Annual Report 2022

20 years of saving lives

Pictured: COVID-19 mobile diagnostic unit camp in Tamilnadu, India. Photo credit Karthikeyan.
Pictured on front cover: Alice Chibeka, teacher at Chitulika primary school in Mpika, Zambia. Photo credit Brian Otieno.

Contents

Message from the CEO 4
Our Beliefs 6
Our History 8
Where We Work 10
Our Guiding Principles 12
CHAI Retrospective 14

Infectious Diseases 19
- COVID-19 20
- Oxygen 22
- Hepatitis 24
- HIV/AIDS 26
- Malaria & Neglected Tropical Diseases 30
- Tuberculosis 34

Women and Children's Health 37
- Diarrhea 38
- Pneumonia 40
- Maternal and Newborn Health 42
- Nutrition 44
- Reproductive Health 46
- Vaccines 48

Universal Health Coverage 51
- Health Financing 52
- Health Workforce 54

Non-communicable Diseases 57
- Cancer 58
- Cervical Cancer 60
- Diabetes, Hypertension, and Sickle Cell Disease 62

Cross-cutting Experts 65
- Assistive Technology 66
- Digital Health 68
- Diagnostics 70
- Global Markets 70
- Global Health Sciences 71

Financials 74
Acknowledgments 76
Our Leadership Team 77
Board of Directors 77

Abhishek Tupe 39
Attila Yaman 67
Christina Bradley 29
Mpumelelo Ndlela 33
Olajumoke Adekeye 41

MESSAGE FROM THE CEO

Dr. Neil Buddy Shah

CHAI CEO

CHAI was founded at the height of the AIDS crisis on the belief that no one, no matter where they live, should die because they could not access HIV treatment. Since then, our work has grown beyond HIV to address the biggest drivers of mortality and morbidity globally.

We started by partnering with governments in Africa and the Caribbean to bring down the price of drugs and increase access to diagnostics and treatment. This has made it possible for 22 million people in low- and middle-income countries to receive the same best-in-class medicines as those in high-income ones. You can learn more about our founding story on page 14.

Over time we quickly broadened efforts to support many other government health priorities across Latin America, Southeast Asia, India, and Africa, including infectious and non-communicable diseases, women and children's health, and health system strengthening.

Our mission is at the heart of everything we do—to save lives and improve health outcomes.

Governments lead the solutions, and CHAI works at their invitation to drive change across the entire health ecosystem, from global price negotiations to national health system planning to operational planning. We do this through the roles CHAI is uniquely positioned to play: as a market shaper, driving down the price of drugs; a trusted government partner, helping to build strong health policies; and an operational partner, turning those policies into action; culminating in our role as ecosystem catalyst, in which we reimage what is possible to have an outsized impact.

Today, CHAI builds off an incredibly strong foundation.

In the coming year, we look forward to launching an updated five-year strategy that will help us deliver on our vision for a world in which everyone is able to live a healthy and fulfilling life.

Sandra Nahloun and Josephine Tiepa, healthcare providers in Chilonga, Zambia. Photo credit Brian Otieno.

OUR BELIEFS

CHAI's vision is a world in which everyone is able to live a healthy and fulfilling life.

Our mission is to save lives and improve health outcomes in low- and middle-income countries by enabling the government and private sector to strengthen and sustain quality health systems.

We have developed a culture of values that drive our mission:

- We are a mission-driven organization.
- We work in cooperation with and at the service of partner governments.
- We work with urgency.
- We operate based on trust and transparency.
- We foster diversity, equity, and inclusion.
- We have an entrepreneurial and action-oriented culture.
- We operate with humility.
- We recognize that our staff is our greatest asset.
- We are frugal.

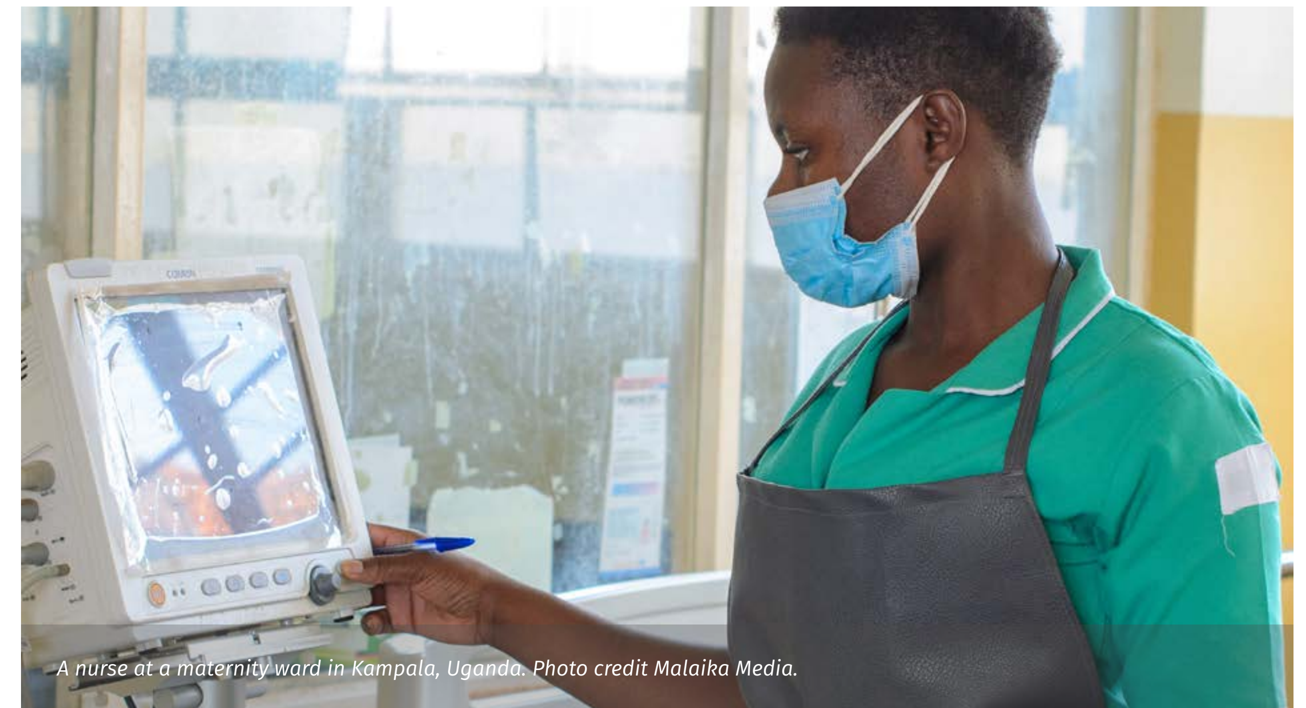
Children hold mosquito nets provided to target populations as part of a national long-lasting insecticidal nets (LLINs) campaign in Guna Yala, Panama. Photo credit Lay Ling Him.

OUR HISTORY

CHAI was founded in 2002 to help save the lives of millions of people living with HIV/AIDS in low- and-middle income countries.

- **2002-2003: Introduced HIV drugs in low- and middle-income countries with CHAI's 60% price reduction.** 60+ countries in Africa and the Caribbean access treatment for the first time as a result of the deal.
- **2009: Delivered US$1B savings for South African government with HIV and TB price cuts.** Partnership dramatically scaled up clients accessing care and treatment as CHAI began expanding into new health areas beyond HIV.
- **2010: Supported development of innovative subsidy mechanism to get ~300M anti-malarials to patients.** Increased access to best-in-class artemisinin combination therapy in eight countries.
- **2011: Averted childhood deaths and saved US$950M with price deals for routine vaccines.** Lowered price of rotavirus vaccine by 67% and pentavalent vaccine by 50%.
- **2012: Created market for long-acting reversible contraceptive implants in low- and middle-income countries with 50% price cut.**
- **2013: Prevented 75,000+ deaths with expansion of life-saving childhood diarrhea treatment of zinc and oral rehydration salts (ORS) in five high-burden partner countries.**
- **2014: Supported Liberia's Ebola rapid response to contain the epidemic.** Led case management and health worker training, serving as critical link between international emergency response and Liberian government.
- **2016: Reduced maternal and newborn deaths by >35% in three Nigerian states with program focused on the 48 hours around delivery.**
- **2016: Created market for hepatitis C treatment in seven countries with 71-95% cost reduction for originator treatments.** Significantly expanded access in 2023 for WHO-prequalified products with >90% reduction for HCV treatment from two generic suppliers and reduced price for hepatitis B treatment to under US$3 per month.
- **2017: Increased access to cancer medications, including chemotherapies, in six high-burden countries in Africa.** Expanded program in 2019 across Africa and Asia with 20+ additional medications.
- **2017: Introduced affordable single-pill DTG-based HIV regimen with landmark TLD deal, making best-in-class optimal medication available in low- and middle-income countries.**
- **2017: Paved way for millions in savings with launch of MedAccess credit facility for healthcare access deals.** Leverages US$200M paid-in capital to negotiate agreements for medical innovations in low- and middle-income countries.
- **2019: More than doubled number of doctors per population with close of Rwanda's flagship health workforce program.** More broadly, CHAI has significantly expanded trained health workforces in 16 countries and provided strategic and operational support to governments to mobilize over US$170M in resources to train and deploy health workers.
- **2020: Achieved fastest-ever generic pediatric HIV drug approval and launch.**
- **2020-2022: Rapidly scaled COVID-19 pandemic response in partner countries with strategic and operational support.** CHAI quickly secured and deployed donations of antigen test kits to 15+ high-burden countries, supported national oxygen strategies in 17 countries, and more.
- **2022: Partnered with governments to screen over 1M women in 10 countries for cervical cancer.** More than 80% of women receive appropriate treatment across the program, with half of partner countries exceeding 90% treatment coverage among women who screened positive for pre-cancerous lesions.
- **2022: Significantly expanded health insurance in Ethiopia.** Scaled community-based health insurance coverage from 10M to 45M+ beneficiaries, including the most vulnerable who now receive fully subsidized coverage.
- **2022: Dramatically reduced cost of HIV treatment over 20 years.** CHAI's pioneering work negotiating price reductions and generic licenses, together with critical efforts from partners like the United States President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund to Fight AIDS, Tuberculosis, and Malaria, reduced cost of HIV treatment from US$10,000 per person per year in the early 2000s to under US$50 in 2022.

**None of these milestones would have been possible without the leadership of governments, communities with lived experience, support from our donors and the partnership of global and local civil society organizations and multilaterals.*



A nurse at a maternity ward in Kampala, Uganda. Photo credit Malaika Media.

WHERE WE WORK

CHAI is deeply grounded in the countries we work.

CHAI was founded in 2002 with a transformational goal: help save the lives of millions of people living with HIV/AIDS. Today, along with HIV, we work with governments and partners to prevent and treat other deadly infectious diseases, accelerate the rollout of lifesaving vaccines, reduce maternal, infant and child mortality, make assistive technology available to those who need it, and strengthen health systems.

With each new program, our mission remains the same: to save lives and improve health outcomes in the regions in which CHAI works to strengthen and sustain quality healthcare systems. Our strategy is rooted in sustainability, which means governments lead the solutions and programs are designed to scale nationally with tactics that can be replicated in other countries. CHAI is deeply grounded in the countries we work, with 85 percent of employees based in program countries.

37 countries where CHAI operated out of an office location

39 countries where CHAI had programmatic engagement

125+ countries have access to CHAI-negotiated deals on medications, diagnostics, vaccines, and other health tools

85% of CHAI employees are based in program countries

Countries with programs and a CHAI office

Benin
Burkina Faso
Cambodia
Cameroon
China
Côte d'Ivoire
Dem. Rep. Congo
Eswatini
Ethiopia
Ghana
Guatemala
Haiti
Honduras
India (CHAI affiliate)
Indonesia
Kenya
Lao PDR
Lesotho
Liberia
Malawi
Mali
Mozambique
Myanmar
Nigeria
Panama
Papua New Guinea
Rwanda
Senegal
Sierra Leone
South Africa
Tanzania
Uganda
Vietnam
Zambia
Zimbabwe

Countries with programs only

Angola
Dominican Republic
Ecuador
Namibia

Top: A mother and child in Sebata Hawas, Ethiopia. Photo credit Melinda Stanley.
Bottom-right: Teachers and children at PAUD Inklusif Cerdas preschool in Banyuwangi, Indonesia. Photo credit Achmad Zulkarnain.
Bottom-left: Staff pose with oxygen equipment donated to Hospital Regional de Escuintla in Guatemala. Photo credit CHAI Guatemala team.

OUR GUIDING PRINCIPLES

CHAI has 20 years experience driving transformational impact.

We seek transformation by targeting areas of the global health landscape where current approaches are failing, moving too slowly, or at a scale that leaves too many people dying or suffering needlessly.

We measure that transformation through our four guiding principles:

Degree of Impact

A CHAI program should drive dramatic improvement over current health outcomes.

Scale of Impact

CHAI should maximize the number of individuals whose lives are impacted by a CHAI program by solving a problem at a large regional, national, or global scale.

Breadth of Impact

CHAI should change the way others approach a problem so today's transformation becomes tomorrow's wisdom.

Sustainability of Impact

Any positive impact that CHAI drives should be maintained over time.

A child drinks a preparation of strawberry-flavored pediatric dolutegravir (pDTG) in Lilongwe District, Malawi. Photo credit Luke Tembo.

20 Years of Impact

AIDS was killing millions of people. CHAI was founded to make treatment equitable.

The Clinton HIV/AIDS Initiative (later, the Clinton Health Access Initiative, or CHAI) was co-founded by former US President Bill Clinton and White House business strategy executive Ira Magaziner to help turn the tide on the AIDS crisis. Over the last two decades, CHAI's unique approach has been replicated to address many more health challenges.

Today, almost 2,000 staff support ministries of health in over 30 countries. The organization is led by CEO Dr. Neil Buddy Shah and a senior leadership team that has decades of collective experience tackling health system gaps in Africa, Asia, and the Caribbean.

In the summer of 2002, a handful of volunteers from CHAI stood by a bed in Nassau's main hospital. They were in the Bahamas at the request of the prime minister, to meet AIDS patients and provide them with affordable drugs.

In the bed lay an 11-year-old girl and 12-year-old boy—sharing was common, the patients were filling up every available space. The boy had just had a stroke. The doctors said neither child had long to live.

CHAI managed to get the medicine into the hospital within a few weeks. The Bahamas were already using generic drugs, but they were going through a supplier that marked up the price, limiting what the government could afford to buy. CHAI cut out the middleman and made a deal directly with the manufacturer that dropped the price by 87 percent. In a few months, the kids who did not have long to live were out of hospital and back in school.

At that time there were close to two million AIDS-related deaths globally every year, yet less than 10 percent of people living with HIV were on lifesaving treatment in low- and middle-income countries. Charity groups operating in the Caribbean and Africa provided HIV treatment to patients in their own clinics. While often successful, the efforts could not keep up with the demand presented by the AIDS crisis.

A few months earlier, President Clinton had addressed the International AIDS Conference in Barcelona alongside former South African President Nelson Mandela. In his address, President Clinton pledged, "I will do all I can in the United States and around the world to get more money, more action, and more understanding. And I ask you to hold me accountable for that commitment, and to give me your ideas on what more I can do."

Dr. Denzil Douglas, Prime Minister of Saint Kitts and Nevis immediately took him up on that offer. He told President Clinton in Barcelona, "We don't have a denial problem, we don't have a stigma problem. We have a money and an organizational problem."

President Clinton and Magaziner took a business-minded approach to address the crisis on an international scale. HIV drugs and tests were too expensive to buy in quantities essential for treating the millions of people in need. Their idea was to work on the supply and demand side of the market to ensure the volumes were in place so that manufacturers could provide treatment at lower costs while remaining profitable.

"We were able to break through," says President Clinton. "Because of the essential support of the governments, multilateral organizations, individual donors, and amazingly dedicated NGOs. When we began the effort in 2002, Canada and Ireland, soon joined by other nations, pledged multi-year assistance to African nations. Private donations got us started in the Caribbean. Generic ARV makers agreed to work with us to shift from a high-cost, low-volume, uncertain payment business to a low-cost, high-volume, certain payment one. Soon the prices began to drop dramatically."

The model worked. At the beginning of the 2000s, treating HIV cost over US$10,000 per person per year. CHAI's pioneering work in negotiating price reductions and generic licenses, together with critical efforts from partners like PEPFAR and the Global Fund, has dramatically reduced that to under US$60 per person per year in 2022.

President Nelson Mandela and President Bill Clinton speak at the closing session of the 2002 International AIDS Conference in Barcelona. Photo credit C-SPAN.org.

> *"This lifesaving impact really is the result of support and collaboration within a global network of advocates, governments, and NGOs."*
>
> -President Bill Clinton

Developing the CHAI approach

Later in the summer of 2002, CHAI volunteers were in Rwanda. Another hospital bed, another child. The goal was the same: to negotiate price reductions on antiretroviral (ARV) drugs and make them available to AIDS patients. But the negotiations took almost a year. Magaziner remembers returning to the same hospital bed every couple of months to find a new patient there. By the time the deal went through, all the patients he and his colleagues had met had died.

"It kept coming back to me that if we could have moved faster, we could have saved their lives. It created a real imperative in my mind to move fast in everything we did," says Magaziner.

The organization hired business and public health experts who could help governments maximize the impact of their limited funding, as well as HIV/AIDS specialists, analysts, and other advisors. Staff listened to what governments said they needed, and worked with ministries of health, state, and local leaders, as well as healthcare professionals to set up systems that would function without CHAI's support.

CHAI was also on the ground, particularly in Africa, supporting government efforts to establish treatment protocols—which drugs would be used, which tests would be done—as well as laboratory systems to do the testing, distribution systems to deliver drugs, and care, and training for health workers. CHAI worked with health ministries to set up units, which could measure the impact of the programs and respond as needed.

"CHAI's ambition has always been to drive transformational impact," says Dr. Neil Buddy Shah, who joined the organization as CEO in June 2022. "We look to drive change at each point in this entire value chain—from global price negotiations to national health system planning to operational support."

The organization's strategy means governments lead the solutions and programs are designed to scale

nationally. CHAI has always been deeply grounded in the countries where it works—85 percent of employees are based in program countries and 68 percent are nationals in the countries they are based—to work closely with ministries of health to develop and implement effective systems and provide on-the-ground support.

"They don't do the real job, but they help you to do your job where you have gaps," Dr. Agnes Binagwaho, Rwanda's then-health minister, told the New York Times in 2015.

This model of cooperation is central to CHAI's mission. "We only work in countries at the invitation of the government," says President Clinton. "So this lifesaving impact really is the result of support and collaboration within a global network of advocates, governments, and NGOs."

