AMR-SORT IT
2021 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
Improving health systems through research

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 and institutions "data rich, information rich and action rich", thereby building health system resilience, enhancing programme performance and improving public health The SORT IT model combines *research training and research implementation* with a hands-on (learning by doing) approach that empowers frontline health workers and new trainers.

The success

SORT IT achievements since its inception

SORT IT has covered

25

public health domains

SORT IT has been scaled up to

94

countries

SORT IT has built networks involving

64

institutions with both low- and middle and high-income country collaborations

70%

of completed research has reported an impact on policy and/or practice

51%

of trainees independently conduct research after one training cycle indicating capacity built

For more on SORT IT, go to https://tdr.who.int/activities/sort-it-operational-research-and-training

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), committed designated funding (£8 212 943) for a SORT IT project on tackling antimicrobial resistance (AMR). This is now referred to as the **AMR–SORT IT project**.

Aim

Build sustainable operational research capacity to generate and utilize evidence to tackle the emergence, spread and health impact of AMR in LMICs.

How?

Strong engagement with WHO country offices, AMR committees and SORT IT partners in addressing country priorities and catalysing the evidence to action cycle. There are integrated performance targets and metrics for accountability.

Who

Frontline health workers and decision-makers

Where?

Seven-countries (2019–2022)

Figure 1. Target countries for the AMR–SORT IT project

Desired impact

Strengthened health systems, better programme performance and improved public health.

Scientific scope

Research priorities are tailored to national AMR action plans and local needs. Reinforced by country ownership, the SORT IT project aims to make each of the five pillars of AMR action plans "data rich, information rich and action rich".

The five pillars of the AMR action

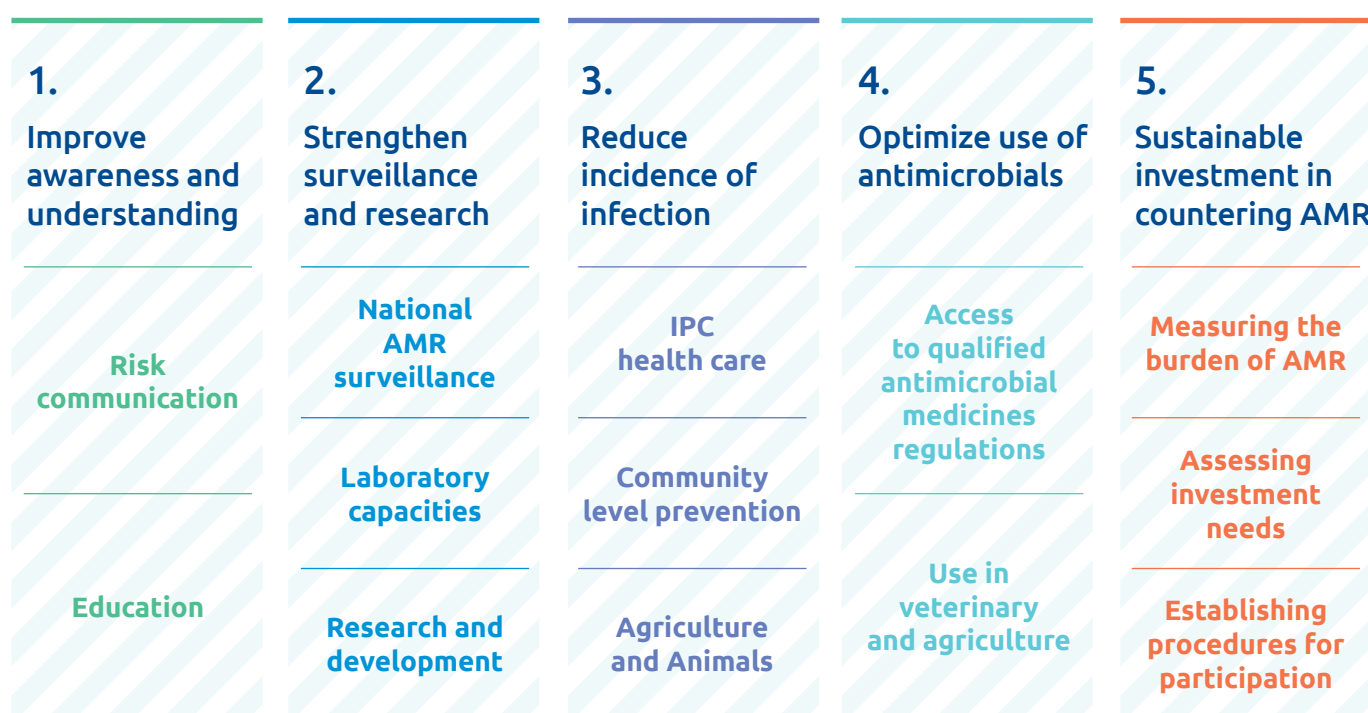| 1. Improve awareness and understanding	2. Strengthen surveillance and research	3. Reduce incidence of infection	4. Optimize use of antimicrobials	5. Sustainable investment in countering AMR
Risk communication	National AMR surveillance	IPC health care	Access to qualified antimicrobial medicines regulations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

Figure 2. The five pillars of the global action plan to tackle antimicrobial resistance

More specific details on the SORT IT AMR programme are available at:
https://tdr.who.int/docs/librariesprovider10/flyers/amr_sort_itflyer.pdf?sfvrsn=373811e7_1

