Global Health Innovation Index

A tool for identifying the most promising Global Health Innovations

USAID | Global Health

CENTER FOR INNOVATION AND IMPACT

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LETTER FROM USAID'S CENTER FOR INNOVATION AND IMPACT (CII)

Confronted with the enormous, unprecedented, and deadly consequences of the global coronavirus pandemic, we feel a renewed imperative to draw on new ideas and approaches to address today's global health challenges. We wrote this Global Health Innovation Index before the coronavirus had sickened millions, before global lockdowns had restricted access to vital services, and before economies had lost millions of livelihoods. Prior to this grim context, we noted that innovations in global health have enormous potential to complement existing programs in addressing the world's most critical needs. Today, there is even more urgency to surface life-saving innovations and rapidly maximize their potential.

In low- and middle-income countries (LMICs), health innovations -- new products, services, delivery modes, financing, and processes -- can help save lives. Whether a drastically simpler rate monitor for safe IV infusions, a digital platform powered by behavioral science nudges to increase treatment adherence, or mosquitoes that can prevent transmission of Zika in whole communities, these and other innovations extend services to unreached communities and overcome barriers to care. Moreover, we can leverage past investments in innovations and adapt them to coronavirus use cases for more nimble and effective responses.

For the past two decades, donors, entrepreneurs, universities, governments, companies, and other partners have invested roughly $4 billion[1] in R&D towards diseases that primarily affect LMICs. While some of these investments have achieved both impact and scale, others have achieved positive but limited results and our CII *Ideas to Impact* series notes the launch planning critical to successful uptake. Beyond support to any individual innovator, these investments inherently represent a portfolio approach, with interventions at different stages of readiness.

This Global Health Innovation Index draws from USAID's health innovation portfolio to offer a strategic approach that can maximize scaling resources by helping identify promising, ready-to-launch innovations. We share this framework in hopes it can be useful to countries, other donors, and partners as well as to our own health teams. To assess the breadth of health innovations across sectors, geographies, and disciplines, this Global Health Innovation Index presents four flexible criteria: 1) health impact; 2) demand and sustainability; 3) organizational and/or partner capacity; and 4) progress to scale. The Index also highlights promising global health innovations that have already scaled to some degree, are ready to scale further, and demonstrate how the Index criteria can be applied.

Cultivating nascent, transformative ideas is important, but it will take a concerted effort to scale beyond pilots and fully harvest the benefits of proven innovations. The coronavirus has imposed new, profound, and unrelenting pressures on every aspect of providing global health services. In addition to our existing tools and programs, we must draw on innovations that are critical to saving lives, quick to implement and scale, and customized to LMIC needs. We invite you to apply this Global Health Innovation Index to your own portfolios and partner with us on opportunities to scale innovations that can help fill the ever-growing health demands of both today and tomorrow.

Center for Innovation and Impact (CII)
Bureau for Global Health, USAID

1. https://www.ghtcoalition.org/r-d-facts

INTRODUCTION

Global health is a priority for the U.S. Agency for International Development (USAID) as the Agency works to end extreme poverty and promote resilient, democratic societies. Our global health programs are dedicated to saving lives and improving the health of the poorest and most vulnerable, so they can reach their full potential. Together with our international and country partners, our investments in global health save millions of lives and improve access to basic health services for people all over the world, while advancing the security and prosperity of the U.S. and the world.

USAID's global health efforts are focused around three strategic priorities: 1) preventing child and maternal deaths; 2) controlling the HIV/AIDS epidemic; and 3) combating infectious diseases.

Achieving these priorities requires developing and funding promising innovations that lead to significant improvements. In global health, innovations have the potential to save lives, improve health outcomes, optimize the use of limited financial resources, and support the achievement of national and global health-related goals. This document uses a framework that looks at four types of innovations - offering (product and service), delivery, finance, and process. This document will focus on offering and delivery of health innovations.

Innovations can serve as catalysts for different degrees of change: incremental, adjacent or transformative change. In general, 70 to 90 percent of global health innovation efforts focus on improving existing products, services, and practices, termed incremental or adjacent innovations. Only about 10 percent of innovation efforts focus on inventing something entirely new that has the potential to address the health needs of previously unreached communities,

termed transformative innovations. Figure 1 defines what each type of innovation effort entails.

Incremental and adjacent innovations can often be supported through USAID's core global health programs. There are many ways these programs can increase the pace of innovation, including different ways of working with partners, different management approaches, and new financing mechanisms. For more information about these approaches, we invite you to review the USAID Center for Innovation and Impact (CII) publication *Innovation Realized: Expanding the Path to Health Impact*.
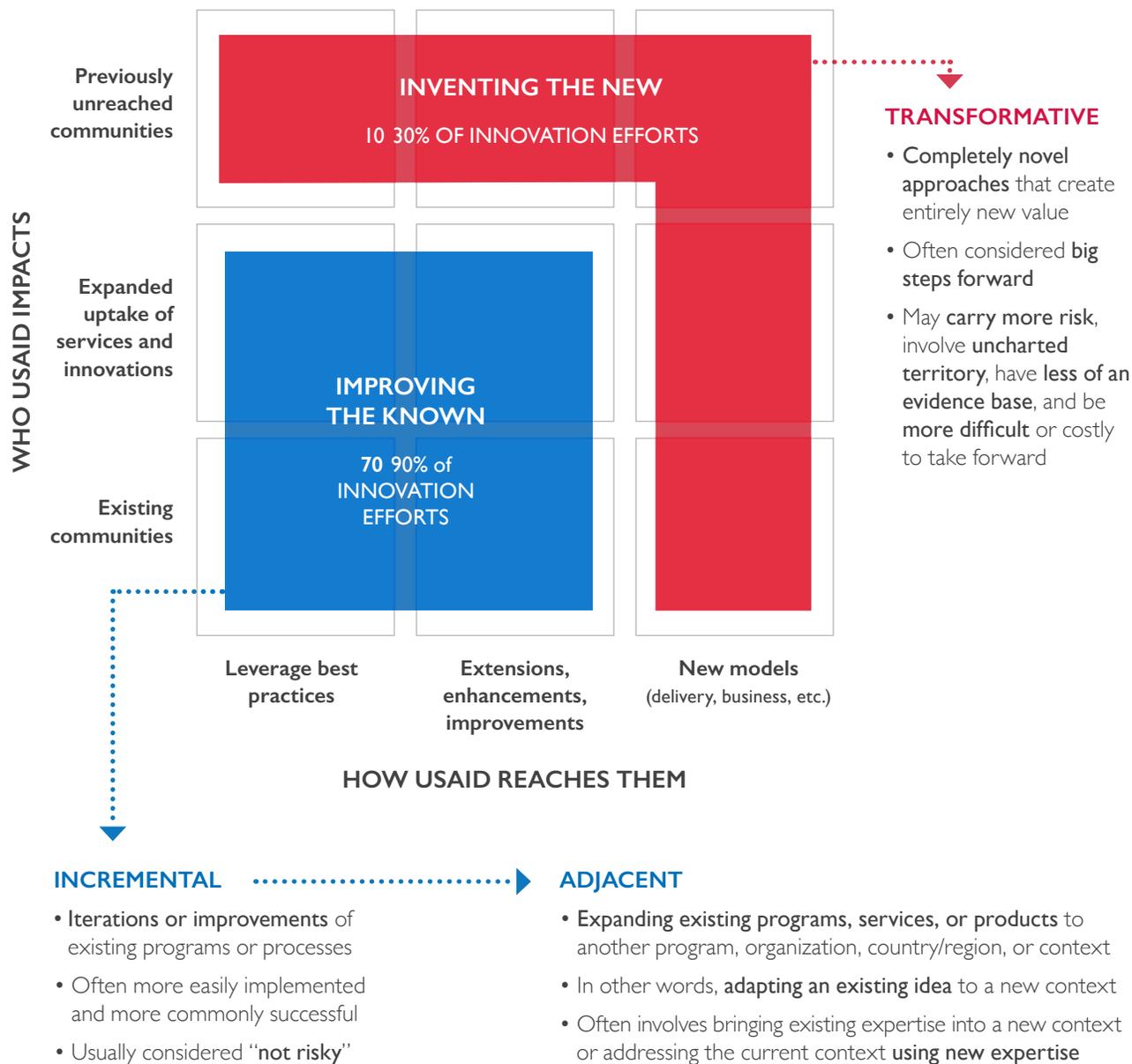
Transformative innovations, however, often require different types of support. Because of the greater risk involved, they cannot be developed easily within the context of a program that delivers services. They need to be developed and tested first, then scaled up.

Across the development enterprise, USAID uses open innovation to identify, test, and scale products, services and practices to tackle major challenges. Open innovation engenders collaboration with a wide range of external partners, many of whom have never worked with USAID previously. Global Health has used open innovation to source and support transformative innovations, as well as certain types of adjacent and incremental innovations.

Over the past decade, USAID has supported over 150 global health innovations through open innovation efforts. While some of these innovations are in the process of scaling, others are still in development— and some never made it to scale. In this document, we highlight nine global health innovations that are ready to scale and outline ways in which national governments, donors, investors, implementors and experts might consider supporting these innovations.

Global Health's typology of innovation

Figure 1

WHO USAID IMPACTS

	Leverage best practices	Extensions, enhancements, improvements	New models (delivery, business, etc.)
Previously unreached communities		**INVENTING THE NEW** 10 30% OF INNOVATION EFFORTS	
Expanded uptake of services and innovations		**IMPROVING THE KNOWN** 70 90% of INNOVATION EFFORTS	
Existing communities			

HOW USAID REACHES THEM

TRANSFORMATIVE

- Completely novel **approaches** that create entirely new value
- Often considered **big steps forward**
- May **carry more risk**, involve **uncharted territory**, have **less of an evidence base**, and be **more difficult** or costly to take forward

INCREMENTAL

- Iterations or improvements of existing programs or processes
- Often more easily implemented and more commonly successful
- Usually considered "**not risky**"

ADJACENT

- **Expanding existing programs, services, or products** to another program, organization, country/region, or context
- In other words, **adapting an existing idea** to a new context
- Often involves bringing existing expertise into a new context or addressing the current context **using new expertise**

Source: USAID Innovation Realized 2019

NO REAL IMPACT WITHOUT SCALING

Many creative solutions to global health challenges exist, but only a few become true game changers, i.e., have the capacity to improve the lives of millions of people. Innovation alone does not create impact. Without scale, the impact of an innovation is limited. So how does a promising innovation achieve scale?

In an article by Christian Seelos and Johanna Mair for the Stanford Social Innovation Review (SSIR), the authors observe, "Innovation is an investment of resources that creates new potential. Scaling creates impact by enacting that potential." The goal is not innovation for its own sake but "productive" innovation. What creates impact is focused and committed scaling, which means delivering innovations to more people and doing this more reliably, efficiently, and with ongoing improvements in quality.

A global health innovation can scale through various pathways: a) commercially or in partnership with the private sector; b) through the public sector, by incorporating the innovation into the practice of developing country governments, donors, or philanthropists; c) through a combination of both.

The Global Health Innovation Index aims to: 1) define criteria that can help programs assess a health innovation's readiness and suitability to scale and 2) highlight innovations that have begun scaling successfully. This Index is designed specifically for global health practitioners to assess health innovations for their readiness and suitability to scale. The criteria and approaches in the index may not be applicable to other USAID technical areas.

