WHO Strategic and Technical Advisory Group for Antimicrobial Resistance (STAG-AMR)

Report of the first meeting

22-24 June 2021
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Introduction

The World Health Organization (WHO) through the Antimicrobial Resistance Division, is leading, guiding and facilitating the Organization's global response to antimicrobial resistance (AMR), based on the Global Action Plan on AMR, the 13th WHO General Program of Work and the Sustainable Development Goals (SDGs). Its major functions include the establishment and coordination of global mechanisms needed to drive political and systemic change, and supporting Member States to build national capacities to implement their national action plans and reduce levels of antimicrobial resistance worldwide.

Mission and functions of the Strategic and Technical Advisory Group on AMR (STAG-AMR)

The STAG-AMR has the mandate of advising the WHO Director-General and the AMR Division on overall global policies and strategies to address AMR within the context of human health, while considering relevant World Health Assembly (WHA) resolutions and decisions. The STAG-AMR reports to the Director-General of WHO, and members are appointed by the Director-General. The Terms of Reference for STAG-AMR are provided at https://www.who.int/groups/strategic-and-technical-advisory-group-on-antimicrobial-resistance

The STAG-AMR has the following functions:

1. To review progress and make recommendations in the implementation of WHO’s priority activities to tackle AMR in countries consistent with WHO’s mandate, relevant WHA resolutions and decisions, and the strategic objectives of the Global Action Plan on AMR;

2. To provide an independent evaluation of the major strategic, scientific and technical challenges and opportunities to be addressed by WHO in order to enhance progress in addressing AMR in the context of human health;

3. To review and make recommendations regarding the adequacy of WHO’s response to emerging national and global public health risks with regards to AMR;

4. To review and make recommendations on the status of linkages between AMR and other health interventions, and other relevant sectors;

5. To review and make recommendations on WHO’s engagement in partnerships to enhance the achievement of global AMR goals.

First meeting of STAG-AMR

The first meeting of the STAG-AMR took place virtually from 22-24 June 2021. The meeting was organized by the ADG Office of the AMR Division, in close collaboration with the Department of Global Coordination and Partnership (GCP) and the Department of Surveillance, Prevention and Control (SPC) of the Division.
Professor Gunnar Kahlmeter has been appointed by the WHO Director-General as STAG-AMR Chair for the period of 2020-2023. He is a clinical microbiologist who has worked in clinical microbiology and the field of antimicrobial resistance since the early 70s. He has headed the Swedish national reference laboratory on phenotypic susceptibility testing of bacteria and is the head of the EUCAST Development Laboratory. Professor Sabiha Essack has been appointed as the Vice-Chair for STAG-AMR. She is the South African Research Chair in Antibiotic Resistance and One Health and is Professor in Pharmaceutical Sciences at the University of KwaZulu-Natal.

There are twenty members of STAG-AMR with appropriate balance in gender, geography and expertise. The list of STAG-AMR members and their biographies are available on the WHO website (https://www.who.int/groups/strategic-and-technical-advisory-group-on-antimicrobial-resistance). All STAG-AMR members attended the first meeting. The STAG-AMR members were joined by WHO staff from Headquarters and representatives from the six WHO Regional Offices, as well as a wide range of partners. See Annex 1 for the list of participants.

The agenda for this first STAG AMR meeting (Annex 2) was developed during an introductory meeting that took place on March 4, 2021 led by the STAG-AMR chair and with full participation of the STAG-AMR members. The minutes of the introductory meeting are available here.

Meeting objectives

At this first meeting, WHO requested STAG-AMR to review and advise on several areas of the WHO global AMR work. The agenda items are summarized below:

Day 1
- Opening (Session 1)
- Updates from the Secretariat (Session 2: informative session)
- The use of surveillance data and consequences for the next phase of the Global Antimicrobial Resistance and Use Surveillance System (GLASS) (Session 3)

Day 2
- Accelerated implementation of evidence-based National Action Plan (NAPs) (Session 4)
- Behavior change to mitigate AMR (Session 5)

Day 3
- Discussion and agreement of STAG-AMR Recommendations (Session 6)
- Closure (Session 7)

Each session of the STAG-AMR meeting began with an introductory presentation by WHO staff. Comments and suggested recommendations were provided by two STAG-AMR members serving as session
discussants, followed by comments and recommendations offered by other STAG-AMR members, and additional comments by other participants/observers.

The WHO technical focal points together with the STAG-AMR members serving as session discussants developed draft written observations & recommendations, with the assistance of the Chair. The draft written observations and recommendations were shared for review with the STAG-AMR members. Their comments were consolidated by the WHO Secretariat and presented on the 3rd day of the meeting for final discussion and agreement.

This report provides a summary of the 1st meeting of STAG-AMR, with a focus on the conclusions and recommendations provided by STAG-AMR to WHO for the topics addressed. The consolidated report was reviewed by the STAG-AMR Chair and the STAG-AMR Members, and finalized by the WHO secretariat.

The report is submitted by the STAG-AMR Chair and the Assistant-Director General of the Antimicrobial Resistance Division to the Deputy Director-General and the Director-General of WHO.

The report of the first STAG-AMR meeting is posted on the WHO website: https://www.who.int/health-topics/antimicrobial-resistance

SESSION 1: Opening

Dr Hanan Balkhy, Assistant Director-General AMR introduced the Director General to provide the official opening of the first STAG-AMR.