The AMR–SORT IT research cycle
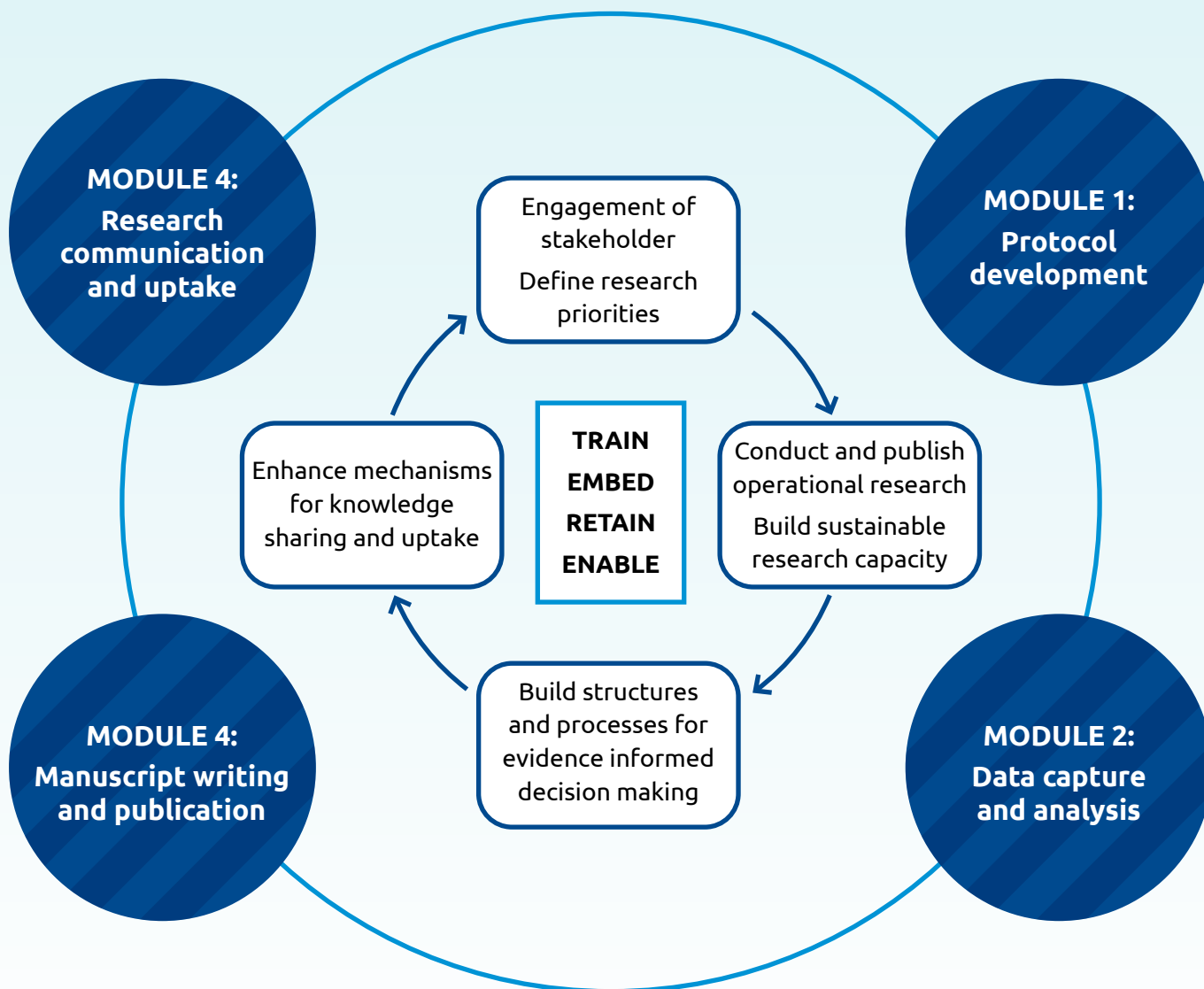
Figure 3. The AMR–SORT IT research cycle

The AMR–SORT IT cycle: The AMR–SORT IT project is geared to catalyse the evidence-to-action cycle from defining the most relevant research in countries to ensuring uptake of research findings. We train those who are embedded and retained within health systems and seek to enable the structures and processes needed for evidence-informed decision-making. SORT IT thus embraces the 'Train, Embed, Retain and Enable' strategy for individuals working within health systems. This approach is in line with WHO's Thirteenth General Programme of Work, 2019–2023. The AMR–SORT IT research cycle is shown in Figure 3.

Overall summary of progress (2019–2021)

During the first two years of the project (2019–2020), through a 'One Health' approach, comprehensive engagement was established with AMR coordinating committees, WHO regional and country offices and SORT IT partners in Asia, Africa, Europe and the Americas. Thirty-seven research studies were launched to inform AMR action plans in target country studies – *local research, for local solutions, with local ownership.*

During the third year (2021), we have:

- *Championed the development and deployment* of a 'SORT IT online training platform' to overcome COVID-19 restrictions on travel and gatherings. Using this innovative tool, 35 research studies were completed, and 37 new studies were started involving countries in Asia, Africa and the Americas (Colombia, Ecuador, Ghana, Myanmar, Nepal, Sierra Leone and Uganda).

- *Improved communication and dissemination of research.* Trainees benefited from a newly developed SORT IT training module (module 4) on 'effective communication of research findings', maximizing the opportunities for research uptake. We pioneered a new mechanism to expedite the research publication process to a record time of 10–12 weeks. Thirty-five studies from Ghana, Myanmar, Nepal, Sierra Leone and Uganda were published in the Open Access Tropical Medicine and Infectious Diseases Journal https://www.mdpi.com/journal/tropicalmed/special_issues/AMR and in the Open Access Public Health Action Journal https://www.ingentaconnect.com/content/iuatld/pha/2021/00000011/a00101s1;jsessionid=1c62edhlr0c0b.x-ic-live-01

- *Strengthened health systems.* Seventy-three percent (73%) of individuals trained through the AMR–SORT IT project continue to apply their acquired skills in a synergistic manner to the COVID-19 global response. AMR activities contributed to building health system resilience by protecting health workers, keeping health facilities safe, improving laboratory diagnostic capacity and informing communities on preventive measures.

