Photo: Aurelio Alaya III

A HealthTech Report

HealthTech V Annual Report

Year 1

October 1, 2011, to September 30, 2012

Cooperative Agreement AID-OAA-A-11-00051

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A catalyst for global health

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Table of Contents

Highlights

- HealthTech coordinated and wrote case studies on newborn resuscitation devices, chlorhexidine for umbilical cord care, and injectable antibiotics for treatment of newborn sepsis for the United Nations (UN) Commission on Life-Saving Commodities for Women and Children. These three case studies were posted on the UN Foundation's Every Woman Every Child website.
- HealthTech prepared technology landscape analyses on preeclampsia/eclampsia, maternal anemia, maternal infection, and intrapartum-related events. These landscapes were used in a maternal and newborn health technology review and prioritization meeting in Washington, DC, on February 15-16, 2012 in conjunction with Accelovate and with the participation of 69 individuals representing 26 organizations.
- Following the regional dissemination meeting held in Nepalgunj, Nepal, in September 2011 under HealthTech IV, the Chlorhexidine for Umbilical Cord Care team finalized and disseminated a chlorhexidine for umbilical cord care technical brief.
- As a convener of the UN Commission on Life-Saving Commodities for Women and Children, HealthTech participated in two work plan implementation meetings, Oslo in August 2012 and New York in September 2012, in order to prepare the submission of the chlorhexidine for umbilical cord care implementation plan to the Commission for review and funding consideration.
- The Cold Chain Equipment Manager (CCEM) team met with Kenya's Expanded Programme on Immunization (EPI) team in September 2012 as part of the effort to support the team in designing a system for routine updates in CCEM. The EPI team expressed strong interest in customizing web-based CCEM to integrate with their monthly cold chain equipment reporting. A follow-up meeting is planned for January 2013.
- The Initiative on Multipurpose Prevention Technologies team launched a multipurpose prevention technologies (MPT) publications resource page with downloadable items including a fact sheet of MPT resource URLs and an MPT brochure.
- The Neonatal Resuscitators team completed interim bench testing of the Laerdal simplified upright resuscitator and disseminated a report of the test results.
- The Noninvasive Anemia Detection Device team is in the process of negotiating a clinical trial agreement with our research partner, Kintampo Health Research Center in Ghana. Planning for the validation study of noninvasive anemia detection devices is proceeding.
- HealthTech received affirmation that CAPRISA is interested in incorporating research on the paper applicator into an existing Tenofovir 1% gel trial. In the first quarter of 2013, HealthTech, CONRAD, and CAPRISA will initiate discussions about how best to incorporate the new study component.
- For cost and coordination reasons, the SILCS Diaphragm team initiated a technology transfer to relocate production of the SILCS Diaphragm to WEFO-*tec* Deutschland GmbH (Germany). WEFO-*tec* has expertise in retractable-pin technology used with silicone injection molding. Switching to the retractable-pin technology production method will simplify production from a three-step to a two-step manufacturing process; this change in manufacturing process has the potential to reduce cost beyond what the original manufacturer's production process could offer.

HealthTech Interim Activities

Oxytocin in the Uniject™ Injection System

Goal

To improve and ease adoption of active management of the third stage of labor (AMTSL) and other postpartum hemorrhage (PPH) prevention initiatives, and therefore, reduce PPH by facilitating both competitive commercial supply of and public-sector demand for oxytocin in the Uniject™* injection system.

Status of the project as of September 30, 2012

Work on this activity has concluded.

Achievements in Year 1

- Completed the data analysis for a pilot introduction of oxytocin in the Uniject injection system during AMTSL at the institutional level in Honduras.
- Liaised with the manufacturers of oxytocin in the Uniject injection system regarding changes in the HealthTech program and linked them with other ongoing programs.

Problems encountered and actions taken

- The final report on this pilot introduction was not completed under HealthTech. Our colleagues in the Maternal and Child Health Integrated Program assumed responsibility for final reporting in English and in Spanish. The report is entitled, Pilot Introduction of Oxytocin in the Uniject Injection System During Active Management of the Third Stage of Labor (AMTSL) at the Institutional Level in Honduras: A Report Evaluating the Acceptability and Feasibility of Introducing Oxytocin Unject for AMTSL.

* Uniject is a trademark of BD.

Technical Assistance to the United Nations Commission on Life-Saving Commodities for Women and Children

Goal

Contribute to several case studies at the request of the United Nations (UN) Commission on Life-Saving Commodities for Women and Children.