Applying the approach to new problems

Today, along with HIV, CHAI works with governments, donors, and other partners to apply this same approach to more than a dozen other health areas. Over the last two decades, CHAI has negotiated over 140 global deals, typically lowering the prices of health products by 50 to 90 percent. The organization has also expanded its support to governments in over 30 countries across Africa, Asia, and Latin America to finance and deliver these products and support frontline workers and communities.

"Ultimately, we want to ensure that when a person comes into a health facility, they receive the healthcare they need to stay healthy," says Mphu Ramatlapeng, a former Minister of Health in Lesotho, and current executive vice president at CHAI.

While global health has improved dramatically over the last 20 years, half the world still lacks basic health services. COVID-19 has only exacerbated pressures on health systems, threatening to set back progress.

Here CHAI continues to use its approach to tackle some of the world's most pressing challenges. During the pandemic, the organization partnered with governments as they respond to COVID-19, securing affordable personal protective equipment, rapid tests, and medical oxygen during global shortages, and supporting COVAX to drive more vaccines to low- and middle-income countries.

"CHAI today builds off an incredibly strong foundation," says Shah. "We have 20 years of experience driving large-scale impact; deep and longstanding partnerships with ministries of health; and an incredibly talented, passionate team. Looking forward to our next 20 years, our aspiration is to use this foundation to dramatically reduce preventable deaths and illnesses and improve health outcomes for millions around the world."

"CHAI's ambition has always been to drive transformational impact."

-Dr. Neil Buddy Shah, CHAI CEO

CHAI Burkina Faso team during a retreat.

Health workers discuss the HIV/syphilis dual rapid test in Rivers State, Nigeria. Photo credit Bernard Kalu / MedAccess / Arete.

INFECTIOUS DISEASES

For years, four infectious diseases drove the majority of illness and death worldwide—HIV, hepatitis, tuberculosis and malaria. COVID-19 has now joined these illnesses as one of the deadliest infectious diseases globally. CHAI has built on the expertise of staff and the on-the-ground experience developed with our HIV work to ensure as we partner with governments and the global health community to respond to COVID-19, we continue to address the risks posed by other infectious diseases.

OUR PROGRAMS:

- COVID-19
- Oxygen
- Hepatitis
- HIV/AIDS
- Malaria & Neglected Tropical Diseases
- Tuberculosis

COVID-19

PROGRAM OVERVIEW: While every region has experienced different waves of the COVID-19 pandemic over the last few years, almost every health system and health worker has been strained to their limits at some point. CHAI has partnered with governments to prevent, test, and treat COVID-19 since the beginning of the pandemic.

COUNTRY PRESENCE: Cambodia, Ghana, India, Kenya, Lao PDR, Malawi, Nigeria, Panama, Papua New Guinea, Rwanda, South Africa, Uganda, Vietnam, Zambia, Zimbabwe

KEY DONORS: Donors: Pfizer, Hilton Foundation, Open Society Foundations (for QuickStart Consortium), Unitaid, The Global Fund to Fights AIDS, Tuberculosis, and Malaria

Despite global investments to scale up access to COVID-19 testing and vaccination in 2021, high risk groups such as people who are immunosuppressed, including those living with HIV, diabetes, pregnant, and above 50, are still at elevated risk of hospitalization and death from COVID-19 complications.

Newly developed, highly effective COVID-19 oral antivirals, Pfizer Paxlovid and Merck Legevrio were US FDA emergency use authorized in December 2021 and began to address this problem in high-income countries in early 2022. However, the path to access for low- and middle-income countries was not clear.

Generic licenses were signed in March 2022 for Pfizer Paxlovid to commercialize a generic version of the drug, but uncertainty remained for many countries due to a lack of funding and technical assistance to help roll out test and treat programs. Limited domestic resources were available to procure originator drugs, and there lacked clarity on when generic equivalents would be available and at what price. To address these issues, CHAI and partners leveraged global forums to highlight the need for immediate action and the steps necessary to make these lifesaving therapies available in low- and middle-income countries.

Our collective messaging was that ministries of health in low- and middle-income countries could roll out test and treat models using COVID-19 antigen rapid diagnostic tests (RDTs) and generic oral antivirals if properly supported by global partners. Because these ministries of health are very familiar with rapidly introducing and administering RDTs and oral drugs on a national scale through existing HIV, Tuberculosis (TB) and malaria programs, introducing a similar program for COVID-19 would not be a huge undertaking. This, even with the relatively novel requirement that COVID-19 treatment must be started within five days of symptom onset to reduce the risk of hospitalization and death.

Breadth of Impact

Through the COVID QuickStart Consortium we helped prove the feasibility of implementing COVID-19 test and treat programs in low- and middle-income countries.

CHAI and partners also saw the need to send a clear signal to the global community that low- and middle-income country access to an affordable and stable supply of quality assured generic antivirals could be a reality and prioritized by suppliers if demand materialized through robust test and treat programs.

Together with partners at Duke University and COVID Collaborative, CHAI contributed to the publishing of Pills to People: Accelerating Equitable Global Access to Oral Therapeutics for COVID-19 in March 2022. The publication was followed by increased engagement with leading generic suppliers on prioritization plans for Paxlovid commercialization and a pricing announcement made at the May 2022 White House Summit that would make the generic drug available at under US$25 per treatment course.

Following this announcement, CHAI, Duke University, and COVID Collaborative formed the COVID Treatment QuickStart Consortium to support ministries of health with introduction of oral antivirals. QuickStart secured technical assistance resources to support 10 ministry of health partners on implementation from three sponsors—Pfizer, Hilton Family Foundation, and Open Society Foundations—and a drug donation from Pfizer to act as a bridge to sustainable supply from generics. Co-funding for CHAI's work from Unitaid and the Global Fund to Fight AIDS, Tuberculosis, and Malaria allowed us to intensify and expand our work from Africa to Southeast Asia and Latin America.

By the end of 2022 test and treat programs in **Rwanda** and **Zambia** had begun to initiate high-risk COVID-19 cases on antiviral treatment with the remainder of CHAI's partners ready to kick off introduction in the new year.

Community health workers attending COVID-19 awareness training of the trainers sessions in Johannesburg, South Africa. Photo credit Earl Abrahams.

Degree of Impact

CHAI negotiated a pricing deal with generic manufacturers to make COVID-19 oral therapy available to lower-income countries for under US$25.

Additionally, Hetero's generic equivalent of Pfizer's Paxlovid was WHO-prequalified on an unprecedented timeline less than one year from US FDA Emergency Use Authorization. Prior to the efforts of CHAI and partners, there was widespread skepticism about the feasibility of implementing COVID-19 testing and treatment programs in low- and middle-income countries.

CHAI played a critical role in catalyzing a global response by negotiating a pricing agreement with leading Indian generic firms to make available the oral therapy for under US$25 and creating a sense of hope that these programs could be both affordable and sustainable, despite the economic challenges. Finally, the Global Fund COVID-19 Response Mechanism was extended through 2025 to provide commodity procurement and programming support to low- and middle-income countries. ■

20 Years of Impact

120M

affordable high-quality COVID-19 antigen tests for low- and middle-income countries

300+

suppliers of quality assured personal protective equipment identified for government partner needs

<US$25

per treatment course of generic Paxlovid available to low- and middle-income countries within five months of US FDA emergency use authorization for originator Pfizer's Paxlovid

Oxygen

PROGRAM OVERVIEW: Medical oxygen is a staple of modern medicine. Mothers giving birth, patients undergoing routine surgery, and people suffering from COVID-19 all need it. When the pandemic began, CHAI's prior work in oxygen for childhood pneumonia enabled us to leverage lessons learned for pandemic response. We partnered with governments as they increased access to oxygen to respond to the pandemic.

Over the last year, governments, donors, international organizations, civil society organizations, and the private sector have begun to collaborate as we look beyond COVID-19 toward more resilient health systems for the future.

COUNTRY PRESENCE: Cambodia, Cameroon, Democratic Republic of Congo, Ecuador, Eswatini, Ethiopia, Ghana, Guatemala, India, Indonesia, Kenya, Lao PDR, Lesotho, Liberia, Malawi, Mozambique, Namibia, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Uganda, Zambia, Zimbabwe

KEY DONORS: Unitaid, Bill & Melinda Gates Foundation, ELMA Philanthropies, USAID, FHI360

In 2022, CHAI leveraged recent investments in oxygen as part of the COVID-19 response into longer-term health systems strengthening. Our primary goal was to reduce maternal, child, and overall mortality from hypoxemia-related causes through better access to quality oxygen services at all levels of the healthcare system.

We worked with ministries of health and other organizations to develop robust oxygen policies and guidelines, identify product needs and quantify demand, quickly procure appropriate equipment, and build up health worker capacity to use the equipment.

Upgrading oxygen infrastructure and equipment

Low blood oxygen, or hypoxemia, is a life-threatening complication of a variety of medical conditions and emergencies such as respiratory infection, preterm birth, and childhood illnesses. Hypoxemia is very common, affecting nearly a quarter of sick newborns and more than one in six hospitalized children. Childhood pneumonia alone accounts for nearly nine million hypoxemia cases in low- and middle-income countries.

Oxygen therapy is the only treatment for hypoxemia. Yet, when CHAI started this work, over 90 percent of health facilities in low- and middle-income countries did not have pulse oximeters—simple, handheld devices used to measure blood oxygen levels—and fewer than half had a reliable supply of oxygen. As a result, only 20 percent of patients in need of oxygen were diagnosed and less than half received it.

Today, we have helped governments identify and pursue their best paths toward oxygen systems that are targeted and comprehensive. With CHAI technical support and funding from Unitaid, 48 health facilities in over 20 countries have upgraded their medical oxygen infrastructure and equipment, including power supply, piping network, cylinder manifold, filling ramps, functional pressure swing adsorption (PSA) plants, and bulk liquid oxygen tanks to support the delivery of oxygen.

In **Cambodia**, with funding from donors, including the Global Fund COVID-19 Response Mechanism, CHAI supported the procurement and installation of 42 PSA plants in 2022 alone.

In **Ethiopia**, funding was secured and installations began on 15 PSA plants—once operational, these will increase public oxygen production by 100 percent.

These efforts demonstrated at scale that effective and sustainable oxygen delivery and maintenance systems are achievable with appropriate investments. Increased access to oxygen at facilities that CHAI has supported in **Cambodia** and **Ethiopia** reduced hospitalized pneumonia mortality rates by 50 percent and all-cause under-five mortality rates by 25 percent.

With funding from the Bill & Melinda Gates Foundation and ELMA, we are now expanding programs in **Cambodia**, **Ethiopia**, **India**, **Kenya**, **Lao PDR**, **Liberia**, **Nigeria**, **Rwanda**, and **Uganda** to build oxygen systems that will dramatically reduce hypoxemia-related mortality, particularly for marginalized groups such as women, newborns, and children.

Degree & Breadth of Impact

CHAI and Unitaid helped shape the liquid oxygen market, which encouraged donors to sustain demand, incentivizing further procurements. As a result, more countries have better access to medical oxygen.

Degree & Scale of Impact

Increased access to oxygen at CHAI-supported facilities in Cambodia and Ethiopia reduced hospitalized pneumonia mortality by 50% and all-cause under-5 deaths by 25%.

Throughout 2022, to help governments build more resilient oxygen systems, CHAI also worked to diversify oxygen supply. This will help bring prices down and create long-term competition and responsiveness in markets that have generally been dominated by single suppliers. We identified suppliers who had previously not engaged with the public sector market but who could benefit from access to a broader market share. In many cases, these were smaller companies, with more local or regional presence compared to existing dominant players.

Building an affordable liquid oxygen market

To alleviate supply and demand pressures on PSA plants in low- and middle-income countries, CHAI is working to increase oxygen supply through the liquid oxygen market.

Through USAID funding, and in close partnership with FHI360, we conducted a scoping exercise in early 2022 to identify liquid oxygen market inefficiencies in select countries with the aim of developing viable market-shaping interventions to improve the availability and affordability of liquid oxygen. We are now working with the **Democratic Republic of Congo**, **Eswatini**, **Lesotho**, **Malawi**, **Mozambique**, **Namibia**, **South Africa**, **Tanzania**, and **Zambia** to develop deals with suppliers to lower the price of liquid oxygen, negotiate supply terms, and coordinate regional implementation.

With the support of Unitaid, we are also providing technical assistance to over 20 countries to develop comprehensive oxygen systems with a particular focus on catalytic investment in the liquid oxygen market.

In 2022, we expanded negotiations with private liquid oxygen suppliers on behalf of a consortium of countries to establish affordable liquid oxygen prices and address infrastructure impediments such as lack of bulk tanks, which drive up the cost of liquid oxygen delivery. To ensure sustainability, we helped improve access to spare parts and maintenance services; upgraded facility infrastructure such as piping networks; and strengthened logistics systems to transport oxygen cylinders.

Unitaid's intervention in the liquid oxygen market has encouraged other donors, including USAID via partners such as FHI and Jhpiego, to sustain the virtuous cycle of increased demand, which incentivizes diversified supply via further procurements. As a result, our work continues to expand. In **Cameroon**, **Eswatini**, **Indonesia**, **Ghana**, **Lao PDR**, **Lesotho**, **Malawi**, **Mozambique**, **Zimbabwe**, and **Zambia**, we are working with governments to shape liquid oxygen supply tenders. We also continue to investigate liquid oxygen market opportunities in places like **Sierra Leone** and Central and South America.

In **Ecuador** and **Guatemala**, our program is focused on strengthening technical capacity, including improving hospital infrastructure, training health workers on clinical aspects of oxygen therapy, and training lab technicians to forecast and procure oxygen-related commodities and maintain equipment.

Overall, through Unitaid investments, CHAI and our partners across 17 countries made a significant impact over the last year. We have unlocked 4.3 million Nm3 of oxygen per month—enough to treat an additional 108,000 patients monthly; procured and distributed 15,180 oxygen cylinders; supported the delivery of roughly 109,000 liters of liquid oxygen; catalyzed procurement of 58 bulk tanks, updated critical oxygen guidelines, tools, and performance management systems (in 14 countries); and built healthcare worker and biomedical engineering capacity to use and maintain these new tools and products. ■

20 Years of Impact

17 countries

have launched national strategic plans to increase oxygen access, and several more are being developed

43%

reduction in the price of bulk liquid oxygen and cylinder refills across five countries: Eswatini, Lesotho, Mozambique, Zambia, and Zimbabwe

18,000+

healthcare workers, biomedical engineers, and hospital administrators trained in oxygen therapy, equipment maintenance, and oxygen consumption monitoring

Hepatitis

PROGRAM OVERVIEW: Viral hepatitis—hepatitis C and hepatitis B— affects more than 350 million people worldwide, with 90 percent of infections concentrated in low- and middle-income countries. The disease leads to significant liver damage, liver cancer, liver failure, and even death.

CHAI is committed to eliminating hepatitis C and eliminating vertical transmission of hepatitis B. We support governments to introduce and scale viral hepatitis programs by using a step-by-step approach to build simple test and treat delivery models within existing health delivery infrastructure.

COUNTRY PRESENCE: Cambodia, India, Indonesia, Myanmar, Nigeria, Rwanda, Vietnam

KEY DONORS: UK Foreign, Commonwealth, and Development Office (FCDO), Bill and Melinda Gates Foundation, The Hepatitis Fund

Despite a highly effective and inexpensive cure for hepatitis C, as well as proven harm reduction interventions to prevent hepatitis C among people who use intravenous drugs, 58 million people are infected globally, with only seven percent of those infected receiving treatment.

There are also tools to prevent new infections of hepatitis B, including a cheap and effective vaccine, as well as a separate vaccine for newborns and antiviral prophylaxis for pregnant women to prevent vertical transmission. Yet, over 1.5 million people are infected each year—most of them babies infected at birth. Only a fraction of those in need receive the vaccine as infants or treatment as adults.

Many factors contribute to these gaps, including insufficient financing for hepatitis programs, limited awareness of viral hepatitis, lack of public screening and treatment programs and auxiliary infrastructure, and historically high costs of care.

Mobilizing resources to eliminate viral hepatitis

CHAI has played a critical role in catalyzing elimination efforts by mobilizing domestic and donor resources and successfully advocated for the Global Fund to Fight AIDS, TB, and Malaria to expand its funding policy for viral hepatitis. Under its 2023-2028 strategy, the Global Fund has committed to funding integration of viral hepatitis prevention, diagnosis, and treatment services, where prioritized within country funding requests, to improve health outcomes for people living with HIV and at risk of HIV infection within HIV clinics, sexual and reproductive health services, harm reduction settings, and antenatal care.

In December 2022, CHAI developed a Hepatitis Resource Toolkit—a simple summary of the Global Fund's latest policy scope for hepatitis-related components, plus country examples, a sample work plan, rationale for integrating hepatitis services and an overview of Global Fund's process. This has been widely disseminated to over 30 countries and has reached the hands of those working within ministries of health, implementing organizations, and community organizations and networks, among others. The document standardizes global knowledge around supporting hepatitis programming with Global Fund resources and empowers individuals involved in grant application cycle seven and beyond, to advocate and include funding asks for hepatitis-related components.

In the previous grant application cycle, CHAI partnered with **Cambodia**, **Myanmar**, **Rwanda**, and **Vietnam** to leverage Global Fund resources to strengthen hepatitis programs, which resulted in around US$6 million of funding for addressing hepatitis C among people living with HIV and key populations across the four countries.

Complementing Global Fund resources with its national social health insurance scheme, **Vietnam** initiated 16,000 patients on hepatitis C treatment between 2021 and 2022.

Leveraging CHAI's experience to drive down the cost of treatment

In 2022, CHAI's market shaping activities improved access to viral hepatitis drugs and provided key market intelligence for procuring countries.

Negotiated in 2021 with CHAI support, **Rwanda**'s US$60 per hepatitis C treatment course has become the benchmark for World Health Organization (WHO) pre-qualified direct acting antivirals (DAAs), with countries like Egypt and Pakistan scaling up their efforts off the back of affordable pricing for locally quality assured DAAs.

Breadth of Impact

CHAI published market intelligence on hepatitis B and C diagnostics and treatment commodities, which countries can leverage to drive down the cost of care.

Yet, the majority of low- and middle-income countries continued procuring DAAs at or above US$100, and in some cases, prices reached as high as US$1,000. This price disparity left millions of people without hope, unable to afford the cure they desperately needed.

In July 2022, CHAI published the Hepatitis C Market Memo. The memo covered the latest trends in diagnostics and treatment markets and provided volume and pricing updates on generic DAAs and diagnostics. The report also shed light on emerging markets like self-testing and pediatrics. Following this, in December 2022, CHAI published our first-ever Hepatitis B Market Report, which provides market intelligence for hepatitis B diagnostic and treatment commodities, in addition to summarizing findings from the scoping exercise CHAI undertook to understand variability in the price of Tenofovir (TDF)—the mainstay of both HIV and hepatitis B treatment—accessed by programs across low- and middle-income countries. The report recommended strategies like centralized pooled procurement, competitive bidding, and alternative financing mechanisms that could be used by countries to access TDF therapy at price parity with HIV programs.