- *Enhanced global engagement through networks to tackle AMR.* The AMR–SORT IT network now includes AMR coordinating committees, WHO regional/country offices and 64 implementing partners from 26 countries in Europe, Asia, Africa and the Americas.

During 2021, 35 research projects were published through a novel expedited mechanism for timely evidence generation and dissemination from Asia and Africa and 37 new studies were started in Colombia, Ecuador, Ghana and Sierra Leone with high-level endorsement from decision-makers.

Value for money of the AMR–SORT IT project

Good *value for money* of SORT IT continues due to TDR's established convening power, global networking capacity, use of SORT IT technical know-how and the trained human resource pool that has been built over the past decade. The deployment of an online training platform has increased *efficiencies*, by allowing projects to continue and at lower costs, despite being significantly delayed due to COVID-19. To promote *effectiveness and impact*, we have continued to engage with those expected to use the research results, such as members of the AMR committees, WHO country offices and disease control programmes. To maximize the opportunities for research uptake, we have improved 'effective communication of research evidence'. Participant selections promote gender and geographic *equity* and *first authorship* from low- and middle-income countries (LMICs). These achievements have reinforced TDR's coordination role, improved TDR partnerships and elevated TDR's position to new levels of strength and international recognition.

Details of achievements in 2021

The activities and achievements have been categorized into:

1) Innovations in digital technology – a SORT IT virtual platform for implementing research during COVID-19;

2) Implementing high-quality policy/practice relevant research;

3) Research capacity building;

4) Strengthening health systems resilience;

5) Informing individual and community behaviour to tackle AMR - the World Antimicrobial Awareness Week;

6) Building global engagement for AMR through networks and LMIC equitable research partnerships.

A SORT IT virtual platform was developed and deployed to provide an efficient means of continuing research and training in 2021, despite COVID-19 related restrictions.

1. Innovations in digital technology – a SORT IT platform for research during COVID-19

In early 2021, we championed the development and deployment of a 'dedicated SORT IT online training platform' which allowed us to resume and propel SORT IT research activities and trainings, despite being significantly delayed due to COVID-19 restrictions. Developed with a SORT IT partner in Armenia (TB–RPC), this platform has allowed us to partner with 26 countries and to link subject matter experts in for one- or two-hour sessions, which in the past would have required travel to countries. It has thus reduced costs and improved efficiencies.

Using the online SORT IT tool, we conducted virtual and "hybrid" trainings which resulted in 35 policy relevant studies from Ghana, Myanmar, Nepal, Sierra Leone and Uganda being published. Thirty-seven new studies from Colombia, Ecuador, Ghana and Sierra Leone were started. The SORT IT platform was used to bring together individuals from WHO country offices in six countries and 64 partner institutions.

Using the platform (digital technology) to bring together individuals from 64 partner institutions in 26 countries.
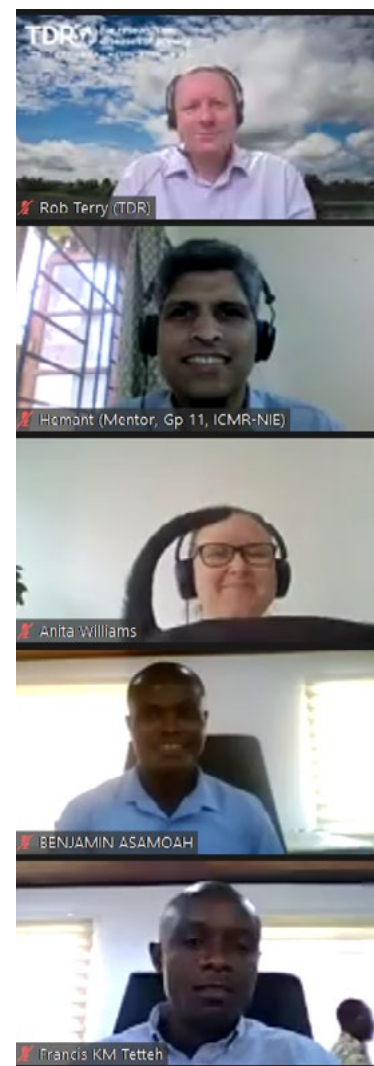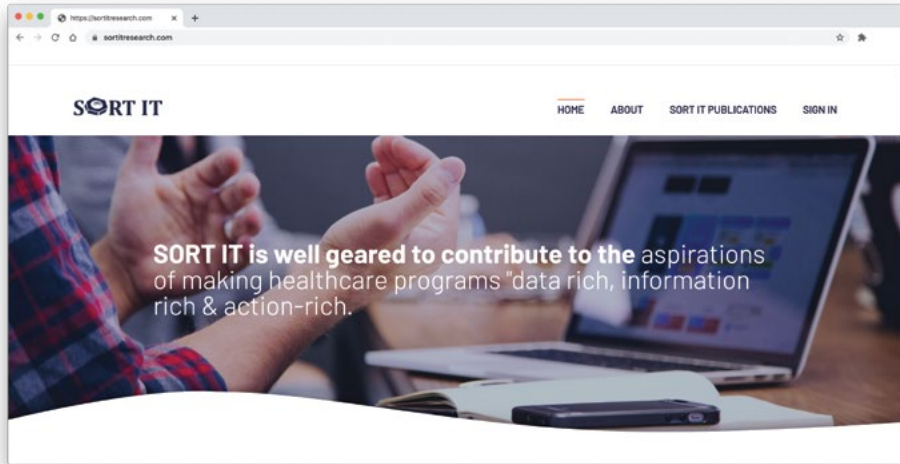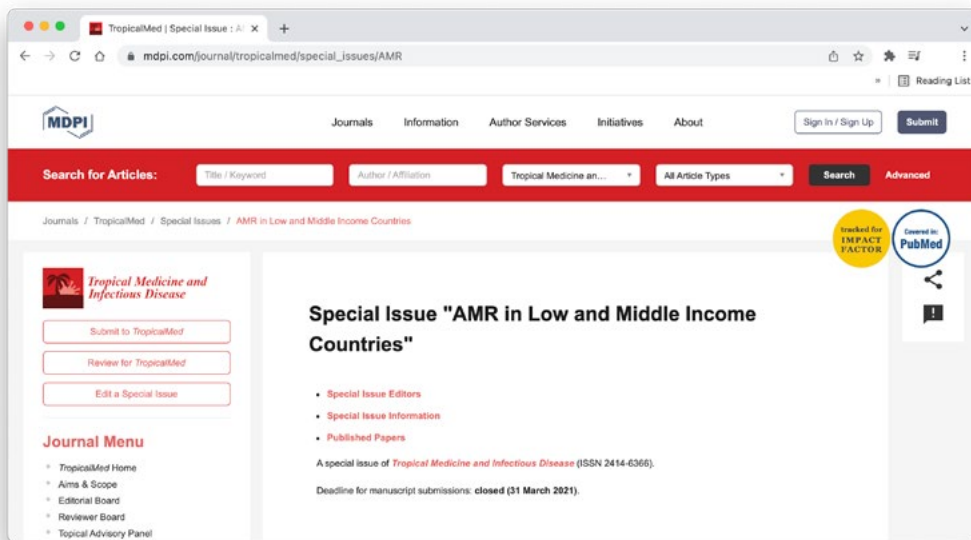
Screenshot of the virtual SORT IT platform for delivering SORT IT trainings. For more details go to https://sortitresearch.com/en