The Director-General of WHO, Dr Tedros Adhanom Ghebreyesus, officially opened the meeting by addressing the members of the STAG-AMR and thanking them for accepting to serve in this role and helping guide WHO in its work in supporting countries to address AMR. He emphasized the global importance of the recommendations of this committee to support the work of the WHO on AMR and highlighted that the COVID-19 pandemic has underscored the urgency of controlling AMR through interventions such as infection prevention and control, laboratory strengthening, surveillance, antimicrobial stewardship and water, sanitation and hygiene.

Dr Hanan Balkhy, Assistant Director-General AMR then initiated the first official meeting of the WHO STAG-AMR, welcoming members of the STAG-AMR, representatives from the six WHO Regions, technical focal points at WHO Headquarters and invited observers.

Dr Balkhy reminded STAG-AMR members that they would be participating in their individual capacities without representing their affiliated institutions or any interest groups. She introduced AMR Directors Dr Kitty Van Weezenbeek, Director, Department of Surveillance, Prevention and Control, and Dr Haileyesus Getahun, Director, Department of Global Coordination and Partnership, and concluded by introducing the Chair, Professor Gunnar Kahlmeter and the Vice-Chair, Professor Sabiha Essack. Taking the floor, Professor Kahlmeter introduced each STAG-AMR member in turn.
Dr Nienke Bruinsma, on behalf of the WHO Secretariat stated for the record that all members of the STAG-AMR had completed and signed a declaration of interest on the occasion of the introductory meeting in January 2021, which had then been assessed by the WHO Secretariat to determine whether any conflicts of interest had arisen. Two members had declared potential conflicts of interest, and it was noted that the interests disclosed did not constitute a conflict for the purpose of the STAG-AMR meeting. All observers attending had signed a confidentiality undertaking. Dr Bruinsma reminded all participants that the meeting was being recorded, for internal use only, and will remain strictly confidential and that French interpretation would be available throughout the three-day meeting.

**STAG-AMR CONCLUSIONS AND RECOMMENDATIONS BY SESSION**

**SESSION 2: Updates from the Secretariat (informative session)**

Dr Haileyesus Getahun introduced two updates from the Secretariat. At the introductory meeting in January 2021, STAG-AMR members had requested information on possible plans to refresh the Global Action Plan on AMR (GAP) that had been adopted in 2015 and on progress in advancing a One Health research agenda.

**Session 2.1: plans to refresh the Global Action Plan on AMR (GAP)**

Dr Elizabeth Tayler (Liaison Officer Tripartite Joint Secretariat, WHO/AMR) reminded participants of the process that had led to the development and adoption of the GAP by the WHA, FAO and OIE, the subsequent political developments at the UN General Assembly and the ongoing implementation of national action plans by 144 countries in line with the GAP. She outlined how the WHO Secretariat, working with Tripartite organizations FAO and OIE, had since developed a monitoring framework and the Tripartite AMR Country Self-Assessment Survey (TrACSS). She reminded participants of the five objectives of the GAP and that it also outlines the responsibilities of WHO, partners, the international community and countries. In the six years since the GAP adoption, new experience and evidence has emerged along with a greater focus on the environment and governance than was initially covered, leading to some calls for the GAP to be refreshed. However, the GAP is not timebound and much remains to be implemented. Furthermore countries are embarking on implementing their national action plans in line with the GAP. The transaction costs and potential for disruption of a refreshed GAP would be considerable for all concerned, particularly as any future GAP should be developed with the Tripartite and UNEP. It was therefore the opinion of the Tripartite senior management that the GAP, as it is, should remain the bedrock of the AMR response and that if any gaps are identified, these should be addressed through complimentary mechanisms. The Tripartite will continue to monitor the need and evidence.

**Session 2.2: progress in advancing a One Health research agenda**

Dr Peter Beyer (Unit Head AMR Global Coordination, WHO/AMR) announced that the WHO Secretariat is now advancing the Priority One Health research agenda as envisaged in the GAP following a grant from
the Danish Ministry of Health through ICARS and a secondment, Tine Rikke Jorgensen (Technical Officer, WHO/AMR), who will be responsible for its implementation.

Ms Tine Rikke Jorgensen (Technical officer, WHO/AMR) introduced the Priority One Health Research Agenda, a three-year joint project with FAO and OIE, with a two-year secondment to WHO, designed to enable stakeholders engaged in One Health research to communicate and collaborate to achieve better public health outcomes. The project aims to identify and prioritize research questions that will build the evidence base to inform policy, to catalyze investment and scientific interest. She described the scope of the project and what will and will not be covered such as research related to only one sector. The next steps include an open call for all stakeholders to provide input on what should be considered as major evidence gaps, a systematic literature review and an expert consultation. Ms Jorgensen outlined the three gaps in evidence that had already arisen namely: transmission across sectors; efficacy of interventions; economics to advocate for action. The WHO Secretariat encouraged STAG-AMR members to engage in the open call and to disseminate it among their networks.

**STAG-AMR observations:**

- STAG-AMR members reiterated the importance of the GAP as a fundamental reference document for both operational planning and resource mobilization, and welcomed the approach of complimentary annexes as needed, to address new areas and incorporate new evidence as they arise.