Leveraging market intelligence from the Hepatitis C Market Memo, Nasarawa State in **Nigeria**, in partnership with CHAI and the World Hepatitis Alliance, negotiated and reduced the pricing for hepatitis C treatment by 70 percent, achieving the benchmark of US$60 per treatment course. As a result, in Nasarawa state, over 250 treatment courses have been procured and an additional 244 people living with HIV have been initiated on treatment, a 428 percent improvement from the previous year. ■

Program in action:

- **72% increase in reach of Indonesia's hepatitis C program.** In 2022, CHAI partnered with **Indonesia**'s Ministry of Health to scale up its hepatitis C program by 72 percent, delivering services to 31 out of 38 provinces (up from 18 the previous year). CHAI led work on simplifying guidelines, setting referral pathways, launching training modules, and facilitating stakeholder consensus for program expansion. Currently, hepatitis C services are limited to a few health facilities in the new provinces, but the Ministry and CHAI continue to explore expansion opportunities.
- **21K+ patients initiated on hepatitis C treatment in Myanmar.** In **Myanmar**, the country's political crisis disrupted the delivery of hepatitis C health services at 12 hospitals across seven states and regions, paralyzing the entire national data collection system and limiting the ability of central-level staff to monitor and manage the program. CHAI worked with the national program to assess facilities' operational statuses and identify ways to revitalize existing services and expand the treatment program. By the end of the year, five hospitals had fully resumed hepatitis screening and treatment services after receiving refresher trainings. To date, more than 21,000 patients have been initiated on treatment through public programs, public-private partnerships, and NGOs.
- **7.7M people in India screened for hepatitis B and hepatitis C in 2022.** In **India**, CHAI organized training sessions for more than 1,000 health workers, which resulted in a fourfold increase in hospitals equipped to provide hepatitis-related services (a total of 3,300 health facilities). Additionally, CHAI supported key state screening programs that led to five million people being screened for hepatitis B and 2.7 million people for hepatitis C, with 13,000 patients with hepatitis B and 58,000 patients with hepatitis C initiated on treatment.

20 Years of Impact

US$80

the price per cure for hepatitis C, driven by CHAI's work to reduce the cost of treatment by up to 97%

>US$365M

in financing for national hepatitis programs mobilized by CHAI

330,000+

patients on treatment in seven CHAI-supported countries

HIV/AIDS

PROGRAM OVERVIEW: In 2022, an estimated 39 million people were living with HIV, with sub-Saharan Africa accounting for two thirds of all cases. Over 600,000 people died from HIV-related causes, and more than 1.3 million were newly infected.

To control the epidemic, CHAI is focused on catalyzing the rapid development and introduction of optimal HIV products, working in partnership with governments and affected communities to build resilient, sustainable, equitable health systems, and acting on the principle that people—no matter who they are or where they live—are at the center of the HIV response.

COUNTRY PRESENCE: Benin, Botswana, Cambodia, Democratic Republic of Congo, Ethiopia, India, Kenya, Lao PDR, Lesotho, Malawi, Mozambique, Myanmar, Nigeria, Senegal, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe

KEY DONORS: Bill and Melinda Gates Foundation, Unitaid, Children's Investment Fund Foundation (CIFF), ELMA Philanthropies, MedAccess, UK Foreign, Commonwealth and Development Office (FCDO)

Optimizing treatment and service delivery for children living with HIV

Despite remarkable progress over the past two decades, the HIV response has missed key global targets, including targets for reductions in new infections and AIDS-related deaths. In particular, children continue to be left behind. Among the 1.5 million children living with HIV, over 40 percent are not on lifesaving treatment, viral suppression is very low compared to adults, and persistent geographic disparities in access to testing and treatment remain. This leads to 84,000 child deaths from AIDS each year.

To help close this gap, in 2022, CHAI supported national HIV programs in 14 countries to accelerate access to dolutegravir 10mg for children (pDTG), a highly optimal medication recommended by the World Health Organization (WHO). At the global level, CHAI served as the co-chair of the pDTG Task Team for the WHO-led Global Accelerator for Paediatric Formulations (GAP-f), with the goal of coordinating and convening all key global stakeholders to drive forward widespread and rapid introduction of pDTG. By the end of the year, several countries, including **Malawi**, **Nigeria**, and **Uganda** transitioned over 90 percent of eligible children to pDTG. Together GAP-f members achieved this milestone through broad engagement with stakeholders and by driving product development and introduction globally and within countries. For example, in **Nigeria**, Unitaid supported the catalytic procurement and introduction of pDTG, while ELMA's support helped provide the tools to simplify and monitor treatment delivery. As a result, all eligible children were transitioned to pDTG, and viral suppression jumped from 54 percent in 2019 to 90 percent in 2022. Today, over 160,000 children living with HIV in more than 85 countries have transitioned to pDTG with more transitioning daily.

Affordable, optimal treatments like pDTG contribute to major savings for national HIV programs while significantly improving the quality of life for people living with HIV. In most low- and middle-income countries, the annual cost of treatment today is US$41 per adult per year and about $100 per child per year. Nearly 30 million people, including 880,000 children, have access to treatment.

Developing screening, diagnostic, and referral strategies to link clients to care

Increasing access to HIV testing is crucial to ending the epidemic. Self-testing is a proven approach to expand access, especially among underserved groups including young people, men, and those at high risk of infection. However, early self-tests could cost up to five times more than conventional HIV rapid tests used in hospitals and clinics. This made it difficult for governments to afford enough self-tests to meet demand. Despite evidence that blood-based HIV self-tests are often preferred, and understanding the more choice clients have, the more likely they are to get tested, most countries could only afford to use less expensive oral fluid self-tests.

In 2022, CHAI worked with MedAccess to negotiate a volume guarantee agreement with Wondfo Biotech Company, setting the ceiling price of their new WHO-prequalified HIV self-test at US$1 per test. The new price represented a 50 percent decrease over the leading HIV self-test.

In **Nigeria**, CHAI supported the Federal Ministry of Health to pilot distribution of the test through the private sector and community-based channels not previously used. With ELMA's support, we also demonstrated operational feasibility and impact of peer-led distribution of test kits for teenagers to reach clients not previously tested, of which 3.6 percent tested positive. Lessons learned and technical assistance by CHAI and other implementing partners contributed to a 400 percent increase in the number of HIV self-test kits distributed to adolescents from 2020 to 2022, which has significantly expanded access to HIV testing for this population.

Scale of Impact

A two-year pilot in Nigeria drove a 400% increase in HIV self-test kits distributed to adolescents, significantly expanding testing among teens.

With the introduction of an HIV self-test that is nearly the same price as the conventional tests currently being procured by countries, countries can now scale up blood-based self-tests and increase overall procurement.

Prioritizing people, systems, and products to prevent HIV

With 1.3 million new HIV infections in 2022 and only 2.5 million oral pre-exposure prophylaxis (PrEP) users that same year, there was an urgent need to improve access to a range of prevention interventions. To address this, CHAI focused on people, systems, and products to ensure HIV prevention priorities center potential users and national HIV programs have agile and sustainable health systems to reach those most at risk.

In 2022, we continued to partner with community advocates to ensure national and global priorities are determined by those affected by HIV. With support from Unitaid, CHAI collaborated with Afrocab to convene nearly 60 community representatives and advocates to align on advocacy priorities and demand access to long-acting injectable cabotegravir (CAB-LA). As a novel long-acting HIV prevention option, CAB-LA offers users discreet, continuous protection without the burden of daily dosing. Despite initial delays to voluntarily license the product, effective community engagement contributed to securing a voluntary license for CAB-LA, which is a critical first step in ensuring widespread, affordable access in low- and middle-income countries. As the leading edge of a promising pipeline of long-acting products, CAB-LA will also set an important precedent for future of access in long-acting HIV prevention and treatment.

However, CAB-LA's potential will not be achieved without responsive, agile health systems to reach those at risk of acquiring the disease. Moreover, impact at scale for new products like CAB-LA as well as more established interventions will require locally-owned prevention programs that can expand cost-effective delivery models and demand generation and user engagement approaches. To address these critical health system needs, CHAI, funded by the Bill & Melinda Gates Foundation, worked with ministries of health in **Zambia** and **Zimbabwe** to support transition toward integrated, sustainable prevention programming that is responsive to shifting epidemic profiles, dynamic user needs, and fiscal realities.

Community engagement and national ownership remain critical to ensuring the sustainability of national HIV responses. System strengthening efforts will not only help optimize existing interventions, but

A mother picks up pediatric DTG medication for her child at a pharmacy in Zimbabwe. Photo credit Baptist Media.

20 Years of Impact

86%

reduction in the annual cost of HIV treatment since 2002, down from US$295 per adult per year to US$41 today

~28M

people on HIV treatment in low- and middle-income countries in 2022, up from around just 50,000 in sub-Saharan Africa in 2002

57%

of children living with HIV initiated on life-saving treatment as of 2022, up from 7% in 2005

set the foundation for the introduction and scale-up of novel prevention interventions and products, like CAB-LA.

Reducing AIDS-related mortality through global and national partnerships

When we kicked off the CHAI-Unitaid Optimal Advanced HIV Disease (AHD) Initiative in 2019, the AHD landscape was siloed, characterized by competing priorities and disparate approaches to integrating an AHD package of care into national health systems. CHAI and Unitaid understood transforming the market and addressing implementation gaps required a cohesive partnership approach. Over the past five years, the project has focused on renewing a global focus on AHD and accelerating access to life-saving diagnostics and medicines.

Through this partnership, we have unlocked stubborn market barriers and built momentum among donors and other stakeholders to accelerate adoption, implementation, and global prioritization of the AHD package of care. For example, by leveraging our strong relationships with governments, multilaterals, and other civil society organizations, CHAI has established two consortiums to push forward our goals. The AHD Alliance, co-chaired by the WHO and United States Centers for Disease Control and Prevention (US CDC), coordinates implementation of the AHD package of care across partners and donors. The Enhanced Partner Network (EPN) facilitates sustainable access to AHD commodities and generates evidence in new regions to reduce HIV-related deaths.

Under the EPN, CHAI coordinated the implementation of 10 AHD-related projects across seven countries in Asia, Africa, and South America. Each project filled a gap in the AHD landscape, which has informed the scale-up of care, equipped stakeholders with resources to advocate for services, and provided decentralized services for more clients. For example, the EPN collaboration in **Vietnam** resulted in the creation of a Ministry of Health-led AHD Technical Working Group. With Ministry partners involved from the start, the approach is sustainable and fosters collaboration among AHD partners across the country.

CHAI's work on AHD has served as a critical catalyst to the wider adoption and implementation of AHD recommendations across low- and middle-income countries and has been crucial in accelerating progress from global stakeholders, aligning partner organizations, and ensuring patients receive life-saving screening and treatment for deadly opportunistic infections. ■

Breadth of Impact

CHAI leveraged strong relationships with governments, multilaterals, and civil society organizations to create two international consortiums—the AHD Alliance and the Enhanced Partner Network—which accelerated adoption and implementation of the AHD package of care.

Program in action:

- **Differentiated and adolescent-centered approach reaches young people living with HIV in Nigeria.** People between the ages of 15 and 24 make up about 16 percent of the global population—but 27 percent of all new HIV infections. In 2022, there were 350,000 new infections among this group, of which 60 percent were girls. This disparity was further exacerbated in sub-Saharan Africa where 77 percent of new infections among adolescents were among girls. A differentiated and client-centered approach for young people living with HIV and those at risk is urgently needed if we are to improve outcomes, reduce new infections, and end the HIV epidemic.

  To address this problem, in **Uganda** and **Nigeria**, CHAI is engaging adolescents in the design, delivery, and evaluation of adolescent-friendly programs and policies and generating evidence on their needs and preferences to inform optimal service delivery. CHAI has also partnered with ministries of health to create a policy environment that enables adolescent-friendly services. For example, in **Nigeria**, we worked with the Ministry to develop its first-ever National Package of Care for Adolescents and Young People living with HIV through evidence generation and stakeholder engagement, including communities. Between 2021 and 2022, CHAI, in partnership with adolescent champions, operationalized peer-led distribution of HIV self-testing, with 84 percent of those reached being first-time testers, and secured commitments for national scale-up.

stories of impact

Christina Bradley

Senior Operations Manager, Global Malaria

I've always been motivated by ambitious goals, and so, what first caught my eye in the job announcement of country associate was the objective: malaria elimination in Central America. As countries get closer to elimination, the last cases are often in the most difficult to reach communities, making the goal more of a challenge. At the time of the post, I was interested in leaving my corporate job for a role where I could make an impact in people's lives, and as a returned Peace Corps volunteer, my experience living in remote areas made me a strong candidate. Being willing to travel to those communities, understand the barriers that people face in accessing diagnosis, treatment, and prevention tools, and working with the government to overcome those barriers was critical to success in the role.

I arrived in Panama in 2016 expecting to stay for two years at most. Seven years on, I've had the opportunity to grow from associate to program manager, leading a team of talented professionals who work relentlessly to provide support to the Ministry of Health as it strives towards zero malaria cases.

During this time, I've had the immense privilege of working with many Ministry of Health officials to design and implement new programs and systems designed to reach those most affected by the disease. My first project at CHAI was to support a pilot of a community health worker network in Guna Yala, the region that, at the time, reported the most cases. While not a new strategy in the region, this was the first-time community members in Panama were equipped with rapid diagnostic tests that could provide test results within 30 minutes. As soon as the community health workers were trained, people that once needed to travel two hours by boat to a health facility or wait for a periodic visit from a vector control technician, could call someone in their community and get a malaria test the same day they began feeling unwell.

Since then, the CHAI country team has worked side by side with the Ministry of Health to ensure community health workers are placed where they are most needed, and that ministry staff are equipped with the guidance and resources to support these workers. To date, the network has been scaled to over 120 communities across all four endemic regions.

In addition to working with incredible people, what I've most enjoyed about CHAI is the freedom teams have to propose and implement projects as long as they are aligned with the overall goal of elimination. Not only does this mean we can be responsive to the Ministry of Health's needs, but also that we get to support a diverse portfolio of projects. I've been able to support the roll out of new electronic surveillance systems, vector control campaigns, and development of new national guidelines—often within the same month.

I look forward to the day when malaria elimination has been accomplished in the region and we can consider our jobs done. In the meantime, I feel very privileged to work for CHAI and the Ministry of Health towards reaching this historic goal. ■

Malaria & Neglected Tropical Diseases

PROGRAM OVERVIEW: Although effective tools for prevention and treatment of malaria and neglected tropical diseases (NTDs) exist, many governments lack the financial resources to ensure they are available everywhere they are needed. CHAI partners with governments across Africa, the Americas, and Asia to enhance disease surveillance, data-driven responses, and evidence-based management of programs to successfully control and eliminate these diseases.

COUNTRY PRESENCE: Angola, Benin, Burkina Faso, Cambodia, Cameroon, Dominican Republic, DRC, Ethiopia, Guatemala, Haiti, Honduras, India, Kenya, Lao PDR, Mozambique, Myanmar, Namibia, Nigeria, Panama, Papua New Guinea, Senegal, South Africa, Uganda, Vietnam, Zimbabwe

KEY DONORS: Asia Pacific Leaders Malaria Alliance, Bill & Melinda Gates Foundation, Children's Investment Fund Foundation (CIFF), Duke University, UK Foreign, Commonwealth, and Development Office (FCDO), Global Fund, Inter-American Development Bank, Malaria Consortium, PATH, UN Foundation, Unitaid

Enhancing disease intelligence

High-quality surveillance and data systems are vital for providing accurate, timely, and detailed information to target and tailor interventions for eliminating malaria and neglected tropical diseases (NTDs). In 2022, CHAI supported 15 governments to design, develop, and roll out digital information systems for collecting, managing, reporting, and responding to malaria case data and deploy timely, targeted, and effective interventions.

Until recently, many countries including **Panama** used paper-based data collection forms for managing malaria information. Delays and errors in data entry resulted in suboptimal data collection. CHAI worked with the Ministry of Health to create a digital application for managing case information and tracking coverage of bed net distribution campaigns. Data can be entered into the application from the point of distribution, improving data quality and speeding analysis, reporting, and response time at all levels of care. Moreover, the digital information system more easily integrates disease data with data on climate, entomology, and vector control, providing a comprehensive overview of disease trends and causes. In countries including **Burkina Faso** and **Mozambique**, CHAI-supported tools are also enabling better reporting of financial and programmatic data, helping allocate resources for prevention and treatment and managing programs more efficiently.

In many rural high malaria burden regions of the world, people—and the health systems they rely on—remain poorly mapped, making it hard to understand the distribution of diseases or know exactly where service gaps exist. In 2022, CHAI helped nine countries—**Burkina Faso**, **Democratic Republic of Congo** (**DRC**), **Haiti**, **Honduras**, **Lao PDR**, **Mozambique**, **Myanmar**, **Namibia**, and **Panama**—use geospatial data to map points of care and populations at risk. We supported the ministries of health to create health facility and community health worker location databases, determine where, when, and how many staff to deploy for interventions based on demand and geographies, and create standardized lists of names of facilities, localities, and communities to make it easier to analyze data across datasets.

As disease intelligence improved, CHAI worked with governments to apply the data to analyze disease trends, intervention coverage, and program impact to identify successes, bottlenecks, and inform data-driven decision-making. In **Benin**, **Burkina Faso**, **DRC**, **Haiti**, **Lao PDR**, **Mozambique**, **Namibia**, and **Vietnam**, we facilitated interactions between national malaria programs, geographers, and mathematical modelers to analyze what interventions would be most impactful across the country in advance of upcoming applications for the next three-year funding cycle by the Global Fund to Fight AIDS, Tuberculosis, and Malaria—which is the largest funding source for malaria control and elimination activities. The resulting operational stratifications will enable almost a billion dollars in malaria funding to be targeted for maximum impact, which should lead to many more lives saved.

Sustainability of Impact

Malaria programs in Namibia, South Africa, and Zimbabwe continue to use CHAI-developed campaign tracking tools to monitor coverage and consumption of indoor residual spraying.

Expanding access to malaria diagnosis and treatment

An estimated 625,000 people, mostly young children in Africa, still die every year of malaria—even though lifesaving drugs exist. Today, many who become sick with malaria will never be diagnosed or treated appropriately because they cannot access quality case management services, especially in remote, rural communities located many hours from a public health facility. In 2022, CHAI worked to extend access to malaria care to endemic communities underserved by formal health facilities through community health worker networks and the private sector.

