TDR For research on diseases of poverty

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# TDR Results

# 2019 Report

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# 1. Summary

In 2019, TDR continued to deliver high levels of achievements, in line with the 2018-2023 strategy, and through collaboration with institutions in low- and middle-income countries, ministries of health, academia and nongovernmental organizations, with strong support from our donors and governing bodies. The estimated leverage generated by TDR support in countries reached US$ 54 million in 2018-2019, which represents one-and-a-half times the amount invested by TDR. During the biennium, around 1000 people in the field worked on TDR projects.

As a result, countries piloted and adopted TDR-generated tools; such as Mexico integrating the Early Warning, Alert and Response System (EWARS) to detect and respond to vector-borne disease outbreaks, improved tuberculosis screening and follow-up on national policies in Benin, Mali and Senegal, accelerating universal health coverage for vulnerable populations in Armenia and Ukraine, etc. At regional level, a TDR-supported approach to enhance country research capacity to support the End TB Strategy has been adopted by African countries, along with a research package for facilitating the use of a new all-oral drug-resistant tuberculosis treatment regimen. Global health actors embedded social innovation in their respective programmes to support enhanced access to health for vulnerable populations. Three Product Development Partnerships (TB Alliance, FIND and the European Vaccine Initiative) validated the utility of TDR's Portfolio-to-Impact R&D modelling tool to analyse their portfolios; the tool was also adopted by the World Health Organization (WHO) as a Global Public Health Good.

In 2019, TDR supported 289 new trainees through the postgraduate training scheme on implementation research, the small research grants through WHO regional offices, new fellows of the Clinical Research and Development Fellowship scheme, and the SORT IT scheme. Specifically, SORT IT trained 128 nationals from country disease control programmes, including Kenya, Myanmar, Nepal, Pakistan, Sierra Leone, Uzbekistan, Zimbabwe, etc. TDR's Regional Training Centres trained 769 participants (72% women) on good research practices and 1265 participants in implementation research. In addition, more than 9000 researchers from 115 countries participated in TDR's Massive Open Online Course on implementation research, conducted in English, French and Spanish.

The budget scenario model used by TDR, with a base level and a higher level, proved successful in 2019 to allow swift scaling up of activities. Leveraging on the success of working models piloted or co-developed by TDR, such as SORT IT, the SIHI Hub initiative and the TB research networks in Africa, we were able to attract additional funds from contributors who were interested in seeing these models expanded and scaled up. As additional funds became available, shifting from the US$ 40 million budget and workplan scenario towards the higher budget and workplan scenario was done in a smooth and efficient manner, as both scenarios had been developed in detail and approved in advance by TDR's governing bodies. Our teams were able to scale up project implementation and increase the value for money of our work, by investing the entire additional amount in operations.

Equity has remained at the core of our organizational values. The importance given to vulnerable populations in our workplan is evidenced in the improved outcomes for these groups as a result of our work, and in the increasing proportion of TDR-supported publications specifically addressing their issues. TDR's focus on disease endemic countries (DECs)[1] resulted in 85% of 2019 publications being authored by researchers from these countries. We have also mainstreamed gender in our work and disseminated training courses that address gender in health research. In 2019, 47% of our contracts and grants were awarded to women.

Our risk management plan is on track. Following a recommendation made in March 2020 by TDR's Scientific and Technical Advisory Committee (STAC), we have added a new risk related to global health security events, and are implementing the mitigation plan.

[1] Low- and middle-income countries with significant burdens of disease

## 2. Expected results and overview of progress on key performance indicators

The 2019 Results Report measures a set of performance indicators against targets, in line with TDR's 2018-2023 Strategy and the TDR Performance Framework 2018-2023[2], for planning, monitoring and evaluation. The report shows progress made on various indicators related to three overarching categories: technical expected results, application of organizational core values and managerial performance. Ultimately, TDR's outputs and outcomes contribute to health impact, measured through the achievement of Strategic Development Goal (SDG) targets and the World Health Organization's (WHO) Thirteenth General Programme of Work (GPW13) triple billion targets.

Given the adoption of the Sustainable Development Goals by the global community in 2016, TDR developed its 2018-2023 strategy to showcase the Programme's unique contribution, through research, capacity strengthening and global engagement, to improved health, quality education, enhanced partnerships and other relevant SDG targets guiding international development work over the next 15 years. The Performance Framework (including a revised set of indicators), which is aligned with TDR's 2018-2023 strategy, the GPW13 strategic objectives and SDG targets, has been in place since 2018.


As shown in Figure 1, TDR aims for a global impact to reduce the burden of infectious diseases of poverty. TDR's contribution is made possible by the overall outcome of the Programme, which is the translation of new knowledge, solutions and tools into policy and practice in disease endemic countries. These in turn are the result of three feeder outputs that support and complement each other, with the sustainability of research outputs being enhanced by the engagement of stakeholders and by the capacity built in countries.

Aligned with TDR's Strategy, the Performance Framework further demonstrates TDR's focus on health impact and value for money throughout the whole results chain, from using resources economically to building efficient processes, to quality of outputs and to partnering to enhance the sustainability of outcomes.

[2] https://www.who.int/tdr/publications/about-tdr/strategy/framework-2018-23/en/

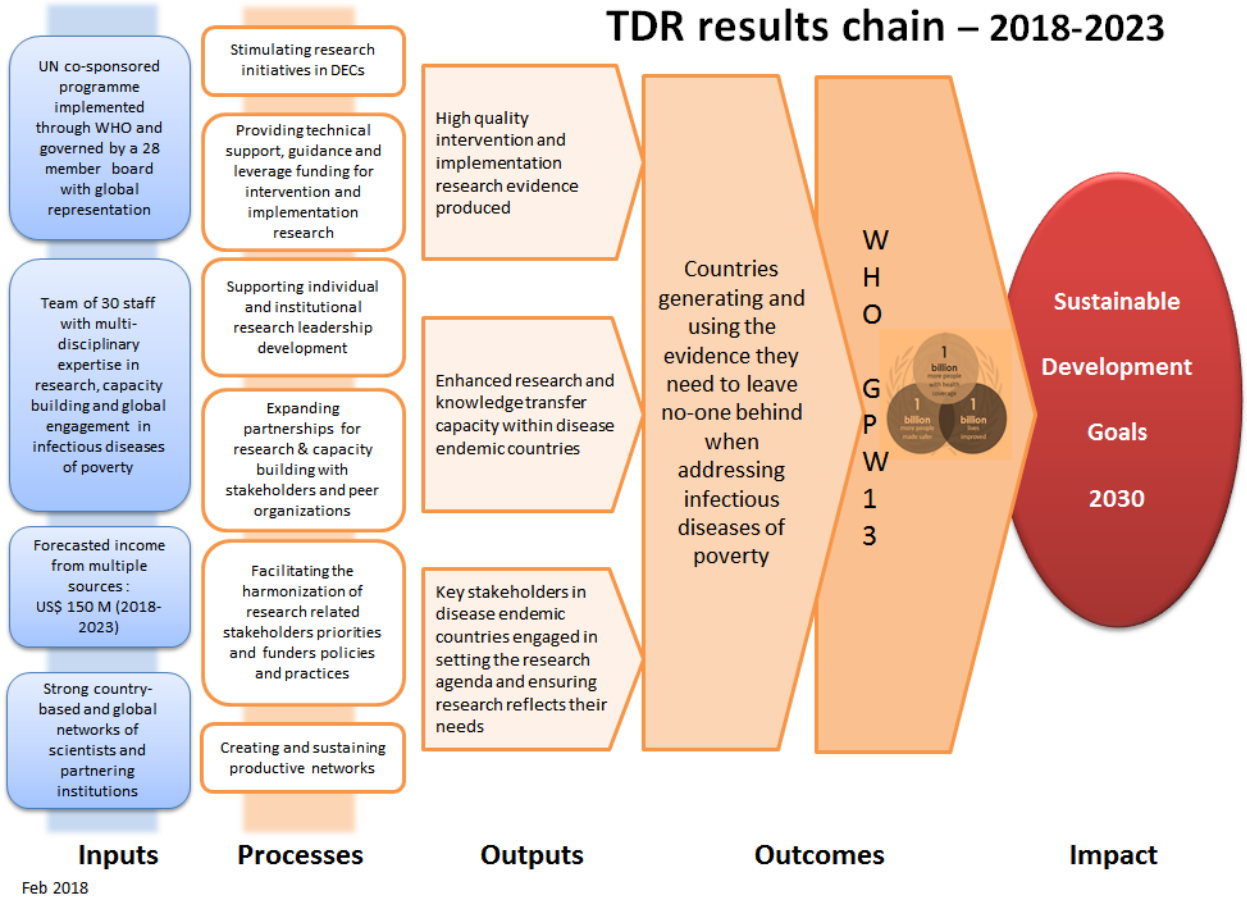


**Figure 1. TDR results chain**

TDR's work is contributing to the research accelerator of the Global action plan for healthy lives and well-being for all[3] that aims to speed up progress towards the targets of SDG3 through a three-pronged approach: align, accelerate and account.

An overview of the progress made on each of TDR's key performance indicators is presented in the monitoring and evaluation matrix (see Table 1), with further details being provided in the body of this report.

[3] See https://www.who.int/sdg/global-action-plan

## Table 1- TDR's key performance indicators matrix 2018-2023

| Expected results | Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* | Frequency of measurement |
|---|---|---|---|---|---|
| ***Technical expected results*** |  | | | | |
| **Impact:**<br>**Countries generating and using the research evidence they need to leave no-one behind when acting to reduce the burden of infectious diseases of poverty.**<br><br>*SDG3-Good health and wellbeing*<br>*SDG4-Quality education*<br>*SDG5-Gender equality*<br>*SDG6-Clean water and sanitation*<br>*SDG9-Industry, innovation and infrastructure*<br>*SDG10-Reduce inequalities*<br>*SDG11-Sustainable cities and communities*<br>*SDG13-Climate action*<br>*SDG17-Partnerships for the goals* | i. SDG3-Goal 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.<br><br>ii. SDG 3-Goal 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.<br><br>iii. SDG3-Goal 3.b: Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines (…)<br><br>iv. SDG3-Goal 3.d: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.<br><br>v. SDG13-Goal 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries<br><br>vi. SDG9-Goal 9.5: Enhance scientific research, (…) encouraging innovation and substantially increasing the number of research and development workers per 1 million people (…) | | | Evaluation demonstrating the link between outcomes and the progress made towards achieving the relevant SDG goals | |

| Expected results | Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* | Frequency of measurement |
|---|---|---|---|---|---|
| **Outcome:**<br>**Infectious disease knowledge, solutions and implementation strategies translated into policy and practice in disease endemic countries**[4] | 1. Number and evidence when innovative knowledge or new/improved solutions/tools developed with TDR support are applied in disease endemic countries | 0 | 100 | 39<br>*(+18)* | Measured annually, cumulative over 6 years |
| | 2. Number and evidence when tools and reports are used to inform policy and/or practice of global/ regional stakeholders or major funding agencies | 0 | 20 | 11<br>*(+8)* | Measured annually, cumulative over 6 years |
| | 3. Evidence demonstrating the benefits of research on gender, on equity or on vulnerable groups, including people with disabilities, used to inform policy and/or practice | N/A | N/A | Evidence provided | Measured annually |
| **Research outputs:**<br>**High quality intervention and implementation research evidence produced in response to global and country needs** | 4. Number and evidence of innovative knowledge, new/improved solutions or implementation strategies developed in response to requests from WHO control programmes and/or diseases endemic countries and engaging disease endemic country stakeholders | 0 | 25 | 33<br>*(+18)*<br>100% | Measured annually, cumulative over 6 years |
| | 5. Number of research data sets/platforms that are i) open access or ii) with an access permission level | 1 | 10 | 8<br>(i. 1, ii. 7)<br>*(+5)* | Measured annually, cumulative over 6 years |
| **Capacity strengthening outputs:**<br>**Enhanced research and knowledge transfer capacity within disease endemic countries** | 6. Number and evidence of DEC institutions and networks demonstrating expanded scope of activities or increased funding from alternative sources, or that have influenced research agenda, policy and practice, as a result of or related to TDR support[5] | 0 | 5 | 9<br>*(+5)* | Measured annually, cumulative over 6 years |
| | 7. Number of TDR grantees/trainees per year, and proportion demonstrating career progression and/or increased scientific productivity, disaggregated by gender | 79 (2017)<br>85% (2014) | 150<br>≥80% | 397*<br>*(+289*)* | Measured on cohorts 3-5 years after training ended |

[4] DEC: low- and middle-income countries where neglected diseases are prevalent / endemic

[5] TDR support may include financial, in-kind, facilitation and/or expert types of support

| Expected results | Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* | Frequency of measurement |
|---|---|---|---|---|---|
| **Global engagement outputs:**<br>**Key stakeholders engaged in harmonizing agenda and practices and in new initiatives** | 8. Number and evidence of research-related agendas, recommendations and practices agreed by stakeholders at global, regional or country level and facilitated by TDR | 0 | 6 | 5<br>*(+2)* | Measured annually, cumulative over 6 years |
| | 9. Evidence of stakeholder engagement in TDR joint initiatives aligned with TDR strategic objectives | N/A | N/A | Evidence provided | Measured annually |
| ***Application of core values*** | | | | | |
| **Equity**<br><br>*Social and economic equity:* | 10. Proportion of TDR grants/contracts awarded to institutions or individuals in DECs (total count and total amount) | 62% (count)<br>74% (amount) | 75% DEC | 62% DEC (count)<br>74% DEC (amount) | Measured annually |
| | 11. Proportion of experts from DECs on TDR external advisory committees | 78% | >60% | 70% | Measured annually |
| | 12. Proportion of peer-reviewed publications supported by TDR with authors from DEC institutions (first author - FA, last author - LA, all authors - AA) | FA: 73%<br>LA: 56%<br>AA: N/A | ≥67% | FA: 85%<br>LA: 63%<br>AA: 71% | Measured annually |
| | 13. Number of peer-reviewed publications supported by TDR and percentage published in open/free access | 200<br>88% | ≥150/year<br>100% | 223<br>93% | Measured annually |
| *Gender equity:* | 14. Proportion of women among grantees/contract recipients (total count and total amount) | 40% (count)<br>29% (amount) | 50% | 47% (count)<br>47% (amount) | Measured annually |
| | 15. Proportion of women on TDR external advisory committees | 50% | 50% | 57% | Measured annually |
| | 16. Proportion of women authors of peer-reviewed publications supported by TDR (first author - FA, last author - LA) | FA: 38%<br>LA: 24% | 50% | FA: 43%<br>LA: 28% | Measured annually |
| | 17. Number and proportion of peer-reviewed publications explicitly considering: gender and women issues, vulnerable groups or people with disabilities | N/A | 80% | Total: 75%<br>Gender: 5%<br>Vulnerable: 57% | Measured annually |

| Expected results | Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* | Frequency of measurement |
|---|---|---|---|---|---|
| | | | | Disabilities: 13% | |
| **Effective multisectoral partnerships** | 18. Resources leveraged as direct contributions (co-funding, services or in-kind) to TDR projects (examples) | $ 1:1 ($ TDR : $ partners) People 1:30 (TDR : in the field) | < $ 2:1 | $1:1.5 ($ TDR : $ partners) People 1:33 (TDR : in the field) | Measured at the end of biennium |
| **Value-for-money** | 19. Evidence demonstrating value-for-money, cost savings and/or enhanced efficiency or effectiveness | N/A | N/A | Evidence provided | Measured at the end of biennium |
| **Quality of work** | 20. Proportion of project reports evaluated as satisfactory by external advisory committees | 100% | >80% | 96% | Measured annually |
| **Sustainability of outcomes** | 21. Number of effective public health tools and strategies developed which have been in use for at least two years | 0 | 40 | 12 (+12) | Measured at the end of biennium |
| ***Management performance*** | | | | | |
| **Effective resource mobilization** | 22. Percentage of approved biennial budget successfully funded | *87.9% (US$ 39.5/45M)* | ≥100% | US$ 40M scenario: 100% | Measured at the end of biennium |
| | 23. Percentage of income received from multi-year, unconditional donor agreements | *17.3% (US$ 6.8M/39.5M)* | 70% | 1% (US$ 0.3M/50.7M) multi-year unconditional 25% (US$ 12.8M/50.7M) multi-year conditional | Measured at the end of biennium |
| **Effective management** | 24. Percentage of staff workplans and performance reviews (including personal development plan) completed on time | 89% | ≥90% | 100% | Measured annually |
| | 25. Proportion of expected results on track | 89% | ≥80% | 84% | Measured annually |
| | 26. Proportion of significant risk management action plans that are on track | 100% | ≥80% | 92% | Measured annually |

# 3. Achieving TDR's scientific and technical objectives

The indicators covering TDR's achievement of expected results measure the outcome level as well as the outputs generated which, once translated into policy and practice, will have an impact on the burden of disease in countries, thus directly contributing to the Sustainable Development Goal targets and to WHO's GPW13 triple billion objectives. Achievements are reported in the technical teams' annual reports and measured against biennial targets approved by the Joint Coordinating Board in the year preceding each WHO biennium (e.g. approved in 2017 for the biennium 2018-2019).

## 3.1 Impact: Countries generating and using the research evidence they need to leave no-one behind when acting to reduce the burden of infectious diseases of poverty

TDR's Strategy 2018-2023 shows how activities and results are expected to contribute to the SDGs, particularly to SDG3, but also to others. The outcomes we plan to achieve are aligned with the strategic plans of our co-sponsors: the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the World Bank and WHO, all of which aim to advance sustainable development work, as illustrated in TDR's results chain. WHO's GPW13 prioritizes targets agreed at global level, with three areas taking centre stage: advancing universal health coverage, addressing health emergencies and promoting healthier populations. TDR's expected results contribute, either jointly or individually, to all of these strategic objectives.

The SDG indicators, together with baseline measures and targets, are being measured by WHO and other UN family agencies. Contributions that TDR outcomes are making towards achievement of SDG and GPW13 targets are being assessed through external review of the Programme (every 5 or 6 years), and through evaluation of the strategic work areas of TDR, or of specific long-term projects, as appropriate.

## 3.2 Outcome: Infectious disease knowledge, solutions and implementation strategies translated into policy and practice in disease endemic countries

TDR works with partners in disease endemic countries (DECs) to generate essential knowledge and evidence for the prevention and control of infectious diseases of poverty, and to facilitate translation of the solutions into policy and improved health care in countries. TDR's approach leads to strengthening health systems operations and research systems in these countries, ultimately reducing the burden of infectious diseases of poverty.

This is done through three key mechanisms – the generation of new evidence and knowledge products, strengthening capacity in disease endemic countries to conduct good quality research, and building close working relationships with key policy-makers and programme staff to ensure the country priorities are guiding research, and thus the translation of new knowledge into effective disease control efforts is facilitated.

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contribution 2019)* |
|---|---|---|---|
| 1. Number and evidence when innovative knowledge or new/improved solutions/tools developed with TDR support are applied in disease endemic countries | 0 | 100 | 39 *(+18)* |
| 2. Number and evidence when tools and reports are used to inform policy and/or practice of global/regional stakeholders or major funding agencies | 0 | 20 | 11 *(+8)* |
| 3. Evidence demonstrating the benefits of research on gender, on equity or on vulnerable groups, including people with disabilities, used to inform policy and/or practice | N/A | N/A | Evidence provided |

## Indicator 1 - Number and evidence when innovative knowledge or new/improved solutions/tools developed with TDR support are applied in disease endemic countries

Several new tools, solutions and strategies generated with TDR support began being used by countries in 2019. There were 15 new instances when countries applied or utilized this new knowledge. Below is a list, including the respective countries. Other tools have not yet reached implementation stage; their use will be reported on in future reports.

