AMR-SORT IT
2020 Annual Report

The Structured Operational Research and Training IniTiative on tackling antimicrobial resistance in Africa, Asia and Latin America – Progress, Achievements, Challenges.

TDR For research on diseases of poverty

UNICEF • UNDP • World Bank • WHO

SORT IT

Background

The Structured Operational Research and Training Initiative (SORT IT) is a global partnership-based initiative coordinated by TDR, the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases. SORT IT seeks to make countries "data rich, information rich and action rich", to strengthen health systems, enhance programme performance and improve public health.

The success

SORT IT has been implemented in various domains of public health

SORT IT has expanded to **93** countries in the last **12** years

70% of research studies have reported an impact on policy and/or practice

51% of trainees independently conduct research after one SORT IT training cycle

50 implementing partners

925 participants trained

See more at: https://www.who.int/tdr/capacity/strengthening/sort/en/

SORT IT for tackling antimicrobial resistance

In January 2019, the Government of the United Kingdom of Great Britain and Northern Ireland, represented by its Department of Health and Social Care, through the National Institute of Health Research (NIHR), contributed designated funding (£8, 212, 943) for a SORT IT project on tackling antimicrobial resistance (AMR) which is now referred to as the AMR-SORT IT project.

Mission

Build sustainable operational research capacity to generate and utilize evidence on the emergence, causes, spread and health impact of AMR in low- and middle-income countries.

How?

Strong engagement with WHO country offices, AMR committees and SORT IT partners in the evidence to action cycle championed by TDR and addressing country priorities. Performance targets and metrics for accountability.

Target audience

Frontline health workers and decision-makers.

Where?

Six countries (2019-2021)

Colombia Sierra Leone Nepal Myanmar Ghana Uganda
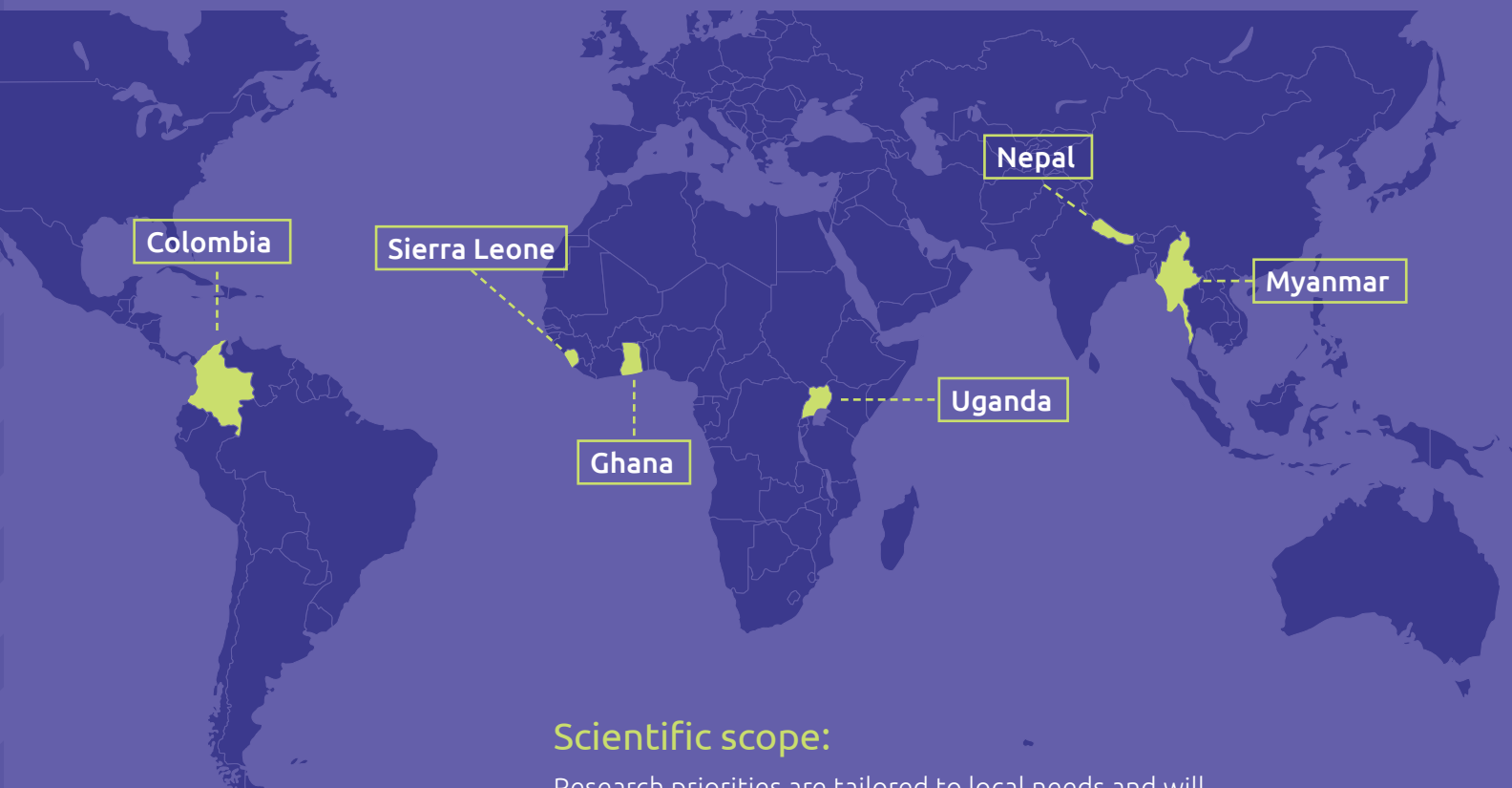
Scientific scope:

