project Title: ***Increasing Access to Antenatal Care in Ngara, Tanzania Through Implementation of the Lady Health Worker Programme***

Time Period: 01/09/2018 - 31/08/2021

A. Personnel Staff and Wages

Note: All personnel salaries are based on competitive wages for Tanzania

Year 1

Position Title	**Annual Salary**	**%FTE**	**Salary Requested**	**Fringe Requested**	**Total Requested**
Principal Investigator	$14,000	15%	$2,100	$640	$2,740
Program Manager	$20,000	100%	$20,000	$4,770	$24,770
Curriculum and Training Coordinator	$9,500	80%	$7,600	$2,430	$10,030
Training Support Staff (x2)	$7,000 ea.	80% ea.	$5,600 ea.	$1,795 ea.	$14,790
Lady Health Workers (x30)	$3,600 ea.	25% ea.	$900 ea.	$325 ea.	$36,750
Facility Supervisor (x3)	$9,000 ea.	30% ea.	$2,700 ea.	$780 ea.	$10,440
Data Technician (x2)	$12,000 ea.	10% ea.	$1,200 ea.	$400 ea.	$3,200
Support Surveyors (x6)	$3,200 ea.	25% ea.	$800 ea.	$275 ea.	$6,450
Total Personnel			**$83,200**	**$25,970**	**$109,170**

Year 2

Position Title	**Annual Salary**	**%FTE**	**Salary Requested**	**Fringe Requested**	**Total Requested**
Principal Investigator	$14,300	15%	$2,145	$635	$2,780
Program Manager	$20,400	100%	$20,400	$4,770	$25,170
Curriculum and Training Coordinator	$9,700	10%	$970	$330	$1,300
Training Support Staff (x2)	$7,150 ea.	10% ea.	$715 ea. 1430	$245 ea.	$1,920
Lady Health Workers (x30)	$3,670 ea.	100% ea.	$3,670 ea. 110100	$1,245 ea.	$147,450
Facility Supervisor (x3)	$9,200 ea.	30% ea.	$2,760 ea. 8280	$750 ea.	$10,530
Data Technician (x2)	$12,250 ea.	30% ea.	$3,675 ea. 7350	$1015 ea.	$9,380
Support Surveyors (x6)	$3,250 ea.	60% ea.	$1,950 ea. 11799	$625 ea.	$15,450
Total Personnel			**$162,375**	**$51,595**	**$213,970**

Year 3

Position Title	Annual Salary	%FTE	Salary Requested	Fringe Requested	Total Requested
Principal Investigator	$14,450	15%	$2,170	$630	$2,800
Program Manager	$20,600	100%	$20,600	$5,000	$25,600
Curriculum and Training Coordinator	$9,800	5%	$490	$110	$600
Training Support Staff (x2)	$7,250 ea.	5%	$365 ea. 730	$110 ea.	$950
Lady Health Workers (x30)	$3750 ea.	100%	$3,750 ea. 112500	$1,245 ea.	$149,850
Facility Supervisor (x3)	$9,300 ea.	30%	$2,790 ea. 8370	$750 ea.	$10,620
Data Technician (x2)	$12,375 ea.	30% ea.	$3,715 ea. 7430	$1015 ea.	$9,460
Support Surveyors (x6)	$3,500 ea.	70% ea.	$2,450 ea. 14700	$650 ea.	$18,600
Total Personnel			**$166,990**	**$ 51,490**	**$ 218,480**

TBD, Principal Investigator

As the head physician of Murgwanza Hospital, the Principal Investigator has extensive experience implementing health care in the district. He has knowledge of health outcomes in the area and is aware of health disparities. He has previously implemented programs aimed at improving maternal outcomes and is qualified to oversee the implementation of an evidence-based program within Ngara district. During the program period, he will also continue his role as the head physician, giving only 15% of his time and effort to the program.

TBD, Program Manager

As a community member with an MPH degree from a US institution, the Program Manager has experience successfully implementing public health interventions. The PI has worked in both the secondary school setting and health care setting in the district and will be able to use partnerships formed from both these locations to help ensure the success of the program. The Program Manager will give 100% throughout the duration of the program and will be the main communicator for all other staff, partners, and organizations. The PM will ensure all tasks are completed, the program is monitored effectively to maintain quality and fidelity, and that data is collected and analysed in a timely manner.

TBD, Curriculum and Training Coordinator

This individual, a nursing instructor, will be hired from the Murgwanza School of Nursing and will work closely with the PM, Advisory Group, Training Support Staff and secondary school staff to modify training to fit the scope of the LHWP. The majority of his effort will occur during Year 1 of the program in the planning phase. However, his services will be retained throughout the program to continue adaptations for future implementation if monitoring indicates changes must be made to improve LHW knowledge and performance.

TBD, Training Support Staff x2

These two individuals will be hired from the Murgwanza facility to assist in modifying the training modules. They will also be involved in planning a scheme of work for the classroom trainings. As healthcare staff, these support staff have completed higher education and have extensive experience instructing students. Similar to the curriculum director, most of their effort will come during the first year when adapting the curriculum. Their efforts will decrease after the implementation of the program, but they may continually make small adaptations to the program for the future.