Figure 2

CREATING SOCIAL IMPACT: INNOVATION PLUS SCALING
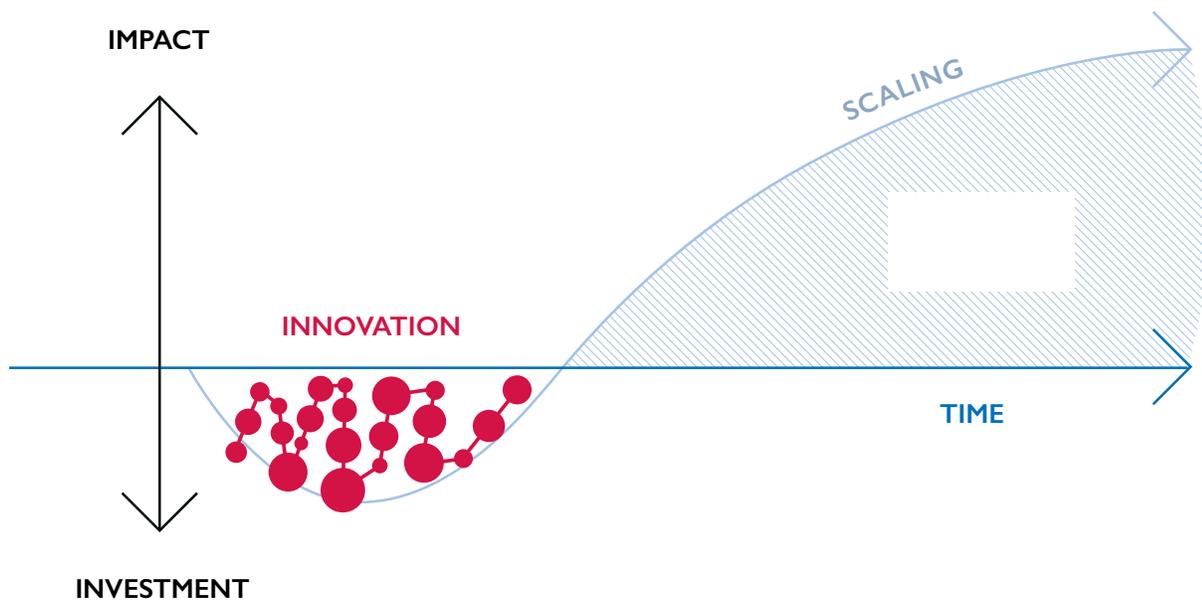
Source: When Innovation Goes Wrong, by Christian Seelos & Johanna Mair in Stanford Social Innovation Review, Fall 2016.

MANY OBSTACLES ON THE ROAD TO SUCCESSFUL SCALING

A transformative innovation requires both a great idea and a robust process for turning that idea into reality. A clinically effective tool for saving newborns or preventing the spread of infectious diseases will have limited impact if it is difficult to use or if health workers do not value it.

Products, services, and/or practices are unlikely to achieve scale without demonstrated health impact, strong demand, and a path to sustainability. How a product or service is designed, what needs it responds to, and how it is introduced into the market are factors that determine whether an innovation will scale for impact. For a fuller description of market launch challenges and tools, see CII's *Idea to Impact series*.

Some innovations supported through USAID's open innovation efforts have stopped development because:

- Innovators did not adequately understand the problems they were trying to solve;
- Innovators were unable to overcome technical hurdles in the development process;
- Products/services were too expensive to be deployed at scale in the context of low- and middle-income countries;
- Products/services were not valued and/or understood by key stakeholders;
- Teams were unable to navigate the transition from academia or being a start-up to forming an organization capable of scaling.

Often, the difference between a successful innovation and a failed attempt is related to an organization's learning process and its ability to adapt to change. The innovations we highlight in this document have undergone a long and iterative process of prototyping, testing, and refining their tools, systems, and delivery models. Successful innovators have created strong teams with diverse skill sets, including operational skills that complement technical ones.

USAID'S OPEN INNOVATION EFFORTS FOR GLOBAL HEALTH

To support the development and scale-up of transformative innovations, USAID has funded numerous open innovation efforts, including Grand Challenges for Development. These initiatives harness the power of crowdsourcing, competition, and partnerships to identify breakthrough innovations around critical health and development problems that require creative solutions.

Through these efforts, USAID and partners have sourced new solutions, tested new ideas, and scaled what works. The innovations highlighted in this Global Health Innovation Index have been supported through four of USAID's open innovation programs or partnerships. See the appendix for descriptions of these open innovation efforts.

Figure 3

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AN ANALYTICAL TOOL FOR ASSESSING PROMISING HEALTH INNOVATIONS

The Global Health Innovation Index is a tool intended to assess global health innovations and identify those with the greatest potential for global health impact — both in the short and long term. The Index examines products, practices, and services, but does not cover drugs or vaccines because of their unique regulatory requirements and pathways to scale.

This tool was created to compare early stage and scaling innovations across the entire USAID and Saving Lives at Birth (SL@B) global health innovation portfolio, irrespective of the health challenge they are addressing.

The Index has two main goals:

1) Provide a versatile tool to evaluate a diverse range of health innovations at every stage of development to assess which ones are the most promising and should be considered for further support — for example, funding, technical assistance, and connections with partners;

2) Highlight some of the most promising near-term innovations to support greater adoption and incorporation in ongoing health programming.

INNOVATION PROFILES

The innovation profiles featured in the Index enable readers to learn from existing products, services, and practices that are already scaling and have the potential to transform the lives of millions of people through global health interventions.

The profiled innovations have all demonstrated early evidence of strong performance across the index criteria. Some have longer track records and/or more rigorous evidence of performance, while others are in an earlier stage of development. All featured innovations are strong candidates for further scaling, but do not represent the only successful health-related innovations supported through USAID's open innovation efforts.

INNOVATION INDEX TOOL

The analytical tools presented in this Index present one approach that can be used by donors, implementers, and innovators alike to assess a wide range of global health innovations. This can be used to evaluate everything from an algorithm that identifies mosquito species, to a novel practice for caring for newborns.

When it comes to scoring global health innovations using this tool, we recommend that evaluators employ a range of techniques to avoid subjectivity. This can include establishing a roster of internal and external evaluators that have been trained on applying these criteria and that are responsible for conducting the evaluations. In addition, evaluators should consider doing these evaluations on a recurring basis, for instance, quarterly, to ensure they have the most accurate and up-to date assessments.

Figure 4

The tool uses four core criteria to evaluate the most promising innovations

CORE QUESTIONS	HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE	CORE QUESTIONS
	Does this innovation improve health outcomes relative to the status quo? Does it relate to an important driver of morbidity or mortality?	Are health workers and other stakeholders willing to use this innovation and able to do so affordably? Is there a sustainable way to pay for the innovation?	Can this organization and/or their partners reliably produce and distribute this innovation at scale?	Has this innovation cleared regulatory and technology hurdles to scale? Has it proven ability to scale successfully?	

Across each criteria, innovations will be scored red/yellow/green and will be light or dark based on the quality of available evidence

KEY:	EARLY STAGE	STRONG EARLY EVIDENCE	MEDIUM QUALITY EARLY EVIDENCE	POOR EARLY EVIDENCE	NO EVIDENCE AVAILABLE
	SCALING	PROVEN POSITIVE EVIDENCE	MIXED OR INCONCLUSIVE EVIDENCE	EVIDENCE OF NO OR POOR IMPACT	

FOUR CRITERIA TO EVALUATE PROMISING INNOVATIONS

More details about how to evaluate innovations against the criteria are in the Appendix.
Please see below for a brief description of the aim of each criterion.

HEALTH IMPACT

Health impact is the most critical criteria. If an innovation does not significantly improve health outcomes or achieve similar health outcomes at a lower cost, it is likely not worth scaling. Health impact is measured with epidemiological indicators such as morbidity and mortality rates but can also be measured with intermediate indicators. Successful innovators demonstrate health impact on the ground with rigorous evidence, though early evidence of impact may be shown in more controlled settings (e.g., in a lab).

USAID encourages innovators and program managers to ask numerous questions when using this criterion, including: "Does this innovation improve health outcomes relative to the status quo?" and "Does it relate to an important driver of morbidity or mortality?" Simply put, the new concept must address a real health need for the people it is meant to support. In addition, we recommend the evaluators consider reviewing the projected social rate of return formula as laid out in Michael Kremer's analysis.[2]

DEMAND AND SUSTAINABILITY

If end-users and key stakeholders (e.g., those responsible for making procurement decisions) do not believe an innovation has value or find it too difficult or expensive to use, it will not scale. Market research and/or human centered design—an iterative approach to problem solving that embeds the user perspective throughout the process—can help innovators understand whether or not health workers and other stakeholders will be willing to use and/or endorse the proposed innovation.

Affordability and willingness to pay for an innovation should always be considered when evaluating whether or not it has the potential to scale. Whether it is a product or a new way of providing care, it cannot be too expensive for the context in which it is meant to scale. In addition, there must be someone, whether the government, private individuals, or donors, who will pay for the innovation on an ongoing basis.

2. https://scholar.harvard.edu/files/kremer/files/sror_div_19.12.13.pdf

ORGANIZATIONAL AND/OR PARTNER CAPACITY

Scaling a global health innovation requires strong organizational capacity to navigate the many challenges that will arise: technical, strategic, financial and operational among others. As an innovation begins to scale, the innovators will need to decide whether to develop these capabilities in-house, find a strategic partner to help, or pursue acquisition by an organization that has the required capabilities. For more information on these options, see CII's *Pathways to Scale* report.

Throughout the scaling process, innovators and strategic partners will need to manage many relationships in order to be successful. These may include funders, local manufacturers, distributors, government ministries, and non-governmental organizations (NGOs). The ability to successfully build partnerships is a critical component of organizational capacity.

PROGRESSION TO SCALE

Innovations that have demonstrated impact at scale (e.g., at the national or state level) are much more likely to be ready to scale further and to be translated to new contexts, than innovations that have demonstrated impact only in lab settings or through pilots.

On the pathway to scale, there are many regulatory, technical, and policy hurdles to overcome. Innovations that have already achieved some degree of scaling have already cleared some key hurdles, and thus likely have the capacity to overcome more. For early-stage innovations, one might ask, "How difficult will the regulatory path for this innovation be?" or "How challenging are the technical requirements to develop this innovation?"

GLOBAL HEALTH INNOVATIONS WITH THE POTENTIAL TO BE GAME CHANGERS

The innovations included in this Index demonstrate strong early evidence or proven results across all four index criteria. Even though they do not represent the only high-potential health innovations funded by USAID, they are a subset that stands out after our analysis.

Donors can support promising innovations to achieve scale in a variety of ways. They can directly fund the scale-up or further development of a promising innovation. In addition, donors can leverage their convening power to encourage partners to integrate a promising innovation into a development program, or help connect innovators with other potential donors, investors or business partners. Donors and partners may also encourage national governments to consider adding an innovation to a recommended list of medical devices and/or guidelines. Furthermore, since most innovations must be adapted to a given context, in-country donors and partners can also provide technical assistance to adapt the innovation to local needs, and help innovators navigate regulatory requirements to effectively scale the innovation.

The innovations presented in figure 5 address critical needs in the global health sector. They can help strengthen health systems, lower maternal and infant mortality rates, prevent diseases, inform health policy, and enable health workers to do their jobs better and save even more lives. They are potential game changers that can help countries achieve global health goals by 2030.

When introducing any innovation, local context and appropriateness must be considered. How a tool is implemented can often determine its impact as much as the tool itself. Introducing innovative tools or approaches will often require aligning stakeholders — including health workers, health system managers, and funders — around a set of shared goals.

Everyone has a role to play when it comes to maximizing the impact of promising health innovations like the ones featured in this document. Alongside USAID, private investors, other bilateral donors, implementing partners, global health experts, and innovators can all invest time, money, or knowledge in innovations that can save or improve millions of lives.

