TDR For research on diseases of poverty

UNICEF • UNDP • World Bank • WHO

TDR Expected Results

Progress 2022–2023 and Strategic Plans 2024–2025

Research for Implementation

Expected Result: 1.1.1

Title: Country preparedness for disease outbreaks

Strategic Work Area: Research for implementation **Workstream:** Research for implementation

ER type:	Evolved	**Funding type:**	UD and DF
Start date:	1/1/2013	**End date:**	31/12/2025
ER status:	On Track	**Comment:**	
WHO region:	Global		
Partners:	Endemic country programmes and researchers, WHO regional offices		
Diseases:	Arboviral diseases; Arboviruses; Chikungunya; Dengue; Vector-borne diseases		
Review mechanism:	Scientific working group + other ad hoc or collaboration-based review systems as appropriate		

ER manager: Corinne Simone Collette MERLE

Team: Michelle Villasol, Corinne Merle, Gildas Yahouedo

Number of people working on projects: 120

FENSA clearance obtained for all Non-State Actors? Yes

Justification for no FENSA clearance: Obtained when applicable but so far all partners are governmental institutions

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	Yes	Build strengths:	Yes
Reduce burden:	No	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	Objectives aligned
Roles complimentary:	Yes	Complementary role and responsabilities
Coordination transparent:	Yes	Transparent coordination
Visibility:	Yes	Visibility of TDR higlighted

Objectives and results chain

Approach to ensure uptake:	National control programmes and WHO (HQ, ROs) fully involved in research planning, implementation and analysis
Up-take/Use Indicator:	TDR outputs considered among evidence informing guidelines and policy decisions or control programme advisory committee recommendations
Gender and geographic equity:	Gender specific Zika issues as they relate to outbreak surveillance and response will be taken into account during research design. All affected regions are considered.
Publication plan:	Scientific meetings, Open access journals, TDR website
Up-take/use indicator target date:	31/12/2023

Sustainable Development Goals

Good Health and Well-being; Reduced Inequality; Partnerships to achieve the Goal

Concept and approach

Rationale:	1. Dengue and Zika outbreaks have shown the importance of coping capacity (surge capacity) and case management under disease outbreak conditions. Availability of training materials based on lessons learnt in past outbreaks will facilitate and accelerate adequate managerial response during the next epidemic. 2. Dengue, Chikungunya and Zika virus outbreak surveillance and response tools are needed. T DR is working with countries and researchers to identify signals that can alert country control programmes to an impending dengue outbreak. This has led to a model contingency plan and an Early Warning and Response System (EWARS) for arbovirus outbreaks. Countries can test and potentially customize this to apply to other arboviral diseases, such as Zika, chikungunya, yellow fever, and other infectious diseases.. 3. There is an arbovirus outbreak threat in Africa because of Urbanization and climate Change. TDR led in collaboration with the WHO NTD department and WHO AFRO region a survey in the 47 countries of the AFRO region for evaluating their capacities for surveillance and control of Arbovirus diseases (AVD). This report was finalised in 2022 and discussed in a regional meeting organised with the WHO regional office of Africa. It will lead to the development of a regional response and the launch of implementation research/capacity strengthening projects to address VBD outbreak threat.
Design and methodology:	Development of an Early Warning System (EWARS) to predict arboviral disease outbreak and integration of this system into the surveillance system of supported countries with training of relevant countries 'staff for using it and trigger vector control actions. Cross sectional survey to estimate countries capacities and gaps in terms of arboviral diseases surveillance and control - based on the results, discussion & consultations with key stakeholders for the development of a regional response for the African region.
Approach to ensure quality:	Scientific working group and, as applicable, other expert review of proposals, progress reports, monitoring of application of the research protocol.

ER Objectives

To enable countries to improve their response capacity to arboviruses outbreaks and other diseases outbreaks

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Lack of interest outside epidemic peaks resulting in insufficient funding**
Actions To Mitigate Risk	Raise awareness of potential donors; explore alternative ways of supporting work
Mitigation Status	On Track
Biennium	**2024-2025**
Risk Description	**Lack of interest outside epidemic peaks resulting in insufficient funding**
Actions To Mitigate Risk	Raise awareness of potential donors; explore alternative ways of supporting work
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**Expanded countries' capacities to use EWARS tool**
Output Indicator	Number of countries using EWARS tool
Output Target Date	31/12/2023

Output Progress Status	On Track
Output Progress Description	
Output Description	**Strengthened capacities of African countries in terms of disease outbreaks response**
Output Indicator	situation analysis report
Output Target Date	31/12/2023
Output Progress Status	Completed
Output Progress Description	
Biennium	**2024-2025**
Output Description	**Integration of EWARS in countries 'surveillance system**
Output Indicator	Number of countries using EWARS tool as integrated tool in their surveillance system
Output Target Date	31/12/2025
Output Progress Status	On Track
Output Progress Description	

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Country preparedness and policy decisions for arbovirus outbreaks informed or facilitated by TDR outputs**
Progress made towards outcome	The Early Warning Response for dengue Outbreak (EWARS) is used by 17 countries. Evaluation studies to measure the impact of EWARS on dengue control are ongoing in Thailand and Colombia
Biennium	**2024-2025**
Outcome description	**Country preparedness and policy decisions for arbovirus outbreaks informed or facilitated by TDR outputs**
Progress made towards outcome	

Expected Result: 1.1.4

Title: Country resilience to the threat of drug-resistant infections

Strategic Work Area: Research for implementation **Workstream:** Research for implementation

ER type:	Continuing	**Funding type:**	UD and DF
Start date:	1/1/2018	**End date:**	31/12/2023
ER status:	On Track	**Comment:**	74 research projects completed, 71% influenced policy and/or practice; 86% of trainees are applying their skills to AMR practice and 25% of trainees became mentors indicating health system benefit and capacity built

WHO region: Global

Partners: 7 WHO country offices, National AMR committees, 69 implementing partners including NGOs, research and academic institutions, relevant MoH departments/programmes, hospitals/clinics in selected countries. Fleming Fund and NIHR (funder)

Diseases: Not Disease-Specific

Review mechanism: Scientific working group + other adhoc or collaboration-based review systems as appropriate

ER manager: Rony ZACHARIAH

Team: Abraham Aseffa, Ekua Johnson, Garry Aslanyan, Corinne Merle, Annette Kuesel, Mohammed Khogali, Michelle Villasol, Maier Mary, Abdul Masoudi, Mariam Otmani del Bario, Kamau Eddy, Terry Robert, Zachariah Rony

Number of people working on projects: 14

FENSA clearance obtained for all Non-State Actors? No

Justification for no FENSA clearance: Obtained when applicable

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	Yes	Build strengths:	Yes
Reduce burden:	Yes	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	Aligned
Roles complimentary:	Yes	WHO country offices and SORT IT partners leverage their local convening power and allow use of their trained and experienced human resources for implementation
Coordination transparent:	Yes	All research subjects and participants are endorsed by national AMR selection committees, data and publications are open access, Phone calls each month with partners, all reports shared widely. SORT IT selection criteria and SOPs established.
Visibility:	Yes	The TDR website is updated every quarter and all reports and training documents include the required Logos. All published studies are open access and disseminated through various channels

Objectives and results chain

Approach to ensure uptake: Early engagement with those expected to use the results, regular updates to stake holders and relevant programmes and active involvement of relevant stakeholders in planning, implementation, consultations, policy and issue briefs. A new training module on building capacity for effective research communication was developed.

Up-take/Use Indicator:	New or updated/improved guidelines , policies, implementation plans and/or practice (as applicable) informed by TDR outputs
Gender and geographic equity:	Beneficiaries: Drug resistance affects both sexes alike. Geographic equity will be dependent on the disease addressed and the target countries which currently include selected countries in Africa, Asia and Latin America. Calls for proposals include the statement that TDR is committed to Equality, Diversity and Inclusivity in science. Researchers are encouraged to apply whatever their gender identity, sexual orientation, ethnicity, religious, cultural and social backgrounds, or (dis)ability status. Collaborators will be those participating in the preparation and submission of the proposal funded by third parties - if applicable.
Publication plan:	Scientific meetings, Open access journals, TDR website, TDR-gateway, Partner websites, published annual reports
Up-take/use indicator target date:	31/12/2025

Sustainable Development Goals

Good Health and Well-being; Quality Education; Gender Equality; Clean Water and Sanitation; Industry, Innovation and Infrastructure; Responsible Consumption and Production; Life Below Water; Life on Land; Partnerships to achieve the Goal

Concept and approach

Rationale:	AMR is a global public health challenge that makes standard treatments ineffective and allows infections to persist and spread. To implement effective plans for containment of /response to emerging drug resistance, countries need support for: 1. Building sustainable local capacity to conduct operational research and for using programme data 2. Improving understanding of AMR along the strategic pillars : a) Strengthen surveillance, monitoring and reporting b) Reduce incidence of infection (health facilities, community, animal health) c) Optimize use of anti-microbials (human, veterinary, agriculture) d) Make sustainable investments in new diagnostics and measuring burden 3. Building sustainable structures and processes for evidence-informed decision-making and knowledge management to maximize broader research impact.
Design and methodology:	The approach involves early and multi-disciplinary involvement with those expected to use the results as appropriate and includes the proven SORT IT approach to generating evidence for informed decision making. Research questions are aligned to country priorities and the training model includes 3 pillars namely 1) research implementation 2) capacity building and 3) global engagement
Approach to ensure quality:	Selection of countries, partners and trainees are guided by specific selection criteria, projects and are followed up and monitored; selection of investigators involve specific eligibility criteria including appropriate expertise through review of their proposals by experienced technical committees complemented by external subject matter experts, and with specific training activities, as applicable. The SORT IT approach has its own built-in quality and performance standards which are monitored and reported on a quarterly basis.

ER Objectives

1. Support countries in developing practical approaches to implementation of effective strategies for preventing, detecting and containing drug resistant infections.

2. Build sustainable capacity to conduct operational research using "one health" data and use the generated knowledge for informed-decision making to improve public health

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Lack of continued engagement from WHO country offices and AMR national committees**

Actions To Mitigate Risk	Continue close collaboration with WHO country offices, AMR committees and implementers throughout the project cycle. Provide additional financial, human resources and implementation support to WHO Country offices and AMR committees
Mitigation Status	On Track
Biennium	**2024-2025**
Risk Description	**Insufficient funding**
Actions To Mitigate Risk	Expand the scope of fund raising activities
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**Strategies for monitoring and responding to potential emergence of drug resistance**
Output Indicator	Report to scientific working group (and DF agency, as applicable)
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	Of 74 studies completed, 47% were focused on improving monitoring and evaluation systems which is the pillar 2 of the Global AMR action plan. The findings of these studies are currently being moved to action. In 2023/2024, we will formally evaluate the impact of the implemented interventions on improving the monitoring system in countries. We have also completed 21 studies through impact grants and these studies have helped better understand the complexities behind AMR in countries
Output Description	**Documentation of practical approaches to improve targeted treatment and reduce drug misuse and risk of resistance development and spread**
Output Indicator	Reports/publications made available
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	74 completed studies and evidence briefs. Of the first 36 SORT IT studies from Asia and Africa that were assessed 12 months after completion, 71% influenced policy and/or practice on approaches related to reducing drug misuse and reducing the risk of resistance development and spread. In terms of applying acquired skills from SORT IT, 86% of trainees are applying their skills to AMR practice, 56% to the COVID-19 response and 64% completed a new research study. To date, 25% of those trained became mentors after one training cycle. These figures indicate collateral benefits to the health system and capacity built within the health system to use practical skills that were acquired.
Output Description	**OR/IR strategies for countries to build effective systems for monitoring and responding to emerging drug resistance of all relevant infectious agents**
Output Indicator	Strategies endorsed by stakeholders at relevant levels
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	72 operational research studies completed and 65 published. About 50% of all studies are focused on improving surveillance which is the pulse of monitoring and evaluations systems for AMR. The findings of these studies are being moved to action to influence policy and/or practices
Biennium	**2024-2025**
Output Description	**Documentation of practical approaches to improve targeted treatment and reduce drug misuse and risk of resistance development and spread**

Output Indicator	Reports/publications and examples of good practice made available
Output Target Date	31/12/2025
Output Description	**OR/IR strategies for countries to build effective systems for monitoring and responding to emerging drug resistance of all relevant infectious agents**
Output Indicator	Strategies and activities endorsed by stakeholders at relevant levels
Output Target Date	31/12/2025

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Guidelines, policies or policy implementation plans (as applicable) informed by TDR outputs**
Progress made towards outcome	74 research studies completed, 215 individuals from 7 countries trained. Of the first 36 studies from Asia and Africa that were assessed 12 months after completion, 71% influenced policy and/or practice. In terms of applying acquired skills from SORT IT, 86% of trainees are applying their skills to AMR practice, 56% to the COVID-19 response and 64% completed a new research study. To date, 25% of those trained became mentors after one training cycle. These figures indicate collateral benefits to the health system and capacity built. 69 partner institutions joined hands with TDR as part of a global partnership to tackle AMR
Outcome description	**National capacity to tackle antimicrobial resistance built**
Progress made towards outcome	215 individuals from 7 countries trained on implementation research including health workers, WHO country office staff, academia and former alumni. Of those trained roughly 65% completed a new research study. To date, 25% of those trained became mentors after one training cycle. These figures indicate capacity built.
Biennium	**2024-2025**
Outcome description	**Guidelines, policies or policy implementation plans (as applicable) informed by TDR outputs**
Progress made towards outcome	Completed research will be assessed for impact in 2024 and new research studies that are relevant to countries will be started

Expected Result: 1.1.5

Title: Directions for development and accelerated access to new tools and strategies

Strategic Work Area: Research for implementation **Workstream:** Research for implementation

ER type:	Continuing	**Funding type:**	UD
Start date:	1/1/2018	**End date:**	31/12/2025
ER status:	On Track	**Comment:**	For Internal Use: Broader accessibility of the E.R. to whole Unit will be ensured for best utilization of opportunities

WHO region: Global

Partners: TBD

Diseases: Not Disease-Specific

Review mechanism: Scientific working group + other ad hoc or collaboration-based review systems as appropriate

ER manager: Abraham Aseffa ARMIDIE

Team: Annette Kuesel, Corinne Merle, Florence Fouque, Bernadette Ramirez, Mariam Otmani, Rony Zachariah, Abdul Masoudi, Ekua Johnson, Michelle Villasol, Daniel Hollies

Number of people working on projects:

FENSA clearance obtained for all Non-State Actors? Yes

Justification for no FENSA clearance: Clearance obtained when applicable.

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	No	Address knowledge gaps:	Yes
Integrate mandates:	No	Build strengths:	Yes
Reduce burden:	No	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	Yes still apply
Roles complimentary:	Yes	Yes still apply
Coordination transparent:	Yes	Yes still apply
Visibility:	Yes	Yes, still apply

Objectives and results chain

Approach to ensure uptake: Quality of work generated and inclusiveness of stakeholders will underpin these activities

Up-take/Use Indicator: Number of: a) projects/initiatives which take into account TDR contributions/directions; and b) researchers, developers, organizations, funders utilizing TDR input/output

Gender and geographic equity: Gender and geographic equity considerations will be included

Publication plan: TBD

Up-take/use indicator target date:	31/12/2023

Sustainable Development Goals

Good Health and Well-being

Concept and approach

Rationale:	Control programme objectives cannot be reached for many poverty-related infectious diseases, especially NTDs, because they lack new effective and safe tools for their diagnosis and treatment, as well as efficient methods for quantifying the effect.
Design and methodology:	Inclusiveness and openness are the guiding principles. The scope of this project covers essential, intertwined elements to develop and assess the right tools that will help achieve control and elimination targets.
Approach to ensure quality:	The entire project will be open to public scrutiny by definition, which will ensure quality.

ER Objectives

1. Foster innovation to fill gaps in new products for neglected infections
2. Engage stakeholders
3. Identify priorities, opportunities

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Resistance to change by key stakeholders unwilling to adopt new solutions**
Actions To Mitigate Risk	Achieving critical mass of supporters; showing concrete results
Mitigation Status	On Track
Biennium	**2024-2025**
Risk Description	**Resistance to change by key stakeholders unwilling to adopt new solutions**
Actions To Mitigate Risk	Achieving critical mass of supporters; showing concrete results
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**Outputs of TDR research projects and TDR staff and adviser expertise used to provide directional perspective for R&D new tools (including advice/support to R&D sponsors) as well as new ways of implementing the tools**
Output Indicator	Number of R&D initiatives informed by TDR research project output or TDR staff /adviser expertise (at least 4 by 2023)
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	Progress in 2022: Output informed by TDR Research Project: Lessons learned from TDR supported implementation

research on elimination of visceral leishmaniasis in the Indian subcontinent are proving valuable in the development of a strategic framework for VL elimination in East Africa.

Ongoing contributions:

1. Technical support to WHO:

Membership to several steering committees (e.g. WHO/NTD, One Heath, PHSM, etc.) as well as assistance in administrative functions [2022 meetings supported: PBAC35 and EB150, PBAC36 WHA75 and EB151]. Support to GMP on WHO document translation into French, 20% consultancy time 6 weeks.1. Generic protocols/toolkits developed for digital technologies in TB (details described in ER 1.2.6)

2. Other technical support:

Expert advice provided to development of moxidectin for onchocerciasis elimination.

3. Review, compilation and publication of unpublished data and experience of the onchocerciasis control programme in west Africa and peer-reviewed literature on the role of the vector in transmission of o. Volvulus, vector-related considerations for criteria for elimination of transmission and diagnostics for post-intervention surveillance:
With the objectives of onchocerciasis endemic countries now being elimination of transmission of the parasite ((https://www.who.int/news/item/30-01-2021-neglected-tropical-diseases-who-launches-new-road-map-to-end-suffering-by-2030,
https://www.who.int/publications/i/item/9789240010352) understanding the role of the vector (Simulium spp.) in transmission is becoming critically important to ensure that countries continue interventions as long as but not longer than needed.
While the strategy of the African Programme for Onchocerciasis Control (APOC, 1995-2015) and the Onchocerciasis Elimination Program for the Americas (OEPA, 1991 to date) was based on mass drug administration of ivermectin, the strategy of the Onchocerciasis Control Programme in West Africa (OCP, 1974-2002) was based on vector control. Consequently, a significant amount of understanding of the role of the vector for parasite transmission as well as operational knowledge relevant to e.g. breeding site identification and vector capture was accumulated in the OCP. This knowledge will be valuable to inform onchocerciasis elimination efforts across Africa.
Furthermore, the OCP evaluated a number of diagnostics in the context of post-intervention surveillance.
The OCP worked with numerous national and international experts on an ad-hoc basis and as members of its external technical advisory committee, the ?Joint Programme Committee? (JPC) which advised on basic as well as operational research. Furthermore, the JCP reviewed the research and operations outcomes summarized by the OCP in reports.
The vast majority of this work was never published in peer reviewed journals and the results, conclusions and lessons learnt are thus not available to be taken into account by countries, to train new generations of entomologists or for systematic reviews informing WHO guidelines.
Recently, documents generated by the OCP have become publicly available on the WHO Institutional Repository for Information Sharing (WHO iris)
(https://apps.who.int/iris/handle/10665/274421) . Search of this collection for ?OCP? shows 2675 documents. The fact that many OCP documents cover numerous topics combined with inaccurate labelling of the documents at the time of uploading into WHO iris and the limitations of the WHO iris search engine and export features, make identification and retrieval of documents addressing specific topics very time consuming. This restricts the extent to which the documented and expert-reviewed OCP experience can inform todays onchocerciasis elimination efforts.
In 2021, an APW was awarded to the Noguchi Memorial Institute for Medical Research to extract and review all OCP documents, summarize the lessons learnt in peer reviewed publications involving entomologists from different onchocerciasis endemic countries to strengthen their capacity in Simulium entomology.