- STAG-AMR members stressed the importance of including social sciences such as behaviour change, related regulatory frameworks, sustainability, affordability and transferability.

**SESSION 3: The use of surveillance data and consequences for the next phase of the Global Antimicrobial Resistance and Use Surveillance System (GLASS)**

Dr Kitty Van Weezenbeek introduced the session by outlining the principles behind the development of the next phase of GLASS: to ensure that surveillance data can and will be used for decision making at local, national and global levels. Can be used, because the data meets essential quality and representativeness criteria. Will be used, because policymakers and professionals recognize the need for an evidence-based approach to tackling AMR. In most countries, the routine surveillance data as collected under GLASS AMR does not yet generate representative and quality data, and does not allow for any trend analysis. Therefore, there is an urgent need to develop and implement additional survey approaches, especially in low- and middle-income countries (LMIC), to define AMR burden and trends. Furthermore, surveillance needs to be fully integrated in a programmatic AMR response at country level.

Dr Carmem Pessoa-Silva (Unit Head, Surveillance & Evidence and Laboratory Strengthening, WHO/AMR) provided a brief summary of the evolution and achievements of GLASS over its initial 5 years. She outlined the ongoing challenges for both countries and partners, and focused on the possible constraints of surveillance based on routine clinical samples and the impact it has on the representativeness, quality and completeness of epidemiological data. These constraints may include the limited access to quality health
care in low resource settings and lack of application of good diagnostic stewardship practices. She also highlighted the ongoing limitations of laboratory capacity, the lack of complete patient clinical and epidemiological data, and the challenge of monitoring use in the community and in primary health care. A complementary approach is now being initiated in low- and middle-income countries (LMIC) to include periodic national surveys, to improve the quality of surveillance data, to improve understanding of antimicrobial use through monitoring its use in the community and undertaking surveys in hospitals.

Dr Viroj Tangcharoensathien (AMR-STAG member discussant):
Dr Viroj Tangcharoensathien presented the strategies and approaches adopted in Thailand to scale up routine surveillance of antimicrobial consumption and use, and new pilots underway for innovative interventions.

Professor Constance Schultz (AMR-STAG member discussant):
Professor Constance Schultz discussed the pitfalls and solutions of surveillance as exemplified in population and laboratory-based surveillance of urinary tract infections in Indonesia and her experience in generating meaningful data for clinical use.

STAG-AMR observations:

- Recognizes the rapid expansion of GLASS worldwide but concludes that laboratory-based surveillance using routine diagnostics data comes with challenges such as limited access to quality health care and limited coverage of eligible patients which will impact on the representativeness and quality of data, especially in low- and middle-income countries and resource-constrained settings.
- Recognizes that limited access to quality assured microbiological laboratory services will affect both individual patient care and the coverage and quality of routine laboratory-based surveillance.
- Recognizes that it may take time for LMICs to generate representative and quality data under a routine laboratory-based surveillance approach and that thus complementary approaches, such as (national) prevalence surveys, should be explored.
- Recognizes the need for AMR attributable mortality data to inform the AMR response and create evidence-based advocacy for policymakers.
- Raises concerns about the importance of unauthorized sales of medicines and the potential impact on the emergence of AMR.
- Recognizes the importance of strengthening AMU and AMC surveillance at different levels of health care, as well as integration with AMR data in human health, and with surveillance data from other sectors.
- Recognizes the urgent need for national AMR governance structures, human resources and capacity building to support the implementation and use of surveillance.
- Recognizes that conflicts leading to displacement of populations may impact on AMU and AMR emergence and spread, which is not yet well understood.

- Considers encouraging countries to introduce hub & spoke models where institutions with high quality surveillance performance foster good practices in other institutions through national and international mentorship programmes.

- Considers increasing the background information in areas conducting AMR and AMU surveillance: availability and cost of antimicrobials, legislation and practices related to the availability of antimicrobials, etc.

- Recognizes the importance of AMR emergence and spread in health care facilities, and the need to explore possible approaches to integrate AMR and AMU surveillance with surveillance of healthcare associated infections

- Recognizes that the selection and use of laboratory equipment in LMICs may be influenced by factors not related to real country needs or resources, and acknowledges the key role of WHO in supporting countries to make rational evidence-based country/setting specific decisions.

**STAG-AMR recommendations to WHO:**

1. Continue strengthening GLASS through the development of strategies, guidance and tools to improve the representativeness and quality of data obtained through routine laboratory-based surveillance.

2. Support countries in establishing and strengthening access to robust national microbiology laboratory networks adhering to good laboratory practices, and diagnostic stewardship.

3. Develop complementary innovative, affordable, population-based prevalence surveys for AMR and AMU, to obtain high quality and representative national and sub-national data for action at different levels of health care, in both public and private sectors.

4. Support the interpretation and use of AMR, AMC, AMU and HAI surveillance data for decision-making at different levels of health care.

5. Continue the implementation of the WHO protocol for the assessment of the attributable mortality of AMR in blood stream infections.

6. Assist countries to tackle specific constraints and build capacities to promote, prioritize and implement surveillance activities according to their needs, resources, specificities and capacities.