Panama, for example, experienced unprecedented malaria increases in 2021 in its indigenous areas where the formal health care system has little reach. Many indigenous communities closed themselves off in 2021 during COVID-19, making it difficult for national authorities to supply malaria commodities, or for health workers to enter and treat malaria patients. CHAI worked to double, to 132, the number of community health workers that can test and treat malaria in remote areas. We also introduced monthly proactive household visits to detect and treat malaria by the community health workers and doubled their monthly incentive payments from US$50 to US$100. CHAI helped procure and distribute additional diagnosis and treatment commodities to make sure the increased demand for such products by health workers could be met. Preliminary data suggests these, and other efforts, are paying off. **Panama** Este, one of the areas that saw huge malaria increases in 2021, recorded a 75 percent drop in cases in Q1 2023 compared to Q1 2022, even as incidence elsewhere continued to rise.

In Kasai and Nord Ubangi provinces in the **DRC**, CHAI analysis identified several remote areas where virtually no community health workers were testing and treating for malaria—despite a high burden of the disease. In close collaboration with local authorities, CHAI recruited and trained 104 community health workers across 42 sites to screen and treat malaria. As a result, about a third of all observed patients were treated for malaria in the highest populated health areas.

However, measuring the impact community health workers have on malaria diagnosis and treatment in remote communities is often difficult because the data is unreliable. Part of our work is helping improve data systems to better capture the impact. In the **DRC**, CHAI supported the design and development of a community health information system that captures data of patients diagnosed and treated by community health workers. In **Burkina Faso**, we worked with the government and other partners to establish a digital registry that tracks whether a community health worker is active and getting paid on time. With better data systems, governments can now routinely track whether patients receive care, identify gaps, and take corrective actions.

20 Years of Impact

95%

fewer annual malaria cases in Cambodia, Lao PDR, and Vietnam since CHAI embedded staff with ministries of health for technical and operational support in 2014

2.6x

increase in confirmatory diagnostic testing for malaria per person across four CHAI-supported Southern African countries since 2014

12 countries

partnered with CHAI since 2015 to build surveillance systems that integrate vector control, demographic, entomological, and other data

In Southeast Asia, CHAI helped improve how patients with Plasmodium vivax malaria are managed. Cure rates for P. vivax malaria are often low because the parasite can remain dormant in patients' liver, unaffected by drugs that treat only the blood state infection. Following CHAI-led pilots in 2021, **Lao PDR** and **Cambodia** adopted and scaled new practices to improve treatment of P. vivax patients nationwide. CHAI trained master trainers on case management best practices who in turn cascaded the lessons to more than 600 health center staff and more than 1,000 community health workers across both countries. We also supported updates to national treatment regimens and new incentive-based approaches to encourage patient referral from rural communities to health facilities. As a result of these efforts, in **Lao PDR** 90 percent of diagnosed P. vivax patients received treatment to fully cure infections in 2022, while in **Cambodia**, cure rates increased from around 27 percent in late 2021 to 40 percent in 2022.

Improving impact of vector control

Insecticide-treated bed nets have been the mainstay of the fight against malaria over the past two decades, with nearly three billion nets contributing to a 40 percent reduction in malaria globally since 2000. But

they are no longer leading to year-on-year reductions in malaria for several reasons. First, net coverage has plateaued over the past five years. Second, mosquitoes have developed resistance to the insecticides used in conventional bed nets, necessitating switches to next-generation products that can restore the protective effect of the nets—which comes at an additional cost. Yet, funding for malaria remains relatively flat even as populations are rapidly growing in high endemic countries.

In 2022, CHAI partnered with 12 countries to improve evidence-based deployment of malaria nets and other vector control tools by strengthening entomological surveillance—the monitoring and evaluation of mosquitoes and their behaviors that cause malaria. Entomological surveillance empowers programs to create evidence-based plans and target vectors effectively. In **Zimbabwe**, for example, CHAI helped investigate persistent transmission in Binga district despite high coverage with indoor residual spraying of insecticide. This enabled the government to measure dramatic increases in vector density as the residual efficacy of the insecticide waned and inform plans for improved timing and insecticide choice for future campaigns.

When distributing malaria bed nets or conducting insecticide spray campaigns, programs need timely, accurate visibility into campaign performance, including measuring whether those intended to receive the tools actually did. CHAI worked with governments to introduce digital tools to track where nets were delivered, or which houses were successfully sprayed with insecticide. In **Mozambique**, for example, our support digitizing bed net campaigns in Cabo Delgado and Nampula helped improve completeness, timeliness, and accuracy of distribution data, enabling more transparent supervision, quicker response times, and more informed decisions on team movement.

We aim to enable malaria programs to fully manage applications of these tools on their own without CHAI's involvement. In 2022, malaria programs in **Namibia**, **South Africa**, and **Zimbabwe** continued to use indoor insecticide spraying modules developed within their malaria information systems with minimal CHAI support, tracking village and/or locality-level spray campaign progress and insecticide consumption using forms and dashboards developed with CHAI in prior years. ■

Program in action:

- **Integrating weak, siloed data systems in Benin to drive better outcomes for NTD campaigns.** NTD programs in **Benin**, **Burkina Faso**, **Ethiopia**, **Kenya**, **Nigeria**, and **Senegal** conduct mass drug administration programs with the aim of eliminating NTDs, including lymphatic filariasis, schistosomiasis, soil-transmitted helminths, onchocerciasis, and trachoma. These programs must accurately quantify target populations, reach all in need with the drugs, and measure impact to ensure the intervention works as expected. Each step requires quality data, but information systems for NTDs are often weak, collecting data on paper forms that may be incompletely or inaccurately tallied into government systems.

  CHAI is working with these governments and their partners to enhance the quality of disease data. In **Benin**, for example, CHAI-led assessments revealed multiple concurrent data systems run by different partners operating in siloes, as well as incomplete or nonexistent data. In response, the national program requested CHAI's support to develop the 2022-2026 NTD Master Plan, which culminated in the creation of a government-owned, interoperable NTD data repository. The repository works with the different data systems run by partners, making it easier to collect, manage, and harmonize fragmented data. By increasing the visibility and integration of NTD data in **Benin** and other CHAI-supported countries, we expect NTD campaigns to achieve higher coverage and thus more efficiently reduce the burden of these debilitating diseases.

- **Half of febrile patients in Kenya tested for malaria by incentivized private service providers.** Drug shops and pharmacies are an important source of treatment for fever in many countries in sub-Saharan Africa, yet few patients are tested for malaria at these outlets, and little is known about what treatment they receive. In collaboration with Duke University and Moi University in **Kenya**, CHAI conducted a National Institute of Health-funded study that examined whether providing access to inexpensive malaria rapid diagnostic tests, together with small financial payments, can incentivize private drug shops and pharmacies to test febrile patients for malaria and sell the recommended first line treatment, artemisinin combination therapy (ACT), at a discount to those who test positive.

  Preliminary findings showed almost half of febrile patients were tested for malaria at the drug shops during the study, compared to virtually no one previously. Only 25 percent of patients testing negative purchased an ACT, compared to 68 percent testing positive, suggesting the intervention improved case management practices at these shops. However, the small financial incentives did not seem to increase testing or lead to more patients with malaria purchasing an ACT.

stories of impact

Mpumelelo Ndlela

Analyst, Infectious Diseases, Eswatini

Having volunteered in medical missions during my studies in Eswatini and South Africa, I discovered my passion for serving people and saving lives. It was clear I needed to find an organization that would provide me with the opportunity to make a difference. That's when I found CHAI, the organization that answered my call to serve communities in desperate need of quality healthcare.

My journey with CHAI began in January 2021, when the organization was introducing the optimized HIV treatment regimen, Tenofovir/Lamivudine/Dolutegravir (TLD), as the first-line treatment for people living with HIV. However, there were concerns about adverse reactions to the drug, which hindered its acceptance among patients. In response, we quickly assisted the Ministry of Health to establish a pharmacovigilance policy and facilities to systematically monitor patients and investigate any new cases of adverse drug reactions. This experience made me realize that CHAI's support extends beyond providing access to treatment; it also ensures the treatment is effective, of high quality, and safe for patients.

Since then, I have provided technical and analytical support to the Ministry of Health. I have been involved in monitoring the resistance to PrEP rollout, coordinating the transportation of HIV samples and results, and facilitating the implementation of multi-month antiretroviral dispensing for clients with suppressed viral loads. Additionally, I have supported the country's COVID-19 response by contributing to the development of treatment guidelines, training materials, resurgence plans, and budgets.

During the peak of the COVID-19 pandemic, Eswatini, like many other countries, faced a shortage of oxygen, leading to the loss of numerous lives. I swiftly shifted my focus from HIV to the field of medical oxygen. Despite being new to this area, I received immense support, mentorship, and capacity building from the local and global team. Through collaboration with the global team, government, and private partners, we achieved remarkable goals, including conducting assessments of medical oxygen facilities to determine the country's oxygen needs, developing an operational plan, and establishing infrastructure, such as a supply chain management system, to enhance access to medical oxygen for patients.

CHAI Eswatini has not only provided me with a platform to deliver essential services to communities in need but has also empowered me to work across different areas, use diverse tools, and develop new skills. The leadership at CHAI has pushed me beyond my limits and helped me believe in my own capabilities.

One aspect that I truly appreciate about this organization is its open-door policy and inclusive culture that embraces diversity in terms of religion, gender, and cultures. I extend my gratitude to all the CHAI staff for their selflessness, empowerment, and humility-driven spirit. Your efforts have undoubtedly saved more lives than you can imagine. ■

Tuberculosis

PROGRAM OVERVIEW: More than 10 million people fell ill and 1.6 million died of tuberculosis (TB) in 2021. At least 68 percent of cases and 82 percent of deaths occurred in Southeast-Asia and Africa.

In 2022, CHAI provided strategic support on TB to health ministries across multiple countries and implemented projects in seven countries. CHAI's work focused on market shaping to improve access to drugs and diagnostics, case finding innovations, introducing new diagnostic tools, accelerating access to shorter drug-resistant tuberculosis treatment regimens, and supporting the scale-up preventative therapies.

COUNTRY PRESENCE: Cambodia, India, Kenya, Nigeria, South Africa, Vietnam, Zimbabwe

KEY DONORS: Unitaid, UK Foreign, Commonwealth and Development Office (FCDO), TB Reach, The Global Fund to Fight AIDS, Tuberculosis and Malaria

The World Health Organization (WHO) has set an ambitious target for tuberculosis (TB) elimination by 2035. Critical to meeting that target is preventing people living with latent TB from developing active infection. Treating latent TB requires less medication and offers shorter regimens. However, the cost of treatment has been a barrier for buyers in many low- and middle-income countries.

Transforming TB preventive treatment through the IMPAACT4TB partnership

Under the Unitaid-funded IMPAACT4TB consortium (Increasing Market and Public health outcomes through scaling up Affordable Access models of short Course preventive therapy for TB), CHAI worked with governments over the last five years to introduce shorter, safer, and more affordable preventive TB treatment.

IMPAACT4TB focused on reaching high-risk populations, including people living with HIV, children under five, and all household contacts, with 3HP treatment. CHAI played a critical role of not only negotiating lower prices for the drugs in the treatment regimen, but also working with countries in Africa and Asia to drive demand for the treatments once they were affordable.

3HP involves once-weekly doses of isoniazid and rifapentine taken for three months. Compared to traditional treatments, which can take up to 12 months, 3HP has fewer side effects and higher adherence. But for many years, 3HP was only available from Sanofi, the pharmaceutical company that created the medication. At US$72 per patient course, the regimen was significantly more expensive than the traditional, often suboptimal, treatments on the market.

CHAI used a two-pronged supplier strategy to negotiate access prices with the innovator and expedite the development and commercialization of generic alternatives.

Sanofi agreed to a low- and middle-income country-ceiling price of US$15 per patient course of 3HP in late 2019 and product delivery began in 2020. That same year, CHAI, MedAccess, and the first selected generic supplier, Macleods, announced a fixed-dose, single pill generic version of 3HP would also be available for US$15 per patient course. In 2022, CHAI helped a second generic manufacturer, Lupin, enter the global market.

At the same time, IMPAACT4TB partners worked with governments in 12 countries to drive uptake of 3HP. CHAI partnered with **Cambodia**, **India**, **Kenya**, and **Zimbabwe**, each country showing remarkable progress in the adoption of 3HP among people living with HIV and household contacts. In **Zimbabwe**, for example, 3HP coverage among people living with HIV increased from nearly 19 percent in 2021 to almost 50 percent just over a year later.

Supporting the roll out of treatment for drug-resistant tuberculosis

TB is the second-leading cause of death from an infectious disease next to COVID-19 worldwide. Shorter, innovative regimens are a crucial tool in the fight against the TB pandemic. In fact, they have the potential to revolutionize treatment, which has historically been slow, complicated, and often toxic.

While CHAI and our partners continue to push down the price of these optimal regimens, we are also leveraging our expertise and in-country relationships to help drive adoption in TB-affected communities.

One of the key developments in the drug-resistant TB treatment (DR-TB) space is the BPaL(M) regimen. BPaL(M) is a new, oral six-month regimen comprising bedaquiline, pretomanid, linezolid, and in instances where there is resistance to fluroquinolones, moxifloxacin. The drug is World Health Organization (WHO) approved for treatment of various forms of DR-TB in patients 14 years and older.

In 2022, CHAI and the **South Africa** National TB Control Program (NTP) convened an international conference to facilitate the uptake of effective, shorter, oral DR-TB regimens in high burden countries. Nine countries—Congo Brazzaville, **Democratic Republic of Congo**, **Eswatini**, **India**, **Kenya**, **Nigeria**, Ukraine, **Vietnam**, and **Zimbabwe**—heeded the call to action.

After the conference, CHAI worked with the Ministry of Health in **Zimbabwe** to develop a national BPaL(M) introduction plan. We also supported **Zimbabwe** to develop a minimum requirement process map across key implementation pillars such as policy, monitoring and evaluation, and supply chain, among others. The country has already procured the medication and begun rolling out the regimen.

Improving access to portable digital x-rays for TB screening in India

CHAI supported the Central TB Division (CTD) of **India** and other organizations to reduce delays in diagnosing TB by using portable digital x-rays and computer-aided detection tools. However, the adoption of these technologies had been slow due to supply challenges. Additional challenges included limited quality-assured suppliers, the high price of both the x-ray and diagnosis tools, and emerging guidelines on the specifications, operations, and deployment of portable x-ray equipment.

To address these barriers, CHAI worked with stakeholders to determine the best setup for primary care and community settings—a handheld digital X-ray machine (dCXR) with computer-aided detection tool (CAD). We encouraged suppliers to offer bundled products and services for seamless integration.

CHAI also facilitated the registration and regulatory approval of three additional computer-aided diagnostic suppliers in **India**, resulting in a 48 percent price reduction on products. With the support of the Global Fund to Fight AIDS, Tuberculosis, and Malaria, the CHAI affiliate in **India** then procured 50 handheld dCXR and CAD machines for deployment across the country.

As a result, 2.5 million high-risk individuals will be screened using these technologies over the next three years, which is expected to lead to the diagnosis of approximately 30,000 TB patients. ■

Program in action:

- **31% more people screened for TB thanks to integrated services in Lao PDR.** Between 2020 and 2021, during the COVID-19 pandemic, TB testing fell by 31 percent in **Lao PDR**. COVID-19 antigen rapid diagnostic tests were introduced in 2022 at hospital entry points but care often focused narrowly on the disease. CHAI supported the Ministry of Health to integrate TB screening into routine screening for COVID-19 at 11 hospitals. All patients were screened using a checklist of COVID-19 and TB symptoms and tested appropriately. Patients with a confirmed diagnosis were linked to appropriate care. At these hospitals, TB tests increased 31 percent and patients diagnosed with TB increased 55 percent above pre-pandemic levels. Based on these promising results, the Ministry of Health is exploring opportunities to scale the approach nationally.
- **Nearly 2M TB patients and high-risk individuals registered in digital database.** In 2022, **Vietnam** continued to address gaps in TB case finding by upgrading and scaling the CHAI-developed Access to Care Information System (ACIS) to 31 of 63 provinces. The system notifies health workers when patients start TB treatment so they can screen the patient's households, neighbors, and high-risk populations in these provinces. ACIS is bi-directionally linked to the National Tuberculosis Program's patient management system and provides SMS-delivered referral support, case-finding, and contact tracing features, and a map to help visualize where all the TB cases and people at high risk for TB are located. The National Tuberculosis Program is now taking ownership of ACIS. Nearly two million TB patients and people at high-risk of TB are registered in the system, with 60,000 patients tested for TB, and 8,000 confirmed TB diagnoses.

20 Years of Impact

>65%

reduction in price of optimal TB preventive therapy 3HP

Pediatric 3HP

Introduced pediatric 3HP fixed dose combination at a lower price per dosage than the adult formulation—a first for any pediatric TB formulation

Midwife Aïssata Ba explains the cervical cancer testing process to her patient at Gaspard Kamara Hospital, Dakar, Senegal. Photo credit Unitaid and CHAI / Makhfou Ndiaye.

WOMEN AND CHILDREN'S HEALTH

Far too few women and children worldwide have access to the essential, quality health services and nutrition they need. As a result, hundreds of thousands of women die every year from avoidable or treatable conditions. More than 2 million babies die within their first weeks of life. And millions more children and teens die from undernutrition, pneumonia, diarrhea, or vaccine-preventable diseases. CHAI works to reduce these deaths and give women and children the opportunity not only to survive but to thrive.

OUR PROGRAMS:

- Diarrhea & Pneumonia
- Maternal & Newborn Health
- Reproductive Health
- Nutrition
- Vaccines

Diarrhea

PROGRAM OVERVIEW: Diarrhea is the second leading cause of death in children under the age of five. Oral rehydration solution (ORS) and zinc supplements are the most affordable and effective interventions available to treat diarrhea. CHAI's program to scale up the use of ORS and zinc dramatically increased coverage for treatment in partner countries and helped save tens of thousands of lives. Now, we are expanding the program to reach even more children.

COUNTRY PRESENCE: India, Kenya, Nigeria, Uganda, Ethiopia

KEY DONORS: IKEA Foundation, Bill & Melinda Gates Foundation, ELMA Philanthropies, GAC, NORAD Global Affairs Canada: Absolute Return for Kids, ARK

20 Years of Impact

76,000

lives saved through CHAI's work to increase ORS/zinc across four countries: India, Kenya, Nigeria, Uganda

37%

increase in ORS coverage, from an average of 35% in 2012 across the four countries to 48% by 2016

24x

increase in combined ORS/zinc coverage, from 1% in 2012 to 24% by 2016 in the four countries

The World Health Organization (WHO) recommends ORS and zinc for the treatment of diarrhea in children. ORS, invented in the 1960s, prevents severe dehydration due to diarrhea, the primary pathway by which children die. Zinc helps reduce the duration of diarrhea and future re-occurrence. Together, these interventions are incredibly effective.

Yet, as of 2021, ORS coverage was 46 percent globally, and ORS and zinc combined—the preferred treatment—was only 16 percent. This is due to decades of underinvestment and complacency within the global health community.