Status of the project as of September 30, 2012

Case studies on technologies for newborn resuscitation devices, chlorhexidine for umbilical cord care, and injectable antibiotics for treatment of newborn sepsis were completed. Work on this activity has concluded.

Achievements in Year 1

- Coordinated and wrote three case studies for the UN Commission.
- Posted the three case studies to the UN Foundation's Every Woman Every Child website.

Problems encountered and actions taken

No problems were encountered.

Technology Landscape Analyses of Maternal and Newborn Health Technologies

Goal

To identify candidate technology-related investments that could accelerate the use of maternal and newborn technologies in support of mortality and severe morbidity reduction.

Status of the project as of September 30, 2012

Technology landscape analyses for preeclampsia/eclampsia, maternal anemia, maternal infection, and intrapartum-related events were completed. A maternal and newborn health technology review and prioritization meeting was held on February 15 and February 16, 2012, with participation from 69 individuals representing 26 organizations. Work on this activity has concluded. The outcomes from the review and prioritization meeting may be used by USAID in future funding and program decisions for the Technologies for Health programs—Accelovate and HealthTech.

Achievements in Year 1

- Prepared four comprehensive landscape analyses.
- In conjunction with the Accelovate project, held a maternal and newborn health technology review and prioritization meeting in Washington, DC, on February 15-16, 2012.
- Used landscape content to complete UN Commission case studies on chlorhexidine, newborn resuscitation, and injectable antibiotics.

Problems encountered and actions taken

No problems were encountered.

HealthTech Projects

Chlorhexidine for Umbilical Cord Care

Goal

Coordinate and support global rollout of 7.1% chlorhexidine for umbilical cord care including its integration into global programs.

Status of the project as of September 30, 2012

World Health Organization (WHO) consultative meeting participants reviewed the evidence for chlorhexidine cord care and made the following recommendation to WHO: Daily chlorhexidine 7.1% digluconate application to the umbilical cord stump during the first week of life for newborns who are born at home in settings with a high newborn mortality rate greater than 30 per 1,000. We also learned that the Bill & Melinda Gates Foundation has revised its position on chlorhexidine such that they are ready to co-invest in African settings where chlorhexidine can save lives. The Chlorhexidine Working Group (CWG) has become more formalized with HealthTech as the secretariat. The group of participating organizations has expanded from 8 organizations to 20 organizations, and HealthTech is leading biweekly calls and tracking activities via an action-item matrix for the group.

Achievements in Year 1

- A chlorhexidine for umbilical cord care technical brief was finalized and disseminated following the regional dissemination meeting held in Nepalgunj, Nepal, in September 2011 under HealthTech IV.
- As the secretariat of the CWG, HealthTech convened a stakeholder meeting in July 2012 in Washington, DC, and planned a second meeting for October 2012, also to be held in Washington, DC.
- HealthTech worked with CWG members to develop the chlorhexidine resource page on the Healthy Newborn Network (HNN) website: http://www.healthynewbornnetwork.org/topic/chlorhexidine-umbilical-cord-care. The website will be formally launched in early 2013.
    - HealthTech has taken the lead on drafting a frequently asked questions document, country guidance document, and dilution instruction document as well as beginning work on a manufacturer's guide and local production brief. All of these documents will be disseminated via the HNN website.
- As a convener of the United Nations Commission on Life-Saving Commodities for Women and Children (UNCoLSC), participated in two work plan implementation meetings, Oslo in August 2012 and New York in September 2012, in order to prepare the submission of the chlorhexidine for umbilical cord care implementation plan.
- Submitted a manuscript on a willingness-to-pay study that was conducted by HealthTech in Bangladesh in 2011 to *BMC Public Health* in August 2012; we are awaiting editor review and comments.
- HealthTech collaborated with PSI and completed a preliminary landscape on pharmaceutical industries in Ethiopia. This work is part of an effort to identify appropriate manufacturing bases for the sub-Saharan African region.

- Began work on a method for market sizing. This work will be important to generating interest by national and regional manufacturers and distributors of the product.
- Engaged with stakeholders in Madagascar and Nigeria as they consider scale-up of chlorhexidine.