**SESSION 4: Accelerated implementation of evidence-based National Action Plans (NAPs)**

Mr Anand Balachandran (Unit Head National Action Plans and Monitoring and Evaluation, WHO/AMR) began with a brief overview of the ongoing challenges to NAP implementation including their complexity, lack of funding, lack of monitoring, and need for greater government ownership and accountability. He also spoke to the disconnect between AMR activities and national health sector programmes, and highlighted the need for a programmatic approach to mitigating AMR that will
ensure sustainability, promote equity, and facilitate stronger oversight and management. He proposed three key approaches: i) developing an AMR patient pathway framework that puts the patient at the centre (the framework identifies challenges and intervention areas to overcome these challenges at the community, primary health care, health-care facility levels across four critical elements of a pathway from prevention to and exposure of AMR, access to care, access to diagnosis and access to appropriate treatment); ii) developing a suite of practical NAP implementation tools to help countries prioritize, cost, manage, implement and monitor activities, many of which are already being developed and additional tools planned; iii) introducing the AMR Technical Assistant Mechanism (TEAM) to facilitate information sharing, integrated technical assistance delivery to countries, development of rosters of available experts and WHO Collaborating Centers, sharing of tools and guidance, joint assessments, collating best practice, mapping of needs, and convening key NAP implementation partners.

Dr Nandini Shetty (AMR-STAG member discussant):
Dr Nandini Shetty presented evidence from external studies on challenges and lessons for implementation, most notably from South East Asia and Europe, including inspiring lessons from Thailand and Ghana. She concluded that the studies had indicated that NAPs need to be country and context-specific, responsive to country priorities, that they must be practical and usable, that governance is critical for the sustainability of activities, and that sudden, dramatic overhauls and changes should be avoided with challenges and barriers being recognized and addressed along the way. She advocated for implementation research and the generation of evidence to inform policy makers.

Professor Samuel Kariuki (AMR-STAG member discussant):
Professor Samuel Kariuki described the experience of Kenya in implementing its NAP and noted the many challenges that remain, such as sales without prescription, infrequent monitoring, lack of implementation of IPC protocols and low levels of awareness. He highlighted the need to determine the economic cost of addressing AMR, the need to better understand the socio-economic drivers of AMU, and the need to scale up stewardship efforts and IPC in healthcare facilities.

STAG AMR observations:

- Recognizes the need for evidence-based country specific plans, supported by leadership, allocation of financial and human resources, technical capacity building and an accountability mechanism for the implementation of the plan.
- Recognizes the need for the development of a training package/e-learning repository together with the AMR TEAM stakeholders.
- Stresses that WHO tools should be useable and adaptable to country contexts, and support their mid-term reviews and revisions moving towards NAP 2.0.
• Suggests that the “AMR Patient Pathway” could include a theory of change perspective (to describe why and how interventions will work), and consider internal and external health systems challenges.

• Suggests that WHO should convene partners (academia, public and private sectors etc.) to articulate, develop and support intervention/operational research to mitigate AMR.

• Recognizes the need for leadership and management training at all levels (policy makers, healthcare professionals).

• Recognizes the need to identify a core set of indicators for success that are achievable by all Member States – this can be linked to the “Essential Package of Interventions” to provide guidance for prioritization of interventions.

• Recognizes the need for the AMR response to be sustainable and equitable; link to existing plans, programmes and budgets including health systems strengthening and Universal Health Coverage (e.g., patient safety).

• Recognizes the need for meaningful partnerships and collaborations between HIC and LMIC partners to support NAP implementation including twinning approaches.

**STAG-AMR recommendations to WHO:**

1. Address critical issues for NAP coordination and implementation, including government ownership, governance, capacity building, sustainable financing, monitoring, and stakeholder engagement, based on individual country needs.

2. Continue the development of an evidence based “Essential Package of Interventions” to assist countries to prioritize and implement simple, cost effective, adaptable and achievable interventions based on country contexts, in a step-wise approach guided by an intervention/operational research framework.

3. Develop an “AMR Patient Pathway” framework linked to a health system strengthening approach, and raise advocacy and training on this new framework for all stakeholders. Implementation at the country level will benefit from existing efforts to strengthen health systems and avoids duplication of resources.

4. Create a simple “AMR NAP Assessment Tool”, with clear indicators for the human health sector that builds on existing tools and leads to actionable results.

5. Periodically convene global, regional and national stakeholders through the AMR Technical Assistance Mechanism (TEAM) to advocate, collaborate, coordinate and provide assistance to countries for NAP implementation based on needs assessments.
SESSION 5: Behaviour change to mitigate AMR

The session was introduced by Mr Thomas Joseph (Unit Head, Antimicrobial Stewardship and Awareness, WHO/AMR) who stressed that behaviour change was an integral part of tackling the complex drivers of AMR across multiple sectors and among a myriad of different actors. Dr Lianne Gonsalves (Technical Officer, WHO/AMR) presented the current thinking on behaviour change around AMR-relevant health behaviours, determined by internal decision-making as well as external drivers. She suggested key groups whose behaviour could be targeted, the importance of considering various socio-ecological drivers on which to intervene, and the diversity of behavior change intervention options. She also highlighted the recently published Tailoring Antimicrobial Resistance Programmes (TAP) toolkit, developed by WHO Regional Office for Europe.