In 2011, CHAI launched a program to support the governments of **India**, **Kenya**, **Nigeria**, and **Uganda** to scale up the use of ORS and zinc by comprehensively addressing supply and demand constraints. While tactics in the four countries varied based on context, the key features of the program were consistent.

The program erased decades of previous stagnation, increasing ORS coverage from an average of 35 percent in 2012 across the four countries to 48 percent by 2016, and combined ORS and zinc coverage from one percent to 24 percent. These increased coverage levels translated to an estimated 76,000 lives saved.

In the regions where CHAI worked, expansion of ORS and zinc coverage has been sustained at increased rates since the end of our program in 2016 and validated by independent measurements.

Now, CHAI is relaunching this program with an aim to eliminate preventable deaths due to diarrhea through scale-up of ORS and zinc in the highest-burden countries. We have targeted nine countries where diarrhea is a substantial contributor to under-five mortality, ORS coverage is lowest, and CHAI has strong partnerships with ministries of health to make the biggest impact. ■

stories of impact

Abhishek Tupe

Country Support Manager, Global Essential Medicines

Before joining CHAI, I worked at the financial services firm, JP Morgan Chase and the American consultancy firm, Boston Analytics. I didn't know much about the organization then as its presence was limited to a few states in India, and public health was not a career path I had initially considered because of my economics background. But CHAI's open policy to candidates with different educational backgrounds changed my perception.

I officially began at CHAI in 2011 when I joined the pediatrics HIV team as a Senior Analyst. I didn't know much about public health—I learned all the knowledge about programs, diseases, and health systems strengthening on the job. The only thing I needed to do was roll up my sleeves and get my hands dirty.

I am currently working as Country Support Manager for the Global Essential Medicines team, which supports 27 countries to expand oxygen access to arrest and reduce the burden of hypoxemia, or low blood oxygen, across high-burden countries. My experiences in HIV, viral hepatitis, and essential medicines have given me exposure to different programs, roles, and functions and allowed me to visit multiple geographies, shaping my understanding of the global health landscape.

Over the years, I have witnessed first-hand the organization's commitment to global health and saving lives regardless of where a person may come from. We strive to empower governments with the tools and expertise to reduce disease burden and death and take ownership of the initiatives we support long after we have left. This dedication aligns with the powerful words of the medical anthropologist and physician Paul Farmer, who said, "The idea that some lives matter less is the root cause of all that is wrong with the world." Our approach ensures sustainability and long-term impact as our efforts become integrated into the fabric of the communities we serve.

One example that vividly demonstrates our commitment to sustainability and impact is our involvement in the diarrhea program in India. We faced a challenging decision regarding whether to collaborate with informal private sector providers with a wider reach or work solely with the public sector facilities that don't have the same reach. CHAI boldly chose the more difficult path of working with informal private sector providers, who are not officially recognized by the government but are the most accessible and trusted providers in rural areas. Our decision was made easier because the first-line treatment drugs (ORS/Zinc) for diarrhea are available over the counter. As a result, we witnessed sincere appreciation within the community and successfully collaborated with over 150,000 providers in Uttar Pradesh, Madhya Pradesh, and Gujarat. Our collaboration led to a more than two-fold increase in coverage of ORS and Zinc, surpassing baseline figures. The achievement reaffirmed that we can build trust and bring substantial positive change through evidence-led solutions, a genuine desire to address an issue, and transparent stakeholder engagement. ■

Pneumonia

PROGRAM OVERVIEW: The success of CHAI's work scaling up ORS/zinc treatment for childhood diarrhea led governments and partners to request our involvement in addressing another leading cause of death for children—pneumonia.

CHAI began its pneumonia program in 2015 in partnership with five countries to foster the policy environment required to influence changes in pneumonia treatment nationally. Our work soon revealed a critical but overlooked intervention in the fight against pneumonia: oxygen.

COUNTRY PRESENCE: Ethiopia, India, Kenya, Nigeria, Uganda

KEY DONORS: BMGF, ELMA, IKEA Foundation

20 Years of Impact

24

new locally-registered Amox DT products available in five countries

99%

increase in Amox DT availability in public facilities in Ethiopia, up from 0%

64%

of children with hypoxemic pneumonia received oxygen across all program countries, up from 19%

Pneumonia kills more children than any other infectious disease. To treat severe cases, antibiotics are needed. Beginning in 2015, CHAI worked with local suppliers to introduce the antibiotic Amox DT and ensure it was added to the national essential medicines lists for each partner county—**Ethiopia**, **India**, **Kenya**, **Nigeria**, and **Uganda**.

But children's lungs can fill with fluid quickly and they will often die from lack of oxygen before the antibiotics take effect. Oxygen therapy can buy the body the time it needs to allow the medicine to work.

Pilots that we ran in each country quickly uncovered a clear gap in access to oxygen therapy. We developed targeted interventions to close this gap by shoring up weak supply systems, improving clinical practices around the use of oxygen, strengthening data systems, and securing sustainable financing.

The knowledge and expertise gained through CHAI's pneumonia program proved to be invaluable when the COVID-19 pandemic struck. Patients with severe COVID-19 symptoms required significant amounts of oxygen to support their respiratory function. COVID-19 patients, particularly those in critical condition, require two to six times the amount of oxygen compared to non-COVID patients in similar circumstances. This sudden surge in demand strained health systems worldwide and underscored the pressing need for accessible and reliable oxygen supplies. CHAI's prior experience in addressing oxygen access for pediatric pneumonia positioned us to play a pivotal role in assisting the World Health Organization (WHO), other global health actors, and governments in responding effectively to the unprecedented demand for oxygen during the pandemic. Learn more on page 22. ■

stories of impact

Olajumoke Adekeye

Country Director, Benin

My first encounter with CHAI was through a meeting. My then manager, the chief of party of a maternal and child health program, told me I would be a good fit for CHAI and have opportunity to grow there. I admitted to him how impressed I had been with the CHAI team's analytics deck on the zinc/ORS market in Nigeria.

The chief of party then put me in touch with the then-program manager for the CHAI Nigeria Essential Medicines Program, Jason Houdek, with whom I met over lunch. I was intrigued by his deep insights about public health and contemporary Nigerian history, as well as his unassuming nature.

Within a few months, I joined the Nigeria Essential Medicines Program and witnessed firsthand how tangible transformational impact happens at CHAI. A diverse, interdisciplinary team was assembled to work alongside government partners and three local pharmaceutical companies to help reduce market supply barriers for zinc/ORS. By the end of the program, the price of combined zinc and ORS had declined by 50 percent and a few months later, more than a dozen local manufacturers were producing ORS at the reduced cost. CHAI had left its imprint on a national scale, and I knew then this was an organization whose purpose aligned with mine.

I started working on a new program in Nigeria: assistive technology. This time around, we needed to understand the market for assistive devices in Africa's most populous country and largest economy, estimated to have about 25 million people with disabilities. Our mission was guided by our propensity at CHAI for tackling big, audacious goals, or in our guiding principles speak, scale of impact.

Our foundational work evaluated how we could support the government and private sector to ensure access to affordable life-changing assistive devices for those who need them. The commodities in question were not drugs, but hardware and software that aid mobility, vision, communication, hearing, and cognition. We were used to working directly with the health sector; however, our initial stakeholder mapping showed us that the assistive technology landscape includes the education, sports, and social welfare sectors. If we truly wanted to have breadth of impact¬—another guiding principle— we needed to not only understand how these sectors interacted with each other, but how to support the development of a government-led coordinating mechanism. We found a champion in the newly established government agency, the National Commission for Persons with Disabilities (NCPWD). Through the NCPWD, the National Strategy for the Scale-up of Assistive Technology was developed, ensuring all stakeholders understood how the government wanted to scale-up access to assistive technologies. This pioneering document will guide investment in the sector for the next five years to come: sustainability of impact.

We then leveraged our relationship with the Ministry of Health under whose leadership, the country's first ever Priority Assistive Products List was developed. The list, alongside other policy documents, will guide government procurement efforts to close the gap in access to assistive technology products in the country. Our job is not yet done, but we will continue to pursue degree, breadth, scale, and sustainability of impact. ■

Maternal and Newborn Health

PROGRAM OVERVIEW: A pregnant woman or newborn dies every 11 seconds. Almost all these deaths occur in low- and middle-income countries. In 2011, CHAI launched a grassroots initiative in two Ethiopian regions, which saw a 62 percent surge in deliveries overseen by trained birth professionals within just one year. Fast forward a decade and our integrated maternal and newborn health program has stretched across multiple countries to prevent the deaths of many more pregnant people and infants.

COUNTRY PRESENCE: Cameroon, Ethiopia, Kenya, India, Lesotho, Mozambique, Nigeria, South Africa, Uganda, Zambia, Zimbabwe

KEY DONORS: ELMA, Bill & Melinda Gates Foundation, MedAccess

An integrated approach to maternal and newborn health

In many regions, especially in poor, rural communities, the odds of survival for pregnant women and newborns can be dismal. Reducing maternal and neonatal mortality and stillbirths is one of the most important goals for the countries in which we operate.

CHAI supports ministries of health to achieve their goals through an integrated approach to maternal and newborn health that aims to (1) identify complications early to prevent them from becoming life-threatening, (2) apply simple interventions to ensure the survival of mother and child, (3) rapidly refer cases to the appropriate level for treatment, and (4) strengthen the capacity of health facilities and providers to provide quality care.

The approach, known as Networks of Care, provides a foundation to achieve sustained reductions in maternal and newborn mortality rates by ensuring the community owns the program. Networks of Care has been identified by the World Health Organization (WHO) as an exemplar of maternal health and primary care strengthening efforts and is in the process of being adopted by global and national partners, such as the World Bank-housed Global Financing Facility, indicating the program's impact beyond project geographies and current interventions.

Between 2018 and 2022, CHAI worked with the **Uganda** Ministry of Health to implement an integrated program across 203 facilities in six of the districts with the highest maternal and neonatal mortality rates nationwide. Prior to the program, more than 60 percent of births occurred outside health facilities in the region, compared to less than 25 percent nationally. In addition, the proportion of pregnant women receiving four or more antenatal care visits was as low as 28 percent. These gaps in care heavily contributed to the high mortality rates the region faced.

CHAI facilitated assessments to understand bottlenecks and gaps in the uptake of antenatal care from the community to all levels of healthcare. We then worked with the Ministry of Health to develop communication materials for the health workforce, including community health workers, to educate women on the benefits of antenatal care. As a result, maternal mortality within health facilities declined by 37 percent, early neonatal mortality fell by 45 percent, and perinatal mortality dropped by 35 percent. The mortality reductions achieved across the program facilities were higher than those witnessed in other non-program facilities. Key components of this transformational program are now being incorporated into the government's health strategy.

Similarly, in **Zambia**, the Northern Province has one of the highest proportions of maternal and neonatal deaths nationwide. Between 2018 to 2022, CHAI worked with the government to support 143 facilities across all 12 districts of the province to reduce maternal and neonatal mortality rates. We trained over 300 peer educators to refer teenagers to services in their communities. We also trained 1,450 community health workers to track pregnant women and newborns and identify and refer complications early, as well as over 370 health workers to better deliver sexual reproductive, maternal, and newborn health services.

We deployed over 20 motorbike ambulances owned and managed by the community to make travel to health centers easier and quicker for women in labor, transporting 4,509 women and 260 newborns over the last two years. Based on data from a robust Maternal and Neonatal Health Surveillance System established across the province, maternal mortality fell by 41 percent, newborn mortality by 45 percent, and perinatal mortality by 43 percent. The CHAI program ended in 2022 and was transitioned to provincial and district leadership. ■

Breadth of Impact

The WHO identified CHAI's Networks of Care approach as an exemplar of maternal health and primary care. Others are now adopting the approach, such as the World Bank-housed Global Financing Facility.

Scale & Sustainability of Impact

CHAI deployed 20+ motorbike ambulances to communities in Northern Province, Zambia. These ambulances are owned, managed, and driven by volunteers in the community. Thousands of women and hundreds of newborns, many with life-threatening conditions, have been transported to higher levels of care—and survived as a result.

Program in action:

- **Over 50,000 fewer stillbirths expected with new syphilis/HIV dual test for pregnant women.** Each year, more than 210,000 stillbirths or newborn deaths are caused by congenital syphilis, which is completely preventable. More than half of these deaths occur in just 11 countries and could be averted through a simple, cost-effective test.

  However, testing for the disease lags behind other diseases, such as HIV. In some countries only half of the women tested for HIV during antenatal care are also tested for syphilis. CHAI is working with the governments of **Ethiopia**, **India**, **Nigeria**, and **South Africa** to close the gap between syphilis and HIV testing for pregnant women by increasing access to a rapid diagnostic test that screens for both diseases. This ensures women are not only tested for syphilis at the same rate they are for HIV, but that they receive their results more quickly, and can get on treatment faster. We anticipate this program will identify almost 300,000 pregnant women with syphilis over the next three years, leading to 38,000 fewer babies born with congenital syphilis, and avoiding at least 51,500 stillbirths.

- **Blood transfusion hubs in Zambia provide life-saving access during postpartum hemorrhage.** The leading cause of death for women during childbirth is bleeding, or postpartum hemorrhage. A blood transfusion can save a woman's life. Yet about 26 percent of deaths in lower income countries occur because blood products are not available to complete the transfusion.

20 Years of Impact

29-41%

reduction in maternal deaths and a 33-45% reduction in infant deaths across program sites in four countries: Ethiopia, Nigeria, Uganda, and Zambia

<18 months

three states operating the program in Nigeria saw maternal mortality drop 37% and neonatal mortality drop 43% percent within only 18 months

141

public health facilities that ran the program in Northern Province, Zambia saw most dramatic increase in survival rates of pregnant women and infants

CHAI has engaged in safe blood-focused initiatives in **Ethiopia**, **Nigeria**, **Uganda**, and **Zambia** to increase the availability of safe blood and blood products for women and newborns—as well as wider populations—during emergencies. Most recently in **Zambia**, CHAI supported the establishment of zonal transfusion hubs to store blood and act as collection points for health facilities across Northern Province. As a result, for the first time, reliable safe blood is accessible for the 200 to 300 women who experience obstetric hemorrhage in the province every year. This is part of a wider government push towards the decentralization of blood transfusion services.

Nutrition

PROGRAM OVERVIEW: Undernutrition is a contributing factor in almost half of all childhood deaths globally, with low- and middle-income countries disproportionately affected. Chronically undernourished children are also more susceptible to disease and infection, as well as cognitive impairment.

However, there are proven, cost-effective interventions available. CHAI's approach to enhancing nutritional status is to improve access to locally produced, nutrient-dense food products during the first 1,000 days of life—when chronic undernutrition is most likely to set in.

COUNTRY PRESENCE: Mozambique, Nigeria

KEY DONORS: UNICEF and Embassy of Ireland, Kano State Ministry of Health, World Bank

Using community structures to improve undernutrition

Undernutrition remains a significant public health concern in low- and middle-income countries, particularly in the first three years of a child's life. These three years, or first 1,000 days, are a unique window of opportunity to reverse changes due to undernutrition. There are inexpensive, cost-effective, and scalable strategies that if applied, can significantly decrease malnutrition-related morbidity and mortality.

In **Nigeria**, CHAI was one of three partners funded by the World Bank to partner with the Kano State Ministry of Health to improve nutrition outcomes for children under five. We worked with the state government to increase access to a package of basic nutrition services, including key nutrition commodities such as iron/folic acid and Vitamin A, through a network of community volunteers. CHAI provided performance-based incentives to the volunteers to actively map and engage key community leadership structures and community-based organizations to ensure community ownership, acceptance, and uptake of the services.

Due to delays in the project start-up, CHAI employed an outreach approach to speed up beneficiary enrollment and achieve service delivery targets. Using existing enrollment and service data, we mobilized the Local Government Agency (LGA) and management teams to target poor performing LGAs for a sweep outreach. The teams moved from one poor performing community to the next, enabling the state to close enrolment and service delivery gaps and reach its targets. Over two million services were delivered to women and children within the past two years. While there were no key outcomes measured for overall impact, we expect reductions in mortality, improved health outcomes, and improved overall economic productivity in the state given the reach of the program.

CHAI has shared key learnings and best practices with relevant stakeholders at both national and state levels. Now CHAI and partners are using the results of the program to advocate state and national governments to maintain financing for the project.

Providing affordable, alternative nutrient sources

Mozambique has long been plagued by a limited supply and high cost of ready-to-use supplementary food (RUSF) and therapeutic food (RUTF), which are used to treat children with moderate and severe wasting also known as moderate and severe acute malnutrition. Because of this challenge, there is a need for affordable, alternative sustainable nutrient sources.

In 2022, to address the intermittent supply of nutritional supplements, CHAI, supported by the Embassy of Ireland, began purchasing peanut presses. These presses can be operated by healthcare workers and caregivers at health facilities to produce peanut butter using locally available groundnuts to supplement children's diets. The pilot was rolled out in two provinces targeting children at risk for wasting to prevent progression to severe forms of the condition. During the first four months of implementation, the intervention reached over 1,000 children, with a monthly retention rate of about 93 percent.

The Ministry of Health welcomed the solution as it is affordable and sustainable and appears to address mild forms of wasting. However, more evidence is needed to determine the health impact of the intervention. CHAI's next step is therefore to evaluate the impact of providing peanut butter as a complementary nutritional supplement. The results of the evaluation are expected in 2023. ■

20 Years of Impact

~3M

nutrition services delivered to over 1M beneficiaries in Kano, Nigeria through community nutrition volunteers

1,000+

children with low weight-for-height, also known as wasting, reached in facilities in Mozambique in the first four months of a pilot, using an innovative approach that employs peanut butter from locally available groundnuts

A newborn at Barau Diko Hospital in Kaduna, Nigeria. Photo credit Melinda Stanley.

Scale of Impact

CHAI worked with Kano State, Nigeria to deliver 2M+ basic nutrition services, such as vitamin A and folic acid, to women and children over the last two years.

Reproductive Health

PROGRAM OVERVIEW: Individuals' right to manage their reproductive health, especially determining whether, when, and how many children to have, is critical to reducing maternal mortality, improving child health outcomes and families' financial wellbeing, and mitigating climate impacts. Over the past 10 years, CHAI has worked with governments, suppliers, donors, and other partners to significantly increase access to contraception.

COUNTRY PRESENCE: Democratic Republic of Congo, Ghana, India, Kenya, Liberia, Malawi, Myanmar, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, Uganda, Zambia

KEY DONORS: Shaping Equitable Market Access for Reproductive Health (SEMA), the Bill & Melinda Gates Foundation, The Children's Investment Fund Foundation (CIFF), UK Foreign, Commonwealth, and Development Office (FCDO), Reproductive Health Supplies Coalition (RHSC)

Promoting contraceptives that meet individual needs and preferences

CHAI believes individuals should be empowered to manage their own reproductive health with or without the support of a healthcare provider. Self-care interventions can help meet people's health needs and rights even when health systems are constrained by inadequate resources or overwhelmed by challenges such as the COVID-19 pandemic. New technologies can enable women to manage their own reproductive health in their homes or communities.