Figure 5

PROMISING HEALTH INNOVATIONS

BEMPU HEALTH TEMP WATCH: PREVENTING HYPOTHERMIA IN LOW BIRTH WEIGHT BABIES
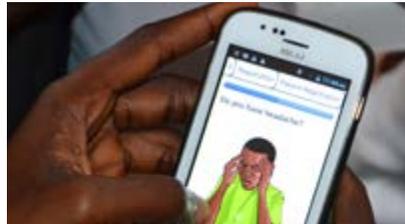
DIMAGI: TECH TOOLS FOR HEALTH WORKERS

DRIPASSIST: A SIMPLE TOOL FOR SAFE IV INFUSIONS

GRADIAN HEALTH SYSTEMS: ANESTHESIA TECHNOLOGY THAT DOESN'T REQUIRE ELECTRICITY

KEHEALA: BEHAVIORAL SCIENCE BASED TREATMENT SUPPORT PROGRAM

LIVING GOODS: PERFORMANCE DRIVEN MODEL FOR DELIVERING LOW COST CARE AND MEDICINES

MUSO AND PROCCM: PROACTIVE, WELL SUPPORTED COMMUNITY HEALTH SYSTEMS

PREMISE: REAL TIME DATA FOR HEALTH WORKERS AND POLICY MAKERS

WORLD MOSQUITO PROGRAM: USING WOLBACHIA TO PREVENT DISEASE TRANSMISSION

BEMPU HEALTH TEMP WATCH: PREVENTING HYPOTHERMIA IN LOW BIRTH WEIGHT BABIES

Despite significant progress, more than 14,000 children and 830 women still die every day from preventable causes. BEMPU Health offers several innovative life-saving health products for children in low-resource areas. These simple devices—which can be used at home, with community health workers, or in health clinics—offer enormous potential to lower both maternal and child mortality rates.

One of BEMPU's life-saving products is the TempWatch, a device that monitors a baby's temperature and alerts caretakers with an alarm when the baby's temperature drops to levels that can lead to hypothermia. With support from the Saving Lives at Birth Grand Challenge, BEMPU was able to generate evidence of its impact on newborn mortality. It has since been scaling its TempWatch by selling the device in public and private markets. BEMPU is also continuing to test its effectiveness in low- and middle-income countries where newborn health is a major concern.

TempWatch has proven to be over 95 percent accurate in predicting hypothermia risk in newborns. Because the device is small and portable, it can be used at home by parents, thus empowering families to monitor the health of their children. Most importantly, the device is easy to use and does not require caretakers to be literate.

While standard thermometers require parents to take their baby's temperature at regular intervals, TempWatch enables parents to simply monitor a baby's temperature remotely and around the clock, including at night. The device is currently a single-use product that costs $15 to produce. BEMPU aims to reduce the cost for the single-use product to $10, while also working to make a device that can be reused up to 10 times at a price between $20 and $25.

TempWatch was designed with parents, caretakers, and physicians in mind and is easy to use. To inform the conceptualization and design of their low-cost products, BEMPU innovators asked hundreds of physicians operating in low-resource settings what they considered to be the most pressing health issues for newborns and mothers and what requirements they would have in a solution. The company is using a private sector model with public partnerships to sustainably develop and sell products for maternal and child health in low- and middle-income countries.
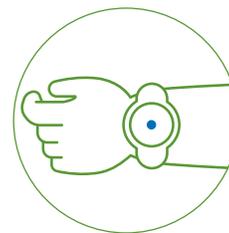
HOW THE TEMPWATCH WORKS
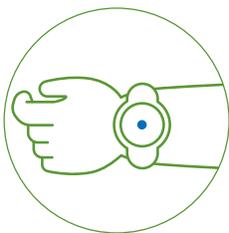
The TempWatch flashes a blue light when the baby is at a normal temperature.

The TempWatch flashes an orange light and alarms when the baby is hypothermic.

The caretaker warms the baby by providing kangaroo care.

Once the temperature returns to normal, the TempWatch flashes a blue light again.

SCALING AND NEXT STEPS

BEMPU has sold 16,000 TempWatches to date, primarily through purchases made by UNICEF. Devices are being used in Papua New Guinea, Zimbabwe, Cameroon, Benin, Guinea Bissau and Bangladesh, among other countries. In India, BEMPU is prioritizing scale up of TempWatch at the state and district levels with funds available to local health departments. The company is also building strong sales teams, connecting to partners with robust distribution networks, generating clinical evidence on behavioral patterns around TempWatch, and continuing to build a strong tech platform.

To accelerate scale up, BEMPU will require additional impact assessments for TempWatch. These assessments help the company demonstrate the need for this innovation and better navigate the regulatory environments in the countries where it aims to deploy it. In addition, direct funding will be needed to either procure more TempWatches for new countries and/or support technical refinements to the tool. BEMPU's technical improvements to both reduce cost and make the device reusable will also contribute to further scale up.

While scaling TempWatch, BEMPU has forged partnerships with the Bill and Melinda Gates Foundation, Grand Challenges Canada, the Korea International Cooperation Agency, the Norwegian Agency for Development Cooperation, DFID, Echoing Green, Siemens, and Villgro, an Indian company that invests in early stage business ventures.

The company is also in the process of developing six other life saving products for monitoring maternal and child health. These include the KangaSling or Kangaroo Care, a well designed and safe pouch for carrying babies that allows for skin to skin contact between parents and their infants; BabyOnTrack, a phone based service that connects parents with expert clinicians for care related questions; and the ApneBoot, a novel detection and stimulation device that helps resolve neonatal apnea before it becomes a life threatening condition.

TEMPWATCH
PHOTO: BEMPUHEALTH

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GLOBAL HEALTH INNOVATION INDEX SNAPSHOT: TEMPWATCH BY BEMPU HEALTH

A snapshot assessment against the 4 core Index criteria
(Statements below are based on data from BEMPU and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
STRONG EARLY EVIDENCE	STRONG EARLY EVIDENCE	STRONG EARLY EVIDENCE	STRONG EARLY EVIDENCE
• Nearly half of all newborn deaths are linked to hypothermia • TempWatch is more than 95% accurate in predicting hypothermia in newborns • The use of TempWatch resulted in 8% lower child mortality rates and higher compliance to Kangaroo care • Tempwatch use has positively impacted parental behaviors and newborn weight • 22 million newborns worldwide are born underweight, and 2.5 million newborns die in their first month of life	• TempWatch was developed through a human-centered design process • TempWatch currently costs $15 to produce, but BEMPU is re-designing TempWatch to reduce cost and make it reusable • TempWatch is recommended by numerous leading hospitals	• Supported by many bilateral donors, foundations, and private sector partners • Multiple advisory boards guide the development and scale of TempWatch • TempWatch meets UNICEF's manufacturing requirements • Company will require new partnerships and/or further support to scale production	• The innovation has protected more than 16,000 newborns in 26 countries • The company is developing additional products to enhance mother and child health • TIME magazine featured TempWatch as one of the top 25 innovations of 2017

INTERESTED IN SCALING BEMPU'S TEMPWATCH?

WHO CAN USE THIS INNOVATION? Anyone supporting or running a program caring for pre-term babies

HOW MUCH IS IT? Current price is just over $20 per TempWatch. Later this year, Bempu will launch two new TempWatches – one that costs $10 and is single-use; one that is reusable for $20-25

HOW DO I BUY THIS? TempWatches are available through the UNICEF product catalog

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DIMAGI: TECH TOOLS FOR HEALTH WORKERS

Thanks to the greater availability of low-cost smartphones, it is now possible to equip frontline health workers (FLWs) with innovative tools to support their performance.

Dimagi is a company that builds technology for social impact. Their flagship technology is CommCare, a powerful mobile data collection and decision support platform for FLWs. This innovation helps improve service delivery and transforms the way health data is collected and used. Health workers who are equipped with the CommCare platform can track patients' health data over time, enhance their capacity to deliver personalized care and input data while offline. Program managers and government officials can also make informed decisions based on the health data collected and the needs identified.

In 2011, USAID's Development Innovation Ventures (DIV) supported Dimagi in scaling up CommCare for community health workers in India through a network of 11 local organizations. This was when Dimagi first started to achieve scale with the CommCare platform. From 2012 to 2014, DIV provided additional support for scaling CommCare. Since then, the platform has been used in many different USAID-supported programs around the world, with a wide range of implementing partners. Dimagi was also supported through the Saving Lives at Birth (SL@B) partnership and USAID's Combating Zika and Future Threats Grand Challenge.

Many studies have demonstrated CommCare's strong positive impact on health systems and health outcomes. For example, the use of this digital platform, and its many applications has helped programs dramatically increase facility-based deliveries, expand the use of modern contraceptives, reduce the time required to train health workers, and improve data quality and timeliness.

As with any tool, CommCare will only deliver positive impact if it is effectively integrated into programs. Stakeholders need to align on the goals of using CommCare and how it will support management of FLWs before the tool is introduced.

REAL-TIME DATA IMPROVES HEALTH CARE DELIVERY AND STRENGTHENS HEALTH SYSTEMS
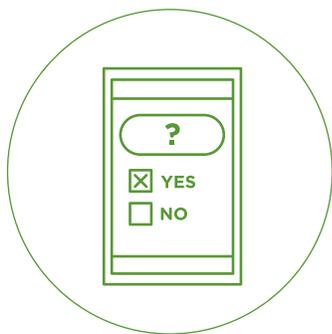
National programs design tools for FLWs on the CommCare platform.

FLWs use CommCare, e.g., to document a mother's pregnancy and provide guidance before and after a child's birth.

Managers use the data captured by the CommCare app to identify trends, inform improvements, and provide support to FLWs.

SCALING AND NEXT STEPS

CommCare is used across sectors in 80 countries. In low income countries, CommCare is the most widely used digital tool for frontline health workers. Globally, there are already hundreds of millions of people reached through the platform. It is actively used by over 450,000 FLWs, with the goal of scaling to 1.4 million FLWs in the coming years. This is a testament to the platform's credibility and versatility. In India, Prime Minister Narendra Modi announced a nutrition initiative in 2018 that will scale a digital platform based on CommCare nationally. The initiative will focus on reducing malnutrition by having FLWs do outreach, education, and follow up with families.

Dimagi is a for profit social enterprise. Though it has achieved scale, their business model is challenged by the project based nature of funding. It is challenging to find funding to invest in improving their digital platforms to increase programmatic impact. Achieving the full potential of digital tools like Dimagi's may require re thinking the way global health funders reward value and the achievement of improved outcomes and cost savings. In the current context, further programmatic funding and grants for investment in product development will be needed to continue to scale.

COMMCARE
PHOTO: DIMAGI

GLOBAL HEALTH INNOVATION INDEX SNAPSHOT: DIMAGI'S COMMCARE

A snapshot assessment against the 4 core Index criteria
(Statements below are based on data from Dimagi and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
PROVEN POSITIVE EVIDENCE	**PROVEN POSITIVE EVIDENCE**	**PROVEN POSITIVE EVIDENCE**	**PROVEN POSITIVE EVIDENCE**
• In Tanzania, there were 32% more facility births in an intervention group that used CommCare vs. the control group • In India, pregnant women monitored with CommCare app had more antenatal care visits • The use of CommCare in Guatemala led to lower infant mortality rates (1.3% vs. 2.5%) • Health workers using CommCare in India were more knowledgeable and self-confident	• The use of CommCare has been shown to be cost-effective in several studies • In India, CommCare significantly improved worker performance and offset costs to implement • In South Africa, CommCare reduced health workers' training costs by 75% • CommCare is most cost-effective when introduced at scale due to fixed program management costs	• The Dimagi CommCare App has been used at scale for over 15 years through programs in more than 50 countries • The Dimagi team has continually evolved and improved the CommCare app • Dimagi has partnered with a broad range of donors, implementers, and private sector partners	• App users submitted over 1 million forms per month in over 50 countries in 2019 • CommCare has many partnerships with renowned implementing organizations • The app is already reaching 1 in 50 malnourished children and 1 in 110 births • In 2018, India launched a national nutrition initiative in 7 states powered by CommCare that will reach 9.5 million people and engage 100,000 health workers

INTERESTED IN SCALING DIMAGI'S COMMCARE?

WHO CAN USE THIS INNOVATION? Anyone supporting or running a frontline health worker program can fund or adopt Dimagi's CommCare tool. Dimagi also offers numerous other tools for different uses. Use of these tools requires at least intermittent cellular data coverage.