Research priorities are tailored to local needs and will complement the Global and National Action Plans on Antimicrobial Resistance. Reinforced by country ownership, the SORT IT project aims to make the pillars of AMR action plans "data rich, information rich and action rich".

Scientific scope: Global AMR Action Plan SORT IT

1. Improve awareness and understanding	2. Strengthen surveillance and research	3. Reduce incidence of infection	4. Optimize use of antimicrobials	5. Sustainable investment in countering AMR
Risk communication	National AMR surveillance	IPC health care	Access to qualified antimicrobial medicines regulations	Measuring the burden of AMR
Education	Laboratory capacities	Community level prevention		Assessing investment needs
	Research and development	Animal health: prevention and control	Use in veterinary and agriculture	Establishing procedures for participation

More specific details on the SORT IT AMR programme are available at:
https://www.who.int/tdr/capacity/strengthening/sort/AMR_SORT_ITflyer.pdf?ua=1

Overall summary of progress and the COVID-19 challenge

During the first year (2019), by embracing a "One Health" approach in the planning process, comprehensive engagement has been established with AMR coordinating committees, WHO country and regional offices and implementing partners in target countries in Asia, Africa and Latin America. SORT IT activities were fully aligned with national AMR action plans and complement ongoing AMR activities (including those of the Fleming Fund).

Thirty-six research studies have been started through SORT IT courses in Ghana, Myanmar, Nepal, Sierra Leone and Uganda. All performance targets were exceeded.

During the second year (2020), high-level endorsement was established for 24 additional research projects in Myanmar and Sierra Leone. TDR also joined forces with WHO regional offices for Africa, the Americas and South-East Asia with a Grants Scheme to support 13 additional studies to tackle AMR.

All TDR-supported operational research officers and 73% of 132 individuals involved with the AMR-SORT IT project are applying their acquired skills on the front lines of the COVID-19 response. These activities have been synergistic with and complement ongoing AMR activities and further contribute to health system resilience in: protecting health workers, keeping health facilities safe, improving laboratory diagnostic capacity and informing communities on preventive measures. However, this has obliged us to reschedule several activities, including trainings.

To overcome COVID-19 travel restrictions, an online SORT IT virtual platform was rapidly developed as a means of continuing SORT IT trainings in early 2021.

Value for money of the AMR-SORT IT project

The **value for money** of this project continues to be demonstrated due to TDR's established convening power, global engagement capacity and the SORT IT know-how that has been built over the past 12 years. To promote *effectiveness* and *impact*, we continued to engage early with those who are expected to use the results of the research. Participant selections in early 2020 promoted gender and geographic *equity* and low- and middle-income (LMIC) *first authorship*. The project has gained significant recognition.

TDR's collaborative relationship with countries and the complementarity it brings to the One Health approach are valuable contributions to the fight against AMR.

Hanan Balkhy,
WHO Assistant Director-General for AMR

TDR's approach to operational research is contributing to national efforts to fight AMR by developing the capacity to generate and use data on the emergence, spread and health impact of AMR.

Jos Vandelaer,
WHO Representative in Nepal

SORT IT is contributing to the global AMR effort by developing operational research capacity that helps monitor country-level progress in real time.

Marc Sprenger,
Former Director, WHO AMR Secretariat

# Details of specific activities and achievements in 2020

1. Coordination, stakeholder engagement and embedding the One Health approach into new projects

High-level endorsement has been established for 24 new AMR national projects in Myanmar and Sierra Leone, while Colombia and Ecuador are together receiving applications for 12 more projects.

In Sierra Leone, we pioneered a pre-mentoring workshop with members of the One Health platform, boosting to 50% the proportion of projects from the environmental and agricultural sectors. Taking place several months prior to the start of research studies, this process allows ample time for validation of data sources and further buy-in from those expected to use the results.