- ✓ **Dissemination of the Early Warning and Response System (EWARS)** has been achieved through in-country training workshops in Colombia, India, Malaysia, Mexico, Sri Lanka and Thailand, as well as through electronic follow-up and TDR-WHO expert meetings. A major push was the successful **incorporation of EWARS into the national surveillance platform** in Mexico. The Pan American Health Organization (PAHO) has translated the EWARS guide into Spanish which will enhance its use in Latin America. Some other countries are interested in applying the EWARS tool, however, their surveillance systems (entomological and epidemiological) need to be strengthened to allow building context-specific EWARS. (5 countries)
- ✓ A TDR-supported approach to enhance country research capacity to support the End TB Strategy has been applied in three African countries. Some implementation research project results have already resulted in improved country policies, such as **national policies for TB screening in HIV patients in Benin and Senegal, or Mali's improved methods to reduce the proportion of loss to follow-up patients**. (3 countries)
- ✓ **Accelerating Universal Health Coverage for vulnerable populations in Armenia and Ukraine.** SORT IT training courses led by alumni of previous SORT IT courses were held in Armenia and Ukraine. The research and trainings have been conducted in collaboration with the WHO Regional Office for Europe (EURO) in the context of the European TB Research Initiative. Findings from these studies are already making an impact on programmes. (3 strategies, 2 countries)
    - o **Strategies for active detection of tuberculosis amongst key populations in Ukraine.** Introducing active TB case finding in about 700 000 people from key populations significantly increased TB detection, with 90% of detected cases starting TB treatment. The TB detection rate was 13 times higher when screening for symptoms and specimen collection was decentralized to outreach sites.[6]

[6] See https://jidc.org/index.php/journal/article/view/11294

- **Engaging people who inject drugs and their peers in HIV testing and harm reduction in Ukraine.** HIV testing increased by over 300% (from 164 417 to 639 685) and significantly more HIV-positive individuals were identified and referred for harm-reduction services.[7]
- **Free hospitalisation for acute respiratory infections in children in Armenia.** Free hospitalization increased access to hospital admissions by 75% in infants and 85% in children. There was an accompanying 19% decline in infant mortality and 11% decline in under-five mortality, respectively. However, the costs of hospitalization in Armenia increased by 57%, therefore new sources of funding are needed to sustain the gains.[8]

✓ The University of Ghana School of Public Health, with support from TDR, has developed an online course aimed at **developing skills in gender-based analysis (GBA) for vector-borne diseases and climate change research**. The course modules were piloted and offered at both the **University of Ghana and at the University of the Witwatersrand in South Africa** in 2019. The target audience for this training is researchers and policy-makers from disease endemic countries. Further to this, TDR supported a delivery method of learning that includes an innovative global classroom approach (use of online learning, web conferencing, video conferencing, discussion forum, blog moderation; use of social media for assignments). Within the University of Ghana, the GBA online course has been integrated within existing gender and health courses offered at both undergraduate and postgraduate levels. (2 countries)

✓ The **TDR Toolkit on Intersectional gender analysis in research on infectious diseases** has been developed and its pilot started in December 2019 at country level in Nepal and Uganda, in collaboration with institutions of the Rings Network (Makerere University School of Women and Gender Studies and HERD International). (2 countries)

✓ Successful community engagement and building adaptive capacity against dengue in Kampong Cham, Cambodia through a socioecological systems and resilience approach using key interventions: bio-environmental (adult mosquito trapping, mosquito larvae-feeding guppy fish distribution, solid waste management) combined with communications and behaviour change (COMBI), school training and education, and participatory epidemiological mapping. This work had resulted in a **significant decline in Aedes aegypti and Aedes albopictus vector indices** (container, house, Breteau, pupal and adult survey indices) at 6 and 12 months post-intervention. An important component of the sustainability plan was achieved with the **integration of dengue control education package in school subjects for Grades 4, 5 and 6, as well as the continued use of guppy fish and COMBI in the community**. (1 country)

✓ Following the successful pilot mosquito population suppression trial using combined Sterile Insect Technology with Incompatible Insect Technique in eastern Thailand, TDR supported the **design of a cluster randomized trial in Bangkok, to include monitoring for epidemiological impact against arboviral diseases, dengue, Chikungunya and Zika**. Additional leverage for funding from the Thai government was successfully achieved. (1 country)

✓ Following TDR support for the development of a knowledge platform in the Ministry of Health of Malawi, six policy briefs were developed with the impact of one of them leading to a **new policy on integration of hypertension screening within HIV clinics** to be piloted in three health districts in Malawi. (1 country)

[7] See https://jidc.org/index.php/journal/article/view/11293

[8] See https://jidc.org/index.php/journal/article/view/11158

## Indicator 2 - Number and evidence when tools and reports are used to inform policy and/or practice of global/regional stakeholders or major funding agencies

- ✓ **A TDR-supported approach to enhance country research capacity to support the End TB Strategy has been adopted by African countries.**

  Inspired by our success with the West African Regional Network for TB control (WARN-TB, composed of 16 countries), we helped establish the Central African Regional Network for TB control (CARN-TB), bringing together 11 countries that are actively collaborating to improve prioritization and management of tuberculosis. The activities of both networks are coordinated by a unique secretariat hosted by the National TB programme in Benin. The approach in both WARN-TB and CARN-TB brings together a range of partners (such as the WHO Global TB Programme - WHO/GTB, the Global Fund to Fight AIDS, Tuberculosis and Malaria, the United States Agency for International Development - USAID, the West African Health Organization - WAHO, the International Union Against Tuberculosis and Lung Disease - The Union and Action Damien) to enhance country research capacities in this region, which has translated to around US$ 5 million already being leveraged for regional activities. Some implementation research project results have already resulted in improved country policies, such as **national policies for TB screening in HIV patients in Benin and Senegal, or Mali's improved methods to reduce the proportion of loss to follow-up patients**.

  'Intensified research and innovation' is the third pillar of WHO's End TB Strategy, and TDR has been contributing expertise in research for implementation to optimize the impact of innovations for tackling TB. Research plays a critical role in saving the lives of millions suffering and dying from this preventable and curable disease. In March 2019, TDR, WHO/GTB, the WHO Regional Office for Africa (AFRO) and 44 African countries, including those participating in WARN-TB and CARN-TB, convened in Benin to tackle latent TB infection and drug-resistant TB. Countries have **defined programmatic gaps and research priorities focused on drug-resistant TB (DR-TB) and latent TB infections (LTBI),** two priority areas critical to the success of the End TB Strategy. One key barrier identified by the countries for the use of new DR-TB treatment was the necessity to use them under operational conditions. (2 subregions)

- ✓ The above outcome led to the **development of a research package for facilitating the use of a new all-oral DR-TB treatment regimen by the countries** under operational conditions. In November 2019, TDR, in close collaboration with WHO/GTB and technical partners, launched an implementation / operational research package dubbed ShORRT (Short, all-Oral Regimens for Rifampicin-resistant Tuberculosis). This research package assesses the effectiveness, safety, feasibility, acceptability, cost and impact (including on quality of life) of the use of all-oral shorter drug regimens for patients with drug-resistant TB. By providing a standardized methodology, ShORRT aims to facilitate operational research on these shorter regimens, and to generate data that are harmonized across different implementation settings. ShORRT includes a master protocol, data collection tools and key study procedures that investigators can adapt. The generic protocol is currently available in English and French and will soon also be available in Spanish and Portuguese. **WHO's "Rapid Communication: Key changes to the treatment of drug-resistant tuberculosis", released in December 2019, points to ShORRT as a resource to facilitate operational research for modified shorter regimens**. (Global)

- ✓ **Global health actors embedded social innovation in their respective programmes** with the support of and in collaboration with TDR and the Social Innovation in Health Initiative (SIHI):

  - o For the past three years TDR and SIHI have collaborated with the **Ahimsa Fund to embed social innovation in the Ahimsa Forum programme**. During the 4th Ahimsa Forum held in 2019, the Ahimsa RoundTable was launched to offer an opportunity to bring social and technology innovators together and to create new partnerships.

- In 2019, **Fondation Mérieux contributed actively** in SIHI activities, supporting the organization of the SIHI hub network meeting in Kampala and promoting social innovation within their portfolio of projects.
- **The London School of Hygiene and Tropical Medicine (LSHTM) and Fondation Mérieux** invited TDR to be part of the advisory committee of the annual "Advanced Course on Diagnostics" (ACDx) in order to **embed social innovation in their programmes** and organize a social innovation session. ACDx advocates for the role and the value of diagnostics in global health and builds capacity for critical decision-making on diagnostics in developing countries through partnerships and networks.
- As a result of the **Sida Science days**, collaboration with Grand Challenges Africa, led by the African Academy of Sciences, has been initiated. **Social innovation has been included in their funding programme** and innovations identified and studied by the SIHI hubs in Malawi and Uganda were invited to bid.

✓ Novel tool: Three **capacity building workshops with small grant grantees** were organized to provide them with an opportunity **to take the MOOC in implementation research**, particularly in the WHO regions of Europe, the Americas and the Eastern Mediterranean. (3 regions)

✓ Following an open call, **TDR supported the use of P2I by three Product Development Partnerships (PDPs) (TB Alliance, FIND and the European Vaccine Initiative) to analyse their portfolios**. This has validated the utility of P2I and an R&D modelling tool. Improvements include the integration of more data supporting the development of diagnostics and findings in attrition rates. In addition, the Global Health Centre based at the Geneva Graduate Institute undertook a review of the findings generated by using the P2I modelling tool. Their findings, based on these analyses and qualitative interviews, where the difference lies between commercial and non-commercial R&D for health product development. This work has been used as a case study by UNDP as part of its Access and Delivery Programme. All of this work was published on the new TDR Gateway open access publishing platform.[9]

## Indicator 3 - Evidence demonstrating the benefits of research on gender, on equity or on vulnerable groups, including people with disabilities, used to inform policy and/or practice

**Accelerating Universal Health Coverage for vulnerable populations in Armenia and Ukraine.** SORT IT training courses led by alumni of previous SORT IT courses were held in Armenia and Ukraine. The research and trainings have been conducted in collaboration with EURO in the context of the European TB Research Initiative. Findings from these studies are already making an impact on programmes:

- **Strategies for active detection of tuberculosis amongst key populations in Ukraine.** Introducing active TB case finding in about 700 000 people from key populations significantly increased TB detection, with 90% of detected cases starting TB treatment. The TB detection rate was 13 times higher when screening for symptoms and specimen collection was decentralized to outreach sites.[10]
- **Engaging people who inject drugs and their peers in HIV testing and harm reduction in Ukraine.** HIV testing increased by over 300% (from 164 417 to 639 685) and significantly more HIV-positive individuals were identified and referred for harm-reduction services.[11]
- **Free hospitalisation for acute respiratory infections in children in Armenia.** Free hospitalization increased access to hospital admissions by 75% in infants and 85% in children. There was an

[9] See https://www.who.int/tdr/publications/tdr-gateway/en/

[10] See https://jidc.org/index.php/journal/article/view/11294

[11] See https://jidc.org/index.php/journal/article/view/11293

accompanying 19% decline in infant mortality and 11% decline in under-five mortality, respectively. However, the costs of hospitalization in Armenia increased by 57%, therefore new sources of funding are needed to sustain the gains.[12]

The **Social Innovation in Health Care initiative** led by TDR and engaging numerous partners in countries conducted research on case studies addressing women, vulnerable populations and persons with disabilities. Some examples are listed below:

- Kyaninga Child Development Centre, which aims at **creating equal opportunities for children living with disabilities** through utilizing a holistic approach that ensures multi-stakeholder engagement in management and care of children with disabilities[13];
- Imaging the World, Africa - aims to address the lack of access to **diagnostic imaging services for pregnant women**, especially in rural areas by training identified nurses and midwives in selected lower level health facilities to perform ultra-sounds[14];
- Inter-island Health Service Boat Project - An integrated boat referral system that **connects remote village health centres to the municipality's main birthing facility**[15];
- Action for Women and Awakening in Rural Environment (AWARE) - AWARE-Uganda aims at **advancing the health, social, cultural and economic status of women in Karamoja** through utilizing a holistic approach to empower women and advocate for their rights in the community[16];
- Bwindi Mothers' Waiting Hostel - a simple, and affordable **solution addressing the lack of access to skilled health care during delivery** by women in remote settings in Uganda[17];
- Healthy Child Uganda's MamaToto Approach - A district-led programme that operationalizes the national community health worker **strategy to promote quality maternal, new-born, and child health**[18].

**Cambodia:** Recognizing the importance of understanding gender dynamics at local level as projects aimed to engage communities in vector control in an inclusive way, so that not only men take an active role. One of the process indicators for community empowerment and project ownership is recognition of the importance of women's involvement. To achieve this, the research teams have included training activities to strengthen the role of women in health outreach programmes for the control of dengue in the community. There was strong women representation in developing responsive actions for the community's protection and preventative approaches for dengue and other mosquito-borne diseases. **Women's groups also lead in the sustainability of dengue control efforts in the community** by locally fabricating and producing Autocidal Gravid Ovitraps for catching adult mosquitoes. This complements more basic aspects, such as teams ensuring that data within their own research projects is sex- and age-disaggregated and using other social stratifiers when possible and as adequate.

An **innovative challenge contest used internet and social media platforms to generate ideas to address the problem of lack of gender equity** in the Clinical Research and Development Fellowship (CRDF) scheme that took place in 2019. The top three ideas sourced from "crowd wisdom" were: 1) enhanced social media communication targeting women; 2) building institutional pre-application support for women applicants; and 3) creating a nomination system to nudge women applicants. These ideas were implemented as part of the 2019 CRDF fellowship application cycle, with the result being considerably increased numbers of eligible women applicants and of fellowships awarded to women.

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12 See https://jidc.org/index.php/journal/article/view/11158

13 See https://socialinnovationinhealth.org/case-studies/kyaninga-child-development-centre/

14 See https://socialinnovationinhealth.org/case-studies/imaging-the-world-africa/

15 See https://socialinnovationinhealth.org/case-studies/inter-island-health-service-boat-project/

16 See https://socialinnovationinhealth.org/case-studies/aware/

17 See https://socialinnovationinhealth.org/case-studies/bwindi-mothers-waiting-hostel/

18 See https://socialinnovationinhealth.org/case-studies/healthy-child-ugandas-mamatoto-approach/

## 3.3 Research outputs: High quality intervention and implementation research evidence produced in response to global and country needs

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 4. Number and evidence of innovative knowledge, new/improved solutions or implementation strategies developed in response to requests from WHO control programmes and/or diseases endemic countries and engaging disease endemic country stakeholders | 0 | 25 | 33<br>*(+18)*<br>100% |
| 5. Number of research data sets/platforms that are i) open access or ii) with an access permission level | 1 | 10 | 8<br>(i. 1, ii. 7)<br>*(+5)* |

### Indicator 4 - Number and evidence of innovative knowledge, new/improved solutions or implementation strategies developed in response to requests from WHO control programmes and/or diseases endemic countries and engaging disease endemic country stakeholders

In 2018, the following research outputs were delivered at the request of WHO control programmes and/or diseases endemic countries, engaging DEC stakeholders:

- ✓ TDR and WHO's Control of Neglected Tropical Diseases Department (NTD) have collaborated with the International Atomic Energy Agency (IAEA) and its joint division with the Food and Agriculture Organization to develop a guidance on testing the Sterile Insect Technique (SIT) to control diseases carried by Aedes mosquitoes such as dengue, Zika and chikungunya. A joint IAEA/TDR/NTD/WHO publication entitled "**Guidance Framework for Testing the Sterile Insect Technique as a Vector Control Tool against Aedes-Borne Diseases**" details consideration for the assessment and planning of SIT programmes in WHO Member States, covering the areas of: modalities of implementation, efficacy testing and indicators, cost effectiveness and risk, phases of programmatic implementation, surveillance, community engagement strategies and registration and regulation of the technology. This guidance was developed in response to several Member States expressing the need for guidance on how to develop, assess and plan for SIT-Aedes experimental and operational programmes.
- ✓ **An improved early warning and response system (EWARS)** has proven effective **in predicting dengue fever, chikungunya and Zika outbreaks**, strengthening preparedness and detection in several countries (Colombia, India, Malaysia, Mexico, Sri Lanka and Thailand). Other countries can test and potentially customize this tool to apply to other arboviral diseases, such as yellow fever and others.
- ✓ Research projects on residual malaria and the impact of insecticide resistance on LLIN efficacy demonstrated that vectors and human behaviours, as well as resistance to insecticide and inadequate control tools, were the main causes of residual malaria, although persistent malaria transmission in many settings was not residual but due to inadequate coverage and use of the tools (long-lasting insecticidal nets-LLINs and indoor residual spraying - IRS). **This has resulted in the production of information briefs and video vignettes[19] for stakeholders and the concerned 13 countries in four WHO regions for each of the six projects**. **New knowledge was provided on the impact of insecticide resistance** on LLINs and IRS efficacy in these countries.

[19] See http://vbd-environment.org/

- **In Mali**, *An. Coluzzii* **resistance to commonly used insecticides (pyrethroid) was very high in all sites**, but the mosquito population was fully susceptible to pyrimiphos-methyl (organophosphate) used for IRS. Entomological transmission and parasitological parameters were all low in LLIN+IRS sites compared to LLIN-only sites. Consequently, **malaria control with LLINs+IRS was found to be much more effective** then LLINs alone, despite some insecticide resistance.
- **In Nigeria**, with LLINs as the main vector control intervention, multivariate analysis found **insecticide resistance was the main factor associated with non-usage or halt in LLIN usage**. The data suggest that only the metabolic P450 mechanism of resistance appears to impair LLIN efficacy and performance in terms of Anopheles monthly biting rates, parasite inoculation rates and malaria prevalence.
- **In Benin**, mosquitoes (*An. gambiae* and *An. funestus*) from most surveyed sites were found to be **resistant to pyrethroid insecticides, with higher resistance recorded in the south**. In the selected study sites, multidrug-resistance mechanisms (target sites and metabolic resistance) were recorded and it was **observed that more severe malaria cases were recorded in the locality with a higher resistance level**.
- **In Peru**, there is a very low entomological Inoculation Rate (EIR) (0–0.25) and a relatively high number of malaria cases (107 in 2016). This suggests either little local transmission or a highly mobile human population. Entomological indices suggest greater risk of malaria transmission in the Mazán district. Indoor Anopheles darlingi EIR 0.25–3, together with indoor Plasmodium falciparum (Pf) incidence rates suggest that **IRS could be effective as part of an integrated intervention/eradication programme**; little insecticide resistance in *An. darlingi* has been noted to date.
- **In Brazil**, the distribution of malaria episodes was over-dispersed and there was **no association between malaria incidence and rainfall**. Characteristics from individuals show higher association with risk of infection vs household characteristics. For example, **going to bed after 22:00 increased the risk of malaria infection** (RR = 1.25, 95% CI 1.14–1.37) whereas the waking time had no association. **The use of bednets was not associated with malaria infection.** In addition, a high proportion of people (70.5%) reported using nets the night before interviews. Limited access to vector control tools (LLINs, IRS) was detected in Mâncio Lima. *An. darlingi* is the main malaria vector and it is likely that most transmission is outdoors.
- **In Thailand**, LLIN universal coverage was not achieved in the study area. It has, nevertheless, been ascertained **that primary biting vectors are active in the early evening or late morning**, with between 20% and 38% of bites occurring when people are not under the nets. Other contributing factors to residual malaria transmission (RMT) in the study site include: i) some members of the population have different sleeping times, going to bed later or rising earlier, thereby increasing their risk of exposure to anopheline bites; ii) a large proportion of the population stay overnight in farm huts or the forest where sleeping times are different and where net use is low; iii) there were 25% to 50% of households with damaged nets, decreasing protective efficacy; and iv) some people do not use nets even if they are available, thereby exposing themselves to biting during the night. This is particularly important where the housing structure is very open and in farm huts. The **key gaps that need to be addressed to reduce the current transmission in this region** include: i) achieving universal coverage and usage of LLINs to remove risk from vectors biting during sleeping times; ii) achieving better maintenance of nets either through behavioural change or more frequent replacement of damaged nets; and iii) novel personal protection tools are required to protect people in the forest and from early evening and late morning biting.
- **In Viet Nam**, LLIN coverage in the study site is optimal, however 100% of biting from secondary vectors occurred before 22:00 and around 26% of households had nets that were observed to have holes or tears, decreasing their protective effect. Further, a large proportion of the population stay in farm field plots for long periods where their sleeping times are different, usually from 19:30 to 05:00. This means they would be exposed to 28.7% of bites if they used LLINs during this time. However, net use in the farm huts was not observed to be universal and farm hut structures are open and offer little or no availability to hang nets. Nets are not used in the forest when people are working or sleeping outside, and these people are thus exposed to about 4.73 bites per person

per night. The following **issues need to be addressed to reduce the current transmission in this region**: i) achieve generalized coverage and usage of LLINs in the farm huts to reduce the risk from vectors biting during sleeping times (distribution of more nets per household to ensure coverage at both household and farm hut locations); ii) improve farm hut structures to offer more protection from mosquitoes; and iii) novel personal protection tools are required to protect people in the forest and from early evening and late morning biting.