Progress in 2022: A total of 3091 documents issued from the start of the OCP to its closure in 2002 as well as around 600 documents issued by APOC after OCP closure and until its closure in 2015 were extracted, reviewed and classified by topics/keywords .
The following publications are being prepared (taking also into consideration peer-reviewed publications)
A systematic review of traps targeted at Simulium damnosum s.l
A review of the impact of seasonal changes on human onchocerciasis vectors breeding and species distribution
Is onchocerciasis elimination mapping necessary for the current disease elimination activities?

	Additional publications under consideration are: Directory of OCP reports in WHO IRIS OCP experience in diagnosing of O. volvulus infections. This will add value towards the WHO efforts to improve diagnosis for NTDs, as evidence by the Diagnostic Technical Advisory Group that the WHO NTD department established (https://www.who.int/neglected_diseases/news/DTAG-sub-group-TOR-June-2020.pdf). Publications: ? Mduma E, Halidou T, Kabore B, Walongo T, Lompo P, Museveni J, et al. (2022) Etiology of severe invasive infections in young infants in rural settings in sub-Saharan Africa. PLoS ONE 17(2): e0264322. https://doi.org/10.1371/journal.pone.0264322 ? Obiero CW, Gumbi W, Mwakio S, Mwangudzah H, Seale AC, Taniuchi M, Liu J, Houpt E, Berkley JA. Detection of pathogens associated with early-onset neonatal sepsis in cord blood at birth using quantitative PCR. Wellcome Open Res. 2022 Nov 8;7:3. doi: 10.12688/wellcomeopenres.17386.3. PMID: 35600002; PMCID: PMC9114825. Plans for 2023 Support to Strategy Development (publications, participation in scientific meetings related to past/future activities without current ER)
Output Description	**Strategy development, implementation and monitoring**
Output Indicator	Scientific working group meeting reports and recommendations
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	Scientific Working Group meeting held in Geneva on 25-26 October 2023 with all members attending in person with virtual joint sessions on 13 Oct and 28 October with the SWG of RCS and STAC (on 28 Oct). (Please see Annual Report of IMP Strategic Work Area and SWG report 2022).
Output Description	**Generic protocols to address Implementation Research issues encountered by different disease control programmes**
Output Indicator	Number of disease control programmes using generic protocols to inform their Implementation Research studies
Output Target Date	31/12/2025
Output Progress Status	On Track
Output Progress Description	Support to generic protocols to address Implementation Research issues encountered by different disease control programmes are described in detail in ER 1.2.6. This ER provides supplementary support.
Biennium	**2024-2025**
Output Description	**Generic protocols to address Implementation Research issues encountered by different disease control programmes**
Output Indicator	Number of disease control programmes using generic protocols to inform their Implementation Research studies
Output Target Date	31/12/2025
Output Progress Status	
Output Progress Description	
Output Description	**Outputs of TDR research projects and TDR staff and adviser expertise used to provide directional perspective for R&D new tools (including advice/support to R&D sponsors) as well as new ways of implementing the tools**
Output Indicator	Number of R&D initiatives informed by TDR research project output or TDR staff /adviser expertise (at least 4 by 2023)
Output Target Date	31/12/2025

Output Description	**Strategy development, implementation and monitoring**
Output Indicator	Scientific working group meeting reports and recommendations
Output Target Date	31/12/2025

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**1. Researchers, developers, funders provided with knowledge available through TDR on specific gaps, needs, opportunities, potential approaches, partners, products and technologies.** **2. Knowledge applied by partners resulting in more efficient processes.**
Progress made towards outcome	Systematic review completed with IDDO on malaria patient spectrum enrolled in clinical trials alerting to the gaps of representativeness with implications on generalization of clinical trial results Studies on impact of implementation research on VL elimination programs in Nepal and Bangladesh completed providing lessons to consider in planning similar programs elsewhere
Biennium	**2024-2025**
Outcome description	**1. Researchers, developers, funders provided with knowledge available through TDR on specific gaps, needs, opportunities, potential approaches, partners, products and technologies.** **2. Knowledge applied by partners resulting in more efficient processes.**
Progress made towards outcome	

Expected Result: 1.1.7

Title: Maximized utilization of data for public health decision-making

Strategic Work Area: Research for implementation **Workstream:** Research for implementation

ER type:	Continuing	**Funding type:**	UD and DF
Start date:	1/1/2012	**End date:**	31/12/2023
ER status:	On Track	**Comment:**	We made progress in 1) operational research to tackle public health emergencies; 2) building research capacity in francophone Africa 3) setting benchmarks for reporting and 4) expanding partnerships

WHO region: Global

Partners: The SORT IT global partnership including Public health programmes in target countries, ministries of health, NGOs and academic institutions.

Diseases: COVID-19; Ebola; Malaria; Neglected Tropical Diseases; Schistosomiasis; Tuberculosis; Not Disease-Specific

Review mechanism: Scientific working group + other ad hoc or collaboration-based review systems as appropriate

ER manager: Rony ZACHARIAH

Team: Abraham Aseffa, Corinne Merle, Mohammed Khogali, Michelle Villasol, Abdul Masoudi, Ekua Johnson Rony Zachariah, Robert Terry, Garry Aslanyan, Maier Mary + relevant RCS staff

Number of people working on projects: 14

FENSA clearance obtained for all Non-State Actors? Yes

Justification for no FENSA clearance: FENSA clearances received as applicable

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	Yes	Build strengths:	Yes
Reduce burden:	Yes	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	Aligned
Roles complimentary:	Yes	SORT IT partners and alumni allow use of trained resources for expansion. Training of trainers is integrated.
Coordination transparent:	Yes	Partner calls each month to coordinate activities. Selections criteria and SOPs established
Visibility:	Yes	TDR and partner Websites updated on a quarterly basis . Inclusion of LOGOS on lectures, publications and evidence briefs acknowlede TDR and its partners

Objectives and results chain

Approach to ensure uptake: Research questions identified and endorsed early with programmes and stakeholders at national and international levels, as well as WHO offices where applicable. Early engagement with those expected to use the results facilitates research uptake.

Up-take/Use Indicator: Number of new or changed policies guidelines or practice change and/or decisions taking into account.

Gender and geographic equity: SORT IT focuses on vulnerable and excluded groups and is in line with efforts to achieve UHC, All calls include the statement that TDR is committed to Equality, Diversity and Inclusivity in science. Researchers

	are encouraged to apply whatever their gender identity, sexual orientation, ethnicity, religious, cultural and social backgrounds, or (dis)ability status.
Publication plan:	Open access publications; policy and issue briefs; documents for WHO control programmes
Up-take/use indicator target date:	31/12/2023

Sustainable Development Goals

Good Health and Well-being; Quality Education; Gender Equality; Clean Water and Sanitation; Reduced Inequality; Life Below Water; Life on Land; Partnerships to achieve the Goal

Concept and approach

Rationale:	Countries and WHO need evidence for informing operational decisions, formulating recommendations/ guidelines and policies. TDR can play a key role in helping to crystallize relevant research questions within programme settings and strengthening country capacity for compilation and analysis/interpretation of available data. This is in line with the SDG 17.18 which is to enhance capacity-building support to countries to increase significantly the availability of high-quality, timely and dis-aggregated data for public informed decision making. Identifying knowledge and information gaps is also important to inform research agendas and move research into action. many countries are data rich but information poor. This paradigm need to change and SORT IT is aimed at making countries and institutions "Data rich, information rich and Action rich" The model is meant to promote "local research with local solutions and local ownership"
Design and methodology:	Priority areas will be identified by the countries in collaboration with WHO country offices and relevant stake holders. Countries will play a central role in identifying the implementing staff. The SORT IT approach which combines research implementation with training and global engagement will be used to empower participants on being able to independently conduct research thereafter .
Approach to ensure quality:	TDR has inbuilt milestones and performance targets for implementation, research subjects and participants will be endorsed by those expected to use the results, including publishing as a part of quality control; Standard Operating Procedures where appropriate are customized to national requirements and capacity. All franchised courses will have quality control measures that need to be accounted for. Quality of reporting is monitored through independently commissioned evaluations.

ER Objectives

1. Build sustainable capacity to promote and support the effective use of public health data for evidence-based decision-making

2. Promote and support data sharing for evidence-based decision-making (guidelines/policy/practice and research)

3. Strengthen health systems to accelerate efforts towards achieving UHC, SDGs and tackling public health emergencies

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Possibility of "weaning funding for TDR" for SORT IT activities**
Actions To Mitigate Risk	Fundraising efforts, including outside usual regular donors
Mitigation Status	On Track
Risk Description	**Loss of quality as we franchise the model to other institutions**
Actions To Mitigate Risk	Quality indicators and strict methodology to be implemented by institutions franchising the SORT IT model. Quality indicators and strict methodology to be implemented for institutions wishing to franchise the SORT IT model. All SORT IT courses have to formally register with TDR and report on

	achievement (or not) of TDR performance targets. SOPs are shared with all institutions that wish to run franchised SORT IT programmes.
Mitigation Status	On Track
Biennium	**2024-2025**
Risk Description	**Possibility of limited or dwindling funds**
Actions To Mitigate Risk	Fundraising efforts, including outside usual regular donors
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**Publications and issue/policy briefs to inform evidence-based policies/ practice**
Output Indicator	Number of publications and evidence of change in policies/ practice
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	Cumulatively since 2009, there has been 802 publications by the SORT IT partnership in 50 journals (impact factor 0.4?19) and in five languages (English, Russian, Spanish, Portuguese and French). In 2022, there were 23 publications including a special issue on Public Health Emergencies. https://www.mdpi.com/journal/tropicalmed/special_issues/TDR. Roughly 70% of all research studies influence policy and practice
Output Description	**Build capacity for the effective collection and analysis and use of data**
Output Indicator	Number of successful trainees and number of data analyses conducted and reported
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	Cumulatively since 2009, there has been close to 1000 operational research projects with data and close to 2000 trained in five languages (English, Russian, Spanish, Portuguese and French).
Biennium	**2024-2025**
Output Description	**Publications and issue/policy briefs to inform evidence-based policies/ practice**
Output Indicator	Number of publications and evidence of change in policies/ practice
Output Target Date	31/12/2025
Output Description	**Build capacity for the effective collection and analysis and use of data for decision making**
Output Indicator	Number of successful trainees and number of data analyses conducted and reported
Output Target Date	31/12/2025

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Strengthened evidence-base for policy and practice decisions**
Progress made towards outcome	Cumulatively since 2009, there has been 802 publications by the SORT IT partnership in 50 journals and in five languages (English, Russian, Spanish, Portuguese and French). In 2022, there were 22 publications including a special issue on Public Health Emergencies. https://www.mdpi.com/journal/tropicalmed/special_issues/TDR. Close to 70% of research has an impact on policy and practice

Roughly fifty percent of alumni continued new research projects independently which is evidence that sustainable capacity is being built.

The study involved 18 countries, 32 journals and 13 public health themes. Reporting quality was graded as ?good? to ?excellent? in 89% of publications. First authorship from LMIC countries was present in 96%, LMIC last authorship in 82%, and female first authorship in 45%.

In conclusion, most SORT IT publications adhered to COREQ standards, while encouragingly supporting gender equity in authorship and the promotion of LMIC research leadership.

Biennium	**2024-2025**
Outcome description	**Quality controlled publications and strengthened evidence-base for policy and practice decisions**

Progress made towards outcome

Expected Result: 1.2.1

Title: Strategies to achieve and sustain disease elimination

Strategic Work Area: Research for implementation **Workstream:** Research for implementation

ER type:	Continuing	**Funding type:**	UD and DF
Start date:	1/3/2014	**End date:**	31/12/2025
ER status:	On Track	**Comment:**	
WHO region:	Global		
Partners:	Control programmes and research institutes in countries, Medicines Development for Global Health, Communauté Evangelique au Centre de l'Afrique (CECA20)		
Diseases:	Onchocerciasis; Visceral leishmaniasis		
Review mechanism:	Scientific working group + other ad hoc or collaboration-based review systems as appropriate		

ER manager: Abraham Aseffa ARMIDIE

Team: Michelle Villasol, Annette Kuesel, Abraham Aseffa

Number of people working on projects: 10

FENSA clearance obtained for all Non-State Actors? Yes

Justification for no FENSA clearance: FENSA clearance obtained when needed (for partnership for moxidectin evaluation) - to be evaluated for new future partners

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	Yes	Build strengths:	Yes
Reduce burden:	No	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	Aligned
Roles complimentary:	Yes	Role complementary
Coordination transparent:	Yes	Coordination transparent
Visibility:	Yes	Visibility of TDR highlighted

Objectives and results chain

Approach to ensure uptake:	Control programmes and researchers from concerned countries, as well as WHO 3 levels are fully engaged in the design and implementation of the research
Up-take/Use Indicator:	TDR outputs considered among evidence informing decision-making at global, regional and national levels
Gender and geographic equity:	Work will target LMICs (for oncho in Africa, for VL Nepal/Bangladesh and Eastern African countries). Whenever possible funding to women investigators will be favoured. Whenever possible results of research will be disaggregated by gender.
Publication plan:	Scientific meetings, Open access journals, TDR website

Up-take/use indicator target date:	31/12/2026

Sustainable Development Goals

Good Health and Well-being; Reduced Inequality; Partnerships to achieve the Goal

Concept and approach

Rationale:	Some diseases are targeted for elimination in certain areas. Research is needed to inform appropriate strategies and practices. While some of these can be broadly applied, others need to be targeted to the disease, and/or the interventions and/or specific epidemiological setting and/or the extent to which prevalence/incidence of infection have been reduced and the elimination goal (elimination as a public health problem or elimination of transmission). TDR has decades long history of research for the tools that have allowed countries targeting VL elimination in the ISC and onchocerciasis elimination where feasible in Africa. TDR has been funding and managing research to support these elimination goals in past biennia and is continuing this work as recommended by the scientific working group, including support to VL control/elimination in Eastern Africa following the recommendations in the new WHO NTD Roadmap 2021-2030.
Design and methodology:	Continuation of collaboration with and between researchers and national/regional or global control programmes. Research will be designed to address specific knowledge gaps and research priorities, and will be conducted by qualified investigators (with appropriate training).
Approach to ensure quality:	Selection of investigators and proposals with appropriate expertise through review of their proposals and progress reports/renewal requests by the scientific working group complemented by external subject matter experts (ad hoc reviewers). Grant proposal review by external reviewers nominated by funders, if applicable.

ER Objectives

Generate evidence to guide programmes on strategies to achieve and sustain elimination, where and when to stop intervention and how to certify elimination

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Insufficient funding**
Actions To Mitigate Risk	Raise awareness of potential donors; explore alternative ways of supporting work
Mitigation Status	Planning phase
Risk Description	Research question are not targetting key priorities for programmes
Actions To Mitigate Risk	Ensure large involvement of WHO country/regional/HQ level and of country representatives in discussion to identify priority research questions.
Mitigation Status	On Track
Risk Description	**Impact of requirements for effective preventive measures for COVID-19 on study implementation**
Actions To Mitigate Risk	Adaptation of study protocols to requirements for infection prevention (which slows down study implementation), replacement of in-person meetings (e.g. for capacity building) by remote meetings. Other COVID-19 effects such as lock-downs (e.g. no laboratory work possible) and travel restrictions (field work interrupted) cannot be mitigated.
Mitigation Status	On Track

Biennium	**2024-2025**
Risk Description	**Insufficient funding**
Actions To Mitigate Risk	Raise awareness of potential donors; explore alternative ways of supporting work
Mitigation Status	Planning phase
Risk Description	Impact of requirements for effective preventive measures for COVID-19 on study implementation
Actions To Mitigate Risk	Adaptation of study protocols to requirements for infection prevention (which slows down study implementation), replacement of in-person meetings (e.g. for capacity building) by remote meetings. Other COVID-19 effects such as lock-downs (e.g. no laboratory work possible) and travel restrictions (field work interrupted) cannot be mitigated.
Mitigation Status	Planning phase
Risk Description	Research question are not targetting key priorities for programmes
Actions To Mitigate Risk	Ensure large involvement of WHO country/regional/HQ level and of country representatives in discussion to identify priority research questions.
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**Data to support WHO guidelines and onchocerciasis endemic country registration and policies on moxidectin for onchocerciasis elimination**
Output Indicator	Study reports/publications provided to WHO and countries (directly and/or via ESPEN)
Output Target Date	31/12/2025
Output Progress Status	On Track
Output Progress Description	The timelines will ultimately depend on participant recruitment speed and what data WHO/NTD will consider sufficient to initiate the WHO guidelines process and what data the Guidelines development committee consideres sufficient to inform a guideline on moxidectin for onchocerciasis elimination.
Output Description	**Improved basis for monitoring progress of preventive chemotherapy-based elimination programmes towards elimination and for decisions to stop interventions**
Output Indicator	Report to scientific working group; results delivered to the country control programmes and/or NTD programmes/advisory committees at regional and/or HQ level
Output Target Date	31/12/2024
Output Progress Status	On Track
Output Progress Description	Reports delivered to SWG at face to face meeting. This project now focusses on onchocerciasis. One output (notably inclusion of genetic information in the definition of transmission zones) has already been adopted by the Ethiopian Onchocerciasis Control/Elimination Programme. The extent to which this will be extended to other countries and provision of relevant genetic markers will depend on the work over the next year - provided this is endorsed by the SWG/ad hoc reviewers. This also applies to the transmission model which allows for the first time to consider areas of different endemicity. The output relating to identification of genetic markers of suboptimal response of O. volvulus to ivermectin is unlikely to be achieved by 2024 and will require additional investments (as available from leveraged funding).