Moving forward, we will embed this approach into all the AMR-SORT IT projects. The capacity building perspective for individuals now embraces the "Train, Embed, Retain and Enable" concept, which is in line with WHO's Thirteenth General Programme of Work, 2019-2023 (GPW-13).

Figure 1. The AMR-SORT IT cycle.
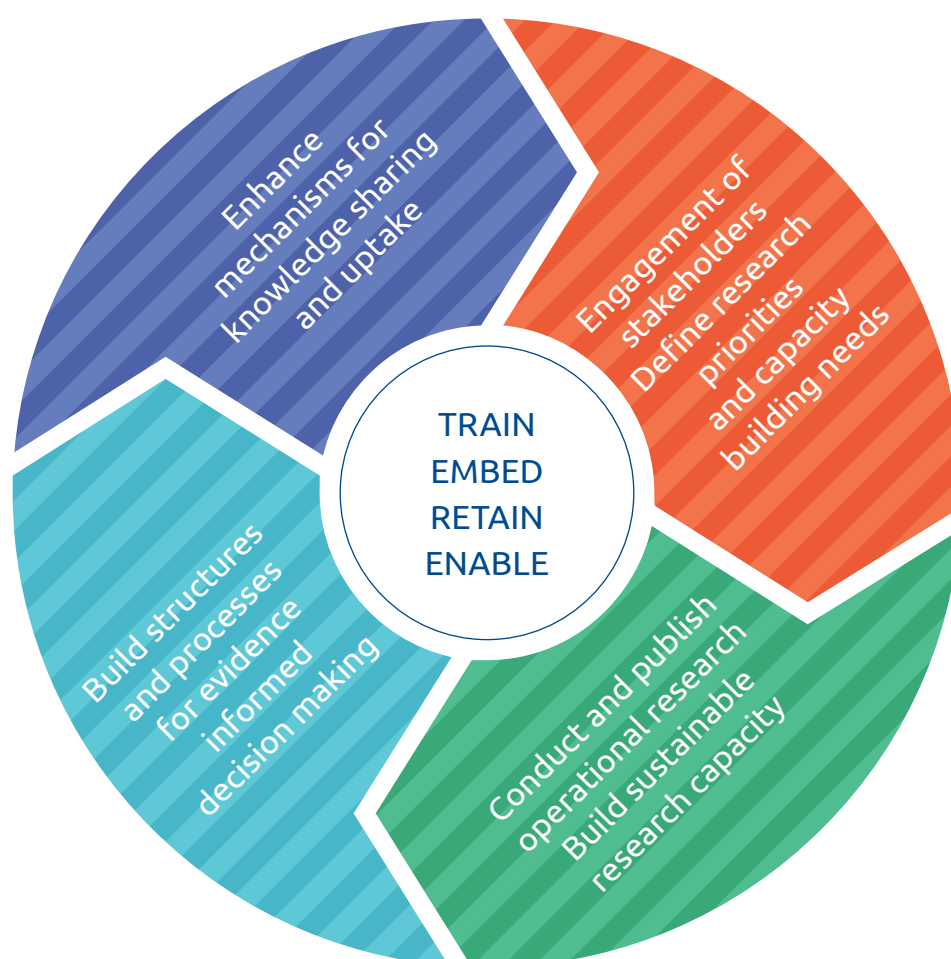
SORT IT is now catalysing the evidence cycle from defining the most relevant research, to implementation of research, to knowledge management and to impact on the ground.

Pictures (Top to bottom): Multisectoral AMR committee meeting chaired by the Minister for Health (Myanmar); training of 28 champions from the Ministry of Health, Ministry of Agriculture, Forestry and Environmental Protection Agency on the One Health approach for combatting AMR (Sierra Leone).