Ms Vanessa Carter (AMR-STAG member discussant):
Ms Vanessa Carter presented the patient perspective, with a focus on the need for communication and providing patients with access to information and understanding of issues in order to empower their decision-making and behavioural choices. She advocated for co-creation of patient-centered IPC programmes and related AMR communication media to; i) more closely tailor promotion of public engagement and education at an individual level; and ii) highlight the opportunities and challenges of access to accurate information in the digital age.

Dr Sujith Chandy (AMR-STAG member discussant):
Dr Sujith Chandy proposed some key considerations for the STAG-AMR including which groups and sub-groups should be targeted by WHO, how interventions should be prioritized in line with feasibility and impact, and which model of behaviour change would be best applied to AMR.

STAG AMR observations:

- Recognizes that the improvement of health security, UHC and health systems strengthening provide a critical environment for sustained behaviour change.
- Recognizes that behaviour change is a long-term endeavor, requiring ongoing, sustainable investments and advocacy.
- Recognizes that communication alone does not change behaviour – behaviour change is complex and has many drivers, including socio-economic drivers.
- Recognizes the importance of understanding the role of media (traditional, social, digital), providing training for communicating on AMR awareness, spreading information, and managing misinformation (infodemic management).
- Recognizes that the availability of online services/commodities (online diagnosis searching, antibiotics ordering) is only going to increase with time.
Recognizes that educating children and youth on AMR, within a broader health perspective (e.g. WASH, IPC, food safety), including through curriculum development, is a critical long-term investment in addressing AMR.

Recognizes that supportive laws and policies are important to facilitate behaviour change among prescribers/dispensers/patients, but enforcement is needed.

Recognizes that countries and settings should have the flexibility to prioritize target populations and interventions for behaviour change.

Recognizes that behaviour change is a relevant priority for all countries, not just LMICs.

**STAG-AMR recommendations to WHO:**

1. Focus on AMR education for diverse populations within the general public, patients, healthcare workers, prescribers, pharmacists, policymakers and politicians.

2. Collaborate with relevant agencies and partners, support the education of children and youth using diverse media, as well as curriculum development, as a long-term investment in mitigating AMR.

3. Facilitate the adaptation of existing behaviour change models and resources, including the Tailoring Antimicrobial Resistance Programmes toolkit, that examine various determinants of behavior (e.g. economic drivers). WHO should aim to mitigate AMR by promoting analytical decision-making for behaviour change appropriate to the country context.

4. Promote the use of different communication media, including social media, to effectively target different populations and promote AMR awareness for behaviour change.

**CLOSING**

Professor Kahlmeter closed the substantive discussion sessions of the meeting reflecting on the challenges inherent in virtual meetings with tight timelines, while concluding the meeting had been successful. He invited STAG-AMR and the WHO Secretariat to reflect on how best to improve the working modalities of the STAG-AMR going forward, particularly while travel remains uncertain. He concluded by thanking STAG-AMR members, the WHO Secretariat, the interest of observers and input from Regional Offices.

Dr Hanan Balkhy closed the meeting by thanking the members for their expertise and guidance, the discussants, the Vice Chair, and the Chair for their work throughout the three days and staff of the WHO Secretariat. She noted that, being a virtual meeting, time had not permitted presentations from Regional Office focal points, but that future meetings of the STAG-AMR would provide this
opportunity. She also noted that many of the STAG-AMR recommendations were timely and in line with requests from Member States.

The WHO Secretariat will prepare a report of the meeting with the STAG-AMR recommendations which will be shared with STAG-AMR members prior to publication. A 2-hour meeting will be planned right after the summer break to catch up with STAG-AMR members to discuss developments, follow up from the report, and to discuss additional topics for the next official STAG-AMR meeting.
ANNEX 1. List of participants

STAG-AMR members

• Prof Gunnar Kahlmeter (CHAIR), Professor of Bacteriology, Clinical microbiology, Central Hospital Växjö, Sweden
• Prof Sabiha Essack (Vice-CHAIR), Professor in Pharmaceutical Sciences. Director Antimicrobial Research Unit, University of KwaZulu-Natal, South Africa
• Dr Jameela Al Salman, Infectious disease consultant, Salamniya Medical Complex, Kingdom of Bahrain
• Dr Laura Isabel Barcelona, Coordinator Appropriate Use of Antimicrobials, Ministry of Health & Professor of Infectious Diseases, Bernardo Houssay Hospital, Vicente López, Buenos Aires, Argentina
• Prof Hanene Tiouiri Benaissa, Head of the Infectious Diseases Dept, University Hospital Rabta of Tunis, Tunisia
• Prof Kirsty Buisung, Infectious diseases physician, Deputy Director of National Center of Antimicrobial Stewardship, Royal Melbourne Hospital and Doherty Institute for Infection and Immunity, Australia
• Ms Vanessa Carter, Patient advocate, Healthcare Communications and Social Media, South Africa
• Dr Sujith J Chandy, Professor, Dept of Pharmacology & Clinical Pharmacology, Christian Medical College, Vellore, India
• Dr Tim Eckmanns, AMR Lead, Robert Koch Institute, Berlin, Germany
• Prof Wail Ahmad Hayajneh, Professor of paediatric infectious disease, Jordan University of Science and Technology, Jordan
• Prof Mukesh Kapila, Professor of Global Health and Humanitarian Affairs, University of Manchester, United Kingdom
• Ms Otridah Kapona, National AMR Focal Point and Coordinator, Zambia National Public Health Institute, Zambia
• Prof Samuel Kariuki, Director of Research and Development, Kenya Medical Research Institute, Nairobi, Kenya
• Dr Lawrence Kerr, Director, Office of Pandemics and Emerging Threats, Office of Global Affairs Department of Health and Human Services, Washington, D.C., United States of America
• Prof Constance Schultsz, Department of Global Health-AIGHD, Amsterdam University Medical Centers, Netherlands
• Dr Nandini Shetty, Consultant Clinical Microbiologist and Infection Specialist, Reference Microbiology, National Infection Service, Public Health England, United Kingdom
• Dr Dawn Sievert, Senior Science Advisor on AMR, National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, United States of America
• Dr Viroj Tangcharoensathien, Health policy analyst, Ministry of Health of Thailand, Thailand
• Prof Timothy Walsh, Professor of Medical Microbiology and Antibiotic Resistance, Department of Zoology, University of Oxford, United Kingdom
• Dr Yu Zhang, State Key Laboratory of Environmental Aquatic Chemistry, Research Center for Eco-environmental Sciences, Chinese Academy of Sciences, China