Output Description	**Generate evidence to support establishment of programmes towards elimination of VL in Eastern Africa**
Output Indicator	Report to scientific working group; results delivered to the country control programmes
Output Target Date	31/12/2030
Output Progress Status	On Track
Output Progress Description	Learning the lessons from the VL elimination effort in the Indian subcontinent: TDR has been working together with the WHO NTD/VL team to derive lessons from the VL elimination effort in Nepal, Bangladesh and India that could be applicable to inform strategies in other regional foci. Currently, the largest regional focus of VL is the Eastern African focus. WHO has proposed a new set of ambitious NTD roadmap targets for 2021-2030. A new global target for VL elimination (as a public health problem) is proposed with number of countries validated for elimination defined as <1% case fatality rate due to primary VL. The new NTD roadmap offers opportunities to accelerate VL control in the Eastern African setting where VL epidemiology is more complex than in its Asian counterparts. In this regard, the success stories and lessons learned from the South-East Asian region have now been documented and key implementation research areas identified to create a platform for research that would support VL elimination efforts in the Eastern African focus. Semi-structured interviews have been conducted with WHO regional and country offices, NTD departments of Ministries of Health, and with the main partners involved in the KEP in SEA and East African regions. A preliminary report is addressing: i) history of the KEP, elimination target and its implications, ii) epidemiology of VL in SEA; iii) key drivers of success of the KEP (political commitment, coordination, intersectoral collaboration, donors, and funding) and programmatic issues (surveillance, diagnostics, and treatment, integrated vector management, implementation issues) and iv) operational research. Eastern African Focus: The problem: Visceral leishmaniasis (VL) is a disease of the most impoverished the true burden of which is unknown due to limitations in diagnosis and reporting. Annual estimates range from 50,000 to 500,000 new cases and untreated the disease is fatal in more than 95% of cases; the majority within two years. VL often occurs in outbreaks and about six hundred million people are at risk globally. The highest burden of VL was in the Indian subcontinent (ISC) until the regional VL elimination effort launched in 2005 reduced it drastically from 80% of global share in 2006 to <30% currently. On the other hand, the proportion of reported cases from Eastern Africa, the second biggest focus in the world, increased from 10% to > 50% of the global total in the same period, with a threefold increase in actual numbers in 2018 compared to 2007 . The WHO NTD Roadmap 2021-2030 has set targets for VL elimination as a public health problem (defined as <1% case fatality rate due to primary VL) in 85% of endemic countries by 2030. It is imperative to tackle VL in Eastern Africa not only for these goals to be achieved, but also to address calls for equity, universal health coverage and poverty reduction. The opportunities: Implementation research is an essential component for the required intervention package towards VL elimination in eastern Africa. Lessons learned in South Asia can provide much needed input to control efforts in Eastern Africa. A key factor for the success of the VL elimination effort in the ISC has been the close interaction between clinical and implementation research, technical advice, policy and program linkage facilitated by TDR stewardship. TDR is very well placed to play a stewardship role in the transfer of experience from the Indian subcontinent to Eastern Africa because of its continued longstanding interaction with national programs and research institutions in all the affected countries on a variety of relevant research, training, capacity strengthening and global engagement activities. VL endemic countries in Eastern Africa have requested for WHO support to address the growing problem of VL in the region. TDR is collaborating with WHO and other partners to initiate VL elimination efforts in Eastern Africa. The recent WHO-organized VL Programme Review Meeting of South Asia and Eastern Africa held on 14 - 16 June 2022 (in which TDR also took part) identified targets for a VL elimination plan as a step towards creating a platform to coordinate efforts in the region. The priorities identified were similar to those previously defined in consultations with research stakeholders currently active in the region.

Proposed activities in 2022-2023:
- Supporting implementation research (mapping disease burden, assessing health service and program constraints, understanding the needs of hard to reach populations and identifying interventions that will improve early diagnosis and treatment and reduce transmission through vector control),
- Strengthening implementation research capacity in the countries and fostering coordination and collaboration of stakeholders.

TDR has been collaborating with WHO/NTD to facilitate the creation of a bi-regional VL elimination programme in the Eastern African focus which falls under the WHO-AFRO and EMRO regions.

A series of consultations has taken place in 2022 with various stakeholders engaged in VL control work in East Africa in preparation for a regional platform for VL elimination. TDR is participating in the planning of a WHO convened meeting in Nairobi on "Development of a strategic plan for the elimination of visceral leishmaniasis in East Africa, From 24 - 27 January 2023." About 60 participants from country programmes, WHO EMRO, WHO AFRO, African Union Commission, research institutions and investigators, partners and other stakeholders involved in VL work in the region are expected. A draft strategic framework for VL elimination in East Africa will be developed at the workshop. TDR will support the participation of investigators from the region and Nepal.

A Joint Call for Applications has been issued in collaboration with WHO/NTD on "Assessing programme capacities in visceral leishmaniasis-endemic countries in East Africa to implement WHO?s treatment recommendations towards achieving universal health coverage and NTD roadmap targets" with deadline on 15 February 2023.

Presentations at the WorldLeish Conference (Aug 2022):
1. Joshi AB, Chuke S, Kroeger A, Aseffa AA, Banjara MR. Implementation science of visceral leishmaniasis (VL) elimination in Nepal. Presented in WorldLeish 7, August 1-6, Cartagena, Colombia.

The presentation by Banjara MR et al at the World Leish7 Conference (Aug 2022) addressing the topic concluded that "the successful model of implementation research for VL elimination can be replicated in other countries with diseases targeted for elimination".

Output Description	**Generate evidence on sustainable strategies for the elimination of VL in the sub-Indian continent**
Output Indicator	Report to scientific working group; results delivered to the country control programmes
Output Target Date	31/12/2025
Output Progress Status	On Track
Output Progress Description	VL elimination in the Indian subcontinent

In Bangladesh and Nepal the VL elimination initiative is moving from the ?attack phase? to the consolidation and maintenance phase as its target (case numbers at district and sub-district level of less than 1 case per 10 000 population) has been reached. TDR, in collaboration with WHO, has coordinated and financed implementation research and clinical trials in support of the VL elimination initiative since initiation. Scientific publications and a large number of documents were developed and the generated evidence has largely been adopted by the national authorities and has shaped Regional Technical Advisory Group (RTAG) recommendations. This is currently being documented and a review has been published recently. India has still quite extensive VL endemic areas but is now receiving large amounts of external funds from different sources (World Bank, DFID, BMGF and others) which will enable the authorities to move faster towards VL elimination. The TDR support is therefore more focused on Bangladesh and Nepal but is keeping the Indian authorities and VL research teams informed.

In our target countries -Bangladesh and Nepal- new challenges are coming up. With the progress towards the elimination goal, more efficient and effective methods of active case detection and vector management which respond to the changing epidemiological profile in the countries are required. In Nepal and Bangladesh new VL cases and foci appearing in previously non-endemic/?non-programme? districts are a matter of concern. The challenge is to detect and treat new cases at an early stage before they can infect the local vector population and initiate the

spread of the disease in populations with low or no herd immunity.

Remarkable progress to meet the elimination target has been made possible by new and effective interventions and delivery systems identified through TDR research and deployed by dedicated programmes. However, a vertical programme on VL is not sustainable in the long run, especially when cases are few and far apart. At the same time, a vertical programme cannot cover all potential transmission foci, as shown already in all countries involved in the VL elimination initiative in non-programme areas. The National Kala-azar Elimination Programme (NKEP) has no active sand fly surveillance system for the consolidation and maintenance phases in Bangladesh. This is required for monitoring transmission in endemic and non- endemic villages. TDR is supporting research to identify sustainable, cost-effective approaches to find cases and foci of transmission early in endemic and non-endemic villages that are adapted to the consolidation and maintenance phases of the VL elimination programme which can be applied widely and do not require a vertical program in both Nepal and Bangladesh. Unfortunately, the field study has been facing disruptions since March-2020 due to the COVID-19 crisis.

Bangladesh: An advocacy meeting and training of the Frontline Public Health Workers (FPHW) was conducted in Trishal and Fulbaria upazila (sbdistrict) under the Mymensingh district. The selected sites were three villages each in high and moderate VL endemic villages and 3 in non-endemic villages adjacent to the 3 high VL endemic villages, in total 9 villages. Data analysis and overall findings of the study was conducted on various aspects; Household information, rk39 POC test, socioeconomic characteristics, information regarding personal protection against insect bite, awareness about VL and Vectors and last of all sandfly collection using sticky traps. A total number of 6907 Households has been screened in the non-endemic area whereas 7140 households have been screened in the moderate endemic area and 15186 households in the high endemic area. A total of 7 asymptomatic positive cases was found through rk-39 POC test in the high and moderate endemic areas. Sandfly collection using sticky traps showed that the vector P. argentipes is present across all areas. All collected female P. argentipes sandflies were tested to see the infection rate by RPA assay. Also assed the knowledge of medical technologists (MT-Lab), health inspectors (HI), assistant health inspectors (AHI), health assistants (HA), community health care providers (CHCP) and family welfare assistants (FWA) was assessed. The study showed that sandfly collection involving frontline health workers using sticky traps is feasible and could be an innovative approach for kala-azar vector surveillance for the consolidation and maintenance phases of the VL elimination programme. Two manuscripts are under preparation reporting on effectiveness of sandfly monitoring using sticky paper by frontline health workers and the reduction of sandfly density with insecticidal wall paint through community involvement in Bangladesh.

In Nepal, a baseline study including integrated active case detection of febrile illnesses and determination of sandfly densities in 9 villages was initiated in November 2019. Vector control interventions were conducted including Insecticide Residual Spraying in 222 households of two villages, Insecticidal Wall Painting in 33 households of one village and 698 bed net impregnations in 242 households of three villages. Final follow-up of active case detection through household screening and determination of vector densities were conducted after 16 months of vector control interventions. Study updates were provided to Epidemiology and Disease Control Division, Ministry of Health and Provincial No.1, Ministry of Social Welfare Health Directorate and District Public Health Office in Morang and active study collaboration was established. Housing structures and land lots were examined based on characteristics as risk factors of VL transmission in a case-control analysis. VL cases from 2013-2017 were identified based on the existing database from the Epidemiology and Disease Control Division and District Public Health Office from the plain Terai area (Morang, and Saptari districts)and hilly area (Palpa district) of Nepal. Two hundred and three built environments were analyzed (66 cases and 137 controls). Inferential statistics and logistic regression analysis were performed to determine the association of risk factors with VL. A concurrent embedded mixed methods design was used for data collection. Qualitative data were gathered through in-depth interviews and focus group discussions with FCHVs of 22 VL endemic villages of 3 districts. Concurrently quantitative data were collected through formal interviews of 203 household heads of the same villages to understand people`s awareness of VL and knowledge of protective measures against VL transmission in houses with and without a previous VL patient. The findings are being submitted for publication.

In continuation of implementation research on VL, the following studies were developed in consultation with the national programmes of Nepal and Bangladesh:

1. Epidemiological, Serological and Entomological Investigation of New Visceral Leishmaniasis (VL) Foci in Nepal and Bangladesh

2. Follow up Assessment of Visceral Leishmaniasis (VL) Treated Patients and Assessment of Impact of COVID-19 in VL Control Services in Nepal and Bangladesh
3. Determination of Prevalence of Post Kala-azar Dermal Leishmaniasis (PKDL) and Assessment of Treatment Seeking Behaviour of PKDL Patients in Nepal and Bangladesh

Progress in 2022

The studies addressed factors behind the emergence of new cases in new foci despite elimination efforts, the prevalence of PKDL and follow up of treated cases to assess risk of relapse in both Nepal and Bangladesh. Despite challenges due to COVID-19 disruptions and delayed ethical approval processes, the studies were conducted in both countries, and the results are being analyzed.

The publications from previously completed projects are shown below. Some of the outputs from these studies have led to changes in the elimination strategies. TDR supported implementation research from Bangladesh and Nepal found that active case detection combined with sandfly control through indoor wall painting (IWP) or indoor residual spraying (IRS) can support VL elimination in the consolidation and maintenance phase. Since the number of VL cases has sharply decreased, active case detection (ACD) for only VL and PKDL would not be cost effective. Therefore, VL detection should be integrated with surveillance of other febrile illnesses. Insecticidal wall painting (IWP) and bed net impregnation can be effective alternatives to indoor residual spraying (IRS) for VL vector control. The active case detection of VL around 50 m of the index case house following vector control intervention through IRS has been implemented in Bangladesh, India and Nepal. It has been incorporated into the national kala-azar elimination strategies based on the evidence from the TDR supported implementation research in Bangladesh and Nepal and recommendations from the Regional Technical Advisory Group (RTAG) of WHO/SEARO. In addition, new evidence has suggested alternatives to IRS.

Reference: Banjara MR, et al. Response to visceral leishmaniasis cases through active case detection and vector control in low endemic hilly districts of Nepal. Am. J. Trop. Med. Hyg. 2022; 107(2): 349-354.
Study: Investigated early case detection by an index case?based approach and assessed the feasibility, efficacy, and cost of an intervention for sandfly control through indoor residual spraying (IRS) or insecticidal wall painting (IWP) in new and low-endemic districts in Nepal
Findings: Both IWP and IRS well accepted; percentage reductions in sandfly density after 1, 9, and 12 months of intervention were 90%, 81%, and 75%, respectively, for IWP and 81%, 59%, and 63% respectively for IRS. The cost per household protected per year was USD 10.3 for IRS and 32.8 for IWP, although over a 2-year period, IWP was more cost-effective than IRS
Significance: Active case detection and better sandfly control with IWP or IRS including sandfly surveillance during elimination efforts can contribute to VL control in the consolidation and maintenance phase
Remarks: Low number of households in villages in hilly areas. Low number of sandflies in the study area, no bioassay tests on mortality.

Reference: Ghosh D, et al. Comparison of Novel Sandfly Control Interventions: A Pilot Study in Bangladesh. Am. J. Trop. Med. Hyg. 2021; 105(6):1786-1794
Study: Compared the effects of existing vector control tools on sandfly densities and mortality to inform and support the National Kala-azar Elimination Program (NKEP). The interventions included insecticidal wall painting (IWP), reduced-coverage insecticidal durable wall lining (DWL), insecticide impregnated bed nets (ITN), and indoor residual spraying with deltamethrin (IRS).
Findings: The relative efficacy of IWP for sandfly reduction varied by ?59% to ?91%, ?75% to ?81%, and ?30% to ?104% compared with DWL, ITN, and IRS, respectively, at different time points during the 12-month follow-up. The safety of IWP, DWL, ITN, and IRS was excellent. IRS acceptability, however, decreased to 54%
Significance: IWP is a new effective tool for VL vector control. The NKEP may consider IWP for subsequent phases of the program for longer efficacy than current IRS (in 50?60 HHs around a VL index case).
Remarks: Currently, manufacturers have stopped production of the KO TAB 1-2-3 and DWL, and therefore IWP remains the only available option at present

Singh-Phulgenda S, et al. Serious adverse events following treatment of visceral leishmaniasis: A systematic review and meta-analysis. PLoS Negl Trop Dis. 2021;15(3):e0009302.
Study: An update of a previous systematic review of all published clinical trials in visceral leishmaniasis (VL) from 1980 to 2019 to document any reported serious adverse events (SAEs).
Findings: Mortality within the first 30 days of VL treatment initiation was a rarely reported event

in clinical trials with an overall estimated rate of 0.068 deaths per 1,000 person-days at risk, though it varied across regions and patient populations.
Significance: Estimates may serve as a benchmark for future trials against which mortality data from prospective and pharmacovigilance studies can be compared. Remarks: Evident need to assemble individual patient data (IPD) to conduct robust IPD meta-analyses and generate stronger evidence

Ongoing and completed projects in 2022

- Determination of Prevalence of Post Kala-azar Dermal Leishmaniasis (PKDL) and Assessment of Treatment Seeking Behaviour of PKDL Patients in Nepal and Bangladesh

Knowledge gap: The burden of post kala-azar dermal leishmaniasis (PKDL) is not known in Bangladesh and Nepal. There is no active case detection of PKDL by the national programs. Macular and nodular PKDL patients are infectious to sandflies. PKDL could be a challenge to sustain VL elimination in the Indian sub-continent.

Nepal (Study completed)
Methods: Surveys were conducted in 98 VL endemic villages of five districts that reported the highest number of VL cases within 2018-2021. A total of 6,821 households with 40373 individuals were screened for PKDL. Cases with skin lesions were referred to hospitals and examined by dermatologists. Suspected PKDL cases were tested with rK39 and smear microscopy from skin lesions. An integrated diagnostic approach was implemented in two leprosy hospitals where cases with non-leprosy skin lesions were tested for VL with the rK39 kit. Confirmed PKDL patients were interviewed to identify the risk factors as well as their knowledge, experience of stigma and treatment seeking behavior.
Findings: Among 147 cases with skin lesions in the survey, 9 (6.12%) were confirmed to have PKDL by dermatologists at the hospital. The prevalence of PKDL is 2.23 per 10,000 population. Among these 9 PKDL cases, 5 had a past history of VL and 4 did not. PKDL cases without a past history of VL were variably detected among the ?new foci? (districts reporting VL cases for the first time), with some PKDL cases in Surkhet but none in Palpa. Most of the PKDL cases had macular skin lesions. None of the cases negative for leprosy were positive for PKDL. There is very limited knowledge of PKDL and VL among PKDL cases. The PKDL cases suffered from some degree of social and psychological stigma (mean ± s.d. score = 17.89 ± 12.84).
Conclusion: Strengthening the programme in PKDL case detection and management will contribute to validation and sustainability of VL elimination. It appears that the current drugs for VL treatment do not fully prevent PKDL development in some cases. Implementation of an integrated approach will require training of the peripheral health workers in the new VL foci on skin NTDs for case referral, diagnosis and better management. Awareness raising activities to promote knowledge and reduce social stigma should be conducted in VL endemic areas.

Bangladesh (Study completed)
Investigations: A total of 16205 individuals were screened amongst the selected households in the five upazilas within the study area. The sex ratio was almost equal; past history of Kala-azar was present in the same range (24.2-26.3%). Overall, suspected PKDL was found in 49 cases/10000 population, with Madhupur having the highest (130/10000 population). Most patients had macular lesions (n=96.2%), and the rest had papular (3.8%). Among 79 individuals screened, rK39 POC tests yielded 59 positive cases with an overall PKDL prevalence of 36/10000. Prevalence of PKDL amongst individuals with past history of VL was 134 (54/4022) [4 (5/12183 amongst individuals without past history of VL); and 49 (79/16205) amongst patients with suspected skin lesion). Following training, medical technologists conducted rK39 POC tests on test-negative suspected leprosy patients. Out of 323 leprosy-negative patients from July 2021 to June 2022, a total of 137 individuals were screened, and 10 were positive for the rK39 POC test. All the 59 confirmed new cases were referred to the nearest Upazila health complex for further management. Capacity building of the frontline public health workers and NGO workers was the benchmark intervention of this study. The study team conducted all training on site. Knowledge and stigma play a pivotal role in the treatment-seeking behavior of these patients. The concerned authority needs to address these issues and design appropriate measures to address them.

- Follow-up Assessment of Visceral Leishmaniasis (VL) Treated Patients and Assessment of Impact of COVID-19 in VL Control Services in Nepal and Bangladesh

Knowledge gap: The follow up assessment of treated visceral leishmaniasis (VL) cases is important

to monitor the effectiveness of treatment regimens. Although the national strategy recommends follow up, there is limited compliance in both countries. The ongoing pandemic of COVID-19 might have in addition disrupted access to health care services.
Nepal
Investigation: 107 VL cases being followed up
Interim results: 48/107 children under 10 years of age; 58 male; 94 knew drug use: 69% had LAMB single dose and 15% multiple doses; 3 had relapse; 7 had appointments cancelled due to COVID; 42/107 had follow up visit. 14/26 did not go for follow up because they felt healthy
Remarks: The preliminary analysis revealed that there is relapse of VL in some patients treated with current anti-leishmanial drugs.
Bangladesh
A total of 44 VL patients were interviewed at baseline, which dropped to 39 at the end of the study. Among the 5 participants lost to follow-up, two had expired during the study period, and the other three refused to come as they felt healthy. Most of them (81.82%) had been treated with single dose of Liposomal Amphotericin B (SDLAmB) monotherapy. 4 patients had either VL relapse or PKDL after the end of treatment (two had VL relapse, one had PKDL, and one had simultaneous presence of VL relapse and PKDL, often regarded as Para-KDL). 36% (16/44) of patients experienced cancellation of appointment because of priorities to COVID, 9 stayed away because they felt well and 2 could not find drugs because of disruptions. Only 1/3rd of the service providers participated in any early response activities during the COVID-19 pandemic. Though vector surveillance was active throughout, IRS activities could not reach their full potential due to lack of insecticides due to disruptions.