2. Building global collaborations and communities of practice

Through TDR's convening power, 25 SORT IT partners from 24 countries, including 70% SORT IT alumni, are engaged with AMR-SORT IT trainings, thereby boosting North-South and South-South partnerships. One-to-one "hands-on mentorship" in operational research trainings is provided by SORT IT alumni from different institutions and countries from the North and South. They join a pool of experts and have opportunities to collaborate with other experts and institutions. This shows TDR's capacity to effectively mobilize institutions and expertise at a global level ("thinking globally to act locally").
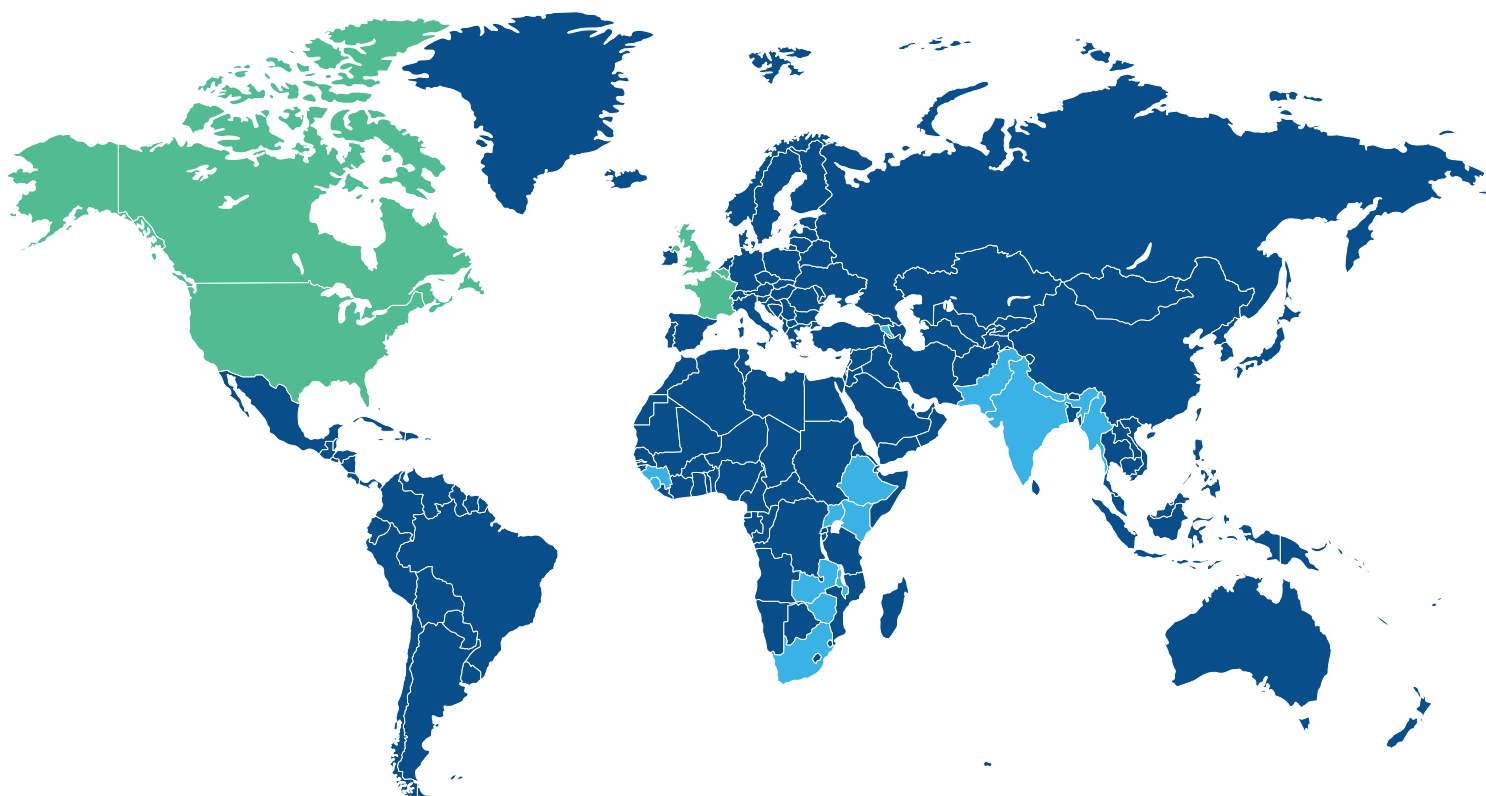
South-South collaboration in AMR (18 institutions):

AMPATH (Kenya), Bahir Dar University (Ethiopia), Lighthouse Trust (Malawi), Damien Foundation (Nepal), Department of Medical Research (Myanmar), B.P. Koirala Institute of Health Sciences (Nepal), Bangalore Medical College and Research Institute (India), Ministries of Health (Pakistan, Sierra Leone, Uganda, Zimbabwe), National Centre for Training and Research in Rural Health (Guinea), School of Public Health (Nepal), Stellenbosch University (South Africa), Sustainable Health Systems (Sierra Leone), Tuberculosis Research and Prevention Center NGO (Armenia) and Zambart (Zambia).

Northern institutions engaged with North-South collaboration in AMR (7 institutions):

Institute of Tropical Medicine (Belgium), International Union Against Tuberculosis and Lung Disease (France), Médecins Sans Frontières, (Luxembourg), Public Health England (United Kingdom), University of Salford (United Kingdom), University of Toronto (Canada) and University of Washington (USA).

3. Support to WHO country offices and national AMR committees

The AMR project includes additional financial support to WHO country offices to strengthen the AMR response where funding has been lacking, such as for quarterly meetings of technical working groups and human resources (e.g. appointment of SORT IT technical officers and research fellows).

SORT IT officers and fellows are contributing to a wide range of strategic AMR activities. Here are some examples:

> *Get the media on our side:* Training on factual AMR reporting and on building better working relationships.