HOW MUCH IS IT? The cost of ownership for CommCare was $93 per community health worker per year in a representative program, though costs will vary based on program needs.

HOW DO I BUY THIS? Go to dimagi.com for more information

DRIPASSIST: A SIMPLE TOOL FOR SAFE IV INFUSIONS

Many procedures and treatments delivered in hospitals require administering medication or fluid to patients intravenously. Whether for treatment of severe malaria, oxytocin for pregnant women, chemotherapy, or anesthesia for surgery, IVs are critical medical tools. In hospitals with limited resources, there is a high risk that medications and fluids given intravenously will be dosed incorrectly, leading to significant risks for patients. For example, in the case of malaria treatment, dosing too fast can lead to kidney failure, and dosing too slowly can lead to less effective treatment. Globally, an estimated 10 million unmonitored IV infusions are performed each day.

With support from the Fighting Ebola Grand Challenge, Shift Labs developed a technology called the DripAssist Infusion Rate Monitor that allows health workers to manage and monitor IV infusion rates without expensive, difficult-to-use infusion pumps. The usual alternative to using a pump is to rely on a gravity drip where nurses count and monitor drops of medication to achieve and maintain an accurate dosing rate. This process is proven to be inaccurate and time-consuming. DripAssist enables gravity infusion to be used safely and effectively without counting drops. This tool both reduces the burden on health workers and improves the safety and efficacy of treatments given intravenously. It can be used for any type of medical treatment requiring intravenous medication delivery.

DripAssist is extremely easy to use, requiring only five minutes of training for health workers. It is also small and highly portable, and runs on one AA battery. DripAssist does not require any calibration and maintenance which gives it extended durability once deployed. The device was designed so that it does not require a change in clinical protocols, but rather simplifies and improves the way existing protocols are delivered by eliminating the need to calculate medication dosage rates and count drops.

DripAssist can help reduce set-up time from ten minutes to less than one minute for a monitored infusion. DripAssist currently costs $250 to procure, and the Shift Labs team is working to further reduce this price. IV infusion pumps, by contrast, cost around $3000, and require extensive training, ongoing maintenance, reliable access to power, and replacement parts.
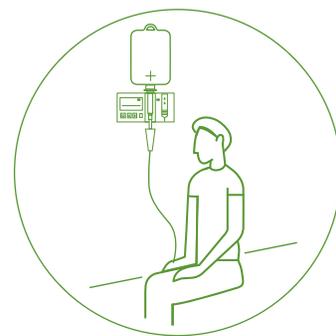
HOW THE IV INFUSION MONITOR DELIVERS SAFE AND RELIABLE DOSING
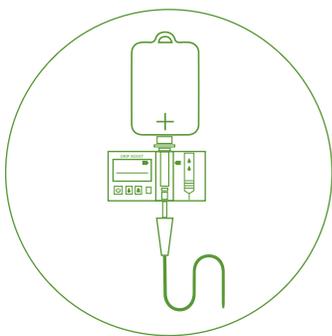
The DripAssist device connects to an existing gravity IV infusion system
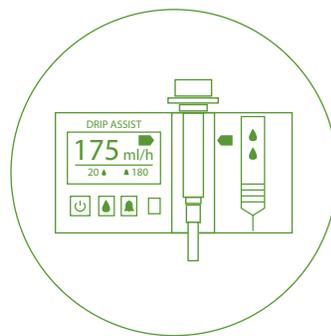
Health worker sets the required drip rate for the medicine or fluid

DripAssist ensures the medicine is dosed at the appropriate rate and for the appropriate time duration

SCALING AND NEXT STEPS

DripAssist monitors are currently in use in hospitals in Haiti, Zimbabwe, Kenya, Afghanistan, Uganda, Niger, Zambia, and the DRC, among many others. The US Military uses DripAssist in field hospitals in many different contexts. DripAssist has been used successfully for treatment of Ebola, malaria, cancer, post partum hemorrhage, iron deficiency, and numerous other conditions.

To scale further, Shift Labs requires new customers to procure and use the DripAssist device. This could include hospitals, programs supporting hospitals to upgrade their facilities, programs operating field hospitals, nursing schools, and/or programs introducing new commodities requiring IV infusions (e.g., cancer treatment programs)

PHOTO: DRIPASSIST

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GLOBAL HEALTH INNOVATION INDEX SNAPSHOT: DRIPASSIST

A snapshot assessment against the 4 core Index criteria
(Statements below are based on data from Shift Labs and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
PROVEN POSITIVE EVIDENCE	**PROVEN POSITIVE EVIDENCE**	**PROVEN POSITIVE EVIDENCE**	**STRONG EARLY EVIDENCE**
• DripAssist is an FDA-cleared and CE marked IV infusion monitor • Correct dosing of IV infusions has been demonstrated to reduce the risk of overdosing during IV infusion, which can lead to kidney failure, congestive heart failure and other serious complications • DripAssist lowers the risk of under-dosing, which reduces treatment efficacy	• DripAssist costs $250 with no ongoing costs; its expected useful life is at least two years. Infusion pumps cost ~$3000 • Health workers in many low-resource contexts have successfully introduced DripAssist and report that it simplifies the process of delivering IV infusions	• Shift Labs has successfully developed partnerships with the US Military, US home care services, and numerous major global health organizations • Shift Labs has raised about $2M from investors • Shift Labs is ISO 13485:2016 certified	• Thousands of DripAssist monitors are currently in use globally • DripAssist monitors are in use in over ten countries • DripAssist has cleared manufacturing and regulatory hurdles and is ready to scale further

INTERESTED IN SCALING DRIPASSIST?

WHO CAN USE THIS INNOVATION? Anyone supporting or running a program that administers medication or fluid to patients intravenously

HOW MUCH IS IT? DripAssist costs $250 with no ongoing costs

HOW DO I BUY THIS? DripAssist can be purchased at shiftlabs.com or by contacting sales@shiftlabs.com

GRADIAN HEALTH SYSTEMS: ANESTHESIA TECHNOLOGY THAT DOESN'T REQUIRE ELECTRICITY OR OXYGEN

The safe provision of anesthesia and critical care is a central pillar of any health system and an essential offering for surgery, obstetrics, emergency medicine, and other key components of universal healthcare (UHC). Gradian is a nonprofit medical technology company that distributes and sustains world-class surgical and anesthesia equipment throughout sub-Saharan Africa.

Gradian's products – including the Universal Anesthesia Machine (UAM) and the Comprehensive Care Ventilator – enable health facilities to provide safe surgical and critical care in spite of infrastructure constraints. The UAM is the first internationally-certified anesthesia machine that generates its own medical oxygen and is capable of functioning without electricity. Since launching, the UAM has become the anesthesia machine of choice in many low- and middle-income countries due to its ease of use, durability, and relatively low cost of ownership.

Gradian has not only innovated in its product development; it has also developed an end-to-end approach to training and maintenance and a unique business model. When a machine is installed, users receive comprehensive, simulation-based training. Gradian's products are covered through a service and parts warranty, which is carried out through partnerships with distributors based in each of their markets. The company's hybrid business model allows it to earn revenue from selling its products while also accepting grants. Revenue from product sales covers the cost of the machine, a 3-year service
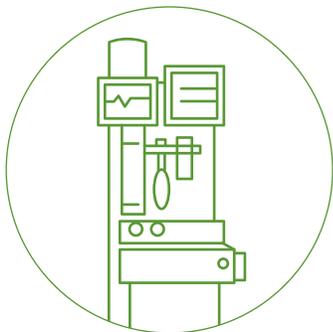

TECHNOLOGY

Gradian develops appropriate technology built to withstand infrastructure challenges in low-resource areas.

TRAINING

Gradian provides on-site or centralized training for all new users in every location it installs a machine. In several countries, Gradian is rolling out their simulation-based training to include a greater focus on clinical skills case-based learning.
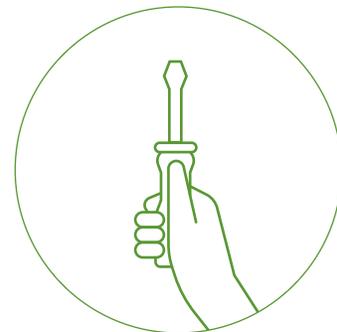
CUSTOMER SERVICE

Gradian sets up distribution and service hubs across East and West Africa to ensure products remain reliable and cost-effective. Gradian offers preventative, on-demand and 24/7 remote support.

and maintenance warranty, and initial user training. Grant funding supports comprehensive simulation-based training for procured products, new product development, and operations.

In Zambia, with support from Saving Lives at Birth (SL@B), Gradian was able to scale the UAM to 32 facilities and enhance their training package for both biomedical technicians and anesthesiologists. SL@B also supported Gradian to engage physicians from Sierra Leone, Zambia and Tanzania to design, formalize and accredit a new, simulation-based UAM training curriculum. The curriculum incorporates key anesthesia and critical care concepts, coaching on core techniques and an intensive set of real-world simulation scenarios.
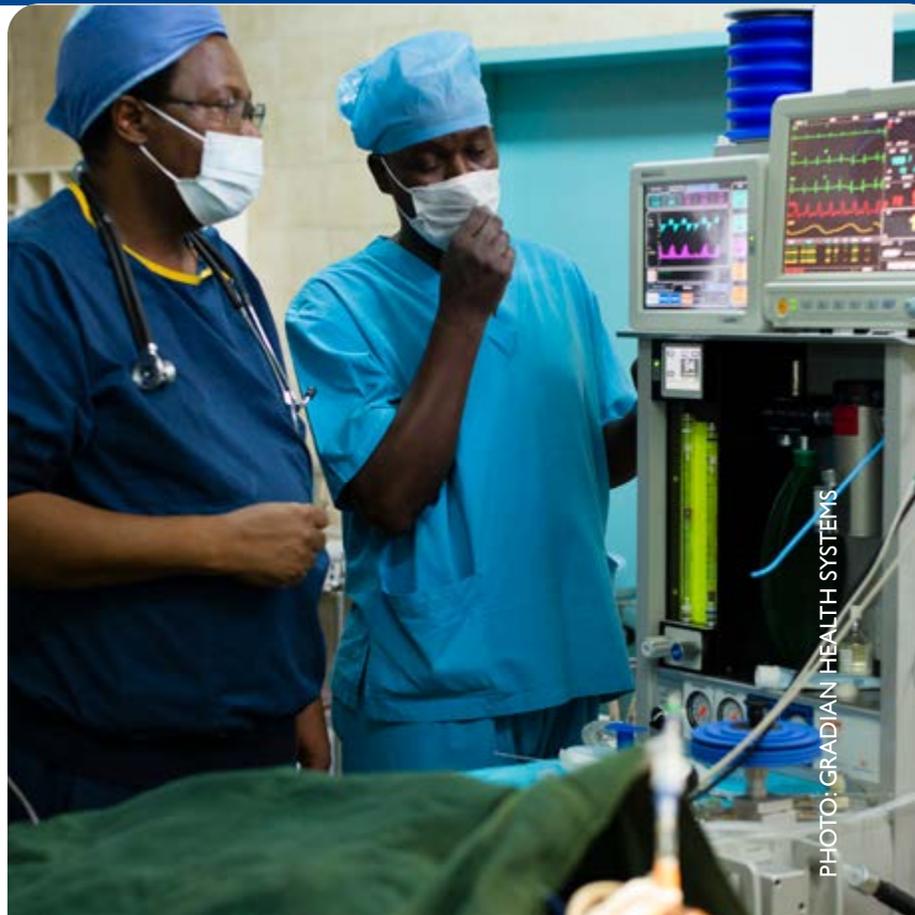

PHOTO: GRADIAN HEALTH SYSTEMS

SCALING AND NEXT STEPS

Since it was first introduced, the UAM has been installed in more than 500 health facilities across nearly 30 countries. In the process of scaling this innovation, Gradian has trained more than 1,000 clinical users on the UAM. To ensure that the product remains operational, reliable, and cost effective, Gradian has set up over ten distribution and service hubs across East and Central Africa that provide preventive maintenance, on demand service visits, and remote support 24/7.