Remarks: Patients' self-evaluation of their health is a key determinant of their follow-up visit. Many patients did not go to the hospital or attend a physician at the scheduled time because they felt healthy. The COVID-19 pandemic created a noticeable impact on VL treatment and control activities in the VL endemic regions. although there were specific dedicated COVID hospitals, and other public health centers were open to all kinds of patients. Fear of getting COVID-19 infection might be a reason behind this finding. The importance of long term follow up of patients for the early detection and management of VL relapse and PKDL cases is evidet.

- Epidemiological, Serological and Entomological Investigation of New Visceral Leishmaniasis (VL) Foci in Nepal and Bangladesh

Knowledge gap: VL cases have been reported in areas previously free from the disease in both Nepal and Bangladesh. Passive reports from the national VL elimination program suggest that there could be indigenous transmission of VL in new foci. However, no systematic studies have been conducted on these suspected new foci, including epidemiological, serological, and entomological investigations of VL.

Interim results Remarks
Nepal
Investigation: A total of 736 individual participants from 126 households of three districts were screened. Two more districts to follow yet.
Interim results: Only 1 had fever of >2 weeks (0.14%), 3 (0.4%) were rk39 positive but had no sign and symptoms for VL. None had splenomegaly or PKDL-like lesions. Sandflies collected from 12 households await species identification and parasitological examination. Among 126 interviewed participants, 71% did not know how to protect themselves from sand fly and mosquito bites. Although 46/126 had bed nets, only 37/46 used them. Only 29/126 had heard of kala azar before
Remarks: The study in Nepal is still ongoing

Bangladesh
Investigation: Villages with new VL cases reported between 2019 to 2020 were selected for this study; 1078 individuals were screened in the selected 5 new foci in five different upazila.
Interim results: Among 560/1078 individuals tested for rk39 in these areas, 11 (1.96%) were positive. There were no cases with fever greater than 2 weeks or splenomegaly. Two individuals had PKDL like skin lesions. Only one had a past history of VL. Sandfly collection using CDC light traps and manual aspirator showed that the vector P. argentipes is present across all areas accept at one focus. All collected female P. argentipes sandflies were tested by PCR and RPA assay to determine the infection rate. Almost 80% of respondents had heard about VL and its control measures at baseline, which increased to 91% at the follow-up visit. Knowledge that VL is curable increased from 72% to 91% and of sandfly as the disease vector from 2.1% to 30%.
In Bangladesh, no active VL cases have been detected in the study areas, but some asymptomatic patients were present. Sandflies are widespread across all regions in various densities except in one of the upazilas.

Remarks: The interim analysis of this study suggests that there is expansion of VL in new foci and local transmission has been established, as demonstrated by the presence of asymptomatic cases in a setting of vector abundance. But this needs further confirmation. There are no programmatic VL prevention and control activities in new foci. The results of the study will provide essential insights for targeted interventions. The study will also ascertain endemicity status of foci. Confirmation of endemicity status of suspected new foci is essential prior to country validation of VL elimination as a public health problem by WHO.

- Determination of the seroprevalence of HIV among VL patients in Bangladesh

Knowledge gap: The prevalence of VL-HIV coinfection in Bangladesh is unknown. Co-infected patients could serve as sources for new infections post-elimination. Treatment requires specialized facilities and combinations of drugs.

The study aims at screening archived sera from VL patients. Institutional IRB and WHO-ERC approval has been obtained for the protocol. The patient log with contact details has been prepared and samples organized. Phone communication is going on with 841 VL treated cases contacted to date, of whom 395 agreed to visit the diagnostic center at SKKRC. Testing will start once the HIV kits are procured. Procurement has been initiated.

- Distilling lessons from the VL elimination effort in the Indian subcontinent for other regional foci

The impact of TDR supported implementation research on VL elimination in Bangladesh and Nepal was assessed from the perspective of each country. The reports highlighted key research contributions that led to impact in diagnosis (rK39 was validated and used as a confirmatory test for VL), treatment (miltefosine replaced sodium stibogluconate as a first line of treatment; liposomal amphotericin B replaced miltefosine subsequently due to increased treatment failures and relapse rates; combination therapy was introduced into the national protocol of treatment), surveillance (active case detection was incorporated into the national protocol of VL elimination), and vector control (integrated vector management was recognized as an important element in the elimination efforts).

Meetings of national programme managers and experts were organized as part of the impact assessment exercise to identify implementation research priorities for the consolidation and maintenance phase of VL elimination and potential funding sources. There is very limited or no funding for VL implementation research from the national budget which is allocated for programmatic activities. The report emphasized that continuous support from TDR is crucial since there are no other committed external funding agencies for VL research in Bangladesh and Nepal.

A presentation by Banjara MR et al at the World Leish7 Conference (Aug 2022) addressing the topic concluded that "the successful model of implementation research for VL elimination can be replicated in other countries with diseases targeted for elimination".

New projects in 2022

- Decision Making for Indoor Residual Spraying in Post Elimination Phase of Visceral Leishmaniasis in Nepal and Bangladesh

Knowledge gap: Indoor residual spraying (IRS) is considered as the key tool in vector control for VL elimination. IRS is presently recommended twice a year in those villages which have reported at least one VL case during the past three years. The effectiveness of IRS in decreasing the number of new VL cases is however debated. IRS relies on the indoor resting habit of the sandfly. Knowledge on susceptibility to the pyrethroid insecticides currently in use is limited.

This study will identify the critical determinants that can inform rational decision making on the application of IRS in the last mile of visceral leishmaniasis (VL) elimination. It will investigate the relationship between the occurrence of VL and the frequency of IRS applied in a specific area on VL vector density, infection rate and insecticide resistance.

Four different villages from the district in Nepal and upazilla in Bangladesh will be selected as high, moderate, low VL endemic and non-endemic which has no reported VL case in the last 10 years. Information on IRS activity from 2012-2022 will be obtained through retrospective data analysis and the present status (2022-2023). Vector density and sandfly infection rate will be monitored over one year (2022-2023) in the villages with selected sentinel households. Insecticide susceptibility of P. argentipes will be studied in the year 2022-2023. Ecological investigations

	including the temperature, rainfall, humidity of the village and presence of pastures, forest, isolated/near a study area will be collected. Epidemiological data (records and current year), and programmatic factors on VL control/elimination (historical as well as current year) will be collected in the 2 types of villages, with VL cases and without VL cases for the last 10 years. Results of the investigation will inform the VL elimination program on decision making of IRS application for VL vector control in the last mile of VL elimination. Remaining risks and challenges - Inadequate research funding despite increased need of evidence to inform strategies in the last mile of elimination - Decreased attention to VL elimination in countries as burden becomes minimal compared to other priorities - Continued civil conflict in the Eastern African focus, instability, internal displacement and interruption of health care services Recent publications include: 1. Younis LG, Kroeger A, Joshi AB, Das ML, Omer M, Singh VK, Gurung CK, Banjara MR. Housing structure including the surrounding environment as a risk factor for visceral leishmaniasis transmission in Nepal. PLoS Negl Trop Dis. 2020;14(3):e0008132. 2. Mazin Omer, Axel Kroeger, Anand Ballabh Joshi, Murari Lal Das, Lina Ghassan Younis, Vivek Kumar Singh, Chitra Kumar Gurung, Megha Raj Banjara. Role of female community health volunteers for visceral leishmaniasis detection and vector surveillance in Nepal. Health Promotion Perspectives 2020; 10(1): 50-58. 3. Banjara MR, Joshi AB, Singh VK, Das ML, Gurung CK, Olliaro P, Halleux C, Matlashewski G, Kroeger A. Response to visceral leishmaniasis cases through active case detection and vector control in low endemic hilly districts of Nepal. Am. J. Trop. Med. Hyg. 2022; 107(2): 349-354. doi: 10.4269/ajtmh.21-0766. PMID: 35895401 4. Ghosh D, Alim A, Huda MM, Halleux CM, Almahmud M, Olliaro PL, Matlashewski G, Kroeger A, Mondal D. Comparison of Novel Sandfly Control Interventions: A Pilot Study in Bangladesh. Am. J. Trop. Med. Hyg. 2021; 105(6):1786-1794. doi: 10.4269/ajtmh.20-0997. PMID: 34695792 5. Singh-Phulgenda S, Dahal P, Ngu R, Maguire BJ, Hawryszkiewycz A, Rashan S, Brack M, Halleux CM, Alves F, Stepniewska K, Olliaro PL, Guerin PJ. Serious adverse events following treatment of visceral leishmaniasis: A systematic review and meta-analysis. PLoS Negl Trop Dis. 2021;15(3):e0009302. doi: 10.1371/journal.pntd.0009302. Presentations at the WorldLeish Conference (Aug 2022): Banjara MR, Kroeger A, Das ML, Halleux C, Aseffa AA, Joshi AB. Active case detection and sandfly control strategies for the consolidation and maintenance phase of the visceral leishmaniasis elimination in Nepal. Presented in WorldLeish 7, August 1-6, Cartagena, Colombia. Main message: Active case detection of VL is an important activity for surveillance of VL in last mile of VL elimination effort. Since VL cases sharply decreased, ACD only for VL and PKDL could not be cost effective. Therefore, to make the ACD continued and cost effective, ACD of integrated febrile illness should be conducted. Insecticidal wall painting (IWP) and bednet impregnation can be an effective alternative to indoor residual spraying (IRS) for VL vector control. IWP has been well accepted by the community.
Biennium	**2024-2025**
Output Description	**Generate evidence to support establishment of programmes towards elimination of VL in Eastern Africa**
Output Indicator	Report to scientific working group; results delivered to the country control programmes
Output Target Date	31/12/2030
Output Description	**Data to support WHO guidelines and onchocerciasis endemic country registration and policies on moxidectin for onchocerciasis elimination**
Output Indicator	Study reports/publications provided to WHO and countries (directly and/or via ESPEN)
Output Target Date	31/12/2025
Output Description	**Generate evidence on sustainable strategies for the elimination of VL in the Indian sub-continent**

Output Indicator	Report to scientific working group; results delivered to the country control programmes
Output Target Date	31/12/2025
Output Description	Improved basis for monitoring progress of preventive chemotherapy-based elimination programmes towards elimination and for decisions to stop interventions
Output Indicator	Report to scientific working group; results delivered to the country control programmes and/or NTD programmes/advisory committees at regional and/or HQ level
Output Target Date	31/12/2025
Output Progress Status	
Output Progress Description	TBD whether TDR will continue to support this output

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Guidelines, policy decisions and or practice informed by TDR outputs**
Progress made towards outcome	- Evidence generated for alternative vector control strategies to indoor residual spraying (IRS) presented to country programmes and regional technical advisory groups; a bi-regional VL elimination strategic plan under discussion for Eastern African foci - Progress to date on the diverse (though research synergistic) tools suggests that ?1 will be available for large-scale piloting by onchocerciasis control (elimination) programmes (OCPs) by the end of 2023
Biennium	**2024-2025**
Outcome description	**Guidelines, policy decisions and or practice informed by TDR outputs**
Progress made towards outcome	

Expected Result: 1.2.6

Title: Optimized approaches for effective delivery and impact assessment of public health interventions

Strategic Work Area: Research for implementation **Workstream:** Research for implementation

ER type:	Evolved	**Funding type:**	UD and DF
Start date:	1/1/2015	**End date:**	31/12/2023
ER status:	On Track	**Comment:**	Good progress
WHO region:	Global		

Partners: Control programmes and research institutions in target countries - WHO/Global TB, WHO NTD and WHO Global Malaria Programmes, WHO regional offices, GFTAM, USAID, PMI, MMV, LSHTM, The Union and Damien Foundation

Diseases: COVID-19; Malaria; Neglected Tropical Diseases; Tuberculosis

Review mechanism: Scientific working group + other ad hoc or collaboration-based review systems as appropriate

ER manager: Corinne Simone Collette MERLE

Team: Corinne Merle, Abdul Masoudi, Vanessa Veronese

Number of people working on projects: 500

FENSA clearance obtained for all Non-State Actors? Yes

Justification for no FENSA clearance: All partners are governmental institutions

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	No
Integrate mandates:	Yes	Build strengths:	Yes
Reduce burden:	No	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes
Roles complimentary:	Yes
Coordination transparent:	Yes
Visibility:	Yes

Objectives and results chain

Approach to ensure uptake: Involvement of different WHO headquarters, regional and country departments, key stakeholders such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, NGOs and control programmes; capacity built at country level

Up-take/Use Indicator: Evidence taken into consideration in treatment and normative guidelines

Gender and geographic equity: For all activities, we try to ensure that men and women researchers are, as far as we can, equally represented.

Concerning the geographic equity, some activities focused initially in West and Central Africa (see rationale) for the WARN-TB and CARN-TB activities- this experience will be expended to East and Southern Africa. Other activities for this ER are not restricted to geographic area allowing us to work with all the 6 WHO regions.

Publication plan:	Peer review publications, presentation at international congress, dissemination in-country including policy brief
Up-take/use indicator target date:	31/12/2024

Sustainable Development Goals

Good Health and Well-being; Reduced Inequality; Partnerships to achieve the Goal

Concept and approach

Rationale:	Disease control is based on either case- or population-based approaches, depending on the nature and the prevalence of the disease, and the efficacy/safety profile of available medications. Country programmes need to build capacity to generate research questions and data that will allow them to effectively implement policy standards. In other cases, the evolving background epidemiology and programme objectives require that standard approaches be reconsidered and evidence generated to inform guidelines and policies.
Design and methodology:	1. Regional workshops: NTP network workshops to define research priorities and capacity building needs to develop a national TB research plan and share progress and issues (collaboration with relevant WHO programmes, in particular WHO/GTB) 2. Training: Activities addressing training needs through: (i) a regional training programme; and (ii) a "learning by doing" approach with technical support and mentoring for the development and conduct of pilot projects that generate data for the implementation and scale-up of new public health interventions; 3. Technical and financial support for scaling-up public health interventions and documenting their implementation through research.. 4. Development of research packages/toolkit such as the ShORRT research package, the IR4DTB toolkit, the TB cost toolkit, etc to facilitate the development of research protocols and data collection tools for the conduct of operational/implementation research projects 5. Collaborative approach with involving WHO departments across the 3 levels, key funders for infectious diseases and key national & international NGOs/researchers
Approach to ensure quality:	- Careful interactive development of the workplan of the full project and risk assessment - Careful selection of key partners - Close monitoring of progress

ER Objectives

1. Build country programme capacity to develop research questions and generate data to inform effective implementation of their policies

2. To support national programmes with evidence for the selection and effective implementation of strategies to control diseases through either case- or population-based approaches

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Insufficient engagement of national control programmes**
Actions To Mitigate Risk	Adequate communication strategy to maintain interaction of all partners within the network
Mitigation Status	On Track
Risk Description	**Inability of some control programmes to define research priorities and capacity building needs**
Actions To Mitigate Risk	Shared experience and expertise within the regional network and external technical support provided for the weakest control programmes
Mitigation Status	On Track

Biennium	**2024-2025**
Risk Description	**Inability of some control programmes to define research priorities and capacity building needs**
Actions To Mitigate Risk	Shared experience and expertise within the regional network and external technical support provided for the weakest control programmes
Mitigation Status	Planning phase
Risk Description	**Insufficient engagement of national control programmes**
Actions To Mitigate Risk	Adequate communication strategy to maintain interaction of all partners within the network
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**facilitation trough the conduct of operational research of the uptake of new all oral shorter regimen for the treatment of Multi Resistant Tuberculosis (MDR/RR-TB)**
Output Indicator	Report provided to SWG and stakeholders at country, regional and global level
Output Target Date	31/12/2022
Output Progress Status	Completed
Output Progress Description	a research package comprising a generic research protocol, an electronic data collection tools and a tool kit for conducting the study was developed. In 2020, TDR supported 23 countries to develop and conduct operational research studies for the use of all oral shorter treatment for patients suffering of MDR/RR-TB.
Output Description	**Extend the WARN-TB approach to other geographical areas and/or other disease burdens**
Output Indicator	Report provided to scientific working group and stakeholders at country, regional and global levels
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	Similar experience of the WARN-TB was launched with the country of the central african region with the establishment of the Central African Regional Network for TB control (CARN-TB).
Output Description	**Capacity strengthened for improving the effectiveness of safety monitoring of new drugs in target countries**
Output Indicator	Serious Adverse event reporting rates in target countries
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	
Output Description	**Approaches to optimized delivery and effectiveness of seasonal malaria chemoprevention in West and Central Africa evaluated and other NTD control strategies**
Output Indicator	Report provided to scientific working group and stakeholders at country, regional and global levels
Output Target Date	30/06/2023
Output Progress Status	On Track
Output Progress Description	baseline analyses of the barriers for effective SMC delivery was conducted in 2020. Implementation research projects are currently developed by countries to overcome these barriers.

Biennium	**2024-2025**
Output Description	**Approaches to optimized the effectiveness of RTS,S malaria vaccine in countries with high seasonality**
Output Indicator	Report provided to scientific working group and stakeholders at country, regional and global levels
Output Target Date	31/12/2026
Output Description	**Strengthened regional networks of National Tuberculosis Programmes in West, Central, East and Southern Africa capable of identifying research priorities and designing and conducting OR/IR to generate the evidence-base for**
Output Indicator	Report provided to scientific working group and stakeholders at country, regional and global level
Output Target Date	31/12/2026

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Guidelines and policy decisions informed by TDR outputs**
Progress made towards outcome	The national disease control programmes supported through this ER, used research results to modify their national strategy. An external evaluation conducted in 2022 estimated that the results of 70% of Operational/Implementation research projects conducted as part of the WARN-TB/CARN-TB activities are translated into new national policy or practices
Biennium	**2024-2025**
Outcome description	**Guidelines and policy decisions informed by TDR outputs**
Progress made towards outcome	

Expected Result: 1.3.3

Title: Population health vulnerabilities to VBDs: Increasing resilience under climate change conditions (Operationalizing a One Health Approach for the Control of VBDs in the Context of Climate Change)

Strategic Work Area: Research for implementation **Workstream:** Research for policy

ER type:	Evolved	**Funding type:**	UD
Start date:	1/1/2020	**End date:**	31/12/2025
ER status:	On Track	**Comment:**	
WHO region:	AFRO		
Partners:	WHO-PHE, WHO-AFRO, WHO-NTD, Fondation Merieux, UN Environment		
Diseases:	Malaria; Rift valley fever; Schistosomiasis; Tuberculosis; Trypanosomiasis; Vector-borne diseases		
Review mechanism:	Through SWG, dedicated ad hoc group of external experts		

ER manager: Corinne Simone Collette MERLE
Team: 1 Professional staff (P5) and 1 admin staff (Daniel Hollies)
Number of people working on projects: 20

FENSA clearance obtained for all Non-State Actors? Yes
Justification for no FENSA clearance:

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	No	Build strengths:	Yes
Reduce burden:	No	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	The objectives of this programme are aligned with TDR strategy
Roles complimentary:	Yes	TDR partners add complementary value and contribution to achieving TDR strategy.
Coordination transparent:	Yes	Coordination with partners is above board and transparent.
Visibility:	Yes	Partners share similar goals as TDR, thus expanding TDR's visibility in the field.