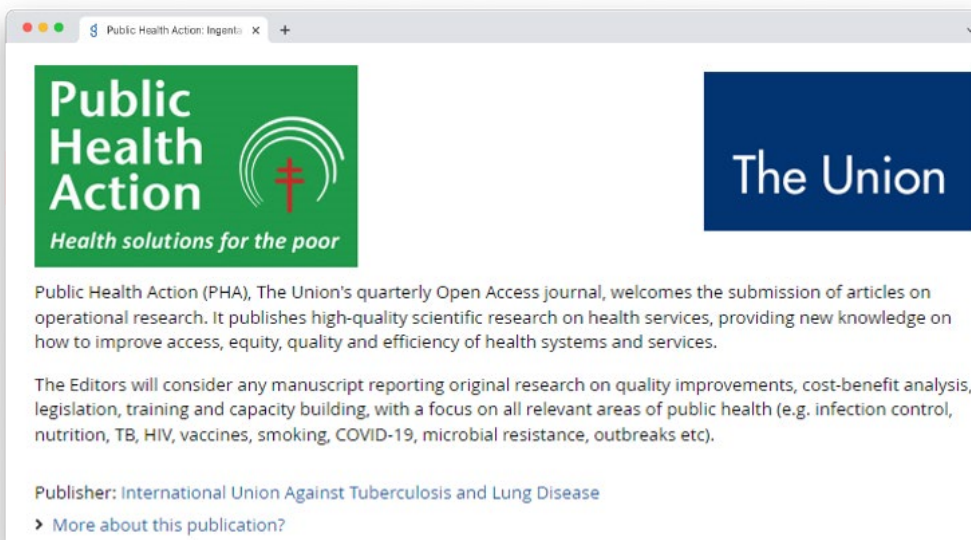# 2. Implementing high-quality policy/practice relevant research

2.1 Rapid publication to ensure timely dissemination of evidence for decision-making

During 2021, thirty-five research projects were completed and propelled through a novel publication mechanism for timely evidence generation for decision-making. These studies were published in a record time of 10-12 weeks by: a) proactively accelerating the journal processes; and b) providing structured support to the researchers, especially in relation to prompt response to editorial and peer review.

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

Available at
https://www.ingentaconnect.com/content/iuatld/pha/2021/00000011/a00101s1;jsessionid=5no9qgf90obpe.x-ic-live-03

2.2 Improving research communication with a 'KISS' – Keep It Short and Simple

Effective communication of research findings is needed to bridge the gap between researchers and decision-makers and influence individual and community behaviour that improves public health.

To improve research communication, TDR and partners developed a new SORT IT training module aimed at providing researchers with the skills and tools needed to effectively communicate their research findings with a KISS – 'keep the information short and simple.' Researchers in Ghana, Nepal, Sierra Leone and Uganda produced four outputs.

- A communication plan targeting decision-makers and stakeholders.
- A one-page plain language summary with key messages and recommendations.
- A PowerPoint presentation of 10 minutes for use at conferences and a lightening presentation (3 minutes) for use with national decision-makers.
- An elevator pitch (30 to 60 second oral presentation) for use in opportunistic one-to-one conversations with stakeholders.

The plain language summaries can be accessed at: https://tdr.who.int/activities/sort-it-operational-research-and-training/communicating-research-findings

> **If research is to have impact and change health outcomes for the better, the research findings should be translated into recommendations that can shape policy and/or practice and SORT IT is invaluable for this purpose.**

Dr Thomas Samba,
Chief Medical Officer, Ministry of Health and Sanitation, Sierra Leone

> **The SORT IT training serves a great need to present research findings in a simple manner, so that we the decision-makers can quickly and easily grasp the key messages and take action to address urgent health issues.**

Dr Madan Kumar Updhyaya,
Chief, Quality Standards and Regulation Division, Ministry of Health and Population, Nepal

2.3 Implementation of new research studies in line with national priorities

Research priorities were tailored to national AMR action plans through the engagement and endorsement of WHO country offices and AMR committees. In 2021, thirty-seven new AMR projects were started in Colombia, Ecuador, Ghana and Sierra Leone.

37 priority research projects were started in Colombia, Ecuador, Ghana and Sierra Leone (local research, with local ownership, for local solutions).

Pictures. (top to bottom): SORT IT researchers writing manuscripts using the virtual platform (Ghana); researchers from the Ministry of Health, Ministry of Agriculture, Forestry and Environmental Protection Agency working on 'One Health' research subjects for combatting AMR (Sierra Leone).