UAM users report very high satisfaction with the technology. A pilot study conducted in Northern Nigeria found no malfunctions and far fewer complications than other forms of general anesthesia, in addition to significant savings on oxygen costs. The same research found that UAM was the preferred method for administering anesthesia to patients. A study that assessed potential failures of the machine concluded that UAM is a reliable and safe anesthesia workstation.

To scale further, Gradian requires partnerships with governments and/or donors to procure and place devices. The company also needs grant funding to continue to support enhanced user training, product development for new products, and operations.

GLOBAL HEALTH INNOVATION INDEX SNAPSHOT: GRADIAN'S UAM ANESTHESIA MACHINE

A snapshot assessment against the 4 core Index criteria
(Statements below are based on data from Gradian and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
PROVEN POSITIVE EVIDENCE	PROVEN POSITIVE EVIDENCE	STRONG EARLY EVIDENCE	PROVEN POSITIVE EVIDENCE
• 5 in 7 people lack access to safe surgery and anesthesia; the UAM has reached nearly 1.2M patients, helping expand access • UAM is CE-certified and designed for use in LMIC settings with infrastructure challenges • UAM is a reliable and safe anesthesia workstation across a range of technical functions	• UAM is the anesthesia machine of choice in many low and middle income countries • In Zambia, more than half of the hospitals do not have 24-hour electricity supply; many LMICs face similar constraints • UAM has demonstrated cost savings upfront and over a lifetime of use	• In 2018, Gradian earned $4M+ in sales revenue • UAM is supported by many bilateral donors, foundations, and private sector partners • Gradian has partnerships with local distributors in all their focus markets as well as regional hubs that provide remote technical support • Gradian was a winner of the Global Financing Facility Innovation-to-Scale initiative	• Nearly 700 UAMs are installed at 500+ hospitals; an additional 100+ have been ordered • More than 1,000 users have been trained on Gradian's products • In 2018, Gradian launched the Comprehensive Care Ventilator, another critical care product

INTERESTED IN SCALING GRADIAN'S PRODUCTS?

WHO CAN USE THIS INNOVATION? Anyone supporting or running a surgical or critical care program

HOW MUCH IS IT? Costs vary based on country; please reach out to info@gradianhealth.org for more information

HOW DO I BUY THIS? Reach out to info@gradianhealth.org

UNIVERSAL ANESTHESIA MACHINE
PHOTO: GRADIAN HEALTH SYSTEMS

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KEHEALA: BEHAVIORAL SCIENCE-BASED TREATMENT SUPPORT PROGRAM

There is an urgent need to improve treatment support and adherence for patients with tuberculosis (TB) and HIV. Poor adherence to treatment can lead to death, disability, or the development of drug resistance, which present risks to both individual and community health. If patients are not treated or if their treatment is interrupted, they can transmit TB to an estimated 10-20 others per year. TB treatment, however, is burdensome, requiring 6-18 months of daily treatment and frequent visits to a health facility. TB patients can also face stigma in their communities.

Keheala, a start-up based in Kenya, developed a digital health platform that can be used with feature phones or smartphones to provide support for patients with TB. Patients enrolled in the treatment adherence program receive text messages and phone calls on a regular basis to encourage them to adhere to the program. These digital reminders, which also include motivational messages, are informed by behavioral science.

Keheala's approach was designed to identify non-adherence among patients quickly and direct them to resources that could help them overcome barriers to treatment. Keheala's program shared messages like, "Taking your pills will help you get better and keep you from infecting family and friends," encouraging patients to focus on the impact their behavior might have on others. Patients also participated in "accountability contests" to help motivate them to continue to take their treatment.

In 2015, USAID's Development Innovation Ventures (DIV) awarded Keheala with a Stage I grant to conduct a randomized control trial (RCT) on its intervention with 1,200 patients. Results from the RCT revealed that Keheala had a positive impact on treatment adherence. Only 4.2 percent of patients in the treatment group had unsuccessful outcomes (loss to follow up, death, or failed treatment), versus 13.1 percent of patients in the control group. This represents a 68 percent reduction in unsuccessful outcomes for patients enrolled in Keheala. All the clinicians involved in the program reported through a survey that if they had a family member with TB, they would want them to be enrolled in Keheala's program. With DIV funding, Keheala is late into an expanded trial with over 16,000 patients in Kenya.

HOW THE KEHEALA MODEL WORKS

After testing positive for TB, patients are enrolled in Keheala's support program

Each day, patients are asked to verify by text message that they have taken their pills. If they do, they are thanked and can earn a spot in the "winners circle" for adherence

Patients who do not respond receive follow up text messages and phone calls. If they continue not to respond, the clinic is informed, triggering further follow ups

Patients enrolled in Keheala's support program had 68% fewer unsuccessful health outcomes – death, failed treatment and loss to follow up – than the standard of care control group.

SCALING AND NEXT STEPS

Keheala is offered at 902 public clinics in eight counties across Kenya and is currently supporting approximately 20 percent of Kenya's annual TB population. The company has launched a new intervention in Zimbabwe for its first customer, UNDP, to address drinking and smoking behaviors amongst TB patients, and work has begun on modifying its intervention for HIV and diabetes care in partnership with a large African telecom. Keheala has also internally piloted a 'differentiated care' product, which predicts a new patient's likelihood of successful treatment six months later with 95 percent accuracy. This tool will help healthcare systems to better focus their limited resources on patients who would benefit most from additional attention.

Keheala is starting a program that will modify its tool to support patients who are HIV positive. The company will be able to draw on many approaches similar to those that were used in their TB program. Keheala can also be used to support treatment adherence for non communicable diseases (NCDs).

To scale further, Keheala will require support to identify TB, HIV, or NCD programs that would be willing to implement and fund their intervention. The intervention is priced between $5 8 per month per patient. Thanks to the program's impact on reducing treatment failure and helping avert new infections, it is estimated that it can save $92 per TB patient supported in Kenya. This figure is based on the cost of second line treatment and diagnostics for patients experiencing treatment failure, as well as the cost of treating new infections.

Keheala is a good fit for any TB, HIV, or NCD program that is seeking to improve treatment adherence. The use of Keheala's digital health platform requires that patients be able to access feature phones or smart phones. It also requires some support from health center staff to enroll patients in the program.
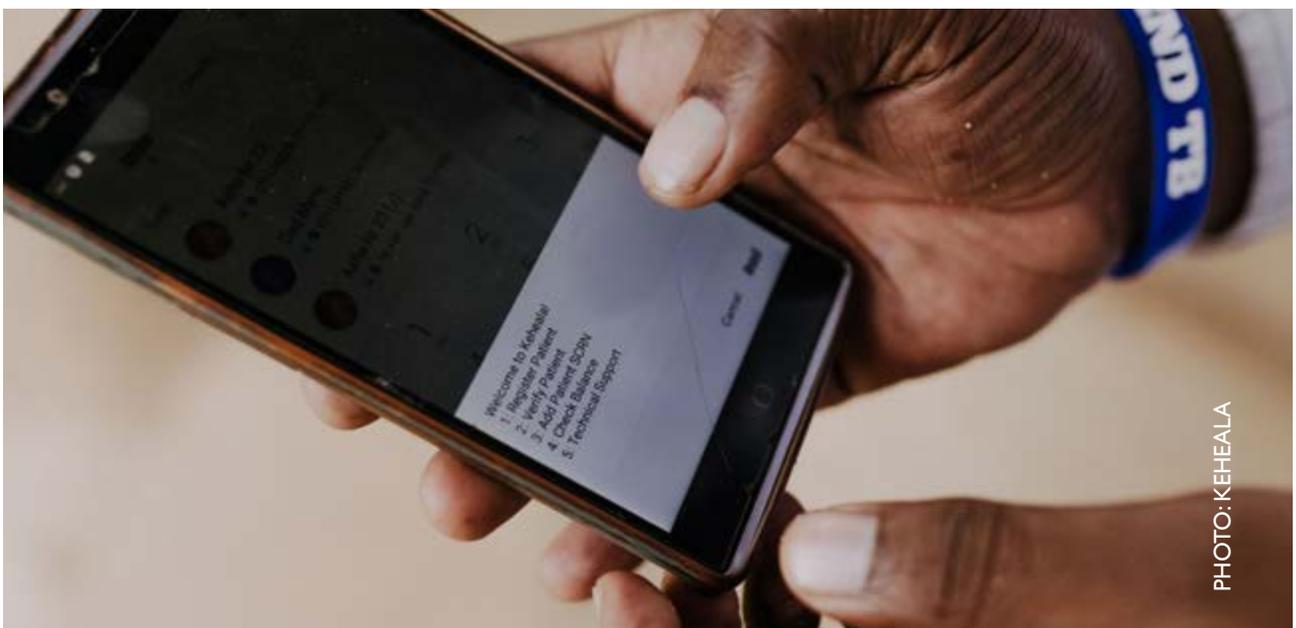

PHOTO: KEHEALA

GLOBAL HEALTH INNOVATION INDEX SNAPSHOT: KEHEALA

A snapshot assessment against the 4 core Index criteria
(Statements below are based on data from Keheala and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
STRONG EARLY EVIDENCE	**STRONG EARLY EVIDENCE**	**STRONG EARLY EVIDENCE**	**STRONG EARLY EVIDENCE**
• Patients enrolled in Keheala's support program had 68 percent fewer unsuccessful health outcomes – death, failed treatment and loss to follow up – than the standard of care control group • Enrolled patients had an estimated 10.5 percent increase in medication consumption	• Intervention demonstrated very high levels of patient and health worker acceptability • Keheala is priced at $5-8 per patient per month; scale and efficiencies will help reduce future costs • Economic analysis estimated Keheala's program reduced health system costs (not including labor) by $92 per patient enrolled	• Keheala has built partnerships with UNDP, the Ministry of Health of Kenya, IFC and others • Keheala has also attracted strategic private investment	• Keheala is currently scaling to cover over 16,000 patients in Kenya • 3,800 TB patients in Zimbabwe are currently enrolled in Keheala's smoking and drinking reduction/cessation program • Keheala's software and systems require minimal modifications to scale further

INTERESTED IN SCALING KEHEALA'S APPROACH?

WHO CAN USE THIS INNOVATION? Any TB, HIV, or NCD program that is seeking to improve patients' treatment adherence. Minimum efficient scale is ~5,000 patients. At least intermittent cellular coverage is required.

HOW MUCH IS IT? Between $5-8 per patient supported per month, depending on the size and type of the program

HOW DO I BUY THIS? Reach out to info@keheala.com for more information

LIVING GOODS:
PERFORMANCE-DRIVEN MODEL FOR DELIVERING LOW-COST CARE AND MEDICINES

In many low-income countries, community health workers (CHWs) are the primary providers of basic health care and referrals to health clinics and hospitals. In these countries, many children under five die of preventable diseases that can be easily treated by CHWs. Investing in the skills of CHWs is essential for saving lives and improving health at the community level. It is thus critical to help them deliver services more effectively.

Living Goods, a nonprofit organization that started in Uganda in 2007, provides quality primary health care to more than seven million people by empowering CHWs with digital technology and business skills. Living Goods trains and supports CHWs to provide health education to families, sell essential health products, and monitor the health of pregnant women and mothers. Living Goods supports CHWs to register every pregnant woman, conduct pre- and post-natal visits, treat sick children, provide family planning counseling, and track immunizations. CHWs earn a margin on product sales and receive performance incentives for providing timely and quality care. In 2016, Living Goods received a USAID DIV award to scale its operations in Kenya. It also received a scaling grant to support work in Uganda from the USAID-Skoll Innovation Investment Alliance in 2017.

