TDR For research on diseases of poverty

UNICEF • UNDP • World Bank • WHO

Annual Report 2021

Research Capacity Strengthening

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List of abbreviations

ADP	Access and Delivery Partnership
AFR	WHO African Region
AMR	WHO Region of the Americas
CRDF	Clinical Research and Development Fellowship
DND*i*	Drugs for Neglected Diseases initiative
EDCTP	European and Developing Countries Clinical Trials Partnership
EFPIA	European Federation of Pharmaceutical Industries and Associations
EMR	WHO Eastern Mediterranean Region
EPPE	Effective Project Planning and Evaluation
ER	Expected result
EUR	WHO European Region
EVI	European Vaccine Initiative
FHS/AUB	Faculty of Health Sciences, American University of Beirut
Gates Foundation	Bill & Melinda Gates Foundation
GCLP	Good Clinical Laboratory Practice
GCP	Good Clinical Practice
GFATM	Global Fund to fight AIDS, Tuberculosis and Malaria
GHRP	Good Health Research Practice
GMU	Gadjah Mada University
GPW13	WHO 13th General Programme of Work
HIV	Human immunodeficiency virus
IDP	Infectious Diseases of Poverty
IDRI	Infectious Diseases Research Institute, the United States
IFPMA	International Federation of Pharmaceutical Manufacturers and Associations
IIR	Intervention and implementation research
IR	Implementation research
ISGlobal	Barcelona Institute for Global Health, Barcelona, Spain
ITM	Institute of Tropical Medicine, Belgium
IVI	International Vaccine Institute, South Korea
JPGSPH	James P. Grant School of Public Health
LMIC	Low- or middle-income country

LSHTM	London School of Hygiene and Tropical Medicine
M&E	Monitoring and evaluation
MDR-TB	Multidrug-resistant TB
MIM	Multilateral Initiative on Malaria
MMV	Medicines for Malaria Venture
MoH	Ministry of Health
MOOC	Massive Open Online Course
MPH	Master's in Public Health
NMIMR	Noguchi Memorial Institute for Medical Research
NSPs	National Strategic Plans
NTDs	Neglected Tropical Diseases
PDP	Product development partnership
R&D	Research and development
RCS	TDR Research Capacity Strengthening Unit
RTC	Regional training centre
RTC/AFR	Regional training centre supported by TDR in the WHO African Region
RTC/AMR	Regional training centre supported by TDR in the WHO Region of the Americas
RTC/EMR	Regional training centre supported by TDR in the WHO Eastern Mediterranean Region
RTC/EUR	Regional training centre supported by TDR in the WHO European Region
RTC/SEAR	Regional training centre supported by TDR in the WHO South-East Asia Region
RTC/WPR	Regional training centre supported by TDR in the WHO Western Pacific Region
SDGs	Sustainable Development Goals
SEAR	WHO South-East Asian Region
SORT IT	Structured Operational Research and Training Initiative
STPHI	Swiss Tropical and Public Health Institute
TDR	UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases
TPO	Training partner organization
UHC	Universal health coverage
UNDP	United Nations Development Programme
WPR	WHO Western Pacific Region

Introduction

Research Capacity Strengthening (RCS) activities are at the heart of the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training on Tropical Diseases (TDR) strategy 2018–2023, which aims at contributing to the achievement of the Sustainable Development Goals (SDGs) by 2030 and supporting universal health coverage (UHC). Within the context of the TDR vision – *The health and well-being of people burdened by infectious diseases of poverty is improved through research and innovation* – the overall goal of the RCS team is to strengthen the capacity of individuals, institutions and societies to produce research evidence useful for reducing the burden of infectious diseases of poverty in low- and middle-income countries (LMICs). In strengthening this capacity, RCS programmes have also built research capacity and equipped health workers with transferable core competencies and skillsets which have contributed to building health system resilience during the COVID-19 pandemic.

Objectives

The RCS objectives refer to the capacity to produce evidence that has the potential for near-term implications for public health practice and policy:

- Strengthen capacity in LMICs to conduct interdisciplinary priority research by supporting individuals, institutions and networks; and
- Promote institutional and individual leadership in health research through postgraduate training grants and career development fellowships, and the development of regional training centres (RTCs).

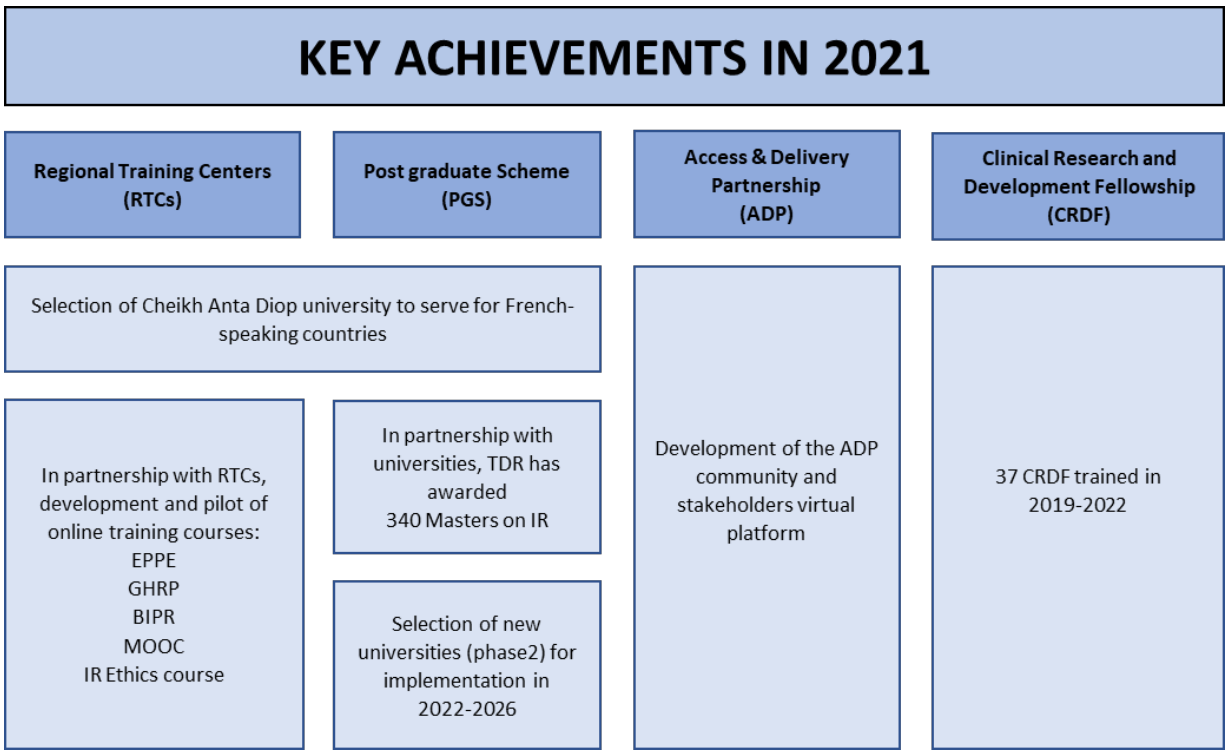
These objectives are aligned with the TDR Strategy 2018–2023, which contributes to a wide range of SDGs, including Goal 3: Ensure healthy lives and promote well-being for all at all ages, and specifically:

> SDG Goal 3 – *Target 3.3: By 2030 end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.*

The World Health Organization (WHO) has set out its interconnected strategic priorities and goals in the 13th General Programme of Work (GPW13) for 2019–2023. In alignment with these priorities and goals, the focus of TDR efforts is on strengthening the capacity of researchers in LMICs in implementation research (IR). This research, therefore, underpins the key areas of action to achieve the WHO GPW13 “triple billion” goals:

- One billion more people with universal health coverage;
- One billion lives are improved (through achievement of the SDGs); and
- One billion people made safer (from better response to emerging health emergencies).

Key achievements in 2021



Summary progress description

This description of progress in 2021 concerns the RCS areas of activity set out in TDR's workplan 2020–2021. Table 1 below provides an overview of this work, showing the Expected Results (ERs) by outcome, with objectives, indicators and the progress against targets, in line with the TDR Approved Programme Budget and Workplan for the 2020–2021 biennium. The narrative report which follows, provides more detail on the activities presented under the respective ERs.

Table 1. Research Capacity Strengthening workplan overall progress

Expected results and deliverables	*Indicators and targets*
2.1.1.1 TDR support to regional training centres: i) RTCs operational in the implementation of short training courses on good health research practices and implementation research; ii) RTCs operational in the dissemination of short training courses in their region; iii) Effective coordination of the RTC initiative.	By 2021, one satellite institution per RTC ready to implement at least one training course in implementation research (IR) or good health research practices, Progress: Except for the RTCs starting their training activities in 2021 (University Cheikh Anta Diop, Senegal and the Malaysian Global Health Consortium, Malaysia), 5 out of the five RTCs supported by TDR in 2021 established.

Expected results and deliverables	*Indicators and targets*
2.1.2 Targeted research training grants in low- and middle-income countries: i) Early career trainees completed their degree in their home country or within the region; ii) A global network (intra & inter-regional) of TDR-supported implementation researchers developed.	By 2021, additional 70 master's trainees enrolled or completed their degree (90 master's trainees for the US$ 50 million budget scenario) Progress: By December 2021, the eight universities participating in the TDR postgraduate training scheme since 2015, have awarded a cumulative total of 402 Master's fellowships and 8 PhD fellowships.
2.1.4 Advanced training in clinical product development: i) Highly skilled scientists in R&D in low- and middle-income countries; ii) R&D skills gained during training implemented in the home institution; iii) An online community of practice created.	By 2021, 30 new fellows enrolled or completed their training Progress: 17 fellows placed in 2019–2020. 18 fellows selected in 2020 to be placed in 2021–beginning 2022.
2.1.6 Structured capacity building in IR (renewal of UNDP Access Initiative): i) Low- and middle-income countries adopt and use TDR implementation research resources; ii) LMIC research teams trained to develop and implement implementation research projects and disseminate the findings; iii) LMICs use IR to optimize and scale up health interventions (including technologies, polices and strategies).	By 2023: - additional five LMICs use TDR IR resources in their research and training activities - at least 3 IR projects aimed at addressing a specific access and delivery issue conducted and reported Progress: In 2021, Ghana and Malawi initiated comprehensive IR training and mentorship guidance projects, including support for demonstration project grants. These activities will inform the ongoing development of the ADP digital platform on a pilot basis. In 2021, Indonesia, Malawi and Tanzania established multidisciplinary IR teams focusing on the national NTD plans that will incorporate the new WHO NTD roadmap (2021–2030) targets and approaches.

Progress description in 2021 and plans for 2022–2023

▪ Area of activity 2.1: Research Capacity Strengthening (RCS)

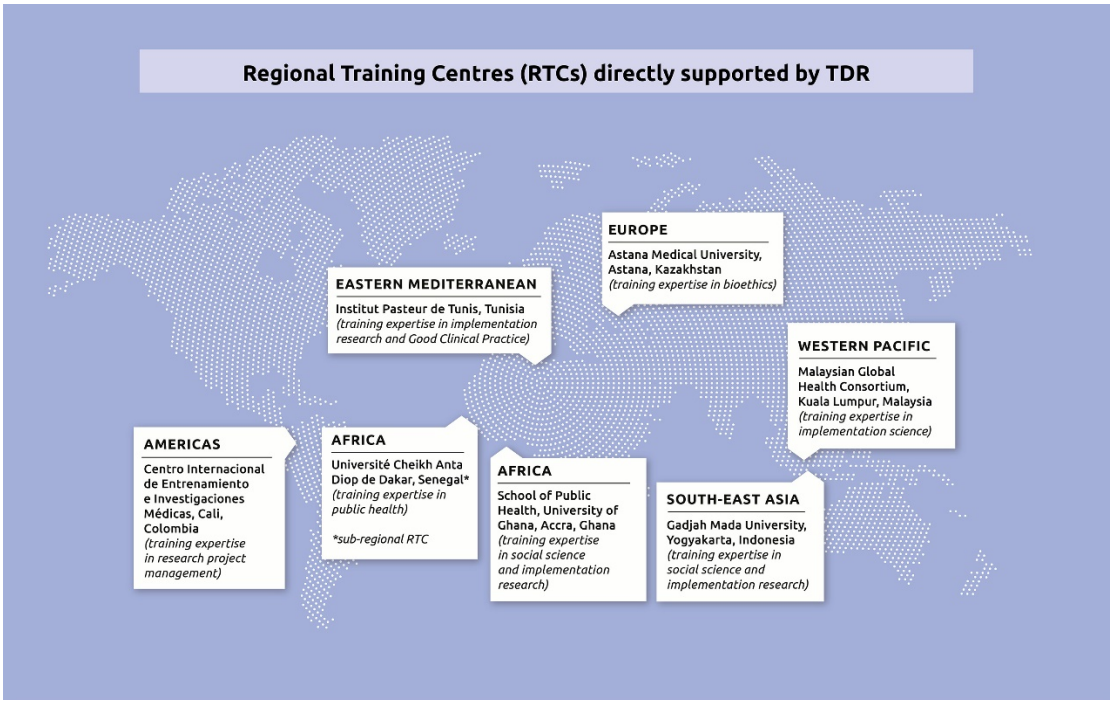
Ensuring that all those in need of health products can gain access to them requires not only clinical research and development, but also strengthened research capacity in LMICs, where the products are needed, to better understand how to deliver them effectively, efficiently and equitably. TDR undertakes a range of explicit RCS activities which contribute to increasing LMIC leadership on IR on infectious diseases of poverty. We report on the four ERs in Table 1 under the RCS Area of activity 2.1 (ER 2.1.1.1, ER 2.1.2, ER 2.1.4, and ER 2.1.6) and on the RCS contribution to ER 1.1.7, the Structured Operational Research and Training Initiative (SORT IT), which is led by the Research for Implementation team.

ER 2.1.1.1 Strategic support to WHO regional activities: The Regional Training Centres

TDR supports a network of Regional Training Centres (RTCs) which have been selected on a competitive basis to conduct and disseminate training courses relevant to the TDR strategy. The training courses include those relevant to good health practice and those relevant to implementation research. The training courses relevant to good health practice are the following: Effective Project Planning and Evaluation (EPPE), Good Clinical Practice (GCP), Good Clinical Laboratory Practice (GCLP) and Good Health Research Practice (GHRP). The training courses and tools relevant to implementation research (IR) are the Massive Open Online Course (MOOC), short course on the Principles of IR, the IR Toolkit and the ethics of IR.

Regionalization of short courses using train-the-trainer (TtT) methodology and training workshops enables TDR to work more closely with the end-users and become more relevant to regional needs, empower centres based in the regions to serve as training hubs, and utilize existing expertise in disease-endemic countries.

The seven RTCs supported by TDR (one in each WHO region) are the following:



Highlights of progress in 2021

- There is now effective institutionalization and wide dissemination in neighbouring countries of short training courses in good health research practice (EPPE, GCP, GCLP, GHRP and research ethics) organized by TDR and supported RTCs.
- All RTCs have now implemented IR training courses, including the two selected in 2021 for French-speaking countries in West Africa and in the WHO Western Pacific Region. The MOOC on IR and/or the training course on Basic Principles in IR are included in the courses.
- RTCs support the development of distance learning:
    - An IR training course based on the TDR training toolkit and the GHRP training course were piloted in 2021.
    - An EPPE training course using examples of successful IR projects on neglected tropical diseases (Chagas diseases and dengue) developed as online training courses.

The main purpose and the target audience for each course are the following:

IMPLEMENTATION RESEARCH (IR) TRAINING TOOLS

TOOL	MASSIVE OPEN ONLINE COURSE (MOOC) ON IR	BASIC PRINCIPLES IN IR	ETHICS IN IR	GOOD HELTH RESEARCH PRACTICE	IR TOOLKIT	EFFECTIVE PROJECT PLANNING AND EVALUATION	GUIDANCE ON PUBLISHING IR
MAIN PURPOSE	To provide an introduction to all concepts and principles in IR	To build upon skills learnt in the MOOC	To provide an introduction to all concepts and principles in IR project	To apply the concepts of Good Clinical Practice in non-clinical research	To develop a strong IR project proposal and a plan for implementing the project	To improve skills in project management	To build skills to publish IR results
TARGET AUDIENCE	Researchers Implementers Public health officers	Researchers Implementers Public health officers	Researchers Ethic review committees	Researchers	Researchers Implementers Public health officers	Researchers	Researchers Implementers Public health officers

Training courses relevant to good health practice

The RTCs have progressively integrated a panel of skills-building courses for bioethics, good practices, project planning, management and evaluation of results within their training programmes.

The RTCs have conducted and disseminated the following training courses: skills building courses (SBCs) and TtT in EPPE, GCP and GCLP, and courses on research ethics and GHRP. The GHRP course has been developed by the RTC network to respond to global needs, i.e. improve the quality of research involving humans (from basic science to implementation research) by applying the concepts of GCP. The EPPE and GHRP training courses are available in English, French and Spanish. The GCP, GCLP and research ethics are only available in English. In addition, some RTCs leveraged funds to organize other training courses to respond to regional needs. These include courses on biosafety, blended biostatistics, data analysis and data management for clinical studies.

During the last 13 years, TDR, through CIDEIM–the Regional Training Centre for Latin-America and the Caribbean (LAC) and its network institutions–is building project management capacity for health research. Together, we have institutionalized and disseminated the Skill-Building course for effective planning, implementation, monitoring and evaluation of health research projects (EPPE), which has an emphasis on biomedical research. In addition, we have developed and disseminated a train-the-trainer (TtT) course to ensure sustainability and local capacities in different countries in the region.

The main goal of the EPPE course is to "*strengthen capacities in the organization and management of research projects so as to achieve effective implementation and successful collaboration and in this way increase competitiveness in accessing available funding*". During the course, participants go step-by-step through their own research project, defining in a clearer way its goal, objectives and indicators, as well as carefully establishing a complete project development and monitoring plan.

After many years of successful experiences, and many different research teams trained, there is still a strong need for expanding this course to other types of research, beyond biomedical research, such as more public health oriented research. An EPPE online course, using IR examples from Latin America, is currently under development and was piloted at the end of 2021.

In 2021, the teams at University Gadjah Mada, Indonesia, in partnership with the Institute of Public Health, Bangalore, have transformed the GHRP material into a blended learning course. The course was piloted from April to June 2021. One of the key distinctions of the GHRP course is that delegates are able to develop key tools and documents for their research project. An external evaluation clearly shows that the challenges were to turn a successful face-to-face course into a distance learning course, which would still provide participants with the key takeaway from a standard GHRP course: an improved and detailed research protocol. This online training course will be shared with the RTC network in 2022.

Training courses and tools relevant to implementation research

The RTCs have also been involved in training courses relevant to implementation research, aimed at improving access to, and delivery of, public health tools, strategies and interventions. These include a Massive Open Online Course (MOOC) on IR, a short course on the Principles of IR (which covers basic methodologies) and more advanced training courses, such as the IR Toolkit and ethics in IR.

Massive Open Online Course (MOOC)

With the help of invited experts from various regions, TDR has developed a MOOC on IR on infectious diseases of poverty to facilitate the dissemination of the concept of IR among the main stakeholders (public health researchers and decision-makers, academic and research institutions and public health practitioners). The aim is to illustrate the following IR concept: how to identify the challenges of various health settings; assess the appropriateness of existing strategies; develop new interventions and strategies by working with communities and stakeholders; specify the IR questions; and design rigorous research projects. Case studies are introduced, presented and interpreted by experienced public health researchers, practitioners and academics.

The goal of the course is to build capacity in how to identify the challenges of various health settings, assess the appropriateness of existing strategies and develop new interventions and strategies by working with communities and stakeholders.

The MOOC was developed in English, French and Spanish. Sessions are moderated by the TDR-supported RTCs, the RTC in WHO/AFR and in WHO/SEAR (English), RTC in WHO/EMR (French and English), the RTC French-speaking countries in West Africa (French) and by the RTC in WHO/AMR (Spanish).