- **In Burkina Faso**, the EIR is very high with 255.45 infectious bites per person per year. A **higher density of malaria vectors was observed indoors** compared to outdoors. However, a change in the mosquito collection methodology (from CDC traps to miniature double nets), demonstrated **higher biting rates outdoors than indoors**. **High resistance of all malaria vectors to the pyrethroids commonly used in LLINs was reported**, with very low mortality rates when mosquitoes were exposed to bednets collected from the households. Community members tended to spend most of the early evening hours outdoors, only moving inside at around midnight. Further, a significant proportion of people in the communities studied were observed to sleep outdoors at night during the dry season due to the hot climate, with no protection against mosquitoes. Finally, **surprising observations included the misconception** that people could get malaria from eating certain fruit and other foods or eating food contaminated by mosquitoes; mosquitoes being just one of the ways to contract malaria.
- **In the United Republic of Tanzania**, the EIR was 8.34 infectious bites per person per year, but surprisingly higher parity was observed in *Anopheles funestus* compared to *Anopheles arabiensis*. **High resistance of all malaria vectors to the pyrethroids commonly used in LLINs was also reported,** again with very low mortality rates when mosquitoes were exposed to bednets collected from households. As in other countries studied, community members are usually outdoors in the early evening hours. There was also a misconception that mosquitoes carrying malaria parasites are only active between midnight and 02:00.
- **In Cameroon, Ethiopia and Kenya** it was concluded that the **use of LLINs by the population** in the equatorial forest, highlands and coastal regions **was associated with a reduction in malaria transmission intensity**. However, several factors related to mosquito species composition, biting and feeding behaviour, **insecticide resistance and human behaviour affect the protective efficacy of LLINs**. Malaria transmission in scaled-up interventions (LLINs and IRS) seems to be driven by more relaxed feeders which are less anthropophilic and more exophilic vectors, such as *An. funestus*, *An. arabiensis* and *Anopheles moucheti*, in the three sites. Some secondary vectors, such as *Anopheles pretoriensis*, *Anopheles coustani* and *Anopheles Squamosus*, also seem to be playing a role in outdoor malaria parasite transmission. These findings highlight the need to identify additional means to control malaria transmission and other related diseases in these foci where the population is particularly exposed to the risk of outbreaks due to the transmission of pathogens from primates to humans. The use of an integrated control approach to improve the performance of LLINs and limit the expansion of insecticide resistance could be indicated. In addition, more sensitization of the population is needed to emphasize the importance of using control measures regularly and avoiding certain activities which could increase their exposure and the transmission of malaria.
- **Papua New Guinea**: This study revealed a higher prevalence of *Plasmodium spp.* infections and incidence of clinical malaria cases in villages on the north coast of Madang compared to villages in the Lemakot catchment of New Ireland Province, as well as differential vector bionomics and patterns of human behaviour in the two areas. In the catchment area of Mugil health facility, the incidence of clinical malaria cases is 279/month/1000 population and the prevalence of RDT positive symptomatic malaria cases in community cross-sectional surveys was 3.4%. Reported LLIN use in each village ranged from 81-94%, however correlating data on **human and vector behaviour indicated that up to 70% of individuals are exposed** (i.e. not under an LLIN) during the peak vector biting period in their village. In villages of the Lemakot catchment the incidence of clinical malaria cases was substantially lower and the prevalence of RDT positive symptomatic cases in community cross-sectional surveys was 1.9%. Reported LLIN use was substantially lower in these villages compared to Madang, ranging from 29-39% and between 45-95% of people reported being exposed during the peak biting period.

- ✓ **High level resistance of fleas to insecticide in Madagascar has been demonstrated** with strong negative consequences on the control of this disease.
- ✓ A **training course on the ethics of implementation research (IR)** comprising six modules was developed in collaboration with the WHO Global Health Ethics Unit and launched in 2019. This two-and-a-half-day course covers ethical considerations in planning, conducting and reporting IR. It is designed for programme managers, public health specialists in ministries of health or national research institutes, staff in the health care system and research ethics committee members. The course was officially launched during the Global Conference on Implementation Science and Scale-up held in June 2019 in Dhaka, Bangladesh. The regional train-the-trainers workshop for LMICs in the WHO Eastern Mediterranean Region (EMR) was held in December 2019 in Cairo, Egypt.
- ✓ **Short course on implementation research.** Given TDR's current focus on implementation research, TDR's Regional Training Centre in the WHO Region for Africa (RTC/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. This will eventually enable the RTC to run the PIR course as a self-sustaining venture. This training has been proposed for integration into various curricula of regular postgraduate programmes. In this regard, two courses (a 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. The RTC/AFR also collaborated with the Nigerian Institute of Medical Research, the University of Nairobi (Kenya) and the Mahniça Health Research Centre (Mozambique) to run a course on basic principles in IR. The PIR training course is also being strategically implemented by RTC/AFR in the other RTCs, for example at the Astana Medical University, by organizing face-to-face training for four institutions in Kazakhstan (the Republican Center for Health Development, the Republic Center for Digital Health, the National Center for Public Health and Astana Medical University).
- ✓ TDR developed and launched the **Health Product Profile Directory** (HPPD). The HPPD is an online database describing eight to ten key characteristics (such as target population, measures of efficacy and dosage) of product profiles for medicines, vaccines, diagnostics and other products that are intended to be accessed by populations in low- and middle-income countries. An analysis of the HPPD content was published by TDR in December 2019. It shows that the 215 profiles contained therein mainly describe R&D priorities in infectious diseases, with the majority describing the needs for HIV, TB and malaria. The emerging diseases contained in the WHO R&D Blueprint, including Ebola, Zika and Lassa Fever, are also covered. However, less than 2% of these strategic documents cover noncommunicable diseases or family and women's health. The information contained in the directory should inform any discussion of R&D priorities in global health, particularly the need to include considerations of access such as price, at an early stage in the innovation cycle. WHO's Chief Scientist requested TDR to lead the establishment of a working group to provide internal guidance on research priority setting methodology.
- ✓ A **strategic approach was agreed by countries of the West and Central African regional networks for TB control** (WARN-TB and CARN-TB) to enhance the capacity for TB research embedded in national TB programmes to support WHO's End TB strategy. A collaborative model was adopted in West and Central Africa (WCA) to create a regional dynamic, synergize all partner efforts and enhance the conduct of operational and implementation research addressing national and regional research priorities. The WCA region is composed of a series of small countries (except the Democratic Republic of the Congo and Nigeria) facing similar challenges which could benefit from similar solutions. These regions were selected taking into consideration the TB burden, country needs and international support already received that is far less compared to the support provided to countries of the Eastern and Southern African sub-regions.
- ✓ Convened 44 African countries for a regional meeting that resulted in **identification of research barriers for the implementation of new treatment guidelines for multidrug-resistant TB** and how

to move forward. One experience of collaborating with national TB programmes (NTPs) showed us that even if countries have the capacity to develop research protocols, they may lack the resources to make this their focus. This is a real barrier for the NTPs to conduct more OR/IR projects and scale up recommended new strategies. We therefore developed a research package (generic protocol, data collection tool, key study procedures) that can be used by the NTPs and adapted easily to their country context for conducting OR projects for the use of new all oral shorter MDR-TB regimens. Thanks to the standardized methodology and data collection tool, similar data should be collected (at least for the key variables) that would ease data sharing if countries are willing to do so. This could be particularly useful for informing TB guideline updates.

- ✓ The guidance document: **A Multisectoral Approach for the Prevention and Control of Vector-Borne Diseases: A Conceptual Framework** has been developed. While the guidance is primarily directed at decision-makers, with specific relevance for governmental sectors, the framework can be tailored to suit the needs of sub-national and decentralized stakeholders. The purpose of this framework is not only to support supra-ministerial leaders in the health sector, but also to enhance the capacity of decision-makers in other sectors to achieve as a collective effort efficient prevention and control of VBDs.
- ✓ An innovative challenge contest used internet and social media platforms for **crowdsourcing ideas to address the problem of lack of gender equity** in the Clinical Research and Development Fellowship (CRDF) scheme. The top three ideas collected and ranked were: 1) enhanced social media communication targeting women; 2) building institutional pre-application support for women applicants; and 3) creating a nomination system to nudge women applicants. All these ideas were then implemented as part of the 2019 CRDF application cycle, with the result being considerably increased numbers of eligible women applicants and of fellowships awarded to women.
- ✓ The final draft of the **TDR Toolkit on Intersectional gender analysis in research on infectious diseases** has been completed. Scientists, including those focusing on implementation research, would benefit from adequately considering sex and gender intersecting social dimensions within their research programmes, by strengthening both the practice and science of implementation, and by contributing to improved health outcomes and reduction of gender and health inequalities. For this purpose, the TDR Toolkit on Intersectional Gender Analysis in Research of Infectious Diseases of Poverty has been developed and its pilot started in December 2019 at country level in Nepal and Uganda, in collaboration with institutions of the Rings Network (Makerere University School of Women and Gender Studies and HERD International).
- ✓ **Promoting gender-responsive health interventions to prevent and control infectious diseases.** Building and sustaining the research capacity of men and women scientists has been a core activity of TDR since its inception. This includes support for researchers through training courses and postgraduate programmes that develop leadership skills of scientists in low- and middle-income countries. In recent years, TDR has also focused on building the capacity of scientists to investigate gender dimensions of health, which are often overlooked. There is growing recognition that gender norms, roles, power relations, socioeconomic factors and other drivers of inequality, intersect with each other and influence access to health services and health outcomes. This must be considered when designing and implementing health interventions and monitoring universal health coverage. In response, TDR has developed tools to strengthen such research capacities, including an **intersectional gender research toolkit and an online course on gender-based analysis**.

  The University of Ghana School of Public Health, with support from TDR, has developed and pilot-tested an online course aimed at developing skills in gender-based analysis (GBA) for vector-borne diseases and climate change research. The target audience for this training is researchers and policy-makers from disease endemic countries. Further to this, TDR supported a delivery method of learning that will deviate from the traditional concept, that is, **an innovative global classroom**

**approach (use of online learning, web conferencing, video conferencing, discussion forum, blog moderation; use of social media for assignments)**. The course modules have gone through two rounds of peer review and have been piloted and offered at the University of Ghana and the University of the Witwatersrand in South Africa in 2019. Within the University of Ghana, the GBA online course has been integrated within existing gender and health courses offered at both undergraduate and postgraduate levels. This is expected to continue in 2020.

In 2019, The University of Ghana also collaborated with the University of the Witwatersrand and the Association of Schools of Public Health in Africa to identify eligible African academic institutions (e.g. schools of public health) who may plan to integrate the GBA short course in one of the modalities listed above. The University of the Witwatersrand is working to integrate modules from the GBA into a Master of Public Health (MPH) course on the social determinants of health: Health and Society (COMH7221). The course is scheduled to run in February 2020.

- ✓ For the first time, TDR collaborated with AMRO/PAHO and the Alliance for Health Policy and Systems Research (AHPSR) to provide grants to researchers and decision-makers to examine how to improve health systems in the Americas. The grant programme, "Embedding Research for the Sustainable Development Goals", supported implementation research projects and sought to facilitate improvements in health programmes, policies or systems by generating knowledge through research that is embedded within existing policy and decision-making systems in Latin America and the Caribbean. This is the first time TDR has collaborated with these partners to focus on an **embedded research approach to improve health care delivery within national health programmes**. The project aims to identify gaps in research capacity and barriers to effective health system performance that are the key steps toward stronger health systems. The grants were awarded to improve programme implementation in public institutions, to improve the efficiency of health policies and programmes, to incorporate research into those programmes, to learn more about how to conduct research for implementation and to facilitate evidence-based health decision-making.
- ✓ The **ADP Platform for South–South Exchange and Learning** was launched in January 2019 to leverage the experience and lessons learned from Access and Delivery Partnership (ADP) focus countries, with the aim of identifying transferable lessons and tools to promote technical learning and exchange, and strengthening regional partnerships and networks that sustain national level capacity development.
- ✓ Many infectious disease researchers in low- and middle-income countries face difficulties when applying for research grants. Crowdfunding can help address these difficulties by allowing LMIC researchers to directly raise funds for their research. In partnership with Social Entrepreneurship to Spur Health (SESH), TDR Global launched a **challenge contest to build capacity for crowdfunding for infectious disease research**. A total of 121 researchers from 37 countries submitted proposals to the challenge contest. Five finalists have been identified, matched with ten TDR Global mentors, and given public engagement training to prepare them for crowdfunding. The researchers joined a capacity building workshop hosted by TDR in Geneva in November 2019, with the goal of enhancing their proposals and developing sharp pitches. The finalists plan on launching their campaigns in early 2020.
- ✓ Building on the novel experimental, methodological, transdisciplinary research advances for critical health & environmental challenges from the research projects in Africa, TDR had further developed **a model for Operationalizing One Health for Vector Borne Diseases in the context of Climate Change**, in which countries in Sub Saharan Africa and the Sahel can use a One Health Scorecard and Metrics tool for effective and efficient programme management.
- ✓ Novel tool: Three **capacity building workshops with small grant grantees** were organized to provide them with an opportunity **to take the MOOC in implementation research**, particularly in the WHO regions of Europe, the Americas and the Eastern Mediterranean.

### Indicator 5 - Number of research data sets/platforms that are i) open access or ii) with an access permission level

Safety first: TDR brings safety to the fore as an essential element of evidence-based decision-making. Three initiatives continued from previous years:

- ✓ Database for countries to share **safety data on drug exposures during pregnancy** (in collaboration with the WHO HIV Department) (Gated access)
- ✓ Database on **novel treatments for multidrug-resistant TB** (in collaboration with the WHO Global TB Programme) (Gated access)
- ✓ The **TB-Platform for Aggregation of Clinical TB Studies** (TB-PACTS) is a partnership among the institutions providing data: TDR, the TB Alliance, and St. George's School of Medicine, University of London; with the platform developed by the Critical Path Institute (C-Path) (Gated access)

These will generate evidence of drug safety in routine use that is needed to support treatment guidelines.

TDR also works with the **Infectious Diseases Data Observatory** (IDDO https://www.iddo.org/) which includes the Worldwide Antimalarial Resistance Network (WWARN https://www.wwarn.org/) and the research community to create efficient and ethical platforms for the sharing of research data in the areas of **tuberculosis, malaria, Chagas disease, leishmaniasis, schistosomiasis and other soil transmitted helminths, and Ebola**. The data on these platforms is available for use by researchers that apply for access with a protocol in line with a community-developed research agenda. TDR provides the chair to the IDDO data access committees that manages this access process. (Four additional databases with gated access.)

In 2019 TDR developed and launched the **Health Product Profile Directory**[20] (HPPD). The HPPD is an online database describing eight to ten key characteristics (such as target population, measures of efficacy and dosage) of product profiles for medicines, vaccines, diagnostics and other products that are intended to be accessed by populations in low- and middle-income countries. An analysis of the HPPD content was published by TDR in December 2019[21]. (Open access)

## 3.4 Capacity strengthening outputs: Enhanced research and knowledge transfer capacity within disease endemic countries

The generation of new research evidence comes as a result of research and capacity strengthening projects and grants, as well as convening and priority setting activities that TDR funds.

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 6. Number and evidence of DEC institutions and networks demonstrating expanded scope of activities or increased funding from alternative sources, or that have influenced research agenda, policy and practice, as a result or related to TDR support | 0 | 5 | 9 *(+5)* |
| 7. Number of TDR grantees/trainees per year, and proportion demonstrating career progression and/or increased scientific productivity, disaggregated by gender | 79* (2017) 85% (2014) | 150* ≥80% | 397* *(+289*)* |

** Only counting trainees and recipients of individual training grants*

[20] https://www.who.int/tdr/diseases-topics/product-directory/en/

[21] https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-019-0507-1

## Indicator 6 - Number and evidence of DEC institutions and networks demonstrating expanded scope of activities or increased funding from alternative sources, or that have influenced research agenda, policy and practice, as a result or related to TDR support

- ✓ **The Western African Network against Arboviruses.** A first meeting fully supported by TDR was organized in 2018. This Network has been taken over by WAHO (West African Health Organization) and has expanded its activities. It is currently implementing a new entomological surveillance protocol in different countries, mostly supported by other funds.
- ✓ **The Caribbean network for vector control.** This network was originally supported by TDR with core funding and has since received other funding to expand (from the European Union, U.S. Centers for Disease Control and Prevention, and other sources), and is influencing the research agenda in the region against arboviruses, as well as policies and practices, through working groups and practical recommendations for vector surveillance, management of severe cases and other related topics.
- ✓ An informal **network of countries involved in research on the causes of residual malaria**. Since its creation, information briefs for stakeholders are influencing policies and new projects have been developed for implementing a multisectoral approach, therefore influencing and expanding the research agenda.
- ✓ **Access and Delivery Partnership (ADP).** TDR facilitated development of implementation research capacity for an integrated rollout plan for the new RTS,S/AS01 malaria vaccine across 275 districts in Ghana. The plan, coordinated by the University of Health and Allied Sciences (UHAS) in Ghana, was in response to an EDCTP call in 2018 on capacity development to facilitate delivery and uptake of new or improved medical interventions in African health systems. The plan involved a multisectoral working group which comprised UHAS, the Ministry of Health, Ghana National Drugs Programme and the Ghana Food and Drugs Authority (FDA). A €2.1 million grant was awarded to UHAS by EDCTP in November 2019 and administrative processing of the grant is currently under way for funding of activities in 2020.
- ✓ **SIHI Philippines hub** (University of the Philippines Manila): dissemination of social innovation approach in Asia. The hub has contributed to institutionalizing social innovation through the creation of the Gelia Castillo Award for Research on Social Innovations in Health, by the Philippine National Health Research System, in collaboration with the SIHI Philippines hub. The hub also organized calls for research on social innovation and they have embedded a course on social innovation in the medical school's curriculum, recognizing in a sustainable manner the important role this field can play in public health. The hub received **additional funding from other sources as their scope of activity in the area of social innovation expanded**.

## Indicator 7 - Number of TDR grantees/trainees per year, and proportion demonstrating career progression and/or increased scientific productivity, disaggregated by gender

In 2019, TDR added 289 new trainees: 77 students entered the postgraduate training scheme on implementation research at the seven universities funded by TDR in regions, while 68 researchers received small research grants through WHO regional offices. Sixteen new fellows were selected as part of the Clinical Research and Development Fellowship scheme.

The SORT IT scheme contributed to these number through various courses, which trained 128 nationals from country disease control programmes, including Kenya, Myanmar, Nepal, Sierra Leone, Pakistan, Uzbekistan and Zimbabwe, etc.

A survey of former recipients of long-term training grants will be carried out in 2020 to provide information on the trainees' career development. The questionnaire will include aspects such as TDR's role in the researchers' career progression, as well as the implications of gender on career development.

TDR's Regional Training Centres trained 769 participants (72% women) on good research practices in 2019, and 1265 participants in implementation research.

In addition, more than 5000 researchers from 200 countries participated in TDR's Massive Open Online Course on implementation research, conducted in English, French and Spanish.