2.4 SORT IT research studies by theme, categorized by AMR pillars (January 2019 to December 2021)

Research themes included: data quality for AMR surveillance in humans and animals; antibiotic consumption patterns; antibiotic resistance in priority pathogens; infection, prevention and control in health facilities; efficiency of sewage plants in reducing bacterial counts; water safety in hospitals; antibiotic use in animal husbandry; bacterial pathogens in agricultural produce irrigated with wastewater; impact of COVID-19 on antibiotic resistance and AMR in ambient air. Figure 4 below shows the classification of 74 research subjects by AMR pillars (in blue) and the proportion of all studies (n-74) that were One Health (in orange).
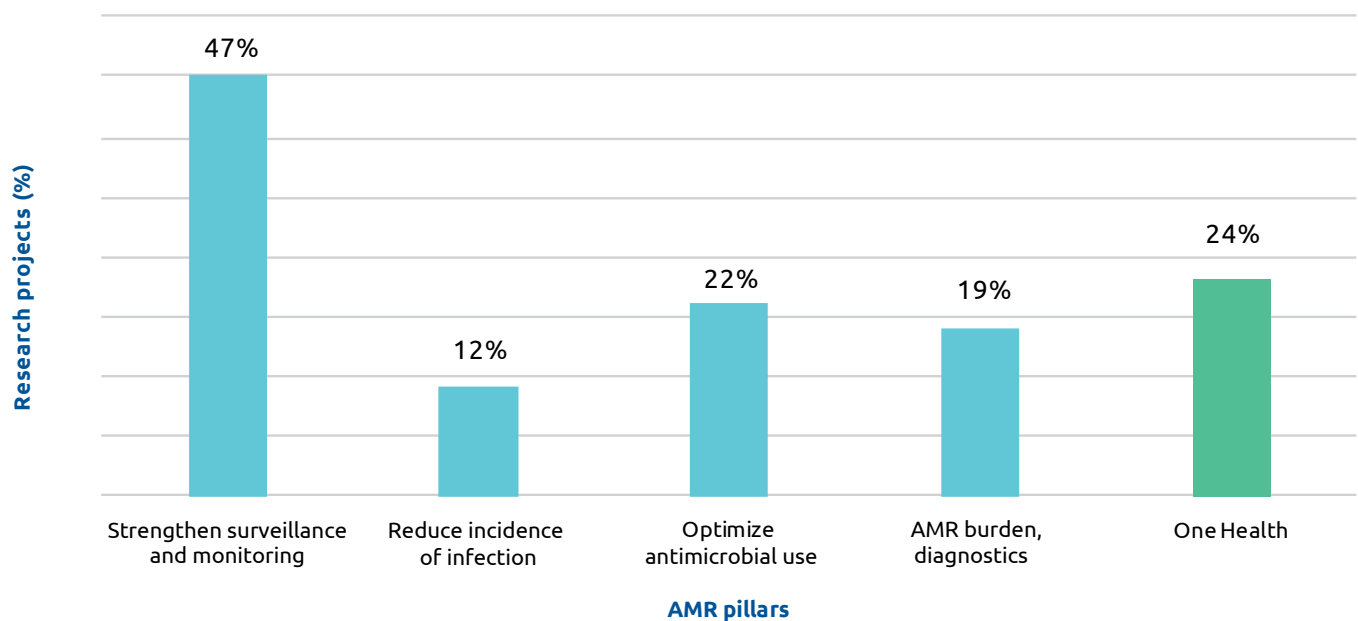
Research categorized by AMR pillars

Figure 4. 47% of the studies (in blue) are on strengthening surveillance and monitoring. This is vital to "feel the pulse" of the AMR situation in countries. Without good surveillance, we would be thinking and acting blindly.

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

Dr Marc Sprenger,
Former Director, WHO AMR Secretariat

3. Research capacity building

The AMR–SORT IT model uniquely combines *research training* and *research implementation* at the same time. Health workers are trained and acquire operational research skills while implementing a research project.

Through an apprenticeship approach, both participants and new trainers are empowered.

Each research project is used to simultaneously implement four layers of training, involving:

1. Frontline workers and programme staff;
2. SORT IT alumni as trainers;
3. Academia as trainers;
4. WHO country staff.

Table 1 shows the four layers of training and numbers trained up to December 2021. The numbers trained per research study is 3.0, which adds to the *value for money*.

SORT IT also enhances *global engagement by building communities of practice*.

Table 1: Layers of training in AMR–SORT IT (January 2019 to December 2021) in Africa, Asia and Latin America.

Layers of training	Number	Training ratio per research study
Total research studies started	**74**	
Total individuals involved in SORT IT training	203	
Layer 1: Frontline health workers / programme staff	72	
Layer 2: SORT IT alumni	59	**~3 persons trained per study**
Layer 3: Academia/others	42	
Layer 4: WHO country staff	30	

> **I am certain that participants will benefit from the SORT IT training and mentorship program which is vital for early-career researchers. This training improves the knowledge, skills and competencies to conduct operational research and generates evidence for reducing the AMR burden**

Dr Joseph Kanu,
National AMR focal person, AMR country coordinating platform,
Sierra Leone

4. Strengthening health systems resilience

The AMR project includes additional financial support to WHO country offices and AMR committees to strengthen the AMR response where funding has been lacking, such as for meetings of technical working groups and human resources (e.g. appointment of SORT IT technical officers and research fellows). This has galvanized the AMR committees in implementing national action plans and boosted WHO leadership in strengthening health system resilience to tackle AMR, COVID-19 and other pandemics such as influenza.

The involvement of SORT IT technical officers, research fellows and three quarters of those in the AMR–SORT IT Project in the COVID-19 response is synergistic with AMR activities and further strengthens health systems by: informing communities on preventive measures, improving laboratory diagnostic capacity, protecting health workers and improving surveillance systems.