> *Bring in the private sector:* Workshops to engage the private sector on rational antibiotic use involving poultry farmers, animal feed millers, over-the-counter medicine sellers and policy-makers.

> *Act early and where it counts:* Antibiotic awareness and infection prevention campaigns in schools and communities.

> *What gets measured gets done:* Global AMR country assessment surveys, improving data for the Global AMR Surveillance System (GLASS), and strengthening surveillance of antibiotic resistance development in human and animal health (including the ESBL Tricyclic project).

Support to WHO country offices and "One Health" committees is improving strategic planning and implementation of AMR plans.

Pictures: of AMR awareness and engagement campaigns (left to right) with the private sector, in communities and schools (Ghana), on TV channels (Myanmar).

4. COVID-19 and the AMR-SORT IT project

4.1 Global survey to guide rescheduling of SORT IT training modules

We conducted an online survey involving all AMR-SORT IT project participants from target countries, including partner institutions and WHO country offices. The aim was to use an evidence-informed approach to guide rescheduling off SORT IT training modules.

Of the 133 individuals involved in the project, 132 responded, with 97 (73%) on the front lines of the COVID-19 response. Due to the COVID-19 situation, 63% expressed feasibility concerns on implementing their research within the initial timeframe due to travel restrictions, quarantine, lockdown and government bans on gatherings in many countries.

Ninety-eight percent (98%) of responders advocated for rescheduling SORT IT activities and a project extension. Sixty-eight percent (68%) felt that the added time would also allow SORT IT to play an important role in tackling the impact of COVID-19 on the AMR situation. For example, through improvements in preventive measures, improving irrational use of antibiotics and chloroquine, over-the-counter sales and use of antibiotics, etc. Results of the survey are available in **Annex 1**.

The unprecedented COVID-19 pandemic resulted in re-deployment of 73% of those involved in the AMR SORT IT project.

To achieve the project goals, training activities have been rescheduled to 2021, and a request to NIHR for a project extension is envisaged.

4.2 COVID-19 and development of a virtual SORT IT platform for training

To mitigate the effects of COVID-19-related travel restrictions and the ban on international gatherings, TDR and a SORT IT partner in Armenia (TB-RPC) developed a virtual platform which was used successfully in 2020 for a SORT IT course on tuberculosis. This digital solution is enabling SORT IT trainings to continue through remote facilitation. Although the gold standard is the in-person face-to-face approach, we are obliged to use the virtual platform to re-start SORT IT training modules in January 2021.

A SORT IT virtual platform was developed to provide an alternative means of continuing training in 2021 despite COVID-19 related restrictions.

Figure 2. Screenshot of the virtual SORT IT platform for delivering SORT IT trainings.
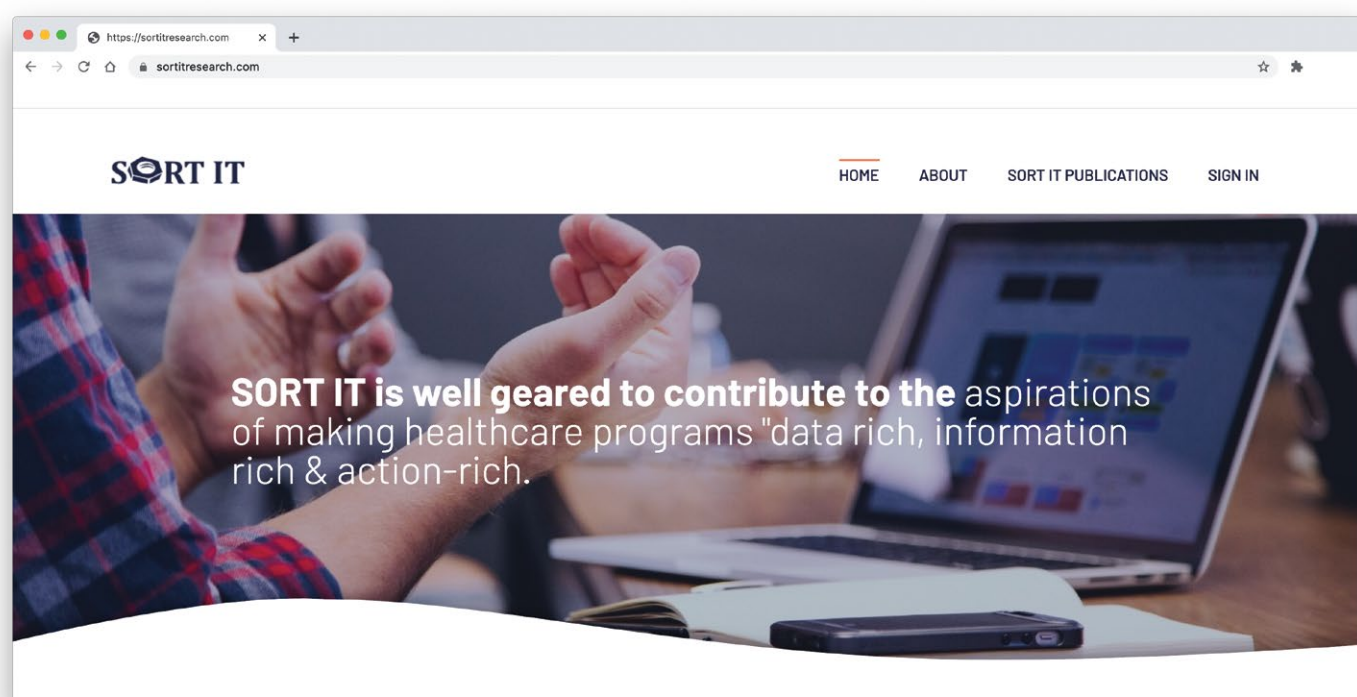
4.3 AMR SORT IT officers and fellows lead health systems strengthening for COVID-19