Over the last several years, following strong acceptability and feasibility studies, CHAI has supported **Ghana**, **Liberia**, **Malawi**, and **Myanmar** to introduce and scale subcutaneous injectable contraceptives (DMPA-SC) which women can inject themselves every three months. In 2022, 180,000 women—or 16 percent of all DMPA-SC contraceptive users—in **Ghana** and **Malawi** opted to self-inject DMPA-SC. CHAI conducted research studies in **Malawi**, a global leader in self-injection uptake, and in **Ghana**, where self-injection has not yet met expectations, to understand the enablers and barriers to self-injection uptake.

In **Myanmar**, we activated DMPA-SC service delivery through the private/NGO sector, given the collapse of the public health system due to the ongoing political crisis. This sector provided an estimated 110,130 DMPA-SC services, a critical effort in a time of limited contraceptive access. In **Liberia**, CHAI worked with the government to evaluate the acceptability and feasibility of self-injectables for the first time among providers and clients. The positive pilot results led to government and partner commitments to scale up the services nationally. Use of DMPA-SC increased by 16 percent in 2022 as compared to 2021 because of CHAI technical assistance to roll out the product to additional counties.

CHAI is also working to increase access to the hormonal IUD, a highly effective, long-acting method of contraception with several non-contraceptive health benefits. In 2021, we collaborated with manufacturers, donors, and global procurers to significantly reduce the price of the product. In 2022, we built on this success, partnering with **Nigeria**, **Rwanda**, and **Zambia** to roll out the hormonal IUD. Across these three countries, more than 58,000 women received IUDs, providing more than 280,000 couple-years of protection. CHAI also partnered with **Kenya**, **Malawi**, **Uganda**, and the **Democratic Republic of Congo** (**DRC**) to develop phased and costed introduction plans to support coordinated rollout of hormonal IUDs, while ensuring supply security. Since the affordable products were made available through USAID and UNFPA catalogues in 2021, more than 250,000 IUDs have been procured.

Looking to the future of reproductive health products, CHAI collaborated with The Children's Investment Fund Foundation (CIFF), the Bill & Melinda Gates Foundation, and Camber Collective to scope potential country interest in an on-demand, pericoital contraceptive pill that could be used at the time of sex. Research indicates a leading reason for non-use of contraceptives among women is infrequent sex. A contraceptive that individuals can use as needed has the potential to satisfy this segment of women. In 2022, CHAI leveraged our strong relationships with stakeholders across six countries (**Ethiopia**, **India**, **Uganda**, **Sierra Leone**, **Liberia**, and **Nigeria**) to conduct initial landscaping on interest in the concept. The findings provided important evidence to inform the donor investment strategy in the development of such a pill.

Degree of Impact

In Myanmar, CHAI launched DMPA-SC services through the private/NGO sector, resulting in a 16% increase in uptake in 2022 compared to 2021.

Degree & Scale of Impact

Nigeria, Rwanda, and Zambia scaled access to hormonal IUDs by leveraging a CHAI-negotiated price reduction. 58,000+ women received IUDs, providing 280,00+ couple-years of protection.

Improving efficiency and effectiveness of product introduction

Globally, CHAI administers a flexible pool of funds on behalf of donors to facilitate the introduction of reproductive health products. The Catalytic Opportunity Fund (COF) is a proof of concept for how pooled donor funding can more effectively and efficiently respond to government priorities. As of the end of 2022, CHAI has contracted over US$14 million to 21 countries across 71 grants to support reproductive health product introduction. This mechanism demonstrates the impact of an innovative demand-side financing model that provides agile, flexible, and transparent funding, is responsive to country needs, and fosters coordinated use of donor resources.

In 2022, using our experience in scaling new and underused contraceptives, CHAI worked with **Kenya**, **Nigeria**, **Tanzania**, and **Zambia** to build systems that would support routine, government-led introduction of new reproductive health products. Previous efforts have been partner-led and product-specific, resulting in inefficiencies and limited government ownership. The systems we are building now are expected to reduce inefficiencies, fragmentation, and suboptimal approaches in roll-out of new products. CHAI is working with **Nigeria** and **Zambia** to test these new systems with the introduction of hormonal IUD. In **Kenya** and **Tanzania**, CHAI and the governments are using the approach to determine which products to introduce to best meet local market needs. ■

Program in action:

- **Kenya invests US$38M toward contraceptive procurement, on road to funding country's contraceptive needs.** In 2019, CHAI, with funding from the Bill & Melinda Gates Foundation, the UK Foreign, Commonwealth, and Development Office (FCDO), USAID, and UNFPA, partnered with **Kenya**'s National Council for Population and Development (NCPD) to establish a long-term contraceptive financing strategy. The strategy was meant to address persistent procurement funding gaps due to declining donor funds and insufficient investment of domestic resources.

We created a pooled funding mechanism that development partners and the government contribute to at an agreed ratio. Over the years the partners' contributions decline, while the government increases its allocation for contraceptives procurement until it funds all the country's contraceptive needs.

This strategy resulted in the government of **Kenya** and the development partners committing US$38 million each towards contraceptive procurement over the last three years, which meets about 90 percent of the contraceptives requirements in the country—compared to 54 percent in the year preceding the strategy.

20 Years of Impact

>50%

price reduction for contraceptive implants, resulting in more than US$500M in procurement savings between 2012 and 2018 for low- and middle-income countries

10x

increase in global procurement of implants, from 1.2M units to 10.8M units between 2012 and 2018

225%

growth in average monthly consumption of implants in CHAI partner countries between 2013 and 2016, compared to 96% in countries without CHAI's support

Vaccines

PROGRAM OVERVIEW: Immunization is one of the most impactful and cost-effective public health interventions available. Since 2010, CHAI has worked in over 15 countries, representing over 50 million births per year. We work with local governments, partners, communities, and global stakeholders to sustainably improve effective immunization coverage and the underlying health systems.

COUNTRY PRESENCE: Cambodia, Cameroon, Ethiopia, Ghana, Indonesia, India, Kenya, Lao PDR, Lesotho, Nigeria, Papua New Guinea, Sierra Leone, Tanzania, Uganda, Vietnam, Zimbabwe

KEY DONORS: Bill & Melinda Gates Foundation, Gavi, the Global Vaccines Alliance, ELMA, The Rockefeller Foundation

CHAI works with governments, communities, other local partners, as well as global donors and stakeholders to reduce the burden of vaccine-preventable diseases and make immunization delivery systems a stronger foundation for primary healthcare through several complementary objectives. We help accelerate access to and uptake of new or under-used vaccines and improve the performance of vaccine cold chains, logistics systems, and service delivery to sustainably reach the unreached.

We also work with governments to build stronger management systems and financing capacity to ensure programs can perform better and be sustained beyond donors' and CHAI's support.

Introducing and scaling up new vaccines

In 2022, CHAI focused on accelerating introductions of new high-priority vaccines that require new and complex delivery systems, such as those for the human papillomavirus (HPV), malaria, and COVID-19. For example, we supported the introduction of a novel malaria vaccine in the **Democratic Republic of Congo**, **Sierra Leone**, and **Uganda** by helping secure access to nearly 4.6 million doses and US$614,000 for the vaccine.

In **Lesotho** and **Sierra Leone**, we also supported the introduction of HPV vaccines, which protect against cervical cancer. These vaccines have already reached 280,000 adolescent girls across the two countries. We are an active partner in the global HPV community, which aims to vaccinate at least 37 million girls in Gavi countries by 2030, averting nearly 600,000 deaths.

We partnered with large high-burden countries such as **Indonesia** and **Nigeria** that have been left behind with the introduction of the pneumococcal (PCV) and rotavirus vaccines. PCV and rotavirus vaccines protect against the two deadliest illnesses children face globally: pneumonia and diarrhea.

Ten months after introducing the rotavirus vaccine, **Nigeria** had already achieved a 62 percent coverage rate. We estimate the vaccine will save at least 100,000 lives over the next ten years. In **Indonesia**, CHAI supported the phased introduction of the rotavirus vaccine in 21 districts with a high burden of diarrheal disease across 18 provinces. The government now plans to scale up the vaccine nationally, which will avert over 8,000 deaths every year. By December 2022, the country had also achieved 41 percent national coverage for the first dose of the PCV vaccine. Once the Ministry of Health reaches its target coverage, it will avert over 7,000 deaths every year.

Promoting vaccine equity and reaching those not yet vaccinated

In 2022, CHAI supported nine countries—**Cambodia**, **Cameroon**, **Ethiopia**, **Kenya**, **Lao PDR**, **Lesotho**, **Sierra Leone**, **Tanzania**, and **Uganda**—to develop equity-based strategies and mobilize up to US$93 million from Gavi to immunize zero-dose children (children who have never had any vaccinations).

Working with local primary healthcare units in **Ethiopia**, CHAI ran a pilot in 2021 in four communities to strengthen routine immunization service delivery at the last mile. This pilot was part of a larger three-year effort to improve child health equity in the public system. The pilot included: (1) house-to-house head counting, (2) capacity building of Health Extension Workers, (3) participatory session planning involving community and administrative leaders, (4) geospatial mapping of immunization service delivery sites, and (5) enhanced supportive supervision and monitoring. The head count approach identified 722 zero-dose and 540 under-immunized children under the age of two in the four pilot communities. Using a paper-based referral system, over 92 percent of the identified zero-dose and 97 percent of under-immunized children between 0-11 months were subsequently vaccinated.

Scale of Impact

Kenya more than doubled the number of COVID-19 vaccines administered in 2022 compared to 2021 through a CHAI-supported assessment of the country's cold chain planning capacity.

Degree & Scale of Impact

Across four pilot communities in Ethiopia, we identified 1,200+ zero-dose or under-immunized children under two, and through local healthcare units, vaccinated almost all of them.

Improving vaccine cold and supply chains

In 2022, CHAI worked to improve vaccine stock availability at primary healthcare facilities and to strengthen the vaccine cold chain.

CHAI supported a last-mile distribution pilot in **Kenya** across three counties representing 1.3 million people. The pilot delivered directly from sub-county stores to health facilities resulting in stock-outs for any of the nine routine immunization antigens dropping by 38 percent over the last quarter of 2022.

CHAI also partnered with **Kenya** to roll out an online electronic logistics management system to all the 313 vaccine distribution stores in the country. Ninety percent of the stores actively use the system to record and conduct their vaccine stock transactions. By providing decision-makers with better vaccine supply chain data and fostering better review of that data, the number of distribution stores reporting stock outs of the nine routine antigens dropped by 30 percent between 2021 and 2022. The system is now being transitioned to the Ministry of Health.

Finally, by assessing the country's cold chain planning gaps, CHAI and the government of **Kenya** accelerated the procurement of cold chain equipment for COVID-19 vaccines. In 2022, with funding from Gavi and the government of Japan, **Kenya** procured ultra-low temperature freezers to increase the country's ultra-cold chain capacity to over 8,000 liters across national and regional vaccine storage points. As a result, the country expanded its vaccination efforts, administering over 23 million COVID-19 doses by December 2022 compared to 10 million doses by end of December 2021. ■

A six-week-old child receiving vaccines at Kitengela District Hospital in Kitengela, Kenya. Photo credit Eric Gitonga.

20 Years of Impact

US$1B

in savings generated over a five-year period because of CHAI-supported price reductions of up to 67% for vaccines such as rotavirus, polio, and pentavalent

157,000

deaths averted per year across nine countries where CHAI accelerated the introduction of pneumococcal and rotavirus vaccines to reach parity coverage with pentavalent

8 countries

across which the number of vaccine storage sites with sufficient cold chain capacity increased from ~60% to ~95% (over >55,000 storage sites), while cold chain optimality increased from ~0% to ~50%

Health budget tracking and advocacy workshop in Kano State, Nigeria. Photo credit Khaliphet Photography.

UNIVERSAL HEALTH COVERAGE

Despite significant increases in access to healthcare over the past few decades, half of the world still lacks basic health services. But many governments are committed to achieving universal health coverage. CHAI is working with governments to invest in primary healthcare as a crucial first step toward universal coverage.

OUR PROGRAMS:

- Health Financing
- Health Workforce

Health Financing

PROGRAM OVERVIEW: Each year half a billion people in low- and middle-income countries are pushed below the poverty line due to healthcare expenses. Millions of others cannot afford to seek or receive the care they need.

CHAI works with governments to implement health sector reforms using limited resources to make primary healthcare available and affordable. We aim to reduce the 77 percent of maternal, newborn, and child deaths that are preventable through these essential primary healthcare interventions.

COUNTRY PRESENCE: Benin, Burkina Faso, the Democratic Republic of Congo, Eswatini, Ethiopia, India, Kenya, Lao PDR, Malawi, Mali, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe

KEY DONORS: SIDA's Regional Team for SRHR in Africa, the Bill & Melinda Gates Foundation, Global Financing Facility (GFF) through the World Bank Group, Large Anonymous Donor (LAD), Global Affairs Canada, International Decision Support Initiative, UNICEF, MIT Solve

CHAI supports governments facing significant financial constraints to prioritize making essential, affordable primary healthcare services available to populations close to where they live. In 2022, we supported governments to re-align external and domestic funds with national plans to strengthen health systems and deliver on a prioritized package of primary healthcare services, while also ensuring funds go as far as possible to improve service delivery.

Reforming domestic financing and public insurance systems

People in the countries CHAI works are often forced to pay more than they can afford for the most basic services. Governments are working to reduce out-of-pocket expenses via pre-paid, tax, or contributory systems. We have partnered with the governments of **Burkina Faso**, **Ethiopia**, **India**, **Nigeria**, and **Rwanda** to set up, strengthen, and sustain these pre-paid systems to subsidize prioritized services for entire populations.

Our work included developing guiding policies, including setting premiums and benefits packages; strengthening insurance institutions and operations; and improving the use of data to measure performance and ensure program success. While the impact of the work will only be measurable in the future, we expect the systems that have been established to cover 13 million people in **Nigeria**, 45 million people in **Ethiopia**, 11.3 million people in **Rwanda**, and seven million women and children in **Burkina Faso**.

CHAI continues work with governments to improve the sustainability of healthcare schemes. In **Burkina Faso**, CHAI supports the domestically funded Gratuité, a free care program that covers women and children under five for a package of maternal, newborn, and child health services. The program began in 2016 and has since reached a US$58 million annual government budget allocation yet continues to experience annual funding gaps in the millions. In 2022, CHAI completed a sustainability study to estimate future funding needs to help the Ministry of Health raise additional funding for the program. Once the study recommendations are realized, it is expected that efficiency reforms will reduce annual costs by an estimated 20 percent by 2027; this includes standardization of tariffs and dispensation rules that will reduce drug and service costs, and revisions to the payment mechanism for primary healthcare facilities which will make it easier for people to access care.

CHAI also worked to expand the services delivered by these healthcare schemes. For example, **Rwanda** has faced significant challenges with rising costs, growing needs, and anticipated declines in donor support for key areas such as sexual and reproductive health. In 2022, CHAI helped the **Rwanda** Social Security Board institute an evidence-based process to determine which services the Community-Based Health Insurance Scheme will cover. To determine coverage, disease burden and equity considerations are weighed against rigorous cost-effectiveness criteria and resource availability. In 2022, the government used this process to expand coverage of critical reproductive cancers and now covers more than 11 million Rwandans (nearly 87 percent of the population) with subsidies for the poorest populations.

Degree & Sustainability of Impact

CHAI completed a sustainability study to estimate future funding needs for Burkina Faso's free-care program for women and children under five. The study recommendations, once implemented, will reduce annual costs by about 20%.

Scale of Impact

Tens of millions of people in five countries expected to be covered by public health insurance systems CHAI supported.

Mobilizing and aligning funds with government plans

Development assistance often contributes between 30 and 60 percent to health expenditures in countries where CHAI works and continues to alleviate pressures on government budgets in the current economic climate.

CHAI supports 12 governments to better align aid by designing, implementing, and strengthening health resource tracking processes that improve visibility over partner and government funding against national plans. In 2022, we supported the governments of **Burkina Faso**, **Ethiopia**, **Eswatini**, **Malawi**, and **Zimbabwe** to implement and improve these processes. The data generated from resource tracking and gap analyses has been used to mobilize or reprogram funds for under-funded areas. For example, in **Malawi**, this work was used to inform the government's successful application to the Global Fund for US$517 million. CHAI also collaborated with the Global Financing Facility/World Bank and the World Health Organization (WHO) to share best practices regarding resource tracking and external donor fund alignment globally.

In 2022, ministries of health of **Eswatini**, **Malawi**, **Nigeria**, and **South Africa** faced budget cuts given fiscal pressures and competing priorities. We worked with these ministries to analyze data and develop investment cases to mobilize funds for their key priorities. In **Eswatini**, CHAI supported targeted negotiations with donors and private pharmaceutical companies to finance the launch of the HPV vaccine that will reach tens of thousands of girls across the country. In **South Africa**, CHAI supported the Ministry of Health to secure a provisional agreement with the National Treasury to restore US$440 million in planned cuts to the national health budget in the subsequent financial year.

Improving resource management to ensure funds translate to better service delivery

Despite insufficient funding for health in Africa, health facilities across the continent, including in many countries we work, still fail to spend roughly 15 percent of their budgets annually. Meanwhile health facilities lack the resources they need to deliver quality care. We are working to address this challenge by strengthening financial management systems and systems used to contract and pay public and private providers across partner countries. CHAI developed tracking tools in Kano State, **Nigeria**, which revealed that only six percent of budget allocations for primary healthcare was released in Q3 2022, and we are now working with state policymakers to ensure funding allocated for health reaches the frontlines.

In **Ethiopia**, **Rwanda**, **Malawi**, and **South Africa**, CHAI supported pilots for provider payment reforms that will shift from paying for inputs to paying for results and ensure funds get to where they are needed most. Working with the government of **Ethiopia**, we implemented a two-year capitation pilot to evaluate the impact on services of paying health facilities in advance for each patient enrolled in their catchment area. This experience showed a positive effect on essential drug availability and service continuity. CHAI is now working with the government to scale this reform. As capitation for primary healthcare is being adopted by more and more countries, CHAI is also working to share practical learnings across the continent through government-led presentations at conferences and exchanges between the governments of **Rwanda**, **Burkina Faso**, and **Benin**. ■

20 Years of Impact

11+ countries

have conducted resource tracking exercises to improve government coordination of the health sector and aid alignment with country plans

4 countries

supported with design and early implementation of insurance and "free care" reforms that have the potential to provide affordable, essential services to tens of millions of people

Health Workforce

PROGRAM OVERVIEW: Health systems are dependent on health workforce labor and the quality and coverage of healthcare is reliant on the availability of skilled health workers. Yet, the World Health Organization estimates a global shortage of 10 million health workers by 2030, with low- and middle-income countries most affected.