Observers
• Mirza Alas, Program Officer, South Centre, Switzerland
• Richard Alm, Director of Alliances, CARB-X, United States of America
• Roxane Berjaoui, International Affairs Advisor, Ministry for Solidarity and Health, France
• Radu Botgros, Scientific Officer, Biological Health Threats and Vaccines Strategy, Clinical Studies and Manufacturing Task Force, European Medicines Agency, Netherlands
• Gemma Buckland Merrett, Science and Research Lead, Drug-Resistant Infections Priority Programme, Wellcome Trust, United Kingdom
• Denise Cardo, Director, Division of Healthcare Quality Promotion (DHQP), National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, United States of America
• Alexandra Clarici, Division for One Health and AMR, Ministry of Health, Germany
• Alex Costa, UNICEF, United States of America
• Michael Craig, Senior Advisor for Antibiotic Resistance, Centers for Disease Control and Prevention, United States of America
• Jane Cunningham, Diagnostics advisor, Médecins Sans Frontières – Access Campaign, Switzerland
• Anders Dalsgaard, University of Copenhagen, Faculty of Health and Medical Sciences, Department of Veterinary Disease Biology, Denmark
• Marcio da Fonseca, Infectious Diseases Medical Advisor (TB, AMR, NTDs, EIDs, HCV), Médecins Sans Frontières – Access Campaign, Switzerland
• Elisabeth Erlacher-Vindel, Head of the AMR and Veterinary Products Dept, World Organisation for Animal Health (OIE), France
• Dr Steven Hoffman, Director, Global Strategy Lab, Toronto, Canada
• Tim Jinks, Head of Drug-resistant Infections Programme, Wellcome Trust, United Kingdom
• Mohan P. Joshi, Senior Principal Technical Advisor, USAID (MTaPS) Program, Management Sciences for Health, United States of America
• Anna-Elisabeth Larsen, Research Analyst, Health, Nutrition and Population, World Bank, United States of America
• Alexis Leonard, Senior Health Systems Technical Advisor, USAID, United States of America
• Dominique Monnet, Head of Disease Programme AMR and Healthcare-Associated Infections, European Centre for Disease Prevention and Control, Sweden
• Mirfin Mpundu, Director, ReAct Africa, Zambia
• Emmanuel Nfor, Technical Director, USAID (MTaPS) Program, Management Sciences for Health, United States of America
• Seamus O’Brien, Director of Research & Development, Global Antibiotic Research & Development Partnership (GARDP), Switzerland
• Rosa Peran, Senior Advisor, Ministry of Health, Welfare and Sport (VWS), Netherlands
• Jessica Petrillo, Senior Advisor for Antimicrobial Resistance and GHSA, USAID, United States of America
• Celine Pulcini, Cheffe de projet national à l’Antibiorésistance, MoH Coordinator of the French AMR National Action Plan, Ministère des Solidarités et de la Santé, France
• Dr Mahbubur Rahman, Global Strategy Lab, Toronto, Canada
• Andreas Sandgren, Director, ReAct Europe, Sweden
• Mike Sharland, Paediatric Infectious Diseases Research Group, Institute for Infection and Immunity, St George’s, University of London, United Kingdom
• Dr Henry Skinner, CEO, AMR Action Fund, United States of America
• Subasree Srinivasan, Consultant Medical Director, Global Antibiotic R&D Partnership (GARDP), Switzerland
• Dr Susan Rogers Van Katwyk, WHO Collaborating Centre on Global Governance of AMR, Canada
• Ana Vidal, Scientific Administrator, Veterinary Medicines Division, European Medicines Agency, Netherlands
• Ghada Zoubiane, Independent consultant, Head of Partnerships and Stakeholder Engagement, ICARS, Denmark

WHO regional AMR focal points
• Socorro Escalante, Regional Office for the Western Pacific
• Walter Fuller, Regional Office for Africa
• Laetitia Gahimbere, Regional Office for Africa
• Danilo Lo Fo Wong, Regional Office for Europe
• Pilar Ramon Pardo, Regional Office for the Americas
• Siswanto Siswanto, Regional Office for South East Asia
• Maha Talaat, Regional Office for the Eastern Mediterranean
• Ali Ahmed Yahaya, Regional Office for Africa