SORT IT officers and fellows have shown leadership by playing key roles in COVID-19 preparedness and response activities. Their involvement is synergistic with, and complements, AMR activities to further contribute to health system resilience in: protecting health workers, keeping health facilities safe, improving laboratory diagnostic capacity and informing communities on preventive measures. Here are some examples:

> *Finding the cases early:* Technical, operational and training support to improve epidemiological surveillance, case investigation and contact tracing for COVID-19.

> *Improving diagnostic capacity:* Technical and procurement support to improve country-wide laboratory testing and quality control procedures for COVID-19.

> *Informing communities effectively:* Combating misinformation by training and monitoring the media, rumour tracking and management.

> *Keeping health facilities safe and saving lives:* Health facility assessments and training for infection, prevention and control compliance. In Sierra Leone, 236 health workers were confirmed COVID-19 positive and six died. Action to improve the situation is under way.

> *Protecting health workers:* Local production of alcohol-based quality assured hand rub solutions and face masks in Sierra Leone. Locally produced rubs cost US$ 2, compared with US$ 14 on the local market. A total of 18 000 litres have been produced and a sustainability plan drafted with the Ministry of Health.

By using SORT IT skills and being on the cutting edge of the COVID-19 response, SORT IT alumni are strengthening health systems, which is also having a synergistic effect in tackling AMR.

Pictures (left to right): Alcohol-based hand rub production in a hospital which is seven times cheaper (Sierra Leone); media messaging on face mask use (Ghana); risk communication with media (Nepal); verification of test results for COVID-19 (Nepal).

5. Implementation of studies and SORT IT curriculum appraisal

There are 36 ongoing research projects in Ghana, Myanmar, Nepal, Sierra Leone and Uganda where data collection was fully under way when the COVID-19 pandemic struck. All SORT IT training modules will restart in January 2021 and we hope to have 24 research projects from Africa and Asia completed by March 2021.

The manuscripts will be part of a Special SORT IT Issue on AMR to be published in the open access Tropical Medicine and Infectious Diseases Journal:

 https://www.mdpi.com/journal/tropicalmed/special_issues/AMR.