CHAI partners with governments to optimize their health workforces within available resources. Governments can then make progress toward universal health coverage by maximizing the extent to which available, high performing, and motivated health workers can provide quality services when and where needed.

COUNTRY PRESENCE: Cambodia, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Nigeria, Rwanda, Tanzania, Uganda, Zambia

KEY DONORS: ELMA, SIDA, Large Anonymous Donor (LAD), Global Affairs Canada

Supporting countries to optimize health workforce mix, skills, and distribution

Many governments face significant challenges planning for, producing, and sustaining their workforces at the quantity and quality needed to meet health system demand. At the same time, the workforce in many countries is characterized by suboptimal skill mix, distribution, and performance—meaning governments are not able to get the most out of their existing resources.

CHAI works with governments to optimize their health workforce within available resources. We do this by setting health workforce priorities and developing strategic plans; analyzing current workforce data and coordinating preservice training to align with workforce supply and demand; developing stronger in-service training; and mobilizing and optimizing allocation of domestic and external resources. We also believe in strengthening primary healthcare as a pathway to universal health coverage. As such, we support government-led, community health cadres and their integration with primary care systems to ensure patients can access the full continuum of care they need to live healthy lives.

To illustrate, health workforce hiring in **Malawi** has historically been based on standardized staffing norms which do not align with actual health service demand. This leads to suboptimal workforce distribution, and ultimately poor quality of services. In response to this challenge, in 2022, CHAI worked closely with the Ministry of Health to develop its third Health Sector Strategic Plan (HSSP III) for 2023-2030. The plan signified the first time **Malawi**'s health sector strategy had been focused to fit within the existing resource envelope, with health workforce targets that could be realistically operationalized within projected timelines.

The targets will be used to inform staffing norms set by the Office of President and Cabinet, which in turn will be used to guide health workforce resource deployment decisions including the number, mix, and allocation of health workers where they are most needed. Furthermore, the HSSP III proposes a transition to center the government's vision of "One Plan, One Budget, One Report" model, under which the HSSP III will be the overall guiding document for all government and donor health investments until 2030. This work has therefore created a framework against which partners across **Malawi**'s health sector can coordinate their support of precisely defined government priorities.

Supporting country-led comprehensive preservice training programs

CHAI partners with governments to scale and strengthen preservice training programs to train health workers with the right skills and at the right volumes to serve the population. Once we have determined health system demand, we work together to develop costed plans, mobilize resources for those plans, and implement targeted activities, including program development, quality improvement, academic partnership, infrastructure development, and scholarship administration. CHAI has contributed to over 31,814 doctors, nurses, midwives, community health providers, and health managers receiving training through preservice programs. Through our work, CHAI has changed the way preservice training is planned and managed in low- and middle-income countries, enhancing government ownership while reducing financial inefficiencies.

For example, in 2019, CHAI supported the development of **Rwanda**'s National Strategy for Health Professions Development (NSHPD). The NSHPD is an ambitious 10-year national strategy to graduate over 6,500 healthcare professionals from 37 programs. Implementation is currently underway, with the introduction of 12 new medical fellowships since 2020, including gynecologic oncology, pediatric cardiology, and gastroenterology. CHAI has provided technical assistance to the Ministry of Health's Human Resources for Health Secretariat to support implementation of the NSHPD. In 2022, this included the development of a comprehensive monitoring and evaluation plan, support to secure a three-year grant from ELMA to the **Rwanda** government to scale up pediatrics training programs, and facilitation of a grant to fund a feasibility study for the construction of a new College of Medicine and Health Sciences at the University of **Rwanda**. ■

Degree of Impact

CHAI has changed the way preservice training is planned and managed in low- and middle-income countries. That is, through government-led preservice training programs that train workers with the right skills and at the right volumes to meet the population needs.

Hepatitis C screening training for healthcare workers in Kampong Chhnang, Cambodia. Photo credit Soksamphoas Im.

Sustainability of Impact

CHAI worked with Malawi to develop its latest health sector strategic plan, which, for the first time, fits within existing resources, with health workforce targets that can be reached within projected timelines.

20 Years of Impact

~32,000

doctors, nurses, and other health professionals completed pre-service training across seven countries over the last 20 years: Ethiopia, Kenya, Liberia, Malawi, Zambia, Rwanda, and Sierra Leone

6 countries

have introduced almost 50 new domestic training programs with CHAI support, e.g., a pediatrics postgraduate training program in Liberia and a Masters of Neonatal Nursing in Rwanda

4 countries

Cambodia, Liberia, Zambia, and Zimbabwe developed and implemented national policies and strategies to strengthen community health worker programs, which are critical to bringing primary care services closer to individuals

Health care workers attend a training session on diabetes management at Bonga Hospital in Ethiopia. Photo credit Scott Miller.

NON-COMMUNICABLE DISEASES

Non-communicable diseases (NCDs) such as heart disease, cancer, chronic respiratory disease, and diabetes are now the leading cause of death globally. Most NCD deaths occur in low- and middle-income countries and are expected to rise significantly over the next decade—even while NCD deaths in high-income countries have been declining for years. CHAI works with governments and partners to increase access to essential medicines and basic health tools across the health system to ensure those in need receive testing and treatment.

OUR PROGRAMS:

- Cancer
- Cervical Cancer
- Diabetes, Hypertension, and Sickle Cell Disease

Cancer

PROGRAM OVERVIEW: Every year, nine and a half million people die of cancer globally. Seventy percent of these deaths occur in low- and middle-income countries, often from forms of the disease that are preventable or treatable, such as breast and cervical cancer. Many people do not seek treatment until it is too late. When they do, healthcare facilities are frequently not equipped with the right tools, medications, or trained workers to treat them. Drugs and diagnostics are often poor quality, unaffordable, or simply unavailable. CHAI focuses on increasing treatment availability, as well as intervening along the cascade to improve survival rates.

COUNTRY PRESENCE: Cameroon, China, Ethiopia, Ghana, Indonesia, Kenya, Malawi, Nigeria, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe

KEY DONORS: American Cancer Society, UBS Optimus Foundation, Parker Institute for Cancer Immunotherapy, Norwegian Cancer Society, University of Notre Dame

Increasing access to quality cancer medicines

Access to quality cancer medications is a challenge for low-and middle-income countries. In many African countries, the small and unpredictable volumes of medicines governments currently procure are not profitable to suppliers, who prefer to sell to wealthier countries. This results in high prices, shipment delays, and a limited response to tenders, often forcing countries to procure from manufacturers and distributors of non-quality assured products. When healthcare providers cannot consistently access the drugs they need, they must delay care, change patient regimens mid-course, or use sub-optimal chemotherapy regimens, all leading to poorer patient outcomes. CHAI partners with the American Cancer Society and high-quality drug companies through the Cancer Access Partnership to address these challenges and improve the availability of medications.

In 2022, the Cancer Access Partnership comprised five companies, offering high quality medications that cover full regimens for 47 cancers, available to procurers in 60 countries. We estimate that during 2022, close to 2,000 patients received these medicines in **Nigeria**, **Tanzania**, and **Zimbabwe**. Over 4,500 patients have been reached since the partnership launched in 2018.

In addition to the Cancer Access Partnership, we partner with governments to conduct evidence-based forecasts and facilitate reforms in procurement processes, including coordinating procurement across cancer treatment centers to increase efficiency. As a result, in 2022, **Nigeria** expanded their access program, coordinating procurement under the Federal Ministry of Health across 21 hospitals, up from 12 in 2021. CHAI also worked with **Zimbabwe** and **Ghana** to quantify their medication needs based on currently diagnosed patients and commonly used treatment regimens. These quantification reports helped the countries determine how much and what type of drugs they needed to procure. **Zambia** conducted a coordinated national procurement across three hospitals based on a quantification done the previous year. Combined, the forecasts suggest that across the four countries governments will incorporate over 13,700 patients and nearly US$36 million in potential medicines value. We are now working with governments to operationalize the purchase of these medicines.

Strengthening breast cancer treatment in Ethiopia

Breast cancer is the most common cancer in **Ethiopia**, representing 20 percent of all cases. In 2018, treatment for breast cancer was only available in Addis Ababa. With support from CHAI, the Tikbur Anbessa hospital, the Norwegian Cancer Society, and Norwegian Breast Cancer Association, the government has since decentralized treatment from the capital to 15 hospitals around the country. One continuing challenge is most women are diagnosed at late stages, when their prognosis is poor.

In response, in 2021, CHAI began working with three regional health bureaus on a program for early detection of breast cancer at primary hospitals, including screening with clinical breast exams, and tissue sampling with fine needle aspiration for diagnosis. These tools are recommended where there is limited health workforce both in number and skillset. By the end of December 2022, 52 primary health facilities were offering clinical breast exams, and 16 primary hospitals were providing diagnostic services using fine need aspiration. Close to 18,000 clinical breast exams have been performed since the beginning of the program—including approximately 700 people who were referred for further tests and at least 33 confirmed cases of breast cancer. ■

Program in action:

- **Kenyan oncology dashboard tool doubles number of patients receiving chemotherapy, cuts stock-outs for critical cancer medicines in half.** In 2020, the Ministry of Health in **Kenya**, in partnership with CHAI, developed an open access digital platform, the **Kenya** Oncology Dashboard Tool, to create visibility into service delivery and availability of medicines across 14 public cancer treatment centers. The centers manage over 60 percent of the total cancer patients in the country. The dashboard aggregates hospital service delivery and supply chain data in real time, provides insights into hospital performance and challenges, enables timely intervention, and informs national decision-making. Thanks to the tool, between 2021 and 2022, medication ordering rates by facilities increased from 56 percent to 82 percent. The stock out period was also cut in half for sixty-four medicines across the 14 cancer centers. Information from the dashboard was also used to advocate for resources from the government which allocated an additional US$1 million annually for procurement of medicines. Consequently, the number of new patients receiving chemotherapy on a quarterly basis has more than doubled from 3,334 to 7,759.
- **Cancer drugs added to Cameroon's national budget for first time—enabling routine procurement.** In **Cameroon**, the government did not routinely procure any cancer medicines, leading to frequent stockouts at hospital pharmacies. As a result, patients turned to the private sector for the medications they needed, paying the entire cost of treatment out of pocket, or choosing cheaper medicines of dubious quality. CHAI worked closely with the government to address this challenge. As a result, the Ministry of Health has allocated nearly US$2 million for procurement of cancer drugs annually for the next three years, and included the budget in the Law of Finance, which has been approved by parliament.

Health workers convene to disseminate cancer patient education materials at National Hospital Abuja in Nigeria. Photo credit Tony Ayenson.

20 Years of Impact

4,000+

cancer patients reached with quality medicines through the Cancer Access Partnership

US$7.5M

mobilized for procurement of cancer medicines in three countries, through evidence-based forecasting that was supported by CHAI

54%

cost savings generated for governments and patients in 12 countries; overall, US$3M in cost savings for buyers to-date

Cervical Cancer

PROGRAM OVERVIEW: Cervical cancer is one of the most preventable types of cancer, yet hundreds of thousands of women continue to die from the disease each year. Ninety percent of those deaths occur in low- and middle-income countries, often because prevention services are not available. Since 2019, CHAI, through support from Unitaid, has worked to increase access to critical tools and services to enable screening and treatment for pre-cancerous cervical lesions in partner countries.

COUNTRY PRESENCE: India, Kenya, Malawi, Nigeria, Rwanda, Senegal, South Africa, Uganda, Zambia, Zimbabwe

KEY DONORS: UNITAID, Judith Neilson Foundation, Global Health Labs

20 Years of Impact

1M+

women screened, including over 316,200 women living with HIV, across 10 project countries

85%

of women who screened positive for pre-cancer received the appropriate treatment at project sites

>40%

price reductions on critical tools, including HPV tests and portable thermal ablation treatment devices

Next 9 years

a projected 56,600 cervical cancer cases averted and 40,500 lives saved due to CHAI's program, according to impact modeling

In 2020, the World Health Organization (WHO) laid out an ambitious Cervical Cancer Elimination Strategy, outlining targets to expand access to critical interventions that will allow future generations of women to live free from cervical cancer. Screening and treatment for cervical pre-cancer figures prominently in the strategy, with targets of reaching 70 percent screening coverage and 90 percent treatment coverage of screen-positive women by 2030.

Through the Unitaid-funded Cervical Cancer Project, CHAI has been working with government partners to roll out an affordable, effective package of tools and accompanying delivery models that can put countries on track to reach the screening and treatment coverage targets laid out in the Elimination Strategy.

In 2022, we capitalized on the groundwork laid in previous years to accelerate cervical cancer screening and improve linkage to treatment and follow-up. The program screened 630,300 women, including 211,400 with HPV tests, and ensured 85 percent of eligible screen-positive women received treatment, with project sites in **Malawi**, **Nigeria**, **Rwanda**, and **Senegal** exceeding the WHO target of 90 percent treatment rates. Over the program's lifetime, over a million women were screened across all 10 countries.

Significant gains have been made across the delivery model components. With the institutionalization of clinical mentorship and supportive supervision structures, capacity of thousands of health workers across different cadres has been reinforced on the use of new and improved technologies: HPV testing for screening and thermal ablation and Loop electrosurgical excision procedure (LEEP) devices for treatment. Decentralizing access to cervical pre-cancer treatment with the use of portable handheld thermal ablation devices combined with community sensitization and robust systems for patient tracking including engagement of community health workers has proven highly effective to improve the treatment completion rates among women screened with cervical pre-cancer.

CHAI, with support from five ministries of health in **Rwanda**, **Malawi**, **Senegal**, **Zambia**, and **Zimbabwe**, spearheaded the development and field validation of Automated Visual Evaluations or AVE, an artificial intelligence-based tool for improving screening accuracy.

At the same time, we continued to build the global conditions to facilitate the scaleup of screening and treatment services for cervical pre-cancer. The average test cost for HPV remains at US$9.37, with three of four key suppliers offering global access pricing under US$9 (test only). CHAI renewed access pricing agreements with Liger and Wisap for thermal ablation devices while securing their commitment to extend global access prices until December 2024 with a reasonable margin. Meanwhile, the market for thermal ablation devices has stabilized as evidenced by the fact that 57 percent of the volume guarantee was met by procurements from designated purchasers other than CHAI. Most government partners have also endorsed HPV testing for screening and thermal ablation devices for treatment of pre-cancerous lesions in their national guidelines and scale-up plans. ■

Breadth of Impact

CHAI is building the global conditions to facilitate widespread screening and treatment for cervical pre-cancer, including lowering the cost of HPV tests and thermal ablation devices used for treatment.

A health worker discusses cervical cancer with a patient at Remera Health Center in Kigali, Rwanda. Photo credit Unitaid and CHAI / Aniket Ukey.

Diabetes, Hypertension, and Sickle Cell Disease

PROGRAM OVERVIEW: Low- and middle-income countries are disproportionally affected by non-communicable diseases (NCDs) like diabetes, hypertension, and sickle cell disease. More than 85 percent of premature deaths occur in these regions—here, NCDs are both a cause and a consequence of poverty.

In 2022, the second year of our NCD program, CHAI focused on laying the groundwork for program expansion and supporting governments to strengthen and implement their NCD prevention and control strategies.

COUNTRY PRESENCE: Cambodia, Cameroon, Eswatini, Ethiopia, Ghana, Kenya, Nigeria, Zimbabwe

KEY DONORS: The Leona M. and Harry B. Helmsley Charitable Trust, Center for Integration Science in Global Health Equity, Partners in Health, Resolve to Save Lives, European Commission

Decentralizing NCD care in Eswatini

People living with HIV are at high risk of developing and dying from NCDs. In many countries in sub-Saharan Africa, HIV services are available at the primary care level, making integrated HIV and NCD care an important way to deliver NCD screening, treatment, and care for people living with HIV.

In **Eswatini**, 50 percent of adults over the age of 40 on antiretroviral therapy are at risk of cardiovascular diseases and a quarter have hypertension. Yet less than 20 percent of the population have been diagnosed for either condition. In response, the Ministry of Health and CHAI worked to decentralize care for NCDs from tertiary to 184 primary care facilities using the WHO-PEN (Package of Essential Noncommunicable Disease Interventions for Primary Healthcare) strategy which advances early detection and management of NCDs to prevent life-threatening complications. To ensure the sustainability and effectiveness of the program, screening and care was integrated with HIV service delivery and community healthcare workers were trained on screening and counseling NCD patients. Because of these efforts, in 2022, over 72,400 patients were seen for diabetes, hypertension, and asthma, including those requiring care for both NCDs and HIV.

Improving access to insulin in Ethiopia and Kenya

Diabetes affects over half a billion people worldwide, of which 81 percent live in low- and middle-income countries. Only half of people living with diabetes are diagnosed, and in low-income countries, only about 23 percent receive treatment. For those who are diagnosed and have access to treatment, glycemic control is low. For example, in **Ethiopia**, between 16 and 27 percent of patients on treatment are estimated to have achieved glycemic control, while in **Kenya**, the estimated range is 22 to 37 percent.

In 2022, with support from the Leona M. and Harry B. Helmsley Charitable Trust, CHAI began work in **Ethiopia** and **Kenya** to improve access to affordable, quality diagnosis, treatment, and monitoring for people living with type 1 diabetes and those with type 2 diabetes who require insulin. To achieve these aims, we are engaging with manufacturers to improve affordability and availability of essential commodities including insulin, insulin delivery devices, and glucose monitors and strips. In tandem, CHAI is supporting governments to increase uptake of these products by strengthening diabetes diagnosis and care, especially at the primary healthcare level.

In 2022, CHAI conducted in-depth landscaping assessments to identify gaps in the provision of diabetes care and create a detailed understanding of the barriers to accessing insulin and related commodities. In both countries, we are playing an active role in strengthening partner coordination towards implementation of the national NCD control strategies.

In **Ethiopia**, CHAI reconvened a coalition of partners to revitalize the NCD Technical Working Group under the leadership of the Ministry of Health. CHAI currently serves as the technical working group secretariat. Under the guidance of the work group, CHAI initiated a decentralization pilot to expand access to diabetes services at the primary healthcare level. The first phase of the pilot was completed in 2022: it included three primary healthcare facilities in Addis Ababa and a referral hospital. CHAI guided updating clinical guidelines for diabetes care, updated training for over 200 physicians, nurses, health officers, and pharmacists, and together with the Ministry of Health, developed a patient education toolkit for primary health centers. As a result of the first phase of this pilot, an additional 337 people living with diabetes who require insulin are accessing treatment (an increase of 39 percent versus baseline), and glycemic control among this group has increased from 14 to 29 percent.