Problems encountered and actions taken

No problems to report**.**

Pathway from research to field implementation and use

The project activities will focus on implementing the chlorhexidine intervention over the course of five years. In Year 1, we will add to the evidence base by strengthening the application to the WHO Essential Medicines List, leading the development and managing the implementation of the UNCoLSC plan for chlorhexidine, and will solidify the strategy for global rollout by convening stakeholders to review a draft plan. The draft plan will identify and coordinate programmatic opportunity for chlorhexidine integration in global and regional platforms as well as build potential supplier bases for regional manufacturing and distribution. In Years 2 and 3, we will work toward coordinating the implementation of the global roll-out plan by providing technical support for both supply and demand initiatives in countries with demonstrated and/or strategic interest. In Years 4 and 5, providing we see favorable results from the randomized controlled trials currently under way in sub-Saharan Africa, we anticipate building on the knowledge and implementation base of the CWG and the UNCoLSC to scale the chlorhexidine product quickly worldwide.

Cold Chain Equipment Manager

Goal

Through the implementation of the Cold Chain Equipment Manager (CCEM), make collecting, managing, and using cold chain inventory data a common and sustainable agenda among Expanded Programme on Immunization (EPI) teams and their partners and demonstrate the value of routine use of inventory data for evidence-based cold chain equipment planning and management in low-resource settings.

Status of the project as of September 30, 2012

CCEM is available on www.path.org and has been validated via implementation by EPI teams in five countries. The HealthTech program has been able to advance CCEM as a routinely used evidence-based planning tool and has demonstrated how EPI stakeholders can engage in mutually reinforcing activities toward a common goal of effective resource management to advance new vaccine introduction. CCEM is providing donors with a transparent line of sight to data demonstrating whether a country's cold chain capacity is sufficient for new vaccine introduction and helping EPI teams present an evidence-based equipment plan and budget that reflects optimization of equipment choices to meet the vaccine storage needs of all health facilities.

Achievements in Year 1

- Updated data collection forms and screens in CCEM as follow-up activities from a September 2011 training workshop in Malawi under HealthTech IV.
- Supported Benin's EPI cold chain manager to analyze equipment inventory and prepare CCEM reports for presentation at vaccine supply chain meetings in July 2012 and September 2012.
- Met with the Partnership for Reviving Routine Immunization in Northern Nigeria (PRRINN) team in Abuja, Nigeria, to provide a tour of CCEM and shared online CCEM support materials. PRRINN requested collaboration with HealthTech on implementation of web-based CCEM at the state and local government authority levels in four states in 2013.
- Met with Kenya's EPI team in September 2012 as part of the effort to support the team in designing a system for routine updates in CCEM. The EPI team expressed strong interest in customizing web-based CCEM to integrate with their monthly cold chain equipment reporting. A follow-up meeting is planned for January 2013.
- Provided technical support to Malawi's EPI team and the Clinton Health Access Initiative (CHAI) to update 2011 CCEM inventory data. HealthTech received the final version of the updating form from the EPI/CHAI team post pilot testing; it should be ready for distribution to district managers in mid-November 2012.
- Responded to a request from the Uganda EPI cold chain team for refresher CCEM training in 2013.
- Invited to participate in a United Nations Children's Fund (UNICEF) Cold Chain and Logistics (CCL) Taskforce meeting in late November 2012 to represent CCEM and highlight the role of cold chain inventory data in the CCL Action Plan for national EPI systems.

Problems encountered and actions taken

CCEM introduction and implementation activities were restricted while waiting for a USAID CCEM user assessment. With limited HealthTech funds, CCEM activities were focused on supporting CCEM users within the EPI teams in Kenya, Malawi, and Uganda and providing limited technical assistance to a new CCEM implementation in South Sudan which was initiated and completed by Uganda EPI staff on a short-term UNICEF consultancy in South Sudan. The team secured co-funding in order to respond to requests for CCEM technical assistance from the Benin EPI team and PRRINN. We also found other funding to replicate key elements of the CCEM tool in an existing open-source web-based tool.

