COR NTD

COALITION FOR OPERATIONAL RESEARCH ON
NEGLECTED TROPICAL DISEASES

Translating Research into IMPACT

2022 Annual Report

(Front cover photo credit: Kim Won)

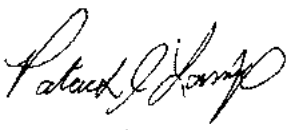
Dear Partners,

In our role as Secretariat for the Coalition for Operational Research on Neglected Tropical Diseases (COR-NTD), we are pleased to share with you our annual report for 2022. The annual report comprises the work not only of the secretariat but also the work of the Coalition—300+ partners working together to eliminate neglected tropical diseases.

Operational research (OR) is critical to achieving the bold elimination goals for NTDs outlined in the World Health Organization's (WHO) road map *(Ending the Neglect to Attain the Sustainable Development Goals: A Road Map for Neglected Tropical Diseases 2021–2030)*. Since its inception in 2013, COR-NTD has grown in both size and scope, supporting a robust research portfolio of nearly 300 OR projects and engaging more than 300 key stakeholder organizations, including ministries of health, implementing partners, researchers, and WHO. COR-NTD-supported research addresses all preventive chemotherapy (PC) NTDs as well as cross-cutting themes related to strengthening program delivery (e.g., engaging the 'never treated'), as well as monitoring and evaluation (including development of new diagnostic tools and strengthening lab capacity). COR-NTD plays an important role in the NTD community by:

1. Defining and implementing coordinated research initiatives to improve the reach and effectiveness of NTD interventions;
2. Working with WHO to translate research outputs into program guidance; and
3. Supporting countries and implementation partners to ensure research uptake.

But COR-NTD represents more than just OR. Our mission is not only to inform best practices through the development of innovative research solutions, but also to build collaborations across partners and serve populations most affected by the inequities that perpetuate NTDs. Looking forward, we are excited by the opportunities on the horizon: new diagnostic tests in the pipeline, new research on how best to reach the unreached, a new focus on refining surveillance tools and strategies, and increasing recognition of the essential role that health system strengthening plays in program success. This report provides a few snapshots highlighting our collective progress as well as brief summaries of the COR-NTD Annual Meeting and our Research Links series.



Pat Lammie
Program Director, COR-NTD Secretariat

(Photo credit:
Sonia Pelletrau)

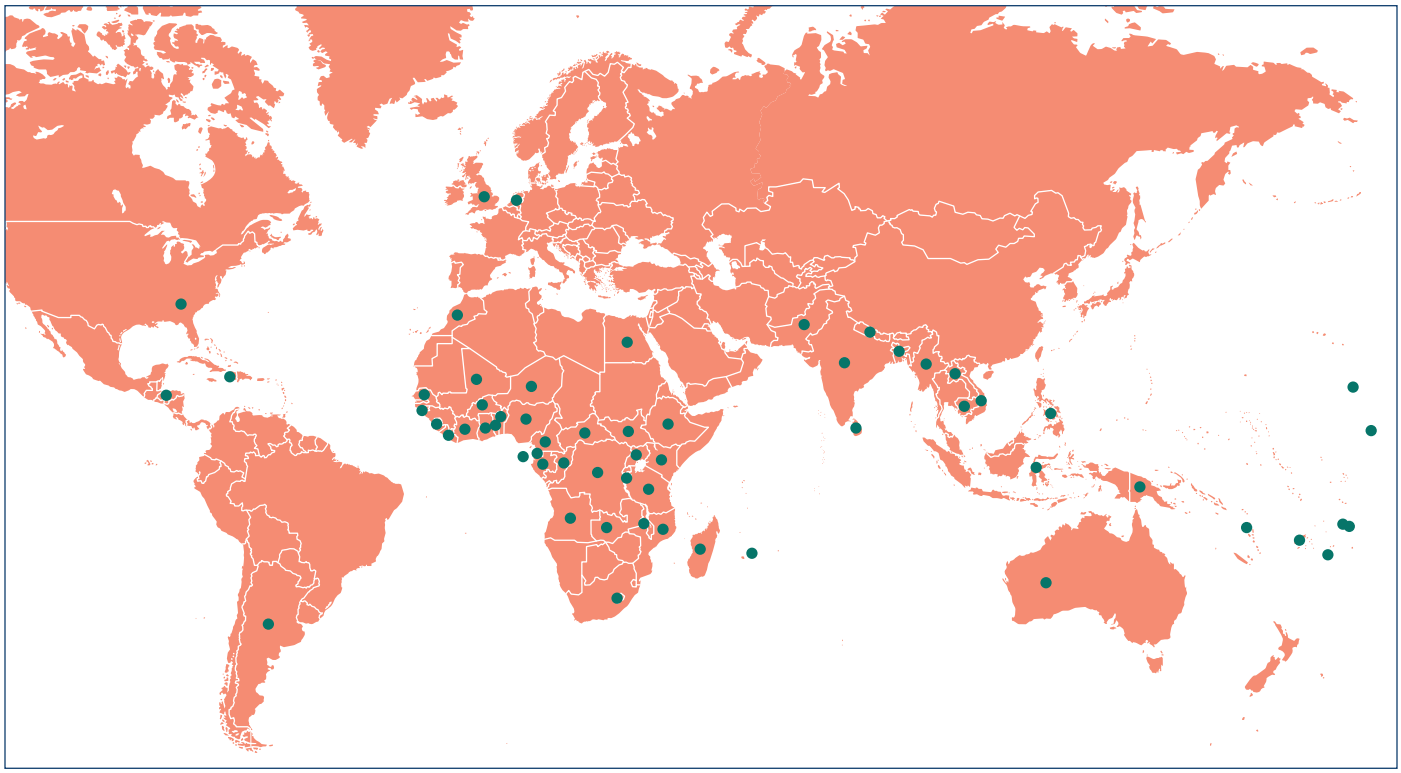
What Are NTDs?

Neglected Tropical Diseases (NTDs) affect more than a billion people worldwide and can lead to disability (including blindness and elephantiasis) as well as cognitive, social, emotional and economic harm.

People living in conditions of poverty in low- and middle-income countries disproportionately feel the effects of neglected tropical diseases. Fortunately, the tools to control and ultimately eliminate many of these diseases exist. For some NTDs, the World Health Organization recommends that populations at risk receive regular treatment using preventative medicines, which are delivered to entire populations through mass drug administration (MDA). Regular administration (typically once or twice a year) of the medicines to at-risk communities reduces the disease burden, alleviates suffering and reduces the extent, severity and long-term consequences of the morbidity in infected individuals. Approximately one-fifth of the world's population requires preventive chemotherapy (PC) for at least one of seven NTDs—lymphatic filariasis, onchocerciasis, schistosomiasis, three types of soil-transmitted helminths, and trachoma—in order to control or eliminate these infections. The uptake of preventative medicines by the population must be high for the MDA intervention to be successful. Operational research plays an important role in ensuring that communities are engaged and support MDA.

A mother gives antibiotic medication to her child in Malawi during MDA for the elimination of trachoma. (Photo credit: Billy Weeks)

63 Countries Participate in COR-NTD Research



What Is COR-NTD?

COR-NTD includes researchers, program implementers, and their partners with the shared goal of optimizing the control and elimination of neglected tropical diseases.