Sustainability of Impact

NCD screening and treatment integrated with HIV service delivery and community healthcare workers trained on screening and counseling.

Expanding access to screening for sickle cell disease

In 2022, CHAI partnered with **Ghana** to improve newborn care by expanding access to cost-effective screening services for sickle cell disease and establishing an integrated treatment management pathway. Since the program's inception, newborn screening services have expanded from two to 11 of the 16 regions within the country. Over the period of implementation, over 24,000 babies were screened. Of those screened, over 397 newborns were diagnosed with sickle cell disease and linked to care. ■

20 Years of Impact

125,400+

patients seen for NCD care at primary health facilities in Eswatini because of service decentralization

7,435

adults screened for diabetes and/or hypertension in Cambodia since July 2021 via integration with COVID-19 vaccination sites

24,000+

babies screened for sickle cell disease, with over 397 newborns diagnosed and linked to care in Ghana

District community health assistant performs blood pressure checks in the community, in Nakonde, Zambia. Photo credit Timothy Silweya.

A lab technician at Kamuzu Central Hospital in Lilongwe, Malawi. Photo credit Tewodros Emiru.

CROSS-CUTTING EXPERTS

Our global team of science, business, and technical experts support the entire organization to fundamentally change of the global health landscape. CHAI's Global Markets, Diagnostics, Global Health Sciences and Digital Health groups work with over 50 CHAI program and country teams as well as governments and companies around the world to develop new and innovative products that will transform care, secure lower prices for key commodities such as medication and diagnostics, improve laboratories and related services, and connect decision makers with the quality evidence they need to inform health policy. The impact of these groups can be seen across nearly every program milestone in this report.

At the same time, we continue to grow into new areas where we believe we can have an outsized impact on health outcomes in the countries where we work. In recent years this has included pushing for more equitable access to Assistive Technology for disabilities as well as applying our market shaping approach to the intersection of Climate and Health.

OUR PROGRAMS:

- Assistive Technology
- Digital Health
- Diagnostics
- Global Markets
- Global Health Sciences

Assistive Technology

PROGRAM OVERVIEW: Nearly a billion people, particularly in low- and middle-income countries, do not have access to the assistive technologies they need—products and services that enhance functioning like wheelchairs, hearing aids, and eyeglasses—to live healthy, productive, independent, and dignified lives. In 2019, CHAI began work with governments in 10 countries as well as other global and local partners to build and strengthen systems that integrate the provision of assistive technology into the public sector and create sustainable demand and supply for appropriate, quality assistive products.

COUNTRY PRESENCE: Cambodia, Ethiopia, Indonesia, Kenya, Lesotho, Liberia, Malawi, Mozambique, Nigeria, Rwanda, Sierra Leone, South Africa, Uganda, Zambia, Zimbabwe

KEY DONORS: ATscale, The Global Partnership for Assistive Technology; GIZ; Global Disability Innovation Hub; UNICEF

Over the last four years, CHA has provided strategic planning support to 10 countries to lay the groundwork from which governments can practically and sustainably provide assistive technology to their populations. This has ranged from supporting the development of national strategies to increase access to assistive technology to launching national priority lists for assistive products. These lists are similar to essential medicine lists, which contain the medications—or in this case products—considered to be most effective and safe to meet the most important needs in a health system. We have also set up coordination mechanisms, supported with the piloting of training packages for providing basic assistive technology at the primary health level, helped design and rollout data management systems, and motivated governments to expand their investments in assistive technology.

In 2022, CHAI began work with five additional countries: **Cambodia**, **Lesotho**, **Mozambique**, **Zambia**, and **Zimbabwe**. We used an assistive technology country capacity assessment tool—which we co-developed with the Global Disability Innovation Hub and the World Health Organization—to identify gaps and opportunities to help regulate, finance, and provide assistive technology. In **Cambodia** and **Kenya**, we supported governments to develop concept notes as they were fundraising toward larger investments.

A new US$14 million investment has also allowed us to expand our work with eight government partners: the LEGO Foundation's Build A World Of Play Challenge aims to support organizations that make substantial contributions to the lives of children under six and prioritize their access to play. Thanks to the investment we are working with countries to implement policies that integrate screening, early access to assistive technology, and access to play into health facilities and schools. ■

20 Years of Impact

5 countries

have launched national lists that prioritize essential assistive products for people with disability, for the first time ever

6 countries

have launched strategies and/or plans to increase access to assistive technology

Program in action:

- **People with disabilities die on average 10 to 20 years earlier, warns report co-authored by CHAI.** In 2022, the Missing Billion Initiative and CHAI published a report that highlights global health inequities affecting more than one billion people living with disabilities; envisions health systems that are designed to be fully inclusive; and provides a practical roadmap with targets and actions for key stakeholders. The report focuses on the fact that people with disabilities often have greater health needs but experience more barriers to accessing care because of health system failures at all levels. As a result, they experience poorer health outcomes and die on average 10-20 years earlier compared to people without disabilities. These inequities were only exacerbated by the COVID-19 pandemic. The report emphasized that as the world moves beyond the pandemic towards "building back better", health services and systems must be inclusive of people living with disabilities and offer a roadmap to achieve this.

stories of impact

Attila Yaman

Associate Director, Strategy and Investment, Global Health Workforce

I joined CHAI in 2016 after studying development economics at Yale University. During my studies, I learned about the power of randomized control trials to generate evidence-based solutions. However, I grew frustrated learning about small-scale interventions that worked when micromanaged by well-resourced foreign academics, but that were rarely scalable by the governments that inherited them. So much of what I studied demonstrated neat theories of what could work—I began to wonder how we could take the next step and support governments to find, scale, and sustain solutions that would work for them.

During my final-year capstone project, I had the opportunity to work with a team to assess health management training programs that CHAI had helped various governments develop in Ethiopia, Rwanda, and Liberia. That experience convinced me that CHAI was asking the same questions about how to build integrated government systems that could work at scale and over time. After graduation, I had the opportunity to work with CHAI on a project that combines two of the most important of those systems from my perspective: education and health.

That project was the Rwanda Human Resources for Health program, an audacious government initiative to launch 17 new specialized medical training programs and train over 4,000 health professionals in the country. While much of the development sector was churning out short-course training and procures commodities, CHAI asked the government what they really needed, and the answer was clear: they wanted their own workforce with the ability to solve the problems their health system faced.

This approach exemplifies CHAI's guiding principle of "breadth": changing the way others approach a problem so that today's transformation becomes tomorrow's wisdom. Instead of the outdated fly-in/fly-out model of medical training that offers week-long disease-specific instruction, CHAI followed the government's lead in developing a model that would bring academic faculty for years-long engagements to develop university-based training programs—as we would see in any high-resource setting. This was done using disease-specific funding at a time when health system investments of this scale were nascent. Today, thanks to the success of this program and others, health system investments are a best practice among the largest multilateral funders, and that started with the vision of governments like Rwanda's.

For me, CHAI is as much a philosophy of service as it is an organization. When I lived in Liberia, I reported to one organization, was paid by another, and sat in the CHAI office, which itself was inside the Ministry of Health. It did not matter who I worked for on paper; the CHAI way is to listen to what the government is asking for on behalf of its people, and to organize ourselves, our teams, and our funders to deliver on that request.

As trusted advisers, our primary interest is the capacity of government, not our résumés, publicity, or profit. Working behind the scenes, we are free from the burden of doing what 'looks good' and can focus on what the government is asking for. Through my experiences in Rwanda and Liberia I've realized that CHAI's philosophy of service is what ultimately guides me—and what gives our partnership with government the best chance of making long-term sustainable improvements to health systems and ultimately saving lives. ■

Digital Health

PROGRAM OVERVIEW: CHAI works hand-in-hand with governments to design, develop, scale, and institutionalize digital technologies and help them accelerate toward their public health goals. We support ministries of health to adopt technologies that serve health workers, health systems managers, and those that simplify the use of and access to data. We provide strategic and operational support to governments, working closely with end-users, global and local software technology organizations, donors, and others to influence digital health initiatives, ensure strong and thoughtful planning and coordination, and drive sustainability.

COUNTRY PRESENCE: All CHAI countries

KEY DONORS: Bill & Melinda Gates Foundation, Gavi, The Vaccine Alliance, Patrick J. McGovern Foundation, Rockefeller Foundation, SIDA, The Global Fund

Integrating and digitizing health campaigns

Public health campaigns have long been important instruments for delivering healthcare interventions for malaria, vaccine-preventable diseases, neglected tropical diseases, and most recently, COVID-19. Campaigns can be efficient tools for delivering priority health services and complement services provided routinely through integrated health systems. However, in practice, many do not achieve the desired population coverage, nor do they effectively use resources. In fact, they often operate separately from routine health services, and in some places, are not truly country-led.

Technology has the potential to catalyze local ownership and oversight of well-planned, efficiently executed campaigns that achieve higher coverage. By facilitating logistics management and improving visibility of where interventions have been delivered and what remains to be achieved, countries can efficiently achieve their health targets. CHAI and the World Health Organization's Regional Office for Africa (WHO-AFRO) have been working with ministries of health, other relevant government departments, local and international technology organizations, and campaign-implementing organizations in four countries, **Benin**, the **Democratic Republic of Congo** (**DRC**), **Kenya**, and **Nigeria**, to digitize and integrate major components of campaign activities. These activities include planning, campaign worker training, intervention delivery, payment, and monitoring and evaluation, as well as and uniting the campaigns with routine, government-owned systems, wherever possible.

For example, in **Kenya**, in 2022, CHAI galvanized the Directorate of Digital Health and Sector Performance to adopt a single interoperable and scalable platform capable of running multiple campaigns, built off the government-owned electronic community health information system (eCHIS). The platform will become a data source for the national routine health data system and a broader comprehensive health information system being developed by **Kenya**. In addition to serving as the main platform for digitizing campaigns across disease programs, the eCHIS is intended to be a core foundational system for the country, serving all cadres of community health workers with clinical decision support, data reporting, job aids, and other needs.

In the **DRC**, CHAI and the WHO collaborated with the Ministry of Health to set up an integrated campaign digitization steering committee and technical working groups. The groups are tasked with coordinating partners and developing a health sector wide approach to digitizing campaigns that will launch in 2023.

A common geo-registry platform, a common source of truth

Public health officers face substantial operational and technical challenges in understanding health data trends across different geographies over time. These challenges stem from uncertainties in the validity of geospatial data. Often, many conflicting data sources exist, there are complexities in matching geographic units across different data sources, and it can be difficult to track information as geographical units evolve over time.

Centralized, functional, and authoritative catalogs of different geographies managed within a technology platform can close these gaps. CHAI, along with partners—Health GeoLab Collaborative (HGLC) and TerraFrame—have begun to develop and scale a common geo-registry platform to facilitate geographic data management, coordination and harmonization across departments, programs, and information systems, thereby enabling a common source of truth.

In **Lao PDR**, CHAI worked with the Ministry of Health Department of Planning and Cooperation, in-country partners, including the WHO, and others to conduct a situational assessment and develop a targeted geo-registry action plan. Between 2021 and 2023, we set up a Common Geographic Information for Health technical working group, helped develop and refine master lists of health facilities and village malaria workers with geolocations, implemented a geo-registry to manage these lists, and institutionalized the platform by integrating it with DHIS2—the primary health information system in the country.

The use of the geo-registry and associated governance mechanisms, guidelines, and data quality improvements enabled strong geographic datasets between departments and stakeholders, reducing the need for multiple data sources. For example, the Center for Malariology, Parasitology, and Entomology used the village malaria worker list to ensure all high-risk villages were assigned a worker to cover it. Where there was no representation, the Center hired and trained additional workers for the high-risk village. The Center also used the list to estimate procurement and distribution needs for malaria prevention and treatment commodities, helping guide distribution and reducing stock-outs. ■

Sustainability of Impact

In the DRC, the Ministry of Health, the WHO, and CHAI set up a steering committee and technical working groups to better coordinate a health sector-wide approach to digitizing health campaigns.

Sustainability of Impact

CHAI partnered with Lao PDR and other partners to set up a common geo-registry platform to better coordinate data collection. We ensured the sustained use of the platform by integrating it with the primary health information system in the country, DHIS2.

Colleagues work on planning new community health care sites in in Banga Lubaka in Kasai, DRC. Photo credit Lisa Murray.

20 Years of Impact

10 years

of working on digital health, first through disease and country-specific initiatives and then as a cross-cutting program

5 countries

Cambodia, India, Kenya, Lao PDR, and Nigeria supported with creating national scale logistics management systems to track and manage inventory, including medical equipment, vaccines, and treatment

10+ countries

with stronger national disease surveillance systems, including digitized data collection, improved data quality, analysis and data use, and integration with other key data systems

Diagnostics

Access to testing is a critical part of the care and prevention for nearly every disease. Accurate diagnosis requires the right mix of affordable, quality technologies and effective health systems. But testing remains a critical gap for many diseases—half the world does not have access to essential tests. The COVID-19 pandemic brought this into sharp focus. Providing testing rapidly became an enormous priority for countries to track and manage spread of the disease.

CHAI supports countries to improve existing testing services and introduce and scale up new technologies so patients can be diagnosed accurately and quickly to begin treatment sooner. We work closely with government partners to support planning upgrades to testing services, cost-effective supply chains, training, and integration of testing within the wider health system. In recent years we have helped countries deliver health services used to diagnose and monitor COVID-19, HIV, tuberculosis, cervical cancer, diabetes, and hepatitis. ■

Global Markets

CHAI was founded to make treatment more equitable for millions of people living with HIV in low- and middle-income countries. Sustainable access to effective and quality assured medicines and diagnostics remains a core pillar of our approach. CHAI helps governments maximize the impact of limited funding by identifying innovative products or enabling access to existing products that improve patient outcomes while reducing costs. We assist pharmaceutical, vaccine, and diagnostics companies with strategies to expand patient access in low- and middle-income countries via various types of market interventions, from enabling effective product licensing and incentivizing accelerated new product development, to leveraging financial tools such as volume guarantees and buy-downs, and devising new product introduction strategies.

As a result, since CHAI was founded in 2002, we have completed over 140 agreements to bring the most effective drugs and diagnostics to tens of millions of people. These agreements ensure people in over 125 low- and middle-income countries can access the best products while realizing billions of dollars in savings. ■

A nurse holds the assay diluent used to combine with a few drops of blood to test for Hepatitis C in Rwamagana District, Rwanda. Photo credit Christine McNab.

Global Health Sciences

CHAI advances our collective understanding of disease and service delivery through establishing new and productive relationships and providing advice and leadership to the broader global health community. Our contributions also dramatically advance CHAI's own work across the entire lifecycle of a program. Three groups within Global Health Sciences work to:

- Ensure products purchased or recommended by CHAI meet appropriate quality standards, and ensure CHAI has rigorously assessed the availability and affordability of key products;
- Support the development and regulatory filing of new single and fixed-dose combination products, new formulations, and dose-optimized treatment regimens for adults and children;
- Provide clinical guidance on disease prevention and management, support the timely transition to optimal treatment paradigms to improve the quality of clinical service delivery; and
- Confirm the benefits and cost-effectiveness of interventions; model expected health outcomes and costs of public health programs; and accelerate the real-world implementation of highly effective interventions.

Analytics and Implementation Research

CHAI conducts implementation research on the introduction and scale-up of new products, innovations, and interventions in settings where we work. By designing and executing research informed by policy and programmatic realities, we ensure evidence is translated into action. CHAI uses analytical methods such as mathematical modeling, cost-effectiveness, analysis, and geospatial analysis to inform decision-making, and advises on how to strengthen data systems and improve data use.

Clinical Sciences

CHAI develops strategies and technologies that advance our understanding of disease and improve the delivery of health services through interpreting and sharing trends in global health, training colleagues on treatment guidelines and standards of care, and helping develop global and national public health policies. CHAI senior clinicians also use their personal experience managing patients to inform our work. This can be a valuable resource when emerging conditions lack evidence or normative guidance, as was the case for COVID-19.

Product Development, Quality, Costing, and Regulatory Affairs

CHAI accelerates affordable access to quality-assured medical products for people living in low- and middle-income countries. Working with innovator and generic suppliers and other global stakeholders across disease areas, we support product development and market introduction, while maintaining a relentless commitment to quality, safety, effectiveness, and affordability, and stringent regulatory standards. ■

Clockwise from left: (1) Group antenatal care session with cohort of pregnant women at a health facility in Kano State, Nigeria.
(2) CHAI Sierra Leone supported the Ministry of Health to launch a five-year Assistive Technology Policy and Strategic Plan. Photo credit CHAI Sierra Leone.
(3) Consultation meeting with West New Britain Province Public Health Authority in Papua New Guinea to identify the Zero Dose Children who missed the childhood vaccination. Photo credit Thynn Thynn Hlaing / CHAI.
(4) CHAI Senior Regional Immunization Coordinator Baisa Gemeda receives the Lifetime Outstanding Professional Service Award from the Ethiopia Ministry of Health. Photo credit Ethiopia MOH.

Financials

Clinton Health Access Initiative, Inc. and subsidiaries. Years ended December 31, 2021 through 2022.

Consolidated statement of activities

Revenues and support	2022	2021
Contributions	US$629,699	US$970,580
Grants	-	-
In-kind contributions	1,734,187	1,618,438
Other	447,473	103,555
Net assets released from restrictions	224,021,452	217,422,994
Total revenues, gains, and other support	**226,832,811**	**220,115,567**

Expenses		
Program services	210,435,557	203,267,889
Management and general	16,662,696	15,454,340
Fundraising	565,283	714,647
Total expenses	**227,663,536**	**219,436,876**

Consolidated statements of financial position

Assets	2022	2021
Cash and cash equivalents	US$971,127	US$14,615,257
Cash and cash equivalents limited as to use	114,818,257	108,342,070
Advances and deposits	5,669,405	1,773,519
Grants receivable	14,268,881	5,995,702
Prepaid expenses	3,003,062	1,765,326
Operating lease right-of-use asset	1,359,225	-
Property and equipment	284,832	245,053
Total assets	**140,374,789**	**132,736,927**

Liabilities and net assets		
Accounts payable	6,230,023	6,313,656
Accrued expenses	8,299,189	7,538,211
Deferred revenue	112,593,086	106,067,327
	1,275,666	-
Total liabilities	**128,397,964**	**119,919,194**

Net assets		
Without donor restrictions	9,712,264	10,542,989
With donor restrictions	2,264,561	2,274,744
Total net assets	**11,976,825**	**12,817,733**
Total liabilities and net assets	**140,374,789**	**132,736,927**

Acknowledgments

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The Susan Thompson Buffett Foundation
The Task Force on Global Health
Touch Foundation
UBS Optimus Foundation
UK Department of Health and Social Care
UK Foreign, Commonwealth and Development Office
Unitaid
United Nations Children´s Fund
United Nations Foundation
United Nations Office for Project Services
United Nations Population Fund (UNFPA)
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