## 3.5 Global engagement outputs: Key stakeholders engaged in harmonizing agenda and practices and in new initiatives

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 8. Number and evidence of research-related agendas, recommendations and practices agreed by stakeholders at global, regional or country level and facilitated by TDR | 0 | 6 | 5 *(+2)* |
| 9. Evidence of stakeholder engagement in TDR joint initiatives aligned with TDR strategic objectives | N/A | N/A | Evidence provided |

### Indicator 8 - Number and evidence of research-related agendas, recommendations and practices agreed by stakeholders at global, regional or country level and facilitated by TDR

- ✓ Convened 44 African countries for a regional meeting that resulted in **identification of research barriers to the implementation of new treatment guidelines for multidrug-resistant TB** and how to move forward. Regional activities were conducted to strengthen the countries' TB surveillance systems to better understand TB control gaps at national and subnational level and **defining TB research priorities**.
- ✓ One report analysing HIV, TB, malaria and NTD pipelines published in 2018 was updated in 2019. In addition, the Portfolio-to-impact (P2I) tool developed by TDR was used to **analyse the R&D portfolios of FIND, the TB Alliance and EVI** and an analysis of all the data was synthesized by the Geneva Graduate Institute to identify where product development process differs between the PDPs and the commercial sector. The final report will be published in 2020.

### Indicator 9 - Evidence of stakeholder engagement in TDR joint initiatives aligned with TDR strategic objectives

- ✓ We have collaborated with the **International Atomic Energy Agency and its joint division with the Food and Agriculture Organization** to develop **guidance on testing the Sterile Insect Technique** (SIT) to control diseases carried by Aedes mosquitoes such as dengue, Zika and chikungunya.
- ✓ With **UNDP**, we have been contributing to the **Access and Delivery Partnership (ADP) to strengthen health systems** to ensure effective access to, and delivery of, tools to fight TB, malaria and neglected tropical diseases (NTDs). ADP is a collaboration between UNDP, WHO, TDR, and PATH and is funded by the Government of Japan. Within the partnership, TDR is working with ADP focus countries to strengthen institutional capacity in the areas of priority setting, implementation research and drug safety monitoring. The ADP focus countries are currently Ghana, India, Indonesia, Malawi, Senegal, Thailand and the United Republic of Tanzania.

- ✓ The Social Innovation in Health Initiative (SIHI) is a network of partner institutions and a community of stakeholders established in 2014 through TDR's leadership, in collaboration with the **University of Cape Town's Bertha Centre for Social Innovation and Entrepreneurship, the University of Oxford, the Skoll Centre for Social Entrepreneurship and LSHTM**. Further, in 2016 the network expanded to engage LMICs as implementing partners and SIHI country hubs were established at the **University of the Philippines, the University of Malawi, Makerere University in Uganda, the Centro Internacional de Entrenamiento e Investigaciones Médicas (CIDEIM) in Colombia and the Social Entrepreneurship to Spur Health (SESH)** project. In addition, SIHI collaborates with various contributing partners, such as **Fondation Mérieux, the Ahimsa Fund, the WHO Department of Service Delivery and Safety, the Pan American Health Organization, UNAIDS, AFRO, the United Nations University International Institute for Global Health, and UNICEF**, to advance and promote social innovation activities in the Global South.
- ✓ **Sharing research data for impact:** TDR provides the Chairperson for the **International Disease Data Observatory**. Meetings were held with stakeholders, including the ministries of health in Sierra Leonne, Guinea and Liberia, to ensure the governance mechanism to share individual patient data is ethical and efficient.
- ✓ To address the priority topic of antimicrobial resistance (AMR), a joint call for proposals under the **TDR/WHO regional office small grants scheme** provided an opportunity to synergize **with the SORT IT AMR programme**. A single call was issued for countries in the WHO regions of Africa, the Americas, Europe and South-East Asia. The objectives of the call are to strengthen the research capacity of relevant individuals and institutions in countries in AMR, to generate new knowledge, solutions and implementation strategies that can be applied by countries for the control and elimination of infectious diseases, and finally to encourage intersectoral dialogue and a One Health approach.
- ✓ For the first time TDR **collaborated with AMRO/PAHO and AHPSR to provide grants to researchers and decision-makers** to examine how to improve health systems in the Americas. The grant programme, "Embedding Research for the Sustainable Development Goals", supported implementation research projects in 2018 and 2019 and sought to facilitate improvements in health programmes, policies or systems by generating knowledge through research that is embedded within existing policy and decision-making systems in Latin America and the Caribbean. This is the first time TDR has collaborated with these partners to focus on an embedded research approach to improve health care delivery within national health programmes.
- ✓ TDR has continued to play a leadership role in developing the field of implementation research by developing a framework for IR core competencies in collaboration with a range of partners, including the **UNDP/UNFPA/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction** (HRP).

# 4. Application of core values

## 4.1 Socio-economic and gender equity

TDR is a Research Fairness Initiative reporting organization and has been externally evaluated as an organization that can use the RFI logo, demonstrating its fairness in:

- Opportunities: involvement of all stakeholders in our work to ensure impact at country level
- Processes: measures our commitment to equity in how our programmes are implemented
- Benefits: fairness in the sharing of costs and outcomes in our research and seeking to apply best practices in our research collaborations and partnerships

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 10. Proportion of TDR grants/contracts awarded to institutions or individuals in DECs (total count and total amount) | 62% (count)<br>74% (amount) | 75% DEC | 62% DEC (count)<br>74% DEC (amount) |
| 11. Proportion of experts from DECs on TDR external advisory committees | 78% | >60% | 70% |
| 12. Proportion of peer-reviewed publications supported by TDR with authors from DEC institutions (first author - FA, last author - LA, all authors - AA) | FA: 73%<br>LA: 56%<br>AA: N/A | ≥67% | FA: 85%<br>LA: 63%<br>AA: 71% |
| 13. Number of peer-reviewed publications supported by TDR and percentage published in open/free access | 200<br>88% | ≥150/year<br>100% | 223<br>93% |
| 14. Proportion of women among grantees/contract recipients (total count and total amount) | 40% (count)<br>29% (amount) | 50% | 47% (count)<br>47% (amount) |
| 15. Proportion of women on TDR external advisory committees | 50% | 50% | 57% |
| 16. Proportion of women authors of peer-reviewed publications supported by TDR (first author - FA, last author - LA) | FA: 38%<br>LA: 24% | 50% | FA: 43%<br>LA: 28% |
| 17. Number and proportion of peer-reviewed publications explicitly considering: gender and women issues, vulnerable groups or people with disabilities | N/A | 80% | Total: 75%<br>Gender: 5%<br>Vulnerable: 57%<br>Disabilities: 13% |

### Indicator 10 - Proportion of TDR grants/contracts awarded to institutions or individuals in DECs (total count and total amount)

In 2019, the total dollar amount of grants and contracts awarded to institutions and researchers in DECs (US$ 9.1 million) was 74% of the total. When measuring the number of grants and contracts awarded to institutions and researchers in DECs, 64% of Principal Investigators were from DECs, receiving 62% of the contracts, an increase from 58% in 2018. The average amount of a contract/ grant was higher for DECs than non-DECs.

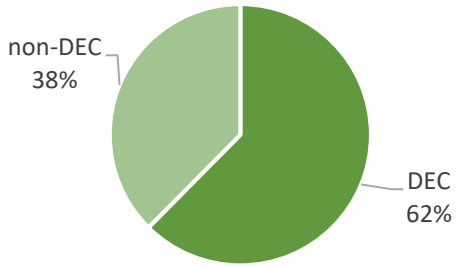


**Figure 2 - GRANTS/CONTRACTS: proportion awarded to disease endemic countries (% count) in 2019**

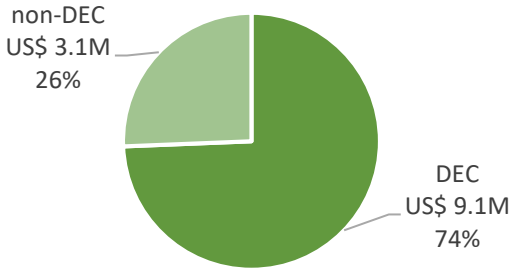


**Figure 3 - GRANTS/CONTRACTS: proportion awarded to disease endemic countries (% amount) in 2019**

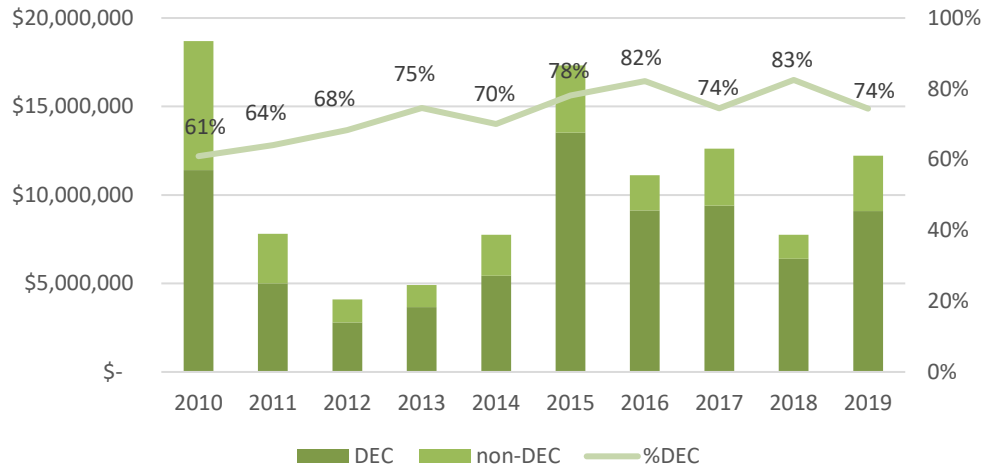


**Figure 4 - GRANTS/CONTRACTS: yearly progress in amounts and proportion awarded to DECs (US dollars)**

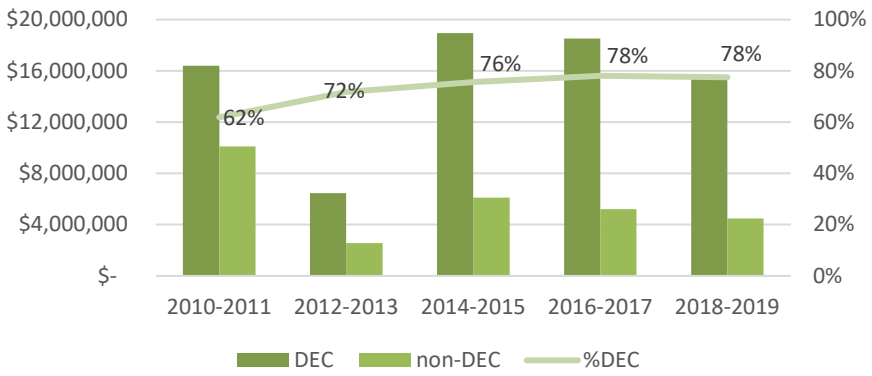


**Figure 5 - GRANTS/CONTRACTS: biennial progress in amounts and proportion awarded to DECs (US dollars)**

## Indicator 11 - Proportion of experts from DECs on TDR external advisory committees

In 2019, the proportion of TDR advisers originating from low- and middle-income disease endemic countries was 70%, increasing from 68% the previous year, and remaining well above the target of 60%. The countries advisers originated from are shown in the map below.

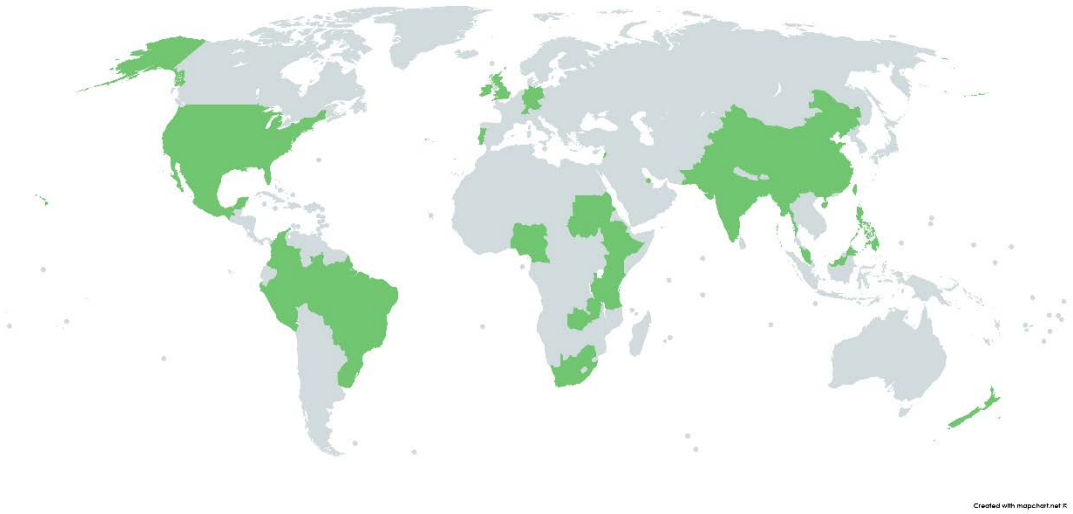

**Figure 6 - EQUITY: Countries of TDR advisers, 2019**

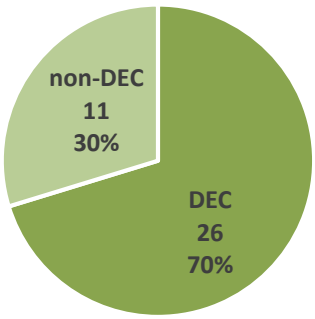


**Figure 7 - EQUITY: Proportion of advisers from disease endemic countries, 2019**

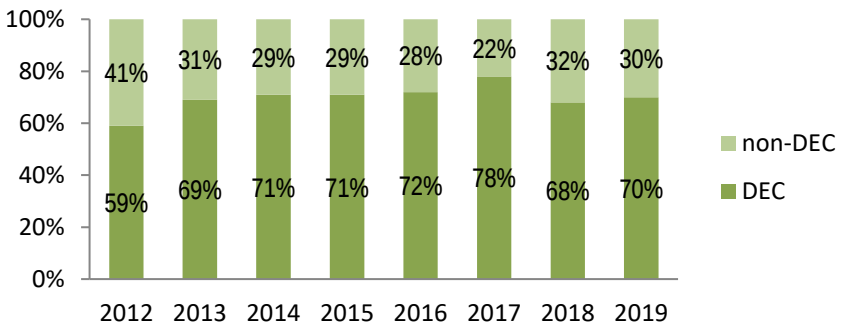


**Figure 8 - EQUITY: Proportion of advisers from disease endemic countries, 2012-2019**

## Indicator 12 - Proportion of peer-reviewed publications supported by TDR with authors from DEC institutions (first author, last author)

There were 223 TDR-supported peer reviewed publications in 2019. Among the authors of these publications, the proportion of first authors from DECs was 85%, the highest level ever recorded, and remaining well above the 67% target. This is a significant increase from previous years (see graph below) and reflects TDR's continued focus on building capacity and leadership for health research in low- and middle-income countries.

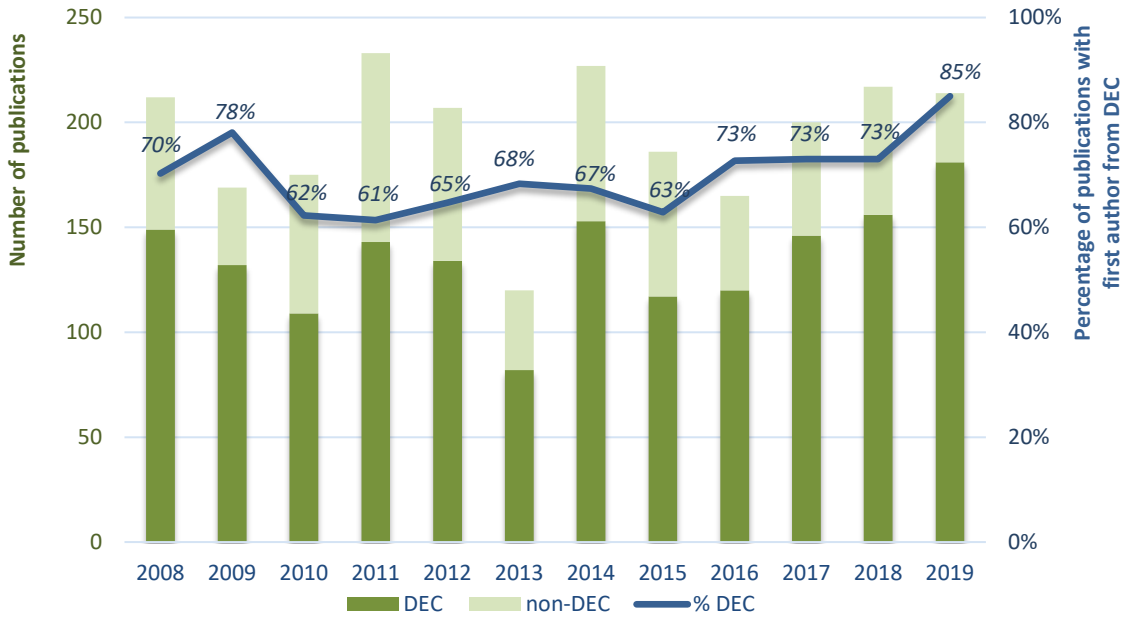


**Figure 9 - EQUITY: Proportion of first authors from DECs, yearly progress 2008-2019**

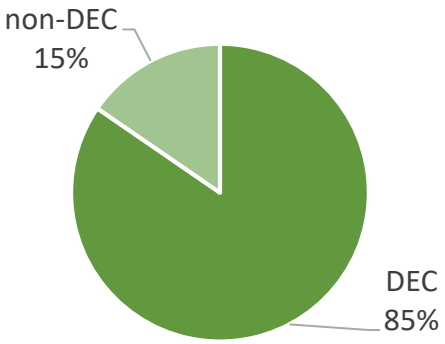


**Figure 10 - EQUITY: Proportion of first authors from DECs, 2019**

The graph below shows the relative distribution of first authors by gender and country of origin (women, men, DEC, non-DEC) in 2018 versus 2019.

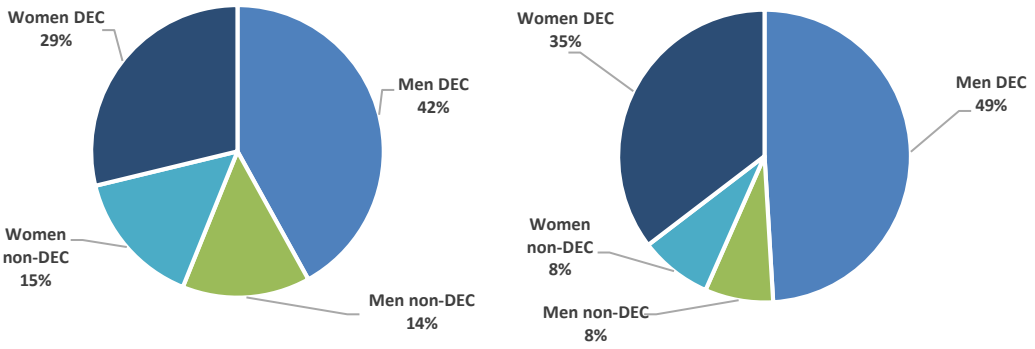


**Figure 11 - EQUITY: Distribution of first authors by gender and DECs, 2018 (left) vs 2019 (right)**

At the same time, we measured the proportion of last authors from DECs, which was 63% in 2019, an increase compared to 2018 (60%) and the baseline established in 2017 (56%). The trend points upward, paralleling the first authors curve. We noticed some interesting patterns that need further exploration. For example, in publications where the first author is from the WHO Western Pacific or South-East Asia region, the last author is almost always from the same region and country. However, for publications where the first author is from the WHO African region, the last author tends to be from either the WHO European or Americas region.

