Improving prevention of mother to child transmission of HIV care: Experiences from implementing quality improvement in Kenya

JULY 2017

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For more information on the work of the USAID ASSIST Project, please visit www.usaidassist.org or write assist-info@urc-chs.com.

Recommended citation

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<tr>
<td>ASSIST</td>
<td>USAID Applying Science to Strengthen and Improve Systems Project</td>
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<tr>
<td>FBO</td>
<td>Faith-based organization</td>
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<tr>
<td>HCI</td>
<td>USAID Health Care Improvement Project</td>
</tr>
<tr>
<td>HR</td>
<td>Human resources</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and evaluation</td>
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<tr>
<td>MOH</td>
<td>Ministry of Health</td>
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<td>QI</td>
<td>Quality improvement</td>
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<td>URC</td>
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<td>USAID</td>
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<td>WHO</td>
<td>World Health Organization</td>
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I. INTRODUCTION

A. Background

In 2013, the USAID Applying Science to strengthen and Improve Systems (ASSIST) project supported the National AIDS and STI Control Program (NASCOP) to launch the Partnership for HIV Free Survival (PHFS) initiative in Kenya to apply quality improvement (QI) to drive the national elimination of mother to child transmission of HIV (eMTCT) strategic plan 2012-2015. PHFS mainly focuses on a) ensuring that all mother-infant pairs know their HIV status, b) are retained in care, c) are optimally protected with antiretroviral treatment (ARV) and d) offered nutritional assessment, counselling and support regularly. The aim of PHFS is to reduce mother-to-child transmission of HIV to less than 5% by 2015 by scaling up the application of quality improvement approaches in all PMTCT sites country wide. The use of quality improvement techniques was aimed at improving retention in care of mother baby pairs and ensuring that the quality of care given ahead to the set county aligns with eMTCT guidelines.

B. Implementation

In Kenya, ASSIST envisaged a two-phase approach for PHFS implementation. Phase I focusing on understanding underlying causes of poor quality of prevention of mother to child transmission of HIV (PMTCT) care and achieving quick results and learning from sixteen pilot sites. Phase 2 built on the learning from Phase I, scaling up successful change ideas. However, due to competing priorities in specific implementation areas from the APHIA Plus mechanisms, and the Ministry of Health, concerning their scope and desire to build mechanism capacities, elements of HIV care and treatment encroached phase 2.

1. Phase One

In the Coast Region county of Kwale, 16 learning sites were selected for Phase I. The process began with consultation with the county health heads to identify the sites to be used in Kwale. The facilities were selected based on existing HIV burden in the facility, number of new ante-natal care (ANC) visits in the facilities, geographical distribution of the facilities within the administrative boundaries of the county and finally distribution across the levels of facilities. The launch was held in September 2013 and was followed by the sensitization of the senior health manages using the Ministry of Health’s Kenya Quality Model for Health (KQMH) guidelines. The mid-level managers then underwent a five-day training on QI techniques using the KQMH model. They then choose from among the managers those that would serve as coaches to each of the selected 16 facilities. At the facility level, teams from each facility were trained on KQMH before forming improvement teams of 8 -13 members at each of the sites and included health workers (i.e. doctors, clinical officers, nurses, lab technologists, public health officers, support staff) and community representatives (community health workers, traditional birth attendants, religious leaders, public administrators, and people living with HIV and AIDS [PLHIV]). In October 2013 ASSIST trained them on QI approaches and techniques. Following the training, the teams began by looking at their data to determine what gaps existed in current PMTCT care and conducted root cause analyses to determine why these gaps existed. These teams then created implementation work plans based on changes to test to address gaps. Initial change ideas included:

- Opening and managing files for each mother-baby pair;
- Integration of HIV comprehensive care centers (CCC) and PMTCT at maternal and child health (MCH) clinic;
- Psychosocial support through mentor mothers, active screening and linking to care at all entry points (Outpatient Department, Labor and Delivery, MCH etc);
- Active follow up of missed clinic appointments

In 2014, ASSIST supported NASCOP in developing the HIV QI Framework, prevention of mother-to-
child (PMTCT) training package, and revision of HIV tools. ASSIST supported NASCOP to develop and finalize a national Kenya HIV Quality Improvement Framework (KHQIF) and training package that has since been rolled out in the country. To ensure institutionalization and sustainability of QI, ASSIST has continued to work with the Directorate of Preventive and Promotive Services and NASCOP to develop various documents that include:

- Development of the national PMTCT training package, including job aids. Piloting of the documents was conducted in Kirinyaga County on September 23-27, 2014.
- Development of the protocol for assessment of the impact of peer support on PMTCT program outcomes – Phase 1 complete.

NASCOP, with support of implementing partners (IPs), developed QI indicators for different HIV service areas. The indicators were shared with all USAID IPs for their use in collecting baseline and follow-up data.

In 2015, ASSIST supported the NASCOP PMTCT program with facilitation of one PMTCT master training-of-trainer (TOT) training. Forty-eight master trainers (from various counties and IPs) were taken through the newly developed bridged PMTCT training curriculum with emphasis on monitoring PMTCT performance at the facility level. These master trainers are still involved on an as-needed basis.

In 2015, PHFS interventions focused on supporting sites to apply the science and model of improvement to:

- Address quality gaps in eMTCT
- Encourage mother-baby pairs to begin treatment immediately after the mother tests positive at ante-natal care (ANC), with targeted follow-up for such clients from then onward
- Open and manage a joint file for each mother-baby pair; integrating HIV comprehensive care centers (CCCs) and PMTCT at maternal and child health (MCH) clinics
- Provide psychosocial support (PSS) through mentor-mothers (expert patients with additional training)
- Encourage mothers to support active screening for HIV-exposed mother-baby pairs at all entry points (outpatient department, labor and delivery, MCH, CCC) and linking them back into care
- Use existing structures to trace mother baby pair that are lost to follow up.
- Ensure all mothers identified as being HIV positive in are provide with the necessary medicine for PMTC for both themselves and their unborn children.
- Conduct the required follow up and lab work ups at the required times.
- Ensure appropriate nutritional assessment and interventions for mother and baby were need be

Using the lessons learnt from setting up the PHFS structures in Kwale in the PHFS program ASSIST was able to scale up to the counties of Kakamega, Busia, Uasin Gishu and Turkana. A total of 46 facilities including phase two of facilities in Kakamega and Kwale that were brought in as part of the scale up plan. KQMH trainings were supported by ASSIST in August 2014 and December 2015, and again collaboratively with APHIA Plus mechanisms in 2016 April, July and August to ensure county teams in the new regions could support the improvement course of work, including any future trainings required for scaling up and spread.

C. Results and Achievements

In Kwale County, the county QI team actively followed nine PHFS indicators in 16 high- and mid-volume sites. The percentage of HIV-exposed babies who test positive on a DNA-PCR test was reduced from 15% in January-March 2012 to 0% in January-March 2015. Comparing the median HIV positivity rate before the intervention (9%, Jan 2012-Sept 2013) with the median since the PHFS work has been conducted in Kwale County (4%, Jan 2014-Mar 2015), there is evidence of a clear shift in PMTCT outcomes in the intervention sites. Other achievements are as follows:

- **Sustained improvements in HIV care.** ASSIST’s support for care and improvement has continued at both facility and county level. As shown in Figure 1 and equally required by the Kenya
ART guidelines, all HIV-positive women are eligible for full ART. Facilities now have active improvement teams, much as this has been hampered with incessant national health workers’ strikes (Dec 2016 – Mar 2017), a lot of the gains have been maintained.