Here are some examples:

Strengthening community awareness

A national network of call centres and media communications was established in Nepal: By December 2021, 286 451 community calls were responded to in relation to COVID-19 management, including avoiding irrational antibiotic use.
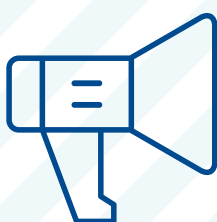
Getting the media on our side

Media practitioners were trained on factual reporting of COVID-19 and AMR in Ghana, Myanmar, Nepal and Sierra Leone.

I commend the valuable technical support provided by the AMR–SORT IT fellow in debunking COVID- 19 rumours, misinformation and concerns. The skills acquired through the SORT IT training proved useful for the review and validation of information, data analysis and effective communication, which helped generate simple and transparent messages for public awareness on COVID-19

Dr Amrit Pokharel,
Call centre, Chief of Epidemiology and Outbreak Management,
Government of Nepal

Here are some examples (continued):

Scaling up national diagnostic capacity and surveillance

In Nepal, quality-controlled laboratories for the diagnosis of COVID-19 were scaled up from one laboratory in January 2020 to 103 by December 2021. This network significantly strengthens COVID-19, AMR and pandemic influenza surveillance and resilience for the future.

The AMR–SORT IT Officer was of great support in strengthening the laboratory network, preparedness and response to COVID-19 in Nepal.

Dr Runa Jha,
Director, National Public Health Laboratory,
Government of Nepal

Here are some examples (continued):

Protecting health workers and communities

Sierra Leone started local production of an alcohol-based hand rub solution which is seven times cheaper than in the local market —US$ 3 compared to US$ 10 on the local market. A total of 45 000 litres is now produced annually. A sustainability plan was endorsed by the Government of Sierra Leone.

> **Through several operational research studies conducted through SORT IT, the AMR–SORT IT programme has played a vital role in demonstrating gaps in Infection, Prevention and Control in health facilities and providing solutions. Proper implementation of Hand Hygiene and Infection prevention and control is a priority in all our health facilities to reduce infection transmission in our Health Care system and to the community at large**

Madam Christiana Kallon,
National IPC Coordinator, Ministry of Health of Sierra Leone

Curtailing COVID-19 transmission across countries

All countries have established COVID-19 surveillance and control measures at border points-of-entry.

Feeling the pulse of the AMR situation in countries

All countries are improving data quality on the Global AMR Surveillance System (GLASS). Monitoring of antibiotic resistance in humans, animals and the environment through the use of standard methodologies for establishing integrated multisectoral surveillance systems on AMR continued – what gets measured gets done.

Pictures: 1. Use of portable RT-PCR diagnostic machines in rural Nepal; 2. Technical AMR working group meeting (Ghana); 3. Health staff at a call centre receiving and responding to community calls (Nepal); 4. Capacity building of media practitioners (Ghana); 5. Commemoration of world hand hygiene day by the Director General of Health Emergencies (Sierra Leone); 6. production of local alcohol-based hand-rub production which is about five times cheaper than on the market (Sierra Leone).

Support to WHO country offices and "One Health" committees builds health system capacity and resilience. Support to the COVID-19 response has also had a synergistic effect in tackling AMR.

5. Informing individual and community behaviour to tackle AMR – the World Antimicrobial Awareness Week

The 2021 theme for the World Antimicrobial Awareness Week (WAAW, 18–24 November) was 'Spread Awareness, Stop Resistance'. Awareness raising activities to avoid the further emergence and spread of drug-resistant infections were conducted in all target countries through effective communication, education and training.

Pictures: 1. AMR campaigns at television stations (Sierra Leone); 2. AMR campaigns in churches (Ghana); 3. AMR campaigns at radio (Ghana); 4. AMR campaigns in markets (Ghana); 5,6. AMR booklets in local language (Myanmar).

6. Building networks and LMIC equitable partnerships

Through TDR's convening power, global engagement on AMR was enhanced by bringing on board 64 SORT IT partners from 26 countries, including 43% SORT IT alumni, and they are engaged with AMR–SORT IT trainings, thereby boosting HIC–LMIC and LMIC–LMIC partnerships. This demonstrates TDR's capacity to effectively mobilize institutions, expertise and build communities of practice on AMR at a global level ("think global, act local").

AMR here, is AMR there, is AMR everywhere ! Sixty-four institutions in 26 countries became part of the AMR–SORT IT programme, highlighting TDR's global engagement in tackling AMR.