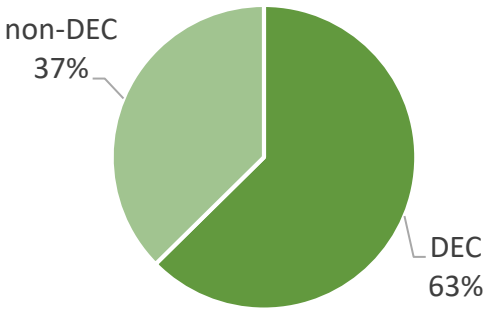


**Figure 12 - EQUITY: Proportion of last authors from DECs, 2019**

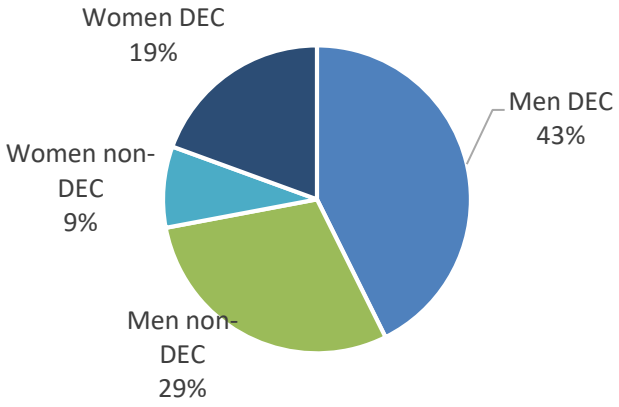


**Figure 13 - EQUITY: Distribution of last authors by gender and DECs 2019**

Also, we continued to measure the proportion of authors from DECs among all authors of a publication. For this, we took a random sample of 10% of all publications and checked the country of each author. The result (on a sample of 22 publications and 195 authors) showed that 71% of authors sampled were from DECs. This was around the baseline established in 2017 (74%).

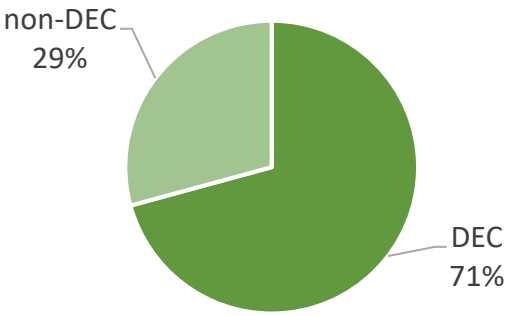


**Figure 13 - EQUITY: Proportion of authors from DECs among all authors, 2019 (sample = 22 publications, 195 authors)**

Upon recommendation by STAC, we measured for the first time the proportion of corresponding authors from DECs. It appears that in 2019, 83% of corresponding authors originated from institutions in DECs, versus 17% from non-DEC institutions. This ratio is closely aligned with the proportion of first authors from DEC institutions (85%).

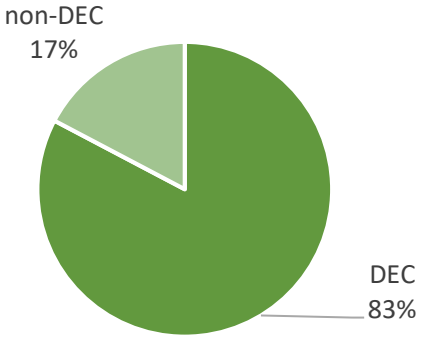


**Figure 14 - EQUITY: Proportion of authors from DECs among corresponding authors, 2019**

Overall, 73% of corresponding authors were the first authors of the respective publications, 21% were the last authors and 6% others.

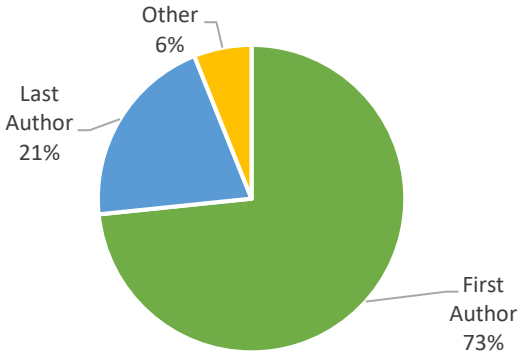


**Figure 15 - EQUITY: Corresponding authors' rank among the authors of TDR supported publications, 2019**

First authors originated from 53 countries around the globe. Country representation is illustrated in the diagram below. Note that in the top 20 countries with most first authors, 17 are low- and middle-income countries and 3 are high-income. The countries ranking highest include numerous SORT IT publications, which every year come from few countries, in high numbers.

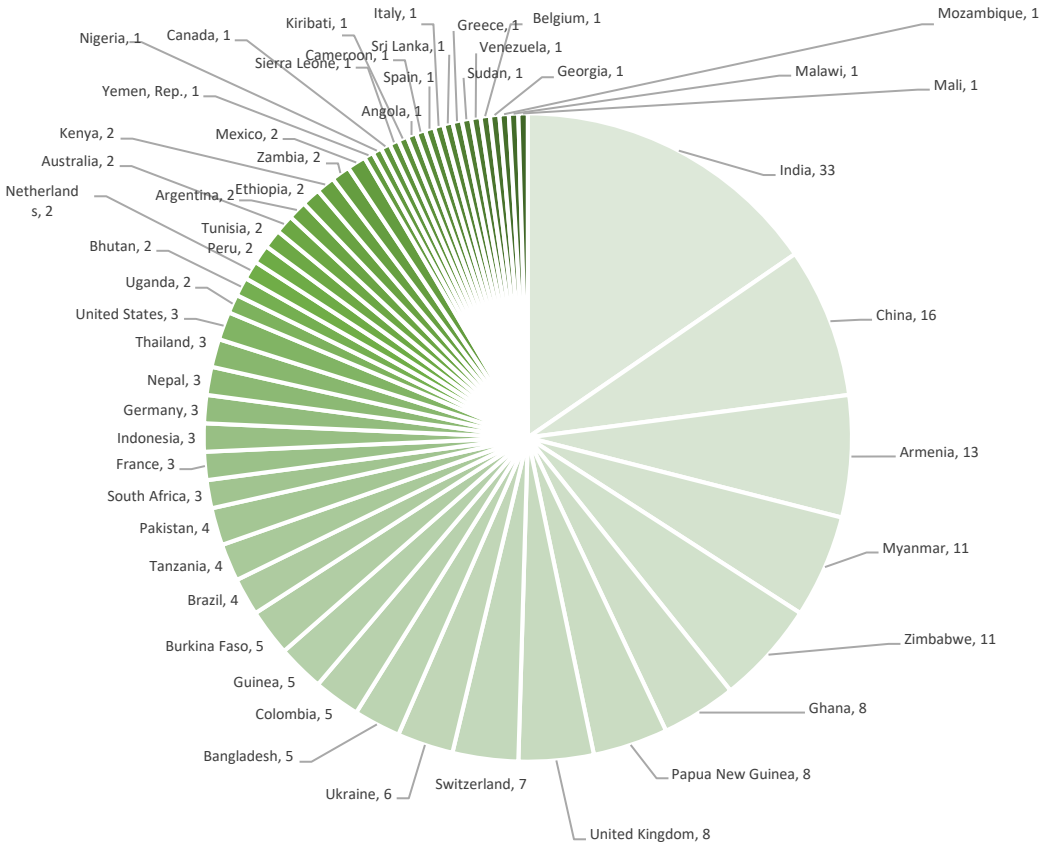


**Figure 16 - EQUITY: First author country representation, 2019**

## Indicator 13 - Number of peer-reviewed publications supported by TDR and percentage published in open/free access

The number of peer-reviewed publications supported by TDR in 2019 was 223.

The complete list of publications supported by TDR in 2019 is attached in Annex 1. It provides the names of the author(s), the publication title and the peer-reviewed journal where it appears.

**Key publications**

Some of the key publications that came out with TDR support in 2019 are listed below. Although it is difficult to foresee which of these will end up having a high impact on policy and practice globally and/or at country level, we chose the following for their potential to represent impact policy and practice globally and in countries, and create models that others can follow.

- Addisu A, et al. Ethiopia SORT IT Neglected Tropical Diseases Group. Neglected tropical diseases and the sustainable development goals: an urgent call for action from the front line. BMJ Glob Health. 2019 Feb 8;4(1):e001334. doi: 10.1136/bmjgh-2018-001334. eCollection 2019

  This article, authored mainly by researchers in DECs, is a strong signal from the front line of the fight against infectious diseases of poverty, and a call to action to invest more and organize better to achieve the SDG targets through research, increased advocacy and capacity strengthening where it is needed most. It makes the case for 'strong activism and political momentum' to escape from the current state, where neglected tropical diseases (NTDs) attract only 0.6% of development assistance for health funding.

- Banjara M R, et al. (2019) Integrating Case Detection of Visceral Leishmaniasis and Other Febrile Illness with Vector Control in the Post-Elimination Phase in Nepal. American Journal of Tropical Medicine and Hygiene, 100(1), 108-114.

  In Nepal, fever camps and insecticidal wall paint proved to be alternative, sustainable strategies in the visceral leishmaniasis (VL) post-elimination programme. Nepal has completed the attack phase of VL elimination (based on active case detection (ACD) with treatment and indoor residual spraying with insecticides) and now needs ACD and vector control methods that are suitable for the consolidation and maintenance phases. This disease is now an infrequent cause of fever in Nepal, and a vertical programme cannot be maintained. However, ACD is very useful in detecting VL and can be engineered to allow integration of disease control and case management for sustainability.

- Edwards H M, et al. (2019b) Transmission risk beyond the village: Entomological and human factors contributing to residual malaria transmission in an area approaching malaria elimination on the Thailand-Myanmar border. Malaria Journal, 18, 20.

  This study suggests drivers of residual malaria transmission in the area. The findings highlight gaps in current intervention coverage beyond the village setting (there are recommendations for novel personal protection tools such as treated blankets and coats). It raises the point that *"Given the low transmission setting, use of epidemiological endpoints in randomized control trials of these tools would be unfeasible and thus the use of entomological endpoints to prove efficacy needs to be accepted among donors, governments and regulatory bodies if the utility of such tools in the elimination context is to be realized".*

- Alonge O, et al. (2019) Developing a framework of core competencies in implementation research for low/middle-income countries. BMJ Global Health, 4(5), 8.

  TDR has led the development of the first framework of core competencies for the rapidly growing field of implementation research in low- and middle-income countries. The framework will be useful for identifying competencies needed by teams based in LMICs to respond successfully to health programme and health service implementation challenges. This framework will also be useful for assessing the effectiveness of training programmes in implementation research, providing direction and support for professional development and guiding the future development of such training programmes in LMICs.

**Open access**

In 2019, 93% of TDR-supported publications were published in open or free access, the highest proportion ever for TDR-supported publications, and up from 81% in 2018. The trend points towards getting closer to 100% open access in a few years from now.

In order to promote and enhance the translation of research into practice, free access to research publications is key. To measure the extent to which TDR-supported publications responded to the open access concept, the percentage of publications electronically accessible (full text) via Web of Science were counted. In general, users can access articles free of charge either because they are published in an open access journal (such as PLoS or BioMed Central journals) or they are stored in a free access repository (such as PubMed Central) at the request of one of the research funders. Other scenarios that guarantee free access are TDR-funded journal supplements or special agreements between authors and publishers to make access to a specific article free of charge for the reader.

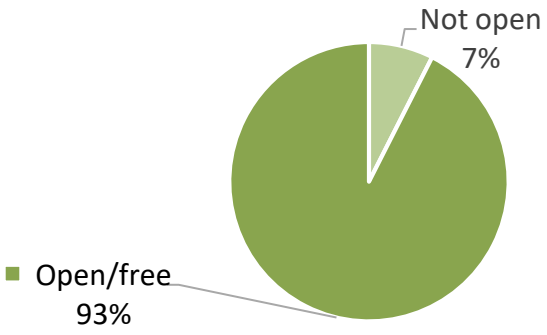


**Figure 17 – EQUITY: Proportion of publications in open/free access, 2019**

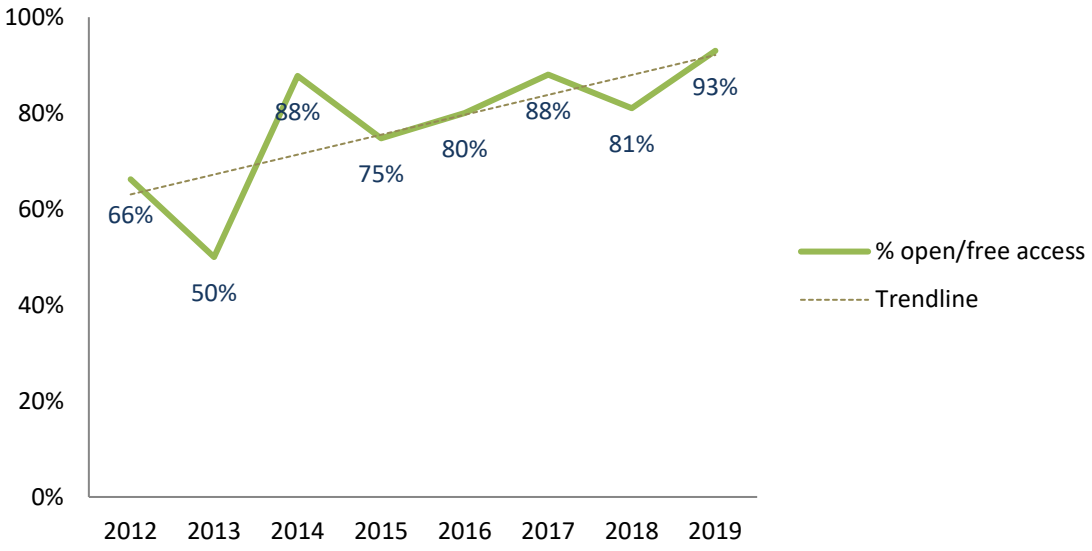


**Figure 18 – EQUITY: Proportion of publications in open/free access, yearly progress 2012-2019**

If we are to achieve 100% open/free publications, some obstacles need to be dealt with. A quick analysis shows that almost all non-open publications are from DEC authors, which may mean that there is a financial barrier in having their publications published in open access. An in-depth analysis is needed to identify incentives and means to support open/free access publications in such cases.

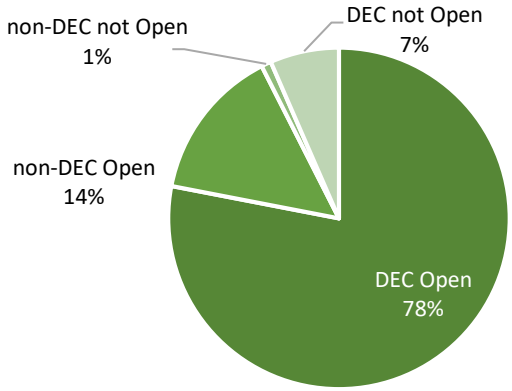


**Figure 19 – EQUITY: Proportion of publications in open/free access, by DEC / non-DEC status of first author, 2019**

We also looked to see if there was a gender bias in the proportion of open/free publications. The measurement shows that this is not a relevant factor, and the likelihood of publishing open is not impacted by the gender of the first or last author (Fig. 20 and 21).

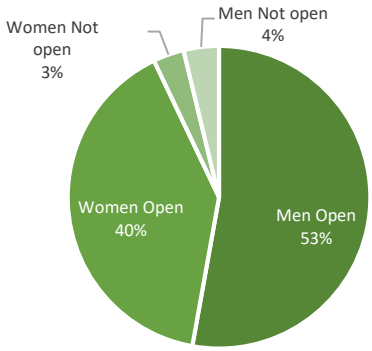


**Figure 20 – EQUITY: Proportion of publications in open/free access, by gender of first author, 2019**

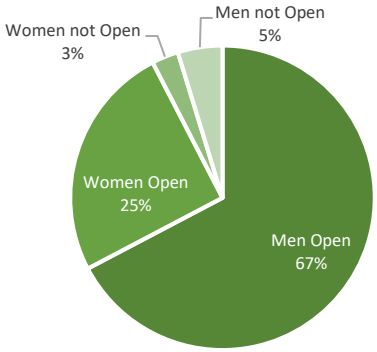


**Figure 21 – EQUITY: Proportion of publications in open/free access, by gender of last author, 2019**

## Indicator 14 - Proportion of women among grantees/contract recipients (total count and total amount)

In 2019, 47% of the amount allocated to contracts or grants was awarded to women (approximately US$ 5.7 million out of a total of US$ 12.2 million), an increase from 45% in 2018 and more than double the proportion in 2012 (22%). Of the number of contracts or grants, the proportion awarded to women remained the highest ever at 47%, compared to 40% in 2017. These measurements show a clear increase and confirm the continuing trend started in 2012, driven by the goal of bringing the proportion of women researchers as close as possible to 50%. The average amount of a contract or grant was equal for men and women.

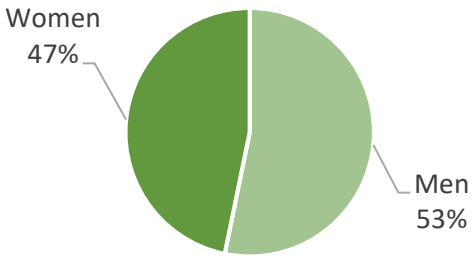


**Figure 22 – GENDER: Proportion of grants and contracts awarded to women ( count), 2019**

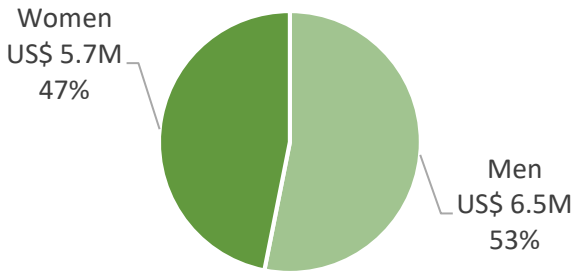


**Figure 23 – GENDER: Proportion of grants and contracts awarded to women (% amount), 2019**

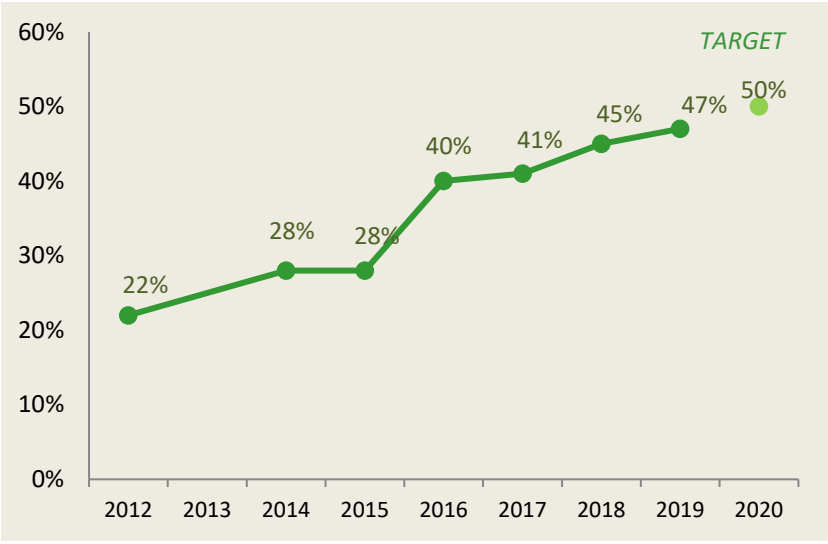


**Figure 24 – GENDER: Proportion of grants and contracts awarded to women, yearly progress 2012-2018 (% amount)**

Figure 25 shows the ratio of men and women among grantees from DECs and non-DECs.

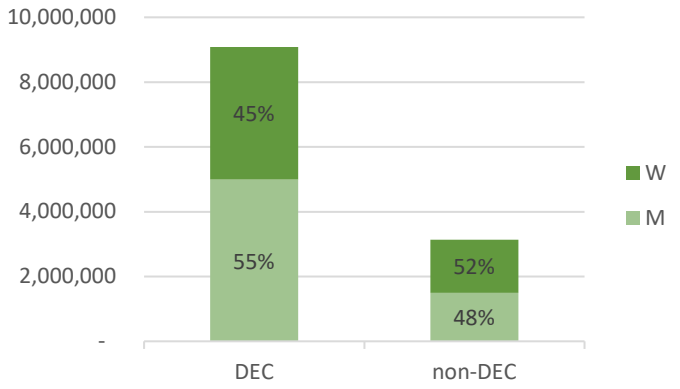


**Figure 25 – GENDER: Proportion and value of grants and contracts awarded to men and women in DECs vs non-DECs (% amount), 2019**

## Indicator 15 - Proportion of women on TDR external advisory committees

In 2019, women continued to make up 57% of the membership of TDR's external advisory committees. This result reflects our continuing drive to involve women in higher advisory roles, and the general effort by TDR towards gender equity. Comparing 2012 to 2019 shows the result of this effort, with the proportion of women doubling from 28% to 57%.