Living Goods stands out from other traditional CHW programs because of its performance management culture and use of data. CHWs, field supervisors, and leadership all have clear Key Performance Indicators (KPIs) and know how it is tracking against these. Living Goods' CHWs are provided digital clinical support and guidance using a tool they co-developed with Medic Mobile. The model shows highly promising results; in a randomized controlled trial in Uganda, the program reduced under-five mortality by 27 percent. It is currently testing impact at scale in various countries.
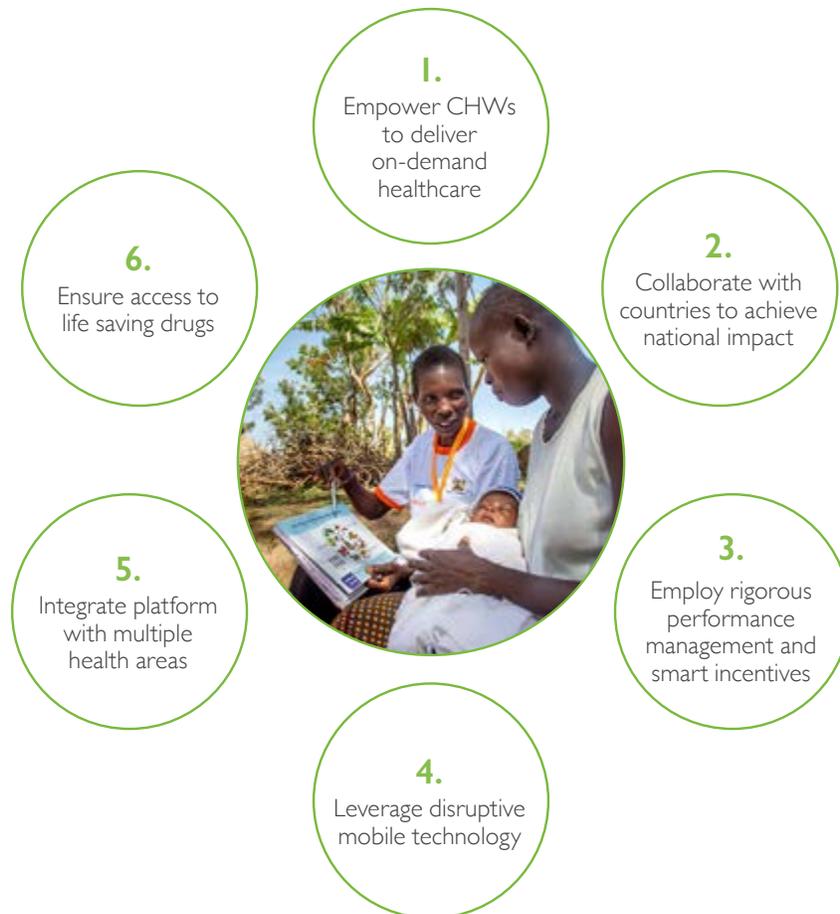
Living Goods is more cost-effective than other similar models. The organization's per capita cost per year of serving over seven million people has averaged about $2.38, which is considerably less than a 2013 World Health Organization estimate from across Africa of $6.86 per capita cost per year.

In addition to running its own programs, Living Goods also provides advisory support to other CHW programs to help improve their results and introduce stronger performance management. Living Goods is piloting a results-based financing mechanism, an instrument that links financing to agreed-upon health outcomes, which has shown positive early results. USAID's DIV is an outcomes funder on the next phase of scale for this innovative financing approach through support to the Global Development Incubator.

SIX CORE ELEMENTS OF THE LIVING GOODS APPROACH

1. Empower CHWs to deliver on-demand healthcare

2. Collaborate with countries to achieve national impact

3. Employ rigorous performance management and smart incentives

4. Leverage disruptive mobile technology

5. Integrate platform with multiple health areas

6. Ensure access to life saving drugs

SCALING AND NEXT STEPS

Living Goods currently supports over 9,000 CHWs in Uganda, Kenya, and Myanmar that reach over seven million people. The organization is currently scoping projects in two to three additional countries in sub Saharan Africa. It has received funding from the Children's Investment Fund Foundation, Bill and Melinda Gates Foundation, UBS Optimus Foundation, Gavi, and Pfizer, among many other donors. At every stage of scale, Living Goods continues to evolve its model, introducing new incentives, adding health areas, and refining it based on rigorous testing.

To scale further, Living Goods needs support to identify opportunities and funding for new CHW programs in more countries, or funding to further evaluate and refine their approach. The organization also needs help to identify existing CHW programs that would benefit from advisory services, perhaps because the programs are not achieving the desired results. Living Goods could provide these programs with technical assistance, further scaling their impact. Living Goods provides a range of technical assistance support – from costing to performance management to policy development – based on the needs of the program they are working with.

GLOBAL HEALTH INNOVATION INDEX SNAPSHOT:
LIVING GOODS ENTREPRENEURIAL MODEL OF CARE

A snapshot assessment against the 4 core Index criteria
(Statements below are based on data from Living Goods and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
PROVEN POSITIVE EVIDENCE	**PROVEN POSITIVE EVIDENCE**	**PROVEN POSITIVE EVIDENCE**	**PROVEN POSITIVE EVIDENCE**
• Reduced under-5 mortality rates by 27% in a 3-year randomized controlled trial • Reduced infant mortality (under 1 year) by 33% • Yielded better outcomes in health knowledge and preventive health behaviors • Another study is underway to measure impact when model operates at scale • In 2017, 5.4M children under 5 years died of largely preventable causes, so need for child health interventions is very high	• Living Goods' model has been demonstrated to be more effective and more cost-effective than standard community health worker models • The per capita cost of delivering this model is $2.38 vs. $6.38 WHO average • The Living Goods approach has had high community acceptance across numerous contexts	• Supported by many bilateral donors, foundations, and private sector partners • Partners with local organizations and national governments • Adopted an innovative financing model with Deerfield Foundation & Instiglio • Partners with renowned research institutions (JPAL, IPA) to measure impact • GiveWell standout charity for reducing child mortality & improving transparency	• Supporting over 9,000 community health workers in Kenya, Uganda, and Myanmar • Serving more than 7M people, with close to 1M children under 5 treated • In 2019, started working directly with a county in Kenya through a co-financing agreement • Scoping potential programs in Sierra Leone, Burkina Faso, and Ethiopia • Beyond own programs, provides consulting support to numerous CHW programs

INTERESTED IN WORKING WITH LIVING GOODS?

WHO CAN USE THIS INNOVATION? Funders can help scale Living Goods' model to new regions. Living Goods also helps other community health programs adopt its secrets to success and improve performance; funders and implementers of community health programs can reach out to Living Goods about this type of support.

HOW MUCH IS IT? The Living Goods community health model annual cost per person supported is $2.38. Costs for support to existing programs will vary.

HOW DO I BUY THIS? Reach out to info@livinggoods.org for more information

MUSO AND PROCCM: PROACTIVE, WELL-SUPPORTED COMMUNITY HEALTH SYSTEMS

Community Health Worker (CHW) programs have huge potential to improve health outcomes, as evidenced by countless successful programs and trials. However, not all programs achieve the desired impact, especially when they scale up regionally or nationally. Learning from best practices in community health worker programs can help ensure these programs truly have impact in improving health outcomes.

Muso uses a model of proactive community case management (ProCCM). CHWs visit families at home a minimum of twice per month to proactively identify sick children, pregnant women, and anyone else requiring health care. This connects patients with care early, improving outcomes. CHWs are trained and given supplies to provide numerous health services in the home — these include family planning, newborn screening, and treatment for children with malaria, diarrhea, and malnutrition. Muso also works with the public healthcare system to remove barriers to patients accessing care at government clinics — removing fees, supporting infrastructure improvements, and training staff.

In a study conducted over seven years of program implementation, the child mortality rate in the study area dropped dramatically. In 2008, under-5 mortality in the study area was 154 per 1000 live births. In 2015, under-5 mortality in the study area was 7 per 1000 live births, a similar level to the child mortality rate seen in the United States. Sites supported by Muso reported a 10x increase in access to care. Muso is currently conducting a randomized controlled trial of the ProCCM intervention in a population of 100,000 in Bankass, Mali across 137 sites.

From 2016-19, Muso received funding from USAID's DIV. DIV's support enabled Muso to reach 350,000 patients in Mali, while pursuing large-scale operational research, including the ProCCM trial, to bring evidence-based, high-impact strategies to scale in policy and practice.

HOW MUSO WORKS

PROACTIVE SEARCH

Community Health Workers and community members search for patients through door-to-door home visits, to connect them with care early. Dedicated supervisors provide 360° supervision to support this process.

DOORSTEP CARE

CHWs provide a package of life-saving health care services in the home. These include family planning, pregnancy testing, newborn screening, and treatment for children with malaria, diarrhea, pneumonia, and malnutrition.

RAPID ACCESS CLINICS

Muso removes point-of-care fees, builds infrastructure, and trains staff so that government clinics can provide universal, early access to care.

SCALING AND NEXT STEPS

In addition to operating and continuing to grow its own programs in Mali, Muso is working with the national government to transform its primary healthcare system. In 2019, Mali's President committed to a national health care reform, which will scale up strategies the Malian government tested with Muso through ProCCM research. This will include deploying paid CHWs for every community in the country, eliminating many user fees for children, pregnant patients, and contraceptives, upgrading primary care facilities, and improving supervision.

Muso has also announced a new technical assistance partnership with the Ministry of Health of Côte d'Ivoire. The Ministry is currently working to build a national community health system, and Muso will support them in building performance management and supervision into the national model.

Muso is also working to support broader scale up of the ProCCM model and other best practices in the delivery of community health programs.

PHOTO: MUSO AND PROCCM

GLOBAL HEALTH INNOVATION INDEX SNAPSHOT: MUSO AND PROCCM

A snapshot assessment against the 4 core Index criteria
(Statements below are based on data from Muso and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
STRONG EARLY EVIDENCE	STRONG EARLY EVIDENCE	STRONG EARLY EVIDENCE	STRONG EARLY EVIDENCE
• Under-5 mortality in the areas supported by Muso dropped from 154 per 1000 live births to 7 per 1000 live births over a 7 year period • Access to care increased by 10x • Early treatment for malaria doubled	• Muso's program costs $6-13 per patient per year, on top of overall system cost of $9 per person per year in Mali's current system • The Ministry of Health of Mali has partnered with Muso to conduct operational research on ProCCM and is now scaling many of the interventions tested together • The ProCCM model can be used to support efforts for universal access to care across multiple disease areas, maternal health, and child survival	• Muso has been successfully scaling its programs in Mali since 2008 • Muso has partnerships with the Ministries of Health of Mali and Côte d'Ivoire	• Muso currently directly supports 350,000 patients in Mali • Through technical assistance partnerships with the Ministries of Health of Mali and Côte d'Ivoire, Muso is supporting national community and primary health care systems, as these two governments aim to serve a total population of 43M

INTERESTED IN SCALING MUSO'S APPROACH?

WHO CAN USE THIS INNOVATION? Any community health program can adopt aspects or the entirety of the ProCCM intervention. Muso is open to providing technical assistance to other implementors and Ministries of Health if Ministries' goals are aligned with ProCCM's approach.

Another tool available to support adoption of this and other best practice innovations is the CHW Assessment and Improvement Matrix (AIM) toolkit, revised in 2018 by USAID, UNICEF, Initiatives Inc. and the Community Health Impact Coalition, of which Muso is a member. The AIM tool can be used by government policy makers, implementers, and funders to assess the design of community health programs. The tool defines practices community health worker programs can use to drive quality and impact. The AIM tool was originally developed in 2011 through the USAID Health Care Improvement Project and was enhanced through this effort.

HOW MUCH IS IT? Cost per patient per year of Muso's program was between $6-13, on top of annual health spending of, e.g., $9 per patient in Mali.

HOW DO I BUY THIS? Reach out to Christian Rusangwa, Director of Technical Assistance for Muso, at crusangwa@musohealth.org

PREMISE: REAL-TIME DATA FOR HEALTH WORKERS AND POLICY MAKERS

In many global health programs, access to reliable information is a challenge. Whether it is data on stock availability, facility readiness, or even mosquito breeding sites, programs are forced to make decisions in the absence of timely and accurate information.