Figure 3. Special Journal issue on "AMR in low- and middle-income countries".
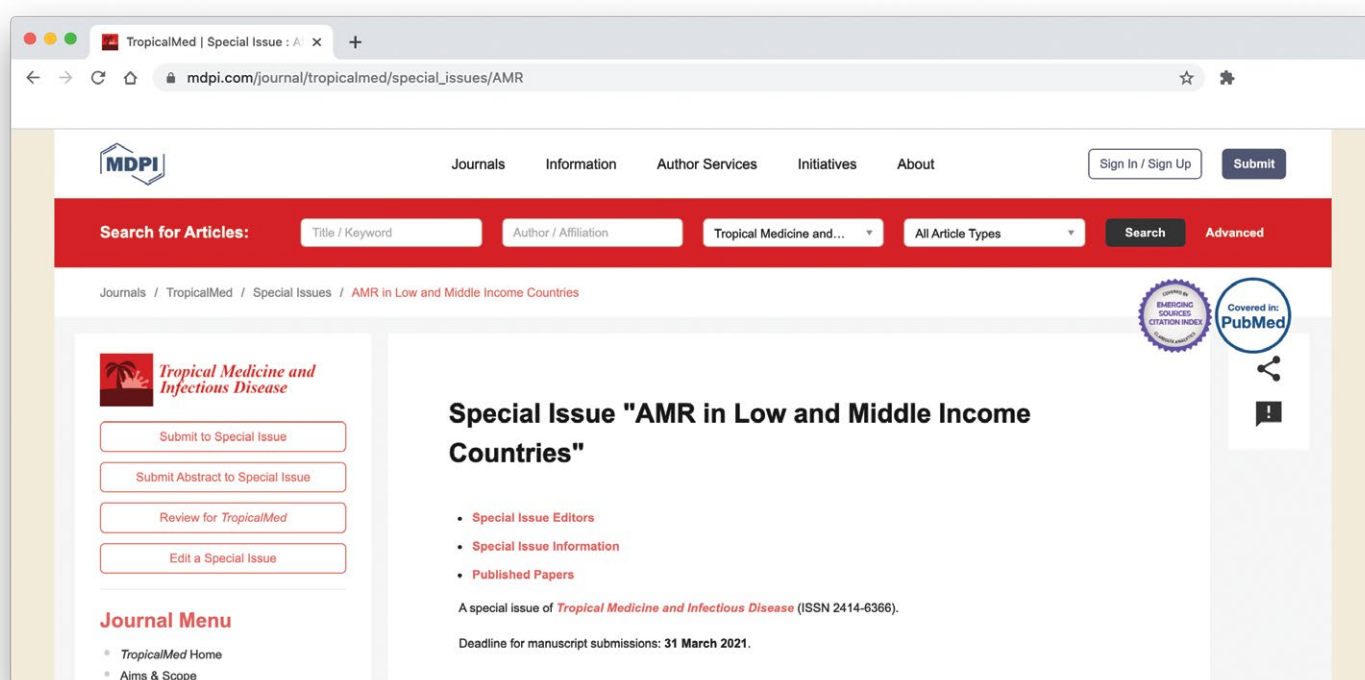
The period of lockdown allowed us to appraise the SORT IT curriculum for AMR. Modifications have been made to the timetable and the content of lectures.

6. The small grants scheme for prospective research studies

TDR joined forces with WHO regional offices for Africa, the Americas and South-East Asia to complement ongoing SORT IT studies with a *Small Grants Scheme* for 13 prospective research studies to tackle AMR. Examples of research topics include: antibiotic resistance in poultry and dairy farming, antibiotic consumption patterns, health care associated infections, knowledge on rational use of antibiotics and resistance patterns in specific bacteria (*Staphylococcus aureus* and *Neisseria gonorrhoeae*). For further details of ongoing SORT IT studies, please see the table in **Annex 2**.

Through the use of small grants, 13 prospective research projects are moving to implementation.

7. World Antibiotic Awareness Week

Championed by SORT IT officers and fellows, all target countries performed activities linked to World Antibiotic Awareness Week.

Pictures (Top to bottom): Campaigns with health workers (Myanmar); COVID-19 and AMR prevention broadcasted on Facebook and zoom (Colombia); locally adapted messaging on AMR (Myanmar).

8. Tracking progress in relation to performance (log frame) targets

The table below shows SORT IT performance targets for year 1 and the progress made in the year. Due to the unprecedented COVID-19 pandemic and embargoes on several activities, including trainings in year 2 (2020), desired progress could not be achieved. We plan to catch up the pace as of January 2021.

Progress in relation to targets for year 1 and year 2 (2020).

Indicators	2019			2020
	Target	Progress	Status	Target
Research projects initiated	21	36	Exceeded	42
Research manuscripts submitted	NA	-	-	19
LMIC leadership and equity				
> First author from a LMIC country	80%	100%	Exceeded	80%
> Female first author	30%	47%	Exceeded	35%
> Government co-authors included	50%	69%	Exceeded	60%
Training performance				
> Milestone completion score (modules)	80%	97 %	Exceeded	80%
> Participant satisfaction score (modules)	80%	90%	Exceeded	80%
Collaborative partnerships				
> Southern institutions involved	30%	75%	Exceeded	45%
> SORT IT alumni as mentors	30%	70%	Exceeded	40%
> Joined the SORT IT network	80%	100%	Exceeded	80%

Unavoidable COVID-19 training delays. Rescheduling and catch-up in 2021

Challenges and solutions

1. The unprecedented COVID-19 pandemic

The main challenge in 2020 was the unprecedented COVID-19 pandemic and the unavoidable delays in implementation of SORT IT course modules. Our plan is to pick up the pace in January 2021.

Proposed solution:

To catch up with the project deliverables, we have rescheduled SORT IT modules through 2021 and 2022, and where necessary, will deliver training and research support through the virtual SORT IT platform.

Submission of a request for no-cost project extension is envisaged, which will need further discussion with the NIHR.

2. Delays in the small grants scheme

All research projects using the small grants scheme require additional review by the WHO regional offices in Africa and Asia. They also need to be submitted for ethics clearance. The COVID-19 pandemic has resulted in unavoidable delays in fulfilling these formalities at regional level. Some proposals received through the open call for applications needed quality appraisal.