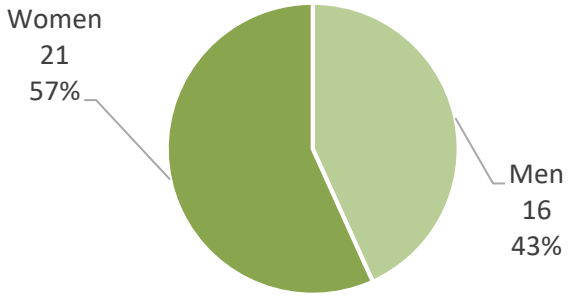


**Figure 26 - EQUITY: Gender distribution of external expert advisers, 2019**

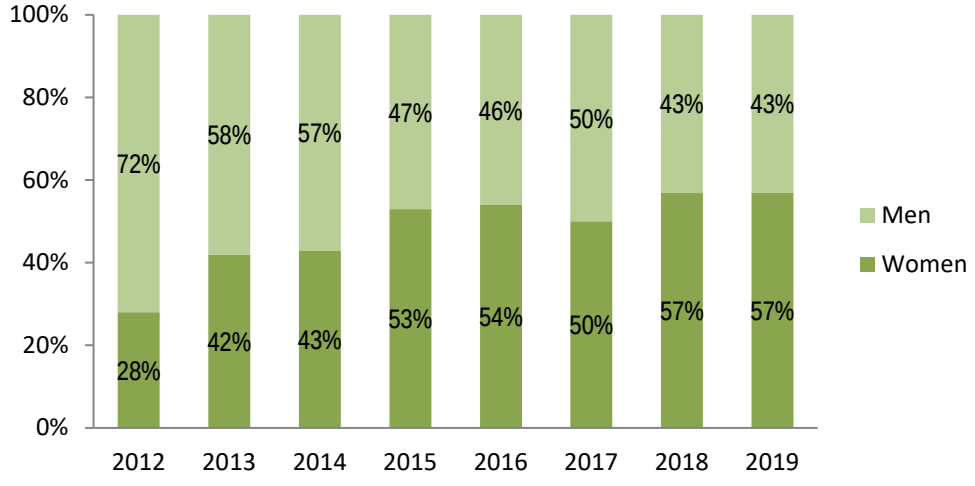


**Figure 27 - EQUITY: Yearly gender distribution of external expert advisers, 2012-2019**

## Indicator 16 - Proportion of women authors of peer-reviewed publications supported by TDR (first author, last author)

In 2019, 43% of first authors of TDR-supported publications were women. This result is similar to 2018 (44%). Compared to baseline (2017, 38%), the proportion has improved.

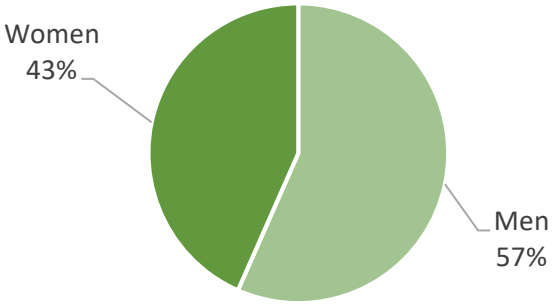


**Figure 28 - TDR-SUPPORTED PUBLICATIONS: Gender distribution of first authors, 2019**

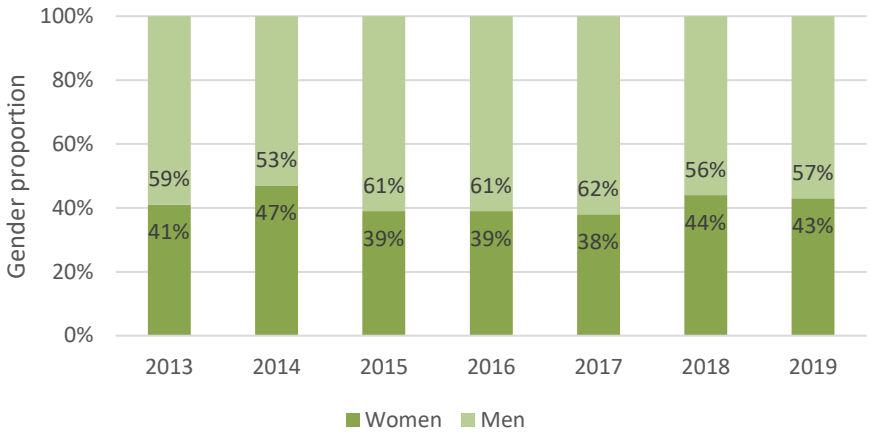


**Figure 29 - TDR-SUPPORTED PUBLICATIONS: Gender distribution of first authors year-to-year, 2013-2019**

In 2019, 28% of last authors of TDR-supported publications were women, the same result as in 2018. Compared to the baseline measured in 2017 (24%), the proportion has improved.

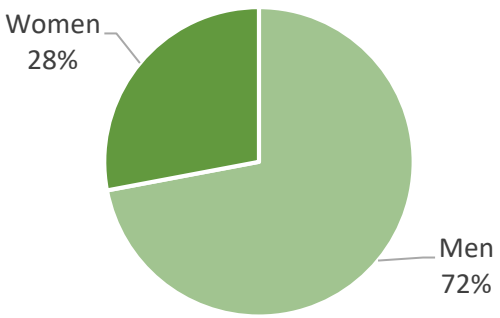


**Figure 30 - TDR-SUPPORTED PUBLICATIONS: Gender distribution of last authors, 2019**

At the request of STAC, we also measured the gender distribution of corresponding authors in 2019. The analysis shows that 42% of first authors of TDR-supported publications were women, a gender split similar to the first author statistics. The similarity is due to the fact that almost three quarters of corresponding authors were also the first authors of those publications.

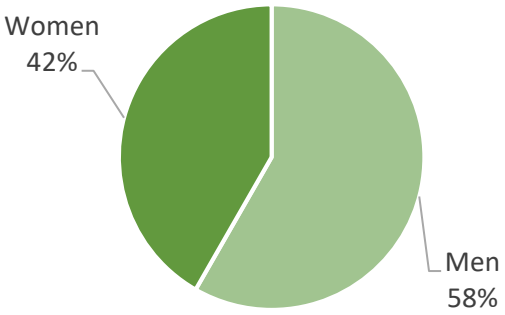


**Figure 31 - TDR-SUPPORTED PUBLICATIONS: Gender distribution of corresponding authors, 2019**

### Indicator 17 - Number and proportion of peer-reviewed publications explicitly considering: gender and women issues, vulnerable groups or people with disabilities

Out of the total number of peer-reviewed publications supported by TDR in 2019, we identified:

- 11 articles (5%) that addressed the topic of gender, from women's global health leadership in LMICs to better engaging women researchers, to antenatal, pregnancy and postnatal health care, to gender-norms focused health interventions, men having sex with men, etc.
- 121 articles (57%) related to research or capacity strengthening in the context of vulnerable populations (pregnant women, neonates, severe chronic diseases such as leprosy, cancer, multidrug-resistant tuberculosis or HIV/TB coinfection, patients with catastrophic healthcare costs, patients in palliative care, migrants and asylum seekers, prison inmates, children under five, adolescents, patients facing stigma, conflict-affected populations, patients with severe mental afflictions, etc.)
- 28 publications (13%) that address populations with disabilities (people suffering from river blindness, leprosy, severe leishmaniasis, lymphatic filariasis, palliative care, severe tuberculosis, trachoma, severely malnourished children, cancer, etc.).

## 4.2 Effective multisectoral partnerships

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 18. Resources leveraged as direct contributions (co-funding, services or in-kind) to TDR projects (examples) | $ 1:1 ($ TDR : $ partners)<br>People 1:30 (TDR : in the field) | < $ 2:1 | $1:1.5 ($ TDR : $ partners)<br>People 1:33 (TDR : in the field) |

### Indicator 18 - Resources leveraged as direct contributions (co-funding, services or in-kind) to TDR projects (examples)

During 2018-2019, it is estimated that TDR leveraged almost US$ 54 million in co-funding of projects, technical contribution, in-kind support, meetings, facilities use, laboratory work, training, site co-funding, network development, etc. For each dollar invested by TDR, there was $1.50 leveraged from other sources. This is a rough estimate, due to the difficulty of quantifying the various contributions. The same period saw an estimated 1000 people in the field working on TDR projects, either as principal investigators, co-investigators, grantees, trainees conducting some form of research or capacity strengthening activities, consultants, etc. This means that the number of people who worked on TDR projects in the field was 33 times higher than the TDR secretariat head count.

The list by TDR expected result appears in Annex 3.

## 4.3 Value for money

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 19. Evidence demonstrating value-for-money, cost savings and/or enhanced efficiency or effectiveness | N/A | N/A | Evidence provided |

### Indicator 19 - Evidence demonstrating value-for-money, cost savings and/or enhanced efficiency or effectiveness

TDR has formalized its value-for-money approach since 2012, by prioritizing, designing, planning, implementing and reporting activities and projects while addressing the principles of effectiveness, efficiency, equity and economy. In 2018-2019, WHO rolled out its Value-for-Money initiative, which added Ethics as a fifth value, which TDR immediately adopted.

We actively participated in the design and planning of WHO's Value-for-Money initiative, contributing with a trainer ("VfM champion") and trainees to an intensive programme that included over one hundred WHO staff, from programme to project managers and administrative staff linked to procurement. In addition, TDR volunteered to be the pilot department for a shortened, phased version of the training in 2020, which will train all TDR staff on the essential knowledge and practices that enhance value-for-money.

Also in 2019, TDR implemented the new, mandatory training on Procurement rolled out by WHO, for everyone involved directly or indirectly in procurement processes. This training, which includes concrete aspects of value-for-money, consolidates the body of knowledge already well represented in TDR and strengthens the procurement controls.

**Effectiveness:** We delivered the expected results as planned, exceeding some of the indicators through increased productivity that resulted in numerous tools being developed in collaboration with countries, regions and WHO programmes. Some of the tools that came out in 2018-2019 may have a broad and significant impact on improving the health of vulnerable populations. This is the case of moxidectin, for example, a novel anti-filarial co-developed by TDR and approved by the United States Food and Drug Administration, which has the potential to speed up onchocerciasis elimination, treating those already afflicted and preventing hundreds of millions more people from being afflicted by this severely disabling disease.

**Equity:** As evidenced under Indicators 3 and 17, in 2019 TDR delivered a multitude of tools, approaches and evidence to support the most vulnerable populations, so that no one is left behind. Vulnerable groups range from people with disabilities and chronic diseases to stigmatized populations, children, pregnant women, community engagement of women, etc. We also further mainstreamed gender by bringing gender and equity research into the Director's Office, giving it a cross-TDR reach. The progress made on socio-economic and gender equity is reflected in the respective set of indicators (10 to 17) in this report.

**Efficiency:** Externally, we worked through partnerships and collaborations with existing networks and organizations, to take advantage of existing infrastructure, field expertise and lower operating costs. For example, working through newly created networks of well established universities and regional training centres that administer TDR's postgraduate training scheme or short courses on research regionally, lowers the cost to TDR and offers a good level of quality. Working with WARN-TB and CARN-TB in West and Central Africa to systematically build capacity and advocacy for implementation research that strengthens country national programmes results in millions in leverage from parties that have become interested in supporting this approach. Similarly, the SIHI Hub activities attracted new collaborations in the field, which enhanced learning and knowledge transfer and scaling up of social innovations. The regional small research grants scheme leverages WHO regional office expertise and efforts to fund regional and country projects that address their priorities and build capacity in regions.

Internally, we increased our efficiency by streamlining the research structure in TDR by bringing together all of the research for implementation work into one unit, which will further simplify and harmonize the management of this strategic work area.

**Economy:** In 2018-2019, savings were made in both staff and support costs. Some positions remained vacant for lengthy durations, and actual salary and benefit costs came in lower than WHO's standard costs. In addition, our working model allowed us to have almost 1000 people in the field working on TDR projects (full-time or part-time) at a lower cost, to supplement the roughly 30 staff in the secretariat.

**Ethics:** We continue to follow WHO's rules on research ethics for all of our research projects, which sometimes results in activity delays. TDR's strong focus on building capacity in research ethics resulted in new courses on ethics in implementation research, disseminated through TDR's regional training centres, and developed jointly with the Research Ethics unit in WHO. We also piloted with SIDCER, FERCAP and PABIN, networks that TDR created in 2000, activities to strengthen the institutional capacity for ethics review and oversight in the countries where WHO is piloting its initiative of capacity strengthening for implementation research.

## 4.4 Quality of work

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 20. Proportion of project reports evaluated as satisfactory by external advisory committees | 100% | >80% | 96% |

### Indicator 20 - Proportion of project reports evaluated as satisfactory by external advisory committees

In 2019, all but one of the interim and final project reports were deemed satisfactory by external advisory committees. The committees reviewed 28 reports in total, and the satisfactory rate was 27 out of 28 (96%). The one report that was returned for improvement lacked sufficient information and internal consistency and will therefore be revised by the Principal Investigator and resubmitted.

## 4.5 Sustainability of outcomes

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2018-19)* |
|---|---|---|---|
| 21. Number of effective public health tools and strategies developed which have been in use for at least two years | 0 | 40 | 12 (+12) |

### Indicator 21 - Number of effective public health tools and strategies developed which have been in use for at least two years

We reviewed the list of effective public health tools and strategies developed which have been in use for at least two years as at 31 December 2019. One item was removed from the list, and twelve others were added. The new tools cover a broad spectrum, from training courses for implementation research to tools that are utilized in outbreaks, and from social innovation to vector control response and research ethics.

This marked a net increase from 86 tools (2017) to 97 in 2018-2019. The detailed list appears in Annex 2.

# 5. Management performance

## 5.1 Effective resource mobilization

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 22. Percentage of approved biennial budget successfully funded | *87.9% (US$ 39.5/45M)* | ≥100% | US$ 40M scenario: 100% |
| 23. Percentage of income received from multi-year, unconditional donor agreements | *17.3% (US$ 6.8M/39.5 M)* | 70% | 1% (US$ 0.3M/50.7M) multi-year unconditional 25% (US$ 12.8M/50.7M) multi-year conditional |

### Indicator 22 - Percentage of approved biennial budget successfully funded

We started the 2018-2019 biennium with two approved budget and workplan scenarios: the starting level at US$ 40 million, and the higher level, conditional on further available funding, at US$ 50 million. The available funding in 2018-2019 (through new income and funds carried forward) fully covered the US$ 40 million scenario and partially covered the US$ 50 million scenario.

At the start of the biennium in January 2018, funds forecasted for 2018-2019 were estimated at US$ 39.7 million (US$ 31.0 million undesignated; US$ 8.7 million designated). As we advanced in the biennium, the forecast increased to US$ 50.7 million by January 2019 (US$ 35.3 million undesignated; US$ 15.4 million designated). Part of the designated funds recognized in 2018-2019 were intended to fund 2020 activities. At the portfolio review in September 2019, planned costs for 2018−2019 were adjusted to US$ 45.8 million based on capacity for implementation and reallocation of undesignated funds. Expenditure was continually adjusted according to the income level, which allowed us to shift implementation towards the higher-level scenario as soon as we were certain that adequate funds would materialize.

### Indicator 23 - Percentage of income received from multi-year, unconditional donor agreements

Income from contribution agreements that were unconditional and lasting three years or longer decreased to 1% of TDR's 2018-2019 income (US$ 0.3/ 50.7 million). If we add conditional agreements, the proportion is 25% (US$ 12.8/ 50.7 million). A higher proportion would give TDR the opportunity to better plan for medium- and long-term results.

## 5.2 Effective management

| Key performance indicators | Baseline (2017) | Target (2023) | Progress *(contrib. 2019)* |
|---|---|---|---|
| 24. Percentage of staff workplans and performance reviews (including personal development plan) completed on time | 89% | ≥90% | 100% |
| 25. Proportion of expected results on track | 89% | ≥80% | 84% |
| 26. Proportion of significant risk management action plans that are on track | 100% | ≥80% | 92% |

### Indicator 24 - Percentage of staff workplans and performance reviews (including personal development plan) completed on time

As for 2018, in 2019 all staff workplans and performance reviews were done on time.

### Indicator 25 - Proportion of expected results on track

At 31 December 2019, 16 of the 24 expected results in TDR's portfolio showed their activities as being on track, while four expected results successfully completed[22] their planned activities on time. The activities of four expected results encountered minor delays (some due to WHO changes during the *transformation* phase, others due to complex circumstances in the field) and were not able to fully implement the revised plans; these activities will likely pick up steam in the 2020-2021 biennium.

The summary status of ERs at 31 December 2019 was:

- 4 completed on time
- 16 ongoing on track
- 4 ongoing with minor delays
- 0 with major delays
- 0 cancelled

The detailed list is available in Annex 3.

[22] The expected results are usually covering the six-year period of TDR's 2018-2023 strategy. Some expected results complete early.

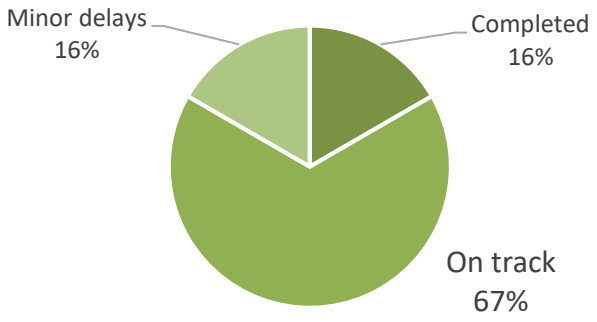


**Figure 32 - Status of expected results as at 31 December 2019**

## Indicator 26 - Proportion of significant risk management action plans that are on track

During 2019, five action items were completed, most of them related to items awaiting the finalization of WHO's transformation process. Another 20 were on track at 31 December 2019, one was on hold, and one was cancelled (no longer relevant). The proportion of actions on track and completed was 92%, well above the 80% minimum threshold. However, some risks have components that are outside of TDR's control, and the fact that action plans are on track does not mean the risks are totally under control.

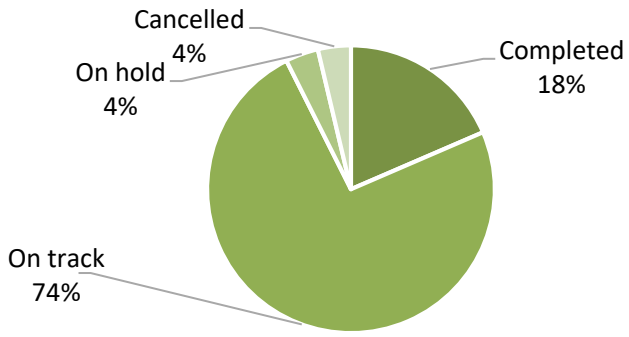


**Figure 33 - Status of risk mitigation actions as at 31 December 2019**

# 6. Lessons learnt

2019 was a successful year from the perspective of performance assessment and continuous improvement. Learning from success and failure is important to be able to further enhance our processes, activities and value for money.

**Enhanced fundraising for specific initiatives in TDR's portfolio of projects**

Leveraging on the success of working models piloted or co-developed by TDR, such as SORT IT, the SIHI Hub initiative or the TB research networks in Africa, we were able to enter into discussions with potential funders, who were interested in seeing these models expanded and scaled up. The SORT IT model attracted a grant the equivalent of just over US$ 10 million focused on developing country capacity for surveillance and monitoring of antimicrobial resistance. The SIHI project, aimed at researching and scaling up social innovation initiatives in low- and middle-income countries, received designated funding that allowed it to expand its hub model to five more countries, broadening the reach towards the most vulnerable populations. The two networks, WARN-TB and CARN-TB, that bring together over 25 countries of West and Central Africa, developed a workplan that attracted millions of dollars in new funding from the Global Fund, USAID and the WHO Global TB Programme, allowing expansion of the breadth of operational research and programme improvement in countries.