Pathway from research to field implementation and use

The project activities for the next five years will focus on ensuring that EPI teams and their partners have access to a no-cost and easy-to-use tool that can increase the efficient and sustained use of cold chain inventory data for effective evidence-based cold chain equipment planning and management. In Years 1 and 2, we will participate in a USAID-led needs assessment exercise designed to identify how CCEM can better meet the needs of EPI cold chain managers in sub-national management positions and help these staff better plan and manage equipment. We will continue to support EPI teams that implement CCEM to identify effective methods for routine inventory data updates and find opportunities to integrate these updates with other immunization program activities. In Years 2 and 3, we will focus on developing regionally based consultants and build the technical capacity of logistics experts in EPI teams in order to broaden the technical resources available to support CCEM implementations at scale. As we build this technical capacity to support CCEM, we will work with EPI teams and partner agencies experienced with CCEM implementations to develop and test CCEM training materials that can support broad, regionally based CCEM training initiatives. Our advocacy efforts will increase in Year 4, and by Year 5 the CCEM software and a comprehensive roll-out package will be finalized and jointly shared with other EPI partner organizations committed to supporting CCEM implementation at scale.

Global Campaign for Microbicides

Goal

The Global Campaign for Microbicides (GCM) is dedicated to advancing the introduction and successful implementation of proven microbicides for preventing HIV acquisition in women. GCM intends to meet this goal through a combination of political mobilization, education, and community engagement activities.

Status of the project as of September 30, 2012

Following a consultation process with key internal and external partners, PATH made the decision to close GCM effective September 30, 2012. HealthTech has received approval from USAID to transfer any remaining FY11 pipeline funds after GCM closure to activities related to use of the SILCS Diaphragm for microbicide delivery.

Achievements in Year I

- In order to spur community engagement and gender analysis, we identified and hosted dialogues with women and men in selected communities using different strategies for engagement such as accredited story-telling techniques. Eight dialogues were conducted in Kenya, nine dialogues were conducted in South Africa, and six dialogues were conducted in Zambia. As a result of these dialogues some individuals were identified as microbicide champions for their communities; these champions will be able to promote awareness and bridge communities to GCM and the wider stakeholder community.
- GCM team members liaised with national HIV/AIDS strategic planning committees regarding the inclusion of HIV prevention for women and the use of microbicides.
- The Microbicide Access Working Group launch meeting was held in March 2012. Given the termination of GCM's activities, the convening of the working group has been transitioned to the Population Council and USAID.
- GCM team members participated in the M2012 Conference and were able to liaise with potential partners to identify opportunities for integrated health partnerships for microbicide implementation.
- GCM team members participated in the AIDS2012 Conference proceedings including co-hosting a *Meet the Experts* dinner with the AIDS Vaccine Advocacy Coalition to facilitate greater collaboration between research and advocacy efforts for microbicide implementation.

Problems encountered and actions taken

GCM completed its consultative process and worked toward a deeper integration into PATH. The transition was more significant than originally planned resulting in GCM terminating its program and transitioning to support of other PATH programs in an effort to include microbicide implementation in the scopes of work of various PATH programs.

Initiative on Multipurpose Prevention Technologies for Reproductive Health

Goal

Advance development of and access to multipurpose prevention technologies (MPTs) that will simultaneously prevent pregnancy and/or sexually transmitted infections and/or reproductive tract infections.

Status of the project as of September 30, 2012

The purpose of the Initiative on Multipurpose Prevention Technologies (IMPT) is to provide a neutral forum through which researchers, policymakers, product developers, providers, advocates, and donors can work together to raise awareness and facilitate increased support, funding, and coordination for the development of MPTs. An online resource hub has been launched; the site (www.cami-health.org) makes available various publications, a fact sheet, and an MPT brochure. IMPT has been expanding efforts to achieve global support for MPTs through presentations at conferences, focused meetings in India and sub-Saharan Africa, and advocacy and fundraising activities.

Achievements in Year 1

- Launched the MPT publications resource page and downloadable items including a fact sheet of MPT resource URLs and an MPT brochure.
- Hosted a webinar in June 2012 on the need and status of MPT research and development.
- Implemented a calendar of key HIV and reproductive health international conferences at which IMPT representatives are submitting abstracts for presentation and satellite sessions to raise awareness of MPTs.
- Submitted abstracts and satellite sessions to the following organizations for presentations: International AIDS Society, Association of Reproductive Health Professionals, American Public Health Association, International Federation of Gynecology and Obstetrics, and Women Deliver.
- Refined the IMPT strategic plan. Three priority activities and working groups were identified: (1) scientific agenda; (2) communications, advocacy, outreach; and (3) delivery and access.
- In order to expand MPT awareness and support in priority settings outside of the United States, regional stakeholders in targeted priority countries were identified and asked to participate in IMPT working groups.
- Plans are under way for an MPT convening in India in late 2012, hosted by the Indian Council of Medical Research, and we are working with Kenyan and South African partners to host MPT meetings in their regions.
- Developed a technical MPT curriculum and PowerPoint presentation, available for use on the Coalition Advancing Multipurpose Initiatives (CAMI) website.
- Refined the MPT target product profiles.
- Convened an initial meeting of the IMPT acceptability and access working group.