The MOOC in Russian was piloted in 2021 and offered to applicants of the Joint TDR and WHO Regional Office for Europe (EURO) Small Grants Scheme for operational/implementation research, to ensure continuity of essential tuberculosis services during the COVID-19 pandemic. Forty-five participants attended the course. The lessons learnt were presented during a seminar organized by EURO on 30 September 2021. A second seminar was organized on 23 October 2021 by TDR partners Dr V. Mutabazi from the University of Rwanda and Dr A. Baumann from the University of Washington in St Louis, USA, who clearly showed the feasibility of using the TDR MOOC beyond Infectious diseases of poverty to noncommunicable diseases. An output of these consultations was a customized MOOC session in Russian held in October 2021 which was organized by the WHO NCD Office in Moscow for participants of the WHO/EUR programme on the Prevention and Control of Noncommunicable Diseases to implement research projects in Azerbaijan, Uzbekistan and Kyrgyzstan.

All sessions of the MOOC were set up on the EdX platform hosted by the Swiss MOOC Service, Switzerland, except for the session in Chinese, which is hosted by a specific Chinese platform (Chaoxing) and managed by the National Institute of Parasitic Diseases, Chinese Center for Disease Control and Prevention in Shanghai. The pilot session of the MOOC in Chinese was launched in December 2021.

The Arabic translation is now finalized. A session in Arabic has been set up on the TDR platform to take place during the first quarter of 2022 in collaboration with the WHO/EMR RTC supported by TDR, Institute Pasteur in Tunisia, and EMRO.

Due to the COVID-19 situation and the need to develop online trainings, TDR was requested to set up different MOOC sessions. Fourteen (14) sessions of the MOOC on IR have already been organized in 2021 for 5474 participants from 128 countries: 7 sessions in English, 3 in French, 2 in Spanish and 2 in Russian. A few sessions have been held at the request of partner universities in the framework of blended courses (University of the Witwatersrand, South Africa and Malaya University, Malaysia) and during a summer camp on IR (RTC in WPR), which means that the MOOC content was used as part of a wider training on implementation research.

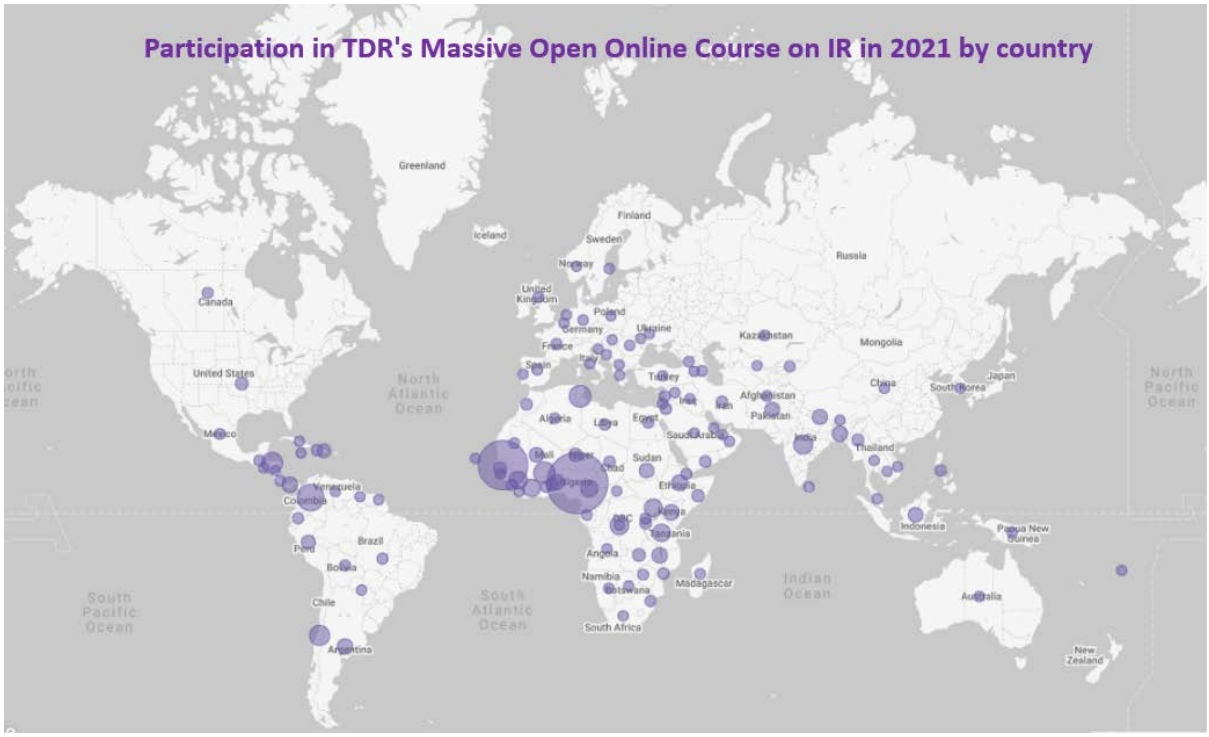
Responding to gaps identified by MOOC participants so far, TDR is currently developing three additional modules: one on the use of qualitative, quantitative and mixed methods in IR; the second on community engagement; and the third on illustrative examples of IR in the control of Chagas disease and leishmaniasis, for participants from Latin America. Recordings of these sessions have been postponed due to COVID-19 travel restrictions. TDR, in consultation with its partners, decided to record the examples from Latin America locally in Cali, Colombia, but this activity was postponed due to political instability in the region in 2021. The MOOC module on methods will also be recorded locally at the University of Heidelberg, Germany, since the main facilitator of this module from Bangladesh, is an invited professor and should be present during the first quarter of 2022. TDR also decided to transform the community engagement module into a storytelling as previously done with TDR SIHI, and is currently being developed in South Africa.

Finally, we are also developing examples of specific IR projects related to NTDs which will be included in the MOOC. Scripts and story boards are finalized for:

1. One example from Latin America on Chagas disease with the Pontificia Unviersidad Católica del Ecuador, a member of the RTC network in Latin America.
2. Two examples identified with the help of the WHO Department of Control of Neglected Tropical Diseases (WHO/NTD) on Visceral Leishmaniasis (VL) in Nepal and trachoma in Ethiopia.
3. Two examples from Asia on leprosy and dengue with the Malaysian Global Health Consortium (MGHC), the RTC supported by TDR in WPR.

A one hour module specifically for implementers to understand the IR concept has also been finalized by the Malaysian Global Health Consortium (MGHC), the RTC supported by TDR in WHO-WPR.

All of these modules should be recorded at EPFL during the first semester of 2022. If the COVID-19 pandemic situation does not allow it, local recordings with EPFL support will be put in place.



Evaluation of the MOOC

The IR MOOC was evaluated using the Kirkpatrick Model, a model which has been widely used to evaluate courses for learners in high-income countries. The Kirkpatrick Model includes four levels of evaluation: 1) reaction, 2) learning, 3) behaviour and 4) results.

On completion of the course, an exit survey revealed that 72.3% of participants, agreed that to a large extent the MOOC met their expectations and that 80.9% of respondents indicated significant improvement to strong and very strong to their IR knowledge.

MOOC participants in the first two sessions in English were invited to take part in an anonymous online survey examining their IR knowledge and how they applied it in their professional practice, approximately 1–1.5 years after completing the MOOC. The IR MOOC proved successful in strengthening participants' professional practice in relation to IR, as participants were able to apply the MOOC content in their daily professional lives. The most cited themes regarding changes to respondents' roles and responsibilities include changes to how they approach the research process, their understanding and thinking about IR and IR research. Respondents reported improvements in how they approach problem-solving, including identifying bottlenecks, and how they approach stakeholder and community engagement with IR activities. For many, the MOOC had increased opportunities for, or in, leadership roles, as well as involvement in IR projects.

The MOOC was successful in enhancing professional results for participants and their organizations. Over a quarter had modified or implemented changes in their professional practice. Findings reveal that respondents felt that their participation in the IR MOOC had improved their ability to conduct

implementation research, enhanced their professional profiles and increased their opportunities for collaboration, research and job promotion. Respondents stated that the MOOC had improved their work quality and productivity, and allowed them to contribute to research, initiate and develop professional collaborations and train others in IR. Respondents were more likely to be successful in applying for grants and scholarships and presenting and publishing work on IR (Ross B et al, submitted BMJ Open).

Altogether, the evaluation of the MOOC clearly shows its usefulness in reaching out to field researchers and public health practitioners who are facing problems in the implementation of control programmes in LMICs.

Level 1: REACTION: How the learners react favorably to the training

MOOC meets the expectations of 72.3% of participants to a large extent

(Launois P et al, 2019 http://www.eurodl.org/materials/briefs/2019/Launois_et_al.pdf9)

Level 2: LEARNING: How the learners acquire knowledge, skills and attitudes as a result of training

80.9% of participants indicated significant improvement in knowledge *(Nwameme A et al., 2021, EURODL In press).*

Level 3: BEHAVIOR: To what degree the learners apply what they learned

30% modified or implemented changes in professional practice, particularly on how they approach stakeholders and community (Launois P, 2021, Health Res Policy Syst. 2021 Apr 6;19(1):59. doi: 10.1186/s12961-021-00703-3).

Level 4: RESULTS: What are the benefits of the training?

25% initiate and develop collaboration (Allotey P et al . *Open Praxis, 2021,* doi: http://dx.doi.org/10.5944/openpraxis.13.1.1172.

However, the evaluation also clearly identified that the MOOC needs to be further enhanced by adopting a "learning by doing" approach. Thus, TDR proposed to enable trainees to rapidly apply the skills developed during the didactic component of training, by incorporating a grant to complete an IR project for selected trainees who have managed to create a high quality concept note for an IR project upon completing the existing TDR MOOC on IR. The Regional Training Centre supported by TDR in WHO/SEAR (Gadjah Mada University, Yogyakarta, Indonesia) is piloting this activity. The RTC-UGM, with TDR's support, hosted a MOOC session for WHO/SEAR countries from May to July 2021. The final assignment for the MOOC was a concept note for a research project on implementation. A peer-review process was used to determine the top twenty concept notes developed at the conclusion of the MOOC for a research project on NTDs. The external reviewers selected the ten best participants to receive a grant to conduct the research project. The ten selected grantees implemented an IR project in their respective country, between mid-September and the end of December 2021, using the grant awarded. A mentoring workshop and sessions were held for grantees to work with their assigned mentor on developing a comprehensive internal research proposal. All of the IR projects should be completed at the beginning of 2022.

Analysis of the textual context of the letters of intent obtained with the MOOC

With funding from the TDR Strategic Development Fund, a systematic analysis of the textual content of the Letters of Intent (LoI), using text mining techniques, is under way. In 2020, TDR and the United Nations University, International Institute for Global Health (UNU IIGH) developed a method and code to automatically extract information from research proposals (or Letters of Intent) submitted for the final assessment of the TDR MOOC. The information to extract consisted of tropical diseases, countries, world regions, research methods and implementation research strategies and outcomes. The method is published here: https://rpubs.com/cimdal2/717755.

The objective of the text mining is to characterize the implementation research trends based on the corpus of LoIs. We are now at the step of illustrating results. Linked here is an example of how the map could look: https://irmooc.org/. Since 2018, TDR has been scaling up the analysis of all sessions of the MOOC in English, French and Spanish. This method and code will contribute to promoting IR as an essential prerequisite to effective public health interventions.

The analysis is still in progress, but the following data could be extracted. As expected, malaria, HIV and tuberculosis represented 22.9%, 19% and 13.8% of the LoIs, respectively, followed by onchocerciasis (3.1%), schistosomiasis (3%), dengue (2.8%), leprosy (1,9%), trachoma (1.5%), influenzae and rabies (1%). The most popular IR strategies put forward by participants included the development and use of tools for quality monitoring, activities to raise awareness within the targeted communities and efforts to deliver ongoing training, conduct local needs assessments and community engagement.

To showcase successful IR projects in NTDs, TDR is currently developing short modules of the MOOC on different examples:

- Transmission assessment of Visceral leishmaniasis in a non-endemic area in Nepal.
- How to improve face washing and latrine utilization practices to reduce transmission in trachoma endemic communities in Ethiopia.
- Evaluation of community-based dog welfare and rabies project in Bali, Indonesia.
- Implementation of an integrated e-leprosy control programme at a primary health care centre in Indonesia.
- Sustainable control and prevention of Chagas disease in Southern Ecuador: a multidisciplinary case study on IR.

Short course on implementation research

In tandem with TDR's current focus on implementation research, the RTC in WHO/AFR developed a short course on the Principles of Implementation Research (PIR). The training is currently being offered as a regular fee-paying short course at the School of Public Health in Ghana. In this regard, two courses (Bachelors' Course on Basics of Implementation Research and a PhD Course on Advanced Implementation Research) have been proposed to the School Management Committee at the University of Ghana. This process is currently at the final stage of approval. Although the PIR training course was being strategically implemented by WHO/AFR RTC in the other RTCs, for example at the Astana Medical University (AMU) and CIDEIM, due to the COVID-19 situation, it was not possible to continue the partnership. Therefore, TDR decided to replace this F2F training course with an online course. The School of Public Health in Ghana developed the course on the virtual platform of the University of Ghana. Its structure ensures that fundamental knowledge on IR and its application is gained before moving forward (Module 1). Comprehension of concepts are strengthened through the application of appropriate methodological tools (Module 2), followed by ethical considerations in IR (Module 3) and competencies to help bridge the know-do gap are done by focusing on community engagement and dissemination (Modules 4 and 5). The course was piloted from 21 June to 2 July 2021 with 18 participants.

TDR toolkit on implementation research

Based on the TDR IR Toolkit and the MOOC on IR, the WHO-SEAR RTC supported by TDR developed an online training course on IR. The course was piloted for nine participants from April to June 2021, in collaboration with three universities in Indonesia (Lambung Mangkurat University; Udayana University and Anadalas University). An external evaluation of this online training course ensured fidelity to the concepts embedded in both the MOOC and toolkit.

A TtT workshop using the toolkit in French was organized for faculties from the RTC in French-speaking countries in West Africa, in November–December 2021, with the objective to develop capacities to allow dissemination of the training tool in the satellite institutions of the RTC in French-speaking countries in West Africa.

Ethics in relation to public health with a specific focus on implementation research

In collaboration with EMRO and IPT Tunis, TDR conducted an IR ethics workshop for the awardees of TDR's small grants in early 2021.

Due to the COVID-19 pandemic, no face-to-face workshops were possible in 2021. TDR converted the course to an online interactive version which can be adopted by the RTCs and the universities in the TDR Postgraduate Training Scheme.

Training outputs

The total number of participants in 2021 trained at the RTCs in good research practice training courses is 430 (Table 2) and in IR training courses is 4256 (Table 3).

Table 2. Number (% women) of participants trained at RTCs in good research practice in 2021

Topic	AFR	AMR	EMR	EUR	SEAR	WPR	Total
EPPE							
SBC	18 (39%)	93 (63%)		59 (85%)			170 (68%)
E-learning		39 (79%)	12 (58%)				51 (74%)
GCP		38 (66%)	44 (79%)	93 (77%)	176 (69%)		351 (72%)
GCLP		25 (88%)	44 (79%)		108 (63%)		177 (71%)
GHRP			20 (85%)	12 (58%)	57 (45%)		89 (56%)
Research Ethics				59 (49%)			59 (49%)
Total							**897 (68%)**

Table 3. Number (% women) of participants trained at RTCs on IR training courses in 2021

Topic	AFR	AFR (west Africa)	AMR	EMR	EUR	SEAR	WPR	Total
MOOC (registered)	2,365 (NA)	973 (NA)	712 (NA)	1,136 (NA)	72 (NA)	216 (NA)		5,474 (NA)
BIPR	18 (39%)				52 (67%)		38 (58%)	108 (59%)
Introduction to IR (TDR IR Toolkit)		12 (65%)		14 (36%)		179 (NA)		205 (NA)
Others IR trainings							308 (NA)	308 (NA)
Total								**6,095 (NA)**

Next steps in TDR IR training courses

As TDR prepares its next generation of IR training programmes and curricula, it is important to be informed with a clear understanding of the range of IR courses that have been carried out by others. This project mapped recent and ongoing IR training efforts globally, as presented in the grey and peer-reviewed literature, followed by interviews with key stakeholders engaged in the development and conduct of IR training programmes, particularly in LMICs.

There is a range of organizations engaged in IR training, in both high-income countries and LMICs. Universities tend to host specialized institutes focused on conducting IR, with many offering some degree of IR training. Postgraduate level courses, workshops and online learning options were all available. North American universities appeared overrepresented here. For LMICs, training seminars tended to be hosted by WHO, either through online or extended in-person training programmes. Two additional programmes from North America were also identified, focusing on NCD related IR in LMICs.

The results obtained from the literature search and interviews with key stakeholders, showed that future programmes could focus more on increasing institutional rather than individual capacity, place greater emphasis on team building and management, provide additional information on community engagement and outline training trajectories for prospective IR practitioners. Additional content needs were also identified, particularly on gender in IR, how to address health inequities and the application of IR findings. The stakeholders also identified that IR training courses were typically designed with researchers rather than implementers in mind.

The following recommendations are proposed for developing future IR training programmes:

- Prioritize team-based approaches to training and increase the focus on conducting collaborative research.
- Revise trainings to enable programme implementors to become informed IR consumers and active collaborators, instead of teaching them how to conduct research themselves.
- Combine ‘training by doing’ programmes and twinning experiences with established online IR trainings.
- Build institutional capacity and demand through integrating IR with established monitoring, evaluation and learning systems.
- Create specialized training modules to fill gaps in content and supplement ongoing trainings.

Based on these results, a framework for future IR trainings has been developed.
http://dx.doi.org/10.37941/RR/2021/2

Another recommendation of the report was to take into consideration IR during the COVD-19 pandemic. The approval of COVID-19 vaccines brings the global challenge of implementing rapid, complete, equitable, safe and a novel therapeutic into clear focus. Given the addition of vaccines into the public health equipment, implementation research must take "centre stage" and ensure this scientific product is optimally implemented. To respond to these challenges, TDR partnered with the University of Washington in St Louis, USA, and the School of Public Health in Ghana to develop tools for: (1) anticipating and describing critical implementation challenges for a COVID-19 vaccine globally; and (2) an approach to conceptualizing, designing, evaluating and reporting on implementation strategies to enhance vaccination. Attention will be given to identifying community-based strategies to help address concerns about the vaccine.

Monitoring and evaluation (M&E) framework for RTCs

TDR has developed a framework for M&E in collaboration with RTC in WHO/AMR to promote and guide each of the RTCs in their systematic assessment of their strategic and technical relevance. Indicators were defined collectively by all six RTCs.

The framework consists of four parts:

1. Purpose, proposed approaches and principles of performance assessment in each RTC. It defines the different levels and specific areas of assessment.
2. RTC's expected results and key performance indicators identified to measure progress and reflect performance.
3. Proposed tools for monitoring and evaluating performance.
4. Explanation of how monitoring and evaluation findings will be utilized for organizational learning and performance improvement.

The framework is now institutionalized in each RTC and used to monitor and assess their performance.

Remaining challenges

The successful introduction of new courses requires assurance of the quality of course content, particularly in the context of developing online training courses. There is a growing spectrum of training tools and modalities and specialized skill sets needed to develop these online training courses. TDR has to support this transition though complementary support to TDR RTC staff on how best to use the recently developed tools.

Operationally, taking ownership involves assurance of training capacity with the availability of an adequate number of trainers. Thus, regional development of research capacity and dissemination requires personnel who can be fully dedicated to RTC activities. Support for human resources is critical to the continued expansion of RTC capacity strengthening activities in regional institutions.

Finally, in addressing the issue of the sustainability of the programme, TDR has used the programme sustainability assessment tool developed by Luke et al. (Prev Chronic Dis 2014:11.130184 doi.org/10.5888/pcd11.130184) that includes eight sustainability domains: 1) environmental support; 2) funding stability; 3) partnerships; 4) organizational capacity; 5) programme evaluation; 6) programme adaptation; 7) communication; and 8) strategic planning. This tool was tested at the end of 2017, with follow-up actions identified for each RTC, and is now included in their annual workplans. Two important elements of sustainability were identified: firstly, the extent of institutionalization of training course, and secondly, financial sustainability. Regarding institutionalization of the different training courses and their inclusion in different curricula of the

universities or research institutions, training programmes such as EPPE, GCP, GHRP and Research Ethics are also now regularly provided by RTCs.