Premise is a data and analytics platform that empowers decision-makers with real-time strategic information and data. The prevalence of smart devices has made it easier than ever to generate real-time data. By combining the power of a global network of on-the-ground contributors with data science and machine learning, Premise can help improve global health programs' ability to deliver services and care and respond to health threats.

Premise stands out from other digital tools because it represents a new method of collecting data rather than processing existing data. As a crowdsourced data technology solution, Premise enables regular citizens to complete data collection tasks on a mobile application. With its network of citizen contributors, Premise has created a flexible and efficient way of generating real-time data. This real-time data can be used with program managers and policy-makers to inform and improve decision-making. The product has evolved through testing and feedback into a highly user-friendly tool for both contributors and data users.

With support from USAID's Combating Zika and Future Threats Grand Challenge, Premise launched pilot programs in three Colombian cities (Cali, Cúcuta, and Santa Marta) with high Zika disease prevalence in 2016, when the Zika outbreak was at its peak. People in many communities helped to identify and control mosquito breeding sites by inputting critical information into a software application installed on their mobile phones.

The outputs and health benefits will depend on the needs of different health areas. For example, in Colombia, the Premise platform enabled vector control programs to maintain a less than five percent prevalence rate of mosquito larvae that carry dengue and Zika, thus reducing the risk of both diseases. During the 2014 Ebola crisis in West Africa, the Premise app received over 90,000 entries on food prices, messaging, and hand washing facilities. This real-time information was used by humanitarian agencies to better respond to the crisis, by directing resources where they were needed most and proactively addressing issues that arose. The impact Premise has on any project will depend on how the tool is used and how the data are integrated into programmatic decision-making.

HOW PREMISE WORKS

| Premise and government authorities create task to crowd-source information. | Citizen and government contributors complete tasks. | The Premise platform captures & validates information. | Premise conducts fraud protection and quality control. | Government authorities analyze real-time data to inform programs. |

SCALING AND NEXT STEPS

Premise has built a network of over 1 million contributors in over 65 countries, and has so far received more than 15 million data submissions. In global health, Premise has been used for vector control and surveillance of infectious diseases, patient compliance with medical treatment plans, market shaping for family planning, malaria products, and routine immunization campaigns. In every health program it is involved in, the company works with local partners who understand both the context and the technology, and thus can serve as an interface between users and Premise. Most recently, USAID funded Premise's entry into Venezuela through the BetterTogether Challenge.

Numerous partners are supporting and using Premise in their programs. These include the Bill and Melinda Gates Foundation, the UN World Food Program, the World Bank, and many governments and civil society organizations. Private sector partners such as Valor Equity Partners, Social + Capital, Google Ventures, and Andreessen Horowitz have also invested in Premise.

To scale further, Premise needs support to identify programs and/or government systems that need stronger data for decision making and can access funding to support this. Financial resources can come from program monitoring and evaluation (M&E) budgets. However, M&E budgets are often designed to be used at the end of programs, while real time data will have the greatest impact if it is used for decision making during the implementation phase. Thus, there is a need for funding models to shift to support monitoring during program delivery.
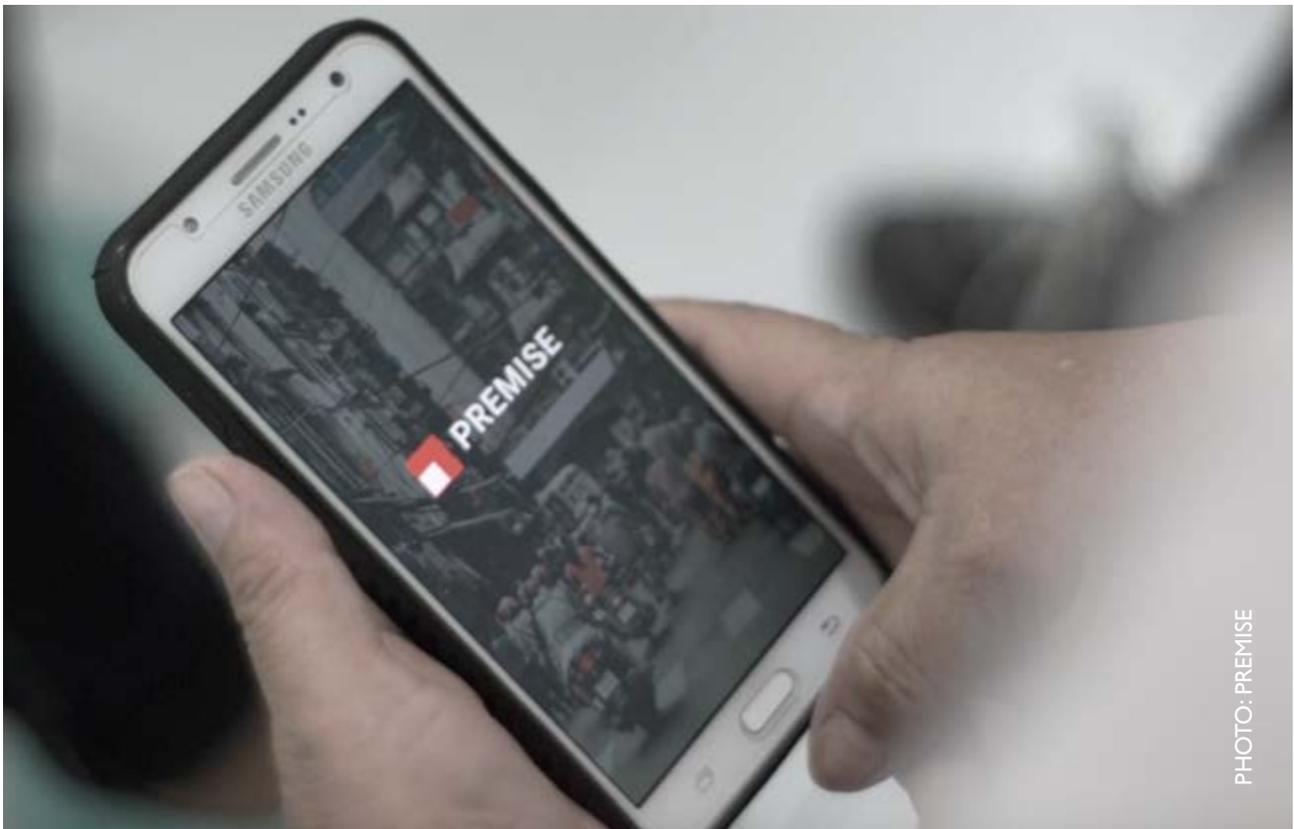

PHOTO: PREMISE

GLOBAL HEALTH INNOVATION INDEX SNAPSHOT:
PREMISE'S CITIZEN-DRIVEN DATA COLLECTION TOOL

A snapshot assessment against the 4 core Index criteria
(All statements below are based on data from Premise and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
STRONG EARLY EVIDENCE	**PROVEN POSITIVE EVIDENCE**	**PROVEN POSITIVE EVIDENCE**	**PROVEN POSITIVE EVIDENCE**
• Supported cities in Colombia to maintain <5% mosquito larvae prevalence rate, an inflection point when infection transmission becomes less likely • In Colombia, use led to high rates of destruction of mosquito breeding sites • Across numerous program types, platform has the ability to generate better data or decision-making in health	• High user-acceptance rates with high quality data generated • The data platform has been extensively tested with various incentives • Ongoing program costs for a representative city would be ~$60,000 per year • The current network of trained data collectors can be used for other health goals	• Premise operates a well-established data platform • It is well-funded and has received over $60M in investments • It has established partnerships with bilateral donors, foundations, and private sector • The city of Cali in Colombia wants to continue the Premise pilot with government funds	• As of mid-2019, Premise has established contributors' networks in over 65 countries • It has worked with about 750,000 contributors and received 15M submissions • The established Premise platform allows for easy implementation and scale-up

INTERESTED IN USING PREMISE?

WHO CAN USE THIS INNOVATION? Anyone supporting or running a program that needs real-time data for programmatic decision-making. Requires availability of at least intermittent cellular data coverage.

HOW MUCH IS IT? Varies based on program. In one representative program, operating costs are $60,000 per major city per year.

HOW DO I BUY THIS? Access through Gavi Annual Grant, a USAID MEL platform contract and/or contact Chris Watson at cwatson@premise.com

WORLD MOSQUITO PROGRAM: USING *WOLBACHIA* TO PREVENT DISEASE TRANSMISSION

Mosquito-borne diseases like malaria, dengue, Zika, and West Nile virus are a threat to millions of people around the world. More than 25 million people, over half of Colombia's population, are at risk of dengue. A number of large-scale outbreaks of mosquito-borne diseases have occurred in recent years, including the 2015-2016 Zika outbreak that the WHO declared a Public Health Emergency of International Concern.

Until now, attempts to combat such diseases have achieved mixed results. However, an innovative method developed by Australian scientists is showing highly promising early results across a range of geographies.

Wolbachia is a type of bacteria that blocks virus transmission from infected insects to humans. It occurs naturally in many insects but not in *Aedes aegypti*, the mosquitoes that carry dengue, Zika, and chikungunya. The World Mosquito Program (WMP) has developed a way to breed *Aedes aegypti* mosquitoes that carry *Wolbachia*. Once *Wolbachia*-carrying mosquitos are released into a community, they breed with wild mosquitoes and pass the bacteria onto their offspring. Over time, the majority of mosquitoes carry *Wolbachia*, greatly reducing the incidences of mosquito-borne diseases being transmitted to humans.

In 2016, when Zika became a public health threat in Brazil and other countries in Central and South America, USAID launched the Combating Zika and Future Threats Grand Challenge. It was through this open innovation effort that the WMP was selected to begin its large-scale pilot deployment of *Wolbachia*-carrying mosquitoes in Colombia.
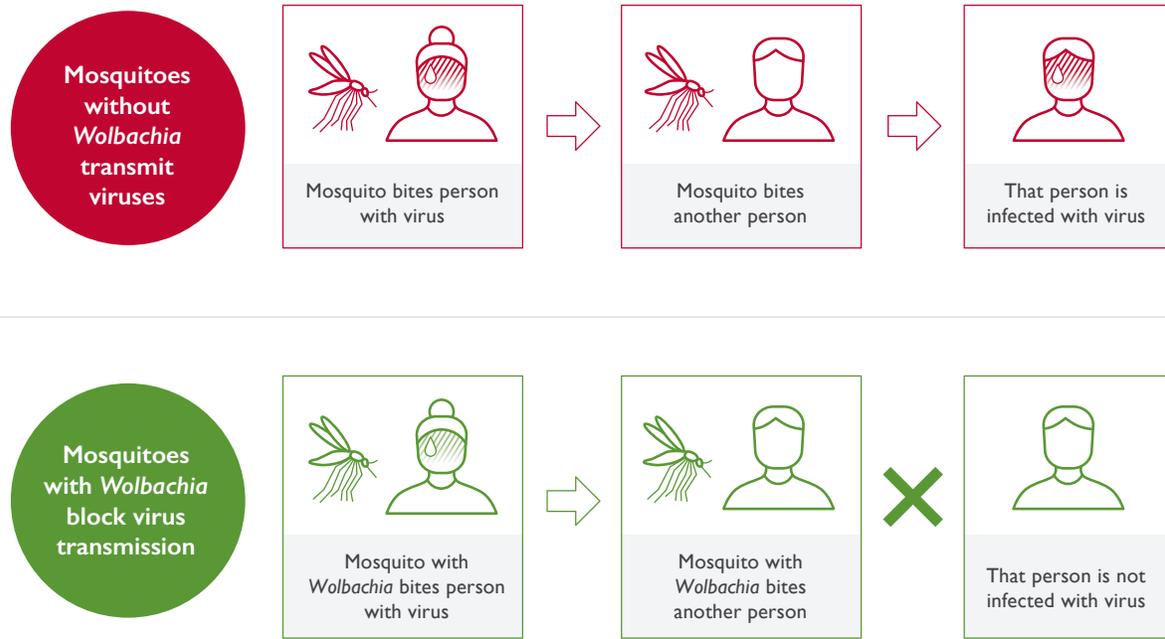
At the end of 2019, WMP completed its deployment of *Wolbachia*-carrying mosquitoes in Medellin, Colombia. Entomological studies conducted to date indicate that breeding has been successful and there is now a high frequency of *Wolbachia*-carrying mosquitoes in the areas where they were released. Epidemiological data is still being generated, but in many of the pilot areas there is very promising evidence of lower incidences of mosquito-borne diseases, especially dengue. Ongoing trials will provide critical data to more clearly measure the impact of WMP's initial programs.