Objectives and results chain

Approach to ensure uptake: TDR and collaborating research institutions will conduct networking and policy-advice activities to promote the products generated from the research programme:

a) Translation and dissemination of the scientific knowledge, evidence and adaptation tools and strategies generated through partnership and networking (south-south and north-south). Project recipients will facilitate the transfer of research findings to various user groups including academics, policy-makers and the public through a range of means including via TDR, projects and partner websites. They will present the results in relevant fora and national dialogues and publish the results in scientific journals from the various disciplines of the investigators, as well as through interdisciplinary publication channels. TDR and collaborators will also produce scientific synthesis and research summaries on the research results;

b) Promotion of research-to-policy uptake of the research results by engaging in researcher, practitioner and policy dialogues at local and national levels through research-to-policy dialogue, policy documents,

media, involving policy-makers in research meetings/workshops, implementation and evaluation of the projects, strategy events such as Community of Practice meetings and stakeholder consultations;

c) Enhancement of public awareness of climate change adaptation options by communicating research findings to communities, health officials and policy-makers through various means (including publications, feedback seminars, dissemination of scientific results to the general public, popularization of research findings by the media in collaboration with research institutions using films and other forms of documentation);

d) Promotion of intersectoral collaboration by integration of representatives of other sectors in the transdisciplinary research activities and in the research meeting process; and

e) Undertake monitoring and evaluation activities (internal and external M&E) to ensure that expected outputs and outcomes are achieved in line with project objectives. In collaboration with the researchers, TDR's communications team and IDRC, the results of the programme will be widely disseminated using various means.

The overall performance of the programme will be monitored and evaluated by TDR. In addition to the annual report, TDR activities are reported in the TDR newsletter and on its website.

Up-take/Use Indicator: 1. Increased national, regional and international attention triggered through research results; 2. Use of tools by African countries for increased resilience to VBD risks under climate change conditions; 3. Number and significance of events where decision-making by public health officials is a focus; 4. Number of reports, workshops, meetings, national fora and media popularization produced/organized; and 5. Evidence of impact of capacity built in research institutions and communities

Gender and geographic equity: All proposals follow gender-sensitive approaches, with all research activities having an explicit gender perspective/framework and taking into account possible gender differentials in the epidemiology and transmission of VBDs and will, if possible and appropriate, define gender-sensitive approaches to the community-based adaptation strategies to reduce population health vulnerabilities. This perspective is further stressed in the call for proposals and during proposed training and workshops where the participation of women researchers is actively encouraged. Best approaches to engage women in programmes and activities aimed at climate change adaptation for health and reduced risk for VBDs will also be addressed.

Publication plan: At least three publications (open access) expected from projects supported by TDR

Up-take/use indicator target date: 31/12/2023

Sustainable Development Goals

Good Health and Well-being; Climate Action

Concept and approach

Rationale: The overall goal of this ER is to generate evidence to enable development of innovative strategies to reduce VBD-related human vulnerability and to increase resilience of African populations to VBD-related health threats. In addition, it aims to broaden and extend knowledge, research capacity, collaboration and policy advice products that can be used throughout Africa and other regions. During previous years (from 2013), and through the TDR IDRC Research Initiative on Vector Borne Diseases and Climate Change, this ER had delivered on the following: 1) identification and characterization of potential impact on vector borne diseases (VBD) of complex socioecological conditions of water systems in Africa, 2) assessment of VBD risks under various environmental exposure conditions and vulnerability context, 3) decision support processes and tools for health impact assessment and management, and 4) a network and community of practice with capacity built to better manage climate and environment-related health risks. For the current biennium (2020-2021), this ER addresses an extraordinary opportunity to build on the outputs of the TDR-IDRC Research Initiative as the basis for operationalizing the One Health, a multisectoral, transdisciplinary approach that ensures collaboration and coordination among all relevant players in public health, animal health, plant health, environment, ministries, stakeholders, sectors and disciplines, to achieve better public health outcomes (see Figure 1. Evolution of ER 1.3.3). This opportunity has now become even more urgent and a critical need with the emergence of Covid-19, re-emergence of Ebola and other zoonotic and vector borne disease (VBD) threats. For example, the social and economic dislocations Covid-19 has catalysed can be expected to increase health risks by increasing the vulnerability of many already vulnerable populations well beyond the pandemic period. Figure 1. Evolution of ER 1.1.3. Vector borne diseases and climate change ? Relevance

Human health is intimately linked to the state of the environment, including the effects of climate change. Nearly one in four premature deaths in Africa, for instance, are linked to the environment and threatens to increase the number of health emergencies and outbreaks in the coming years. IMP SWG members highlighted the importance of the interrelationship between health and climate and acknowledged that research in this area remains highly topical albeit the completion of the TDR IDRC Research Initiative on Vector Borne Diseases (VBDs) and Climate Change.

One of the approaches that could prove to be valuable in the implementation of joint interventions in health and environment, to address population health vulnerabilities and to increase resilience is the One Health approach, which ensures that human, animal, and environmental health concerns are addressed in an integrated, multisectoral and holistic manner, and to provide a more comprehensive understanding of the problems and potential solutions than would be otherwise not be possible with siloed approaches by the stakeholders concerned (researchers, public health practitioners, environment, agricultural sectors, communities and other relevant partners). At the same time, the One Health approach is quite complex, making its practical implementation and operationalization not straightforward, and thus, the stakeholders concerned will benefit from capacity building on the One Health approach to build resilience against VBDs under climate change conditions.

Demonstrable impact The goal of this ER is to ensure resilience to the adverse impacts of VBDs and climate change among vulnerable populations in Africa. It is expected to contribute to the following: · 2030 Agenda for Sustainable Development through Sustainable Development Goal 3 (Health and Well Being) and 13 (Take urgent action to combat climate change and its impacts) and the UNFCCC's Paris Agreement on Climate Change

· WHO's Triple Billion target and WHO's 13th General Programme of Work (2019-2023)

· Strategic Action Plan to Scale up Joint Interventions in Health and Environment in Africa (2019-2029)

· WHO's Global Vector Control Response (2017-2030) and the 2030 NTD Road Map for Ending Neglected Tropical Diseases

Design and methodology:

Operationalizing One Health encompasses a set of tools, currently under development through ER 1.3.3, that combines well-documented, evidence-based principles and practices that specifically address the problem of population vulnerabilities to VBDs in the context of climate change. It is widely agreed among international development agencies, medical and public health scientists that One Health can contribute significantly to global health in this regard. Yet the challenge is how to extend One Health operationalization efforts that are focused on organizational requirements, on elaboration of specific methods including performance metrics (through a scorecard) that reflect the interdependence of human health and ecosystem health. Thus, for operationalizing One Health, we are combining established methods from the environmental and health fields using analytical systems, planning and organizational approaches to form the basis for risk mitigation and management against emerging zoonotic diseases, climate variability and extreme weather events. The One Health scorecard system is critical to measure success and evaluate performance of the One Health plan through performance indicators for collectively developing a metrics standard that incorporates variances of specific settings for a harmonised evaluation (see Figure 2. Example of a One Health Scorecard) . Figure 2. Example of a One Health scorecard (?What is not measured is not done, What is not measured can not be managed, What is not measured can not be improved, What is not measured is not important to justify?).

A significant advance toward accomplishing this was to employ Implementation Science in the design of a Framework/Draft Plan and associated provisional metrics and indicators, which was presented and discussed during the One Health Consultation Meeting held in Brazzaville, Congo, last December 2019 (see Figure 3. Components of an adaptive One Health approach) . Participated in by IMP SWG (represented by Dr Mario Henry Rodriguez, who also chaired the meeting), key researchers from the TDR IDRC network, representatives from the ministries responsible for health and environment, and partners/collaborators [WHO AFRO, Fondation Merieux, UN Environment, OIE-Africa, FAO-Africa, PAMCA], the Brazzaville meeting acknowledged the value of the TDR IDRC research initiative for laying the foundation for more holistic, locally adaptable health systems capable of VBD and climate change risk management and can now be envisioned for the implementing the One Health approach. The refinement of the Framework/Draft Plan from the Brazzaville meeting is expected to result in an essential policy and management tool that currently does not exist for operationalizing One Health. Figure 3. Components of an adaptive One Health approach

The main recommendation from the Brazzaville meeting was a Call to Action to implement the Draft Plan to fully develop the One Health operationalization system using the extensive experience and data outputs from the TDR-IDRC Africa Initiative. Aligned with the Libreville Strategic Action Plan to Scale Up Health and Environment Interventions in Africa (2019-2029), this scorecard and performance metrics system is envisioned to assist in mitigating the impacts of VBD health consequences on the most vulnerable populations. It was further recommended to implement the Draft Plan on a pilot scale based on the Initiative?s projects in Cote d?Ivoire, Kenya, Tanzania and South to facilitate increased integrated

coverage of health, agricultural and environment interventions for primary prevention of VBDs while integrating ecosystems preservation in Africa.

Progress in 2020 The following activities have been completed and undertaken: · Consultation Meeting for Operationalizing a One Health Approach for VBDs in the context of Climate Change, 17-18 December 2019, Brazzaville, Republic of Congo (see Group photo from the Consultation Meeting) o Jointly organized and funded by TDR with Fondation Merieux; participants included TDR partners and collaborators, SWG, researchers, public health practitioners, ministry representatives from public health and environment, other stakeholders o Objectives: 1) To discuss how research products from the TDR IDRC Research Initiative on VBDs and Climate Change can be aligned with and contribute to the Strategic Action Plan (SAP) to Scale up Health and Environment Interventions in Africa (Libreville, 2019-2029), 2) To discuss and provide input into a draft plan that will guide the implementation of One Health o Brief from the meeting: 1) Participants were informed of the new Libreville Strategic Action Plan and discussed how future work can be aligned with and contribute to the SAP, 2) Discussed and provided input to the draft plan for Operationalizing One Health, 3) Conducted a workshop on country scenario-setting for the application of the One Health scorecard/metrics system; 4) Identified research and capacity building needs for the implementation of One Health o Recommendations from the meeting: 1) Revise draft plan for OH with input from participants, 2) Call to Action to pilot test the draft plan including the metrics based assessment tool, 3) Request TDR and partners to support the testing of the draft plan through funding and technical support for country projects and activities for 2020-2021

Group photo from the Consultation Meeting

· Engagement with partners o TDR is engaged with the following partners: § Fondation Merieux § UN Environment § OIE-Africa (World Organization for Animal Health) § FAO-Africa (Food and Agriculture Organization) § PAMCA (Pan Africa Mosquito Control Association) · Established collaboration with Global Health Group International (led by Prof Bruce Wilcox at the ASEAN Institute for Health Development, Mahidol University, Thailand) for technical support for the delivery of products relevant to Operationalizing One Health o Completion of a Master Plan and Guidance Document for use by research projects in the development of their workplans o Development of an interactive web-based collaboration platform for knowledge sharing and to maximize communications and information exchange o Planning and organization of a writeshop for African principal investigators to assist in development of workplans to help facilitate TDR?s engagement with technical and policy personnel with WHO AFRO, WHO country office in Africa, UN Environment, OIE-Africa, FAO-Africa, Fondation Merieux and PAMCA o To assist TDR in providing guidance to countries (researchers, policy makers and other relevant stakeholders) to lay the foundation and tools necessary for translation and uptake of One Health strategies an strengthened capacity for integrating human, animal and ecosystem health o Preparation of a publication and research dissemination plan · Participation at the 26 th Tripartite Annual Executive Meeting on One Health, WHO Headquarters, Geneva, 12-13 February 2020 o Objective of the meeting: to discuss critical issues at a political and strategic level, review progress and address bottlenecks o TDR presented its One Health research portfolio in the Session on One Health Research as part of information sharing among partners with an interest to strengthen collaborative research activities on specific topics and methodologies o Presented were the One Health research portfolio on Antimicrobial Resistance and the projects on vector borne diseases and climate change · Participation of TDR in the Virtual 2 nd Meeting of the Interagency Liaison Group on Biodiversity and Health, 4-6 May 2020 o This meeting was hosted by the Department of Environment, Climate Change and Health and the Convention on Biological Diversity (CBD) o Contributed to the finalized Guidance for mainstreaming biodiversity for nutrition and health o Contributed to the WHO Q&A on climate and health, and post COVID recovery o Contributed to the WHO Q&A on biodiversity, health and infectious diseases o Discussed how to leverage joint WHO-CBD work programme on biodiversity and health can be aligned in the context of COVID 19 o Contributed towards the preparation of a Draft Global Plan of action on Biodiversity and Health, including addition of key elements of the biodiversity-inclusive One Health Guidance · Completion of a Virtual Writeshop with principal investigators (from Cote d?Ivoire, Kenya, South Africa and Tanzania) on 8, 16, 22 and 29 July 2020; 10.30-12.00 CET o To develop workplans for pilot testing the Draft Plan for One Health including the use of the scorecard/metrics system o Proposals submitted to TDR by 1 August 2020; contracts processed, with projects starting by the 1 st week of Sep 2020 for a duration of 1 year. Please see below for an annotated list of projects; see also Proposed Pathway/Logic Model for the 4 Projects. Project 1. From an Ecohealth research project to operationalizing One Health approach in West Africa (Cote d?Ivoire and Mauritania) Principal Investigator: Dr Brama KONE , Centre Suisse de Recherches Scientifiques en Côte d?Ivoire (CSRS), Abidjan, Côte d'Ivoire o Main objective. To operationalize a One Health approach through the assessment of capacity building needs among stakeholders, activities and outcomes of knowledge and learning process and risk management strategies o Specific objectives: § To analyse the actors (governance, organizations) and resources, capacity building activities and their outcomes, employing socio ecological systems analytical methods and stakeholder analysis § To assess the effectiveness of the EcoHealth approach principles in the implementation of One Health intervention science and risk management scorecard components § To Investigate how the previous project results and experience

with Malaria and Schistosomiasis interventions, and the role of public versus private health facilities could guide interventions to improve health systems disease risk management capacity, considering OneHealth approach, taking as example the zoonotic disease COVID-19 pandemic management

Project 2. Operationalizing One Health Initiative for Malaria and Rift Valley Fever Project in Kenya Principal Investigator: Professor Benson B.A. ESTAMBALE , Research, Innovation and Outreach, Jaramogi Oginga Odinga University of Science and Technology, Bondo, Kenya o Main objective. To contribute to the operationalization of a One Health Research protocol for Implementation Research o Specific objectives: § To synthesize the existing project data based on a One Health Approach and guided by the tenets of social-ecological systems framework (SESF). § To build the capacity of the project team on the One Health Approach to climate sensitive vector borne disease research. § To publish synthesized research papers based on the One Health Approach which incorporates findings from the project.

Project 3. One Health Operationalization in Tanzania Principal Investigator: Professor Paul S. GWAKISA , The Genome Science Centre and Department of Veterinary Microbiology and Parasitology, Faculty of Veterinary Medicine, Sokoine University of Agriculture, Morogoro, Tanzania o Specific objectives: § To build capacity for transdisciplinary research for operationalizing One health at different levels (community level/extension workers/postgraduates and young researchers). § To work closely with all stakeholders and develop a framework for addressing key one health-based community needs using a Theory of Change approach (eg, the human-livestock-wildlife interface and zoonotic diseases). § To collaboratively develop a metrics-based assessment of a One Health scorecard.

Project 4. Operationalizing One Health in Ingwavuma Community: Developing Transdisciplinarity Methodology (South Africa) Principal Investigator: Professor Moses J. CHIMBARI, College of Health Sciences, University of Kwazulu-Natal, Durban, South Africa o Main objective. To address capacity development, knowledge and learning and threat management for operationalizing One Health in South Africa o Specific objectives: § To enhance and develop capacity at different levels for operationalizing One Health § To co-develop a theory of change with stakeholders to easily identify priority areas for research and intervention § To identify hurdles to full empowerment of communities through a co-development of a monitoring and evaluation framework

· Scientific Session at the recent virtual World One Health Congress 2020, 30 Oct-3 Nov 2020. The title of the session was A Metrics Based Evaluation of One Health: Toward Control of VBDs in the context of Climate Change in Africa . This session brought together 6 scientist-leads (from Bangkok, Germany, Cote d?Ivoire, Kenya, South Africa and Tanzania) to further articulate the fundamentals of One Health and to draw insights into the conduct of integrative research using One Health transdisciplinary systems approaches including pilot testing a scorecard/metrics-based evaluation for its operationalization. For more information on this Scientific Session, please refer to https://www.fondation-merieux.org/en/events/6th-world-one-health-congress-2020-virtual-event/ . For more information on the One Health scorecard, please refer to https://onehealthscorecard.org/ .

· Aside from the Scientific Session on One Health at the virtual WOHC 2020 (mentioned above), TDR also participated in another Scientific Session, ?Addressing zoonotic diseases at the animal-human-ecosystem interface: responding to threats, as part of the Science Policy Interface (Global Health Security) - see figure below.

Progress in 2021: Key achievements:

- A Master Plan and Guidance document for the development of the operational protocol was finalized. It provided an overarching synthesis of the input from the One Health Consultation Meeting (December 2019, Brazzaville), as the basis for developing a standardized approach for the One Health Metrics and Scorecard. This Master Plan supported a follow-up consultation process through bi-monthly online meetings (with technical support from TDR and Global Health International Group [GHGI]) that helped the development of actions plans for the country projects and to clarify the expected outputs, collaborative teamwork process, timetable and milestones for the African research teams.

- Establishment of an on-line platform for Operationalizing One Health as a Transdisciplinary Ecosystem Approach (https://onehealthscorecard.org/) . This web-based collaborative member login platform was developed and launched in July 2020, and continually upgraded based on feedback from the country teams. It has proven effective as the primary means of collaborative learning, organizational management, and progress tracking.

This on-line platform also includes an interactive collaborative space for two working groups composed of members from the network of researchers and stakeholders from the country projects, TDR, GHGH and other stakeholders/partners (see FIGURE 1) : o Fundamentals Working Groups § Capacity building, approach planning and organizational evaluation - To integrate knowledge that is both scientific and technical pertaining to zoonotic disease risk mitigation with that of operational theory and management approaches (https://onehealthscorecard.org/login/approach-planning-and-evaluation/) § Systems thinking, resilience and risk management (https://onehealthscorecard.org/login/systems-thinking/) §

Intervention management and implementation research (https://onehealthscorecard.org/login/intervention-science/) o Topical Working Groups § Transdisciplinary research on zoonoses and VBDs (https://onehealthscorecard.org/login/transdisciplinary-research-on-zoonoses-and-vbds/) § Health and biodiversity (https://onehealthscorecard.org/login/health-and-biodiversity/) § Sacred ecology (https://onehealthscorecard.org/login/sacred-ecology/) § Gender and equity (https://onehealthscorecard.org/login/gender-and-equity/) § Community engagement (https://onehealthscorecard.org/login/community-engagement/)

FIGURE 1. Interactive collaboration space in onehealthscorecard.org ? Published a One Health Handbook. This is a comprehensive reference source of One Health framing and integration of its challenges including the basis for its operationalization. This cutting-edge One Health fundamentals document was developed and incorporated into the web-based platform, along with key supporting materials, providing the scholarly and evidence-based background on One Health. This document was subsequently published as a chapter in the Springer/WHO handbook of Global Health [B. A. Wilcox and J. A. Steele. ©The Editors and the World Health Organization, April 2021 R. Haring (ed.), Handbook of Global Health, https://doi.org/10.1007/978-3-030-05325-3_88-1 ; see FIGURE 2], making it widely available within WHO and other collaborating agencies and organizations (FAO, OIE, UNEP, among others) for their One Health programmes.