In 2021, the RTC supported by TDR organized a web based postgraduate training course in the framework of the Fogarty Global Infectious Disease (GID) research training programme, for students enrolled in postgraduate basic biomedical, public health and health sciences programmes in Colombia. The course builds upon, and utilizes components of, the TDR MOOC on IR as background, and includes the participation as facilitators of members of the WHO-AFR and SEAR RTCs. This collaboration complements and supports the TDR training initiative in the region. Recently, the contents of the training course on basic principles on IR were integrated into the module of the epidemiology of diseases in Malaysia, taught in the MPH course of the University of Malaya.

Contributions towards TDR key performance indicators

Partnerships and collaborations

The IR training materials and the lessons learnt form the pilot of the MOOC session in Russian were presented during a seminar organized by EURO at the end of 2021, supporting the Prevention and Control of Noncommunicable Diseases (NCD) team in Moscow in their implementation research projects on NCDs in Azerbaijan, Uzbekistan and Kyrgyzstan. A session of the MOOC in Russian for their specific stakeholders was offered in Q4 2021.

Estimated leverage created by this project

The WHO-AMR RTC is developing a new collaboration with the Fogarty International Center at the National Institutes of Health, USA. In 2021, the RTC organized a web-based postgraduate training course within the framework of the Fogarty Global Infectious Disease (GID) research training programme for students enrolled in postgraduate basic biomedical, public health and health sciences programmes in Colombia. The course builds upon, and utilizes components of, the TDR MOOC on IR, and includes the participation as facilitators of members of the WHO-AFR and SEAR RTCs.

Gender aspects and vulnerable populations

The total percentage of women participants who attended the good research practice and IR training courses is given in Tables 2 and 3.

Of the seven RTC principal investigators currently supported by TDR, four are women.

Training

Tables 2 and 3 show the number of participants in the different short training courses.

Strengthened institutions or networks

In addition to institutionalization in each RTC, an objective of the RTC initiative is to disseminate short training courses in satellite institutions, within the country and at regional level. Thus, in addition to Colombia, Ghana, Indonesia, Kazakhstan and Tunisia, where the RTCs are located, short training courses in good health research practice and IR have been institutionalized in Bolivia, Ecuador, Guatemala, Honduras, Jamaica and Peru for WHO/AMR; in India, Myanmar and Nepal for WHO/SEAR; in Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan, Tajikistan, Uzbekistan, Ukraine and the Kazan state of Russia for WHO/EUR; in Kenya, Mozambique and Nigeria for WHO/AFR; and in Lebanon for WHO/EMR.

Publications

- Launois, P., Allotey, P., Reidpath, D., Maher, D., Certain, E., & Ross, B. (2019). Lessons learnt from a professional development MOOC: Engaging culturally and linguistically diverse learners from low- and middle-income countries. *The European Journal of Open, Distance and E-Learning*. http://www.eurodl.org/materials/briefs/2019/Launois_et_al.pdf.
- Nwameme A., Dako-Gyeke P., Asampong E., Allotey P., Reidpath D.D., Certain E., Vahedi M., Ross, B., Maher D. & Launois P. (under review). Improving understanding of implementation research through a MOOC with participants from low- and middle-income countries: The TDR MOOC on implementation research with a focus on infectious diseases of poverty. EURODL.

- Launois P, Maher D, Certain E, Ross B, Penkunas MJ. Implementation research training for learners in low- and middle-income countries: evaluating behaviour change after participating in a massive open online course. Health Res Policy Syst. 2021 Apr 6;19(1):59. doi: 10.1186/s12961-021-00703-3. PMID: 33823859; PMCID: PMC8025553.).
- Allotey, P., Reidpath, D., Certain, E., Vahedi, M., Maher, D., Launois, P., & Ross, B. (2021). Lessons learned developing a massive open online course in implementation research in infectious diseases of poverty in low-and middle-income countries. Open Praxis, 13(1), 127-137. doi: http://dx.doi.org/10.5944/openpraxis.13.1.1172.

Results dissemination and uptake

TDR presented the lessons learnt for developing and implementing the MOOC at the Evidence and Implementation Summit (EIS), 30–31 March 2021 in Sydney, Australia (virtual).

The evaluation and lessons learnt from dissemination of the MOOC on IR in eight LMICs were presented at the Global Research on Implementation and Translation Science (GRIT) consortium at the 14th Annual conference on the science of dissemination and implementation health from 14–16 December 2021 (virtual).

Plans for 2022–2023

RCS will work on wider dissemination of the courses in all WHO regions. The RTCs will continue firstly to institutionalize training courses in good health research practices and IR in their region, through the identified satellite institutions, and secondly to encourage the participation of women in research trainings, tracked by monitoring gender-disaggregated data.

RCS will maintain its efforts in supporting the development / implementation of online training courses in each RTC.

We will also have to think about the strategic opportunity to reorganize the content of the training courses into smaller units, to support the different roles of IR teams. An effort should be made to support the development of expertise of the implementation practitioner, to act as a facilitator between implementation researchers and users of implementation research and therefore to help translate evidence into practice.

ER 2.1.2 Postgraduate training grants

As part of TDR's efforts to increase the capacity of LMICs to undertake a leadership role in research on the control of infectious diseases of poverty, we provide training grants with a focus on implementation research. Support for postgraduate training is a TDR core area of work. Fellows generally go on to establish careers in research or public health in LMICs and become part of the TDR Global network.

Since 2015, the Postgraduate Training Scheme has comprised a network of seven universities in the disease-endemic regions, and since 2021 an additional university was selected on an open competitive basis, giving a total of 8. They are the following:

1. James P. Grant School of Public Health (JPGSPH), BRAC University, Dhaka, Bangladesh
2. The National School of Public Health (NSPH), University of Antioquia, Medellín, Colombia
3. School of Public Health, University of Ghana, Accra, Ghana
4. Faculty of Medicine, Universitas Gadjah Mada (UGM), Yogyakarta, Indonesia
5. Faculty of Health Sciences, American University of Beirut (AUB), Lebanon
6. University of the Witwatersrand, Johannesburg, South Africa
7. Department of Public Health, University of Zambia, Lusaka, Zambia
8. Institut de Santé et Développement, Université Cheikh Anta Diop, Sénégal

Since the inception of the TDR scholarship scheme in 2015, the eight universities have awarded a cumulative total of 402 Master's fellowships (Table 4) and 8 PhD fellowships (five at the University of Ghana and three at the University of the Witwatersrand). Among the 402 Master's students, 200 (49.7%) are men, 201 (50%) are women and 1 (<1%) is transgender. Of the eight PhD students, one is a woman. There has been wide coverage of IR themes relevant to TDR's disease priority areas (Figure 1 and Figure 2).

Highlights in 2021

- As of December 2021, the total number of people awarded a Master's scholarship is now 402 (see Table 4).
- The eight universities actively adopted virtual trainings to ensure smooth continuation of the scheme due to the COVID-19 pandemic related social distancing and travel restrictions.
- Institut de Santé et Développement, Université Cheikh Anta Diop, Sénégal was selected to serve students from French-speaking countries in West Africa.
- The process of selection of universities for the second phase of the scheme was completed in a timely manner.

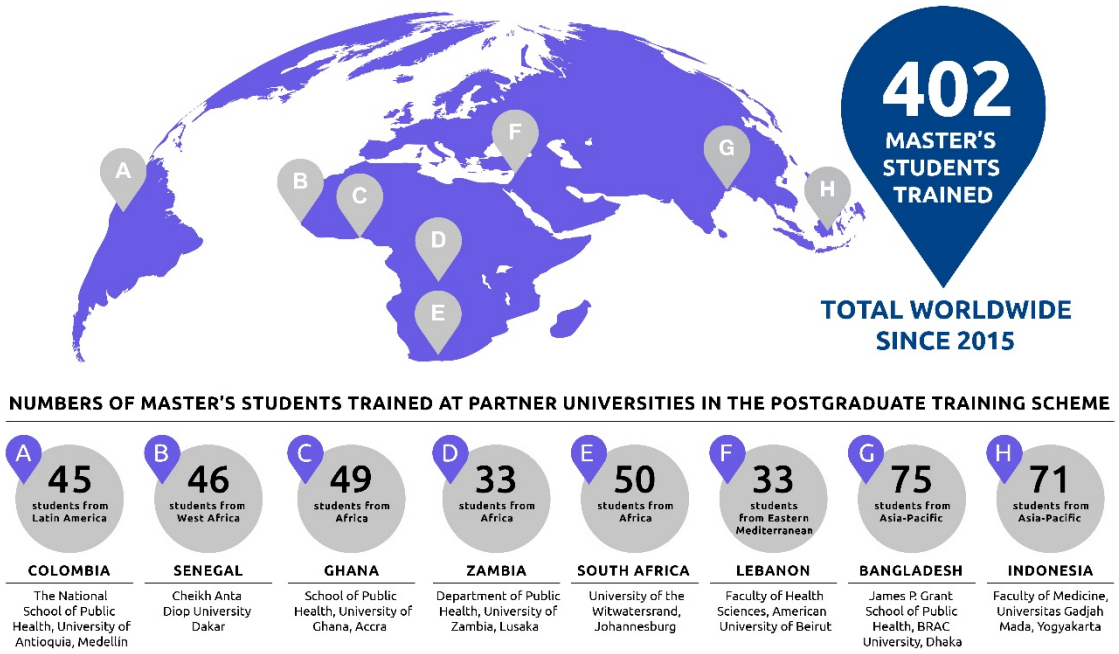


Table 4. Number of Master's students at the universities in the postgraduate training scheme (as of December 2021)

	Cohort 1		Cohort 2		Cohort 3		Cohort 4		Cohort 5			Cohort 6		TOTAL
University	M	W	M	W	M	W	M	W	M	W	T	M	W	
BRAC University, Bangladesh	7	4	7	3	5	4	7	6	5	9	1	8	9	75
Universidad de Antioquia, Colombia	6	9	3	6	3	7	6	5						45
University of Ghana, Ghana	6	3	5	5	3	3	6	4	9	5				49
Universitas Gadjah Mada, Indonesia	8	8	4	6	3	7	8	7	8	12				71
American University of Beirut, Lebanon	4	5	3	3	1	3	4	2	5	3				33
Université Cheikh Anta Diop, Sénégal	24	22												46
University of Zambia, Zambia	3	2	2	1	2	1	5	3	9	5				33
University of the Witwatersrand, South Africa	6	2	5	4	2	3	1	5	3	5		4	10	50
Total	64	55	29	28	19	28	37	32	39	39	1	12	19	402

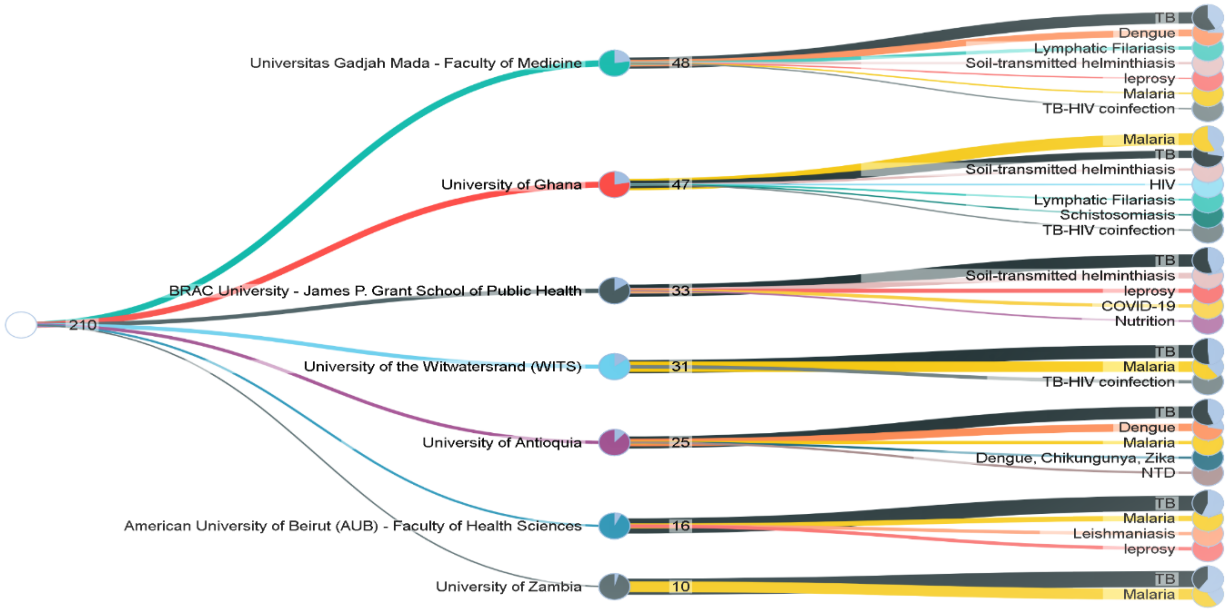


Figure 1. Disease areas for the students' research projects at the universities in the postgraduate training scheme (as of September 2021)

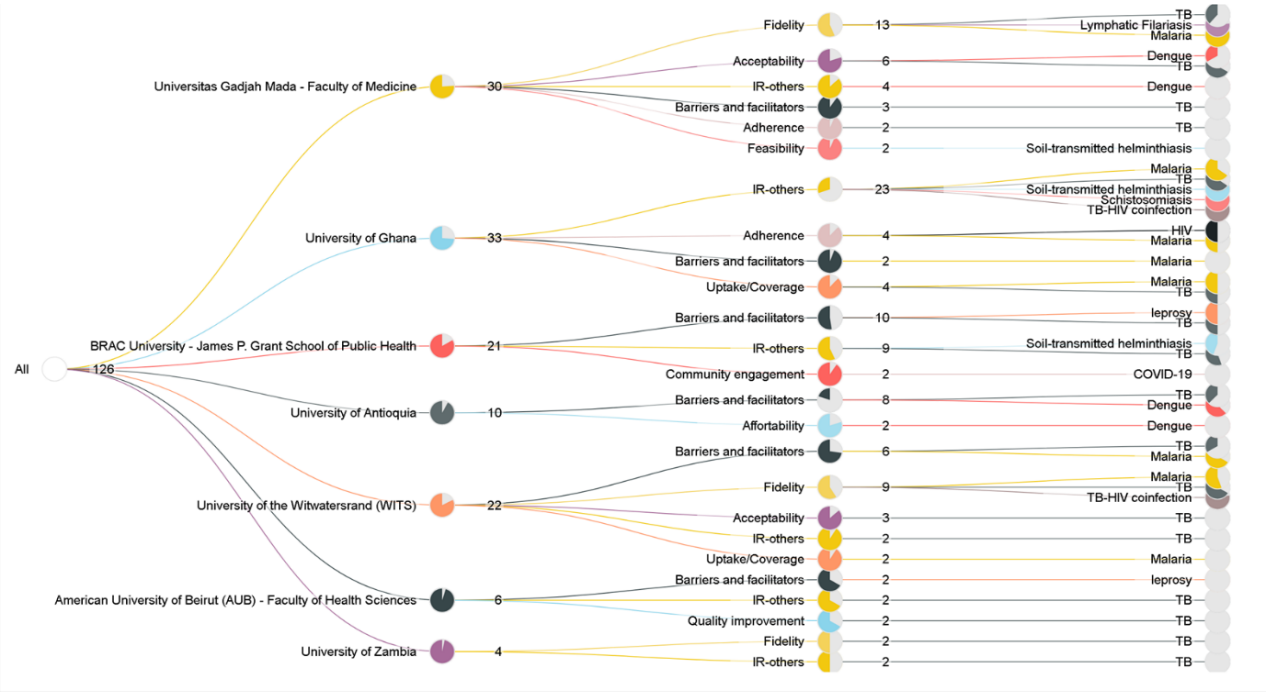


Figure 2. Implementation research themes for students' projects at the universities in the postgraduate training scheme (as of September 2021)

Progress in 2021

Summary of progress in each participating university

1. James P. Grant School of Public Health (JPGSPH), BRAC University, Dhaka, Bangladesh

The James P. Grant School of Public Health (JPGSPH) at BRAC University has been implementing the TDR Postgraduate Training Scheme since 2015 with a view to developing capacity of public health researchers on implementation research for the countries of South-East Asia and Western Pacific regions. From the first cohort in 2016 to now, the Scheme has recruited five cohorts with a total of 58 TDR fellows. Those from the first four cohorts graduated in 2017, 2018, 2019and 2020 respectively. The fellows of cohort five graduated on 21 January 2022.

COHORT 5: The fifth cohort commenced their public health learning on 23 January 2021 by participating in an orientation programme. Soon after the orientation, the fellows joined the first module, 'Introduction to Public Health', where students got to know and understand the competency-based learning and the vision of the experiential learning in public health. After taking part in the interactive lecture sessions, students were oriented on the Solution Project along with a simulated field visit approach. They were divided into seven thematic groups under the broader umbrella of 'Community Health during COVID-19 in Bangladesh'. The aim was to understand the characteristics of a context and its population, which is necessary for effective public health programme implementation, development of observation skills, identification of implementation bottlenecks and undertaking solution thinking exercises around an implementation challenge. As we are running the programme online due to the pandemic, two simulated field visits were arranged in order to equip the students to identify health ideal, health need, health problem, etc.

As the world was experiencing the second year of the COVID-19 pandemic and the students were joining us from their home countries, BRAC held a three week extensive experiential field work in the urban and rural areas, in different parts of Bangladesh, where they could apply structured processes to identify implementation barriers in BRAC Health's Maternal, Neonatal, Child and Adolescent Health (MNCAH) Programme and some government

health care facilities from the community level to the district level. The fellows had also completed two other experiential modules before the COVID-19 pandemic. During the pandemic, they continued their MPH learning with online versions of courses. The fifth cohort of TDR students will graduate on 20 January 2022.

2. The National School of Public Health, University of Antioquia, Medellín, Colombia

The National School of Public Health, University of Antioquia in Colombia offers students from LMICs in Latin America and the Caribbean a two year full-time Master's programme in epidemiology with content and emphasis on IR. Since 2015, the National School of Public Health has enrolled four cohorts with 45 students. All of the students from the first two cohorts have graduated.

To date, 45 students from twelve LMICs have been admitted to the two year full-time MPH programme. Of these, 24 graduated, 10 are finishing their thesis (cohort 3) and 11 (cohort 4) were just admitted.

COHORT 3: The University announced the call in May 2019, received 47 eligible applications (14 men, 33 women) and offered ten TDR fellowships (three men, seven women) for the third cohort, which started on 25 September 2019. Students are from Haiti, Paraguay, Venezuela, Honduras, Peru and Colombia. All of them have formulated implementation research projects on one of TDR's priority infectious diseases: Tuberculosis (4), Leishmaniasis (2), Dengue (2), Chagas (1) and Helminthiasis (1). However, due to the COVID-19 pandemic they will not conduct such projects, because of travel and field work limitations. Instead of this, they will conduct secondary data analysis, systematic or scoping reviews in the same topics. They graduated in December 2021.

COHORT 4: The call for applications for cohort 4 was announced in December 2020 through the TDR and the University of Antioquia websites. The review of applications, shortlisting and selection of candidates was undertaken between April and July 2021. The students commenced their course in August 2021. The cohort is composed of 11 students (5 women, 6 men) who come from Haiti (3), Honduras (2), Bolivia, Costa Rica, México, Paraguay, Dominican Republic and Colombia (1 each). This group of students is committed to carrying on thesis projects in implementation research in: tuberculosis (2), malaria (2), dengue (2), leishmaniasis, Chagas, scabies, rabies and helminthiasis. This new cohort includes participants from two new countries (Bolivia and Mexico) and thesis projects in two new topics (scabies and rabies).

3. School of Public Health (SPH), University of Ghana, Accra

Master's students

The university offers a 12-month Master's in Public Health. The programme is designed to provide students with classroom and field training, as well as supplementary workshops and seminars in IR. The first semester focuses on coursework, while the second semester is devoted to both coursework and research project activities that include proposal development, conducting research, report writing and presentation. Since the inception of the programme in 2015, there have been five cohorts of Master's students. To date, forty-nine students have successfully completed their Master's programme. In 2021, no new cohort was selected.

PhD students

Since the inception of the programme in 2015, there has been one cohort of PhD students. Five PhD students (four men, one woman) started in January 2016, four of whom graduated in 2020 and one who graduated in 2021.