In addition to its groundbreaking innovation in biotechnology, WMP has continuously innovated in its efforts to engage with community and reduce associated costs. It has evolved its strategies to help inform and gain support from people in communities where *Wolbachia* is introduced and have achieved high levels of acceptance. WMP has also developed techniques to reduce the cost of releasing mosquitoes towards their target of $1 per person protected in large, urban settings. By evolving its approach, WMP continues to overcome challenges and establish a pathway to scale and major global impact.

WOLBACHIA-CARRYING MOSQUITOES STOP VIRUS TRANSMISSION TO HUMANS

Mosquitoes without *Wolbachia* transmit viruses

Mosquito bites person with virus → Mosquito bites another person → That person is infected with virus

Mosquitoes with *Wolbachia* block virus transmission

Mosquito with *Wolbachia* bites person with virus → Mosquito with *Wolbachia* bites another person ✕ That person is not infected with virus

SCALING AND NEXT STEPS

Since the establishment of its first project site in northern Australia in 2011, WMP has undergone significant expansion from a small research project to an international not for profit initiative operating in 12 countries. WMP has three regional hubs – an Asia hub in Ho Chi Minh City, Vietnam, an Oceania hub, based at Monash University in Melbourne, Australia, and a Latin America hub in Panama City (scheduled to be opened in early 2020).

WMP is committed to strengthening the capacity and resilience of local communities around the world. Through collaboration and innovation, their global approach can help to protect many thousands of communities from the threat of mosquito borne disease. In addition to USAID, WMP has other important partners that help sustain its global efforts, including Monash University, the Bill and Melinda Gates Foundation, the Wellcome Trust, and other Government international development donors, including Australia and New Zealand.

INNOVATION: WORLD MOSQUITO PROGRAM

A snapshot assessment against the 4 core Index criteria
(Statements below are based on data from WMP and its partners)

HEALTH IMPACT	DEMAND & SUSTAINABILITY	ORGANIZATIONAL AND/OR PARTNER CAPACITY	PROGRESSION TO SCALE
STRONG EARLY EVIDENCE	PROVEN POSITIVE EVIDENCE	PROVEN POSITIVE EVIDENCE	PROVEN POSITIVE EVIDENCE
• Since 2015, more than 500K Zika cases and 1.5M Chikungunya cases have been reported • Dengue infects 360M people on average per year • The World Health Organization recommended in 2016 that the *Wolbachia* method be piloted and monitored • Epidemiological studies have shown dengue incidence is lower in treated communities • The program has achieved high rates of *Wolbachia-*carrying mosquitos in pilot areas • Epidemiological impact studies are ongoing in several locations	• WMP is adapting its approach to achieve a cost per person protected of $1 in large, urban settings; current per person cost in Colombia is $3.50 • Program has achieved high community acceptance and support across its pilot areas • After initial investment, WMP's method is self-sustaining, and the approach requires no behavioral change	• WMP is well-established with 50 staff at HQ and over 500 people working globally • The program has been well-funded for over 10 years (~$50M in support) • The WMP has been funded by USAID, the Gates Foundation, Wellcome Trust and others • Strong track record of programmatic delivery and evolving approaches	• WMP has been deploying since 2011; first deployments were in Australia • WMP currently works in 12 countries and has 3 regional hubs • Within target countries, WMP is expanding to additional cities with government support

INTERESTED IN IMPLEMENTING WORLD MOSQUITO PROGRAM'S APPROACH?

WHO CAN USE THIS INNOVATION? Individuals supporting or managing vector control programs for *Aedes Aegypti* mosquitoes.

HOW MUCH IS IT? The WMP approach currently costs $3.50 per person protected in Colombia, but the team is continuously innovating to lower costs.

HOW DO I BUY THIS? Reach out to contact@worldmosquito.org for more information.

ENACTING THE POTENTIAL OF GLOBAL HEALTH INNOVATIONS

Innovations can help countries meet critical health targets and save lives— but only if they scale. USAID has supported high-impact health innovations for many years with the goal of finding high-impact, cost-effective solutions to global health challenges. While some of these solutions have reached a moderate level of scale, there is a compelling need to scale them further.

This Global Health Innovation Index invites global health donors, venture philanthropists, partner governments, implementing organizations, and global health innovators to think about health innovations differently and to focus on the path to scale. Large-scale impact is what makes a health innovation truly successful. Saving or improving the lives of *millions* of people, not just a few thousand, is what turns a new idea or approach into a transformational one.

With the Global Health Innovation Index criteria— health impact, demand and sustainability, organizational capacity, and progression to scale—one can better evaluate whether an innovation has high potential or not. Focusing efforts on further developing and scaling the most promising solutions will help achieve the most substantial impact. While more progress is needed to find new solutions to problems, the global health community, private sector, and partners should not neglect the need to scale existing solutions.

Different actors have different roles to play in supporting innovations to scale, from funding to technical assistance to adoption. By working together, national governments, donors and other key partners can more effectively scale innovations for impact, helping accelerate progress toward critical health goals.

PHOTO: USAID

SCALING UP PROMISING INNOVATIONS:
EVERYONE HAS A ROLE TO PLAY

	NATIONAL GOVERNMENTS	DONORS	INVESTORS	IMPLEMENTORS	EXPERTS
Fund and/or invest in scale-up of innovations	X	X	X	X	
Fund and/or invest in further refinement of the innovation	X	X	X		
Encourage partners to adopt the innovation in programs	X	X			X
Adopt the innovation in ongoing programs	X			X	
Provide technical assistance, e.g., understand the country context and how to adapt the innovation to meet local needs		X		X	X
Use convening power to add the innovation to a country's medical devices list and/or other guidelines	X	X		X	X
Support innovators to navigate the regulatory pathway	X	X		X	
Connect the innovator to donors, investors, and other partners (e.g., distributors, providers of complementary services)	X	X	X	X	X
Learn from other promising innovators which factors contribute to success	X	X	X	X	X

APPENDIX

Every two minutes a woman dies in childbirth. Saving Lives at Birth (SL@B) calls on the brightest minds across the globe to identify and scale groundbreaking approaches to save the lives of mothers and newborns in poor, hard-to-reach communities. SL@B partners — USAID, the Norwegian Agency for Development Cooperation, the Bill & Melinda Gates, Grand Challenges Canada, UK's Department for International Development, and the Korea International Cooperation Agency — have already committed nearly $100 million to support the scale up of innovative tools and approaches to save the lives of mothers and newborns. To date, SL@B has leveraged more than $150 million in additional money and funded 120 promising innovations. Innovators work in partnerships that foster creative and sustainable solutions that span science and technology, service delivery, and demand creation.

FIGHTING EBOLA:
A GRAND CHALLENGE FOR DEVELOPMENT

Launched during the first major Ebola outbreak in West Africa in 2014, the Fighting Ebola Grand Challenge addressed barriers faced by health care workers combating the epidemic and aimed to prepare the world for future disease outbreaks. In an overwhelming global response, Fighting Ebola received over 1,500 ideas, which underwent a rigorous review process. The award nominees fell under six categories: increasing the protection and comfort of health care workers and patients, improved health care worker tools, decontaminants, rapidly deployable care settings, behavior change incentives, and health information technology solutions. USAID and partners ultimately selected 14 top innovations that addressed a broad range of gaps in the Ebola response.

COMBATING ZIKA
AND FUTURE THREATS
A GRAND CHALLENGE FOR DEVELOPMENT

On February 1, 2016, the World Health Organization (WHO) declared the Zika virus as an international public health emergency. The virus, spread primarily through mosquito bites, is linked to serious birth defects in the babies of mothers who were infected while pregnant.

To stop the spread of Zika and prevent other infectious disease outbreaks, USAID launched Combating Zika and Future Threats: A Grand Challenge for Development. In just nine weeks, USAID received nearly 900 submissions from across the globe. In the end, 26 potentially game changing solutions that cut across vector control, personal and household protection, vector and disease surveillance, diagnostics, and community engagement were selected for funding for accelerated development, testing and deployment.

DEVELOPMENT INNOVATION VENTURES

Development Innovation Ventures (DIV), housed within the U.S. Global Development Lab, is USAID's open innovation program that helps test and scale creative solutions to any global development challenge,including global health. DIV's funding model, which is inspired by venture capital funds, bridges the innovation funding gap by providing tiered grant funding of up to $5 million early seed funding to test new ideas, take strategic risks, build evidence of what works, and advance the best solutions. DIV funds innovations that are evidence-based, cost effective, and scalable. DIV-funded innovations cover new technologies, new ways of delivering or financing goods and services, cost-effective adaptations to existing solutions, new ways of scaling proven solutions, policy changes, shifts or nudges based on behavioral economics research, and social or behavioral innovations. Since its launch in 2010, DIV has awarded over $130 million through over 200 grants across 46 countries. Innovations related to the health and the water, sanitation and hygiene sectors represent about 35 percent of the entire USAID DIV portfolio.

CRITERIA FOR EVALUATING PROMISING
HEALTH INNOVATIONS

HEALTH IMPACT	• What is the quality of the evidence that the innovation will contribute to improved health outcomes? Can include, e.g.,:
	  – Epidemiological data (e.g., 20% reduced mortality among deliveries using a particular intervention)
	  – Clinical data
	  – Entomological data (e.g., 70% reduction in insect landings for a vector-borne disease)
	  – Intermediate outcome data (e.g., 50% improvement in data quality)
	• Does the innovation address a major cause of mortality or morbidity?
	• Does the innovation contribute to capacity strengthening of intermediaries?
	Note: This should be quantified as specifically as possible, e.g., in terms of potential number of lives saved or morbidity averted

DEMAND & SUSTAINABILITY	• What is the quality of the evidence to suggest that health workers, patients, and/or other stakeholders will be willing to use this innovation and be able to do so sustainably? Includes:
	  – End-user demand
	  – Decision-maker demand and stakeholder acceptability
	  – Cost-effectiveness and willingness to pay
	  – Market size
	Note: This assessment should draw on sales/usage data wherever possible and may be supplemented by survey data. For early-stage innovations, would be based on market size, early evidence of demand, and value proposition relative to other products

ORGANIZATIONAL AND/OR PARTNER CAPACITY	• What is the evidence of the organization's and/or their partners' capacity and ability in:
	  – Strategic planning
	  – Production
	  – Sales, marketing, and distribution
	• What is the organization's level of financial resourcing and stability?
	Note: This assessment should draw on evidence of operational effectiveness – e.g., on-time deliveries, service quality at scale – if possible. Qualitative assessments of strategic planning and operational effectiveness should also support the assessment

PROGRESSION TO SCALE	• To what extent has this innovation already scaled?
	• What is the innovation's readiness to scale, in terms of:
	  – Technology readiness (i.e., is the product/service ready to be deployed?)
	  – Regulatory status (has the innovation cleared regulatory hurdles required for scale?)
	  – Readiness for adoption into existing country systems
	• For early stage innovations:
	  – How clear and straightforward is the pathway to scale?
	  – How strong is the organization's strategic planning to prepare for scale?
	Note: This assessment should quantify the scale where possible and include available evidence of the readiness to scale

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