WHO Regional and Country Office staff and consultants
• Yamile Celis, Consultant, WHO Country Office, Colombia
• Nathalie El Omeiri, Advisor, Antimicrobial Resistance Response, WHO Regional Office for the Americas
• Jacky Fuentes Rodriguez, Consultant, WHO Regional Office for the Americas
• Marcelo Galas, Technical Officer, Antimicrobial Resistance Surveillance, WHO Regional Office for the Americas
• Saskia Nahrgang, Technical Officer AMR, Division of Country Health Programmes, Regional Office for Europe
• Rodolfo Quiros, Consultant, WHO Regional Office for the Americas
• Rehab Rayan, Consultant, Antimicrobial Resistance and Infection control, WHO Regional Office for the Eastern Mediterranean
• Grisel Rodrigues Cuns, Consultant, WHO Country Office, Uruguay
• Genara Romero, Consultant, WHO Country Office, Argentina
• Valeska Stempliuk, Advisor, Health Surveillance, Disease Prevention and Control, WHO Country Office, Jamaica
• Germán Vásquez Niño, Technical Officer, Pan American Center for Foot-and-Mouth Disease and Veterinary Public Health (PANAFTOSA) of Regional Office for the Americas
• Sara Tolba, Medical Epidemiologist, Division of Communicable Disease Control, Regional Office for the Eastern Mediterranean
• Bassim Zayed, Medical Officer, Antimicrobial Resistance and Infection control, Regional Office for the Eastern Mediterranean

WHO headquarters staff and consultants
• Solange Alves, Technical Officer, AMR Stewardship and Behaviour Change, GCP Dept, AMR Division
• Penelope Andrea, Technical Officer, Assistant Director-General’s Office, AMR Division
• Ellen Attafuah, Assistant to Team, Assistant Director-General’s Office, AMR Division
• Anand Balachandran, Unit Head, National Action Plans and Monitoring and Evaluation, SPC Dept, AMR Division
• Dr Hanan Balkhy, Assistant Director-General, AMR Division
• Amina Benyahia, Scientist, Nutrition and Food Safety, UHC/Healthier Populations
• Silvia Bertagnolio, Medical Officer, Global HIV, Hepatitis and STIs Programmes, UHC/Communicable and Noncommunicable Diseases
• Peter Beyer, Senior Adviser, Impact Initiatives and Research Coordination, GCP Dept, AMR Division
• Nienke Bruinsma, Executive Officer, Assistant Director-General’s Office, AMR Division
• Alessandro Cassini, Technical Officer, SPC Dept, AMR Division
• Rosalie Edma, Team Assistant, GCP Dept, AMR Division
• Sergey Eremin, Medical Officer, Surveillance & Evidence and Laboratory Strengthening, SPC Dept, AMR Division
• Haileyesus Getahun, Director, GCP Dept, AMR Division
• Lianne Gonsalves, Technical Officer, Awareness and Campaigns, Antimicrobial Stewardship and Awareness, GCP Dept, AMR Division
• Breeda Hickey, Technical Officer, National Action Plans and Monitoring and Evaluation, SPC Dept, AMR Division
• Verica Ivanovska, Technical Officer, Antimicrobial Consumption and Use Surveillance, SPC dept, AMR Division
• Thomas Joseph, Unit Head a.i., Antimicrobial Stewardship and Awareness, GCP Dept, AMR Division
• Jorge Matheu Alvarez, Team Lead, Impact Initiatives and Research Coordination, GCP Dept, AMR Division
• Britney McMurren, Consultant, National Action Plans and Monitoring and Evaluation, SPC Dept, AMR Division
• Diriba Mosissa, Consultant, GCP Dept, AMR Division
• Arno Muller, Team Lead, Antimicrobial Consumption and Use Surveillance, SPC dept, AMR Division
• Alessandro Patriarchi, Consultant, National Action Plans and Monitoring and Evaluation, SPC Dept, AMR Division
• Sarah Paulin, Technical Officer, National Action Plans and Monitoring and Evaluation, SPC Dept, AMR Division
• Carmem Pessoa Da Silva, Unit Head, Surveillance & Evidence and Laboratory Strengthening, SPC Dept, AMR Division
• Pravarsha Prakash, Technical Officer, National Action Plans and Monitoring and Evaluation, SPC Dept, AMR Division
• Charlotte Rasmussen, Technical Officer, Diagnostics, Medicines & Resistance, UHC/Communicable and Noncommunicable Diseases
• Tine Rikke Jorgensen, Technical Officer, Impact Initiatives and Research Coordination, GCP Dept, AMR Division
• Katya Rykovanova, Programme Officer, SPC Dept, AMR Division
• Hatim Sati, Consultant, Impact Initiatives and Research Coordination, GCP Dept, AMR Division
• Hayet Souissi, Assistant, Office of Assistant Director-General, AMR Division
• Liz Tayler, Liaison Officer, Tripartite Joint Secretariat, GCP Dept, AMR Division
• Barbara Tornimbene, Technical Officer, Surveillance & Evidence and Laboratory Strengthening, SPC Dept, AMR Division
• Maarten van der Heijden, Consultant, Impact Initiatives and Research Coordination, GCP Dept, AMR Division
• Kitty van Weezenbeek, Director, SPC Department, AMR Division
• Suzanne Young, Technical Officer, Tripartite Joint Secretariat, GCP Dept, AMR Division
• Katie Zingg, Technical Officer, Assistant Director-General’s Office, AMR Division
### MEETING OF THE STRATEGIC AND TECHNICAL ADVISORY GROUP FOR ANTIMICROBIAL RESISTANCE (STAG-AMR)