**Embracing funding from low- and middle-income countries**

Aside from TDR's major contributors, who contribute most of TDR's biennial funding, a number of smaller contributions prove to be equally important, as they are coming from disease endemic countries, the focus of TDR's work. We have improved the way we acknowledge these contributions in our reporting, by giving them more space, and continue to recognize the importance of having a number of disease endemic countries actively participating in our governance processes.

**Communicating with visuals**

As recommended by STAC, we have added and improved the use of infographics in our technical reports and advocacy documents, making them more user-friendly and transparent.

**Learning from evaluation studies and reshaping some of our training initiatives**

As part of regular monitoring and evaluation of the Regional Training Centres supported by TDR, problems were identified with the training centre in the WHO Western Pacific Region, which ultimately were not resolved, despite supportive action. Taking into account the outcome of an external evaluation, the Research Capacity Strengthening Scientific Working Group advised discontinuation of TDR support to this centre and identification of a new centre in this region through a call in 2020, primarily focusing on implementation research. Furthermore, STAC recommended documenting and integrating lessons learnt from the evaluation of this training centre for new centres in all regions.

**Improved value for money in scaling up operations towards a higher level budget scenario**

The budget scenario model used by TDR, with a base and higher level, proved successful in 2019 to allow swift scaling up of activities. As additional funds became available, shifting from the US$ 40 million budget and workplan scenario towards the higher US$ 50 million scenario was done in a smooth and efficient manner, as both scenarios had been developed in detail and approved in advance by TDR's governing bodies. Our teams were able to scale up project implementation and increase the value for money of our work, by investing the entire additional amount in operations. We actively participated in the design and planning of WHO's Value-for-Money initiative, contributing with a trainer ("VfM champion") and trainees to an intensive programme that included over one hundred WHO staff from programme to project managers and administrative staff linked to procurement.

# 7. Annexes

## Annex 1. List of TDR-supported peer-reviewed publications 2019

(Retrieved from Web of Science on 7 Jan 2019; the list also includes SORT IT publications not indexed by the Web of Science)


1. Abdul-Ghani R, Mahdy MAK, Al-Eryani SMA, Fouque F, Lenhart AE, Alkwri A, Al-Mikhlafi AM, Wilke ABB, Thabet AAQ, Beier JC. Acta Trop. Impact of population displacement and forced movements on the transmission and outbreaks of Aedes-borne viral diseases: Dengue as a model. 2019 Sep;197:105066. doi: 10.1016/j.actatropica.2019.105066. Epub 2019 Jun 18
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3. Addisu A, Adriaensen W, Balew A, Asfaw M, Diro E, Garba Djirmay A, Gebree D, Seid G, Begashaw H, Harries AD, Hirpa Adugna A, Ayalew Jejaw Z, Kamau EM, Kelbo T, Manzi M, Medebo Daniel D, Moloo A, Olliaro P, Owiti P, Reeder JC, Senkoro M, Takarinda K, Terry R, Timire C, Tucho S, Tweya H, Wendemagegn Y, Verdonck K, Vogt F, van Henten S, van Griensven J, Worku B, Zolfo M, Zachariah R; Ethiopia SORT IT Neglected Tropical Diseases Group. Neglected tropical diseases and the sustainable development goals: an urgent call for action from the front line. BMJ Glob Health. 2019 Feb 8;4(1):e001334. doi: 10.1136/bmjgh-2018-001334. eCollection 2019.
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9. Anaba, M. K., Ibisomi, L., Owusu-Agyei, S., Chirwa, T. & Ramaswamy, R. (2019) Determinants of health workers intention to use malaria rapid diagnostic test in Kintampo North Municipality, Ghana - a cross-sectional study. Bmc Health Services Research, 19, 8.
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## Annex 2. List of tools generated with TDR support that have been in use for at least two years at 31 December 2019

| # | Year | Tools / strategies / solutions |
|---|---|---|
| 1. | **1981** | *Leprosy - WHO recommendation for use of multidrug therapy (MDT) for leprosy following its registration in 1980 by Ciba-Geigy.* |
| 2. | **1983** | *Schistosomiasis* - Diagnostic urine-filtration technique in disease control use |
| 3. | **1983** | *African trypanosomiasis* - Card agglutination diagnostic test for trypanosomiasis (CATT) in disease control use. |
| 4. | **1989** | *Onchocerciasis* – Ivermectin is shown to be safe and efficacious during community studies opening the path to mass drug administration with ivermectin provided via the Mectizan Donation Programme |
| 5. | **1989** | *Chagas disease* - Improved agglutination blood test for rapid screening of transfusion blood in disease control use. |
| 6. | **1990** | *African trypanosomiasis* - Eflornithine® registered by Marion Merrell Dow. |
| 7. | **1993** | *Onchocerciasis* - Rapid epidemiological mapping of onchocerciasis (REMO) in disease control use. |
| 8. | **1994** | *Filariasis* - Single-dose treatment with DEC or ivermectin is shown to be an appropriate treatment regimen, providing the basis for a new global control strategy based on mass drug administration. |
| 9. | **1994** | *Leishmaniasis - Direct agglutination diagnostic test (DAT) and standard leishmania skin test antigen in disease control use.* |
| 10. | **1994** | *Chagas disease, sleeping sickness and leishmaniasis* - Parasite genome sequencing project launched in meeting in Brazil, co-sponsored by TDR and FIOCRUZ. Sequences published in 2005. |
| 11. | **1994** | *Onchocerciasis* - Effectiveness of mass drug administration with ivermectin in preventing posterior segment eye disease, visual impairment and blindness demonstrated in longitudinal studies in Africa. |
| 12. | **1994** | *Visceral leishmaniasis* - Liposomal amphotericin B registered by NeXstar. |
| 13. | **1995** | *Schistosomiasis* - Method for rapid identification of urinary schistosomiasis in highly endemic communities validated and in control use. |
| 14. | **1995** | *Onchocerciasis* - Importance of onchocercal skin disease determined, providing the basis for extending onchocerciasis control to forest areas in Africa. |
| 15. | **1996** | *Lymphatic filariasis* - Drug delivery strategies developed for lymphatic filariasis elimination in Africa. |
| 16. | **1996** | *Schistosomiasis* - Guidelines for diagnosis of female genital schistosomiasis completed. |
| 17. | **1996** | *Malaria* - Final results of large field trials of insecticide-treated bednets involving 400 000 people in Ghana, Burkina Faso, Kenya and The Gambia demonstrate that insecticide-treated bednets could reduce overall childhood mortality by around 20%. |

| # | Year | Tools / strategies / solutions |
|---|---|---|
| 18. | **1996** | *Onchocerciasis* - Community-directed treatment (ComDT) with ivermectin (CDTI) becomes the APOC mass drug administration delivery strategy following multi-country field studies showing that community direction results in better population participation than 'health system direction. |
| 19. | **1997** | *Leprosy* - Improved multidrug therapy based on rifampicin, oflaxacin and minocycline (ROM) used for leprosy control. |
| 20. | **1997** | *Malaria* - A TDR-supported pan-African conference on research in Dakar, Senegal decides to create the Multilateral Initiative on Malaria. |
| 21. | **1998** | *Malaria* - Home management of malaria approach adopted as a strategy by WHO. |
| 22. | **1998** | *Lymphatic filariasis* - Safety demonstrated for albendazole as treatment. |
| 23. | **2000** | *Lymphatic filariasis* - Rapid mapping of filariasis in control use. |
| 24. | **2000** | HINARI, a partnership for Health InterNetwork Access to Research Initiative, is launched with TDR as part of the partnership in the area of research capacity building. |
| 25. | **2000** | *Malaria* - Germline transformation of *Anopheles* mosquitoes. |
| 26. | **2000** | WHO published the Operational guidelines for ethics committees that review biomedical research |
| 27. | **2001** | TDR initiates several partnerships for developing capacity in bioinformatics. |
| 28. | **2001** | *Malaria* - Evidence for policy – Reducing potential for artemisinins resistance via use of artemisinins combination therapy (ACT) in uncomplicated malaria |
| 29. | **2001** | *Good laboratory practice:* Quality practices for regulated non-clinical research and development |
| 30. | **2002** | *Malaria* - Genome sequencing of *Anopheles gambiae* activity completed through TDR-initiated consortium. |
| 31. | **2002** | *Visceral leishmaniasis* – Miltefosine registration as first oral therapy against VL |
| 32. | **2002** | The Strategic Initiative for Developing Capacity in Ethical Review (SIDCER) is inaugurated. |
| 33. | **2002** | *Workbook for Investigators* |
| 34. | **2003** | *Malaria* – Unit-dose packaging of Coartem® to ensure adherence and suitability for home management of malaria in collaboration with Novartis. |
| 35. | **2003** | *Lymphatic filariasis* - Longitudinal studies produce evidence that mass drug administration would be required for more than 4–6 years in most places to eliminate lymphatic filariasis. |
| 36. | **2003** | *Sexually transmitted diseases* - TDR-led evaluation of rapid syphilis diagnostic tests led to those with acceptable performance being placed on the WHO procurement list at negotiated pricing for Member States. |
| 37. | **2004** | *Malaria* - Regulatory label extension is obtained for the use of Coartem® (oral treatment of artemether + lumefantrine) in infants and young children above 5 kg in weight. |
| 38. | **2004** | *Human African Trypanosomiasis* – Framework for clinical product development (in collaboration with NTD) |

| # | Year | Tools / strategies / solutions |
|---|---|---|
| 39. | **2005** | *Visceral leishmaniasis* - The health ministers of India, Nepal and Bangladesh sign a Memorandum of Understanding pledging to eliminate kala azar (visceral leishmaniasis) from their countries by 2015. |
| 40. | **2005** | *Visceral leishmaniasis* - Validation of RK39 as a diagnostic for use in India but not in Africa, incorporated into visceral leishmaniasis elimination programme. |
| 41. | **2005** | *Onchocerciasis, lymphatic filariasis* - RAPLOA (rapid assessment procedure for determining areas of *Loa loa* endemicity) developed, validated and incorporated into disease control use. |
| 42. | **2005** | *Malaria* - Results from studies in Ghana indicate that the proportion of caregivers using ACTs correctly in terms of promptness, dosage and number of days is more than 90%, leading to reduced delay in seeking treatment. |
| 43. | **2005** | WHO published the Operational Guidelines for the Establishment and Functioning of Data and Safety Monitoring Boards |
| 44. | **2005** | *Effective project planning and evaluation for biomedical and health research* – Planning for success training programme launched |
| 45. | **2006** | *Malaria* - Evidence for pre-referral treatment use provided in WHO Malaria Treatment Guidelines |
| 46. | **2006** | *Dengue* - Multi-country studies validating pupal productivity survey methods for dengue vector control are published, demonstrating method effectiveness. |
| 47. | **2004** | *Human African Trypanosomiasis* – Clinical product development approaches (in collaboration with NTD) |
| 48. | **2007** | *Leishmaniasis* - Paromomycin is registered for use in India through the Institute for One World Health. |
| 49. | **2007** | *Tuberculosis* - WHO Policy recommending reduction of the number of smears for the diagnosis of tuberculosis and defining a new sputum smear-positive case |
| 50. | **2008** | *Community-directed interventions* (CDI), an integrated approach for improved access to vital drugs and preventive measures, including for malaria, in remote African communities. |
| 51. | **2008** | *Schistosomiasis* - Evidence for dosage of Praziquantel for the control of schistosomiasis |
| 52. | **2008** | *Malaria* - Mefloquine-artesunate combination drug has been developed for malaria treatment and introduced in Brazil. |
| 53. | **2008** | *Dengue* - Dengue diagnostics tests tested and available |
| 54. | **2008** | *Tuberculosis* - WHO Policy online probe assays and second-line drug susceptibility testing |
| 55. | **2010** | *African trypanosomiasis* - the tsetse fly genome sequenced, assembled and annotated by the International Glossina Genomics Initiative (IGGI) Consortium |
| 56. | **2010** | WHO guidelines recommend *rectal artesunate* in paediatric populations with severe malaria living in remote locations in rural Africa and Asia |
| 57. | **2010** | WHO recommendation against the use of *immunodiagnostics tests for active or latent TB* infection |

| # | Year | Tools / strategies / solutions |
|---|---|---|
| 58. | **2010** | *TB fluorescence microscopy*. Research results informed the introduction of LED-FM in high burden countries in Nov 2010 |
| 59. | **2010** | A simplified, revised and evidence-based *disease classification system for dengue* adopted in Latin-American and Asian countries |
| 60. | **2010** | *Visceral Leishmaniasis (VL) active case detection* methods applied at large scale by control programmes in the Indian subcontinent |
| 61. | **2011** | *Malaria rapid diagnostics tests* evaluation rounds have led to quality improvements and the RDTs have become part of the overall strategy for malaria: Test, Treat, Track. |
| 62. | **2011** | *An evidence-based strategy to support the elimination of visceral leishmaniasis* is being used in the Indian subcontinent |
| 63. | **2011** | *New synthetic routes for enantiomerically-pure L-praziquantel* identified in collaboration with the Australian Research Council; used to develop a new paediatric formulation. |
| 64. | **2012** | *ESSENCE good practice document: Five keys to improving research costing in low- and middle-income countries* |
| 65. | **2012** | *Optimized and standardized trapping and bait technology for relevant vectors of HAT* |
| 66. | **2012** | *HAT-Trick*, a decision support system for improved vector control intervention methods of human African trypanosomiasis (HAT) |
| 67. | **2012** | *Framework for the introduction of rapid tests on sexually transmitted infections into country programmes* |
| 68. | **2012** | *Dengue vector control methods and strategies*, combining targeted breeding containers and insecticide-treated materials in Asia |
| 69. | **2012** | Evidence contributing to the WHO and UNICEF *Integrated Community Case Management (iCCM) strategy to reduce childhood mortality* through community case management of malaria, pneumonia and diarrhoea (updated in 2016) |
| 70. | **2012** | *T3: Test. Treat. Track.* Evidence on feasibility and costs of universal coverage diagnostic, testing and antimalarial treatment |
| 71. | **2012** | Guidance framework developed for *testing efficacy and safety of genetically-modified mosquitoes* for malaria and dengue control |
| 72. | **2012** | *The Global Report for research on infectious diseases of poverty* is used to inform EC's strategic direction in addressing neglected diseases of poverty |
| 73. | **2013** | *Evidence from clinical trials of the efficacy and safety of multiple-dose and single-dose regimens with liposomal Amphotericin B* informed policy decisions in Bangladesh and Nepal. |
| 74. | **2013** | *The Report on Priorities for Tuberculosis Research*, from the disease reference group on tuberculosis, leprosy and Buruli ulcer. |
| 75. | **2013** | *The Report on Research Priorities for the Environment, Agriculture and Infectious Diseases of Poverty*, from the thematic working group comprising international experts convened by TDR. |

| # | Year | Tools / strategies / solutions |
|---|---|---|
| 76. | **2013** | *ESSENCE good practice document: Framework for planning, Monitoring and Evaluation for research capacity strengthening* has been adopted by several funding agencies and initiatives and revised in 2016 |
| 77. | **2014** | *The eco-health approach* to improve and innovate the routine Chagas disease and Dengue fever vector control interventions in Latin-America |
| 78. | **2014** | *Implementation Research Toolkit* to strengthen country capacity to conduct implementation research embedded in disease control programmes |
| 79. | **2015** | *West African Regional Network for TB control (WARN-TB),* grouping sixteen countries and national TB control programmes, was created with TDR facilitation |
| 80. | **2015** | *SORT IT, The Structured Operational/Implementation Research and Training Initiative* that trains national programme officers in conducting operational research and using evidence to solve implementation bottlenecks and optimize health interventions |
| 81. | **2015** | ESSENCE good practice document: *Seven principles for strengthening research capacity in LMICs* |
| 82. | **2015** | *Caribbean network on vector control*, initiated by TDR, officially launched and self-sustainable, active in outbreak prevention and detection |
| 83. | **2015** | *Malaria and NTDs - VBD-environment.org*, a web-based knowledge sharing platform resulting from the research on population resilience to climate change in Africa and currently presenting in more details all ex-VES research projects. |
| 84. | **2015** | *Arboviral diseases (Dengue, Zika, Chikungunya) - Worldwide Insecticide Resistance Network (WIN),* initiated by TDR, focuses on surveillance of insecticide resistance and alternative methods of vector control |
| 85. | **2015** | *The TB-Platform for Aggregation of Clinical TB Studies (TB-PACTS)* a partnership-based data sharing platform aggregating the REMoxTB, RIFAQUIN, and OFLOTUB studies |
| 86. | **2015** | *WHO Central registry for the epidemiological surveillance of drug safety in pregnancy* established |
| 87. | **2015** | *WHO global aDSM database,* for TB active drug safety monitoring and management |
| 88. | **2015** | *Enhanced, user-centred informed consent form and process*, developed through SIDCER for clinical trials |
| 89. | **2016** | *EWARS: Preparedness for early identification and response to dengue outbreaks*. A 'Model Contingency Plan' was developed and published together with a how-to guide |
| 90. | **2016** | *Guidance on reporting implementation research* |
| 91. | **2016** | *The Six Practices to Strengthen Evaluation of Global Health Research for Development* published by ESSENCE on Health Research initiative of funders |
| 92. | **2016** | *A short training course on the principles of Implementation Research* for use at the Regional Training Centres. |
| 93. | **2017** | *Massive Open Online Course on implementation research* |
| 94. | **2017** | *TDR's Regional Training Centres* located in each WHO region, training local researchers on a range of good research practices and project management |
| 95. | **2017** | *The Clinical REsearch During Outbreaks (CREDO)* training curriculum has been granted accredited status by the African Academy of Sciences |

| # | Year | Tools / strategies / solutions |
|---|---|---|
| 96. | **2017** | *Global Vector Control Response*, developed jointly with the WHO Global Malaria Programme and the Control of Neglected Tropical Disease Department |
| 97. | **2017** | *SIHI country hubs,* a new approach to advance social innovation in health through research, advocacy and capacity strengthening |

# Annex 3. Leverage estimate in 2018-2019

| | Partners' contribution | | | |
|---|---|---|---|---|
| TDR Expected Result | Partners and collaborations | 2018-2019 contribution (US$) | Approx. number working on the project in the field[23] | Contribution type |
| **TOTAL** | | **53 660 000** | **991** | |
| **Research for implementation** | | **44 610 000** | **682** | |
| Population health vulnerabilities to VBDs: increasing resilience under climate change conditions in Africa | Ministries of both health and environment in Africa, WHO-PHE, AFRO, UNEP, FAO, OIE, IDRC, Fondation Mérieux, Global Health Institute, Pan-African Mosquito Control Association | 500 000 | 100 | Voluntary participation of experts and partners in programme implementation (particularly in technical implementation and training). Leverage is through funding support for follow-up activities, such as research uptake meetings and dissemination of findings to stakeholders, once the project has ended. Additional leverage through technical/financial support from other partners at WHO (HQ/PHE and AFRO/PHE) and from Fondation Mérieux. |
| Environmental prevention and control of vector-borne and infectious diseases in South-East Asia | ASEAN NDI Secretariat, Malaria Consortium partners in Thailand, Cambodia and the United Kingdom, Go Green, health, environment and education ministries | 500 000 | 50 | Voluntary participation of experts and partners in programme implementation (particularly in technical implementation and training). Leverage from ASEAN NDI through funding support for capacity building and for hosting stakeholder and research uptake meetings. |
| Evaluation and improvement of malaria control policies through studying the impact of insecticide resistance on LLINs and IRS efficacy, and preliminary analysis of the burden and causes of residual malaria | AFRO/PHE, WHO/HTM/GMP/VCP, WHO/HTM/NTD/VEM, national malaria control programmes in Africa | 800 000 | 60 | Malaria control programmes in countries through donors such as PMI, the Global Fund and bilateral cooperation, and from operational research on vector control and insecticide resistance monitoring activities funded partially by the Gates Foundation. In addition, funding was leveraged to organize a workshop, including a parallel training course supported by Vector-Base. |
| Urban health interventions for the prevention and control of vector-borne and other infectious diseases of poverty, and new vector control technologies to prevent and control emerging arboviruses | WHO/NTD, IAEA | 100 000 | 35 | Funds leveraged by the first activity on the new vector control technologies were in the context of the development of the Guidance Document for SIT against Aedes, for which US$ 50 000 each came from TDR UD, WHO/NTD and IAEA. |
| Multisectoral approach for the prevention and control of malaria and emerging arboviral diseases | Swiss Development Cooperation (SDC), IDRC, STPH, Sida, WHO/PHE | 1 000 000 | 100 | Funds leveraged on this activity came from different funders, including Member States (Canada, Sweden and Switzerland), research institutions and other WHO departments leveraging resources in terms of staff hours and funds for meetings. |
| Strategies to promote gender-responsive health interventions on prevention and control of infectious diseases of poverty and a training course | WHO/PHE, University of Ghana, Wits University (South Africa); Association of Schools of Public Health in Africa (ASPHA), TDR regional training centres, Makerere University, HERD International | 400 000 | 20 | Leverage is expected through funding support from WHO partners working on gender equality and environmental health. |