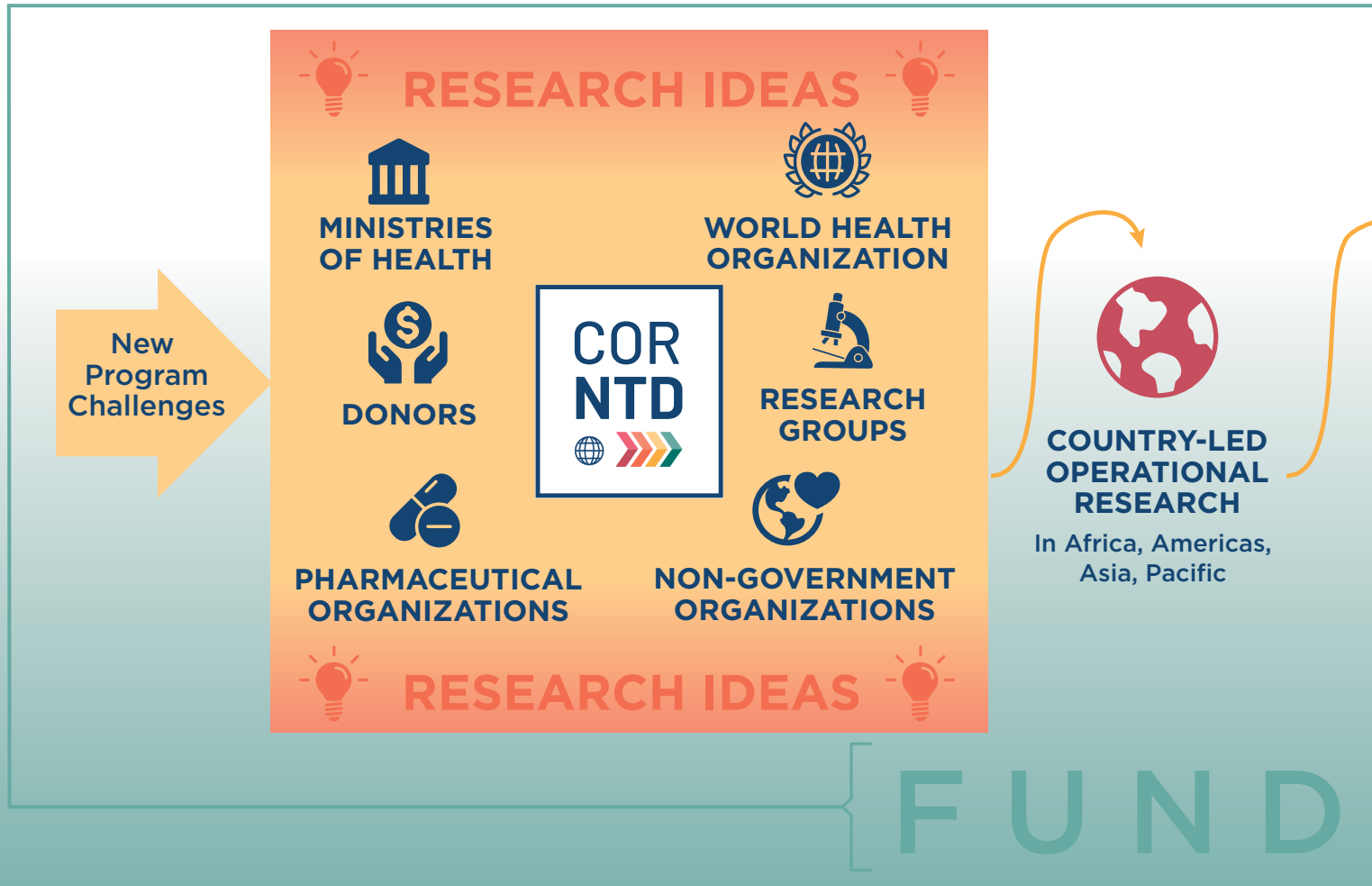
The aim of COR-NTD is to create new synergies within the operational research arena for NTDs and to align that research with programs' needs. COR-NTD is funded at The Task Force for Global Health's Neglected Tropical Disease Support Center by the Bill & Melinda Gates Foundation, the United States Agency for International Development (USAID), and U.K. Aid from the U.K. Government.

Translating Research for Global Health Impact

COR-NTD research addresses operational challenges arising as national programs strive to reach the targets of the WHO Roadmap for NTD control and elimination. For example: How do we determine where NTD interventions are needed? How can we extend the reach and effectiveness of MDA programs? How do we use new diagnostic tools to improve program decision making? How can we accelerate progress to reach elimination goals?

To answer these and other questions, COR-NTD supports research studies that are conducted collaboratively with organizations and ministries of health throughout the world. Research supported through COR-NTD has been endorsed by key WHO expert groups and is being adopted by country programs.

Our Research Model



Our Mission

To support the global effort to control and eliminate neglected diseases, which impact more than a billion people worldwide, by:

- ENGAGING PARTNERS—including ministries of health, researchers, non-government organizations (NGO), donors, and WHO—to identify and overcome knowledge gaps and other barriers to disease prevention.
- INFORMING BEST PRACTICES through operational research (OR) studies and other innovative solutions that improve and sustain health services.
- SERVING POPULATIONS most affected by the inequitable distribution of power and resources, catalyzing the elimination of NTDs for all.

INFORMING BEST PRACTICES

(Photo credit: Billy Weeks)

I: Power of Collaboration

The Need for Precision Public Health

NTD programs require accurate, reliable, and timely data to support programmatic decisions about where treatment is needed and to monitor the progress and success of NTD interventions. As programs develop and mature, infection prevalence declines and NTDs are increasingly found in smaller pockets around the globe. These pockets represent communities experiencing more significant barriers to accessing services, either culturally or geographically. Targeting these populations efficiently requires that data become more granular in order to support more precise delivery of NTD interventions and to help programs prioritize the areas and people at greatest risk.

Through improved data use and visualization, COR-NTD seeks to support stakeholders to use data effectively and rapidly to guide NTD program implementation and achieve sustainable outcomes. Supporting this shift to "precision public health" will require supporting research in a number of key areas.

Geostatistical Impact Assessments

Many NTD programs measure the impact of MDA by conducting impact assessments, often based on 30 cluster community surveys. Using new geostatistical methods, researchers at Lancaster University have determined that it is possible to design surveys based on as few as 10 clusters that have the same statistical precision as much larger surveys based on random sampling methods. These geostatistical surveys will save scarce human and financial resources. COR-NTD is supporting researchers to develop geostatistical tools that can be easily used and resourced by program managers in the operational setting.

Looking to the future, we will need:

- To support additional approaches to collect, preserve, compile, analyze, and visualize cluster-level data, facilitating in-depth geospatial data analysis.
- To develop and use new tools for electronic data collection to improve routine data management in front line health facilities. Then, the data should be integrated into health information systems where it can be used by public health practitioners.
- To adapt our survey methods to identify high risk populations and individuals in populations who serve as reservoirs of infection and maintain the cycle of NTD transmission.
- To work across public health programs to integrate NTD surveillance with other public health programs, including malaria, HIV and immunization programs. Integration will become a requirement, not an option.
- To integrate and develop new diagnostic tools and platforms that integrate serologic and molecular testing, seamlessly, across many diseases. NTDs will be left behind if we continue to rely on testing one NTD at a time.

These research efforts will help prepare NTD programs for a future guided by collaboration and innovation across diverse sectors of global health. Research will continue to be a key driver of public health success.

Reaching the Unreached

Nomadic populations are often missed when NTD programs implement mass drug administration programs. These communities miss out on the benefits of treatment and can serve as a reservoir of infection, undermining progress toward elimination goals. COR-NTD-supported research teams are using satellite imagery to identify camps where nomadic populations cluster, in order to increase their access to essential NTD treatments. Read more about this in our blog article: https://tinyurl.com/4xfawkcy

II: Evolution of Research

From Prescribing Pills to Behavioral Changes: An Approach to Disease Management and Disability Inclusion

During the past two decades, efforts to control or eliminate NTDs have been so successful that more than 50 countries have already eliminated at least one NTD. Achieving elimination means not only mapping the distribution of disease and implementing treatment through MDA, but it also means managing the long-term morbidity that results from infection and supporting the behavioral changes necessary to sustain elimination. One illustrative case comes from lymphatic filariasis (LF).

LF is caused by thread-like worms that spread from human to human through bites of infected mosquitoes. After many years with the infection, people can develop chronic manifestations of the disease: lymphedema and elephantiasis, and in men, swelling of the scrotum, called hydrocele. These conditions can be incapacitating and cause stigma that prevents affected persons from living full and productive lives. LF is a leading cause of permanent disability worldwide, with accompanying economic losses estimated in millions of dollars annually.

Even after the spread of LF has been globally eliminated, millions of currently affected patients will remain with lymphatic damage and at risk for later development of clinical disease. Therefore, understanding how to manage lymphedema and how to prevent its progression is an important research priority. COR-NTD's 'LEDoxy' project, with funds from USAID, supports research studies focused on developing a new global standard for managing lymphedema (and elephantiasis) associated with LF—in partnership with WHO and the 'TAKeOFF' project supported by the German government.

Clinical research studies, which trained patients on the use of washing and hygiene protocols with or without an additional antibiotic (doxycycline) treatment, took place at health centers in the Sahelian desert

communities of Mali, in clinics of peri-urban areas in Sri Lanka, and at a medical center hospital in an urban/peri-urban area of South India. Patients came from their homes to these centers for evaluation and care every two months. The study began its development in 2016, and each patient was followed closely under protocol for two years between 2018 and 2021. Full data analysis will be completed during 2023.

For 25 years, WHO has published documents describing 'best practices' (identified as the Essential Package of Care, EPC) for managing patients with lymphedema, but this EPC is based largely on *experiences* of clinicians and health workers, and rarely on detailed clinical trials. To create WHO guidelines requires greater rigor in data collection and analysis. The present LEDoxy/TAKeOFF trials of very large numbers of patients whose two-year management has been very closely studied, can provide the necessary documentation and insight for new WHO management guidelines to be formulated later this year. In addition, the potential for use of the antibiotic doxycycline to enhance the effectiveness of EPC can be clearly defined.

All of the new evidence-based care guidelines, informed by these studies and formulated by WHO, can then be taken up by LF affected countries. The result for those living with the disabling effects of LF will be improved long-term care, the ability to return to work or other impactful roles within their communities, and better quality of life.

How Can New Data Help Us Treat NTDs? Using Spatial Data to Improve Targeting

NTD treatment has been underway for several decades. Most endemic areas have been identified and have received some MDA in an attempt to eliminate the NTDs amenable to it. As countries move closer to elimination and the prevalence of disease declines, it becomes increasingly difficult to find the remaining pockets of infection. Operational research is needed to develop better approaches to identify these communities and strategies to ensure that they receive treatment.

For example, the default of many PC-NTD programs is to provide treatment at the district level; however, because disease prevalence may vary substantially within a district, this approach can result in over treatment of some communities. Targeting treatment at a subdistrict level may help to ensure that treatment is given to the populations that need it most, while reducing overtreatment in the areas where the drugs are no longer needed. However, distinguishing between the subdistricts that merit treatment and those that don't is not a trivial task. Specifically for schistosomiasis, there is a need to develop a sampling approach that programs can use to determine the spatial area to target the distribution of praziquantel, the drug donated to prevent schistosomiasis.

To answer these questions, COR-NTD and partners conducted a schistosomiasis oversampling study (SOS), a multi-country operational research study to help schistosomiasis programs identify optimal survey sampling method(s) for conducting impact assessments that are cost-effective, feasible for country programs and result in appropriate treatment classifications. The field work was conducted in Ghana, Mali, Togo and Cote d'Ivoire.

COR-NTD convened experts to conceptualize the study design and protocol and to draft the protocol itself with each of the individual country sites throughout the study. Country teams collected questionnaires and urine samples from upwards of 8,000 individuals despite very challenging field conditions.

"This study has been one of (if not *the*) most collaborative research efforts we've supported, with great leadership from the principal investigators and strong engagement from technical experts around the world," said Katie Gass, Director of Research, COR-NTD Secretariat.

This study is ongoing, but has already generated some important learnings:

- Actual prevalence of schistosomiasis post-MDA can differ dramatically from the predicted, reduced prevalence, due to hard-to-classify factors such as people's continuous interaction with infected water and treatment coverage (untreated individuals may carry infection and contaminate local water sources)
- Recognition that while treating areas based purely on risk is often ideal from an epidemiological perspective, it is still impractical for many programs that prefer to base treatment on a district or subdistrict for logistical reasons
- A simple dipstick for hematuria is an effective tool for diagnosing one of the forms of schistosomiasis, *S. haematobium*; it correlates very well with egg presence.

Modelers and statisticians are currently working with the data from the country sites to simulate different survey designs. A meeting of the study PIs and program managers was held in Kenya in 2023. Forthcoming, outputs will be published on our website.

"We in Ghana are in the process of organizing our data for schistosomiasis endemicity by sub-district level. The results from the SOS data have been used to populate data for sub-districts that were part of the SOS, thus paving the way for our treatment plan moving forward. We are thus so grateful."

—Dr. Kofi Asemanyi-Mensah, NTD Program Director in Ghana and study PI

III: Eliminating Health Inequities

Battling FGS: A Condition Depriving Millions of Women of Their Right to Health

The right to health means that all people should have access to the health care services they need, without suffering financial hardship, regardless of their economic status, race, gender identity, education, or geographical location.

NTDs are both a consequence and a cause of the inequitable distribution of power and resources. They largely affect communities lacking access to adequate housing, clean water and sanitation, protection from disease vectors and essential healthcare services. They cause physical disease, mental health issues, stigma, social exclusion, and perpetuate negative economic and social disadvantages in endemic communities. Specific NTDs can also disproportionately impact certain groups within disadvantaged populations, such as women, migrants, or ethnic minorities, compounding the level of inequity. More effort is required to understand who is affected, who is left out of treatment, and why, to identify solutions that make access to care more equitable and help all people realize their right to health.

Schistosomiasis, for example, is a neglected tropical disease caused by parasitic worms, second only to malaria as a parasitic disease causing death and disability. Female genital schistosomiasis (FGS) is a lesser-known clinical manifestation of schistosomiasis that affects millions of women and girls in Africa with painful, stigmatizing symptoms and can lead to serious complications. However, in many endemic countries, FGS is not incorporated into medical training; consequently, health centers lack adequately trained personnel to perform the colposcopies necessary for correct diagnosis. Because of this, FGS is often misdiagnosed or underdiagnosed, as clinicians often believe it is a sexually transmitted disease or cervical cancer instead of a malady caused by waterborne parasites that affect the urinary and genital tract.

If left untreated, FGS can lead to serious urogenital complications including bleeding, ectopic pregnancies, miscarriages, and infertility. Studies have also shown a connection between FGS, HIV and cervical cancer. Evidence suggests that women with FGS are three times more likely to contract HIV.

COR-NTD supports research studies that help address the challenges that prevent women from receiving treatment for FGS. The aim of these studies is three-fold:

1. To determine the prevalence of FGS in order to target treatment of the disease;
2. To educate and integrate FGS care into local health delivery systems; and
3. To create greater awareness in the communities and aid efforts to prevent the disease.

With the support of U.K. Aid from the U.K. government, COR-NTD and partners have conducted 10 studies in seven countries thus far. Key findings include the following observations:

- The burden of FGS is often highly variable across settings. The prevalence of FGS in women in communities in Malawi and Madagascar ranged from 22% to 87%, respectively.
- Public health approaches are feasible. Integration of FGS screening into existing sexual and reproductive health services in Zambia, Côte d'Ivoire, and Cameroon increased access to care.
- Women in at-risk communities can be helped. After undergoing training, health workers are able to effectively raise awareness of FGS, diagnose, and engage symptomatic women for treatment.

Successful results will be repurposed and expanded to other endemic communities to further improve treatment options. Increased awareness of the disease is critical so that communities understand the risks and impact of FGS. Through early diagnosis and treatment, women and girls can effectively manage their symptoms and improve their quality of life.

Using MERLA for Health Equity in the Americas

The Americas is the most inequitable region of the world in terms of health disparities within and between countries. Communicable diseases are significant drivers of both devastating health outcomes and inequality.

In 2019, the Pan American Health Organization (PAHO) launched an ambitious new Elimination Initiative (EI) targeting the elimination of 30 communicable diseases and conditions from countries in the region by 2030. Elimination goals encompass not just the transmission of the diseases, but also the morbidity, mortality and disability that they cause. This EI aims to improve health equity within the region by prioritizing people-centered health service delivery among populations in conditions of vulnerability. The approach is based on taking action to build sustainable health systems that are better equipped to respond to the needs of the populations they serve now and in the future. The EI will complement (not replace) existing vertical disease programs by strengthening health systems.

The NTD Support Center is working in collaboration with PAHO to develop a MERLA* framework and data visualization platform to measure progress towards EI goals and to draw attention to the gaps in health service delivery. More specifically, this framework will combine existing data from current health system records about disease prevalence and treatment across the Americas with information about the populations and communities served. It will enable countries to make informed decisions and take evidence-based action to adapt disease control programs according to their needs. The data will be used to allow decision-making bodies at all levels (even down to the community level) to review and adopt evidence-based policies and help local partners generate scientific evidence to inform policy. The framework will also be adaptable and flexible to fit the needs of individual countries. New data will be incorporated as available to ensure a continuous cycle of learning and updating.

** MERLA is monitoring and evaluating research and results to continuously learn, adapt and apply them for improved program effectiveness.*

ENGAGING PARTNERS

I: Sustainability and Researcher Engagement

Celebrating Five Years of the African Researchers' Small Grants Program (SGP)

Research is an important component of ensuring that NTD control programs deliver impactful results; however, the research which is carried out should be aligned with program needs and country-led. It is, however, largely due to the lack of opportunities for young scientists to lead research that African institutions have played a somewhat limited role in global research aimed at eliminating NTDs. Providing professional development opportunities via early career research grants to young African researchers represents a promising solution to address this problem. Key players in the NTD field are working to alter the status quo.

The African Researchers' Small Grants Program (SGP), implemented by the African Researchers Neglected Tropical Diseases Network (ARNTD) and funded through COR-NTD was designed to achieve this essential objective.

Launched in 2017, the African Researchers' Small Grants Program provides research funding to individual researchers based on the African continent. With this funding, they can develop solutions to the problems posed by NTDs in their home countries.

In the five years since the inception of the Small Grants Program, there have been a total of 5 cohorts, which include 1446 applicants, 66 awards for 62 awardees, and $1.5 million in research funds disseminated. Supported researchers have made significant contributions to the NTD programs in their own countries and authored 18 scientific publications.

2017 After extensive discussions between ARNTD, COR-NTD, and support from the United States Agency for International Development, the Small Grants Program was created. The first request for proposals (RFP) attracted 97 applicants and six grants were awarded.

2018 After a successful pilot of the RFP mechanism used in the first iteration of the SGP, joint funding from USAID and U.K. Aid from the U.K. Government enabled a second cohort of 18 individuals to be selected out of 108 applicants.

2019 The RFP for the third cohort resulted in a record 515 applicants from which thirteen individuals were selected to receive awards. This was also the first year that awardees were able to request up to $30,000 per grant.

2020 The SGP IV cohort consisted of 14 researchers selected from 354 applicants.

2021 SGP V was the final round of joint USAID and U.K. Aid funding. The fifth cohort received proposals from 372 applicants, 16 of whom received grants.

2022 The RFP for SGP VI was launched on 1 September 2022 and garnered nearly 300 applicants from over 15 countries. This marks the first year that additional funding was provided by the Bill & Melinda Gates Foundation.

SGP strives to support endemic country researchers and focus on gender equity. Female researchers are especially encouraged to apply and applications from women have grown exponentially. In the first five years, 21 female researchers were awarded grants through SGP.

Stories and more about the Small Grants Program researchers and their research can be found at: www.cor-ntd.org/SGP.

II: Engaging with Our Community

The Evolution of COR-NTD: 10 Years of Growth and Community Connection

Following the 2012 London Declaration on NTDs, in 2013, the Bill & Melinda Gates Foundation funded The Task Force for Global Health to build a Coalition to foster collaborative research on NTDs and better inform NTD elimination efforts. One year later, the United States Agency for International Development joined the effort and in 2017, U.K. Aid from the U.K. Government became the third major donor. More than 300 organizations worldwide are now involved in the work of the Coalition, which has grown rapidly over time.

In order to ensure that we are collaborating to achieve the best results, the Coalition has created a new communication and convening strategy to match its level of growth.

In 2022, COR-NTD conducted a stakeholder survey which informed this strategy. Members were asked questions that covered COR-NTD's role, its responsibilities to stakeholders, and endemic-country participation within the coalition. The feedback that was received was overwhelmingly positive about the organization's convenings and support for operational research on NTDs.

Survey respondents also identified key areas where COR-NTD could improve its impact. They suggested that COR-NTD do more to amplify endemic country voices, not just passively (through knowledge dissemination) but more importantly, by providing capacity building (i.e., operational training activities and workshops).

Survey participants also suggested that COR-NTD should have a greater focus on facilitating partnerships and sharing information. Another key theme was a desire for more openness and transparency about how we work and why we make the choices we do.

In 2023, the following will be included in our COR-NTD convening strategy:

- **COR-NTD will call for broader participation within the COR-NTD breakout session selection committee.**
- **COR-NTD breakout session proposals will require endemic country representation within session's planning and core agenda.**
- **A reflexivity statement will be available year round for further transparency; the communications team will keep the page updated with the latest news regarding the COR-NTD annual meeting and other important information.**

Support for the annual meeting is strong, but there is also an appetite for events and connections throughout the year to maintain engagement (Research Links Series), and to organize meetings and events outside the global north (Regional Meetings).

Based on the feedback from the 2022 stakeholder survey, several steps have been taken to enhance COR-NTD's 2023 communication and convening strategy.

In order to improve communications, COR-NTD is now present on several additional social media platforms, including Facebook, LinkedIn, and Instagram. COR-NTD will also continue to update the community through the News Roundup newsletter, mass email communications, and the COR-NTD website [www.cor-ntd.org]. These communications will include pieces for the general audience as well as our research community.

To stay up to date on all our news, make sure to follow COR-NTD. Find all of our accounts at cor-ntd.org/follow-us-social-media.

Communication and Convening Funnel

GOAL	AUDIENCE
Educate	General public
Inform	NTD Community
Convene	NTD Partners, Country Partners, Researchers
Engage	Researchers, Program Implementers
Catalyze change	NTD Community, Researchers, Program Implementers
Implement change	WHO and MoH

The principal COR-NTD activities remain popular and will continue. These include the annual meeting that was launched in 2013. This event brings together the NTD community to share information, discuss knowledge gaps and develop priorities for improving research and implementation strategies worldwide.

Also continuing are the COR-NTD technical meetings, which bring together global experts to work on a specific technical topic, and the virtual Research Links sessions introduced in 2020 due to the COVID-19 pandemic. These sessions are additional opportunities for the community to meet and discuss specific research topics in a more casual and inclusive virtual format.

These efforts complement and inform the Coalition's operational research work, ultimately informing country and global NTD program policies.

Additional measures will continue to be developed throughout 2023 in order to keep Coalition members informed and engaged with the community.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III: COR-NTD 2022 Annual Meeting

2022 COR-NTD Annual Meeting: Translating Research into Global Impact

The COR-NTD 2022 annual meeting took place virtually, Oct. 4 and 5. This meeting, which historically has provided a key opportunity for research partners and program implementers to exchange ideas, has been held virtually since the beginning of the COVID-19 pandemic. Although the in-person interactions have been missed, the virtual format has increased access to the presentations for people around the world.

Highlights of the 2022 Meeting

- **Keynote by Prof. John Gyapong, public health physician and epidemiologist, who spoke about the foundational role of operational research in the development of NTD control and elimination programs.**
- **15 breakout sessions, where scientific presentations were followed by in depth group discussions about important research themes**
- **Innovation Lab—10 innovators shared their inspired new products**
- **Kyelem Prize winner, Dr. Uche Amazigo, was honored for her passionate leadership of the African Programme for Onchocerciasis Control.**
- **Announcement of the Trachoma RFP: www.cor-ntd.org/trachomaRFP**

Recordings for all COR-NTD Annual Meeting sessions are available here: tinyurl.com/ytab77mv

Outputs from the Breakout sessions can be found at: cor-ntd.org/outputs-2022-cor-ntd-meeting

COR-NTD Annual Meeting—Breakout Sessions

Moving beyond 'business as usual' to address never treatment in LF MDA

Over the past two years, there has been a renewed focus on understanding the role that individuals never treated during mass drug administration (MDA) might play in the elimination of lymphatic filariasis (LF). Never treatment (NT) has been defined as a self-reported indicator that someone has never swallowed LF treatment. Research has interpreted the timespan of 'never treatment' differently—some report NT during any MDA rounds while other studies have indicated NT over three to five consecutive rounds. Early research from Haiti, Egypt and Samoa (Boyd et al 2010; El-Setouhy et al 2007; Coutts et al 2017) demonstrated that never treated individuals may also be mf-positive, potentially risking LF elimination goals.

The extent to which never treatment persists within an LF elimination program is not uniformly known and a concerted effort has been made to include a question on never treatment in routine programmatic monitoring and evaluation tools. A specific guide has been developed through the iCHORDS (Improving Community Health Outcomes through Research, Dialogue and Systems Strengthening) community of practice and is available for download with guidance on incorporating a question on never treatment into CES (coverage evaluation survey), SCT (supervisor's coverage tool), pre-TAS (pre-transmission assessment survey) and DQA (data quality assessment).

Several countries have agreed to include this question within their M&E tools in 2022. Results from these experiences will be presented during this session by USAID's Act to End NTDs | West and USAID/Act to End NTDs | East collaborators.

Tackling Trachoma Endgame Challenges: a two-year review of progress, outstanding and new operations research questions

In 2020, there was recognition that a small but growing proportion of districts could not reach TF<5% despite repeated MDA-TIS-MDA cycles and others had achieved the TF elimination threshold during TIS but returned to TF≥5% during TSS. Since then, important steps have been taken by the global trachoma community. In December 2021, WHO convened an informal consultation on trachoma end game challenges, which expanded opportunities for countries to consider alternative MDA strategies, such as more-frequent-than-annual MDA and encouraged the implementation of modified surveys, such geostatistical approaches or infection and serological data collection. Following the WHO consultation, certain countries with

districts with persistent and/or recrudescent trachoma developed alternative strategies; in several settings, these strategies are now being implemented. While there has been a shift in the global framework of trachoma MDA options for national trachoma programs to address districts with persistent or recrudescent trachoma, other priority questions identified during the 2020 COR-NTDs session, such as methods/tools to help predict which districts may be at-risk for becoming persistent or recrudescent are in nascent stages. It also opens the door for new OR on the alternative MDA and monitoring strategies.

Strategies to improve *Trypanosoma cruzi* screening and diagnostic testing to strengthen health systems' response to Chagas Disease

The Chagas disease global community is working hard towards the ambitious goal of eliminating Chagas disease as a public health problem (i.e., interrupting disease transmission, particularly via vector-borne and congenital routes) by 2030. Access to effective diagnostic tests and treatment must be scaled up drastically to meet this elimination goal. A confirmed diagnosis of chronic Chagas disease requires two different positive serologic tests. Variable sensitivity is reported among current clinically available tests and even varies by geographic region, presenting a particular challenge in low-prevalence settings. Additional limitations to efficient Chagas disease testing programs are that many clinical laboratories lack the equipment, reagents, and trained staff needed to carry out appropriate testing. Many new Chagas disease diagnostic tools and treatments are under study and in the developmental pipeline. While increasing availability of rapid and accurate *Trypanosoma cruzi* testing will lead to earlier detection and treatment of infected patients, anti-trypanosomal drug acquisition and distribution must be augmented proportionally to meet the increased demand for treatment.

"My favorite part of the annual meeting was the virtual option being available as more people from the around the world can participate."

—Anonymous comment from annual meeting survey

Reassessment mapping survey designs to inform intervention strategies to accelerate the interruption of transmission of soil-transmitted helminthiasis and schistosomiasis

The WHO NTD 2030 Roadmap targets for soil-transmitted helminths (STH) and schistosomiasis (SCH) have shifted from a focus on morbidity control to elimination as a public health problem, and the potential interruption of transmission. As such, there is the need for refined, reduced-cost impact assessment methodologies to assess program impact and facilitate decision making. This session showcases novel reassessment mapping methods undertaken in four countries (Rwanda, Ethiopia, Kenya and Zimbabwe) to support the development of refined treatment and intervention strategies and accelerate progress towards achieving interruption of transmission of STH and SCH.

Recent progress towards VL elimination

Substantial progress has been made toward the elimination of visceral leishmaniasis (VL) from endemic countries in Asia. To reach and sustain elimination targets, new strategies for case detection and surveillance will be required. This session will be focused on recent work toward this goal with specific presentations on: the status of VL elimination programs, options for patient case finding, diagnostic algorithms for patient screening, and integrated vector control and surveillance.

Integrated surveillance for malaria and lymphatic filariasis

Since 2000, malaria and lymphatic filariasis cases have been reduced to low levels in many disease endemic countries through efforts of national programs with the assistance of the international community. The transmission of these two diseases has become focal and heterogenous. Several lymphatic filariasis and malaria endemic countries share the same Anopheles sp. vector, and apply integrated vector management; however, national programs implement disease surveillance independent of each other. Among the responses to the COVID-19 pandemic, the Philippines has re-organized the central operations of national infectious disease programs and moved to integrate national disease programs, including surveillance, at the subnational level. It is, therefore, necessary to identify approaches that ensure the surveillance for diseases targeted for elimination is not adversely affected. The first speaker of this session will discuss how the Philippines has responded to this development and how challenges to preserving the focus on disease elimination are addressed.

Multiplex bead assays make it possible to monitor population exposure to multiple infectious disease pathogens. Standards are being developed for using serological markers for malaria and lymphatic filariasis.

Finding Goldilocks: How to determine which implementation unit is 'just right' for schistosomiasis programs?

The majority of schistosomiasis endemic countries throughout sub-Saharan Africa have successfully scaled-up preventive chemotherapy (PC) with praziquantel through either school or community platforms in districts with moderate and high infection prevalence. Surveys are now needed to evaluate the impact of the interventions and ensure resources are being directed to the areas of greatest need. But given the highly focal nature of schistosomiasis, what is the optimal sampling approach to assess disease prevalence and enable treatment decisions at a sub-district level? Recognizing this urgent gap, WHO set up a technical working group to evaluate multiple sampling strategies.

The purpose of this session is to discuss the key environmental, epidemiologic and programmatic factors that influence schistosomiasis heterogeneity and how they could be combined into a simple programmatic tool to identify the best impact assessment strategy and implementation unit for interventions.

Integrating Gender, Equity, and Social Inclusion (GESI) to reach the last mile in neglected tropical disease (NTD) elimination: From Assessment to action in Uganda and Ethiopia

This session will share information, learning, and skills from USAID's Act to End Neglected Tropical Diseases (NTDs) | East (Act | East) program, following a series of gender equity and social inclusion (GESI) assessments and subsequent community-focused root cause analysis exercises in Ethiopia and Uganda, intended to continuously gather information and pose new questions, and devise locally led strategies, for how best to reach the 'last mile' in trachoma elimination and control. The session is intended to be a practical, country-focused session that allows participants to learn from Act | East and country stakeholders who have helped facilitate the integration of GESI into national NTD programs, with assessments and root cause analysis, via the iDARE approach, as a critical component to ensuring GESI integration approaches are relevant and locally led.

Effective approaches to enhanced MDA in a setting of persistent TF

At the global level a WHO informal consultation was hosted by the International Trachoma Initiative December 7-9, 2021, during which there was agreement on defining those districts that would benefit from a modified approach, and what may be included in a modified approach. In response, ITI and the Trachoma Expert Committee (TEC) are inviting countries and partners to request additional Zithromax® for 2022 and for 2023 applications in areas that fit the criteria of "persistent" or "recrudescent" trachoma.

In this session we will focus on the programme experience in Kajiado, Kenya. Recent impact survey results show that TF is still persistent in Kajiado West, Kajiado Central / East and Kajiado South, the latter requiring multiple MDA rounds. There were instances when MDA treatment failed to reach the desired epidemiological coverage rate of ≥ 80% of the target population (2008 in the entire Kajiado, 2010 in Kajiado central; 2011 in Kajiado Central, Kajiado South and Kajiado North; and 2012 in Kajiado Central, Kajiado South and Kajiado North). This is contrary to assertions made in the annual reports of epidemiological coverage rates greater than 80%.

Hacking the Coverage Evaluation Survey (CES) for enhanced decision making

The data provided by the CES is increasingly important as country programs approach elimination for lymphatic filariasis, trachoma, and onchocerciasis and face unique challenges.Three adaptations to the standard CES methodology will be discussed during the session: additions to the questionnaire, changes to the sampling methodology, and inclusion of qualitative data collection. Questions have been added to the CES tool to capture outcomes of specific MDA improvements, such as new social mobilization approaches, distribution methods, or different timing of MDA. In Uganda, sampling has been changed to specifically target villages with high disease prevalence, low reported MDA coverage, and to attempt to better capture migrating populations. In Tanzania, qualitative data collection has been added in parallel to the quantitative data collection to elucidate deeper understanding of specific areas of behaviors and attitudes in communities with historically low MDA coverage and/or high disease prevalence. The session participants will hear about what has been learned from these adaptations as well as brainstorm what other changes could be made to the CES.

Surveillance for NTDs: Lessons learned and cross-disease implications

Pathogen surveillance for neglected tropical diseases (NTDs) is of central importance to estimating current infection burden, refining target populations, and deciding when to stop mass drug administration. Yet, there is no single agreed framework as to the necessary criteria and relevant sources of information required for an effective surveillance system. Target product profiles are well developed or in progress for most neglected tropical diseases. Better diagnostics are essential for accurate surveillance, but these improvements must be coupled

with the right surveillance approach. Passive surveillance often uses routine data and standard case definitions to regularly report cases through existing national health information systems. Active surveillance is initiated for purposes where samples are sought out from participants in endemic communities or from local health centers; it provides point estimates of prevalence that otherwise would not be available from routine health care data. Syndromic surveillance utilizes patient self-reports of symptoms that are collected at regular intervals as proxy indicators of the infection or disease. It remains an open question as to whether passive or active approaches are better suited for NTD surveillance and whether there remains a role for syndromic approaches.

Addressing persistent transmission of LF and repeated LF survey failure—experience from Asia

Countries in Asia (under the WHO Western Pacific and South-East Asia Region) have a long history of national efforts to eliminate LF. Out of 31 LF endemic countries in WHO Western Pacific and South-East Asia Region, 13 countries have been validated by WHO for having eliminated LF as a public health problem, and nine countries have been implementing triple drug therapy to date. Nevertheless, many of the remaining countries and areas are struggling to achieve reduction of LF transmission to the level where MDA is no longer required, despite multiple rounds of annual MDA with reportedly high coverage, and even after adoption of the triple drug therapy strategy. Countries with a long history of nearly two decades of annual MDA are typically facing MDA fatigue both among community members and health care providers. It is critically important at this rather early stage of rollout of the triple drug therapy strategy to identify the key factors contributing to persistent transmission of LF and repeated survey failure in part of such countries and determine targeted strategies to address these factors to revive momentum and accelerate LF elimination.

Addressing mental health needs among persons affected by NTDs

We will demonstrate the mental health-related challenges faced by persons affected by NTDs, using evidence from some of our recent studies and the literature. COR-NTD has funded several studies on NTD-related disability, stigma and mental health. We will bring together findings from three of these, one conducted in Mozambique and two in India, to compare findings, draw joint conclusions and list follow-up research questions in this field.

Introducing pediatric praziquantel for schistosomiasis control: platforms and approaches

Current schistosomiasis control efforts are mainly targeted at school-aged children, yet the World Health Organization (WHO) also recommends treatment for other at-risk populations, including preschool aged children (PSAC). The recommendation to treat PSAC is based on the recognition that PSAC may already experience morbidity and that serious morbidity in adults is the result of chronic infection over many years, potentially starting yearly in life. In response to the need for a suitable and safe drug formulation for PSAC, the multi-stakeholder Pediatric Praziquantel Consortium has developed a novel child-friendly praziquantel orodispersible tablet (ODT), ar-Praziquantel 150 mg. Compared to the praziquantel 600 mg tablets, the palatability of the newly developed ODT has been improved significantly. In addition to the improved palatability, drug administration is facilitated as the tablets are orodispersible and can alternatively be dissolved in liquid.

The phase III clinical trial in Kenya and Côte d'Ivoire to study the efficacy and safety of the new pediatric tablets in children aged three months to six years infected with *S. mansoni* or *S. haematobium* has been completed successfully in 2021. Currently, the Consortium through Merck is working towards submitting the registration file to the European Medicines Agency (EMA), with regulatory approval and WHO Essential Medicine Listing expected in early 2024. In parallel, the ar-Praziquantel access program has been launched including the ADOPT operational research project, with current work focusing on the identification of potential platforms for the distribution of the drug and a series of social science studies establishing a baseline of acceptability and perception and informing the social mobilization strategy design.

Moxidectin—A new tool for accelerating onchocerciasis elimination?

Though significant progress towards elimination has been made in many countries, onchocerciasis remains a persistent concern in a variety of settings on the African continent despite years of treatment with ivermectin. Moxidectin is a promising new treatment option that may help accelerate elimination efforts in settings with persistent transmission, but further evidence is needed to develop a formal strategy for its use at scale. Through a series of presentations and guided discussions, this session will seek to identify operational research priorities that will answer the following critical questions around the use of moxidectin as a tool for onchocerciasis elimination: What concerns do endemic countries have with regards to delivery, access, sustainability, etc.? Where will moxidectin add value for programs in Africa? What evidence is needed to inform the WHO guideline development process?

(Photo credit: Sonia Pelletrau)


Unit 4 The Alphabet
A Listening and Speaking
The first letter of the English Alphabet is A and the last letter is Z.
Read and sing the letters of the English alphabet after your teacher.
Capital letters or Big letters:
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Small letters:
a b c d e f g h i j k l m n o p q r s t u v w x y z
B Reading
Read, sing and write
a is for apple
b is for ball
c is for cup
d is for dog
e is for egg
f is for fish
g is for goat
h is for hen
Number
Words
3. a) Write numbers 1 to 25 and their words in your exercise books.
Sprite

COR-NTD Annual Meeting—Innovation Lab

A Novel Algorithm to Screen for Female Genital Schistosomiasis (FGS) in Zambia

We used behavioral, clinical, and colposcopy data from 497 adult Zambian women to build a screening algorithm for FGS that is feasible to use in government clinics. This study developed the first FGS screening algorithm, which may be a cost-effective screening tool to improve referral for diagnosis and treatment of FGS in adult women.

The Country Health Information Platform (CHIP): Using Official Annual Reporting Forms to Produce a Multi-year Interactive Dashboard for National NTD Programmes

Originally presented as a future innovation through this forum in 2020, CHIP is now an open and accessible tool via the WHO ESPEN Portal.

CHIP was conceived as a highly scalable, low-cost solution to improve national capacity for longitudinal analysis of NTD data, both to fill a gap in countries that lack a fully functional national database, and to enhance analytics in those that do through its integrated precision visualizations. Furthermore, as the source of CHIP are the JAP and TEMF, CHIP also serves to incentivize complete, timely and high-quality form submission, as submission gaps will compromise effective utility of the tool.

Early successes with CHIP have included support to the national program in Kenya to find and submit absent historic JRFs to maximize the utility of CHIP, support to the national program in Ethiopia to show how CHIP can be used as a visual enhancement to their national database, and support to national programs in Ethiopia, Kenya, Nigeria, and Zimbabwe to build capacity for analysis of NTD alongside WASH data.

Access CHIP here: espen.afro.who.int/tools-resources/chip

Real Time Tracking of CDD Activities during MDA

Kajiado county located in the southern part of Kenya and bordering Tanzania is one of the counties in Kenya that is trachoma endemic. Kajiado West has been experiencing trachoma persistence even after several rounds of Azithromycin and since 2007 it has failed to reach elimination threshold. Kajiado south on the other hand, has had recrudescence having achieved TF elimination threshold in 2017, but subsequent surveillance survey in 2020 showed an increase in TF necessitating resumption of MDA. A deeper look into the data and the challenges experienced revealed a pattern of geographical pockets of historical poor MDA coverage coinciding with high TF rates amongst children aged 1-9 years. These areas have been identified to be predominantly semi-nomadic Maasai communities. In addition, community drug distributors (CDDS) supervision has been identified to be weak.

To address these challenges and ensure enhanced MDA coverage in these areas, an innovation using real time GIS tracking and monitoring of CDDs activities has been developed. The implementation of MDA is combined with real time monitoring to allow for immediate programmatic adjustments to identify and address areas missed or where there is poor coverage. This innovation introduces a new visual tool, which tracks CDDs movement on a map, pre-populated with identified residential structures. The MDA supervisors can monitor the movements of the CDDs, visually identify if there are any locations not visited during the MDA and allow for immediate response, to confirm the structures not visited are inhabited, to verify if drugs were not delivered and ultimately deliver drugs if necessary.

CDMO for Rapid Diagnostics

We offer researchers novel contract development and manufacturing (CDMO) services for their reagents that are used in point-of-care (POC) rapid diagnostic kits. Next generation microarray rapid immunochemistry tests (multiplexed) as well as POC Molecular platforms (LAMP) also are available. Our organization is fully USA FDA compliant, USDA Biologics licensed and follows ISO 13485:2016 quality standards. Researchers that have developed new diagnostic analytes can have their biomarkers incorporated into existing platforms for evaluation, and ultimately, large volume manufacturing.

'eSkinHealth' App: An Innovative Digital Health Tool to Support Case Detection and Management of Skin NTDs and Other Skin Diseases to Reach Skin Health for All

Our 'eSkinHealth' is a tablet-based application being in development for skin neglected tropical diseases (NTDs). It serves as: 1) a portable patient chart which stores longitudinal patient records and clinical photos for improved follow-up, and 2) a tool to provide direct diagnostic and management assistance to healthcare workers in remote settings, and through teledermatology. It also supports wound management, a condition shared by several skin NTDs, by providing an automatically-calculated wound score. Importantly, we are developing our system for use in both off-line and on-line environments so that its use will not be determined by or affected by Internet access. Its further strength is that it addresses not only skin NTDs, but all skin conditions; this leads to sustainability and to a greater impact envisioning Skin Health for All, as was also described in the recently launched WHO strategic framework for integrated control and management of skin NTDs.

Bilha Toto Story Card Game

Creative practitioners "Bilha Toto" were looking for a way to get school-aged children in Kwale county to limit their contact with contaminated water during play, swimming, bath time and chores, and help them understand how this behavior exposes them to bilharzia.

Focusing on school-aged children —at once influential in the home and particularly vulnerable to schistosomiasis—the team's theory of change was that if children understood bilharzia's fundamentals through story and were also able to tell their own stories about the disease, their understanding of good behavior and its benefits would also grow.

The team developed a deck of story cards, which they used as a guided storytelling tool to build children's awareness of the disease, help them understand what practices put them at risk, and also find strategies that would keep them safe. These lessons were modeled and introduced during a school-based activity, during which children were invited to tell their own stories. Thereafter, children were given their own deck of cards to encourage them to play the game after the team's departure.

DHIS2 Supplemental Dashboard to Optimize the Use of NTD Data

We set out to design a user-friendly, intuitive digital tool to supplement and optimize the architecturally sound structure of DHIS2 which allows users to interact with, manipulate and map their data in real time with little to no training required. Such a solution would maximize the use of the data in DHIS2.

As part of the CIFF-funded ARISE (Accelerate Resilient, Innovative, and Sustainable Elimination of NTDs) programme in East Africa, we developed an interactive, flexible web application which supplements the ARISE DHIS2 database, or instance, that was developed to manage programme data over the lifetime of the project and allows users to engage with their data in real time. Users of the application range from programme MEL teams (both Ministry of Health [MOH] and partner) and data analysts to MOH NTD disease focal points, MOH NTD directors, consortium leadership, and donors.

It is important to note that this is not a parallel data storage/collection system, but a supplement to existing instances of DHIS2 aimed at optimizing the use of data already stored therein.

This innovation will optimize the use of data and tracking progress and performance, and provide the user with the ability to access, manipulate and analyze their data in real time and produce graphics and tables for presentations and reports.

DHARA-WN (Digital @ Home, Artificial Intelligence-enabled, Realtime, Appropriate Interventions for WASH & NTDs)—Critical Experiences of Implementation

DHARA-WN, in real time and at the person's home, screens, documents, understands, grades, and provides customized interventions for WASH and NTDs, universally. DHARA delivers all these with icons, images, intelligence, and interventions in an iterative modular model. The user interface of DHARA software has no language or text. It has "icons" that are understood universally and developed iteratively.

Training local grassroots level health care workers using DHARA is 5 times faster; 'visit to value generation' through icons and images is done in real time and is 10 times faster compared to analog paper-based processes. We share 'snapshots' of the digital literacy assessment process of local women, their training process, and implementation process of this innovation by the trained women, along with early learnings for discussion.

Creating Visibility Around the Diagnostic Landscape for NTDs

FIND, the global alliance for diagnostics, a WHO Collaborating Centre, is working to create visibility around the diagnostic landscape for NTDs, through development of an open-access online portal for NTD diagnostics, which in the first instance will focus on Buruli ulcer, Chagas disease, human African trypanosomiasis, lymphatic filariasis, onchocerciasis, schistosomiasis and visceral leishmaniasis. Moving forward, we will extend the scope to include all 20 NTDs.

A New Set of Micro Planning Tools for NTD Preventive Chemotherapy Campaign Planning and Monitoring

A new set of NTD-specific micro planning tools have been adapted from innovations and learning from malaria campaigns. These tools are available for governments and stakeholders to improve the effectiveness of NTD preventive chemotherapy campaigns through a better understanding of the size and distribution of the target population, more efficient drug and HR allocation, improved supervision and accountability, and faster and more accurate reporting.

IV: COR-NTD Technical Meetings

COR-NTD conducts Technical Meetings to convene NTD community experts to discuss research data results and guide policy decision-making in the treatment and surveillance of NTDs. In 2022, the following Technical Meetings were supported by COR-NTD.

Schistosomiasis (SCH) Oversampling Technical Advisory Group (TAG) Meeting (January 17, 2022)

The purpose of this meeting was to update TAG members on field progress and get feedback on protocol modifications and analysis plans. The TAG appreciated hearing about the field work in Ghana and seeing the preliminary results. There was a lot of discussion regarding the heterogeneity of S. haematobium prevalence seen across the three districts, which ranged from some villages along Lake Volta with 50% prevalence to more inland villages with 0% prevalence. The TAG recommends that field teams immediately conduct additional sampling in a neighboring community when the observed sample size in the selected community is small. It was noted that clear guidance on how to pick these neighboring communities will be necessary. Read the full report: cor-ntd.org/resources/sch-oversampling-technical-advisory-group-meeting-0

SCH Oversampling Technical Advisory Group Meeting (July 7, 2022)

It is important that any new impact assessment surveys being considered for SCH adhere to a survey design that is feasible and meets the needs of SCH programs. Consequently, a SurveyMonkey questionnaire was circulated to SCH program managers and experts via ESPEN with the aim of understanding 1) how are programs currently conducting their SCH assessments; 2) what information do programs readily have at their disposal that might lend itself to new impact assessment designs; and 3) what survey designs would be most feasible for NTD program. This questionnaire was followed up by a virtual consultation with program managers and SCH experts to further discuss their preferences for a new survey design. The results of this questionnaire and consultation were presented and discussed. Read the full report: cor-ntd.org/resources/sch-oversampling-technical-advisory-group-meeting

Xenomonitoring as a Tool for Lymphatic Filariasis Post-Validation Surveillance (August 24, 2022)

Surveillance tools are very important in reaching and sustaining elimination goals, as the lack of appropriate diagnostic tools has been a challenge across all NTDs. Lymphatic filariasis (LF) elimination efforts were already supported by the target product profiles (TPPs) for LF, or guidelines for developing diagnostic tests for monitoring and surveillance efforts, but a similar TPP for xenomonitoring (of mosquitoes) for LF was lacking. The aim of this meeting was to review the current landscape and help the research community understand what role xenomonitoring might play in the surveillance of LF. Read the full report or watch the recording: cor-ntd.org/resources/xenomonitoring-tool-lymphatic-filariasis-post-validation-surveillance

SCH Oversampling Technical Meeting (October 27-28, 2022)

The purpose of the SCH Oversampling Study (SOS) technical results meeting was to review the fine-scale SCH prevalence surfaces generated from the SOS study sites, to discuss the different survey sampling simulations, and start identifying an impact assessment strategy for SCH programs. The country-level results highlighted that even after 5-6 rounds of MDA, the prevalence of SCH can remain highly heterogeneous, with some villages having well above 50% prevalence while others in close proximity are near 0%. In several settings the heterogeneity extended below the sub-district level, underscoring the importance of having a flexible strategy for defining implementation and evaluation units to fit the local context. The participants generally agreed that relying on the mean prevalence for treatment decision making would mask the observed heterogeneity; instead, a treatment strategy that incorporates village level prevalence in decision making will be important. The data presented indicated that the urine dipstick is an effective diagnostic for *S. haematobium*; it correlates very well with egg presence and a strong reading ('level 5') is highly correlated with heavy intensity infections. Read the full report: cor-ntd.org/resources/schistosomiasis-oversampling-study-sos-technical-results-meeting

Integrated Surveillance Technical Meeting (October 27, 2022)

The purpose of the meeting on integrated surveillance was to review surveillance platforms that provide models or opportunities for NTDs and to discuss country experiences applying different approaches to integrated surveillance. Among platforms reviewed were WHO's systems for Integrated Disease Surveillance and Response and Malaria Surveillance. These systems are supported by tool kits that provide countries with guidance on how to develop and operationalize their surveillance strategies. New tools for surveillance, including integrated xenomonitoring and serosurveillance, also provide important opportunities to integrate NTD surveillance into systems established for routine data collection for other public health programs. The use of multiplex bead assays (MBA), in particular, has increased dramatically over the past few years, with an increased appreciation of the cost savings that can be afforded by testing dried blood spots (DBS) for antibodies to multiple antigens in a single assay.

Pan American Health Organization (PAHO) was among the first global health agencies to see the potential for the public health application of this technology and in collaboration with U.S. Centers for Disease Control, has provided technical support to several countries that are using multiplex bead assay (MBA) to test dried blood spots generated through country-designed surveys. PAHO has also published guidance for countries on how to design and carry out integrated surveys. Meeting participants identified a number of challenges that will need to be addressed in order to scale up laboratory-based tools to support integrated surveillance. Startup costs to set up a lab can be significant, training opportunities are limited and reagents needed to support integrated molecular and serological surveillance are not readily available. The quality of the data generated by MBA assays is also disease-dependent. Well-established assays with good biomarkers are available for malaria and vaccine-preventable diseases, but the currently available biomarkers for many NTDs require further validation.

Never Treatment Technical Meeting (October 28, 2022)

The objective of this meeting was to review progress on never treatment research, program experiences and modeling data; discuss possible programmatic responses to different levels of never treatment detected through routine data collection; and identify next steps. The next steps:

- Further rollout of integration of NT question into programmatic data tools
- Identify data needed by modelers; discuss possible mechanisms to share data
- Define what is needed to help programs tackle never treatment; identify mechanisms to package and share results from current and future OR
- Define further OR questions

Read the full report: cor-ntd.org/resources/never-treatment-meeting-report-october-2022

IDA Technical Meeting (October 29, 2022)

The purpose of the IDA Technical meeting was two-fold. Firstly, the meeting was the first opportunity in three years to bring together the principal investigators from each of the IDA monitoring and evaluation (M&E) operational research study sites. The principal investigators presented summaries from each of the study sites, using a standard template to facilitate comparison across sites; participants were able to review the most recent M&E study data and prioritize secondary analyses to further drive the LF elimination agenda. Secondly, the meeting also created an opportunity for WHO regional focal points, country program managers, and technical partners to review country experiences implementing IDA impact assessments. Meeting participants were then able to discuss current and future state best practice advice to countries needing to implement IDA Impact Surveys in the coming years. Read the full report: cor-ntd.org/resources/ida-technical-meeting

"The LF xenomonitoring meeting was an excellent opportunity to bring together key stakeholders in an effort to advance this important topic. Meeting participants generated critical outputs on the use case, the methodology, and the research priorities that will serve as an important foundation in the process of making xenomonitoring a useful and reliable tool for LF program surveillance efforts globally."

—Lee Hundley, Associate Director of Programs, COR-NTD Secretariat

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