4. Faculty of Medicine, Gadjah Mada University (GMU), Indonesia

Universitas Gadjah Mada, in collaboration with TDR, has been initiating a Graduate Program on Public Health Special Program of Implementation Research on Tropical Diseases since December 2015. The university offers a 24-month Master's in Public Health in the Special Programme of Implementation

Research on Tropical Diseases. The programme curriculum consists of participatory teaching methods, such as mini lectures, case and field studies and a course project.

To date, 35 alumni (cohorts 1, 2 and 3) from various countries in SEAR and WPR Region have graduated from this programme. Currently, 15 students in cohort 4 are finishing their studies and this year, 20 students were accepted for cohort 5 and began the study in September 2021.

COHORT FOUR: The fourth cohort consists of fifteen students (eight men and seven women) from seven countries: India, Viet Nam, Bangladesh, Timor Leste, Nepal and Indonesia. These students started class in August 2019 and underwent thesis expected examinations in August-September 2021. They graduated in October 2021.

COHORT FIVE: The fifth cohort consists of twenty students (eight men, twelve women) from six countries: Bangladesh, India, Indonesia, Myanmar, Nepal and Timor Leste. The students started the course in September 2021.

5. Faculty of Health Sciences, American University of Beirut (AUB), Lebanon

Since 2015, the Faculty of Health Sciences at the American University of Beirut (AUB) has hosted the TDR scholarship scheme which has allowed for the provision of full scholarships for a Master's in Public Health (MPH) and MSC in Epidemiology to five cohorts of students totalling 33 students. All TDR supported students enrolled in a specially developed three-credit course on implementation research.

All the students from the first (four men, five women) and second cohorts (three men, three women) have graduated. Currently there are ten students (four in cohort three and six in cohort four) enrolled at AUB.

COHORT 4: In December 2018, the call for applications for six new scholarships for cohort four to enrol in August 2019 was widely circulated. Out of 55 received applications, 33 were eligible and six have received TDR scholarships. These include: two from Sudan, one from each of these countries: Lebanon, Yemen, Tunisia and Egypt. The students started the course in September 2019. Students in this cohort entered into the second year of their MPH programme in August 2020. They developed an implementation research 'integrative learning experience' and conducted their practicum and ILE project. They presented their project and publishable written product to an interdepartmental jury in May 2021 before they graduated in mid-2021. Only one student from Sudan did not complete the MPH programme due to ill health.

COHORT 5: In December 2020, a call for applications for eight new scholarships for cohort five to enrol in August 2021 was widely circulated. Out of 41 received applications, 28 were eligible and eight (four women, four men) from Afghanistan, Pakistan, Palestine, Jordan and Syria have received TDR scholarships. The students started the course in September 2021.

6. University of the Witwatersrand, Johannesburg, South Africa

The University of the Witwatersrand has been supporting the TDR postgraduate scheme since 2015, by offering an 18-month (MSc) and 42-month (PhD) programme in Implementation Science (IS) to a total of 36 MSc students. Twenty-four (24) MSc students and two PhD students have graduated. Currently there are 12 MSc students (1 from cohort three, 2 from cohort four and 9 from cohort five) completing their Master's programme. One PhD student will graduate in 2022.

Master's students

COHORT 4: In response to the call in 2018, the university received 93 eligible applications (58 men, 35 women). Six students (one man, five women) from Malawi, Nigeria, South Africa, Uganda and Zimbabwe were offered TDR scholarships. They all started their studies in January 2019 with four students graduating in July 2021 and two in December 2021. One student declined the course in 2020, which was too late to find a replacement international student. The position was filled by a local student in 2020.

COHORT 5: The advertisement for the 2020 students' intake was released on 3 June 2019 and closed on 31 July 2019 for the Master's Programme. Candidates were selected through a three tier process. At the first level, the candidates' documents were screened for minimum entry requirements. At the second level, the candidates' qualifications, academic transcript, language proficiency, motivation for applying for study, work experience, and computer literacy, were scored using a rubric. Lastly, the successful candidates at the second level wrote an online quantitative and qualitative assessment. A total of 219 applications were received for the MSc Epidemiology Programme in the field of Implementation Science. Of these, 64 were eligible for admission into the field of study. Nine students (four men, five women) are supported by TDR scholarships. The students submitted their research report for examination and graduated in December 2021. Due to the COVID-19 pandemic, students were unable to undertake the quality improvement practicum at the Ekurhuleni Health District of Gauteng Province and so conducted secondary analysis of existing data and systematic reviews for their research work.

COHORT 6: Selection of the students for placement in 2022 is currently under way.

PhD students

The current PhD student who commenced his studies in February 2018, has successfully completed the five compulsory courses and is currently finalizing his research project. He will graduate in mid-2022.

7. School of Public Health, University of Zambia, Lusaka, Zambia

The implementation research programme is part of a 24-month full-time postgraduate course offered by the School of Public Health through a Master of Science in Epidemiology; Master's in Public Health (MPH) – Health Promotion and Education; and a Master's in Public Health, Health Policy and Management. IR methodology and theory are embedded in the MPH programmes and provide an opportunity for all postgraduate students to gain skills in IR. The TDR supported students also acquire writing skills for research publications and policy briefs, as well as knowledge translation skills. During fieldwork, TDR-supported students are attached to health institutions or study sites in their home countries. To date, eleven students from cohort one (two men, three women), cohort two (two men, one woman) and cohort three (two men, one woman) have graduated.

COHORT 4: In 2019, a call for applications was announced through the University and TDR websites. One hundred and eighty-five (185) eligible applications were received and 20 candidates were shortlisted for interview. The final selection of eight students (three women, five men) was finalized in October 2019. All students have finalized their course work and defended their research projects. They graduated in December 2021.

COHORT 5: In 2021, a call for applications was announced through the University and TDR websites. More than two hundred and twenty (220) eligible applications were received. The final selection of fifteen students (8 women, 7 men) from eight countries (the Democratic Republic of the Congo, Malawi, Tanzania, Namibia, Rwanda, Kenya, Uganda and Zambia) was finalized in December 2021.

Selection of a university in a French-speaking country in West Africa to participate in the TDR Postgraduate Training Scheme

With the support of the Directorate for Development Cooperation and Humanitarian Affairs (Ministry of Foreign and European Affairs) of the Government of Luxembourg, in June 2020, TDR announced a call for applications from universities in the Directorate's French-speaking partner countries in West Africa (Burkina Faso, Niger, Mali and Senegal) to participate in the TDR Postgraduate Training Scheme and serve as a sub-Regional Training Centre for French-speaking countries in sub-Saharan Africa. In early 2021, the Université Cheikh Anta Diop in Dakar, Senegal, was selected to join the Postgraduate Training Scheme, filling the training gap in French-speaking West African countries. A call for applications from prospective students revealed great demand from French-speaking candidates in

the region. To fill 29 places, a total of 1682 applications were submitted, among which 1506 were eligible. The 29 selected students are from 15 countries in sub-Saharan Africa.

Later in 2021, with the generous support of GIZ, Germany, an additional 17 students were included in the first cohort of students. In total 46 French-speaking students began their MPH in February 2022.

Selection of universities for the second phase of the scheme

As the Scheme's first phase (2015–2021) has come to an end, the process of selecting universities to participate in the second phase (2022–2026) began with a call for applications from 22 March to 10 May 2021. A total of 20 applications were received, of which 19 were eligible. Each application was reviewed by one member of the RCS Scientific Working Group (SWG) and an external reviewer. Each application was scored from 1 (lowest) to 5 (highest) for the following criteria: University's profile; implementation research expertise; staff experience in teaching IR; sustainability; and proposal relevance and feasibility.

TDR invited all reviewers to a virtual selection committee meeting to present and discuss their findings for final scoring. Three virtual meetings were arranged on 24 and 25 June 2021 to review all applications and the final meeting on 29 June 2021 aimed at reviewing and finalising the scores.

The following universities have been selected for the second phase of the scheme:

- Universidad de Antioquia, Colombia
- University of Sciences, Techniques and Technologies of Bamako, Mali (for consideration to add another French-speaking university if further funding becomes available)
- University of Ghana, Ghana
- Indian Institute of Health Management Research (IIHMR), Jaipur, India
- Institut de Santé et Développement, Université Cheikh Anta Diop, Sénégal
- University of the Witwatersrand, South Africa
- BRAC University, Bangladesh
- University of Gadjah Mada, Indonesia

Remaining challenges

The COVID-19 pandemic since 2020 posed a particular challenge to the delivery of MPH training across the seven universities. It was challenging to transfer the face-to-face teaching materials to virtual training. It has, however, provided an opportunity for the universities to plan to strengthen their capacities in developing online IR course materials. Due to travel restrictions, students were unable to do field work for their thesis. We encouraged students to use secondary data for their thesis.

Contributions towards TDR key performance indicators

Partnerships and collaborations

List of partners. As a result of this scheme, TDR developed strong partnerships with the universities participating in the scheme and promoted a number of collaborations.

Collaborations

- With the generous support of Luxembourg's Directorate for Development Cooperation and Humanitarian Affairs of the Ministry of Foreign and European Affairs, TDR successfully expanded the scheme to include the Université Cheikh Anta Diop in Dakar, Senegal to serve students from French-speaking countries in sub-Saharan Africa. We are currently in discussion with other donors to support the scheme.

- IR courses have been institutionalized across the existing universities and all students received relevant training in IR, e.g. Gadjah Mada University has TropEd accreditation to facilitate broader international recognition and credit transfer (ECTS). A course on IR has been accredited and there are two TropEd students who attended the course in October 2018 (http://www.troped.org/courses/SPT--FullRecord.php?ResourceId=268). The University of Gadjah Mada is also collaborating with the Network of Humanitarian Action (NOHA) Master Program. NOHA is education and training programme offers inter-university and multidisciplinary Joint Master's Degree. Since 2018, NOHA has sent nine students to take several courses within the IR programme.
- As a result of participation in the TDR postgraduate scheme, the University of the Witwatersrand has successfully renewed its grant with NIH Fogarty to train PhD candidates of Southern African origin. The scheme has also gained visibility among CARTA fellows as they participate in the implementation science courses offered by the University of the Witwatersrand.
- The second online Global conference is planned for late 2021 at University of the Witwatersrand. This will be a collaborative activity across universities.
- There has also been increasing recognition of the scheme within WHO programmes, e.g. the Department of Reproductive Health and Research carried out a joint field visit with TDR to review the implementation of the Department's similar scheme at the University of Ghana.

Estimated leverage created by this project

In all the participating universities, the main leverage is in-kind contributions made by the faculty and personnel based at the collaborating institutions in terms of staff time and research resources. Furthermore, the collaborating institutions have the opportunity to utilize the research findings as evidence to influence practice and policy or a basis for further research.

Gender aspects and vulnerable populations

RCS monitors gender distribution among grant applicants and recipients, with the goal of ensuring gender equity across TDR activities. Among the 402 Master's students, 200 (49.7%) are men and 201 (50%) are women and 1 (< 1%) transgender. Among the 8 PhD students 7 (87%) are men and one (13%) is a woman. The challenges for women applying to these scholarships are often associated with starting a family.

Notwithstanding the underlying social, cultural and educational factors at country level beyond TDR's control, the ways of promoting gender equity that can be considered by TDR in 2020–2021 (without compromising on quality and merit) include piloting flexible training schemes such as part-time training for women with families.

In September 2021, the eight universities supporting the TDR Postgraduate Training Scheme participated in a consultation meeting to explore opportunities and needs for capacity building/strengthening on sex and gender in health research. This is a joint activity between two special programmes housed within WHO: TDR and HRP (the UNDP/ UNFPA/ UNICEF/ WHO/ World Bank Special Programme of Research, Development and Research Training in Human Reproduction). The objective of this joint activity is to identify the existing gaps and develop relevant trainings on sex and gender in health research.

Training

By December 2021, the eight universities had awarded a cumulative total of 402 TDR Master's fellowships and 8 PhD fellowships.

Strengthened institutions or networks

There are several ways that IR capacities across these universities are strengthened:

- All of the universities have developed capacities to deliver IR courses. The Université Cheikh Anta Diop is currently embedding the IR short courses and MOOC within its postgraduate programme before the first cohort of students begin their studies in early 2022.
- Their participation at development of IR core competencies framework has strengthened their network by comparing their IR curricula and exchanging materials.
- An online networking platform was launched in 2020. This platform is managed by the University of Gadjah Mada to enhance communications and promote trainings for staff and students across the seven universities.

Development of IR core competencies framework

In collaboration with Johns Hopkins University, HRP and the universities supporting the TDR Postgraduate training scheme, a framework of core competencies in implementation research was developed to address a lack of consistent curriculum for IR training programmes globally, especially the curriculum that is responsive to IR training needs in LMICs. The framework identified 59 competencies and 52 sub-competencies relevant for teams addressing implementation challenges surrounding effective delivery of lifesaving programmes and health services, in real time and under real life conditions, through research embedded in their local contexts. The content validity of the framework was established via global online surveys and a modified-Delphi process with IR training coordinators and academics affiliated with LMIC institutions, and global IR experts from both LMICs and high-income countries. A theory-based approach was used to define proficiency levels for the competencies and sub-competencies at three levels: knowledge of the competencies (level 1), limited practical experience applying the knowledge of the competencies (level 2), and expert practical experience applying the knowledge of the competencies (level 3).

Seven academic LMIC institutions involved in IR training under TDR and HRP were recruited to participate in a pilot assessment to further establish the validity and utility of the framework for guiding IR training programmes in LMICs and examining the performance of students using a multi-method approach. These institutions and training programmes include: 1) Universidade Estadual de Campinas, Brazil; 2) National School of Public Health, Universidad de Antioquia, Colombia; 3) University of Ghana, Ghana; 4) University of the Witwatersrand, South Africa; 5) School of Public Health, University of Zambia, Zambia; 6) Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Indonesia; and 7) Hanoi School of Medicine, Viet Nam. First, a competency mapping exercise was conducted to map the coverage gaps under each of the training programmes. Second, assessment tools based on the framework were developed for conducting self-assessment and objective assessment of participants in IR. Third, the assessment tools were applied to 166 participants across five of the seven institutions. The construct validity and reliability of the self-assessment tool was assessed by conducting an exploratory factor analyses using the principal component analyses (PCA) method and estimating the internal consistency (Cronbach's alphas (α)) of the items in the tool. The construct validity and reliability of the assessment tool was very high for assessing IR knowledge and self-efficacy, and this reflected on the validity of the IR framework upon which the tool was based. A preliminary assessment of IR training programmes in the participating universities using the core competency framework and assessment tools revealed that the different programmes are in various stages of development, with some more established than others. The framework will be used to address the IR training gaps amongst those universities which continue collaborating with TDR during the second phase of the scheme.

Publications

- Alonge O, Vahedi M, Launois P et al. A multi-methods study to validate an IR competency framework and assess the performance of IR training programs in LMICs. (Draft Manuscript)
- Zachariah R, Maher D, Aseffa A, Vahedi m, Launois P, Khogali M, Aslanyan G, Reeder J. Strengthening the core health research capacity of national health systems helps build country resilience to epidemic: a cross sectional survey. F1000 Research 2020, 9:583 (https://doi.org/10.12688/f1000research.24192.2)

Plans for 2022–2023

- Issuance of Letters of Agreement to the universities selected for the second phase of the scheme.
- Expansion of the scheme to include the University of Sciences, Techniques and Technologies in Bamako, Mali, if additional funding becomes available.
- Training on IR ethics to be carried out across universities.
- Developing an online IR Masters programme.
- Launching a postdoctorate programme with re-entry grants.

ER 2.1.4 Advanced training in clinical product development: TDR Clinical Research and Development Fellowship scheme

Introduction

This training scheme enhances the capacity of individuals and institutions in LMICs to undertake and manage clinical research that meets international standards of regulatory requirements to develop new diagnostics, drugs and vaccines for infectious diseases of poverty. Starting in 1999, the Career Development Fellowship (CDF) scheme was scaled up in 2008 and 2014, with the support of the Bill & Melinda Gates Foundation (Gates Foundation), in partnership with the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA). In 2014, this became a joint TDR programme with the European and Developing Countries Clinical Trials Partnership (EDCTP), in partnership with the European Federation of Pharmaceutical Industries and Associations (EFPIA), and was renamed the Clinical Research and Development Fellowship (CRDF).

Since 1999, a cumulative total of 129 fellows (39 women, 90 men) from 39 LMICs have been selected to be placed with 34 partner organizations. All fellows returned to their home institutions except one who has played a pivotal role in a wide range of R&D projects, including trials for new candidate vaccines and drugs. The current phase of support from the Gates Foundation is from 2018 to 2023. The life cycle of a CRDF round is three years: one year for the selection of fellows, one for the fellows' training at the host institution and the final year for the fellows' reintegration back in their home institution.

Highlights of progress in 2021

- Eighteen fellows were selected in 2020 for a placement in Q4 of 2020 through to Q1 of 2021. Thirteen are already in place. The remaining fellows will be placed in the UK in the first quarter of 2022, if the pandemic situation allows.
- Reintegration plans for the 17 fellows placed at the end 2019/beginning 2020 were implemented in response to institutional needs, using the TDR framework for core competencies in clinical research.
- Organization of a series of webinars by TDR, specifically for CRDF audiences, pending improvement of the COVID-19 situation.
- An online M&E course for capacity building activities based on the revised version of workshops held in Barcelona, Spain (April 2019) and Cali, Colombia (March 2020), was developed and piloted.

Progress in 2021

Results of the 2019–2020 TDR CRDF selection

Two CRDF fellows, from Burkina Faso and India, who were not able to be placed in the previous selection process were placed at IDDO in the United Kingdom and GSK Biologicals in Belgium, respectively.

The first step in the process was to have 30 placements identified and supported by 17 host institutions of different types. Pharmaceutical companies included: GSK Biologicals, Belgium; Janssen Pharmaceutica, Belgium; Novartis Institutes for BioMedical Research; Novartis AG. PDPs included the Drugs for Neglected Diseases initiative (DNDi), FIND, Switzerland; EVI, Germany, the International AIDS Vaccine Initiative (IAVI), United Kingdom and IVI, South Korea. Academic institutions included: the Luxembourg Institute for Health, Luxembourg (the Competence Center for Methodology and Statistics

(CCMS)) and the Clinical and Epidemiological Investigation Center (CEIC); ISGlobal, Spain; and IDDO, United Kingdom. Other host institutions include the Pasteur International Network Association in Madagascar; FIOCRUZ, Brazil; and STPH, Switzerland.

Following a call for applications, there were 155 eligible applications (of whom 48 were women and 107 men) from 37 countries. Among these, 133 (86%) were from the WHO African Region (WHO/AFR), 10 (6.5%) from the WHO South-East Asia Region (WHO/SEAR), five (3.25%) from the WHO Region of the Americas (WHO/AMR), five (3.25%) from the WHO Eastern Mediterranean Region (WHO/EMR) and 2 (1%) from the WHO Western Pacific Region (WHO/WPR). Compared to the 2016–2017 call for applications, the number of eligible applications increased from 55 to 107 for men (x2) and from 11 to 48 for women (x4.4).

All eligible applications were sent to our training partner organizations (TPOs). As a result, 36 candidates were shortlisted for interview by the host institutions: 28 (78%) from WHO/AFR, four (14%) from WHO/SEAR and four (14%) from WHO/AMR, with the country distribution below:

- WHO/AFR: Burkina Faso (3): Cameroon (2), Congo (1), Democratic Republic of the Congo (2), Ethiopia (5), Gambia (1), Kenya (1), Mali (2), Malawi (1), Nigeria (3), Rwanda (2), Sierra Leone (1), Uganda (2) and the United Republic of Tanzania (2)
- WHO/AMR: Brazil (1) and Colombia (3)
- WHO/SEAR: Bangladesh (2), India (1) and Nepal (1)

Of the 36 shortlisted applicants, 11 (30.5%) were women and 25 men (69.5%). The women were from Colombia (3), Ethiopia (1), Malawi (1), Nepal (1), Nigeria (3), Rwanda (1) and Uganda (1).

CRDF funds supported 15 fellows. An active fundraising activity resulted in the support of one fellow by IDDO and the training costs of another fellow supported by GSK Belgium and the Geigy Foundation in Switzerland (50% each).