[23] Part time or full time

| | Partners' contribution | | | |
|---|---|---|---|---|
| TDR Expected Result | Partners and collaborations | 2018-2019 contribution (US$) | Approx. number working on the project in the field[23] | Contribution type |
| Strategies to achieve and sustain disease elimination | Control programmes and research institutions in target countries: Noguchi Memorial Institute for Medical Research, Ghana; Onchocerciasis Elimination Programme laboratory Ethiopia; La Trobe University, Australia; University of Antwerp, Belgium; Division Provinciale de la Santé, Democratic Republic of the Congo; Medicines Development for Global Health, Australia and the United Kingdom; Division Provinciale de la Santé, Democratic Republic of the Congo; Eglise du Christ au Congo, Democratic Republic of the Congo; European and Developing Countries Clinical Trials Partnership; Erasmus University, Netherlands; Imperial College, United Kingdom; Luxembourg Institute of Health, Luxembourg; Royal Veterinary College, United Kingdom; University of Health and Allied Sciences, Ghana; Centre for Research on Filariasis and other Tropical Diseases (CRFilMT), Cameroon; Institut de Recherche pour le Développement, France; International Centre for Diarrhoeal Disease Research, Bangladesh: Public Health and Infectious Disease Research Center (PHIDReC), Nepal; Rajendra Memorial Research Institute of Medical Sciences, India; Liverpool School of Tropical Medicine, United Kingdom; WHO/NTD. | 20 000 000 | 10 | TDR (and OCP and APOC) investment of around US$ 15 million over approximately 20 years into development of moxidectin leveraged:<br>(1) US$ 14 million investment by MDGH and the GHIF to complete work towards US FDA registration;<br>(2) €4.77 million EDCTP grant for additional studies required to inform WHO guidelines and country policies on moxidectin use for onchocerciasis elimination (see output 4); and<br>(3) the FDA priority review voucher (PRV) sold for an amount not publicly available. MDGH will invest their part of the proceeds in further studies to support WHO guidelines and country policies for the use of moxidectin for onchocerciasis elimination and scabies control.<br>Stipends, fee remissions, laboratory work, support for LMIC PhD students (Ghana, India, Mexico) working on topics related to TDR funded research at La Trobe University (US$ 170 000), salary for modeller (US$ 5000). |
| Structured Operational Research and Training Initiative (SORT IT) | The Institute of Tropical Medicine and Gondar University supporting a national SORT IT in Ethiopia; Kirby Institute in Australia supporting countries in the Pacific; Public Health England running a SORT IT focused on health protection issues in the United Kingdom; Burnett Institute in Papua New Guinee providing SORT IT for TB workers; Damien Foundation implementing a SORT IT for their own workers; and Partners in Health adapting SORT IT for the Rwandan context. Ministries of health in China, Kenya, Pakistan and Sierra Leone have also supported national SORT ITs. | 10 660 000 | 40 | Technical support, staff time, support for research, data management, meetings, co-funding of projects and publications |
| Vulnerability of preventive chemotherapy programmes for helminths to emergence of resistance | The 13 national malaria programmes of West and Central Africa implementing SMC, GMP, AFRO, the Global Fund, Medicines for Malaria Venture (MMV), PMI (USAID), Malaria Consortium, CRS, WAHO, University Cheick Anta Diop and Thies, Senegal.<br>Six WHO country offices and 23 institutions have partnered with TDR on the AMR programme: AmPATH – Kenya, Bahirdar University, Ethiopia, Blantyre Lighthouse Trust, Malawi, Department of Medical Research, Myanmar, International Union Against TB and Lung Disease, South East Asia office, India, Institute of Medical Research, Bangalore, Koirala Institute of Health Sciences, Nepal, Ministry of Health Zimbabwe, Ministry of Health Uganda, Ministry of Health Sierra Leone, Ministry of Health Pakistan, National Center for Rural Research and Training, Guinea, School of Public Health, Nepal, Stellenbosch University, South Africa, Sustainable Health Systems, Sierra Leone, TB-Research and Prevention NGO (TB-RPC), Armenia and Zambart, | 1 660 000 | 50 | Control programmes, research institutions, hospitals/clinics in target countries, WHO country offices in Colombia, Ghana, Myanmar, Nepal, Uganda and Viet Nam, Fleming Fund, FIND, implementing partners<br>Initiatives are under way to leverage another US$ 1.5 million with UNICEF for an AMR course in Bangladesh |

| | Partners' contribution | | | |
|---|---|---|---|---|
| TDR Expected Result | Partners and collaborations | 2018-2019 contribution (US$) | Approx. number working on the project in the field[23] | Contribution type |
| | Zambia, The Institute of Tropical Medicine Antwerp, Belgium, The International Union Against TB and Lung Diseases, France, Médecins Sans Frontières – Luxembourg, The University of Exeter, United Kingdom, The University of Toronto and the University of Washington.<br>Haydom Lutheran Hospital, United Republic of Tanzania, Nanoro Research Center, Burkina Faso, University of Virginia. | | | Provision of Taqman cards and laboratory work for analysis by PCR. |
| Support adequate country response to epidemic challenges: evidence-based guidance for outbreak detection and response - EWARS | Ministries of health and/or national institutes of health in Brazil, Colombia, Dominican Republic, India, Malaysia, Mexico, Sri Lanka and Thailand.<br>AFRO, ministries of health of the 16 West African countries, the WAHO. | 50 000 | 1 | WAHO regional meeting to discuss the findings of the situation analysis mentioned above.<br>Training workshops in Colombia, India, Malaysia, Sri Lanka and Thailand were financed by partner countries; TDR financed the facilitator only. |
| Strengthen evidence base for policy decisions | The Gates Foundation, research institutes and WHO control programmes, Wellcome Trust, LIH | 10 000 | 2 | TB-PACTS: The maintenance and functioning of the TB-PACTS is funded by the Gates Foundation. In-kind contributions are also provided by LIH for data analysis.<br>Loa-loa: local investments in data collection.<br>With the University of Oxford Infectious Disease Data Observatory (IDDO), leveraged funding from the Wellcome Trust for the development of a 'Data sharing platform to improve treatment outcomes in neglected tropical diseases' for improving the M&E of anthelmintics efficacy. |
| Maximized utilization of safety information for public health decision-making | WHO headquarters control programmes: in particular, HIV and the Global TB Programme.<br>Countries involved in safety data collection which are contributing data to the central databases.<br>UNDP, WHO (strengthening regulatory capacity) and PATH are partners in the ADP project. | 160 000 | 30 | Technical expertise, infrastructure, in-kind from countries and other collaborators participating in projects, in particular for data collection. |
| Optimized approaches for effective delivery and impact assessment of public health interventions | WHO Global TB programme; WHO regional offices; WHO intercountry office for West and Central Africa; WHO health statistics and information systems; the Global Fund; The Union; Damien Foundation; WAHO; Expertise France; United States Agency for International Development (USAID); London School of Hygiene and Tropical Medicine; MacGill University; Action contre la Faim, France; Institut de Recherche pour le Développement, France; Université de Reims, Faculté de Médecine, France; Université Abomey Calavi, Benin; Université Cheikh Anta Diop and Université of Thies, Senegal; Institut de Santé publique et Centre Muraz, Burkina Faso; Université Gamal Abdel Nasse, Faculté de Médecine, Guinea Conakry; National TB programmes of the WARN and CARN-TB countries; NTP Brazil, India, South Africa; FIND (DIAMA); MOLBIO; Institut of Tropical Medicine of Antwerp, NRL Rwanda, Ethiopia, University FAN. | 8 770 000 | 184 | TDR contributed to the submission to the Global Fund of a regional project led by the National TB Programme of Benin for strengthening the national reference laboratories of West and Central Africa. The successful application will cover part of the cost of WARN-TB and CARN-TB annual meetings and training courses on IR/OR for laboratory staff.<br>Financial contribution from the Global Fund to organize two one week workshops for West and Central African countries (27 countries) to prepare countries to conduct TB cost surveys.<br>Financial contribution from AFRO to organize a regional workshop on MDR/RR-TB and LTBi new recommendations and research needs.<br>EDCTP funding leveraged for optimising the effectiveness of the Seasonal Malaria Chemoprevention campaign in west and Central Africa (replication of the WARN-TB model with national malaria programmes). |

| | Partners' contribution | | | |
|---|---|---|---|---|
| TDR Expected Result | Partners and collaborations | 2018-2019 contribution (US$) | Approx. number working on the project in the field[23] | Contribution type |
| **Research capacity strengthening** | | **4 500 000** | **240** | |
| Regional Training Centres | WHO regions, training centres supported by TDR (Colombia, Indonesia, Kazakhstan and the Philippines) | 500 000 | 20 | Development of courses, course fees and additional grants leveraged. The number of sites and researchers that meet international good practice standards will be increased and as a consequence the number of projects financially supported by national or international bodies. |
| Postgraduate training grants | Host Institutions: J.P. Grant School of Public Health, BRAC University (Bangladesh), Universidad de Antioquia (Colombia), University of Ghana (Ghana), Univesitas Gadja Mada (Indonesia), American University of Beirut (Lebanon), University of The Witwatersrand (South Africa), University of Zambia (Zambia). | 250 000 | 180 | In-kind contributions made by the faculty and personnel based at the collaborating institutions in terms of staff time and research resources. |
| Advanced training in clinical product development (Career Development Fellowship grants) | GSK Biologicals, Belgium; Janssen Pharmaceutica, Belgium; Novartis Institutes for BioMedical Research; Novartis AG and Takeda Pharmaceuticals International AG, Switzerland; South Africa, Foundation for Innovative New Diagnostics (FIND), Switzerland; European Vaccine Initiative (EVI), Germany; Infectious Diseases Research Institute (IDRI), USA; the International Vaccine Institute (IVI), South Korea. Institute for Health, Luxembourg; Barcelona Institute for Global Health (IS Global), Spain; and the Infectious Diseases Data Observatory (IDDO) at the Centre for Tropical Medicine and Global Health, Oxford, United Kingdom. Pasteur International Network Association in Madagascar; FIOCRUZ, Brazil; and the Swiss Tropical and Public Health Institute (STPHI), Switzerland. | 1 200 000 | 30 | Host institutions as in-kind support (accommodation , meeting support , trainings in situ and support for site visits in LMICs. EDCTP partnership. |
| UNDP Structured capacity building in implementation research to improve access and delivery of health technologies in low- and middle-income countries | UNDP, PATH, Ghana Health Service, Ghana FDA, Ministry of Health Ghana, Ghana National Drug Programme and the University of Health and Allied Sciences Ho (UHAS) | 2 550 000 | 10 | This ER facilitated development of IR capacity for an integrated roll-out plan for the new RTS,S/ AS01 (RTS,S) malaria vaccine across 275 districts in Ghana. The plan, supported by TDR and coordinated by UHAS was in response to an EDCTP 2018 call on capacity development to facilitate delivery and uptake of new or improved medical interventions in African health systems. The plan involved a multisectoral working group comprised of The University of Health and Allied Sciences, the Ministry of Health, Ghana National Drugs Programme and the Ghana FDA. A €2.3 million grant was awarded to UHAS in November 2019. |

| | Partners' contribution | | | |
|---|---|---|---|---|
| TDR Expected Result | Partners and collaborations | 2018-2019 contribution (US$) | Approx. number working on the project in the field[23] | Contribution type |
| **Global engagement** | | **4,550,000** | **69** | |
| Harmonized stakeholder-endorsed research agenda and research-to-policy | Duke University, Policy Cures Research, TB Alliance, FIND, EVI, Global Health Centre | | 20 | Provide technical input and analysis to enable mapping of the pipeline for poverty-related neglected diseases using the TDR Portfolio-to-Impact tool, GFINDER data and the portfolios of selected PDPs. |
| WHO regional office collaboration and small grants | All WHO regional offices plus EDCTP, HRP and AHPSR and the SORT IT AMR programme | 2 000 000 | 6 | Technical support, staff time of regional office focal points, reviewers from regions and meetings, matching funds. |
| Social innovation in health care delivery | LSHTM, Bertha Centre at the University of Cape Town, Makerere University, the University of Malawi, the University of the Philippines, CIDEIM, ICESI Universidad, the Social Entrepreneurship to Spur Health, Ahimsa Fund, UNAIDS, WHO, UN University, UNICEF, UNDP, Fondation Mérieux, MAD NGO, Schwab Foundation, Swedish Sida. | 2 250 000 | 31 | SIHI's various partners and stakeholders contribute directly to promote and advance social innovation in health care delivery. TDR funding greatly leverages resources from: (i) established academic centres whose regular activities focus on social innovation (Bertha Centre, Skoll centre, research hubs in low- and middle-income countries - time, infrastructure, events, grant schemes); (ii) new interested partners who dedicated time to work with us, sometimes co-funding SIHI activities (e.g. LSHTM, Fondation Mérieux, Ahimsa, UNAIDS); and (iii) experts (convenings, review panels). |
| ESSENCE for Health Research - Collaborative networks and Global Health Initiatives (GHIs) | Wellcome Trust, ESSENCE members, NIH/FIC, IDRC and the African Academy of Science | 250 000 | 2 | ESSENCE member funding agencies will support specific areas of joint interest to the agency. Voluntary support provided by ESSENCE members to host a meeting to discuss revision of the good practice documents, as well as to develop a mechanism to coordinate funders' capacity building efforts (NIH/FIC, IDRC and the African Academy of Science all contributed). |
| TDR Global - the community of former trainees, grantees and experts | AHRI, advisors, experts, regional training centres, SESH | 50 000 | 10 | Voluntarily participation of experts and partners in the development of the system and contribution from TDR alumni and other experts in providing technical support to TDR activities (mentorship, meetings, external review of TDR activities, etc.) |

# Annex 4. Progress on the TDR's current portfolio of expected results Status update as at 31 December 2019

| *ER Title* | *ER Status 31 Dec 2019* |
|---|---|
| Country preparedness for disease outbreaks | On track |
| Country resilience to the threat of drug-resistant infections | Minor delays |
| Directions for development and accelerated access to new tools and strategies | On track |
| Maximized utilization of data for public health decision making | On track |
| Maximized utilisation of safety information for public health decision making | On track |
| Strategies to achieve and sustain disease elimination | On track |
| Optimized approaches for effective delivery and impact assessment of public health interventions | On track |
| Population health vulnerabilities to VBDs: increasing resilience under climate change conditions in Africa | Completed |
| Advancing social innovation in health care delivery through research, capacity strengthening and advocacy | Completed |
| Evaluation and improvement of malaria control policies through study of LLINs and IRS efficacy, and of the burden and causes of residual malaria | On track |
| Environmental prevention and control of vector-borne diseases and infectious diseases in South-East Asia | Completed |
| Developed, pilot-tested and replicated an innovative training course for capacity building on gender-based analysis in vector-borne disease research and potential others infectious diseases of poverty | Completed |
| Multi-Sectoral Approach (MSA) for Prevention and Control of Malaria and Emerging Arboviral Diseases | Minor delays |
| Urban health interventions for the prevention and control of vector-borne and other infectious diseases of poverty, and new vector control technologies to prevent and control emerging arboviruses | On track |
| Strategies to promote gender-responsive health interventions on prevention and control of VBDs and other infectious diseases of poverty | Minor delays |
| Strategic support to WHO regional activities: the regional training centres | On track |
| WHO Regional Office collaboration and small grants | On track |
| Targeted research training grants in low-and middle-income countries | On track |
| UNDP Structured capacity Building in Implementation Research to improve access and delivery of health technologies in LMICs | On track |
| Advanced training in Clinical Product Development (Career Development Fellowship grants) | On track |
| Knowledge Management shaping the research agenda | Minor delays |
| Capacity strengthening to bring research evidence into policy (R&D Funding) | On track |
| Collaborative networks and Global Health Initiatives (GHIs) | On track |
| TDR Global - the community of former trainees, grantees and experts | On track |

## Annex 5. TDR 2019 revenue

TDR is able to conduct its work thanks to the commitment and support from a variety of funders. These include our long-term core contributors from national governments and international institutions, as well as designated funding for specific projects within our current priorities.

| Contributor | |
|---|---|
| **Core contributions** | **Amount (US$)** |
| Sweden[24] | 5 037 630 |
| United Kingdom of Great Britain and Northern Ireland | 3 575 990 |
| Switzerland | 1 688 843 |
| Luxembourg | 1 114 827 |
| Germany | 1 016 387 |
| Belgium | 707 547 |
| World Health Organization | 700 000 |
| Norway | 324 957 |
| Spain | 112 083 |
| China | 110 000 |
| Japan | 100 000 |
| India | 55 000 |
| Thailand[25] | |
| Malaysia | 25 000 |
| Mexico | 10 000 |
| Panama | 7 000 |
| Miscellaneous | 1 059 |
| **Subtotal** | **14 586 323** |

| **Contributors providing specific project funding** | **Amount (US$)** |
|---|---|
| Bill & Melinda Gates Foundation | 1 771 434 |
| United Nations Development Programme | 980 000 |
| National Institute of Health Research (NIHR), United Kingdom | 967 601 |
| Sweden | 471 945 |
| U.S. Agency for International Development (USAID) | 358 175 |
| World Health Organization departments | 328 589 |
| Luxembourg | 111 483 |
| United Kingdom of Great Britain and Northern Ireland | 23 432 |
| **Subtotal** | **5 012 660** |
| Total contributions | 19 598 983 |

[24] The contribution from the Government of Sweden reflects the 2019 portion of their 2018-2019 funding agreement.

[25] The 2019 contribution from the Government of Thailand was reported in 2018.

## Thank you to our core contributors who provided **overall Programme** support in 2019.

Sida – Swedish International Development Cooperation Agency

UKaid – from the British people

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Agency for Development and Cooperation SDC

Luxembourg Aid & Development

Federal Ministry for Economic Cooperation and Development – BMZ

Belgium

World Health Organization

Norwegian Ministry of Foreign Affairs

Gobierno de España – cooperación española

National Health Commission of the People's Republic of China

厚生労働省 – Ministry of Health, Labour and Welfare
Japan

Ministry of Health and Family Welfare
Government of India

Ministry of Public Health
Thailand

Ministry of Health Malaysia

Gobierno de México

salud – Ministerio de Salud Panamá

## Thanks also to the contributors who provided support to **specific projects** in 2019.

Bill & Melinda Gates foundation

Sida – Swedish International Development Cooperation Agency

UNDP – Empowered lives. Resilient nations.

NIHR | National Institute for Health Research

USAID – From the American People

World Health Organization

Luxembourg Aid & Development

UKaid – from the British people

** Listed in order of level of contribution*