- To achieve improvement, QI teams tested a number of changes. HIV service integration at antenatal clinic has been a key contributor to ensure ARVs for pregnant HIV-positive women are provided in the ANC clinic and not in the comprehensive HIV treatment centers. Mother-to-mother psychosocial support (PSS) groups have been a constant in HIV treatment. They also introduced standard operating procedures (SOPs) on HIV-exposed infant (HEI) prophylaxis based on current guidelines.

- County level technical working groups (TWGs) were established and met quarterly. These brought together stakeholders in HIV and eMTCT in general. This included IPs, government agencies, county departments of health, and community level representatives especially for PLHIV. This meeting formed a platform to streamline and synergize the activities of all those involved in eMTCT. It also formed a high level platform for feedback on the successes at the facility level and discussions on how best to scale what had been learned.

- Quarterly facility coaches’ meetings were held to discuss technical areas of performance at the facility level by coaches, the meeting offered a platform for brainstorming and providing solutions to issues raised at facility level that could not be solved there.

- Learning sessions. These were critical in the implementation of the collaborative learning method adopted by USAID ASSIST. These meetings took place once a year on average and were two-day meetings that brought together all 16 facilities participating in the program as well some that were not in the program. Also included in the latter learning session were representatives from other counties in whom ASSIST had been working in on eMTCT. The meetings were intended to showcase what each of the facilities had achieved in implementing QI approaches. The facilities were working on similar challenges but using different approaches designed by the individual facilities. This gives the opportunity to critique different approaches and solutions to the same challenge. In the end teams were able to identify what solutions worked best and those that could be packaged and used to significantly increase the success of scale up facilities by implementing the package.

- Nutritional assessment and categorization is an important aspect in ensuring better patient outcomes in HIV treatment. However, this component is not often given the utmost focus. Where this is provided, the assessment is either provided to the baby or mother or at most times based on clinical presentation. The government has given guidelines on the need to have nutritional assessment and categorization as a standard measure at all clinic encounters. As shown in Figure 2 from Kakamega County, this service is still reaching both baby and mother during clinic visits. Teams tested changes to ensure they reached the desired 100% performance. This includes task shifting the assessment duty to volunteers; changing the triage process to allow for assessment before visits to the clinician; and assuring that 100% of HEIs should undergo nutrition assessment and categorization to spur appropriate remedial and support. Facilities optimized nutrition assessment, counseling and support (NACS) by ensuring the Nutrition Department was integrated with the MCH Department to ensure that all services were available in one area. Facilities introduced weekly review meetings to monitor how well the change ideas were working in improving the nutritional services of mother-baby pairs in MCH. ASSIST support sites in introducing SOPs based on the current guidelines.
Retention of HIV-exposed mother-baby pairs in care is paramount for the reduction of mother-to-child transmission of HIV. QI teams are focused on ensuring integrated care is provided to both the mother and her baby to avoid unnecessary clinic visits. This ensures that all the required PMTCT services are offered in one stop. The teams are trying to sustain and improve retention of mother-baby pairs in care. The changes tested over time include: linking care at delivery or first post-natal contact; having one case file for both mother and baby until confirmation of baby's HIV status (in case positive, the case file remains same); individualized client visit timed to coincide
with child welfare clinic/immunization schedules; and inviting other counties to learning forums on successful strategies in retention of mother-baby pairs.

2. How the process worked: APHIA Plus Nairobi case

In September 2014, ASSIST held a QI training with facilities under APHIA Plus Nairobi. Following this training, ASSIST held monthly meetings with county QI coordinators to follow up on progress against work plans and conducted monthly facility level mentorship at Mbagathi District Hospital (high HIV caseload facility) to follow up on the HIV care and treatment and eMTCT baseline assessment conducted after the QI training held in September 2014. ASSIST with the county QI coordinators supported the work improvement team (WIT) to conduct a process flow analysis of clients within the CCC and developed a more efficient client flow to ensure that all clients seen are triaged and that the filtering of patients is done (Jan 2015). ASSIST helped the CCC WIT conduct a baseline assessment and select the key indicators for improvement. A root-cause analysis was conducted showing that there was a delay in filing of CD4 results in the patients’ files and delayed treatment preparation sessions. The following change ideas were suggested: CD4 results were filed by data clerks immediately after being received from the lab; structured treatment preparation sessions were introduced; line list of all clients eligible for anti-retroviral treatment (ART) was to be produced at the end of the week to allow flagging of files. These changes resulted in an increase in pediatric patients (ages 0-14 years) started on ART from 20% at baseline to 33% over six months and adult ART initiation from 45% to 61% over the course of six months in Mbagathi Hospital.

II. RECOMMENDATIONS TO THE COUNTY

Based on ASSIST’s experience working with counties and health care providers to improve PMTCT care in Kenya, we have the following recommendations to county leaders who will be taking this work forward:

- Integrate MNCH and CCC services
- Focus on facility driven solutions

A. Integrating MNCH and CCC component

Integration of maternal newborn and child health (MNCH) and CCC services is key to the success of eMTCT programs. This means that the facility provides one stop solutions for mother baby pairs. The services to be provided to the mother and the baby should not only be offered on one day, but we should strive to have them provided in one place in the facility ‘one stop shop’ in the MNCH clinic. The services to be offered include:

- Family planning
- Provision of ARVs for the mother
- Clinical services for the mother
- Nutritional assessment and counselling for the mother and interventions if needed
- Drawing of samples like viral load for the mother
- Screening for TB and cervical cancer
- Immunization for the child
- Child welfare clinic
- Provision of prophylactic medication
- Required work ups for testing at the required times for the baby
Integration of these services and others offer great advantages to the mother baby pairs as well as the health care providers. Integration allows for better planning by the health worker for the services to be provided. It offers a good opportunity for an organized and structured approach to service provision to ensure all requirements are met. It also enables the health care workers to distribute their workload more easily by booking less of their services on a specified day in order to concentrate on the required services for the mother baby pairs. Easy and early follow-up identification of those who don’t turn up for the scheduled appointments to reduce of lost to follow up.

The biggest gain for the mothers is a cost benefit. Because the mother does not have to make several trips to the facility to cater for the different need for both postnatal care and PMTCT care. The mother baby pairs only made one visit to the clinic for each month. The integration of services also allows better psychosocial support, when the mother baby pairs are booked on the same day allowing for use of support groups that consists of mothers going through the program.

3. Case example of integration

Upon formation of the WIT at the facility level one of the initial challenges to them was to undertake integration of services at the MNCH. The service to be integrated included the CCC component, ANC, Post-natal services, Child welfare clinic and PMTCT services. As it was all this services were rendered in different departments and in some instance different buildings. This meant that the mother and children would be given different appointment dates for each of the services, there was no continuity in the work flow as the continuum of care progressed. The multiplicity of services was found to be one of the leading factors in loss of mother baby pairs to follow up.

The WIT were taken through the process mapping and process re-engineering technics. They then did a walk through in there facilities in the shoes of the patients allowing them to actually visualize what the clients go through. The process was then transferred on paper as a process map. In subsequent meetings the WIT would them redesign and re-engineer the process mother baby client went through. This resulted in re-designation of physical room to the facility but most importantly ensuring that there was a proper mix of required skills to offer all the services in one room or department when the clients come in. some facilities ensured that all cadres that interact with the mother baby pairs seat in one area during clinic visits or in the case of the smaller facilities that the nurses and clinicians seeing the clients were well trained and could offer all services required.

B. Facility driven solutions

One of the key pillars in QI has been the ability to let facilities generate solutions to their challenges. It has been interesting to note that as part of collaborative learning the use of different approaches to solve common challenges has resulted in many change ideas. This also allowed the effectiveness of change ideas to be measured against each other in the different environments. This allows the best ideas to then be shared and adopted to fit each facility. It also allows the development of change packages that can be used to accelerate learning and scale up in the new facilities that might come on board.

Secondly, this approach in QI ingrains the culture of sourcing for solutions within their own means to solve the challenges they have control over. In so doing it also promotes the culture of self-assessment and measurement of changes made over time. The functionality of the plan do study act (PDSA) cycle is enveloped in the ability of facilities to develop ideas on how to better the quality of the services offered. For the coaches, it also show cased the fact that they don’t necessarily have to be the source of solutions for challenges at facility level. By empowering the healthcare workers on the QI models, they are just as capable of producing great examples of better processes.

4. Case example of facility driven solutions

According to Mwanajuma Ali Magadi, a nurse, the 2012 PMTCT training triggered the capturing and tracking babies for Poly-merase Chain Reaction (PCR) after 6 weeks through to 18 months. However, factoring the socio-cultural issues of Kwale residents, Mwanajuma’s 14 years of service as a nurse intuitively demanded for a closer monitoring of mothers and babies – fulfilling part of the four-pronged strategy on eMTCT.
Using materials at her disposal, Mwanajuma converted an old Tetanus data book to a homemade register – this became the first ‘Mother-Baby Pair Register’ which tracks both mother and child as pairs in Kenya. As an innovation, the birth of the Mother-Baby Pair Register evolved after she registered 100% success rate in reaching both mother and child on each appointment and addressing emerging issues at each millage through the integrated approach of having the pair visit clinic on

In its very essence, Mwanajuma’s innovation is a pillar of QI. Today, Mwanajuma holds her original draft register as a memoir, and the new version being piloted by NASCOP which has materialized to include an additional 30 months monitoring of both mother and baby.

The Age of Male Involvement is Here: Involving Communities in Rolling the Tentacles of Innovations - the Kinango Experience

After declaration of free hospital delivery in Kenya (June 1, 2013), mothers reached through health talks saw it fit to undertake all ANC visitations. With an average household size of 6.9 which is 2.5 higher than the national household size of 4.4, hospital delivery is number one strategy in saving lives in Kwale County. For the two men, fortunately as Juma recalls, the Antena-tal Care (ANC) nurses managed to provide information on pregnant mother requirements and also counseled for HIV testing; this outcome struck a mind wave in health workers – it raised energy for next level thinking...it is possible to get men off the long standing traditions of not accompanying pregnant women to clinics.

Like most rural communities in Africa (and other third world countries), the women of reproductive age in Kinango sub-County are trapped in a patriarchal system; hinged on polygamy. Low literacy and numeracy skill among women is a direct causality of lack of access to resources for production by womenfolk. This possibly leaves room for manipulation as access to quality care is pegged on the ‘man’s account’; his opinion and mone-tary support to women seeking ANC counts to improving survival of both mother and baby – who have to either take public means or walk for 0.5 and 2 hours respec-tively in order to reach Kinango sub-County hospital. If men are not brought on board, this setting presents a fragile elimination of Mother to Child Transmission (eMTCT) promotion platform.

According to Clinical Officer, upon testing HIV positive, it was difficult to put mothers on care and treatment due to lack of disclosure to their spouse. Juma stressed the fact that there have been reports from HIV positive mothers who have suffered domestic violence in an attempt to get their men understand the new status and also get tested. Those who attempted treatment to start the treatment ended up defaulting; making it impossible to get their husbands / men as treatment buddy. Equal-ly, the eMTCT process only reached one half of the population, the women, as men were never tested.
After attending a Rapid Result Initiative workshop on Male Involvement, the Quality Improvement Team (QIT) decided to: (i) sensitize all mothers (reaching an average of 100 per month) for a month at the ANC clinic on the importance of couple testing, (ii) sensitize the staff on the change idea—bracing them for reinforcement and implementation of the new hospital policy and increased workload.

The strategy achieved the following: (i) their change idea was accepted across board (healthcare workers, community, and opinion leaders) - despite initial attempts to stop the couple accompaniment by the local leader (after their male counterparts complained) who was later sensitized on the need to implement a government plan (PMTCT) rolled out in 2010 that suffered a couple of challenges including low involvement of men at community level; (ii) there is 100% couple testing at Kinango sub-County hospital – leading to identification of those testing positive, negative, and discordant put in appropriate care and treatment plan; (iii) equally, there is 100% partner disclosure, leading to increase adherence to care and treatment, and reduced domestic violence as earlier perpetrated by the male counterparts; and (iv) spread of idea to three other facilities (Samburu, Vigurungani and Ndavanya) in the catchment.

In conclusion, (i) engagement of community administrators (opinion leaders) by health workers on matters of male involvement works better as the patricidal system picks a quick buy-in to roll out the process, and (ii) enforcing the couple testing at Kinango as the main facility for the region, enables smaller facilities adopt the same under almost zero resistance by service seekers.

Fostering Imprints of Sustainable Quality I

C. Addressing processes

Please describe how this was done, what it achieved, and what the specific recommendations are.

One of the critical components of quality improvement for health services is the continuous evaluation of the process to ensure that they maximize on effectiveness and efficiency. The use of quality improvement techniques by the WIT included process mapping, which allowed the health care workers a different perspective that of the patient. This allowed the health care workers to understand the importance of process redesign and re-engineering to optimize the quality of the services to the client. It also formed a platform to show case and ensure the continuity in the cascade of care.

As a result the facilities were able to integrate service in to one department resulting in a one stop shop approach. This has been proven to have great benefits in retention of clients as well as much improved customer experience.
5. Case example

Globally, reducing the incidence of children infected through mother-to-child transmission has taken centre stage in the realization of a free HIV generation. With an adult prevalence of 6.7% in Kwale County, an accelerated effort towards achieving the recommended implementation of the four-pronged strategy for eMTCT is vital, with a stratagem evolving around; (i) prevention of HIV among women of child bearing age, (ii) prevention of unintended pregnancies among women living with HIV, (iii) prevention of transmission from a woman living with HIV to her infant, and (iv) provision of care and treatment to women living with HIV and their children.

The sub-county WIT conducted root-cause analyses and decided to focus on testing at ANC and uptake of ARV by both mother and child. The process divulged gaps aligned to (i) mother and child not being followed together due to divergent clinic visits - thus resulting to increase in defaulters, (ii) missed opportunities in identification of HIV exposed infants and appropriate HIV testing, (iii) laborious treatment process at the facilities – took up to 6 hours for a mother and child, (iv) lack of learning curves to facilitate exchange of good practices for scale and spread, and (v) low community and other stakeholder engagement to catapult eMTCT aims.

While focused on achieving eMTCT (as infection can occur before, during and after delivery), first, the WIT quickly introduced an integrated service delivery point, where mother and baby were paired, enabling them to attend clinic on same day. The approach unpacked a one-stop-point for all services required by both mother and child, cutting across immunization, family planning, growth monitoring, and proper record keeping as their files were now kept at the MNCH clinic. The healthcare workers mind set was changed at Continuous Medical Education (CME) sessions to achieve collective agreement on spread of work load to improve client experience.

Second, the client flow within the clinic, was re-engineered to reduce client’s time at the facility; a factor that influences health seeking behavior as many will internally battle with opportunity cost of being at the health facility to wait for treatment vis-à-vis making sales at the local market. On average the change knocked off 3 hours of clients waiting time, increasing client retention. The improved client flow chart is displayed in public to act not only as reference for staff, but enable clients know every required step of treatment at the facility.

Third, WIT embraced learning sessions, as gallery walks (presented by pinning charts around the learning room) were facilitated by USAID ASSIST to enable different facilities share their strategies of getting work and its environment improved for both patient and facility. For external incubation, the facility embraced exchange programs; the latest is an intercountry visit to Tanzania that has triggered matters of scaling up and spreading the services to other facilities.

Forth on the list is the branding of the program as a community-based and driven affair, by supporting and being part of the County HEI Graduation. The strategy pursued to engage local populations in ensuring success of the HEI program, with the aim of strengthening individual and social development, harnessing an inclusive knowledge society. This platform offered an opportunity for the industrial sector, Office of the First Lady of Kwale County, the political wing and community to invest in the event through the provision of basic items (i.e., event ground, refreshments, token of

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**Improving Retention of Mother-Baby Pairs in 16 Facilities in Kwale County**

![Graph showing improvement in retention of mother-baby pairs from Jan 2013 to Dec 2015.](image-url)
III. Recommendations

UNAIDS estimates that approximately 370,000 children were infected with HIV in 2007[1]. More than 90% of these infections were caused by vertical transmission from mother to infant and approximately 90% occurred in Sub Saharan Africa (UNAIDS, 2008). Prevention of mother to child transmission (PMTCT) interventions such as antiretroviral (ARV) prophylaxis have dramatically reduced the risk of vertical transmission from around 40% to less than 5% in some research and pilot settings in Sub Saharan Africa (WHO, 2008). Programme evaluations from a number of countries in Africa have found deficiencies in various components of PMTCT programmes including uptake of antenatal HIV testing (Doherty T, 2003), receipt of results uptake of prophylaxis and postnatal mother baby pair follow up (Doherty TM, 2005) (Stringer EM, 2003) (Doherty T, 2003). This has led to unnecessary infections for children born to HIV positive mothers.

The use of quality improvement methods and collaborative learning leveraged on the strengths already existing in the program and improving on the weaks areas of the health systems that were leading to poor outcomes in PMTCT

- ANC attendance for the first visit in the country is relatively good. This offers a great opportunity to ensure that all mothers are tested for HIV.
- The introduction of free maternity services in Kenya held to markedly improve the skilled deliveries in health facilities. This offers an opportunity to test mothers who may not have been tested earlier as well as reducing the risk of infection at delivery. It also allows the opportunity to confirm adherence and reaffirm counselling for the mother and child care.
- Retention of the mother baby pair in care at the facility is a major component of improving the quality of care offered to mother baby pairs. This has proven to be invaluable in ensuring we can track the services and condition of mother and child. The PMTCT guidelines can then be instituted in a manner that is timely and effective in reducing the chances of infection.
- Nutritional assessment on both mothers and babies has been key in improving the outcomes of the mother baby pair. The use of CHWs through task shifting this component has remarkably improved contribution towards better outcomes in the long run.
- Integration of services at the MNCH for mother and child through process mapping and reorganization has proven to be a key factor in enhancing retention of mother baby pairs. This was especially so due to the economic factors faced by most women due to poor resource settings.
- In addition to these local “host” factors, the Collaborative learning system used in this project was a central mechanism for engaging front line health care providers in local innovation that led to improvements and facilitated rapid diffusion of successful changes (Michele S youngleson, 2010). Published reports indicate that the BTS mechanism has been successful in accelerating and spreading changes within large healthcare organizations and improving outcomes on a national scale (Berwick DM, 2006)
APPENDICES

Appendix I: Improving Provider Initiated Testing and Counseling among Children at Kakamega County General Hospital Outpatient Department
CASE STUDY

Improving Provider Initiated Testing and Counseling among Children at Kakamega County General Hospital Outpatient Department

Summary

In Kakamega County improvement work began in August 2014 following a Kenya Quality Model for Health (KQMH) training. Quality improvement teams (QITs) were formed in the month of training. Kakamega County General Hospital (KCGH) was one of the first 12 high volume facilities that were trained. In January 2015 KCGH was sensitized in Kenya HIV Quality Improvement Framework (KHQIF) a panel of key indicators from National HIV AIDS and STI Control Program (NASCOP) for continuous quality improvement (QI) for ART programs in Kenya. A Work Improvement Team (WIT) was formed in February 2015 and chart abstractions done based on KHQIF. The first KHQIF revealed several opportunities for improvement. The team has been implementing improving work since then. In February 2016, another round of data abstraction and data review was done, and a number of indicators were identified for improvement. In February 2016, the team was concerned that only 21% of children seen at the outpatient department (OPD) were offered Provider Initiated Testing and Counseling (PITC) for HIV. Similar performance was noted in the previous quarter. With the support of ASSIST, the team identified root causes for low PITC for HIV for children. Countermeasures were established and improvement work tested in line with the change ideas suggested. The proportion of children tested for HIV by PITC increased at least four-fold in a span of six months and sustained months after HIV support from ASSIST reduced in September 2016.

Background

Kakamega County General Hospital (KCGH) is the main referral and specialist hospital in Kakamega County, Western Kenya. It has a catchment population of 79,316 of which roughly 20% are paediatrics. The hospital also offers comprehensive HIV care and prevention services.

The USAID Applying Science to Strengthen and Improve Systems (ASSIST) project, with funding from the US President’s Emergency Plan for AIDS Relief (PEPFAR) extended quality improvement (QI) support in HIV programs in Kakamega County between August 2014 and September 2016 before transitioning to elimination of mother to child transmission of HIV (eMTCT) only support. ASSIST supported eight facilities (Butere, Iguhu, Kakamega CGH, Likuyani, Lumakanda, Makunga, Malava and Manyala) in Kakamega County. Spread of improvement work has since been done to three more facilities (Bukaya, Khwisero and Navakholo). ASSIST is currently supporting improvement of quality eMTCT services in 47 high volume facilities across five counties in Kenya.

Implementation

The hospital formed their first quality improvement team (QIT) in August 2014 immediately after the Kenya Quality Model for Health (KQMH) training. The QIT had six members drawn from the hospital administration, and departmental heads. The team held two meeting in August and September 2014 but since they did not agree on priority improvement areas, and there was limited partner and county support in QI, no one was available to help them carry on. In February 2015 representatives from the ART clinic were invited and trained in the Kenya HIV Quality Improvement Framework (KHQIF). KHQIF is a panel of mandatory and important indicators for ART programs in Kenya propounded by the National HIV/AIDS and STI Control Program (NASCOP). The panel is an elaboration of the processes and outcomes for continuous quality improvement of ART programs under KQMH.
An HIV testing services (HTS) work improvement team (WIT) comprising of HIV counsellors, ART clinician, adherence nurse, and data officer was formed in February 2016. Three rounds of KHQIF each six months apart had already been done. Each round had improvement opportunities for the team. In March 2017, following the third round of KHQIF, the HTS WIT elected to improve provider initiated testing and counseling (PITC) among children. Through the support of ASSIST, in collaboration with APHIA Plus Western, the WIT was sensitized on QI, and an improvement project was developed following brainstorming sessions, multi-voting, priority setting (decision matrix) and root cause analysis through a fish bone diagram (Figure 1). Change ideas to address the root-causes were highlighted (Table 1).

An implementation plan with fortnight review meetings was agreed upon. The facility QIT decided to be meeting on the last Friday of the month to track progress and give oversight of the HTS WIT.

Table 1. Change ideas tested by the team

<table>
<thead>
<tr>
<th>Improvement AIM</th>
<th>Change Ideas Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>To improve patient flow</td>
<td>Counsellors relocated to the consultation rooms and wards, with testing happening before clients sees clinician</td>
</tr>
<tr>
<td>To increase client and caretaker awareness</td>
<td>Health education, and group counselling on HIV testing, provide and use SOPs for HTS</td>
</tr>
<tr>
<td>To increase the number of providers</td>
<td>Hospital administrators, and heads of departments sensitized, and reminded about need for their teams to offer testing</td>
</tr>
<tr>
<td>To increase daily testing outputs for counsellors</td>
<td>Targets set for all HIV testing counsellors</td>
</tr>
</tbody>
</table>

In May 2016, the HTS WIT resolved to have HTS counsellors sitting at the entrance or adjacent rooms of consultation rooms to ensure that children eligible for PITC are tested for HIV. Consequently, the client flow was adjusted (Figure 2).
**Results**

There was at least four fold increase in children offered PITC for HIV between March 2016 and September 2016 (*Figure 3*).

**Figure 4. Percentage of children offered PITC for HIV in OPD at Kakamega County General Hospital (Oct 2015-Mar 2017)**

A similar performance was noted with PITC for HIV among adult clients (*Figure 4*) however a rapid drop in the proportion of adults offered the service sharply dropped off in the 6 months post HIV support transitioning to eMTCT in ASSIST in the county.
Lessons Learned

Good results achieved by Kakamega HTS WIT has been attributed to the application of improvement concepts and teamwork. It is also clear that improving one indicator has an influence on another related indicator.

Next Steps

The team requires additional support from health administration, the QIT, especially, for them to address human resource challenges. Support such as enforcing that HIV tests are equally offered by the health care providers themselves to the clients they serve will certainly contribute to achieving and sustaining the global goal of ensuring that at least 90% of the population knows their HIV status.
Appendix II: Improving Nutrition Assessment and Categorization in Kakamega County: A tale of Kakamega County General Hospital and Khwisero Health Centre
CASE STUDY

Improving Nutrition Assessment and Categorization in Kakamega County: A tale of Kakamega County General Hospital and Khwisero Health Centre

Background

Kakamega County is one of the five counties supported by the USAID Applying Science to Strengthen and Improve Systems (ASSIST) project to implement improvement of elimination of mother-to-child transmission of HIV (eMTCT) in Kenya. Improvement work began in August 2014 following a Kenya Quality Model for Health (KQM) training. Quality improvement teams (QITs) were formed in the month of training. Kakamega County General Hospital (KCGH) was one of the first 12 high volume facilities that were trained. In January 2015, KCGH was sensitized in Kenya HIV Quality Improvement Framework (KHQIF) a panel of key indicators from National HIV AIDS and STI Control Program (NASCOP) for continuous quality improvement for ART programs in Kenya. A work improvement Team (WIT) was formed in February 2015 and chart abstractions done based on KHQIF. The first KHQIF revealed several opportunities for improvement. The WIT prioritized areas for improvement among them the care of mother-baby pairs especially nutrition assessment and categorization, that would lead them to provide the requisite support to the group. The WIT has worked their way through the root causes of the poor performance. The team integrated eMTCT services in maternal and child health (MCH), teamed up during eMTCT clinics when serving clients, ensured that the mother and baby are served at the same time, and that the duo share the same file at the clinic. Consequently, they have progressively improved assessment and categorization of nutrition status, its documentation, and eventual support for the clients requiring nutritional care. Lessons from KCGH were scaled-up in Khwisero Health Centre (KHC) in August 2016. KCGH performance has since moved from 11% in February 2015 and achieved a peak performance of 83% in April 2017 while that of KHC improved from 84% to above 96% since January 2017.

Implementation

The hospital formed their first quality improvement team (QIT) in August 2014 immediately after the Kenya Quality Model for Health training. The QIT had six members drawn from the hospital administration, and departmental heads. The team held two meetings in August and September
2014 but since they did not agree on priority improvement areas, and there was limited partner and county support in QI, no one was available to help them carry on. In February 2015 representatives from the ART clinic were invited and trained in the Kenya HIV Quality Improvement Framework (KHQIF). KHQIF is a panel of mandatory and important indicators for ART programs in Kenya propounded by the National HIV/AIDS and STI Control Program (NASCOP). The panel is an elaboration of the processes and outcomes for continuous quality improvement of ART programs under KQMH.

Chart abstractions were done in February and March 2015 to complete the first round of KHQIF. Dismal results were reported in a number of focus indicators among them nutrition assessment and categorization of clients. Close to 90% of the mothers and babies had not been assessed for their nutrition status and uncategorized. A work improvement team (WIT) was formed in the ART clinic in April 2015 with a resolve to improve the poorly performing indicators. A simple problem based work plan was done. The WIT met and reviewed their work monthly in the five preceding months but little progress was made. No changes were made, and neither did the team purpose to accomplish an agreed upon improvement aim.

The first county QI continuing medical education (CME) was held in August 2015 and in the three months that followed to improve understanding in QI. Teams were reconstituted to include clinical staff and peer clients working in the ART and PMTCT programs. Changes were instituted haphazardly without taking account of root causes between August 2015 and January 2016. Changes made included having records of all HIV exposed infants (HEIs) in their mother’s files; coinciding the dates of the HIV exposed infants (HEIs) and that of their mothers so that they are served the same day; and, integrating eMTCT clinic with MCH services. The changes marked the initial phase of the plan do study act (PDSA) cycle when ASSIST project’s QI advisor begun routinely working in Kakamega County in August 2015.

In March 2016, the team held a QI CME with the eMTCT and ART program staff and the CQI project was reviewed and streamlined. Root causes identified on the cause and effect diagram for poor performance were (a) poor documentation, (b) inadequate or missing tools to document nutrition assessments, (c) varied understanding on the assessment parameters (d) little involvement of nutritionists and (e) minimal chart review post clinic. As a result a set of countermeasures were proposed as highlighted in Table 1. Another round of KQMH training was conducted in August 2016 supported by ASSIST in collaboration with APHIA plus Western. New staff from KCGH and for the first time participants from Khwisero Health Centre (KHC) forming part of the trainee pool. The facilities participated in their first learning session in February 2017.

### Table 1. Small Changes Tested at Kakamega County General Hospital

<table>
<thead>
<tr>
<th>Root causes</th>
<th>Countermeasures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Poor documentation</td>
<td>Data managers to conduct OJT on documentation to all personnel</td>
</tr>
<tr>
<td></td>
<td>Documentation to be done during the clinical encounter</td>
</tr>
<tr>
<td>2. Inadequate or missing tools to document nutrition assessments</td>
<td>The clinic and unit heads to photo-copy and give copies to team</td>
</tr>
<tr>
<td></td>
<td>APHIA Plus Western to support</td>
</tr>
<tr>
<td>3. Varied understanding on the assessment parameters</td>
<td>Adopt standard highlighting the four minimum parameters for HEI nutrition assessment (weight, height, milestones and Z-score charting) and BMI calculations for eMTCT lactating women</td>
</tr>
<tr>
<td>4. Little involvement of nutritionists</td>
<td>Set up sit-in teams among them a nutritionist to serve clients under “one roof, one room” integrated approach</td>
</tr>
<tr>
<td>5. Minimal chart review post clinic.</td>
<td>Implement pre and post visit reviews of client files</td>
</tr>
</tbody>
</table>

Tremendous progress was made between April 2016 and August 2016. Khwisero HC was selected to implement the set of changes that were tested and appeared to be working at KCGH. The performance of this scale up facility has been astoundingly good a month since ASSIST began supporting them.
Results
The WIT at KCGH achieved 71% improvement over a span of two years from 11% testing changes while KHC improved to 98% in just three months from the time they started implementing the changes that were scale-up to them (Figure 1).

Figure 1. Mother-baby pairs assessed and counselled on nutrition at Kakamega CGH and Khwisero HC (Jan 2015-May 2017)

Facilitating Factors
The WIT at KCGH attributes their success to teamwork, support from the hospital administration, KQMH training and QI coaching sessions; while KHC quickly adopted teamwork and flexibly implemented change concepts from KCGH.

Tensional Changes
Both teams experienced staff changeovers and reshuffles: at KCGH staff changes were experience in March and November 2015; in November 2016 and January 2017 Khwisero HC.

There was a county health worker strike in September 2016 and national industrial health workforce in December 2016.

Lessons Learned
The two facilities are particular that teamwork is an anchor for improvement work. Consistent and frequent administration support helps in addressing challenges beyond the purview of the team.

Next Steps
JUNE 2017
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KCGH is considering to relook their root causes and systems to establish if there is any missing link that will enable them achieve greater than 95% performance. The WIT at KCGH is also working on three other CQI projects. On the other hand, KHC is now looking at picking a second improvement CQI indicator.
Appendix III: Improving Retention of Mother-Baby Pairs in eMTCT Program through Integration in MCH at Nambale Sub County Hospital
CASE STUDY
Improving Retention of Mother-Baby Pairs in eMTCT Program through Integration in MCH at Nambale Sub County Hospital

Summary
The goal of the elimination of mother to child transmission of HIV (eMTCT) program is to eliminate new HIV infections among children and to keep mothers alive through universal access to comprehensive prevention of mother to child transmission of HIV (PMTCT) services. Integration of maternal child health (MCH)/family planning (FP) with HIV is now a favored approach, because children and women are a priority target population in prevention and care of HIV/AIDS. In 2015 at Nambale Sub-County Hospital antenatal and post-natal mothers and HIV Exposed Infants (HEIs) used to receive their care in the ART clinic. Most of these mothers and the HEIs missed out on critical interventions meant for them such as counselling on adherence. Follow-up and retention in this group was very poor. A good number of mothers failed to come with their families and feared long waiting time. With the support of the USAID Applying Science to Strengthen and Improve Systems (ASSIST) project and APHIA Plus Western, in August 2016, they integrated services and phenomenal improvements have been seen in the proportion of mother-baby pairs retained in eMTCT clinic.

Background
Nambale Sub-County Hospital (NSCH) located in Nambale Sub County, Busia County. The serves a catchment population of 32,000. It has in-patient and outpatient (OPD) facilities. Amongst the OPD services offered are the mother child health (MCH) clinics and HIV prevention, care and treatment. With an average workload of 200 patients per day and about 5 admissions daily, it has a bed occupancy of 25.

The USAID Applying Science to Strengthen and Improve Systems (ASSIST) project has continued to support health facilities in Busia County in QI initiatives and in the implementation of the Kenya Quality Model for Health (KQMH) through formation of work improvement teams (WITs) to address selected opportunities for improvement.

Implementation
ASSIST, in collaboration with APHIA Plus Western and the Ministry of Health, trained participants from Nambale sub County Hospital (NSCH) in April 2016. This was the second QI training after the first one that was done in August 2014. However, like most of the facilities that were trained, NSCH did not immediately buy into the concepts of improvement due staggering leadership and membership at the facility. Therefore, ASSIST having conducted a situation analysis on the reasons for the team having not pick up, supported the facility to form an MCH WIT in June 2016. WIT members included all maternal and child health (MCH) nurses, community health workers (CHWs), and a data officer. The new WIT elected a coach who received orientation in coaching from the county in conjunction with ASSIST in July 2016. The WIT resolved to be meeting monthly, and to continue with semiannual and ad hoc Kenya HIV Quality Improvement Framework chart abstraction exercises as a problem identification avenue in the MCH. Working from the issue to the root cause perspective, in August 2016, WIT members conducted a root cause analysis using the fishbone diagram (Figure 1) and brainstorming,
determined that clients and staff were distraught with having elimination of mother to child transmission of HIV (eMTCT) clients being seen in the ART clinic.

They decided to integrate nutrition, eMTCT, and MCH services. The client flow was changed from a seven-step process to only five steps (Figures 2 and 3). eMTCT patients openly commended the move of offering their services in a near one stop shop. The waiting time had markedly improved they said.

Figure 5. Fishbone diagram used by the WIT at Nambale

Figure 2. Process Map Prior to Integration

Figure 3. Integration Process Map
Specific eMTCT days were established in MCH depending on the number of clients booked and clinical care to be given. The WIT meets monthly to review progress of eMTCT services, among them retention of their clients.

**Results**

Feedback from eMTCT clients indicated that the move to integrate their services with MCH care was a good one. A review of waiting time done in November indicated nearly 50% time saved between the time clients on follow-up arrived and left the clinic (median time was 95 minutes with old process map as opposed to 40 minutes with integration).

In the same vein, retention of mother-baby pairs increased from a baseline median of 65% (early 2016) to 85% (early 2017). A sharp rise, which has since been maintained was experienced in the month of integration (Figure 4).

**Figure 4. Retention of mother baby pairs 0-24 months in active care, NSCH (Jan 2016-May 2017)**

![Retention Graph](image)

**Lessons learned**

Change concepts such as service integration have a place in improving retention and thus follow up of clients in a program such as eMTCT. Nonetheless, it takes team effort to successfully implement service integration.

**Next step**

Despite the increase in mother-baby pair retention in eMTCT clinic at the MCH, the team is yet to optimize their retention rate to the desired minimum of 90% (UNAIDS and Government of Kenya goal). Therefore, a review of the primary and secondary countermeasures in line with their improvement aims and, root causes is required. This is bound to help generate a fresh school of thoughts into which changes can be tried and confirmed to enable them perform better.
Appendix IV: Improving Documentation and Uptake of HIV Testing Services in Post Natal Clinic at Malava County Hospital in Kakamega County
CASE STUDY

Improving Documentation and Uptake of HIV Testing Services in Post Natal Clinic at Malava County Hospital in Kakamega County

Introduction

Box 1. A brief on improvement events at Malava County Hospital

Quality Improvement Work at Malava County Hospital begun in August 2014 when a team from the ART clinic, MCH and hospital administration was trained by ASSIST in collaboration with NASCOP on the Kenya Quality Model for Health (KQMH) course integrated with the Kenya HIV Quality Improvement Framework (KHIQF). The trainees formed a facility level Quality Improvement Team (QIT) a month after training, and requested departments to form Work Improvement Teams (WITs). The first such WIT that was formed was that from the ART clinic. The ART WIT started improvement work immediately by conducting chart abstractions for the core HIV program indicators, but the performance was dismal. Since no one was specifically selected to take charge as coach, in the teams, coordination was a problem and the teams collapsed a month after they formed. Minimum level of KHIQF reporting was done semi-annually, QI indicator reports in partner meetings. In August 2015, a regional improvement officer was posted by ASSIST to work in Western Kenya. Beginning from where the team had reached, a long range KHIQF exercise was done, data analysed and presented. Among the areas reviewed were adult and paediatric care and treatment indicators, as well as eMTCT as shown in figure 1.

Figure 6. Snapshot eMTCT KHIQF report for Malava County Hospital as at August 2015

Background

Malava is the third largest hospital in Kakamega County. The hospital offers basic and emergency medical, reproductive health, and preventive health services. ASSIT first trained the hospital quality improvement August 2014. However, the team that was first formed collapsed in an attempt to drive improvement on all indicators of concern (Box 1). The
second QI training was done in August 2016 and was followed by formation of a QIT, and departmental WITs. In the Post Natal Clinic (PNC) at Malava County Hospital was experiencing challenges with documentation and HIV testing.

Implementation

Following a coaching and data review visit conducted by the Quality Improvement Advisor from ASSIST in March 2016, the facility formed a Work Improvement Team (WIT). The MCH lead was elected to be the coach, while the eMTCT nurse, the data clerk and two community health volunteers (CHV) agreed to be part of the WIT. Since the team felt their main problem was with documentation, the CHV at triage was nominated to complete the PNC register each time a client walks in past the customer care desk. However, within the month, the CHV was reassigned by the hospital and another one assigned to work at the customer care desk. Only one client was captured in the PNC register in April 2016. Follow up coaching was done by ASSIST early in May 2016 but later on the MCH lead transferred to another county. WIT meetings stopped for two months after staff were reshuffled by the county government and supporting partner in May and June 2016. Among staff lost in the changes were the MCH lead and the data clerk.

In August 2016, ASSIST in collaboration with APHIA Plus Western trained the facility in Kenya Quality Model for Health, and new WIT in MCH with the help of ASSIST, and Quality Improvement Team (QIT) in liaison with the county department of health were formed. The new and QI trained eMTCT nurse was appointed coach, while two MCH nurses, CHV and data clerk completed the WIT in MCH. QIT members included the hospital matron, the sub county RH coordinator, the hospital administrator, and hospital records information officer. A situation analysis was done in September 2016, and a priority matrix done to select the issue of focus in MCH (Table 1). The team agreed to continue with the previous improvement work. Overall, PNC attendance was a low of 21% achievement of their expected clients.

Table 1. Priority Setting Matrix Used by Malava County Hospital in September 2016

<table>
<thead>
<tr>
<th>Problem / Issue</th>
<th>Important</th>
<th>Scope Control</th>
<th>Likelihood of success</th>
<th>Potential Impact</th>
<th>Total</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 weeks post-delivery HIV counselling and testing</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Family Planning at 6 weeks</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Exclusive breastfeeding for 6 months</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>13</td>
<td>2</td>
</tr>
</tbody>
</table>

Root cause analysis was done by the WIT with the support of the coach and mentorship from ASSIST. From the fishbone diagram drawn (figure 2), poor documentation of PNC services, knowledge gaps on the provision of PNC services and procedures, a disintegrated MCH clinic and
lack of space were identified as contributory to low postnatal HIV testing. A brainstorming session helped the WIT enumerate possible countermeasures to test for improvement. Firstly, the team adopted the integrated MoH MCH patient flow (figure 3), and begun holding fortnight WIT meetings in October 2016. In November 2016, the WIT accepted to have a nurse at the customer care desk to triage mothers and babies. The nurse would flag out all postnatal clients at six weeks and appropriately inform them of the PNC package of care according to national guidelines. Consequently, all eligible women flagged out opted to undergo an HIV test. Weekly tracking of post-natal clients was done between October 2016 and January 2017.

A learning session was done in February 2017. In March 2017, the eMTCT nurse transferred to another county. WIT meetings have since dropped to monthly. The QIT appointed another eMTCT nurse to replace the outgone coach in June 2017.

Results

Marked increase in the number of clients served was documented in PNC register in March 2016. No client was documented in the register in a month earlier. However, declines were recorded in December 2016 and June 2017 due to a national health care worker strike and in March 2017 with the transfer of the coach (figure 4).
Overall, HIV testing rates improved from a median of 23% to 100% among eligible women who were flagged out as they entered the MCH (figure 5 ~ insert run chart) between the period the WIT resolved to measure improvement weekly as opposed to monthly.

**Figure 10. Time Series for Improving PNC Documentation (long QI cycle) and HIV testing (short QI cycle as insert)**

The median increase in documented PNC attendance has been 63% (10% - 73%).

**Lessons Learnt**

The WIT at Malava recognized the importance of teamwork to drive improvement in their work. Moreover, it was possible for them to stabilize wide variations in their performance by switching to
short improvement cycles (weekly data tracking, and fortnight WIT meetings) as opposed to monthly data reviews and meetings to drive their improvement agenda. Addressing a set of priority areas is also important in grounding teams on improvement work.

**Recommendation**

The team is yet to achieve at least 90% documented attendance of the clinic suggesting at least 17% missed opportunity in their catchment population. Therefore, considerations should be made on addressing change ideas that would improve clinic attendance, and proportionally increase testing rates while continuing to account for each single clinic visit made by accurately and completely documenting. This way, they will be able to achieve and even surpass the first UNAID ambitious goal of ensuring that at least 90% of the population knows its HIV status.
Appendix V: Improving Viral Load Monitoring in Two Facilities in Kakamega County
CASE STUDY
Improving Viral Load Monitoring in Two Facilities in Kakamega County

Summary
HIV viral load (VL) suppression is one of the ultimate goals of antiretroviral therapy (ART). Patients on ART should normally achieve VL suppression within six months of initiation. Classically, with low VL there is a reduction in opportunistic infections among HIV seropositive clients, increased quality of life, and longevity of life. National and international guidelines regarding HIV clinical management have been very dynamic in an attempt to combat the HIV pandemic. In Kenya, while the need for ART is still unmet, most health facilities are struggling with the mechanics of monitoring clients on ART. Access to facilities such as viral load testing is not guaranteed, relying heavily on laboratory networking. The USAID Applying Science to Strengthen and Improve Systems (ASSIST) project in collaboration with APHIA Plus supported facilities in the region to ensure they improving their support and monitoring of HIV clients in line with the national guidelines. The percentage of clients with VL results at Butere increased from 7% in January 2016 to 100% in July 2016. At Manyala increased from 19% in October 2016 to 100% in March 2017.

Background
Butere County Hospital found in Kakamega County is located in Butere Sub-county. It is the second largest Hospital after Kakamega County General Hospital (CGH) with a catchment population of 1,661,512 and a hospital population of 30,961. It offers comprehensive HIV care and treatment, and preventive services. On the other hand, Manyala is a sub county hospital, in the same county and Sub County with Butere County Hospital. Manyala offers basic and immediate emergency medical and preventive health care services. HIV care and treatment, and prevention is among services offered. The HIV clinic has 1,631 number of clients ever enrolled.

The USAID Applying Science to Strengthen and Improve Systems project (ASSIST) has continued to support health facilities in Kakamega County in quality improvement (QI) initiatives and in the implementation of the Kenya Quality Model for Health (KQMH) through formation of work improvement teams (WITs) to address selected opportunities for improvement. First contact made between ASSIST and the county was in August 2014, when a select number of facilities were trained in QI. Butere and Manyala hospitals were among the initial crop of trainees.

Implementation
In January 2016, in the course of support to the facilities, ASSIST supported Butere County Hospital identify improvement areas in the ART clinic. The Quality Improvement Team (QIT), which was been formed earlier in September 2014 was still in place but not very active (meeting only once in a quarter). With the support of the data officer and AIDS and STI coordinator, the team conducted a Kenya HIV Quality Improvement Framework assessment on a sample of files and established many opportunities for improvement (Figure 1).

Further file by file analysis was conducted by the WIT to determine the magnitude of the problem. Only 60% of the 1,395 clients active in care had had a baseline viral load done. 558 eligible clients required VL monitoring. A fishbone diagram was then done to enumerate possible root causes for the
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dismal performance and established that poor documentation, inadequate follow up and weak patient reminder systems, long waiting time in the facility, unavailability of internet bundles to download results on time, missing viral load results were contributory (Figure 2).

Figure 1. KHQF extract report used to select VL monitoring as an opportunity for improvement contributory (Figure 2).

Figure 2. Fishbone diagram (left) and table with countermeasures (right)

To mitigate against these root causes, the enlisted countermeasures were implemented as activities in their improvement work plan in the two months that followed. In April 2016, staff changeovers took place, and with the aid of APHIA Plus Western, the team was reconstituted replacing the outgone clinical officer and nurse. A refocus on monthly review and planning meetings began, and in August 2016 training of the new personnel in QI was done beside monthly coaching visits. This resulted in a rapid increase in clients accessing baseline VL testing in Butere by end of August and ensuing months. In October 2016, ASSIST encouraged Manyala to implement the changes made at Butere.

Particular changes were collecting viral load samples for all clients from the ART clinic, reminding all clients on the importance of VL monitoring and knowing their results, using SMS reminders and line lists to alert the clients and clinical teams about viral loads that are due for collection a day prior to
clinical encounters. Updating files with viral load results and providing counselling to clients with high viral loads was also done (Table 1).

**Table 2. Change Concepts Employed by Manyala Sub County Hospital**

<table>
<thead>
<tr>
<th>CHANGE AREA (ROUTE CAUSE)</th>
<th>SPECIFIC ACTIVITY / COUNTER MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Missing clients viral load results</td>
<td>Updating clients files with viral load results</td>
</tr>
<tr>
<td>2. Clients due for viral load not identified</td>
<td>Line listing clients eligible for viral load testing</td>
</tr>
<tr>
<td>3. Clients with high viral load not offered adherence support counselling</td>
<td>Adherence support counselling to offered to all clients with high viral load</td>
</tr>
<tr>
<td>4. Viral load results not downloaded on time</td>
<td>Download viral load results</td>
</tr>
</tbody>
</table>

**Results**

A nearly similar increase in viral load uptake was seen in both facilities with each ensuring that all their clients eligible for VL monitoring access the service, despite their relying on samples being processed in a different county. Manyala appeared to achieve the desired coverage faster than Butere, in 5 months.

The percentage of clients with VL results at Butere increased from 7% in January 2016 to 100% in July 2016. At Manyala increased from 19% in October 2016 to 100% in March 2017 (Figure 3).
**Lessons Learned**

Application of QI has an important place in driving the desired outcomes at work places, this is evident when teams work in synergy, and acknowledge the cyclical processes involved in initiating changes, and identifying changes that bring the sought after results.

**Next Steps**

It is useful that the teams consider the rates at which VL results are received from the central laboratory. At the same time, moving further and ensuring that clients are virally suppressed will facilitate achievement of ART goals. To do this, a number of ART guidelines suggest additional change concepts that influence psychosocial dynamics of clients such as pursuing differential models of ART care and follow up; testing age and sex–appropriate HIV treatment services; layering interventions in service delivery as would happen with hard to reach populations; and, correctly selecting regimes in line with national guidelines. Promoting adherence initiatives through strategies like Operation Triple Zero in which zero missed appointments is aimed at, zero missed pills is achieved, and hence zero viral load attained.
Appendix VI: Change Concepts for eMTCT
Are there any tools you want to include as appendices? We can include the change package from 2014.

I would like us to include the mother baby pair register, HEI cohort analysis tool and mother baby pair

4.4 Prevention of mother-to-child transmission of HIV

4.4.1 Change concept: Increase awareness of HIV in pregnant women

<table>
<thead>
<tr>
<th>Change idea</th>
<th>How to guide</th>
<th>Notes on level of evidence from the rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular community Dialogue meetings on importance of testing for HIV and benefits of PMTCT</td>
<td>Community dialogue meetings were held through chief’s barazas, TBAs, religious gatherings, and other community gatherings where issues of HIV and PMTCT were discussed.</td>
<td>Scored 17/20 Meetings already existed but QITs helped to activate and strengthen them. Male partners’ perceptions on testing affects dialogue; e.g., when a partner is tested HIV-positive, the male partner concludes that he too is HIV-positive, hence see no need to take part in Community Dialogues.</td>
</tr>
<tr>
<td>Health education sessions at the facility</td>
<td>HCWs and CHWS worked together to form duty rosters for which each of them had a particular day of the week that they would give health education at the facility in the morning before start of service.</td>
<td>Scored 19/20 This is easy to implement in all facilities as it does not involve any financial inputs.</td>
</tr>
<tr>
<td>Male spouse involvement and couple testing</td>
<td>HCWs encouraged pregnant mothers to ask their husbands to accompany them when they came for ANC clinic. Small notes were given to the mothers to give to their spouses asking them to accompany their spouses in the next ANC visit. Women accompanied by their spouses were attended to first and their partners tested for HIV. In addition the male partner was offered other services such as simple</td>
<td>Scored 9/20. The turn-out from the male spouse was not good. Male spouse assumed their HIV status based on his partner’s results; the need for actual testing needs to be encouraged. This idea may be repackaged and tested again.</td>
</tr>
</tbody>
</table>
medical check-ups, e.g., blood pressure measurement as an incentive.

4.4.2 Change concept: Increase accessibility and utilization of quality PMTCT services

<table>
<thead>
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</tr>
</thead>
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<tr>
<td>Decentralization of PMTCT sites to all facilities in the district.</td>
<td>All facilities in the district became PMTCT sites and the staff were trained and mentored through on-job training. Regular supportive facilitative was done and regular supply of antiretrovirals (ARV) was insured.</td>
<td>Was found to be effective and scored highly 17/20, can be implemented on a large scale with proper training and supervision.</td>
</tr>
<tr>
<td>Laboratory networking: health workers collect CD4 and DBS samples at the facilities and take them to the District Hospital and KEMRI Labs for analysis.</td>
<td>Identify a suitable lab to network with; set up a particular day of the week for specimen collection. Proper collection, labeling and transportation are done. Collect results, record and disperse to the clients when they come for their next visit.</td>
<td>Scored 16/20. However, the initiative was successful due to support by partners. Service currently supported by partners up to 75% of the total cost. This can be implemented across many facilities easily when partner support is available. For sustainability, facilities have to include it in their Annual Work Plan.</td>
</tr>
<tr>
<td>On-the-job training on how to collect CD4 and DBS samples and transportation</td>
<td>HCWs that were well versed with the procedures visited other sites and showed their colleagues how to collect, label, and transport the samples.</td>
<td>Scored 13/20. Likewise success was largely attributable to substantive donor/partner support.</td>
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</table>

4.4.3 Change concept: Improved commodity management of ARVs and related items

<table>
<thead>
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<td>On-the-job training on how to collect CD4 and DBS samples and transportation</td>
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</tr>
<tr>
<td>Redistribution of drugs, test kits, reagents, equipments and non-pharmaceuticals from facilities with excess to those experiencing stock-outs.</td>
<td>This was done by the DHMT in collaboration with the facilities through enhanced supportive supervision. Immediate actions to replenish stocks were done by redistribution, especially when there was delayed supply from the national level.</td>
<td>Was scored 18/20. With an active DHMT, this can be implemented successfully.</td>
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