Eighteen fellows (of whom 3 are women and 15 are men) were selected by eleven training partner organizations: IDDO/WWARN in the UK and South Africa/Australia (3), GSK-Biologicals, Belgium (5), EVI, Germany (1), the Luxembourg Institute of Health, Luxembourg (2), Institute Pasteur in Madagascar (IPM) in collaboration with the University of Oxford (1), ISGlobal Barcelona, Spain (1), IVI in South Korea (1), FIND, Geneva, Switzerland (2), the Swiss Tropical and Public Health institute (1) and Novartis Pharma AG, Switzerland (1).

All fellows were placed during Q4 of 2019 through to Q1 2020, except two (one fellow from Nigeria to be placed in South Korea and one fellow from Congo to be placed in the UK). The delay was due to the challenges of obtaining visas and to COVID-19 border closures. The placement of one fellow in South Korea was postponed to mid-2021. The placement of the second one is still on hold. The fellow has been included in the year 2 cohort.

Fourteen fellows are from WHO/AFR: Cameroon (1), Democratic Republic of the Congo (1), Ethiopia (3), Gambia (1), Kenya (1), Mali (1), Nigeria (1), Rwanda (1), Sierra Leone (1), Uganda (1) and the United Republic of Tanzania (2). Two fellows are from WHO/AMR: Brazil (1) and Colombia (1), and two are from WHO/SEAR (Nepal).

In March 2020, as a result of COVID-19 containment measures, TPOs, home institutions and fellows, discussed the possibility of working from home, with tight supervision from the mentor in each TPO. Thirteen (13) fellows indicated their willingness to remain placed at TPOs and work remotely from their respective locations. Three fellows, respectively placed at ISGlobal, Spain, FIND Switzerland and GSK Biologicals, Belgium, returned to their country (2 from Ethiopia, 1 from Rwanda). One returned in September 2020 to finish the TPO placement. In agreement with their home institution and TPO,

it has been decided that the remaining time of the fellowship for the two fellows working remotely will be carried out as soon as the COVID-19 pandemic allows. A two month placement was set up at the beginning of 2021 for both. One was placed for four months at IDDO South Africa but could not be placed at IDDO Australia for the remaining eight months as planned. It was therefore decided that he should return to his home country (Ethiopia) to work remotely with IDDO UK during the remaining period.

Results of the 2020–2021 TDR CRDF selection

Twenty eight placements were identified and offered by 16 host institutions of different types. Pharmaceutical companies included: GSK Biologicals, Belgium; GSK Global Health, UK, Novartis Institutes for BioMedical Research and Novartis AG, Switzerland; Product Development Partnerships (PDPs) included Drugs for Neglected Diseases Initiative (DNDi), the Foundation for Innovative New Diagnostics (FIND), Switzerland; European Vaccine Initiative (EVI), Germany; The International AIDS Vaccine Initiative (IAVI) London, and the International Vaccine Institute (IVI), South Korea. Academic institutions included the Luxembourg Institute of Health, Luxembourg; Barcelona Institute for Global Health (ISGlobal), Spain, the Swiss Tropical and Public Health Institute (STPHI), Switzerland, and the Infectious Diseases Data Observatory (IDDO) at the Centre for Tropical Medicine and Global Health, Oxford, United Kingdom. Other host institutions include the Pasteur International Network Association in Madagascar and FIOCRUZ, Brazil.

Following a call for applications, TDR received 147 eligible applications from 37 countries, of which 35 were from women and 107 from men. Among these, 127 (87%) were from WHO/AFR, twelve (8.2%) from WHO/SEAR, five (3.5%) from WHO/EMR and two (1.5%) from WHO/AMR.

All eligible applications were sent to TPOs. After some internal conversations about their capacity to onboard a new fellow, IAVI and FIND decided not to take fellows from this round. This decision was based on the fact that the scientific leadership team of the respective TPOs is currently facing some transitions, in addition to the present global COVID-19 situation that affects their ability to accommodate new fellows.

As a result, 36 candidates were shortlisted for interviews by 13 TPOs, with the vast majority from WHO/AFR (33/36). Fellows from WHO/AFR are from Burkina Faso (1), Cameroon (2), Congo (2), the Democratic Republic of the Congo (1), Eritrea (1), Ethiopia (11), the Gambia (1), Liberia (1), Madagascar (1), Malawi (1), Mali (4), Mozambique (1), Nigeria (2), Uganda (1), the United Republic of Tanzania (1), Zambia (1) and Zimbabwe (1). The fellow from WHO/AMR is from Argentina and the two fellows from WHO/EMR are from Sudan (2).

Among the 36 shortlisted applicants, there were 15 women (41.5%) and 21 men (58.5%). The women were from Argentina (1), Cameroon (1), Ethiopia (2), the Gambia (1), India (1), Madagascar (2), Mali (2), Mozambique (1), Sudan (1), Uganda (2) and Zimbabwe (1).

Sixteen fellows, of whom 8 are men and 8 women, were selected by nine TPOs: DNDi Switzerland (1), IDDO/WWARN, UK (4), GSK-Biologicals in Belgium (3), GSK Global Health in UK (1), EVI in Germany (2), FIOCRUZ in Brazil (1), the Luxembourg Institute of Health, Luxembourg (1), IVI in South Korea (2), and the Swiss Tropical and Public Health Institute in Switzerland (1).

Thirteen fellows are from countries in WHO/AFR: Cameroon (1), Congo (1), Ethiopia (4), Gambia (1), Guinea (1), Liberia (1), Madagascar (1), Malawi (1), Uganda (1) and Zambia (1). One fellow is from a country in WHO/AMR (Argentina), one fellow is from a country in WHO/SEAR (India) and one fellow is from a country in WHO/EMR (Sudan). The women fellows are from Argentina, Cameroon, Ethiopia (2), the Gambia, India, Madagascar and Uganda.

Due to the quality of the applications and the willingness of TPOs to train more fellows, TDR agreed

to support the placement of three additional fellows. After sending the remaining applications from the current and previous round of selection to TPOs, the Luxembourg Institute of Health and ISGlobal in Spain selected fellows from Nigeria (1 woman), Gabon (1) and Mozambique (1).

Unfortunately, one of the fellows from Malawi cancelled his participation for a placement at GSK Biologicals, Belgium due to family reasons.

In summary, at the end of this process, 18 fellows were selected, of whom 9 were women and 9 men, by nine TPOs: DNDi Switzerland (1), IDDO/WWARN, UK (3) and Australia (1), GSK-Biologicals in Belgium (2), GSK Global Health in UK (1), EVI in Germany (2), FIOCRUZ in Brazil (1), the Luxembourg Institute of Health, Luxembourg (3), ISGlobal in Spain (1), IVI in South Korea (2), and the Swiss Tropical and Public Health institute in Switzerland (1). Fourteen fellows are from countries in WHO/AFR: Cameroon (1), Congo (1), Ethiopia (4), Gambia (1), Guinea (1), Liberia (1), Madagascar (1), Mozambique (1), Nigeria (1), Uganda (1) and Zambia (1). One fellow is from WHO/AMR (Argentina), one fellow is from WHO/SEAR (India) and one fellow is from WHO/EMR (Sudan). The women fellows are from Argentina, Cameroon, Ethiopia (2), the Gambia, India, Madagascar and Uganda.

On 31 December 2021, all except four had been placed in their respective training organizations i.e. DNDi in Switzerland (1), EVI in Germany (2), Fiocruz in Brazil (1), GSK Biologicals in Belgium (2), IDDO in Darwin, Australia (1), ISGlobal, Spain (1), IVI in South Korea (2), LIH in Luxembourg (2) and STPHI in Switzerland (1).

Four CRDF fellows will be placed in early 2022 at IDDO, UK (3) and LIH (1), Luxembourg, if the COVID-19 pandemic situation allows.

One fellow should have been placed at GSK, UK but due to an internal restructuration, GSK cancelled the placement. However, a placement at STPHI was proposed, following active discussion with the TPOs, but the candidate did not accept it.

The women fellows are from Argentina, Cameroon, Ethiopia (2), the Gambia, India, Madagascar, Nigeria and Uganda. Selection of the candidates was announced on the TDR platform at the following link: Selection of 2021-22 Clinical Research and Development Fellowship recipients (who.int).

Reintegration of the 2019–2020 fellows

The fellows placed in 2019 started their respective reintegration placement at the end of 2020. One objective of this plan is to implement the skills gained during the placement at the TPO at home institutions. A total of 632 scientists were trained through different reintegration plans. An overview of the topics of the training and the number of participants in each is given in the table below:

Table 5. Summary of capacity building activities during reintegration grant of the 2019 CRDF

Institution	Capacity building activities	Number of participants
Mekelle University, Ethiopia	Introduction to clinical research operations	26
Malaria Research Training Center (MRTC), Mali	Pharmacovigilance	20
	Research project management	19
	Grant and scientific writing	20
University Gamal Abdel Nasser, Guinea	Clinical research and data management	31
Centre National de Recherche et de Formation sur le Paludisme (CNRFP), Burkina Faso	Risk and safety management and research regulations	20
	Improvement of local ethics review committees	26
	Good quality management systems	35
Centre de recherche de Nanoro, Burkina Faso	Clinical trial conduct	19
University of Ghana, Ghana	Monitoring clinical trials	32
	Introduction to diagnostic research trials	38
University Cheikh Anta Diop, Senegal	Grant writing	20
	Scientific writing	21
	Project management	20
National University of Littoral, Argentina	Protocol development in research	100
	Protocol development in epidemiology	100
	Pharmacovigilance	30
Tribhuvan University, Nepal	Good clinical practice	25

Following the training activities developed during his re-integration, Dr Miguel Vicco, from the National University of Littoral in Argentina, was appointed Director of the Research Development Program and was able to develop an academic agreement with the Barcelona Institute of Global Health to develop joint clinical research capacity building projects. Information is available at the following link: Miguel H. Vicco (who.int)

During their re-integration plan, fellows were also hired as investigators or co-investigators in different clinical research projects/clinical trials. An overview of the clinical trials in which fellows are involved is given in the table below:

Table 6. List of clinical trials in which 2019 CRDF are involved as investigator or co-investigator

Country	Projects
Burkina Faso	Dynamics of Plasmodium falciparum infection and transmission to inform the elimination of malaria (INDIE-1)
	Randomized, Double-blind, Phase IIb Study to Investigate the Efficacy, Safety, Tolerability and Pharmacokinetics of a Single Dose Regimen of Ferroquine (FQ) with Artefenomel (OZ439) in Adults and Children with Uncomplicated
	MORDOR: macrolides oraux pour la réduction de la mortalité infantile
	A phase 2 and 3 clinical trial programme to assess safety, efficacy and transmission blocking properties of the new anti-malarial KAF156 combined with a new formulation of lumefantrine in children and adults with uncomplicated Plasmodium sp. malaria in West and Central Africa
	SMC-NUT project which aims to assess in a randomized superiority trial whether SMC + Vitamin A-Zinc or SMC+ Plumpy'DozTM is more effective and safer in reducing uncomplicated malaria incidence, and malnutrition compared to the SMC alone.
Ethiopia	Truenat TB assay trial to identify rifampicin resistance in tuberculosis
Mali	Evaluation of 3 doses of Intermittent Preventive Treatment in pregnancy with Sulfadoxine pyrimethamine (IPTp-SP) performed with the enhanced intervention package compared to standard care to improve health in infants.
	Efficacy and Safety of Pyronaridine-Artesunate (PYRAMAX®), a newly registered Artemisinin-Based Combination for the treatment of malaria in African pregnant women.
	Safety and Protective Efficacy of a Human Monoclonal Antibody, HRV-MALMAB0100 00 AB (CIS43LS) Against malaria: randomized, double-blind, phase 2 clinical trial in Mali
	Conduct an open label phase IIa trial to assess safety, reactogenicity and immunogenicity of ChAd63-KH in cured Visceral Leishmaniasis (VL) patients in Sudan
	Conduct a phase IIb randomized controlled trial to evaluate safety and efficacy of ChAd63-KH for prevention of PKDL in cured VL patients in Sudan
	Conduct an in-depth analysis of the immune set point at cure from VL in patient cohorts from Ethiopia, Kenya, Sudan and Uganda
Bangladesh	Reducing the risk of P. vivax after P. falciparum infections in co-endemic areas - a randomized controlled trial
	A randomized, open design, phase III clinical trial to evaluate the safety and immunogenicity of Inactivated Enterovirus Type 71 Vaccine (Vero Cells) when administered in one-month apart two consecutive doses in Bangladeshi healthy children aged 6 months through 71 months.
	Reducing the risk of P. vivax after falciparum infections in co-endemic areas - a randomized controlled trial"
Nepal	Multicentre, observer blinded, randomized, active controlled, safety and immunogenicity phase III study of diphtheria toxoid conjugated Vi-polysaccharide Typhoid vaccine compared to Typbar TCV® in healthy Nepalese subject"
	Reducing the risk of P. vivax after falciparum infections in co-endemic areas - a randomized controlled trial"

Follow-up on the impact of the CRDF programme

Between March 2018 and January 2019, ISGlobal carried out an external evaluation of the CRDF programme. To complete information on the impact of the CRDF scheme at the three levels (individual, institutional and societal), in collaboration with the Centre for Science and Technology Studies, Leiden University in the Netherlands, TDR has been reviewing the publications output of the fellows pre- and post-grant as a proxy of the impact of the fellowship on their career progress.

In summary, we analysed around 935 publications in which all of the fellows from round 1 to round 7 were co-authors. These include publications output from 2000 to 2019, which were retrieved from the Web of Science and PubMed.

Below are performance scores of the fellows' publications output before and after the fellowship:

	Before fellowship	**Since fellowship**
Publications output (P)	329	606
MNCS (Scientific Impact factor)	0.95	0.96
Collaboration	0.87	0.94
International collaboration	0.76	0.82
Collaboration with industry	0.09	0.15

The publications output (P) in the funded period is almost twice that prior to the fellowship. This does not mean that the fellows have become more productive since the grant, but rather an artifact of the period of analyses we used and the years in which the programme ran. Considering that there has been a general trend that the research output has increased, even though the scientific impact factor (MNCS) for the publications output has not significantly changed, this could be due to the fact that most publications were in open access journals. Publications output in different research areas:

Table 7. Publication output in different research areas

Research area	**Number of publications**	
	Before fellowship	**Since fellowship**
Drug discovery	1	5
Basic research	95	143
Pharmacokinetics K study	10	15
Case control study	8	10
Case report	3	3
Clinical trial	59	101
Health system research	152	322
Other	1	7
Total	329	606

The previous table describes a general increase in the fellow's publications output since their fellowship. This includes their involvement in both product development and health systems research. Further analysis also shows that most of the research is related to infectious diseases of poverty, malaria, NTDs, TB, HIV and HIV co-infection. There has also been an increasing trend in research related to NCDs and nutrition.

In summary, there have been positive trends in the fellows' career progress in research, in particular clinical trials and health systems research in LMICs. A full analysis and draft manuscript for this work are under way.

Resource leader trained in monitoring and evaluation

A workshop using the M&E curriculum developed in 2019 in partnership with ISGlobal, was planned in Addis Ababa in March 2020 for fellows from the Africa region but was cancelled due to the COVID-19 pandemic. Considering the challenges imposed by the pandemic, TDR decided to develop online interactive materials, including guides for participants and facilitators. The documents are available at the following link, Facilitator's Dashboard (monitoring-and-evaluation-workshop.com).

An online course, with both synchronous and asynchronous elements, was piloted from 6 April to 6 June 2021. Sixteen participants (11 men, 5 women) from eight countries, including Burkina Faso, Ethiopia, Ghana, Guinea, Nigeria, Senegal, Tunisia and Zimbabwe, were able to join and engage in the course. Fifteen of the participants submitted a completed M&E framework project. The curriculum is currently translated in French and Spanish.

Promoting career development through CRDF networking and alumni meeting

Within the TDR framework for core competencies in clinical research developed in collaboration with the Global Health Network at the University of Oxford, a grading system has been developed for the Professional Development Scheme (PDS) that allows comparison over time and between individuals. All fellows are enrolled in the PDS. The tool provides a mechanism for a research team member to record and track their research skills and experience, gathering additional points as they gain experience. They are awarded a membership level and each year go through a career review process and update their points. This audited and highly robust system provides ongoing recognition for research staff. Guidance has also been developed on pilot testing and using the framework in practice (https://globalhealthtrials.tghn.org/site_media/media/medialibrary/2016/11/TDR_Framework_User_Guide.pdf).

Users post profiles through which their development and skills acquisition are measured and tracked to capture advancement throughout their career. It currently has 2345 members.

Two Regional CRDF alumni meetings were planned, one for CRDF fellows from WHO/AMR and Asia in Cali, Colombia from 2–4 March 2020, the other for CRDF fellows from Africa, in Addis Ababa, Ethiopia, from 31 March to 1 April 2020. Unfortunately, the meeting in Addis Ababa was postponed due to the COVID-19 situation. As a result, TDR organized a series of webinars, specifically for CRDF audiences. The first webinar was organized on 11 February 2021 and featured the impact of the CRDF fellowship on the career development of one fellow: Mr Mohammad Sharif Hossain, Research Investigator, Infectious Diseases Division at the International Center for Diarrhoeal Disease Research (icddrb,b) in Bangladesh. The title of the presentation was “CRD fellow’s response against malaria and COVID-19 pandemic – An impact of CRD Fellowship”. The second was organized on 28 April 2021, in partnership with the Alliance for Accelerating Excellence in Science (AESA) in Africa, hosted by the African Academy of Sciences (AAS), to demonstrate the Clinical Trials Community (CTC) Online Platform that had recently been developed. The objective is to build an online transparent and accessible platform to increase the visibility of African clinical trial investigators, sites/centres and their capabilities. Ultimately, these efforts will result in an increase in clinical trial investments in Africa.

Development of a curriculum with the skills needed for engaging in research

In collaboration with The Global Health Network (TGHN, Oxford, UK), an Essential Research Skills Training Curriculum was developed to identify the minimum set of skills, knowledge and key principles that would enable those with limited or no previous experience to undertake high-quality research for health. A set of 13 modules cover all aspects of the research cycle including study design, conduct analysis and reporting the findings as recommendations for policy and practice. A report has been developed and will be published on the respective websites, i.e. TDR and TGHN, in January 2022.

Global Health Clinical Consortium (GHCC) supported Clinical Trial Operations for Study Coordinators course

The study coordinators course was developed from training tools and resources made available by The Global Health Network, TDR Regional Training Centres, University of Siena, and other similar institutions. The course has been delivered three times, in collaboration with the following organizations which have actively participated in its design, delivery and continuous improvement through a formal measurement and evaluation framework: Faculty of Capacity Development (FCD), FIND, Medicines for Malaria Ventures (MMV), IAVI and PATH. In 2021, management of the course was transferred to the Center for Innovative Drug Development and Therapeutic Trials for Africa (CDT-Africa) at Addis Ababa University. TDR former fellow Dr Dawit Ejigu, is managing the delivery of the online course.

TDR has been supporting the monitoring and evaluation aspects of the course and, along with other PDPs in the GHCC, have been providing feedback on the course content. Two former TDR fellows have also been involved in the facilitation of the course. For the course in Q3 2021, around 10 applications from the TDR CRDF network were received and two were selected.

Location of work

In the 2019–2020 CRDF selection, 18 fellows were selected. Fifteen were from WHO/AFR: Burkina Faso (1), Cameroon (1), Democratic Republic of the Congo (1), Ethiopia (3), Gambia (1), Kenya (1), Mali (1), Nigeria (1), Rwanda (1), Sierra Leone (1), Uganda (1) and the United Republic of Tanzania (2). Two from WHO/AMR: Brazil (1) and Colombia (1), and two from WHO/SEAR: Nepal.

In the 2020–2021 CRDF selection, 18 fellows were selected, of whom 9 were women and 9 men. Fifteen fellows are from countries in WHO/AFR: Cameroon (1), Congo (1), Ethiopia (4), Gambia (1), Gabon (1), Guinea (1), Liberia (1), Madagascar (1), Mozambique (1), Nigeria (1), Uganda (1) and Zambia (1). One is from WHO/AMR (Argentina), one from WHO/SEAR (India) and one from WHO/EMR (Sudan).