*Agenda for virtual meeting: 22-24 June 2021, 13.30-16.30*

#### DAY 1. 22 JUNE 2021

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<tr>
<th>TIME</th>
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<tr>
<td></td>
<td><strong>Session one. Opening (30 min)</strong></td>
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<tr>
<td>13.30</td>
<td>Welcome</td>
<td>Hanan Balkhy, ADG, AMR Division</td>
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<td>Hanan Balkhy, ADG, AMR Division</td>
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<td>Gunnar Kahlmeter, Chair, STAG-AMR</td>
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<tr>
<td>14.00</td>
<td>Opening remarks - Tedros A Ghebreyesus, Director-General WHO</td>
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<tr>
<td>14.10</td>
<td>AMR Global Action Plan refresh – Elizabeth Tayler, Liaison Officer Tripartite Joint Secretariat, WHO/AMR</td>
<td>Gunnar Kahlmeter, Chair, STAG-AMR</td>
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<td>14.20</td>
<td>Developing a One Health AMR priority research Agenda – Peter Beyer, Unit Head a.i. AMR Global Coordination &amp; Tine Jorgenson, Technical Officer, WHO/AMR</td>
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<tr>
<td>14.30</td>
<td>Q&amp;A</td>
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<td>14.45</td>
<td>Break</td>
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<td></td>
<td><strong>Session two. Updates from the Secretariat (informative session, 45 min)</strong></td>
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<tr>
<td>14.55</td>
<td>Topic Introduction – Kitty van Weezenbeek, Director SPC &amp; Carmem Pessoa da Silva, Unit Head, Surveillance &amp; Evidence and Laboratory Strengthening, WHO/AMR</td>
<td>Gunnar Kahlmeter, Chair, STAG-AMR</td>
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<tr>
<td>15.10</td>
<td>Presentations from AMR STAG members</td>
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<td></td>
<td>Discussants: Viroj Tangcharoensathien (Thailand) and Constance Schultsz (The Netherlands)</td>
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<tr>
<td>15.30</td>
<td>Discussion</td>
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<tr>
<td>16.20</td>
<td><em>Wrap up for the day</em></td>
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**DAY 2. 23 JUNE 2021**

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<tr>
<th>TIME</th>
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<tr>
<td><strong>Session four. Discussion topic: Accelerated implementation of evidence-based National Action Plan (NAPs) (80 min)</strong></td>
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<tr>
<td>13.30</td>
<td>Topic Introduction – Anand Balachandran, Unit Head NAPs and M&amp;E, WHO/AMR</td>
<td>Gunnar Kahlmeter, Chair, STAG-AMR</td>
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<tr>
<td>13.45</td>
<td>Presentations from AMR STAG members</td>
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<td></td>
<td>Discussants: Nandini Shetty (United Kingdom) and Samuel Kariuki (Kenya)</td>
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<tr>
<td>14.00</td>
<td>Discussion</td>
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<td>14.50</td>
<td><em>Break</em></td>
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<tr>
<td><strong>Session five. Discussion topic. Behavior change to mitigate AMR (80 min)</strong></td>
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<td>15.00</td>
<td>Topic introduction – Thomas Joseph, a.i. Unit Head, Antimicrobial Stewardship and Awareness, WHO/AMR &amp; Lianne Marie Gonsalves, Technical Officer, WHO/AMR</td>
<td>Gunnar Kahlmeter, Chair, STAG-AMR</td>
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<tr>
<td>15.15</td>
<td>Presentations from AMR STAG members</td>
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<td></td>
<td>Discussants: Sujith Chandy (India) and Vanessa Carter (South Africa).</td>
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<td>15.30</td>
<td>Discussion</td>
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<tr>
<td>16.20</td>
<td><em>Wrap up of the day</em></td>
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## DAY 3: 24 JUNE 2021

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<tr>
<td>13.30</td>
<td>The use of surveillance data and consequences for the next phase of GLASS – Carmem Pessoa da Silva, WHO/AMR</td>
<td>Gunnar Kahlmeter, Chair, STAG-AMR</td>
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<tr>
<td>14.00</td>
<td>Accelerated implementation of evidence-based NAPS – Anand Balachandran, WHO/AMR</td>
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<td>14.30</td>
<td>Behavior change to mitigate AMR – Thomas Joseph, WHO/AMR</td>
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<tr>
<td>15.00</td>
<td>Discussion</td>
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<td>15.30</td>
<td>Break</td>
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### Session 6. Discussion topics: Draft conclusions & Recommendations (120 min)

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<tbody>
<tr>
<td>15.40</td>
<td>Final STAG-AMR Recommendations - Gunnar Kahlmeter, Chair, STAG-AMR</td>
<td>Hanan Balkhy, ADG, AMR Division</td>
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<tr>
<td>16.00</td>
<td>Closure of meeting</td>
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