- As a means of informing MPT product development, a comprehensive literature review was initiated to assess socio-behavioral gaps relevant to potential MPT device adherence. This was done in alignment with the Scientific Agenda Working Group preliminary product priority recommendations.

Problems encountered and actions taken

No problems to report.

Pathway from research to field implementation and use

As part of a global coalition with the goal of advancing MPTs for reproductive health, the project team will participate on four activities for the next five years. These activities include supporting CAMI as the secretariat for IMPT, expanding global support for MPTs, facilitating the MPT scientific agenda, and developing a MPT communication strategy. The focus in Years 1 and 2 are on identifying regulatory pathways for MPTs; the focus will expand to include access and delivery in Years 2 through 5.

Neonatal Resuscitators

Goal

Conduct independent, third-party evaluation of new designs of neonatal resuscitators and/or component pieces (i.e., face/device interface) as part of the Helping Babies Breathe (HBB) Global Development Alliance to reduce neonatal mortality by improving newborn resuscitation.

Status of the project as of September 30, 2012

HealthTech learned that the hand-operated neonatal resuscitator set listed in the United Nations Children's Fund (UNICEF) catalogue was selected based on the outcome of a competitive bid and that Laerdal Medical now has a new three-year contract with UNICEF as the supplier listed in the catalogue. Laerdal estimated the total need for newborn resuscitators and suction devices in the Millennium Development Goal countries as 1 million sets. PATH is a sub-awardee to Save the Children on a project funded by USAID Child Survival which includes a user evaluation of the Laerdal upright resuscitator design in Uttar Pradesh, India.

Achievements in Year I

- Attended the HBB annual meeting in July 2012 and participated in quarterly HBB teleconferences.
- Participated in the United Nations Commission on Life-Saving Commodities for Women and Children (UNCoLSC) market-shaping technical working group.
- Provided input to the Neonatal Resuscitation Commodities Year 1 implementation work plan prepared for the UNCoLSC.
- In an effort to reach out to key global and regional resuscitation equipment manufacturers around the opportunity for them to engage actively with HBB activities, HealthTech selected a list of suppliers from the Global Inventory of Neonatal Resuscitators for discussions.
- Completed interim bench testing of the Laerdal simplified upright resuscitator and disseminated a report of the test results.

Problems encountered and actions taken

We experienced a delay in delivery of the newest prototype of simplified resuscitator devices from Laerdal; delivery was in October 2012. Laerdal had been working on modifications to the device to address the following problems seen in earlier prototypes:

1. Excessive leakage from the threads of the patient connection port, which is being mitigated by replacement of this component with a molded (rather than rapid prototyped) part.
2. The activation pressure of the pressure-release valve was found to be difficult to control from one device to the next. It was also found to be inconveniently located by some users, and the reliability of the valve over the life of the device had not yet been established. Due to these issues, the valve was relocated next to the intake valve.

Pathway from research to field implementation and use

Project activities will focus on identifying and evaluating any innovation in this product category over the course of five years. Of immediate interest are the simplified resuscitator designs being developed by Laerdal Medical. In Year 1, we will evaluate these devices in bench testing. In Years 1 and 2, we will seek funding to conduct independent evaluation of these devices in developed- and developing-country settings. In Years 3 to 5, provided we see favorable results from the independent user evaluations in various settings, we anticipate joining a wider group of partners in integrating the new devices into the existing HBB programmatic platform to achieve global scale. We anticipate that any other product innovation in this category will follow a similar pathway from discovery to field implementation and use.

Noninvasive Hemoglobin Measurement Technology for Anemia Screening

Goal

Advance the introduction of noninvasive anemia screening technologies in low-resource settings.