Colombia

Nepal

Myanmar

Ecuador

Sierra Leone

Uganda

Ghana
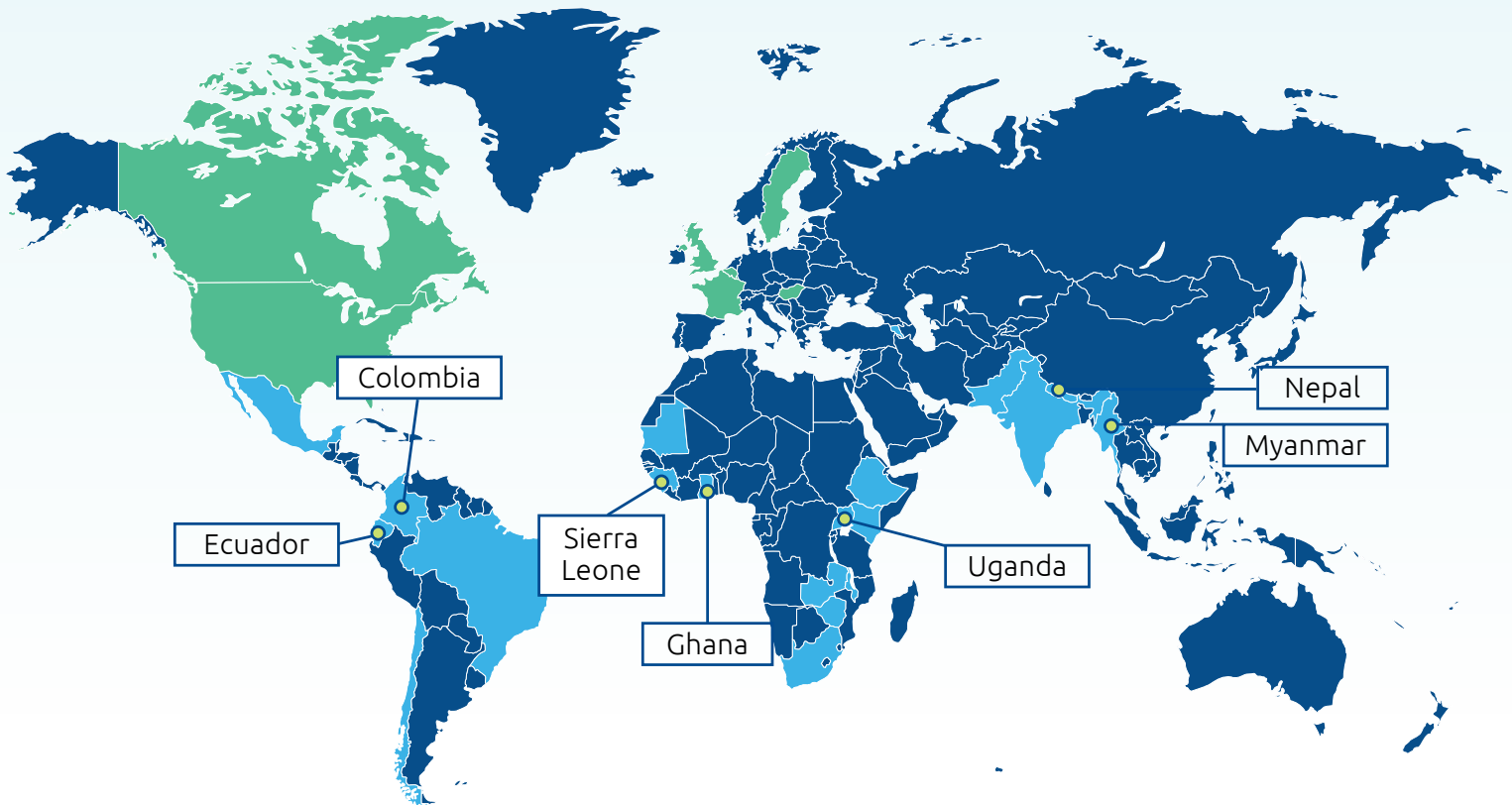
- **LMIC-LMIC COLLABORATION IN AMR**
- **HIC–LMIC COLLABORATION IN AMR**
- WHO country offices

LMIC-LMIC collaboration in AMR (50 institutions):

Tuberculosis Research and Prevention Center NGO (Armenia); The Universidade Federal de Ciencias de Saude de Porto Alegre, (Brazil); Universidade de Brasilia, (Brazil); Universidad de Concepcion (Chile); Universidad de los Andes (Colombia); Universidad Pontificia Bolivariana (Colombia); Universidad Pedagógica y Tecnológica (Colombia); The Central University (Ecuador); Bahir Dar University (Ethiopia); CSIR–Water research institute (Ghana); Kintampo Health Research Center (Ghana); Environmental Protection Agency (Ghana); Institute of Statistical, Social and Economics Research (ISSER, Ghana); University National Centre for Training and Research in Rural Health (Guinea); University of Nairobi (Kenya); Madhira Institute (Kenya); AMPATH (Kenya); Lighthouse Trust (Malawi); Damien Foundation (Nepal); School of Public Health (Nepal); B.P. Koirala Institute of Health Sciences (Nepal); Patan Academy of Health Sciences, (Nepal); National Public Health Laboratory (Nepal); KIST Medical College and Teaching Hospital, (Nepal); Department of Medical Research (Myanmar); ICMR–National Institute of Epidemiology, Chennai, (India); Bangalore Medical College and Research Institute (India); All India Institute of Medical Sciences (India); International Union Against Tuberculosis and Lung Disease (The Union), South East Asia office (India); Indian Council of Medical Research- National Institute of Epidemiology (India); Jawaharlal Institute of Postgraduate Medical Education & Research (India); GMERS Medical College Gotri Vadodara Gujarat, (India); Medical College Baroda, Gujarat, (India); Sri Manakula Vinayagar Medical College, (India); Ministries of Health (Colombia Pakistan, Nigeria, Sierra Leone, Uganda, Zimbabwe); Ministry of Agriculture and Livestock (Nepal, Sierra Leone); The Autonomous University of Yucatán, (México); Food and Agriculture Organization (Sierra Leone); Stellenbosch University (South Africa); Sustainable Health Systems (Sierra Leone); Makerere University (Uganda); Lire University (Uganda) and; Zambart (Zambia).

HIC–LMIC collaboration in AMR: (14 institutions):

Institute of Tropical Medicine (Belgium); University of Toronto (Canada); Public Health, Ontario (Canada); International Union Against Tuberculosis and Lung Disease (France); National Public Health Center, (Hungary); Médecins Sans Frontières, (Luxembourg); Public health Agency (Sweden); University of Saint Andrews (Scotland); Public Health England (United Kingdom); University of Salford (United Kingdom); University of Liverpool (United Kingdom); The Quadram Institute Bioscience, Norwich, (United Kingdom); University of Washington (USA). California State University of Fullerton (USA).