Remaining challenges

The COVID-19 pandemic posed a particular challenge to place CRD fellows in the different TPOs. Potential remote online training has been discussed with TPOs. The hands-on, learning by doing process was highly appreciated by fellows and TPOs in 2020, when the COVID-19 pandemic necessitated a switch to remote training with a mentor at the relevant TPO. There is no substitute for the opportunities provided by placement at the TPOs as this allows interaction with an identified mentor and the different research groups. These exposures generally enhance the development of leadership skills and the levels of professional support and peer-to-peer support, including group reflection exercises. In addition, while many online training resources are available, they are insufficient on their own. Learning by doing is essential for deepening knowledge and discovering how to use this acquired knowledge in complex situations, such as performing clinical research. This is the basis of the concept of the placement of Clinical Research and Development Fellows in TPOs.

Despite TDR's active efforts to promote the scheme globally, limited numbers of applications were received from regions other than sub-Saharan Africa. There is a need to explore which alternatives might be more attractive to encourage researchers outside of sub-Saharan Africa to apply to this programme.

Contributions towards TDR key performance indicators

Partnerships and collaborations

The collaborating training partner organizations (TPOs) which host fellows are listed earlier (under "results of the 2018–2019 and 2019–2020 TDR CRDF selection").

Estimated leverage created by this project:

Based on the documentation received from two pharmaceutical companies, the estimated in-kind contribution for a one year assignment for one fellow is around US$ 65 000. This includes: mentoring time; conference attendance; relocation agency; two monitoring trips (calculated as cost to monitor sites in Africa); public transport; travel to Geneva for mentoring; insurance (site) and miscellaneous costs depending on the location. The total for 30 fellows is US$ 1 950 000.

Gender aspects and vulnerable populations

Since the inception of the CRDF scheme, there have been more men than women candidates. This issue has been tackled by developing a gender challenge contest. To help narrow the gender gap in applications and fellowships awarded, a gender challenge contest was organized in 2018, using the TDR guide on designing, implementing and evaluating a challenge contest (https://www.who.int/tdr/publications/year/2018/crowdsourcing-practical-guide/en/). As a result of the implementation of suggestions identified in the challenge contest during the third selection of fellows in 2020–2021, 41.5% of the identified candidates for interviews with TPOs and 50% of finally selected participants are women (see below scaling up CRDF placements).

Training

The training offered by TPOs is mainly hands-on rather than through a degree course. The training plan developed at the beginning of the fellowship is aligned with the needs of the home institution and according to the TDR framework for core competencies in clinical research.

Strengthened institutions or networks

The dedicated website for TDR Fellows has different sections (e.g. home, about, community activity, members and progress reports) and offers various tools. For the fellows, the most useful sections or tools available are: Conferences and meetings, progress reports, news, conference reports and articles, newsletter and members. The website is strategically placed on the Global Health Network website (https://tghn.org/) in such a way that fellows who use the TDR fellows' website also have access to all other site materials and facilities offered by the platform. The most used tool is the online training materials or courses, and the most popular courses are those on ICH good clinical practice and an introduction to clinical research.

Publications

- Casamitjana N, Vahedi M, Maher D, Davoren S, Kavoura E, Tallada J, Zamaka S, and Launois P. Benefits and Barriers in a Clinical Research Competency Development Scheme for Low- and Middle-Income Countries accepted in Global Health Action.
- TDR Global Women in Science compendium for International Women's Day 2021. The compendium, which is available on our website at https://tdr.who.int/publications/i/item/women-in-science, Women in science (who.int), compiles inspiring stories of women in science, extracted from TDR Global profiles.

Related news

- Mr Mohammad Sharif Hossain Mohammad Sharif Hossain (who.int) (personnel profile)
- Dr Wilfried Mutombo Kalonji Wilfried Mutombo Kalonji (who.int) (personnel profile)
- Dr Lyda Osorio Women scientists capture public attention as COVID-19 rages across the world Women scientists capture public attention as COVID-19 rages across the world (who.int)
- Announcement of the 2021–2022 CRDF recipients Selection of 2021-22 Clinical Research and Development Fellowship recipients (who.int)

Results dissemination and uptake

Mr Mohammad Sharif Hossain, Research Investigator, Infectious Diseases Division, International Center for Diarrhoeal Disease Research (icddrb,b), Bangladesh, made a presentation during a CRDF webinar organized by TDR. The title of the presentation was "CRD fellow's response against malaria and COVID-19 pandemic - An impact of CRD Fellowship".

A publication on the results of the previous CRDF evaluation has been accepted by Global health action for publication in 2022.

Plans for 2022–2023

Building on the experience and evaluation of the CRDF programme, TDR proposed a new programme on Clinical Research Leadership (CRL) to the Bill & Melinda Gates Foundation. The 2018 CRDF evaluation highlighted the need for training in clinical research leadership when fellows return to their home institution. This new programme is based on that result and has three key features: 1) it is customized to the needs of individual fellows regarding the relevant leadership and research competencies; 2) the flexible mentoring approach is suitable for fellows with family responsibilities; and 3) it maximizes opportunities for remote interaction. The proposed CRL programme comprises four main pillars: 1) clinical research skills, 2) clinical research leadership skills, 3) gender equity and 4) institutional capacity.

ER 2.1.6 Access and Delivery Partnership (ADP) project (in collaboration with the TDR Research for Implementation unit)

Scaling up implementation research capacity development approaches

Strengthening of in-country IR capacity is an ongoing priority for TDR, the Access and Delivery Partnership and partners in focus countries and beyond. Since its launch in 2014, use of the IR Toolkit has been innovative and continuously evolving.

To reach a greater level of impact, new approaches are now needed to:

- expand the scale of IR capacity building that can be accomplished;
- facilitate more exchange between IR researchers/teams of varying experience and competence;
- drive higher levels of engagement among learners; and
- support focused IR-related technical assistance.

Since IR is a team effort, it requires persons with differing and complementary skills, experiences and backgrounds to collaborate and support one another in addressing an implementation problem together.

Sharing of lessons learned, approaches, tools and experience among IR stakeholders through online communities of practice (CoP) can achieve many of these goals, adding a new dimension to the capacity-building process, helping to improve research standards and decreasing dependence on organized in-person training events. In the medium- to long-term, this combination will shift emphasis towards more decentralized capacity building, self-learning and peer-to-peer/mentoring approaches.

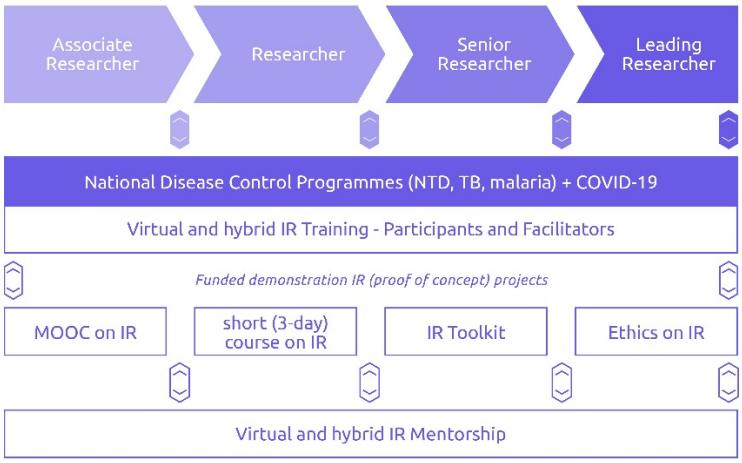
This approach also supports research teams during the ongoing COVID-19 pandemic, as current travel and meeting restrictions are limiting opportunities for such networking, collaboration and exchange to take place in person. Online networking will clearly continue to be an important cornerstone of the initiative for the duration of the pandemic and as benefits and efficiencies become more evident – are also likely to endure once current restrictions come to an end.

Since early 2020, focused online networking, information exchange and organized events, such as webinars, have quickly become accepted and popular ways of working to bring people together despite travel restrictions. One example has been the establishment of the ADP Community platform in 2021. Nevertheless, more can be done to scale up and design such platforms and interactions more purposefully, with the specific goal of online learning in mind.

Highlights of progress in 2021

- Development of a new module on gender and intersectionality (under editing and formatting) to be incorporated in the existing TDR IR Toolkit.
- Development of the ADP community and stakeholders virtual platform and eDiscussion forum.
- Initiation of a comprehensive IR training and mentorship encompassing mentorship guidance and funding for demonstration projects.
- Further development of the online IR Toolkit to add new features and functionalities, including: individual user registration, support to establishment of research teams among/ between individual users, comprehensive self-assessment and module progress/tracking tools, including user/administrator 'dashboards'.

2021 Updates (3): Piloting a Comprehensive IR training package in Ghana and Malawi



Progress in 2021

Further development and set-up of IR online learning tools/platforms, including the existing IR Toolkit (stage 1), that will be followed by a concerted roll-out of the 'decentralized' capacity building approach and related technical support, initially to be pilot tested in Ghana and Malawi (stage 2).

Stage 1. Enhancement of online learning tools and networking platform

The latest version of the Toolkit is divided into seven main modules and was intentionally not provided as a 'linear' course or set of materials. This enables users with differing IR capacities to engage with the content in varying ways depending on their unique needs: ranging from exploring the content from start to finish, to choosing to jump in to use specific modules more selectively.

The Toolkit is undergoing a review to enhance its use by both individuals and IR teams under varied circumstances and team arrangements (national or inter-country teams). Other planned enhancements will extend existing options to address new and emerging user needs:

- Supporting users/teams to carry out comprehensive IR-related self-assessments to identify specific gaps/capacities they need to develop/improve, and providing suggestions to focus developing those competencies specifically.
- Facilitating IR teams to collaborate and use the Toolkit as a small group, together moving research questions and approaches through the proposal development process systematically.
- Integrating progress tracking features, providing individual users and teams with a self-monitoring process and progress dashboard, and parallel progress tracking and reporting by administrators.

Incorporation of comprehensive user progress metrics to help inform planning for tailored online events (workshops/webinars) and management of the proposed online IR community of practice. Establishment of an online peer-to-peer learning and mentoring CoP on IR is designed to support the interaction and engagement of IR Toolkit users, faculty, mentors and research capacity development alumni.

Remaining challenges

The main challenge following IR training/workshops is the availability of funding opportunities or resources to allow learners to apply the acquired knowledge and skills. To this end, TDR is piloting a small grants approach for IR demonstration projects. This approach was initiated in Ghana, Indonesia and Malawi in 2021.

Contributions towards TDR key performance indicators

Partnerships and collaborations

ADP partners, UNDP and PATH, are part of the project implementation team at country level in addition to their specific roles in the Access and Delivery Partnership package. The UNDP country focal points provide both on- and off-line support to research and training teams.

Estimated leverage created by these projects

Both collaborators have made in-kind contributions of their expertise and time during the concept development phase and are involved in the project implementation activities, including liaison and advocacy with in-country stakeholders.

Gender aspects and vulnerable populations

No gender specific aspects were addressed in the submitted proposals. However, it is anticipated that some participants could identify vulnerable populations as part of their stakeholders in the IR demonstration projects. In these cases, such vulnerable populations will not receive any direct immediate benefit from the projects. Any future benefits will be realized once the research findings have been incorporated into the health system.

Training

The blended training workshops do not include advanced degrees registration for participants. At the end of the workshop, participants should understand the main characteristics of IR and have gained some knowledge and skills which they can apply in the context of the IR demonstration projects.

Strengthened institutions or networks

The blended virtual workshops focused on strengthening the IR knowledge and skills of individual researchers. It also provided an opportunity for the establishment of networks among participants and facilitators through the ADP community platform. The advancement of LoIs to draft IR proposals and selection of demonstration projects indicates some level of enhanced understanding and application of IR principles.

Publications

None in 2021. However, funding of the demonstration projects will lead to the publication of research findings emanating from the comprehensive training and mentorship package.

Plans for 2022–2023

The priorities for 2022–2023 will be to expand the digital enhancement of the ADP community platform, including the new ADP focus countries and completion of the incorporation of the bilingual module on gender and intersectionality in the online IR Toolkit. This will be done in collaboration with other TDR units and external partners. On completion of this update, including translation into French, new reprints and USB versions of the Toolkit will be produced.

The other priority, depending on the budget allocated to ADP, will be the expansion of IR demonstration project grants available to training participants.

ER 1.1.7 Structured Operational Research and Training Initiative (SORT IT) (in collaboration with the Research for Implementation unit)

The Structured Operational Research and Training Initiative (SORT IT) is a global partnership-based initiative coordinated by TDR. SORT IT aims to support countries and programmes to conduct operational research (OR) around their own priorities, build sustainable OR capacity, and make evidence-informed decisions for improving public health performance. As a TDR-led initiative, SORT IT aims to deliver output and outcome-orientated, policy-relevant OR and capacity-building embedded within the public health programmes in LMICs, while enhancing the availability and utilization of high-quality, timely and disaggregated data for informed decision-making. This area of capacity strengthening ensures effective service delivery and access to health interventions, while leaving no one behind.

Highlights of progress in 2021

- The e-SORT IT virtual platform piloted during a blended module 3 course on NTDs in Nairobi, Kenya.
- The planned pilot for module 3 course on NTDs in Addis Ababa, Ethiopia, end of September 2021 was not undertaken due to limitations of hosting simultaneous courses. This course, organized as a blended format, was led by ITM (SORT IT partners) who were able to travel.

Progress in 2021

Module 3 face-to-face SORT IT workshop on NTDs and snakebite rescheduled for Q1 2021 was postponed again. However, this course was held as a blended format from 4–11 June 2021.

In June 2021, the TDR feature stories series highlighted the role of operational research in improving women's health. Despite being a specialist obstetrician and gynecologist at the University of Nairobi, Kenya, since 2013, Dr Kosgei started her research career as a SORT IT trainee in 2009. She is currently a senior SORT IT mentor and leads a national SORT IT team that has to date successfully conducted three national courses (including the ongoing NTD course). Following on this feature story, Dr Kosgei was invited to deliver a technical brief during the 44th session of the TDR Joint Coordinating Board in June 2021.

Remaining challenges

The current main challenge is finding a balance for blended delivery of SORT IT courses in the ever-changing COVID-19 pandemic setting. The blended format has been piloted in several settings, covering the complete course package (modules 1–4). The platform will be updated continuously to address any emerging obstacles to improve its utility. This will ensure that the quote by Dr Kosgei "SORT IT helped me to structure the research logically, in a way that was relevant to this particular setting", becomes true for many more researchers in LMICs.

Contributions towards TDR key performance indicators

Partnerships and collaborations

The SORT IT activities outlined above continued to partner with country based and international collaborators, including NTD control programmes, national SORT IT alumni, public health associations and academia.

Estimated leverage created by this project

These activities received expert facilitation by national, and where necessary regional, SORT IT alumni. National partners provided local hosting arrangements as their contribution. The delayed course on NTDs and snakebite (held in a blended format) in Ethiopia was co-funded (US$ 30 000) by The Institute of Tropical Medicine, Antwerp, Belgium.

Gender aspects and vulnerable populations

No gender specific aspects were addressed by these projects. The NTD research projects involved diseases associated with vulnerable populations living in hard-to-reach areas, who did not receive a direct immediate benefit from the course, but are likely to when the research findings are incorporated into effective interventions (practice and policy briefs), the subject matter for module 4.

Training

The current activities do not include advanced degrees registration for participants. At the end of the module 3 training in Kenya, all participants had grasped the basic skills of scientific writing with the development of manuscripts currently in preparation for submission to peer-reviewed journal. The development and publication of the feature stories series on the role of SORT IT in shaping research careers provided the global audience with the opportunity to appreciate the value and scope of operational research.

Strengthened institutions or networks

Local partners, the Ethiopian Public Health Institute (EPHI), the University of Gondar, Ethiopia, and Moi Teaching and Referral Hospital, Eldoret, Kenya, have strengthened their capacity to organize workshops with national, regional and international participants and facilitators. They have also enhanced their financial management and reporting capability.

Publications

None so far, although it is anticipated that publications and the corresponding practice and policy briefs resulting from these research training workshops will be published in 2022.

Related news

SORT IT operational research and training (who.int)

https://tdr.who.int/newsroom/feature-stories/item/rose-kosgei

Activities funded by the TDR Strategic Development Fund

Integrating SORT IT programmes into Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) grants in selected countries

Following submission of the four country reports on the incorporation of SORT IT in Global Fund applications and National Strategic Plans from Ethiopia, Guinea, Kenya and Zimbabwe, two countries (Ethiopia and Guinea) have undertaken national stakeholder meetings to validate the report and discuss the way forward.

In addition to providing the basis for country-based discussion on the scope and funding opportunities for operational research, the country reports will be used as case studies to inform on the ongoing revision of the Framework for OR/IR in Health and Disease Control Programmes. This revision activity was led by James Cook University, Australia, and is awaiting the conclusion of a co-publishing agreement between WHO and the Global Fund.

In Zimbabwe, technical support provided by TDR resulted in the successful incorporation and approval of a 4 module SORT IT course in the 2021–2023 Global Fund application budgeted for US$ 125 000.

Budget and financial implementation

Table 8. Approved Programme Budget 2020–2021 and funds utilized

Expected result	Research Capacity Strengthening	$40m scenario			Revised planned costs (September 2021)			Implementation at 31 December 2021			Implementation rate*		
		UD	DF	Total	UD	DF	Total	UD	DF	Total	UD	DF	Total
2.1.1.1	TDR support to regional training centres	1050 000	200 000	1250 000	1465 000	240 000	1705 000	1425 391	87 734	1513 125	97%	37%	89%
2.1.2	Targeted research training grants (MSc, PhD)	3 050 000	500 000	3 550 000	3 550 000	403 000	3 953 000	3 320 427	362 801	3 683 227	94%	90%	93%
2.1.4	Career development fellowship grants		2 400 000	2 400 000	300 000	2 400 000	2 700 000	19 210	2 187 317	2 206 527	6%	91%	82%
2.1.6	Structured capacity building in IR (ADP Initiative)		1000 000	1000 000	0	426 000	426 000	0	434 233	434 233		102%	102%
	Delays from prior biennium				300 000		300 000	292 561		292 561	98%		98%
	Total	**4 100 000**	**4 100 000**	**8 200 000**	**5 615 000**	**3 469 000**	**9 084 000**	**5 057 589**	**3 072 084**	**8 129 673**	**90%**	**89%**	**89%**

* **Implementation against revised planned costs**

Table 9. Proposed Programme Budget 2022–2023

Expected result	Research Capacity Strengthening (RCS)	2022-2023					
		$40m scenario			$50m scenario		
		UD	DF	Total	UD	DF	Total
2.1.1.1	TDR support to regional training centres	1 050 000	200 000	1 250 000	1 200 000	200 000	1 400 000
2.1.2	Targeted research training grants (MSc, PhD)	3 050 000	500 000	3 550 000	6 000 000	700 000	6 700 000
2.1.4	Career development fellowship grants	0	1 500 000	1 500 000	0	1 500 000	1 500 000
2.1.6	Structured capacity building in IR (ADP Initiative)	0	500 000	500 000	0	500 000	500 000
2.1.7 (new)	Strengthening OR capacity in Global Fund programmes	50 000	50 000	100 000	200 000	200 000	400 000
				0			0
	Total	**4 150 000**	**2 750 000**	**6 900 000**	**7 400 000**	**3 100 000**	**10 500 000**