Status of the project as of September 30, 2012

The Pronto, developed by the Masimo Corporation (Masimo) and the ToucHb, developed by Biosense Technologies (Biosense) are emerging noninvasive anemia screening technologies. These devices use a finger probe and technology analogous to noninvasive pulse oximetry to measure hemoglobin (Hb). A quantitative measure is displayed on a screen in a minute or less. These devices provide simultaneous measurements of Hb, oxygen saturation, and pulse rates. The noninvasive devices do not require a blood draw, do not generate hazardous materials, are portable, and are easy to use. The Pronto devices are commercially available with United States Food and Drug Administration clearance and have been extensively tested in developed-country settings. Testing in resource-poor settings among target populations in Africa has been limited. This is a critical step to understanding the most appropriate use scenarios and health applications for the devices.

Achievements in Year 1

- A clinical trial agreement is being negotiated with our research partner, Kintampo Health Research Center (KHRC) in Ghana, and planning for the validation study of noninvasive anemia detection devices is proceeding.
- Study protocol and data collection tool development is under way in close collaboration with KHRC and with input from the device developers.
- Preparations are under way for submissions for ethical approval from the PATH Research Ethics Committee, the Ghana Health Service, and the Kintampo Institutional Ethics Committees.
- A consultant with expertise in cost analysis from the University of Accra has been identified to support comparative cost analysis work that examines introducing a noninvasive Hb measurement technology into the exisiting health system in a developing-country setting.
- A meeting was held with the leadership team of one of the device developers, Masimo, and more sustainable business plans were discussed with an initial commitment from Masimo to lower price points for low-resource areas.

Problems encountered and actions taken

Throughout the validation study period, HealthTech has been in close contact with Biosense to stay abreast of their progress in having prototypes of their ToucHb devices ready for the study in Ghana. We have encountered delays in receiving the ToucHb prototypes, and we do not have confirmation that they will be ready for the trial. In the event that the ToucHb devices are not available, the validation study will proceed as planned with the Masimo noninvasive anemia screening devices.

Pathway from research to field implementation and use:

The project activities will follow a progression over the course of five years. In Years 1 and 2 we will conduct technology validation and operational research. We will also submit an application to the World Health Organization to include noninvasive devices on the Essential Devices List. Starting in Year 3 we will follow with demonstration pilots to generate demand and create sustainable business models which will lead to successful larger-scale introduction in developing-country programs. HealthTech will work closely with stakeholders to ensure that the noninvasive technologies support and integrate with other efforts to combat anemia. Partnerships to conduct pilot introductions with country programs and ministries of health, the Global Alliance for Improved Nutrition, the Maternal and Child Health Integrated Program, MEASURE DHS, and others in developing countries will inform and support plans for scale-up.

Paper Applicator for Microbicide Delivery

Goal

Facilitate adoption and use of a low-cost paper applicator for the delivery of Tenofovir (TFV) 1% gel in clinical trials and for broader commercial introduction and use in South Africa and elsewhere.

Status of the project as of September 30, 2012

This project has focused on continued work with TFV gel both in respect to the paper applicator and to providing technical assistance to trials in Africa for incorporation of the paper applicator. The data collected to date on the paper applicator has been very limited, thus additional data that can inform the use of the applicator with TFV (e.g., questions related to delivery, use, storage, disposal, and other factors related to distribution and the environment of use) will be instrumental to planning for introduction. HealthTech also continues to work closely with CONRAD, ProPreven, and Tekpak Inc. to inform the strategic planning related to incorporating the paper applicator into the manufacturing and introduction frameworks in South Africa.

Achievements in Year 1

- In preparation for bench tests to identify the optimal time between the filling of the paper applicator with TFV 1% gel and gel delivery and to assess the potential for the paper applicator to be reused, standard operating procedures have been developed by HealthTech and reviewed by CONRAD. In addition, a materials transfer agreement for transfer of TFV to PATH was drafted and is under review by CONRAD.
- Initial interest was voiced by Follow-on African Consortium for Tenofovir Studies (FACTS) investigators to incorporate the paper applicator into Phase 3 trials with TFV in South Africa.
- A confidential disclosure agreement has been executed between PATH and ProPreven to enable sharing of more detailed information relating to understanding activities undertaken to estimate microbicide demand size. HealthTech has provided ProPreven with the clinical trial report for the applicator bridging study.
- HealthTech received affirmation that CAPRISA is interested in incorporating research on the paper applicator into an existing TFV trial. In the first quarter of 2013, HealthTech, CONRAD, and CAPRISA will initiate discussions about how best to incorporate the new study component.

Problems encountered and actions taken

There is a delay in the manufacture of TFV. CONRAD anticipates manufacturing will take place later this year, and PATH would receive more TFV early in 2013 in order to conduct the bench testing.