Lady Health Workers x 30

The LHWs will perform the majority of the program implementation. Once trained, Lady Health Workers will give 100% effort to their tasks of providing care to the community. Beyond treating the community, each LHW will be responsible for the collection and submission of data to determine the effectiveness of the program.

TBD, Facility Supervisors x 3

Each Facility Supervisor will be a trained healthcare clinician with several years of experience treating patients in the district. They will give a constant effort of 30%, which will involve oversight of the LHWs and a bimonthly meeting with the women.

TBD, Data Technicians x 2

These two individuals will be university graduates contracted from the Ministry of Health in Dar es Salaam. These will travel to Ngara a total of four times during the program to receive and compile data. They will then return to the city to perform analysis, which they will return electronically to the PM.

TBD, Support Surveyors x 6

These six individuals will be hired from the community. They will be Form Six Leavers and as such, will be knowledgeable about how to perform surveys in the community. Surveyors will be responsible for performing the pre- and post-tests, as well as performing satisfaction surveys throughout the duration of the program.

B. Resources (Equipment and Supplies)

Item Requested	Number Needed	Unit Cost	Year 1 Amount Requested	Year 2 Amount Requested	Year 3 Amount Requested
Stethoscope	30	$150 ea.	$4500		
Classroom Supplies	30	$ 5 ea.	$150		
Training Supplies			$500		
Data Logbooks	30	$3 ea.	$90		
Drugs			$15,000	$6,000	$2,000
Dissemination Costs			$100	$50	$100
Total Supplies			**$20,340**	**$6,050**	**$2,100**

Prior to implementation, program staff will be 30 Littman 3M Cardiology stethoscopes to aid the LHWs during their work. Other planning necessities include pens, pencils, and a large notebook (labeled classroom supplies); these will be purchased at wholesale stores around the area. Training supplies include gloves and masks for practicals and field trainings. Additionally, each LHW will receive a large logbook in which to record data throughout the program. The PM and PI anticipate purchasing a large proportion of necessary medications during the first year and stockpiling these for the duration of the program, as expiration dates should not be an issue. Smaller amounts of money will be set a side for the second and third years to assure that there is never a shortage of medications. Dissemination will occur through village meetings and through radio. Program personnel anticipate providing a small sum of money in exchange for broadcast time throughout the program. Years 1 and 3 will require more dissemination in order to explain the program and to show results.

C. Travel

	Year 1	Year 2	Year 3
Land Cruiser	$ 35,000		
Petrol	$ 2,600	$2,600	$2,600
Bus Fare		$ 300	$ 300
Conference		$7,000	$7,000
Total	**$37,600**	**$9,900**	**$9,900**

As the Program Manager will be traveling often between the three locations, the program has budgeted for the purchase of a vehicle in order to make travel easier. The PM estimates filling the vehicle with $100 worth of fuel every two weeks. Additionally, bus fare for the Data Technicians must be taken into account. During Years 2 and 3, two program staff will be able to travel for conferences, specifically the African Maternal Care Conference, held for three days each year in different locations across the continent. The conference fare includes airfare, registration fees, lodging, and food.

D. Other

	Year 1	Year 2	Year 3
Focus Groups	$350		
Stipends	$5,650		
Housing	$3,000	$150	$150
Participation Incentive	$750	$250	
Performance Incentive		$1,000	$300
Pre-test Incentive ($5 x 450 households)		$2,250	
Post-test Incentive ($5 x 450 households)			$2,250
Car Repair	$3,000		
Total	**$ 12,750**	**$ 3,650**	**$ 2,700**

During the initial planning phase, focus group participants will be provided a small amount of money for their participation. During the classroom-training period, each LHW will be provided a per diem. Additionally, a weekly travel stipend will be provided for weekend travel home (first three months) and for a monthly return to Murgwanza for problem-based modules. While living at Murgwanza, the program will house the LHWs; rent is anticipated to be $3000 for the three-month period. A small sum is included in the budget for incentives: for both participants and staff. The PI and PM do not anticipate using this money frequently, but have included it in case of challenges to program fidelity. Households in the control wards, who are not receiving care, will be provided a comparable incentive in exchange for completing surveys, both at the beginning and end of the program. Though the budget accounts for the purchase of a well-maintained vehicle, a small amount for car repair has been requested in case of unforeseen issues of wear and tear.

Total Budget Request for Three Year LHWP in Ngara, Tanzania

	Year 1	Year 2	Year 3
A. Personnel	$ 83,200	$ 162,375	$ 166,990
B. Fringe	$ 25,970	$ 51,595	$ 51,490
C. Equipment	$ 4,500	$ 200	$ 200
D. Supplies	$ 15,840	$ 6,050	$ 2,100
E. Travel	$37,600	$ 9,900	$ 9,900
F. Other	$ 12,750	$ 3,650	$ 2,700
Total	**$179,860**	**$233,770**	**$233,380**