Projects and activities funded

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
A90399	Khytkul Sarymsakova	Regional Training Centre in Health Research	TSA with Regional Training Centre in Astana, The Astana Medical University, Astana, Kazakhstan	80 000	Kazakhstan
A90402	Nancy Saravia	CIDEIM	TSA with the Regional Training Centre, The Centro Internacional de Entrenamiento e Investigaciones Medicas (CIDEIM), Cali (Colombia)	79 978	Colombia
A90403	Yodi Mahendradhata	Pusat Kedokteran Tropis Fakultas Kedokteran Kesehatan Masyarakat Dan Keperawatan Ugm	Regional Training Centre for Health Research: Contribution towards evidence-based disease control policy and practice in South-East Asia by improving the quality of research for disease	80 000	Indonesia
B40101	Phyllis Dako-Gyeke	University of Ghana	Health Research Regional Training Centre in the WHO African Region	47 800	Ghana
B40189	Hu_Profmohamed Samir Boubaker	Institut Pasteur de Tunis	A Regional Training Centre for research on infectious diseases of poverty with a focus on intervention and implementation research the WHO Eastern-Mediterranean Region	44 000	Tunisia
B80281	Claudia Isabel Marques de Abreu Lopes	United Nations University (UNU)	Scaling up the data mining exercise on the final assignments of the MOOC on implementation research on infectious diseases of poverty.	24 840	Malaysia
P20-00095	Norma Meldon	Lexical Ventures Pty Ltd	GES to cover MOOC interview sessions done by Dr Bella Ross at the Monash University.	248	Australia
P20-00151	Manager / Translatortiran Zhang	Tjww Languages Llc	This GES is to cover the cost of review of the MOOC videos translated in Chinese.	3 300	United States
P21-00158	Maria Echavarria	CIDEIM	This APW with CIDEIM aims to adapt the current EPPE skill-building Course to a blended-learning format.	22 612	Colombia
P21-00169	Maria Hoole	Because Stories	The objectives of this APW are to develop simple to follow, attractive training courses (a module of the pre-existing TDR MOOC on Implementation research) that will be useful for field implementation and used as regular tools for delivering	47 241	South Africa
P21-00172	Adama Faye	Institut of Health And Development (ISED)	This TSA is to cover the activities of the University Cheikh Anta Diop, Dakar to serve as a sub-Regional Training Centre (RTC) for French speaking countries in Wes Africa.	80 859	Senegal

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P21-00179	Hanan Shatat	Shatat,Doctor Hanan Zakaria**Trl136748	This GES is to cover the cost of review of the subtitles of the TDR MOOC on Implementation Research videos translated in Arabic.	2 400	Egypt
P21-00185	Hind Bouguerra	Bouguerra,Ms Hind **Trl144280	This GES is to cover the cost of managing the MOOC forum discussion at the recently selected sub-Regional Training Centre, ISED, University Cheikh Anta Diop, Dakar, Senegal.	1 000	Tunisia
P21-00187	Wafa Kammoun	Kammoun, Ms Wafa Rebai	This GES is to cover the cost of managing the MOOC forum discussion at the recently selected sub-Regional Training Centre, ISED, University Cheikh Anta Diop, Dakar, Senegal.	1 000	Tunisia
P21-00193	Michael J. Penkunas	United Nations University (UNU)	To develop the contents of two examples of successful IR projects related to NTDs from the WHO-Western pacific Region (WHO-WPR) to be included in the TDR MOOC on IR with focus on Infectious Diseases of Poverty.	24 067	Malaysia
P21-00195	Michael J. Penkunas	United Nations University (UNU)	Develop a mini MOOC on implementation research for health programme implementors in LIMICs.	24 067	Malaysia
P21-00205	Elvin H. Geng	Washington University	To develop training materials to help national and regional public health implementers in implementing COVID-19 vaccination.	69 939	United States
P21-00230	Phyllis Dako-Gyeke	University of Ghana	The purpose of this APW is to develop training materials to help national and regional public health implementers on implementing COVID-19 vaccination by synthetizing the key strategies to involve communities.	29 700	Ghana
P21-00241	James Logan	Chariot Innovations Ltd	Maintenance and further development of the Global Atlas of Medical Entomology Schooling (GAMES) on the Global Vector Hub, developed through a TDR activity.	10 384	United Kingdom
P21-00274	Michael James Penkunas	United Nations University (UNU)	Non Grant LOA raised for the development of personas and journeys to showcase TDR strategy on implementation research training.	23 936	Malaysia
P21-00282	Missanne-Marie Mcmanus	Biomed Central Ltd	Publication fees of an article entitled “Implementation research training for learners in low- and middle-income countries: evaluating behaviour change after participating in massive open online course“ in PLOS	2 809	United Kingdom

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P21-00286	Patricia Henley	Henley, Patricia Colleen	APW is to review the online GHRP training course for the content, engagement of participants and readability, by providing constructive feedback, including amendments and additions in the contents.	6 000	United Kingdom
P21-00287	Lara Gautier	Gautier, Lara	To cover the cost of a review of qualitative method module of the TDR implementation research MOOC.	1 600	Canada
P21-00310	A. Krentel	Krentel, Alison	To review the online implementation research(IR) training course developed by the RTC supported by TDR in WHO-SEAR, the Gadjah Mada University, Yojyakarta, Indonesia.	4 600	Canada
P21-00317	Kristen Cloots	Institute of Tropical Medicine	APW to cover the support for the development and review contents of one video case examples of successful Implementation Research (IR) projects related to Visceral Leishmaniasis (VL) in Nepal.	3 150	Belgium
P21-00318	Esmael Ali Habtamu	Ali, Esmael Habatmu**Trl202579	This APW is to develop contents of one video case examples of successful Implementation Research (IR) projects related to trachoma in Ethiopia to be included in the TDR MOOC on Implementation Research (IR)	16 950	United Kingdom
P21-00322	Surendra Uranw	Uranw, Surendra Kumar	To develop the contents of one successful IR project related to Visceral Leishmaniasis.	10 350	Nepal
P21-00323	Edith Certain	Certain, Edith**S014637	To assist in all the activities necessary for the successful management of the TDR MOOC on Implementation Research (IR).	41 160	France
P21-00393	Majumdar	Majumdar, Debashree	GES to cover the cost of editing "Developing an evidence-led essential research skills training curriculum".	1 750	Switzerland
P21-00400	Maria Echavarria	CIDEIM	This APW with CIDEIM to produce the final version of a module of the TDR MOOC on Implementation Research (IR) with examples from Latin America, including presentations and illustrations such as videos, pictures and animations.	16 530	Colombia
P21-00419	Wafa Kammoun	Kammoun, Wafa Rebai	GES for the support to setting up the session of the TDR MOOC on IR in Arabic on the edX platform.	1 000	Tunisia
P21-00420	Bouguerra	Bouguerra, Hind **Trl144280	GES for reviewing the quality of the content of the TDR MOOC on IR session in Arabic.	1 000	Tunisia

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P21-00420	Bouguerra	Bouguerra, Hind **Trl144280	GES for reviewing the quality of the content of the TDR MOOC on IR session in Arabic.	6 000	Tunisia
P21-00426	Nwameme	Nwameme, Adanna	APW raised for the management of TDR MOOC on IR sessions in English, French and Arabic and assistance for the external review, as detailed in the TORs.	7 200	Ghana
P21-00427	Hikabasa Halwindi	Halwiindi, Hikabasa **Trl137292	This APW is for the review of the online training course on principles on implementation research (PIR).	6 000	Zambia
P21-00434	M. Penkunas	Penkunas, Michael James	This APW is raised for the follow up on the development of the new training modules to be added to the TDR MOOC on IR.	13 200	United States
P21-00452	Aurelia Souares	University of Heidelberg - Department of Tropical Hygiene And Public Health	This APW is for developing a module for the TDR massive open online course (MOOC) on implementation research on mixed research methods.	24 860	Germany
P21-00472	A. Krentel	Krentel, Alison	To develop and deliver a training programme for facilitators of future IR workshops on IR, using the TDR toolkit.	5 000	Canada
P21-00473	Sanou	Issa Sanou	This APW is for the facilitation of a French virtual workshop for the implementation research (IR) toolkit.	2 500	Burkina Faso
P21-00476	Majumdar	Majumdar, Debashree	GES to cover the cost of editing "IR training report: a global scan" and "Research framework 2.0: making the whole greater than the parts".	700	Switzerland
P21-00482	Elaine Fletcher	Global Policy Reporting Association	This PR is raised for the development of seven feature stories on the TDR-supported Regional Training Center programme.	16 066	Switzerland
P21-00484	Annechien Helsdingen	Swiss Mooc Service Association	This N-GLOA is to cover the hosting of the TDR Massive Open Online course (MOOC) on implementation research on infectious diseases.	27 322	Switzerland
P21-00489	J. Alger	Alger, Jackeline **Trl31035	This PR is raised for the development of a coordination process plan for the TDR supported Regional Training Centres (RTCs) Networks.	8 500	Honduras
P21-00526	Uche Veronica O Amazigo	Amazigo, Uche Veronica O.	Video recording of Module 6 of the MOOC on IR on Social Innovation in Health (SIHi).	5 200	Nigeria
B80035	Alonge Olakunle	Johns Hopkins University	Developing online content for addressing competency gaps in IR training programs.	78 416	United States

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P20-00013	Malabika Sarker	Brac University	LoA 5 - Agreement with the BRAC University to manage TDR-supported Postgraduate Training Scheme	362 483	Bangladesh
P21-00161	Adama Faye	Institut of Health And Development	Agreement with the Institut de Santé et Développpement (ISED), Université Cheikh Anta Diop, to manage TDR-supported Postgraduate Training Scheme	401 000	Senegal
P21-00222	Charles Michelo	University of Zambia	LoA 4 - Agreement with University of Zambia to manage TDR-supported Postgraduate Training Scheme	454 250	Zambia
P21-00223	Latifat D. G. Ibisomi	University of the Witwatersrand Faculty of Health Sciences	LoA 3 - Agreement with the University of the Witwatersrand to manage TDR-supported Postgraduate Training Scheme	474 578	South Africa
P21-00475	Elaine Fletcher	Global Policy Reporting Association	Supported Series – TDR Postgraduate Training Scheme.	15 038	Switzerland
P21-00510	Ahmad Watsiq Maula	Maula, Ahmad Watsiq	Data management and statistical analysis of data from TDR Research Capacity Strengthening activities including 1) M&E of postgraduate Training Scheme, 2) Survey of TDR former grantees.	2 500	Indonesia
B80094	F. Nikiema	Nikiema, Wendlamita Frederic	Fellowship to cover re-entry grant Dr Frederic Nikiema (ID:B80094), Clinical Research and Development Fellow, who was placed at GSK-Biologicals, Belgium	24 985	Burkina Faso
B80124	Sauan Singh	Singh, Sauman	This fellowship is raised to cover re-entry grant for Clinical Research and Development Fellow Dr Sauman Singh (B80124), from India who was placed at IDDO, UK	24 475	India
B80232	Kalabamu Salvatory	Kalabamu, Florence Salvatory	Fellowship to cover excess luggage for Clinical Research and Development Fellow Dr Florence Salvatory KALABAMU (TDRID: B80232) who was placed at GSK-Wavre	325	Tanzania, United Republic of
B80232	Kalabamu Salvatory	Kalabamu, Florence Salvatory	Fellowship to cover re-entry grant for Clinical Research and Development Fellow Dr Florence Salvatory KALABAMU (TDRID: B80232) who was placed at GSK-Wavre	21 550	Tanzania, United Republic of
B80233	Richard Kajubi	Kajubi, Richard	This fellowship is raised to cover additional stipend as per extension plus insurance premiums for CRDF Dr Richard Kajubi (TDR ID: B80233) who is based at GSK-Biologicals in Wavre, Belgium.	6 573	Uganda

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
B80233	Richard Kajubi	Kajubi, Richard	This fellowship is raised to cover conference package and miscellaneous expenses for CRDF Dr Richard Kajubi (TDR ID: B80233) who was based at GSK-Biologicals in Wavre, Belgium.	3 546	Uganda
B80233	Richard Kajubi	Kajubi, Richard	This fellowship is raised to cover excess luggage for Clinical Research and Development Fellow Dr Richard Kajubi (TDR ID: B80233) who is based at GSK-Biologicals in Wavre, Belgium.	123	Uganda
B80233	Richard Kajubi	Kajubi, Richard	This fellowship is raised to cover re-entry grant for CRDF Dr Richard Kajubi (TDR ID: B80233) who was based at GSK-Biologicals in Wavre, Belgium.	22 000	Uganda
B80237	Marie Aimee Unyuzimana	Unyuzimana, Marie Aimee	This fellowship is raised to cover additional stipend plus miscellaneous expenses for Dr Marie Aimee Unyuzimana who is placed at GSK-Biologicals in Wavre, Belgium	6 613	Rwanda
B80237	Marie Aimee Unyuzimana	Unyuzimana, Marie Aimee	This fellowship is raised to cover re-entry grant for Dr Marie Aimee Unyuzimana who is placed at GSK-Biologicals in Wavre, Belgium	21 830	Rwanda
B80259	Kwame Oneill	Oneill, Kwame **Trl156120	Fellowship to cover additional stipend for Clinical Research and Development Fellow Dr Kwame ONEILL (B80259) from Sierra Leone who is placed at IDDO, Oxford, UK	16 000	Sierra Leone
B80259	Kwame Oneill	Oneill, Kwame **Trl156120	Fellowship to cover miscellaneous expenses for Clinical Research and Development Fellow Dr Kwame ONEILL (B80259) from Sierra Leone who is placed at IDDO, Oxford, UK	1 447	Sierra Leone
B80259	Kwame Oneill	Oneill, Kwame **Trl156120	Fellowship to cover re-entry grant for Clinical Research and Development Fellow Dr Kwame ONEILL (B80259) from Sierra Leone who was placed at IDDO, Oxford, UK.	22 097	Sierra Leone
B80263	Jyotshna Sapkota	Sapkota, Jyotshna	Fellowship raised to cover ire-entry plan for Clinical Research and Development Fellow Dr Joytshna SAPKOTA (TDR ID: B802683) who was placed at FIND, Geneva, Switzerland	14 977	Nepal
B80266	Yves Lula Ntamba	Lula, Yves Ntamba**Trl100788	Fellowship to cover excess luggage and miscellaneous expenses for Clinical Research and Development Fellow Dr Yves LULA NTAMBA (B80266) from DRC who was placed at SWISSTPH, Switzerland	382	Congo, The Democratic Republic of the

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
B80266	Yves Lula Ntamba	Lula, Yves Ntamba**Trl100788	Fellowship to cover insurance premiums for Clinical Research and Development Fellow Dr Yves LULA NTAMBA (B80266) from DRC who is placed at SWISSTPH, Switzerland	2 969	Congo, The Democratic Republic of the
B80266	Yves Lula Ntamba	Lula, Yves Ntamba**Trl100788	Fellowship to cover re-entry grant for Clinical Research and Development Fellow Dr Yves LULA NTAMBA (B80266) from DRC who was placed at SWISSTPH, Switzerland	13 915	Congo, The Democratic Republic of the
B80268	Mulualem Jano	Jano, Mulualem Tadesse	Fellowship raised to cover conference package for Clinical Research and Development Fellow Dr Mulualem Tadesse JANO (TDR ID: B80268) who was placed at FIND, Geneva, Switzerland	3 000	Ethiopia
B80268	Mulualem Jano	Jano, Mulualem Tadesse	Fellowship raised to cover re-entry grant for Clinical Research and Development Fellow Dr Mulualem Tadesse JANO (TDR ID: B80268) who was placed at FIND, Geneva, Switzerland	21 158	Ethiopia
B80268	Michelle Buckingham	Foundation for Innovative New Diagnostics (FIND)	Fellowship raised to cover travel expenses for Clinical Research and Development Fellow, Dr Mulualem JANO (TDR ID: 80268), who was based at FIND, Geneva.	30	Switzerland
B80271	Modibo Diarra	Diarra, Modibo **Trl152252	Fellowship to cover re-entry grant for Clinical Research and Development Fellow Dr Modibo Diarra (B80271 from Mali who was placed at Institut Pasteur of Madagascar, Antananarivo, Madagascar.	22 919	Mali
B80273	Amadou Jallow	Jallow, Amadou Woury	Fellowship raised to cover partial payment of re-entry grant for Clinical Research and Development Fellow Mr Amadou Woury Jallow (TDRID: B80313) who is currently placed at IDDO, UK	13 831	Gambia
B80275	Robert Adamu Shey	Shey, Robert Adamu	Fellowship raised to cover re-entry grant for Clinical Research and Development Fellow Dr Robert SHEY (B80275), From Cameroon who was placed at EVI, Heidelberg, Germany.	24 998	Cameroon
B80276	Tsige Ketema Mamo	Mamo, Tsige Ketema	Fellowship raised to cover re-entry grant for Clinical Research and Development Fellow, Dr Tsige Ketema MAMO, from Ethiopia, (TDR ID: B80276) who was placed at ISGlobal, Barcelona, Spain,	22 000	Ethiopia
B80277	Moses Ngari	Ngari, Moses Mukaba	Fellowship to cover re-entry grant for Clinical Research and Development Fellow Dr Moses K. NGARI (B80277) from Kenya who was placed at LIH, Luxembourg.	22 000	Kenya

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
B80279	Nobile Franco	Nobile Franco, Marcelo	Fellowship to cover miscellaneous expenses (excess luggage) for Clinical Research and Development Fellow Mr Nobile Franco Marchelo who was placed at GSK-Wavre	332	Brazil
B80279	Nobile Franco	Nobile Franco, Marcelo	Fellowship to cover re-entry grant for Clinical Research and Development Fellow Mr Nobile Franco Marchelo who was placed at GSK-Wavre	22 000	Brazil
B80324	Mohammed A. Rashid	Rashid, Mohammed Ally	This fellowship is raised to cover re-entry grant for Clinical Research and Development Fellow Dr Mohammed Ally Rashid (B80324), from Tanzania who was placed at LIH, Luxembourg	22 000	Tanzania, United Republic of
P20-00074	Holley Russel	Artifex Creative Webnet Ltd - Acw	This GES is to cover the development of an advocacy material for the TDR Clinical Research and Development Fellowship programme.	4 829	United Kingdom
P20-00077	Carrer Dolores	Carrer, Dolores Catalina	This fellowship is to cover on month stipend for Clinical Research and Development Fellow Dr Dolores Carrer (TDR ID: P20-00077), from Córdoba, Argentina who is placed at FIOCRUZ, Brazil.	4 000	Argentina
P20-00077	Carrer Dolores	Carrer, Dolores Catalina	This fellowship is to cover stipend travel rate for Clinical Research and Development Fellow Dr Dolores Carrer (TDR ID: P20-00077), from Córdoba, Argentina who is placed at FIOCRUZ, Brazil.	5 000	Argentina
P20-00077	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance complementary coverage for Clinical Research and Development Fellow Dr Dolores Carrer from Argentina (TDRID: P20-00077) who is placed at FIOCRUZ, Rio de Janeiro, Brazil	953	Belgium
P20-00082	Hiwot A. Hailemariam	Hailemariam, Hiwot Amare	Fellowship raised to cover conference package for Clinical Research and Development Fellow Dr Hiwot Amare HAILEMARIAM, from Ethiopia (TDRID: P20-00082) who is placed at GSK-Biologicals, Belgium.	3 183	Ethiopia
P20-00082	Hiwot A. Hailemariam	Hailemariam, Hiwot Amare	Fellowship raised to cover full stipend for Clinical Research and Development Fellow Dr Hiwot Amare HAILEMARIAM, from Ethiopia (TDRID: P20-00082) who is placed at GSK-Biologicals, Belgium.	40 900	Ethiopia

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P20-00082	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance complementary coverage for Clinical Research and Development Fellow Dr Hiwot Amare HAILEMARIAM, from Ethiopia (TDRID: P20-00082) who is placed at GSK-Biologicals, Belgium.	1 012	Belgium
P20-00083	Anna Jammeh	Jammeh, Anna H.	Fellowship raised to cover conference package for Clinical Research and Development Fellow Dr Anna JAMMEH (TDRID: P20-00083) who is placed at GSK-Biologicals, Wavre, Belgium.	3 120	Gambia
P20-00083	Anna Jammeh	Jammeh, Anna H.	Fellowship raised to cover stipend travel rate for Clinical Research and Development Fellow, Dr Anna H. Jammeh, (TDR ID: P20-00083), who will be placed at GSK-Biologicals, Wavre, Belgium	4 200	Gambia
P20-00083	Anna Jammeh	Jammeh, Anna H.	Fellowship raised to cover yearly stipend for Clinical Research and Development Fellow Dr Anna JAMMEH (TDRID: P20-00083) who is placed at GSK-Biologicals, Wavre, Belgium.	36 700	Gambia
P20-00083	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance coverage for Clinical Research and Development Fellow, Dr Anna Jammeh, from the Gambia (TDR ID: P20-00087), who is now placed at GSK-Biologicals, Wavre, Belgium.	1 083	Belgium
P20-00084	Alebachew	Kebede, Alebachew Messele	Fellowship is raised to cover part of the stipend for Clinical Research and Development Fellow Dr Alebachew Messele KEBEDE, from Ethiopia (ID: P20-00084), who is placed at IDDO, Darwin, Australia.	26 500	Ethiopia
P20-00085	Ngwewondo	Ngwewondo, Adela	Fellowship raised to cover subsidy for accommodation for Clinical Research and Development Fellow Dr Adela NGWEWONDO (TDR ID: P20-00085) who is placed at DNDI, Geneva, Switzerland	1 311	Cameroon
P20-00085	Ngwewondo	Ngwewondo, Adela	Fellowship raised to cover yearly stipend for Clinical Research and Development Fellow Dr Adela NGWEWONDO (TDR ID: P20-00085) who is placed at DNDI, Geneva, Switzerland	47 317	Cameroon
P20-00085	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance coverage for Clinical Research and Development Fellow, Dr Adela NGWEWONDO, from Cameroon (TDR ID: P20-00085), who is now placed at DNDI, Geneva, Switzerland.	934	Belgium