Pathway from research to field implementation and use

The project activities over the next five years are designed to lead to introduction of TFV 1% gel with a low-cost paper applicator in South Africa. In Years 1 and 2, we will establish support for the paper applicator with ProPreven, the South African joint venture responsible for registration, manufacture, and

distribution of TFV 1% gel, and facilitate discussions with Tekpak, the applicator manufacturer. In parallel, in Years 1 and 2, we will ensure necessary technical data is generated to support registration and user instructions, and in Years 2 through 5, we will provide technical assistance to ensure appropriate clinical data is collected to inform introduction of TFV with the paper applicator in South Africa. This project will work closely with key stakeholders, including CONRAD, ProPreven, CAPRISA, and Tekpak.

SILCS Diaphragm, a Nonhormonal Barrier Method for Contraception and Dual Protection

Goal

Advance the commercialization of the SILCS Diaphragm by conducting developing-country assessments, scaling production, pursuing regulatory approvals, and building evidence for appropriate gels to be coupled with the device.

Status of the project as of September 30, 2012

HealthTech has continued activities that lay the groundwork for future developing-country introduction of the SILCS Diaphragm as a nonhormonal contraceptive with dual protection potential when combined with a microbicide gel. The lack of an approved alternative contraceptive gel (that does not contain nonoxynol-9) is the single largest issue keeping the SILCS Diaphragm from moving toward introduction in developing countries; thus, one of our main activities has been to make progress toward validation of an alternative contraceptive gel. We are undergoing in vitro screening and bench testing and developing a testing plan to characterize the safety of alternative gels. Kessel Marketing & Vertriebs GmbH (Kessel), the license-holder for the SILCS Diaphragm, has been responding to questions from the European Union Notified Body reviewers in anticipation of receiving CE Mark for the device. Production of the SILCS Diaphragm has been transferred to a new manufacturer, WEFO-*tec* Deutschland GmbH.

Achievements in Year 1

- Completed the first of two in vitro screening laboratory studies of Contragel that are required as a first-tier test for safety and efficacy.
- Completed a desk research market scan of alternative available contraceptive gel products and drafted landscape documentation.
- Finalized test protocols and commenced bench testing to assess the compatibility of alternative contraceptive gels with the SILCS Diaphragm.
- HealthTech selected a country, initiated discussions with stakeholders, and selected an organization (Ashodaya) to evaluate country preparedness, potential market segments, distribution channels, and advocacy necessary to raise awareness about the SILCS Diaphragm as a barrier contraceptive in India.
- In preparation for a SILCS Diaphragm with TFV gel market assessment study in South Africa, HealthTech selected MatCH via a competitive process and has worked with them to adapt data collection tools from previous assessments. Ethical reviews of the study are under way and stakeholder discussions have been initiated.

- For cost and coordination reasons, the team initiated a technology transfer to relocate production of the SILCS Diaphragm to WEFO-*tec* Deutschland GmbH (Germany). WEFO-*tec* has expertise in retractable-pin technology used with silicone injection molding. Switching to the retractable-pin technology production method will simplify production from a three-step to a two-step manufacturing process; this change in manufacturing process has the potential to reduce cost beyond what the original manufacturer's production process could offer.
- A factory audit was completed for European Union regulatory approval (CE Mark), and final review of the SILCS Diaphragm technical file was completed by the CE Notified Body (auditor). Regulatory approval is awaiting final production validation at the WEFO-*tec* factory.
- Kessel registered the brand name Caya®—contoured diaphragm and will market the SILCS Diaphragm under this brand name through existing distribution channels in Europe.
- Finalized and submitted the label comprehension study implemented by the California Family Health Council, to CONRAD.

Problems encountered and actions taken

Leakage was experienced at elevated temperatures during testing of the first samples of Amphora, an alternative gel. We requested and received additional samples for continuation of testing.

Pathway from research to field implementation and use

Over the next five years, project activities will focus on advancing the commercialization of the SILCS Diaphragm by validating a contraceptive gel for use with the device in developing countries; conducting developing-country market assessments and demonstration studies to clarify the value proposition for the SILCS Diaphragm as both a barrier contraceptive and as a microbicide delivery system for dual protection; and then building strategies for market introduction, developing regulatory submissions and scaling up production to bring the SILCS Diaphragm to key developing-country markets; and supporting market development to ensure awareness, access, and sustainable supply.