Proposed solution:

We are trying to accelerate the process of ethics clearance. To improve the quality of proposals, we have assigned SORT IT mentors to provide technical support and this will also serve as a capacity building initiative.

3. Budgetary considerations

The slowing of SORT IT activities has had a direct impact on the timely utilization of allocated budget lines for some SORT IT activities.

Proposed solution:

With the rescheduling of SORT IT activities and training modules through 2021 and 2022, we plan to catch up on the implementation of planned activities and budget expenditures.

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Annex 1.
Survey to inform rescheduling of upcoming SORT IT courses on antimicrobial resistance due to COVID-19

Responders: SORT IT facilitators from 24 partner institutions, all SORT IT participants in five target countries and WHO country office staff.

Table 1: Involvement in the COVID-19 response and availability concerns for participation in SORT IT courses

	Facilitators n (%)	Participants n (%)	WHO and TDR staff n (%)	Total
Number contacted	62	60	11	133
Number responded	61 (98)	60 (100)	11 (100)	132 (99)
Involvement in the COVID response:				
Currently involved	44 (72)	43 (72)	10 (91)	97 (73)
Would be involved in future	15 (25)	10 (17)	1 (9)	26 (20)
Not going to be involved	2 (3)	7 (11)	0 (0)	9 (7)
Concerned with participating in SORT IT courses	37 (61)	40 (67)	6 (55)	83 (63)
Support rescheduling of SORT IT courses	60 (98)	58 (97)	11 (100)	129 (98)
Support a one-year extension to the AMR project	60 (98)	51 (85)	11 (100)	122 (92)
SORT IT could play an additional role in tackling impact of COVID on AMR	46 (75)	34 (57)	10 (91)	90 (68)

Percentages calculated with 'number responded' as the denominator.

Table 2: Breakdown of reasons for not being able to participate in SORT IT courses during the COVID-19 pandemic

	Facilitators n (%)	Participants n (%)	WHO and TDR staff n (%)	Total
Number of individuals concerned	37	40	6	83
Travel restrictions (national/ international)	35 (95)	34 (85)	6 (100)	76 (92)
Quarantine (in hosting or resident country)	32 (86)	23 (58)	4 (67)	59 (71)
Lockdown in SORT IT hosting country	22 (59)	25 (63)	6 (100)	54 (65)
Host government restricts gatherings	17 (46)	27 (68)	6 (100)	50 (60)
Personal safety and/or insurance cover	17 (46)	18 (45)	3 (50)	38 (46)
Because of COVID-19, I will be unable to collect data and/or fulfil other milestones	3 (8)	18 (45)	3 (50)	24 (30)
My institution restricts my travel	12 (32)	6 (15)	2 (33)	20 (24)
I have vulnerable members staying with me at home	11 (30)	8 (20)	0 (0)	19 (23)
Availability for workshops (10-14 days)	6 (16)	9 (23)	2 (33)	17 (21)
Other concerns	10 (27)	5 (13)	3 (50)	18 (22)

* Percentages calculated with 'number of individuals concerned' as the denominator. The column total does not add up to the 'number of individuals concerned', as each individual could chose multiple reasons.

Annex 2.
Some examples of research topics by strategic AMR pillars

Strategic AMR pillars	Research topics
Strengthening surveillance and monitoring	> Data quality from AMR surveillance sites *(Nepal)*. > Antibiotic resistance patterns and outcomes in neonates and children *(Myanmar, Nepal)*. > Surgical site infections after caesarean section *(Sierra Leone)*.
Reducing incidence of infection	> Infection prevention and control in health facilities *(Myanmar, Sierra Leone, Uganda)* and border posts *(Sierra Leone)*. > Health care-associated infections with invasive devices and surgery *(Nepal)*. > improving hand hygiene in health facilities *(Sierra Leone)*.
Optimizing antimicrobial use	> Country-wide antibiotic consumption *(Myanmar, Nepal, Sierra Leone, Uganda)*. > Surgical antibiotic prophylaxis *(Nepal)*.
Sustaining investments (AMR burden, diagnostics)	> Burden of methicillin resistant *Staphylococcus aureus* in health facilities *(Myanmar)*. > Blood cultures for febrile illnesses at AMR surveillance sites *(Uganda)*. > Utilisation of culture and sensitivity for meningitis and genital tract infections *(Sierra Leone)*.
One Health	> Data quality for antibiotic use in animal husbandry and livestock *(Ghana, Sierra Leone)*. > Antibiotic residues in meat and milk products *(Nepal)* Antimicrobial pesticide imports *(Sierra Leone)* Antibiotic resistance in poultry excreta *(Sierra Leone)*. > Antibiotic susceptibility in hospital and waste water effluents *(Ghana, Sierra-Leone)*.