FIGURE 2. One Health and Emerging Zoonotic Diseases: Framework, Integration and Challenges. B. A. Wilcox and J. A. Steele. ©The Editors and the World Health Organization, April 2021 R. Haring (ed.), Handbook of Global Health, https://doi.org/10.1007/978-3-030-05325-3_88-1 ? Put together a One Health Glossary. An A-Z index of terms relevant to One Health. (https://onehealthscorecard.org/login/one-health-glossary/) An online One Health pilot curriculum development component was added to the collaborative effort which will build on and extend the fundamentals section of the web-based platform. 2 to 3 individuals from each of the Country teams have been selected and will participate in the pilot course development from October 2021 through January 2022. The Prototype Online Training course (An innovative / interactive virtual classroom for use in an open eLearning platform) ?Operationalizing One Health as a Transdisciplinary ecosystem approach: Linking health, environment and communities? is a coordinated effort by TDR in collaboration with GHGI and researchers from Tanzania, ? Kenya, Cote d?Ivoire and South Africa. Progress towards implementation of this course are as follows: ? Modules for the course have been developed ? Selection of initial batch of trainees (4 per country team) is now finalized. This training course is also one of the proposed WHO Technical Products on norms/standards, data and research for 2022-23 (TP), a collaboration between TDR and NTD.

Plans for 2022-2023 The proposed plans for this biennium include the following: · A call for proposals to scale up the implementation and application of the One Health metrics/scorecard in Africa. · Technical and funding support for a portfolio of projects in Africa. · Mentoring and capacity building through a training course on Operationalizing One Health.

Approach to ensure quality:

VES will collaborate with WHO-PHE, WHO Regional Office for Africa (AFRO), through the Department of Protection of Human Environment (PHE), UN Environment, FAO-Africa, OIE-Africa and Fondation Merieux for implementation of the programme by ensuring that project outcomes feed into national climate change and health policy processes.

Uniqueness Building on previous projects from ER 1.3.3, TDR?s unit on Research for Implementation is best positioned for research and capacity building toward operationalizing an integrated, multisectoral and holistic One Health approach for the control of VBDs in the context of climate change. Through TDR?s convening and facilitation role, various partners and stakeholders from different sectors are brought together for the One Health approach which is envisioned as a novel, essential policy and management tool (including a metrics/scorecard system) for the control of VBDs at a time of changing environment/climate conditions in Africa.

ER Objectives

To operationalize and implement a One Health approach, embedded into the health and environment strategic alliance of country task teams, to enable African countries to manage the impact of VBDs in the context of climate change

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Health researchers and other stakeholders may encounter challenges in working under transdisciplinary circumstances (e.g. across different disciplines, knowledge sources and other multisectoral partners).**
Actions To Mitigate Risk	The transdisciplinary approach will be promoted and advocated for from the onset as an essential aspect required of the proposals and throughout the projects. The online training course will also supplement the implementation of the research projects.
Mitigation Status	On Track
Risk Description	**Knowledge translation outcomes may usually not be under the control or influence of the projects, particularly those in the decision- and policy-making positions.**
Actions To Mitigate Risk	For this research programme, stakeholders, including from the affected communities and policy/decision-makers, will be engaged from the very beginning at the inception and during the course and completion of the research projects to ensure their active involvement in conducting and reporting on the research on the research with the expectation that the results will be utilized as effectively as possible. It is anticipated that the periodic review of successes and failures of the projects and of the implementation of the research programme will allow timely remediation to potential problems that might occur during the course of the implementation of the projects.
Mitigation Status	On Track
Biennium	**2024-2025**
Risk Description	**Health researchers and other stakeholders may encounter challenges in working under transdisciplinary circumstances (e.g. across different disciplines, knowledge sources and other multisectoral partners).**
Actions To Mitigate Risk	The transdisciplinary approach will be promoted and advocated for from the onset as an essential aspect required of the proposals and throughout the projects. The online training course will also supplement the implementation of the research projects.
Mitigation Status	Planning phase
Risk Description	**Knowledge translation outcomes may usually not be under the control or influence of the projects, particularly those in the decision- and policy-making positions.**
Actions To Mitigate Risk	For this research programme, stakeholders, including from the affected communities and policy/decision-makers, will be engaged from the very beginning at the inception and during the course and completion of the research projects to ensure their active involvement in conducting and reporting on the research on the research with the expectation that the results will be utilized as effectively as possible. It is anticipated that the periodic review of successes and failures of the projects and of the implementation of the research programme will allow timely remediation to potential problems that might occur during the course of the implementation of the projects.
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**Project protocols developed from proposals and submitted to WHO ERC and National Ethics Review Committees for approval**
Output Indicator	Protocols reviewed for ethics approval at WHO and at the country level
Output Target Date	30/04/2023
Output Progress Status	On Track
Output Progress Description	Proposals recommended for funding will be developed into project protocols and submitted to WHO ERC and National Ethics Review Committees for approval.

Output Description	**A call for proposals for technical and funding support addressing the scaled up us of the One Health Transdisciplinary Ecosystem Approach for Vector Borne Diseases in the context of Climate Change in Africa**
Output Indicator	Publication and dissemination of a call for proposals
Output Target Date	31/03/2022
Output Progress Status	Completed
Output Progress Description	The call for proposals will initiate the implementation of this ER for 2022-23.
Output Description	**Implementation of an online training course on Operationalizing One Health**
Output Indicator	African researchers trained in Operationalizing One Health through an online course which is offered at least once a year (in 2022 and 2023)
Output Target Date	31/07/2022
Output Progress Status	
Output Progress Description	The operationalization of One Health will be supplemented by an online training course including the use of the scorecard/metrics system. This will be offered at least once a year (July 2022 and July 2023)
Output Description	**Research Uptake meeting with researchers, project stakeholders and collaborators**
Output Indicator	A research uptake meeting to share new knowledge, data, decision support processes/tools to stakeholders
Output Target Date	31/12/2023
Output Progress Status	
Output Progress Description	A research uptake meeting with researchers, project stakeholders and collaborators will be organized to share new knowledge, data and decision support processes/tools
Output Description	**Establish a Special Project Team to review proposals for funding/implementation**
Output Indicator	A Special Project Team composed of at least external experts to review and recommend proposals for funding.
Output Target Date	30/04/2022
Output Progress Status	Completed
Output Progress Description	The Special Project Team, composed of external experts will be put together to review and recommend proposals for funding.
Output Description	**Implementation of a portfolio of projects for the scaled up application of the One Health Transdisciplinary and Ecosystem Approach for Vector Borne Diseases in the context of Climate Change in Africa**
Output Indicator	2 projects being implemented in Africa
Output Target Date	30/06/2022
Output Progress Description	Implementation of projects from June 2022-Dec 2023
Biennium	**2024-2025**
Output Description	**Finalisation of One Health research projects**
Output Indicator	publication of research results
Output Target Date	31/12/2024
Output Progress Status	On Track

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Capacity building for research on the application of the One Health Transdisciplinary Ecosystem Approach for Vector Borne Diseases in the context of Climate Change in Africa; including roll out of an online training course (at least 20 trainees across Afr**
Progress made towards outcome	South-South sharing experience contribute to capacity building activities for improving research capacities of African countries for conducting research on One Health approach for improving VBD control
Outcome description	Research uptake and translation of tools/products from the research projects including the use of online training course for the scorecard/metrics systems on One Health operationalization
Progress made towards outcome	on track
Outcome description	**Scaled-up application of the One Health Transdisciplinary Ecosytem Approach for Vector Borne Diseases in the context of climate change in African countries**
Progress made towards outcome	4 consortia started to develop new research projects applying One health transdisciplinary Ecosystem Approach for VBD in Africa
Biennium	**2024-2025**
Outcome description	Scaled-up application of the One Health Transdisciplinary Ecosytem Approach for Vector Borne Diseases and other infectious diseases in the context of climate change
Progress made towards outcome	

Expected Result: 1.3.10

Title: Urban health interventions for the prevention and control of vector-borne and other infectious diseases of poverty

Strategic Work Area: Research for implementation **Workstream:** Research for implementation

ER type:	Continuing	**Funding type:**	UD
Start date:	1/1/2020	**End date:**	31/12/2023
ER status:	On Track	**Comment:**	Previous project under this expected result was finalized last year and following SWG 2019 recommendations, in 2020 a new call for proposals was launched.

WHO region: Global

Partners: Universities and research consortium in Latin America

Diseases: Vector-borne diseases; Not Disease-Specific

Review mechanism: Scientific working group and ad hoc expert reviewers

ER manager: Mariam OTMANI DEL BARRIO

Team: Abraham Aseffa, Bernadette Ramirez

Number of people working on projects:

FENSA clearance obtained for all Non-State Actors? Yes

Justification for no FENSA clearance: All partners are State-actors for now

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	Yes	Build strengths:	Yes
Reduce burden:	Yes	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes
Roles complimentary:	Yes
Coordination transparent:	Yes
Visibility:	Yes

Objectives and results chain

Approach to ensure uptake:	Evidence generated will also inform the development of information briefs for policy and practice. Local decision-makers will be part of the community engagement strategy in the implementation phase. In addition to oversight by an expert committee, quality assurance mechanisms include fact checking, peer review of concept paper, technical and copy editing
Up-take/Use Indicator:	Increased national, regional and international attention triggered through research results; number of reports and publications generated; number of meetings with decision-makers at local level
Gender and geographic equity:	Intersectional gender analysis will be applied and tools facilitated by the TDR team for local researchers to ensure disaggregated data.
Publication plan:	Literature reviews planned to be published in peer review journal.

Up-take/use indicator target date:	31/12/2023

Sustainable Development Goals

Gender Equality; Reduced Inequality; Sustainable Cities and Communities

Concept and approach

Rationale:	Urban health interventions to prevent and control infectious diseases would benefit from incorporating a gender analysis in order to understand bottlenecks in implementation of interventions and to ensure that social determinants of health are addressed to design effective prevention and control strategies for all urban settings.
Design and methodology:	Design and methods following proposal selection.
Approach to ensure quality:	An ad-hoc review committee will assess suitability of proposals to conduct the literature reviews. SWG members will be also updated on progress made.

ER Objectives

To generate new knowledge and evidence generated on effectiveness of interventions to prevent and control vector-borne diseases by addressing socioeconomic determinants in health in urban settings

2024/2025 To generate new knowledge and evidence to prevent and control vector-borne diseases by addressing socioeconomic determinants in health in urban settings

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Weak capacities at country level to effectively apply an intersectional gender analysis in research processes. Research teams really affected by the Covid19 pandemic. Despite the challenges, the work could be implemented.**
Actions To Mitigate Risk	Ensuring interdisciplinary teams, with social scientists and biomedical scientists and entomologists
Mitigation Status	On Track
Biennium	**2024-2025**
Risk Description	**Weak capacities at country level to effectively apply an intersectional gender approach in the research processes.**
Actions To Mitigate Risk	Ensuring interdisciplinary teams, with social scientists and biomedical scientists and entomologists
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**Evidence from literature reviews on urban health, gender dimensions of infectious diseases and social determinants in urban settings analysed, followed by Research uptake activity in terms of evidence briefs for policy generated.**
Output Indicator	Journal papers published following literature reviews conducted by ICDDRB in Bangladesh and the Regional Medical Research Centre in India. Systematic reviews will include a focus on infectious diseases among urban poor during COVID-19 pandemic
Output Target Date	31/12/2023

Output Progress Status	On Track
Output Progress Description	Systematic reviews from the research teams have been submitted to peer review journal. The team in Bangladesh authored two manuscripts which received WHO Executive Clearance and were submitted to BMC Systematic Reviews. 1. Protocol for a systematic review on exploring the implications of the social determinants of health and identifying effective community-based interventions to prevent and control infectious diseases in urban informal settlements in low- and middle-income countries. 2. Implications of the social determinants of health and identifying effective community-based interventions to prevent and control infectious diseases in urban informal settlements in low- and middle-income countries: a systematic review. The ICMR team in India authored two manuscripts which received WHO Executive Clearance and are currently in submission to two different journals. 1. Housing-related opportunities and challenges during COVID-19 pandemic among urban poor in low-and middle-income countries: A systematic review and gap analysis. 2. Community engagement and involvement in managing the COVID-19 pandemic among urban poor in low-and middle-income countries: A systematic review and stakeholders mapping. Icddr,b team, Bangladesh: The team explored what community-based interventions are effective in preventing and controlling infectious diseases, including COVID-19, in urban informal settlements; and what implementation strategies are effective in overcoming social, economic and gender inequities in the prevention and control of infectious diseases including COVID-19, in urban informal settlements. In July-August 2021, the team conducted a virtual global expert consultation to gather experts? feedback to the preliminary research questions for the proposed systematic review. This feedback contributed to the design of the review process and research questions. The final protocol was registered in PROSPERO in August 2021 (CRD42021218448). A stakeholder consultation was performed to refine the preliminary research questions for the proposed systematic review through collation of feedback received from national and regional policy makers from government bodies as well as from international organizations, healthcare professionals, researchers, academics and other development partners. This systematic review was conducted following the criteria of Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P). Inclusion criteria were developed in accordance with the PICO (population, intervention, comparison, and outcome) principle (Cochrane). Incidence and prevalence of the selected diseases was measured as main outcome. A descriptive analysis of the study findings was done as meta-analysis was not possible to conduct due to significant heterogeneity regarding type of interventions, comparison groups, outcomes of interest, outcome measurement and statistical analysis. Across the reviewed studies, it was observed that community-based interventions have the potential to substantially reduce the disease incidence among the urban poor communities. However, it was difficult to pin-point effectiveness of any single social determinant of health component working towards making a significant change in any health outcome. This was because the interventions taken were complex and designed with multi component along with variations in social settings. Providing health education was identified as the most prevalent community-based intervention. The type of interventions identified in this review were Socio-economic support, Hand washing intervention, Water purification, Counselling, Mobile phone SMS reminder, Health education, Case detection and directly observed therapy (DOT) implementation, social mobilization by community health workers, Community based screening, Nutrition supplementation, Delivery of insecticide treated material in community, Community based vector control. The approaches of community engagement taken to deliver the mentioned interventions were community meeting, pictorial card distribution, household visit, conditional cash transfer, training to CHWs and vocational training to community. ICMR team Review 1: The research team reviewed evidence on gender related aspects in infectious disease

epidemiology, prevention and control, including gender-based violence, under a COVID-19 scenario where infectious diseases prevail and are often exacerbated by compromised access to health care as well as aspects related to community participation and engagement in risk management of infectious diseases, including through housing and water, sanitation and hygiene interventions.
Consequently, the purpose of this analysis was to evaluate and assess housing-related opportunities and challenges during the COVID-19 pandemic among urban poor residing in low- and middle-income countries (LMICs).
The study protocol of this review is registered in PROSPERO (CRD42022300387). The study followed standard procedures and presented the results using thematic framework analysis.

Results: The urban poor in the included studies comprised refugees, slum dwellers, migrant workers, and the urban homeless. Three main themes emerged in the findings: 1) Housing infrastructure and existing facilities, 2) Challenges related to housing conditions during COVID-19 pandemics, and 3) Coping mechanisms, social support, and expectations.

ICMR team Review 2:

The team conducted a second systematic review of the community engagement and involvement (CEI) with an emphasis on stakeholder identification, accountability mapping, the support system, and the engagement process among urban poor populations in LMICs during the COVID-19 pandemic. They searched eleven databases, including PubMed, Embase, Web of Science, and CINAHL, following the PRISMA-2020 guidelines to find articles published between November 2019 and August 2021. They registered their protocol in PROSPERO (CRD42021283599). The process for the second review was similar to the first one described above.

The findings revealed that various stakeholders had a significant role in managing COVID-19 among the urban poor of LMICs with community participation. These included city authorities (urban local bodies), civil society groups (CSO), Community-based organizations (CBO), Community health workers (CHW), Community volunteers, corporate social responsibility (CSR) groups, mass media and local non-governmental organizations (NGOs). The police, a private food supply agency, private hospitals, the public health system, United Nations (UN) specialized organizations, researchers, and academic institutions participated in several community engagement activities and were supported differently. From the grass-root to the central level, these stakeholders supported urban slum communities on different platforms, such as awareness of the pandemic, facilitated healthcare, supply of food and water, as well as financial support. Many stakeholders were involved in COVID-19 support, particularly for health care, livelihoods, and WASH infrastructure, and their accountability mapping by adopting an interest?influence matrix.

The interest?influence matrix findings revealed that specific community volunteers, community-based organizations, and civil society organizations had high interest but less influence, indicating that it is necessary to recognize and engage them. Similarly, motivation is crucial for those with high influence but less interest, such as corporate responsibility/conscience and private food supply agencies, for the health system's preparedness plan among urban populations. This review emphasizes the significance of meaningful CEI in designing and implementing public health efforts for pandemic management among urban slum populations.

Output Description	**Evidence informed policy and practice at urban level.**
Output Indicator	Evidence informed policy related instruments or policy documents resulting from evidence reviews
Output Target Date	30/06/2023
Output Progress Status	On Track
Output Progress Description	Research teams are planning workshops on research uptake to inform evidence briefs for policy.

Biennium	**2024-2025**
Output Description	**Evidence informed policy and practice at urban level.**
Output Indicator	Number of research studies implemented following findings resulting from the systematic evidence reviews conducted in the previous biennium

Output Target Date	30/11/2025
Output Progress Status	
Output Progress Description	This output has not started yet, it is for 24/25 and so at planning stages.

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Evidence generated to inform policy and practice on control of infectious diseases in urban settings in low- and middle-income countries**
Progress made towards outcome	call for proposals launched to conduct literature reviews and research gap analysis on social determinants of urban health; the call is also expected to illustrate to the extent possible, how social and gender dynamics in a COVID-19 context affect the prevention and control of infectious diseases of poverty.
Biennium	**2024-2025**
Outcome description	**Evidence generated to inform policy and practice on control of infectious diseases in urban settings in low- and middle-income countries with an intersectional gender lens**
Progress made towards outcome	This outcome is for next biennium.

Expected Result: 1.3.11

Title: Multi-sectoral Approach (MSA) for prevention and control of vector-borne diseases

Strategic Work Area: Research for implementation **Workstream:** Research for integrated approaches

ER type:	Continuing	**Funding type:**	UD and DF
Start date:	1/1/2020	**End date:**	31/12/2023
ER status:	On Track	**Comment:**	ER on track with all case studies well started, preliminary results provided and all case studies expected to be completed by end of 2023.

WHO region: Global

Partners: Sweden International Development Agency (Sida), WASH/PHE/WHO Team
UNPeace and Development Funds
Global Malaria Programme/WHO
CDC China

Diseases: Arboviral diseases; Arboviruses; Chikungunya; Dengue; Malaria; Neglected Tropical Diseases; Vector-borne diseases; Zika virus

Review mechanism: Through ad hoc expert review and steering groups, approved by TDR senior management and TDR advisory bodies, including SWG, STAC and JCB

ER manager: Florence FOUQUE
Team: Abdul Masoudi
Number of people working on projects: 1

FENSA clearance obtained for all Non-State Actors? No

Justification for no FENSA clearance: FENSA Clearance will be sought for all Non-State Actors as the ER is progressing and contracting new institutions to perform the work.

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	Yes	Build strengths:	Yes
Reduce burden:	Yes	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	Objectives aligned with TDR strategy and the strategy of the partners.
Roles complimentary:	Yes	Roles and complementary of partners achieved through the different work packages and deliverables of the ER.
Coordination transparent:	Yes	Transparent coordination through open meetings with minutes available and transparent decision process
Visibility:	Yes	The visibility of the ER is through all communication channels and materials from all partners

Objectives and results chain

Approach to ensure uptake: To ensure the uptake of the findings and their application into countries, the different activities performed through this ER are involving since the planning stage all the relevant stakeholders. The WHO collaborating partners of the ER, WASH/WHO, NTD/WHO and GMP/WHO also have their own channels to

	provide recommendations to countries based on the findings. A communication partner (Lushomo) has also being contracted to transform the scientific findings into information briefs for countries.
Up-take/Use Indicator:	The indicator for uptake will be the number of countries for which a multisectoral approach for preventing and controlling VBDs will be tested, based on the TDR framework. For capacity building within countries, other indicators will be the numbers of participants and countries attending the training workshops. Another uptake indicator will be the number of countries using the TDR MSA Framework for improving the MSA approach against VBDs. Case studies have also demonstrated that some countries (involved in the case studies) have already nominated a multisectoral task force/Committee against malaria, a new indicator will thus be the number of countries with such an official MSA task force/Committee approved by the Health Authorities at the National level.
Gender and geographic equity:	Gender and geographical equities are taken into account in all activities among which the building of the ad hoc review groups, the consultancies and in the selection criteria of the research teams, the participation to the training activities.
Publication plan:	The publication plan include framework documents that will be updated regularly, thematic briefs, scientific publications in open access peer review journals (with special issues) and other materials such as training materials and briefs for stakeholders (communities and technical staff).
Up-take/use indicator target date:	31/12/2023

Sustainable Development Goals

Good Health and Well-being; Clean Water and Sanitation; Partnerships to achieve the Goal

Concept and approach

Rationale:	Vector-borne diseases, including malaria and emerging arboviral diseases, account for about one quarter of all infectious diseases. Although there has been significant progress for malaria, with a recent decrease in malaria morbidity and mortality rates, other diseases, such as those caused by arboviruses like dengue, chikungunya, yellow fever and more recently Zika, are expanding, with an increased number of cases and fatalities. It has become evident that the prevention and control of these diseases must include more than a single orientated approach, since the transmission patterns are driven by vector host-pathogens relationship where natural conditions, human societies and vector parameters are dynamically interacting. Further, the Global vector control response (GVCR) 2017?2030, which was approved at the World Health Assembly in 2017 by more than 190 Member States (WHO 2017) consider the intra- and intersectoral approach as one of the 4 pillars to achieve efficient vector and vector-borne diseases control. The rationale of this expected result is to work with all partners to develop tools, framework and guidance on how to implement an efficient multisectoral approach (MSA) for preventing and controlling vector-borne diseases (VBDs) as well as test into field conditions and case studies the MSA. This activity is building up on the Multisectoral Action Framework for Malaria (MAFM) developed by the Roll Back Malaria (RBM) Partnership and the United Nations Development Programme (UNDP), and a concept Note was issued by the Swiss Tropical Public Health (STPH) institute and the Swiss Development Cooperation (SDC) entitled: ?Leveraging the Sustainable development Goals to intensify transdisciplinary & multisectoral collaboration in the global malaria response. In this context, a collaboration on Multi-Sectoral Approach (MSA) for the prevention and control of malaria and emerging arboviral diseases was started between the Swiss Agency for Development and Cooperation (SDC), the Canadian International Development and Research Centre (IDRC), the Swiss Tropical and Public Health Institute (Swiss TPH) and TDR/VES, to build a multi-disciplinary approach to support commissioned reviews on specific items related to MSA against VBDs, and the development of a Guidance document. Following these first steps a collaboration was established with the WHO Water and Sanitation (WASH) group and supported by funding from the Sweden International Development Agency (Sida) to strengthen countries capacity on MSA against VBDs with a focus on the WASH sector. The overall objectives of the collaboration are to reduce WASH-related disease of poverty as per the WHO WASH Group strategy, with a primary focus on VBDs, as per TDR Strategy including through the progressive mainstreaming of WASH in TDR, and throughout WHO. Another collaboration was started in 2021 with the Global Malaria Programme (GMP) from WHO to implement a proposal which has received the financial support from the UN Peace Funds Development. The overall goal of the project is to explore and validate the application of an innovative surveillance and response as well as multisectoral approaches to reduce malaria burden in different settings in Africa. The project has two components, both of which fit well to the national strategic plans (NSPs) for malaria countries: i) testing innovative surveillance and response namely "malaria Reactive Community-based Testing and Response approach (1-7 mRCT))" adopted from the Chinese 1-3-7

	surveillance and response experience; ii) multisectoral approach in coordination and implementation to reduce malaria burden. The project will be implemented in selected districts and villages of four countries (Burkina Faso, Senegal, Tanzania and Zambia).
Design and methodology:	To promote the MSA and define the conceptual framework and indicators on how to deploy a MSA for VBDs prevention and control, an action plan with several steps was started in 2016: Step 1 was to gather evidence through a landscape analysis through commissioned reviews. Step 2 was to convene a workshop to present the evidence to a panel of experts and to discuss the research on case studies, stakeholder involvement, capacity-building needs and any other topic that may put the MSA into concrete actions. Step 3 was to develop a guidance Framework for countries on how to implement MSA. Step 4 is to support the cases studies. Within the current collaboration with the WHO WASH Team, other activities were added that can be found in the approved concept note attached. The design and methodology for the UNPeace Funds Development (UNPFD) project includes 2 main activities and TDR is responsible for Activity 2 which has 5 specific items (all details can be found in the attached document): Update the TDR's guidance document on MSA, adding a specific chapter for malaria. Organize a regional workshop to train the National Malaria Control Programmes staff on MSA. To help integration of MSA activities in the current malaria task forces of the countries included in the project. To implement an MSA case study in one of the countries. To identify the most suitable MSA mechanisms in the different contexts.
Approach to ensure quality:	The following approaches were taken to ensure quality of the expected results: 1. The objectives, planning, activities and budget of the ER is aligned with TDR strategy and was approved by TDR governing bodies. 2. The groups of experts were invited based on their competencies and experience and approved as per TDR SoPs. All experts accepting to be part of a group completed their DOIs and COIs. 3. The Guidance Document was developed by a consultant, with external and internal reviews, external editing, final check and WHO publication clearance system. 4. For the selection and following up of research proposals, review and steering groups of external experts were established and approved accordingly. 5. The quality of the findings is reviewed by the selected experts groups through mid-term and final reports and published in open access peer review scientific journals .

ER Objectives

1. Support research activities on case studies implementing MSA approaches for several chosen diseases and contexts, following the topics already established in the previous part of this ER, which are: i) industrial activities and VBD transmission, with a special focus on gold-mining activities that are strongly disturbing the malaria ecosystems; ii) integrated vector control strategies using Dengue Virus as a proxy; iii) displacement of people and consequences on VBD transmission, with impact of migration (for economic or civil unrest or war reasons), displacement of temporary workers and any other population movements; iv) impact of environmental changes including climatic changes, biological changes such as biodiversity loss and consequences on VBDs cycles and social changes also taking into account water management; and v) intersectoral collaborations for prevention and control of VBDs and how stakeholders are working together to achieve the implementation of a global strategy.

2. Help countries to deploy MSA through capacity building activities, guidance documents, networking and workshops.

4. Support health systems strengthening to better address infectious diseases of poverty in general and vector-borne diseases in particular by joint TDR/WASH efforts focused specifically on WASH services in health care facilities and building capacity of health workers in WASH.

3. Refine and promote TDR?s research for impact on multi-sectoral action for health with a focus on priority research relevant to WASH through harnessing TDR?s comparative advantage in research and training on diseases of poverty increasing the impact of WHO?s WASH work through joint convening of WASH and health sectors.

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Delay in the implementation of the activities due to the situation of the countries health system within the COVID pandemic**
Actions To Mitigate Risk	Monitor closely the activities and update the implementation according to the situation
Mitigation Status	On Track
Biennium	**2024-2025**

Risk Description	**Implementation of MSA in Burkina Faso not completed because of the country situation**
Actions To Mitigate Risk	Follow up closely with the team and authorities
Mitigation Status	On Track
Risk Description	**Deployment of the MSA MOOC in countries not receiving enough support from countries**
Actions To Mitigate Risk	Strengthen advocacy for capacity building on MSA
Mitigation Status	On Track

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**MSA for prevention and control of VBDs implemented in some countries for some VBDs**
Output Indicator	5 countries implementing multisectoral approaches, with monitoring and evaluation of epidemiological results
Output Target Date	31/12/2023
Output Progress Status	Completed
Output Progress Description	Within the collaboration with WASH/WHO, already 6 countries included into the first 2 case studies and 2 more countries included through a second call for application. Within the collaboration with GMP/WHO, 4 more countries included.
Output Description	**Documentation for training stakeholders from the National Malaria Control Programmes on how to implement a MSA for malaria control available**
Output Indicator	Number of countries having used and received the training documentation
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	This activity will be implemented within the project supported by UNPDF in collaboration with the WHO Global Malaria Programme. Training workshop in preparation to be held in November 2022 and training package developed as a full MOOC for mid of 2023.
Output Description	**New Case studies implemented in malaria control in several African countries**
Output Indicator	7 countries with MSA approach against malaria initiated
Output Target Date	31/12/2023
Output Progress Status	Completed
Output Progress Description	The activity will be under the UNDPF Funds approved in January 2021 and in collaboration with the WHO Global Malaria Program. Four countries included (Burkina Faso, Senegal, Tanzania, Zambia) with case study started in one country, Burkina Faso.
Biennium	**2024-2025**
Output Description	**Countries implementing fully MSA against vector-borne diseases**
Output Indicator	Number of countries with MSA implementation (through joint activities and/or coordination Committees)
Output Target Date	31/12/2024
Output Progress Status	On Track
Output Progress Description	At least 12 countries have started implementing MSA
Output Description	**Deployment of MSA MOOC**
Output Indicator	Number of persons following the MSA MOOC

Output Target Date	31/12/2024
Output Progress Status	On Track
Output Progress Description	No started

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**African countries strengthened for the implementation of multisectoral approaches for the control of malaria, through capacity building of the stakeholder and support in the deployment of the interventions**
Progress made towards outcome	Two countries, Mali and Nigeria have established MSA Task Force, nominated by the Governments. Other outcomes on track.
Biennium	**2024-2025**
Outcome description	**Capacity building on MSA enhanced for countries through the availability of an online course**
Progress made towards outcome	Development of the MOOC started and module 1 completed
Outcome description	**Guidance for implementing MSA updated with supplementary recommendations including for other specific sectors (WSH and others**
Progress made towards outcome	Update for guidance started with new chapters

Expected Result: 1.3.12

Title: Strategies to promote gender-responsive health interventions on prevention and control of infectious diseases of poverty

Strategic Work Area: Research for implementation **Workstream:** Research for implementation

ER type:	Continuing	**Funding type:**	UD
Start date:	1/1/2018	**End date:**	31/12/2023
ER status:	On Track	**Comment:**	
WHO region:	Global		
Partners:	Research teams in countries; WHO and other entities working on gender and public health (e.g. WHO/GER, WHO/HRP; WHO Alliance for Health Systems Research); Health programmes interested in and using research evidence		
Diseases:	Vector-borne diseases; Not Disease-Specific		
Review mechanism:	Scientific working group plus ad hoc review group(s) dealing with specific calls		

ER manager: Mariam OTMANI DEL BARRIO
Team: Bernadette Ramirez, Abraham Aseffa
Number of people working on projects: 10

FENSA clearance obtained for all Non-State Actors? No
Justification for no FENSA clearance: Not applicable

TDR partnership criteria

Add value:	Yes	Use resources:	No
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	Yes	Build strengths:	No
Reduce burden:	No	Foster networking:	Yes
Increase visibility:	No		

TDR partnership criteria indicators

Objectives aligned:	No	Completed
Roles complimentary:	No	Completed
Coordination transparent:	No	Completed
Visibility:	No	Completed

Objectives and results chain

Approach to ensure uptake:	Engagement with senior management at universities; research teams that involve at least 50% women, engagement with various ministries and public health services
Up-take/Use Indicator:	Engagement with ministry officials, including MoH, MoFA and MoEd
Gender and geographic equity:	Gender parity will be ensured when establishing external review panels, convening meetings of experts, issuing contracts, and in general within all of our collaborations.
Publication plan:	Peer review publication of a Toolkit to conduct intersectional gender

Up-take/use indicator target date:	31/12/2025

Sustainable Development Goals

Good Health and Well-being; Gender Equality; Reduced Inequality

Concept and approach

Rationale:	Great progress has been made towards combatting infectious diseases of poverty (IDPs). However, considerable public health challenges remain, including gender and intersecting inequalities that affect health conditions associated with infectious diseases. This ER focuses on gender intersecting inequalities that influence differentials in vulnerability to, and the impact of, particular health conditions associated with infectious diseases in low- and middle-income countries. This expected result recognizes that gender norms, roles and relations influence people?s susceptibility to different health conditions and they also have a bearing on people?s access to and uptake of health services, and on the health outcomes they experience throughout the life-course. It also acknowledges that WHO has recently recognized the importance of being sensitive to different identities that do not necessarily fit into binary male or female sex categories. In this context, delivery and access to prevention and control approaches and products to prevent and control infectious diseases should not be one-size-fits all but instead should benefit from approaches that take into account the complex interaction of several social stratifiers, and their influence in health outcomes. There is growing recognition that gender roles, gender identity, gender relations, apart from institutionalized gender inequality influence the way in which an implementation strategy works (e.g. for whom, how and why). There is also emerging evidence that programmes may operate differently within and across sexes, gender identities and other intersectional characteristics under different circumstances and contexts. Research should inform implementation strategies to avoid ignoring gender-related dynamics that influence if and how an implementation strategy works. Therefore scientists, including those focusing on research for implementation, would benefit from adequately considering sex and gender intersecting social dimensions within their research programmes, by strengthening both the practice and science of implementation, and by contributing to improved health outcomes and reduction of gender and health inequalities.
Design and methodology:	1. Development and pilot of a toolkit on intersectional gender analysis in research on infectious diseases of poverty. 2. Methodologies and gender analysis frameworks will be detailed and explained within the above-mentioned toolkit and presented in a practical "hands-on" toolkit for researchers to incorporate a gender analysis with an intersectional lens, throughout the whole research process, from research study design to the dissemination of research findings stage.
Approach to ensure quality:	Oversight by expert committee and quality assurance through fact checking, peer review of documentation, technical and copy editing.

ER Objectives

Strengthen research capacities and provide innovative tools to generate evidence that informs the design and implementation of gender responsive health interventions to control and prevent infectious diseases of poverty.

from 2021: Utilize research capacities and innovative tools built to generate evidence that informs the design and implementation of gender responsive health interventions to control and prevent infectious diseases of poverty.

2024/2025 Strengthen implementation research capacities that incorporate intersectional gender analyses within their projects and generate evidence that informs the design and implementation of gender responsive health interventions to control and prevent infectious diseases of poverty with an intersectional gender lens.

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Knowledge translation outcomes on gender equality are usually beyond the control or influence of projects**
Actions To Mitigate Risk	For this programme stakeholders, including from the affected communities, research teams and policy/decision-makers, will be engaged from the beginning and during the course and completion of the projects to ensure their active involvement with the expectation that the results will be utilized as effectively as possible
Mitigation Status	On Track
Biennium	**2024-2025**
Risk Description	**Knowledge translation outcomes on gender equality are usually beyond the control or influence of projects. Research teams working in silos with limited collaboration between biomedical and social science communities.**
Actions To Mitigate Risk	
Mitigation Status	Planning phase

ER Biennium Outputs

Biennium	2022-2023
Output Description	**New knowledge & evidence on intersection of sex & gender with other social stratifiers to address power relations, social exclusion, marginalization & disadvantages in access to health services, health impacts, prevention/control of IDPs**
Output Indicator	Research studies implemented and evidence generated to inform policy and practice
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	Two research teams from Nepal and Uganda completed their research studies where they incorporated an intersectional gender analysis in infectious disease (schistosomiasis and tuberculosis (TB) in Uganda and lymphatic filariasis (LF) and TB in Nepal). Both have submitted two articles each for peer reviewed publication: ?Gendered Lives, Gendered Vulnerabilities: An Intersectional Gender Analysis of Vulnerability to and Treatment of Schistosomiasis in West Nile Region, Uganda? (PLOS Neglected Tropical Diseases). ?Piloting intersectional gender analysis to understand challenges in Tuberculosis care at four health care facilities in Uganda? (PLOS One). ?Gender and its intersection with social stratifiers influencing lymphatic filariasis (LF) prevention and care seeking behavior in Nepal? (Infectious Diseases of Poverty). ?Conducting intersectional gender analysis for gender inclusive health system in Nepal ? Where we are and what can be done?? (Infectious Diseases of Poverty). In 2021, two projects were selected following a TDR Call for Proposals on generating evidence to strengthen intersectionality and gender research efforts in infectious disease prevention and control?. Awards were given to a research team in Bhutan and a multi-country consortium with research teams from Kenya, Malawi and South Africa. Project 1: ?Studying the intersections of sex and gender dimensions with other social stratifies in accessing TB & Dengue health care services of Transgender Men, Transgender Women, MSM, WSW in Bhutan?. (Bhutan team): Data collection started in July 2022. By the end of August 2022, 96 semi structured interviews have been completed with the key population at all four sites as per plan. The focus group discussions (FGDs) with the key population and health workers are being conducted. So far, 280 interviews have been completed to gather quantitative data. Project 2: "An assessment of Gender and intersectionality in disease exposure, care seeking behaviour and treatment pathways in Malaria and Tuberculosis prevention and control in Kenya, Malawi and South Africa?.

	A multicounty consortium with teams from Kenya, Malawi and South Africa are working on this collaborative study. The study in Migori County, Kenya and Chikwawa district in southern Malawi focuses on gender and intersectionality in disease exposure, care seeking behaviour and treatment pathways in malaria prevention and control. The study in Eastern Cape Province, South Africa is conducting gender and intersectionality analysis of Tuberculosis pre-treatment loss to follow up. In Kenya, required research team members have been recruited and training provided. The two-day intensive training covered methodological (both qualitative and quantitative) and practical details of the project and discussed logistical challenges. Field work has started with, 449 respondents (179 men and 270 women) interviewed for quantitative data collection and 31 In-depth interviews (13 men and 18 women) and four FGDs with twelve members each completed for qualitative analysis. Transcription and translation of the qualitative data is currently ongoing. Follow up interviews are planned for October In South Africa, the study protocol has been finalized and local approval secured. Relevant Standard Operating Procedures (SoPs) have been written and translation of guides and consent/information sheets to Afrikaans completed. Stakeholder engagement with various officials is ongoing since end of March 2022. Recruitment of field researchers is ongoing and training is planned. In Malawi, District Health Management Team support has been secured. The team visited five health facilities and met with management and engaged with eight community traditional leaders within the catchment area of Chikwawa District Hospital to introduce the study. Recruitment of and training of research assistants is underway. (This study by the multicounty consortium teams from Kenya, Malawi and South Africa experienced delays in getting ethical approval for Malawi and sub-contractual delays between University of Nairobi and Malawi and South Africa resulting in the two countries undertaking minimal activities until activities got back on track.)
Biennium	**2024-2025**
Output Description	**New knowledge & evidence generated from intersectional gender analyses in IR to address marginalization & disadvantages in access to health systems and services, health impacts, prevention/control of IDPs**
Output Indicator	Implementation Research Studies and Research uptake initiatives
Output Target Date	31/12/2026
Output Progress Status	
Output Progress Description	Planning stage, this activity for the 24/25 biennium and beyond.

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Strengthened capacities and increased understanding for generation of gender responsive interventions for control and prevention of VBDs and other infectious diseases of poverty.**
Progress made towards outcome	Capacity strengthening activities included embedded research training through the supported projects and provision of online courses for increased knowledge on the concepts of gender intersectionality: Developing a module on gender for TDR?s implementation Research Toolkit In collaboration with TDR?s research capacity strengthening unit, the existing online version of the IR toolkit https://www.adphealth.org/irtoolkit is being updated with a module on gender entitled ?Integrating an intersectional gender lens in Implementation Research? to guide the researcher and health practitioner to develop an implementation research proposal incorporating an intersectional gender lens. It aligns with the format of TDR?s current IR toolkit and draws from the WHO/TDR Incorporating intersectional gender analysis into research of infectious diseases of poverty toolkit https://tdr-intersectional-gender-toolkit.org/.

After completing this module, researchers will be able to:

- understand the relevance and importance of gender and intersectionality in IR;
- develop an IR proposal incorporating an intersectional gender lens;
- plan to implement IR projects using an intersectional gender lens.

The offline version is complete and is in the process of being uploaded.

Developing a module on gender for TDR?s implementation Research Massive Online Open Course (MOOC)

In June 2022, TDR launched a new module of the Massive Open Online Course (MOOC) on Incorporating an intersectional gender perspective in implementation research. The content was developed in collaboration with TDR?s research capacity strengthening unit. The duration of the course is three weeks with 2.5 hours per week of study time. The pilot course for this new module enrolled 450 students of which 284 completed their registration and 112 got the pass mark of 80% to receive the certificate. The next session is scheduled for 3rd October 2022 and will be facilitated by the University of Ghana.

By the end of the course, students will be able to understand the relevance of sex, gender and intersectionality to infectious disease of poverty and have the skills to apply the knowledge and understanding to their IR projects. This course will enable students to:

- Design their own implementation research projects with an intersectional gender lens;
- Critically evaluate and use the evidence produced by other implementation research projects;
- Commission robustly designed implementation research projects that consider gender dimensions and other intersecting axes of inequality.

The course with the new module on Incorporating an intersectional gender perspective in implementation research in Massive Open Online Course (MOOC) enrolled 450 students of which 284 completed their registration. Out of this number, 112 got the pass mark of 80% and received the certificate.

In Bhutan, 15 people and in Kenya, 14 people were trained regarding incorporating gender and intersectionality within infectious disease research.

Biennium	**2024-2025**
Outcome description	**Strengthened implementation research capacities that incorporate intersectional gender analyses within their projects and generated evidence to strengthen equitable health systems and inform the design and implementation of gender responsive health interv**
Progress made towards outcome	Planning phase. For next biennium 24/25 and beyond.

Expected Result: 1.3.14

Title: Testing of innovative strategies for vector control

Strategic Work Area: Research for implementation **Workstream:** Research for innovation

ER type:	Continuing	**Funding type:**	UD and DF
Start date:	1/1/2020	**End date:**	31/08/2024
ER status:	On Track	**Comment:**	After delays in the start of the ER, the contract with CDC for funding this activity was signed and the work on the research project has now well started. Other supporting activities are also well on track.

WHO region: Global

Partners: WHO/NTD; the International Atomic Energy Agency (IAEA); the US CDC Fort Collins

Diseases: Arboviral diseases; Chikungunya; Dengue; Neglected Tropical Diseases; Vector-borne diseases; Zika virus

Review mechanism: Through ad hoc expert review groups approved by TDR senior management, and through TDR advisory bodies, including the scientific working groups, STAC and JCB

ER manager: Florence FOUQUE

Team: Abdul Masoudi

Number of people working on projects: 1

FENSA clearance obtained for all Non-State Actors? No

Justification for no FENSA clearance: The FENSA clearance will be submitted for the NSA partners as we start raising the contract with the research teams.

TDR partnership criteria

Add value:	Yes	Use resources:	Yes
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	Yes	Build strengths:	Yes
Reduce burden:	Yes	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	Partnership well in place and objectives aligned with the respective strategies of the partners
Roles complimentary:	Yes	The complementary roles of the partners is established through a Memorandum of Understanding signed by TDR, WHO and IAEA
Coordination transparent:	Yes	The coordination mechanism is transparent and follow the rules of the partners.
Visibility:	Yes	The visibility of the partnership is achieved through the communication offices of all partners.

Objectives and results chain

Approach to ensure uptake: To ensure the uptake of the findings and their application into countries, the different activities performed through this ER are involving since the planning stage the relevant stakeholders. The partners of the ER, namely US-CDC, IAEA and NTD/WHO also have their own channels to provide recommendations to countries based on the findings.

Up-take/Use Indicator:	The main indicator for uptake will be the number of countries for which innovative vector control activities or tools have been tested and/or will be used. Other uptake indicators can include number of countries where vector surveillance and control tools are improved through knew acknowledged acquired during the development of this ER, as well as number of countries showing clear reduction in targeted mosquito vector populations.
Gender and geographic equity:	Gender and geographical equities are taken into account in all activities among which the building of the ad hoc review groups, the consultancies and in the selection criteria of the research teams.
Publication plan:	The publication plan include guidance documents that will be updated regularly, thematic briefs, scientific publications in open access peer review journals (with special issues) and other materials such as training materials and briefs for stakeholders (communities and technical staff).
Up-take/use indicator target date:	31/08/2024

Sustainable Development Goals

Good Health and Well-being; Industry, Innovation and Infrastructure; Climate Action; Partnerships to achieve the Goal

Concept and approach

Rationale:	Causing more than one million deaths per year, with few new drugs or strategies to combat these emerging infectious pathogens, vector-borne diseases (VBDs) such as malaria, dengue, Zika, chikungunya, yellow fever and others account for 17% of the total morbidity from infectious diseases. The incidence of some VBDs has grown dramatically in recent decades, with about one third of the world population now at risk from Aedes -borne epidemics. This increase is due to global changes and has prompted WHO to state the urgent need for alternative vector control methods in its Global vector control response (GVCR) 2017?2030, which was approved at the World Health Assembly in 2017 by more than 190 Member States (WHO 2017). The rationale of this expected results is to work with all partners to test innovative vector surveillance and control technologies, as well as to support access to relevant training and capacity building on these technologies. One of these alternative technologies is the ? Sterile Insect Technique? (SIT) a method of pest c ontrol using area-wide releases of sterile males to mate with wild females, which will then not produce offspring. This technique has been successfully implemented in agriculture against numerous insects since about 60 years, with no side effects and environmentally safe impact. As a first step, a joint collaboration was established between the Department of Nuclear Sciences and Applications (NA), the Department of Technical Cooperation (TC) of the International Atomic Energy Agency (IAEA), and the UNICEF/UNDP/World Bank/ WHO Special Programme for Research and Training in Tropical Diseases (TDR) of the World Health Organization (WHO), in partnership with the WHO Department of Control of Neglected Tropical Diseases (NTD), to develop activities on providing guidance to countries and testing SIT against the Aedes mosquitoes, vectors of arboviral diseases. Other tools will also be supported through this activity such as capacity building tools and vector surveillance tools, to be able to provide a full package of innovative technologies for prevention and control of vectors and vector-borne diseases.
Design and methodology:	Design and Methodology of the ER are briefly described below through key activities and timelines, but more detailed description of each phase is available in the technical documentation: Phase 1: January 2019 to April 2020: Development and Production of a Guidance Document on how to test SIT for countries Phase 2: July 2019 to December 2021: Resource mobilization, buildings of ad hoc review committees and Special Project Team, call for proposals and selection of research consortium(s) to test SIT into field conditions. Landscape analysis for new vector control technologies. Development of training and surveillance tools. Phase 3: January 2022 to December 2023: Update of proposals, contracts and first field tests including epidemiological evaluation. Phase 4: January 2024 to December 2025: Continuation of field tests and if satisfactory implementation of the results and policy recommendations and deployment of this new vector control technology at the country level.
Approach to ensure quality:	The following approaches were taken to ensure quality of the expected results: The objectives, planning, activities and budget of the ER is aligned with TDR strategy and was approved by TDR governing bodies. The groups of experts were invited based on their competencies and experience and approved as per TDR SoPs. All experts accepting to be part of a group completed their DOIs and COIs. The Guidance Document was developed in phase 1 by a group of experts, with external and internal reviews, external editing, final check and WHO publication clearance system. For the selection and following up of research proposals in phase 2, review and steering groups of external experts were established and approved accordingly. The quality of the findings in phase 3 is reviewed by the selected experts groups through

mid-term reports and published in open access peer review scientific journals. The quality of the findings in phase 4 is reviewed by the selected experts groups through mid-term and final reports, published in open access peer review scientific journals, and submitted to the Vector Control Advisory Group (VCAG) of the WHO operational program (NTD/WHO) for policies development.

ER Objectives

1. Provide to countries and stakeholders up to date guidance on how to test new vector control technologies through different materials such as guidance document, training materials, workshop and in site evaluations.

2. Support research activities to test into field conditions the entomological outcomes of new vector control technologies.

3. Support research activities to test into field conditions the epidemiological outcomes of new vector control technologies.

4. Develop indicators to evaluate the impact on the vectors populations, the human health and the health systems of innovative vector control technology.

5. Provide to the WHO operational programs and the countries the required support to make new recommendations and policies on innovative vector control technologies, and allow full deployment of new validated vector control tools.

6. Provide to countries the knowledge and guidance on new vector surveillance tools needed for the implementation of the new vector control tools.

7. Provide to countries the required tools to improve training and capacity building on innovative vector surveillance and control.

ER Biennium Risks

Biennium	**2022-2023**
Risk Description	**Delay in the testing of the new vector control technologies due to delayed funding and/or Health systems challenges due to COVID**
Actions To Mitigate Risk	Keep close contact with countries showing interest on the technology and monitor the situation with the partners and vector control agencies involved in the projects.
Mitigation Status	Completed
Risk Description	**The testing of the efficacy of the technologies cannot be performed because of lack of support/interest from the countries**
Actions To Mitigate Risk	Follow closely with the partners and the countries and eventually organize more information meetings and exchanges to better understand the requests, the needs and the challenges, in order to address them in the best possible way.
Mitigation Status	Completed
Biennium	**2024-2025**
Risk Description	**The completion of all required tests SIT not completed before the end of the biennium**
Actions To Mitigate Risk	Close follow up on the testing activities and engagement with the research team to mitigate the deadlines
Mitigation Status	On Track
Risk Description	**Delays in building capacity for the countries in implementing the technology once the SIT efficiency on the diseases is proven.**
Actions To Mitigate Risk	Development of training packages through MOOC or other materials
Mitigation Status	On Track

ER Biennium Outputs

Biennium	**2022-2023**
Output Description	**Field testing of innovative vector control technologies done**

Output Indicator	Number of countries in which field testing could be done
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	Field testing of SIT will be done in 3 countries

Output Description	**Development and availability for countries of supporting tools in surveillance, capacity building and data sharing for innovative vector control technologies**
Output Indicator	Number of countries using the new surveillance and capacity building tools developed through this activity
Output Target Date	31/12/2023
Output Progress Status	On Track
Output Progress Description	A capacity building tool is now available through a Directory for courses on medical entomology mage available at the global level on the Global Vector Hub Platform. A landscape analysis for innovative vector control technologies completed and under review to be released in 2023. The development of an innovative surveillance tool for Aedes mosquitoes completed. Collaboration for data sharing well on track with the GBIF (Global Biodiversity Information Facility) with released of a Special Issue on data papers on vectors in Gygabyte Journal, awarded the best Journal for Innovation by ALPSP in September 2022.
Biennium	**2024-2025**
Output Description	**Countries integrating the SIT into the integrated Vector control against Aedes mosquitoes and arboviral diseases**
Output Indicator	Number of countries in the process of integrating SIT
Output Target Date	31/12/2025
Output Progress Status	On Track
Output Progress Description	Will start in 2024
Output Description	**SIT technology against Aedes mosquitoes and arboviral diseases presented at the WHO Vector Control Advisory Group for advise and review**
Output Indicator	VCAG recommendation
Output Target Date	31/12/2024
Output Progress Status	On Track
Output Progress Description	Engagement with VCAG started

ER Biennium Outcomes

Biennium	**2022-2023**
Outcome description	**Availability of new tools for surveillance of vectors, data sharing and capacity building on vector surveillance and control.**
Progress made towards outcome	Capacity building on vector surveillance and control enhanced through the Directory of courses of medical entomology release through the Global Vector Hub platform. Landscape analysis on innovative vector control tools on track. Innovative surveillance tool for Aedes mosquitoes in development. Data sharing activities in collaboration with the Global Biodiversity Information Facility.
Outcome description	**Findings from field testing on innovative vector control tools**

Progress made towards outcome	On track.
Biennium	**2024-2025**
Outcome description	**Procedure for implementing SIT and integrating the technique into the vector control activities**
Progress made towards outcome	Writing of the documentation will start in 2023, based on the field testing of SIT
Outcome description	**Evaluation of the vector control activities using SIT on arboviral diseases transmission**
Progress made towards outcome	Evaluation will proceed with the SIT field testing

Expected Result: 1.3.15

Title: VBD prevention and control for vulnerable and hard to reach population

Strategic Work Area: Research for implementation **Workstream:** Research for integrated approaches

ER type:	New	**Funding type:**	UD and DF
Start date:	1/1/2024	**End date:**	31/12/2025
ER status:	On Track	**Comment:**	Activities started in 2022 through Strategic Development Funds in 2022
WHO region:	Global		
Partners:			
Diseases:	Arboviral diseases; Malaria; Vector-borne diseases		
Review mechanism:	Through Ad Hoc Committee of experts and TDR SWG		

ER manager: Florence FOUQUE
Team: Admin Officer
Number of people working on projects: 2

FENSA clearance obtained for all Non-State Actors? No
Justification for no FENSA clearance: No contract at the moment

TDR partnership criteria

Add value:	Yes	Use resources:	No
Align goals:	Yes	Address knowledge gaps:	Yes
Integrate mandates:	No	Build strengths:	Yes
Reduce burden:	Yes	Foster networking:	Yes
Increase visibility:	Yes		

TDR partnership criteria indicators

Objectives aligned:	Yes	Partnership not fully established yet
Roles complimentary:	Yes	Partners will be complementary to TDR competencies
Coordination transparent:	Yes	Coordination transparent through shared Teams folders
Visibility:	Yes	No progress on visibility yet

Objectives and results chain

Approach to ensure uptake:	To ensure uptake of findings for more adequate tools and better access of the vulnerable populations to VBDs prevention and control, partnership will be established with stakeholders and communities and research and capacity building activities will be essential component of the ER.
Up-take/Use Indicator:	Document published on definition and factors of vulnerability. Number of countries hosting vulnerable populations having better information and access to VBDs prevention and control.
Gender and geographic equity:	Gender equity will be sought but geographical equity will be based on vulnerabilities according to the geographical location.
Publication plan:	Documents on relationship between poverty and VBDs (on track). Document on vulnerabilities (definition and factors). Scientific publications

Up-take/use indicator target date:	31/12/2025

Sustainable Development Goals

No Poverty; Good Health and Well-being; Clean Water and Sanitation; Reduced Inequality; Partnerships to achieve the Goal

Concept and approach

Rationale:	Although there has been tremendous progress in the control of vector-borne diseases (VBDs), these diseases together with other infectious diseases are still causing enormous burden, especially to vulnerable populations already facing several challenges such as poverty and displacements. The complex interconnection between different socio-economic aspects and the determinants of health and vulnerability to VBDs require further extensive attention. The proposed activity would thus address the challenges in VBD prevention and control linked to vulnerabilities. A landscape analysis conducted on the relationships between VBDs and poverty and a case study on hard to reach population in malaria control provided better understanding of ?who?, ?where?, ?why? and ?how? VBDs are interacting with vulnerabilities in a vicious cycle. The rationale of this expected result is to address vulnerabilities through effective intervention and strategies that can reach the underserved populations in LMICs in order to accelerate universal health coverage. The project will develop a knowledge and skills base and demonstrate how to extend health care access to hard-to-reach and underserved populations in LMIC in order to accelerate universal health coverage.
Design and methodology:	The first phase of the expected results will look at definitions and factors of vulnerabilities in a range of different situation including but not limited to hard to reach populations, migrants, displaced population either for political unrest or climatic changes. Based on the findings, the project will convey group(s) of experts to develop strategies to increase health care access and improve health outcomes according to context and specificities of the populations. In a second phase of the project, approaches and strategies will be tested through case studies. The lessons learned from these interventions will then provide the basis for a good practice document for reaching the more vulnerable population and giving them better access to health. Ultimately, the project will engage and empower communities, develop implementation research leadership capacity in local institutions and promote uptake of research findings into policy and practice in countries.
Approach to ensure quality:	Quality of the activities and project will be ensure through regular review process of activities, documentation and implementation. The review will be performed at different level of the project and of the TDR structure by external experts, committees and representatives of Member States.

ER Objectives

Document the definition and factors of vulnerabilities to deploy the adequate intervention for prevention and control of VBDs.

ER Biennium Risks

Biennium	**2024-2025**
Risk Description	**Funding not raised for full activities**
Actions To Mitigate Risk	Engagement with funders having specific targets on vulnerabilities
Mitigation Status	On Track
Risk Description	**Delays in the implementation of the activities**
Actions To Mitigate Risk	Close follow up of the activities
Mitigation Status	On Track

ER Biennium Outputs

Biennium	**2024-2025**
Output Description	**Better knowledge of the factors of vulnerability in prevention and control of VBDs**

Output Indicator	Description of the factors with qualitative and quantitative analysis
Output Target Date	31/12/2024
Output Progress Status	On Track
Output Progress Description	Not started yet

Output Description	**Plan for setting up research activities and case studies**
Output Indicator	Number of case studies where vulnerable populations have an improved access to VBDs prevention and control
Output Target Date	31/12/2025
Output Progress Status	On Track
Output Progress Description	Not started yet

ER Biennium Outcomes

Biennium	**2024-2025**
Outcome description	**Guidance document on factors of vulnerabilities and handling/strategies to mitigate them on prevention and control of VBDs.**
Progress made towards outcome	Not started yet.
Outcome description	Proceeding of a workshop and publication of scientific articles on vulnerabilities against VBDs.
Progress made towards outcome	**Not started yet.**