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P20-00086	Masauso Phiri	Phiri, Masauso Moses	Fellowship raised to cover stipend travel rate for Clinical Research and Development Fellow Dr Masauso Phiri from Zambia (TDRID: P20-00086) who will be placed at EVI, Heidelberg, Germany.	5 000	Zambia
P20-00086	Masauso Phiri	Phiri, Masauso Moses	Fellowship raised to cover yearly stipend for Clinical Research and Development Fellow Dr Masauso Phiri from Zambia (TDRID: P20-00086) who is now placed at EVI, Heidelberg, Germany.	45 500	Zambia
P20-00086	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance coverage for Clinical Research and Development Fellow, Dr Masauso PHIRI, from Zambia (TDR ID: P20-00086), who is now placed at EVI, Heidelberg, Germany.	1 007	Belgium
P20-00087	Antsa	Rakotondrandriana Antsa, Nomenjanahary	Fellowship raised to cover remaining stipend for Clinical Research and Development Fellow, Dr N. Rakotondrandriana Antsa (TDR ID: P20-00087), who is placed at LIH, Luxembourg.	45 500	Madagascar
P20-00087	Antsa	Rakotondrandriana Antsa, Nomenjanahary	Fellowship raised to cover stipend travel rate for Clinical Research and Development Fellow, Dr N. Rakotondrandriana Antsa (TDR ID: P20-00087), who will be placed at LIH, Luxembourg.	5 000	Madagascar
P20-00087	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance coverage for Clinical Research and Development Fellow, Dr N. Rakotondrandriana Antsa (TDR ID: P20-00087), who is now placed at LIH, Luxembourg.	910	Belgium
P20-00087	Sarah Gninkoun	Welcome Service Sarl	To cover first month lease and services of the Welcome Services towards the placement of Dr Adela Ngwewondo from Cameroon who will be placed at DNDi, Geneva Switzerland (TDR ID: P20-00087)	5 086	Switzerland
P20-00088	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance complementary coverage for Clinical Research and Development Fellow Ms Parveen Abdulgani SHAIKH from India (TDRID: P20-00088) who is placed at IVI, Seoul, Korea.	1 192	Belgium
P20-00088	Parveen Shaikh	Shaikh, Parveen Abdulgani	Fellowship raised to cover conference package for Clinical Research and Development Fellow Ms Parveen A.SHAIKH from India (TDRID: P20-00088) who is placed at IVI, Seoul, Korea.	3 661	India

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P20-00088	Parveen Shaikh	Shaikh, Parveen Abdulgani	Fellowship raised to cover full stipend for Clinical Research and Development Fellow Ms Parveen A.SHAIKH from India (TDRID: P20-00088) who is placed at IVI, Seoul, Korea.	50 500	India
P20-00089	Rediet Fikru Gebresenbet	Rediet Fikru Gebresenbet	Fellowship raised to cover insurance coverage (Dec_21_Feb_2022) for Clinical Research and Development Fellow, Dr Rediet Fikru GEBRESENBET (TDR ID: P20-00089), who is placed at SWISS TPH, Basel, Switzerland.	545	Ethiopia
P20-00089	Rediet Fikru Gebresenbet	Rediet Fikru Gebresenbet	Fellowship raised to cover insurance coverage for Clinical Research and Development Fellow, Dr Rediet Fikru GEBRESENBET (TDR ID: P20-00089), who is placed at SWISS TPH, Basel, Switzerland.	663	Ethiopia
P20-00089	Rediet Fikru Gebresenbet	Rediet Fikru Gebresenbet	Fellowship raised to cover remaining stipend for Clinical Research and Development Fellow, Dr Rediet Fikru GEBRESENBET (TDR ID: P20-00089), who is placed at SWISS TPH, Basel, Switzerland.	50 500	Ethiopia
P20-00090	Amanda Wanyana	Wanyana, Amanda	Fellowship raised to cover remaining stipend for Clinical Research and Development Fellow Dr Amanda Wanyana from Uganda (TDRID: P20-00090) who is placed at EVI, Heidelberg, Germany.	45 500	Uganda
P20-00090	Amanda Wanyana	Wanyana, Amanda	Fellowship raised to cover stipend travel rate for Clinical Research and Development Fellow Dr Amanda Wanyana from Uganda (TDRID: P20-00090) who will be placed at EVI, Heidelberg, Germany.	5 000	Uganda
P20-00090	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance coverage for Clinical Research and Development Fellow, Ms Amanda WANYANA, from Uganda (TDR ID: P20-00090), who is now placed at EVI, Heidelberg, Germany.	1 009	Belgium
P20-00117	Peter Asaga	Peter Asaga, Philomena Ehiagie	Fellowship raised to cover part of the re-entry plan for Clinical Research and Development Fellow Dr Philomena PETER ASAGA (TDR ID: B80274), who was placed at IVI, Seoul, Korea.	12 500	Nigeria
P21-00183	Nuria Casamitjana	Barcelona Institute for Global Health (Isglobal)	The purpose of this APW is for the ISGlobal, Barcelona, Spain, to adapt the online Monitory and Evaluation (M&E) toolkit for translation into French and Spanish.	14 518	Spain

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P21-00183	Nuria Casamitjana	Barcelona Institute for Global Health (Isglobal)	The purpose of this APW is to develop the M&E face to face training course developed by TDR, in collaboration with IS Global in Barcelona, Spain into a virtual one.	41 017	Spain
P21-00192	Daniel Yilma Bogale	Bogale,Daniel Yilma**Trl65519	Fellowship raised to cover re-entry grant for Clinical Research and Development Fellow Dr Daniel Yilma BOGALE (TDRID: B80268) who was placed at IDDO,/WWARN, South Africa and Australia	20 870	Ethiopia
P21-00192	Daniel Yilma Bogale	Bogale,Daniel Yilma**Trl65519	Fellowship raised to cover stipend not perceived during placement for Clinical Research and Development Fellow Dr Daniel Yilma BOGALE (TDRID: B80268) who was placed at IDDO,/WWARN, South Africa and Australia*	49 769	Ethiopia
P21-00213	Esteban Baus	Pontificia Universidad Catolica Del Ecuador	The development of contents of a successful IR project example related to NTDs from the WHO region for the Americas to be included in the TDR MOOC.	19 210	Ecuador
P21-00244	Moussa Sidibé	Sidibe, Moussa	This fellowship is to cover stipend travel rate for Clinical Research and Development Fellow Dr Moussa Sidibé (TDR ID: P21-00244), from Conakry, Guinea who will be placed at IVI, Korea.	5 000	Guinea
P21-00244	Moussa Sidibé	Sidibe, Moussa	This fellowship is to cover stipend travel rate for Clinical Research and Development Fellow Dr Moussa Sidibé (TDR ID: P21-00244), from Conakry, Guinea who will be placed at IVI, Korea.	21 500	Guinea
P21-00244	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover complementary insurance coverage for Clinical Research and Development Fellow Dr Moussa SIDIBE from Guinea (TDRID: P21-00244) who is placed at IVI, Seoul, Korea	969	Belgium
P21-00245	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover complementary insurance coverage for Clinical Research and Development Fellow Ms Nifarta P. ANDREW from Nigeria (TDRID: P21--00245) who is placed at FIOCRUZ, Rio de Janeiro, Brazil	988	Belgium

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P21-00245	Nifarta Andrew	Andrew, Nifarta Peingurta	Fellowship raised to cover remaining stipend for Clinical Research and Development Fellow Ms Nifarta P. Andrew from Nigeria (TDR-ID: P21-00245) who is placed in Luxembourg Institute of Health (LIH), Luxembourg.	45 500	Nigeria
P21-00245	Nifarta Andrew	Andrew, Nifarta Peingurta	Fellowship raised to cover stipend travel rate for Clinical Research and Development Fellow Ms Nifarta P. Andrew from Nigeria (TDR-ID: P21-00245) who will be placed in Luxembourg Institute of Health (LIH), Luxembourg.	5 000	Nigeria
P21-00269	Nuria Casamitjana	Barcelona Institute for Global Health (Isglobal)	Fellowship to cover additional training fees for Clinical Research and Development Fellow Mr Pio Mauricio VITORINO (P21-00269) from Mozambique.	5 903	Spain
P21-00269	Pio Mauricio Vitorino	Vitorino, Pio Maurício	Fellowship to cover first 6 month stipend for Clinical Research and Development Fellow Mr Pio Mauricio VITORINO (P21-00269) from Mozambique.	21 500	Mozambique
P21-00269	Pio Mauricio Vitorino	Vitorino, Pio Maurício	Fellowship to cover remaining 6 month stipend for Clinical Research and Development Fellow Mr Pio Mauricio VITORINO (P21-00269) from Mozambique.	24 000	Mozambique
P21-00269	Pio Mauricio Vitorino	Vitorino, Pio Maurício	Fellowship to cover stipend travel rate for Clinical Research and Development Fellow Mr Pio Mauricio VITORINO (P21-00269) from Mozambique.	5 000	Mozambique
P21-00269	Alain Van Noten	Cigna International Health Services Bvba	Fellowship raised to cover insurance complementary coverage for Clinical Research and Development Fellow Mr Pio M. VITORINO from Mozambique (TDRID: P21-00269) who is placed at ISGlobal, Spain.	1 007	Belgium
P21-00182	Ratchanekorn Wutirat	Inis Communication Ltd	Updating TDR Implementation Research Tool Kit: Design and hosting of Gender module on the ADP website	19 970	United Kingdom
P21-00182	Ratchanekorn Wutirat	Inis Communication Ltd	Updating TDR Implementation Research Tool Kit: Design and hosting of Gender module on the ADP website - Revised online/offline site contents	2 030	United Kingdom
P21-00206	Valerie R. Louis	Louis, Valerie Renee	Translation of the new Gender Module for Implementation Research Toolkit (IRTK) to French	3 750	Germany

Project ID	Principal Investigator	Supplier Name (Institution)	Project title	Funding in US$	Countries involved
P21-00305	Paul Erasto Kazyoba	National Institute for Medical Research	Strengthening capacity of the NTDCP to adopt and implement the new WHO road map for NTD 2021-2030.	44 112	Tanzania, United Republic of
P21-00309	Dzinkambani Kambalame	National Health Sciences Research Committee	Letter of Agreement with the Research department of Ministry of Health Malawi for Comprehensive Implementation Research and Mentorship Training Project (UNDP ADP)	52 000	Malawi
P21-00324	Julius Fobil	School of Public Health Main Account	Comprehensive Implementation Research and Mentorship Training Project. Contract covers deliverables of 2021. New contract for the remaining amount of US$12,995.94 will be raised in due course.	51 984	Ghana
P21-00330	Ova Emalia	Pusat Kedokteran Tropis Fakultas Kedokteran Kesehatan Masyarakat Dan Keperawatan Ugm	Development of the Indonesian National NTD Roadmap 2021-2025. Contract covers deliverables of 2021. New contract for the remaining amount of US$8569 will be raised in due course.	34 276	Indonesia
P21-00391	Ratchanekorn Wutirat	Inis Communication Ltd	Updating TDR Implementation Research Toolkit: Development of Online learning Tools and Networking platform	24 615	United Kingdom
P21-00449	Dzinkambani Kambalame	National Health Sciences Research Committee	Strengthening capacity of the NTDCP to align and implement the new WHO NTDs roadmap (2021-2030).	43 944	Malawi
P21-00453	Ratchanekorn Wutirat	Inis Communication Ltd	Design, development and deployment of a digital version of IR Toolkit	57 772	United Kingdom

TDR funding in 2021

Core contributions	Amount (US$)
Sweden	4 804 002
Switzerland	1 925 255
United Kingdom of Great Britain and Northern Ireland	1 662 159
Germany	1 659 850
Luxembourg	1 331 719
Nigeria [1]	1 097 398
Belgium	675 676
Norway	349 365
China [2]	165 000
Spain	112 613
India	55 000
Japan	50 000
Thailand	49 751
Malaysia	25 000
Panama	14 000
Mexico	10 000
Miscellaneous	518
World Health Organization [3]	
Subtotal	**13 987 305**

Contributors providing project-specific funding	Amount (US$)
National Institute of Health Research (NIHR), United Kingdom	2 546 199
United Nations Development Programme (UNDP)	1 352 000
Sweden	1 190 970
Bill & Melinda Gates Foundation	1 133 360
United States Agency for International Development (USAID)	987 274
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) [4]	814 387
World Health Organization [5]	706 895
Luxembourg	404 030
Medicines Development for Global Health Limited (MDGH)	93 041
Robert Koch Institute (RKI)	58 048
Subtotal	**9 286 203**
Total contributions	**23 273 508**

1. *The contribution from the Government of Nigeria for the period 2015 to 2020 will be reported in the certified financial statement in 2022 due to the timing of its receipt in TDR.*
2. *The 2020 contribution from the Government of the People's Republic of China will be reported in the certified financial statement in 2021. The contribution for the year 2021 will be reported in 2022. This is a result of timing of receipt in TDR.*
3. *The 2020-2021 core contribution from WHO was received in full in 2020.*
4. *The 2021 designated contribution from GIZ includes funding from BMBF.*
5. *The 2021 designated contribution from WHO includes funding from UNPDF (the United Nations Peace and Development Trust Fund) for joint TDR/Global Malaria Programme activities.*

Scientific Working Group recommendations in 2020 (with RCS responses in italics)

Clinical Research and Development Fellowship scheme	**Continue to collect and analyse information about the impact of the training on fellows' career paths and on institutional capacity, making use of a range of opportunities including the alumni meetings.**	***To complete information on the impact of the CRDF scheme at individual, institutional and societal levels, TDR has been reviewing the publications output of the fellows pre- and post-grant in collaboration as a proxy of the impact of the fellowship on their career progress***
	Consider how to promote further the role of fellows in training colleagues in their home institutions.	*Each re-entry plan includes a training plan at institutional level.*
	Continue to promote retention of trainees in disease-endemic countries.	*The new phase of the CRDF scheme, the Clinical Research Leadership scheme (CRL) strengthened institutional capacity by maximizing the fellow's contribution on re-entry by including the support of a research project.*
	In developing the proposed clinical leadership scheme, consider how the re-entry grant could support a research project and thereby contribute to institutional capacity strengthening, and build on success in promoting gender equity in CRDF.	*Solutions identified to promote gender equity will be maintain in the CRL scheme and is one of four pillars.*
Regional Training Centres	Continue to develop plans with each RTC to develop and strengthen links with satellite institutions to help maximize the impact of the training courses.	*A process to develop partnership with satellite institution is included in the WP of each RTC. The five RTCs in AMR, AFR, EUR, SEAR already developed their own network. The RTCs in EMR, WPR and in French speaking countries are in the process of identifying potential partners.*
	Continue to promote the virtualization of courses aimed at increasing the numbers of people trained and adapting to the COVID-19 pandemic.	*Short training courses on good health practice (EPPE, GHRP) and IR (PIR) are currently developed as online ones.*
	Continue to consider issues of sustainability.	*A sustainability plan is included in the 2022–2023 WP of each RTC.*

MOOC and course on IR ethics	Support ongoing activities to evaluate the potential impact of the MOOC, e.g. the survey of participants to assess what they have learned and have put into practice in their research.	*A MOOC evaluation on the two first sessions in English has been developed using the Kirkpatrick's model and should be extended to all MOOC sessions since 2019, including those in Spanish and French.*
	Support ongoing efforts to ensure that the students at the universities in the Postgraduate Training Scheme access the MOOC as part of their Master's training.	*Specific MOOC sessions are organized for Students participating in the Master programme (WITS, university of Medellín, University of Ghana and Gadjah Mada University). MOOC in French will also be embedded in the postgraduate scheme for French-speaking countries early 2022.*
	Suggested consideration of a more advanced MOOC for researchers.	*New MOOC modules are under development.*
	Support ongoing efforts to develop an interactive online IR Ethics course, taking into account the challenges in making it virtual, and looked forward to seeing progress on this process in 2021.	*An interactive online IR course is developed and is now ready for dissemination and translation to French.*
Postgraduate Training Scheme	Continue to build on the effective and efficient management of the scheme, including the evaluation and the improvements in the process of reviewing the universities' progress reports (which involves iterations between each individual university and the secretariat prior to the SWG meeting).	*As previous years, the technical progress reports for each Letter of Agreements are reviewed by TDR manager responsible for the scheme prior to submission to the SWG for their reviews. In some instances, it entails a close follow up of the progress of the cohorts by arranging monthly meetings with the Dean and project coordinator*.
	Continue to explore how to promote sustainability, including emphasizing the importance of sustainability plans in annual progress reports and in the proposals submitted by universities for consideration in phase 2, and encouraging universities to seek counterpart funding from potential sources, e.g. national science funding boards.	*The sustainability plan has been one of the key criteria for the submission of applications for the second phase of the scheme. The SWG has been involved in the selection process. As the first phase of the scheme comes to an end in 2021, from next year, the annual reports will be revised and will include sustainability plan.*

	Continue to encourage and monitor adaptation of training activities during COVID-19 pandemic.	*All universities switched to online teaching methods during the current pandemic. As the students could not conduct field visits for their research project, they were asked to conduct secondary data analysis, scoping or systematic reviews and meta-analysis.*
	Explore how to assess the quality of remote learning for a master's degree.	*TDR is in process of issuing a contract with Johns Hopkins University to assess the quality of remote learning for a master's degree. This is based on the identified gaps in IR curriculum offered by each university.*
	Building on the universities' progress in developing COVID-19 resilience by changing to remote learning, exploring ways to encourage class participation and interaction with teachers and between peers.	*TDR and the faculties from participating universities arrange regular online interaction with teachers and students via the IR connect platform which was launched last year.*
SORT IT programme	Continue to review teaching/learning materials and adapt them as virtual formats.	*Participants provide feedback on their learning experiences which assists in the revision of the training materials and/or delivery format.*
	Encourage countries to explore funding for operational research from research councils in and beyond the health sector.	*SORT IT alumni champion support to promote the "One Health" approach as a means to expand funding sources.*
	Explore opportunities to advocate for OR with more stakeholders.	*National OR stakeholders meeting planned in two countries.*
	Continue to engage with the wide range of stakeholders represented on national Global Fund country coordinating committees, including disease control programmes and academic and other research institutions, to promote the inclusion of OR in Global Fund grants.	*Four SORT IT alumni based in academic institutions and NGOs were supported to provide technical guidance for the incorporation of OR in NSPs and GF applications. The activity reports form the basis for the national OR stakeholders meeting for validation and discussion on the way forward.*
	Explore opportunities to engage with AMR or ONE Health Committees at country level.	*There is a parallel and complimentary SORT IT programme on AMR which is based on One Health approach in participating countries.*

Access and Delivery Partnership project	Encourage advocacy with research councils, in and beyond the health sector, to explore potential funding opportunities, to help fill the gap in funding available to support the implementation of research proposals developed through the ADP project.	*In the focus countries, all ADP activities are supported by the country focal points from UNDP and PATH both of which have a reach beyond the health sector. The inclusion and piloting of IR demonstration project grants in two ADP focus countries will highlight the value and scope of a comprehensive IR training, while creating a demand for small grants funding.*
	Explore links with institutions in countries that have successfully developed virtual platforms, as this expertise has grown significantly during the COVID-19 pandemic.	*The ADP community virtual platform under development will have links with TDR supported institutions that offer or participate in online courses and will be involved in the piloting phase. This will allow for compatibility testing and eventually the evaluation of the effectiveness of the platform.*