Tracking progress in relation to performance (log frame) targets

Table 2 shows SORT IT performance targets (based on the log frame) from year 1 to year 3. Due to the unprecedented COVID-19 pandemic and embargos on several activities, desired progress could not be achieved in 2020. In 2021, all targets were exceeded except for one: SORT IT alumni as mentors to reach 50% (currently at 43%). With increased involvement of SORT IT alumni, we hope to achieve this target in 2022. In January 2021 we moved to full implementation mode with an extension of the AMR–SORT IT project agreed upon by NIHR until December 2022 which will allow us to achieve all deliverables.

Table 2: Progress in relation to targets for years 1 to 3 (numbers and percentages are cumulative)

Indicators	2019		2020		2021		
	Target	Progress	Target		Target	Progress (Dec 2021)	Status
Research projects*							
Started	21	36	42		64	72	Exceeded
Completed	NA	-	19		38	35	92%
Published					1	35	Exceeded
LMIC leadership and equity							
First author from LMIC	80%	100%	80%		80%	100%	Exceeded
Female first author	30%	47%	35%		40%	47%	Exceeded
Government co-authors included	50%	69%	60%		70%	78%	Exceeded
Training performance							
Milestones achieved (all completed SORT IT cycles)	80%	97 %	80%		80%	97%	Exceeded
Participant satisfaction (all completed modules)	80%	90%	80%		80%	93%	Exceeded
Collaborative partnerships							
Southern institutions involved	30%	75%	45%		60%	82%	Exceeded
SORT IT alumni as mentors	30%	70%	40%		50%	43%	86% of target
Joined the SORT IT network	80%	100%	80%		80%	100%	Exceeded

Middle spanning column: Delays due to COVID 19 Catch-up during 2021/2022

The target numbers are cumulative and based on Logframe targets

Challenges and solutions

1. The unprecedented COVID-19 pandemic causing delays

The main challenge was the delay in implementation of SORT IT course modules in 2020 due to the unprecedented COVID-19 pandemic.

SOLUTION We developed and deployed a virtual SORT IT platform which allowed training activities to restart in January 2021. To catch up with the project deliverables, we rescheduled SORT IT modules through 2021 and 2022 and a project extension was accepted by NIHR until December 2022. This should ensure that we meet all the required deliverables.

2. The political situation in Myanmar

The unstable political situation in Myanmar continues, including civil disobedience and many health workers being detained and arrested. The United Nations guidelines for Myanmar stipulate that meetings and capacity building activities with the de facto authorities should be avoided. It was thus not feasible to consider a national SORT IT cycle in Myanmar in 2021.

SOLUTION To maximize the overall value for money of the AMR–SORT IT project, we brought forward and launched an AMR–SORT IT programme in Ghana in November 2021. Ghana is one of the agreed target countries for the project and the WHO country office team, the national AMR coordinating committee and the SORT IT partnership have welcomed this move. NIHR agreed with this decision. If the situation in Myanmar improves, we will consider revamping a new SORT IT cycle there.

3. Delays in the small grants scheme

Research projects using the small grants scheme require additional review and ethics clearances by the relevant WHO regional office. The COVID-19 pandemic resulted in unforeseen delays in fulfilling these formalities at regional level. Some proposals received through the open call for applications also needed quality appraisal. Thirteen projects were accepted, including four from Asia, six from Africa and three from the Americas.

SOLUTION We continue to try to accelerate the administrative processes. To improve the quality of proposals, we have assigned SORT IT mentors to provide technical support which will also serve as a capacity building initiative.

However, for the outstanding amounts in this budget line, we will consider changing the strategy to direct allocation of funds to AMR–SORT IT alumni who will perform further research. This will be managed through WHO country offices.

4. Budgetary considerations and delays

Understandably, the unprecedented and sustained COVID-19 pandemic resulted in the slowing of SORT IT activities, which had a direct impact on the timely utilization of allocated budget lines for some activities.

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

Contact for further information

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Annex 1.
# 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 adults and children *(Colombia, Myanmar, Nepal)* > Impact of the COVID-19 on antibiotic resistance (Colombia) > Surgical site infections after caesarean section *(Sierra Leone)*
Reducing incidence of infection	> Infection prevention and control in health facilities *(Colombia, Myanmar, Sierra Leone, Uganda)* and border posts *(Sierra Leone)* > Antibiotic resistance in ventilator associated pneumonias *(Ecuador)* > Health care-associated infections with invasive devices and surgery *(Nepal)*
Optimizing antimicrobial use	> Country-wide antibiotic consumption *(Colombia, Myanmar, Nepal, Sierra Leone, Uganda)* > Surgical antibiotic prophylaxis *(Nepal)*
Sustaining investments (AMR burden, diagnostics)	> Burden of methicillin resistant Staphylococcus aureus in health facilities *(Myanmar, Nepal)* > Blood cultures for febrile illnesses at AMR surveillance sites *(Colombia, Uganda)* > Utilisation of culture and sensitivity for meningitis and genital tract infections *(Sierra Leone)*
One Health	> What's in the salad? Bacterial pathogens and antibiotic resistance in lettuce irrigated with wastewater *(Ghana)* > Data quality for antibiotic use in animal husbandry and livestock *(Ghana, Sierra Leone)* > Antibiotics in poultry production *(Ecuador, Nepal, Sierra Leone)* > Antimicrobial pesticide imports *(Sierra Leone)* > Antibiotic susceptibility in hospital, sewage and seafood processing effluents *(Colombia, Ghana, Sierra Leone)*

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. A full list of TDR donors is available on our website at: **https://www.who.int/tdr/about/funding/en/**.

The United Kingdom Department of Health & Social Care has contributed designated funding for this SORT IT AMR initiative which is branded as the NIHR–TDR partnership.initiative which is branded as the NIHR-TDR partnership.

These are our top donors during the past 5 years.
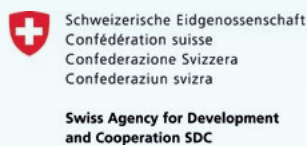
Belgium

Japan

TDR is co-sponsored by the following organizations: