3RD MEETING OF THE WHO AMR SURVEILLANCE AND QUALITY ASSESSMENT COLLABORATING CENTRES NETWORK – *Meeting Report*

17-19 February 2019

WHO Regional Office for the Eastern Mediterranean

Cairo, Egypt

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Abbreviations

AFRO	Regional Office for Africa
AI	Artificial Intelligence
AMC	Antimicrobial Consumption
AMR	Antimicrobial Resistance
AMU	Antimicrobial Use
APW	Approval for performance of work
AST	Antibiotic Susceptibility Testing
AWaRe	Access-Watch-Reserve
BOD	Burden of Disease
BSI	Blood Stream Infection
CAESAR	Central Asian and Eastern European Surveillance of Antimicrobial Resistance
CC	Collaborating Centres
CDDEP	Center for Disease Dynamics, Economics & Policy
CRE	Carbapenem resistant *Enterobacteriaceae*
DSP	Diagnostic Stewardship Program
EARS-Net	European Antimicrobial Resistance Surveillance Network
EB	Executive Board
EML	Essential Medicine List
EMRO	Regional Office for the Eastern Mediterranean
EQA	External Quality Assessment
ESBL	Extended-spectrum Beta-lactamase
EVIP-Net	Evidence-Informed Policy Network
FAO	Food and Agriculture Organization
GAP	Global Action Plan
GASP	Gonococcal Antimicrobial Surveillance Programme
EGASP	Enhanced Gonococcal Antimicrobial Surveillance Programme
GLASS	Global Antimicrobial Resistance Surveillance System
GLASS-EAR	GLASS emerging AMR reporting

GMI	Global Microbial Identifier
GPW	General Programme of Work
HAI	Healthcare-associated Infection
HQ	Headquarters
ICU	Intensive Care Unit
IPC	Infection Prevention and Control
JANIS	Japan Nosocomial Infections Surveillance
MDR	Multidrug resistance
MoH	Ministry of Health
MSF	Médecins Sans Frontières
NAP	National Action Plan
NFP	National Focal Point
NRL	National Reference Laboratory
NSS	National Surveillance System
OIE	World Organisation for Animal Health
POC	Proof of Concept
POP	Proof of Principle
PPS	Point Prevalence Survey
QMS	Quality Management System
ReLAVRA	Latin American Surveillance Network of Antimicrobial Resistance
RO	Regional Office
SOP	Standard Operating Procedure
STAG	Strategic and Technical Advisory Group
TB	tuberculosis
TISSA	Tripartite Integrated Surveillance System on AMR
TOR	Terms of Reference
TP	Target Product

UHC	Universal Healthcare Coverage
UTI	Urinary Tract Infection
WAAW	World Antibiotic Awareness Week
WASH	Water, sanitation, and hygiene
WGS	Whole Genome Sequencing
WHA	World Health Assembly
WHO	World Health Organization

Executive summary

The World Health Organization (WHO) Global Antimicrobial Resistance Surveillance System (GLASS) was developed to support the implementation of the global action plan (GAP) on antimicrobial resistance (AMR), in line with World Health Assembly (WHA) Resolution WHA68.7. In the early implementation phase of GLASS (2015-2019), data collection on AMR and the implementation status of national AMR surveillance systems has been initiated to strengthen understandings of the extent and impact of AMR globally, and inform interventions and advocacy. To date, 74 countries have enrolled in GLASS, highlighting the rapid and significant achievements that have been made.

To support AMR surveillance globally, the WHO AMR Surveillance and Quality Assessment Collaborating Centres Network (CC Network)[1] was established in December 2016. Two meetings were held in 2016 and 2018 to gain joint agreement between the CC Network members and WHO Regional Offices (ROs) on strategies to support participating countries, promote exchange and peer support, and develop the implementation of the CC Network workplan. In order to develop a plan for the revision of GLASS at the end of the early implementation phase,[2] the third CC Network meeting was held 17-19 February 2019 at the WHO Regional Office for the Eastern Mediterranean Region (EMRO) in Cairo, Egypt.

The objectives of the third CC Network meeting were to:

1. Follow up on contributions of each participating CC to the implementation of GLASS according to 2017-2019 CC Network workplan, and establish priority areas of future work and support for specific Target Products (TPs) and activities.
2. Develop and agree on the plan for the revision of GLASS following the early implementation phase.
3. Further improve and enhance collaboration of participating CCs and ROs for continuous support on capacity building.

The meeting highlighted the need for continued support and commitment to strengthen: national surveillance systems; country participation, and global collaboration and coordination between partners; the quality and representativeness of data; and translation of data to inform policy and interventions. At the end of the meeting, Dr Malin Grape (SWE-66) handed over coordination of the CC Network to Dr Jean Patel (CC USA-281). The next CC Network meeting will be held following the third Member State consultation, which is likely to take place in the third quarter of 2020.

The key outcomes of the meeting included:

1. An agreed plan for the revision of GLASS, including common understanding of the status of GLASS development and support for global AMR surveillance efforts.
2. Defined priority activities, respective roles and responsibilities, and timelines for the CC Network work plan over 2019-2020 to support GLASS development and ROs to address AMR surveillance challenges in all WHO regions.
3. Agreed framework for monitoring and evaluation of the CC Network.

This document summarizes the key meeting activities and outcomes, including: reports from the CCs and ROs on progress on the workplan TPs, and areas of need for support; an update on GLASS and key challenges; breakout sessions to discuss progress in achieving target products and areas for revision for each TP; joint discussion to define activities and timelines for the GLASS revision; and the generation of a revised CC Network workplan for 2019-2020 and ways of working together moving forward.

[1] More information on the CC Network at http://www.who.int/glass/collaborating-centres-network/en/

[2] Global Antimicrobial Resistance Surveillance System - Manual for Early Implementation. At http://www.who.int/antimicrobial-resistance/publications/surveillance-system-manual/en/

WHO AMR Surveillance and Quality Assessment Collaborating Centres Network Master Plan 2019-2020: GLASS development & implementation

Area of work	Target Product	Activities and inputs
Capacity building/ technical support: **microbiology laboratory**	TP1: Technical assistance to countries	• Strengthening Laboratory Quality Management Systems (QMS) • Provision of reference testing for AMR • Provision of EQA programme for AMR • Address ad hoc requests on capacity building
	TP2: Tools for strengthening national reference laboratories (NRLs) to support AMR surveillance	• WHO NRL assessment tool and its application • Finalization of the guidance on NRL best practices to support AMR surveillance • Define minimum set of SOPs for GLASS pathogens and processes • List of drugs to be reported (to be revised in the end of cycle) • Generic list of drugs to be tested
	TP3: Detection and reporting of colistin resistance	• Review and revise the colistin resistance technical note[3]
	TP4a: Guidance on use of molecular methods to foster surveillance implementation	• Define molecular targets which can be reported • Review of the technical note[4]
	TP4b: Technical note on use of WGS for AMR surveillance	• Development of landscape analysis on the application of WGS to support AMR surveillance
Capacity building/technical support: **Surveillance system**	TP 5: Technical assistance to countries	• GLASS Repository and Toolbox • Contribution to international educational initiatives • Webinars • Country training/workshops, missions upon request, including conducting training of trainers
	TP6: Strategies and operational research to inform sustainable implementation of AMR surveillance in limited resource settings	a. Revised manual for implementation of national surveillance systems
		b. Guidance on how to use AMR data for policy making
		c. Promotion of diagnostic stewardship

[3] The detection and reporting of colistin resistance. Geneva: World Health Organization; 2018 (WHO/WSI/AMR/2018.4)

[4] Molecular methods for antimicrobial resistance (AMR) diagnostics to enhance the Global Antimicrobial Resistance Surveillance System. Geneva: World Health Organization; 2019 (WHO/WSI/AMR/2019.1)

Area of work	Target Product	Activities and inputs
		d. Support surveillance of AMR in *Neisseria gonorrhoeae* (GASP and EGASP)
		e. Develop generic protocols for point prevalence surveys (PPS) on AMR, using a tiered approach for including antimicrobial use and health care associated infection
GLASS Development	TP7: One Health AMR surveillance	• Support development and implementation of surveillance of one AMR indicator (ESBL *E. coli*) across human, animal, food and environmental sectors
	TP8: Development of IT and data management tools	• IT and data management tools to support GLASS modules and special studies • Recommendations on national IT solutions and capacity building • Use of AI to support surveillance of AMR
	TP 9: Early detection and information sharing of unusual types of AMR	• Develop the risk assessment approach for emerging AMR • Promotion of GLASS-EAR
	TP 10: Guidance on detection and reporting of antifungal resistance in selected invasive fungal disease	• Pilot protocol for surveillance of AMR in *Candida* BSI • Support country capacity building for detection and reporting of antimicrobial resistance in invasive fungal disease
	TP 11: Revision of GLASS methodology for the 2nd phase of GLASS	a. Develop GLASS manual 2.0
		b. Define criteria for categorization of levels of evidence generated by AMR surveillance
		c. Facilitate application of GLASS standards by existing lab-based national AMR surveillance systems
		d. Develop additional GLASS metrics
Increase understanding of impact of AMR	TP 12: Assessment of health impact of AMR and estimation of AMR burden of disease	a. Tier 1 - National representative data
		b. Tier 2 – Diagnostic test practices
		c. Tier 3 – Attributable mortality

Full proceedings

Organization of the meeting

On 15-19 February 2019, WHO hosted a meeting with WHO Collaborating Centres, hosted at the WHO Regional Office for the Eastern Mediterranean in Cairo, Egypt. Prior to the meeting, several background documents were prepared including:

1. Meeting concept note
2. Meeting agenda
3. List of participants
4. WHO AMR Surveillance and Quality Assessment Collaborating Centres Network workplan updated at 2nd CC network meeting in March 2018
5. DRAFT GLASS guidance for national reference laboratories

5a. Annex to DRAFT GLASS guidance for national reference laboratories

6. DRAFT GLASS Pilot Protocol for the inclusion of *Candida* spp.
7. Scoping the role of whole genome sequencing for AMR surveillance
8. DRAFT GLASS BOD methodology for AMR bloodstream infection
9. GLASS early implementation: lessons learnt and proposed steps for further development
10. Group distribution for breakout sessions
11. Terms of Reference WHO AMR Surveillance and Quality Assessment Collaborating Centre Network

The list of participants in the meeting is provided in Annex 1.

The agenda is provided in Annex 2.

Overall coordination

Dr Maha Talaat, Regional Advisor, Antimicrobial Resistance/Infection Prevention and Control, EMRO

Dr Carmem L Pessoa-Silva, Lead, Surveillance, AMR Secretariat, HQ/WSI/AMR/SUV

Chair

Dr Malin Grape, Director, WHO Collaborating Centre for Antimicrobial Resistance Containment, Public Health Agency of Sweden

Session I - Opening

Opening Address

Speaker: Dr Ahmed Al Mandhari, WHO EMRO Regional Director

Dr Al Mandhari welcomed participants to Cairo, and to the Regional Office for the Eastern Mediterranean (EMRO). He wished them a fruitful meeting, emphasizing EMRO's full commitment to such an important topic.

In his opening address, Dr. Al Mandhari underscored that AMR surveillance is fundamental to control the emergence of antimicrobial resistance (AMR). For this reason, the World Health Organization (WHO) has developed the Global Antimicrobial Resistance Surveillance System (GLASS), in accordance with the World Health Assembly (WHA) resolution 68.7 to support the implementation of the Global Action Plan (GAP) on AMR. Since 2015, GLASS has initiated the collection of data on AMR, and the implementation status of national AMR surveillance systems, to assess the extent and impact of AMR globally, and generate evidence to inform interventions and advocacy. In the 13th General Programme of Work (GPW 13), WHO has prioritized awareness raising, partnerships, and resource mobilization around AMR, taking an integrated

approach supporting the overarching goal to promote population health, advance universal healthcare coverage (UHC), and address health emergencies.

EMRO regards AMR as a health priority, and combatting AMR is a core element of their work, including provision of technical support to countries to implement national action plans (NAPs) and national surveillance systems (NSSs) on AMR. 14 countries in EMRO have enrolled in GLASS, and 12 have reported data on AMR. They continue to work with countries in the region to strengthen NSSs, and improve the quality of data.

Dr Al Mandhari offered his hopes the meeting will progress work on AMR, before thanking and welcoming the participants.

Welcome and introductions

Speakers: Dr Carmem Pessoa-Silva, Dr Malin Grape

Objectives achieved: Introductions, meeting rules, procedures, format, and objectives

Dr Pessoa-Silva thanked EMRO for hosting the Network meeting, before summarizing progress in GLASS. Dr Pessoa-Silva thanked the Public Health Agency of Sweden and Dr Malin Grape for supporting the coordination of the Network, and outlined the meeting rules, procedures, agenda, and objectives.

The objectives of the consultation were to:

1. Follow up on contributions of each participating CC to the implementation of the GLASS according to the 2017-2019 CC Network workplan, and establish priority areas of future work and support to specific Target Products (TPs) and activities;
2. Develop and agree on the plan for the revision of GLASS following the early implementation phase;
3. Further improve and enhance collaboration of participating CCs and WHO Regional Offices (ROs) for continuous support on capacity building.

The expected outcomes were to:

1. Agree a plan for the revision of GLASS, including common understanding of status of GLASS development and support to the global AMR surveillance efforts;
2. Define priority activities and respective roles and responsibilities, and timelines for the CC Network workplan for 2019-2020 to support GLASS development and ROs to address AMR surveillance challenges in all WHO regions;
3. Agree a framework for monitoring and evaluation of the work of the CC Network.

Dr Grape thanked EMRO for hosting, and acknowledged the support provided by the CCs to participating countries implementing GLASS, and the importance of the revisions.

Session II – GLASS updates and RO requests for help

Progress reports from the CCs on the target products (TP) in the CC workplan

Speakers: Prof Olga Perovic, Dr Jean Patel, Dr Nandini Shetty, Dr Monica Lahra, Dr Jonas Fuks, Prof Magnus Unemo, Dr Rachel Smith, Prof Wing Hong Seto, Prof Jaap Wagenaar, Dr John Stelling, Dr Shawn Lockhart, Dr Nienke Bruinsma, Dr Marlieke De Kraker

Objectives achieved: TP updates from the CC Network

TP1: Technical assistance to countries

Prof Olga Perovic (SOA-43):

Prof Perovic summarized progress towards TP1, including the provision of external quality assessment (EQA) for the African Region. Key activities of SOA-43 included trainings and introducing EQA programmes

for national reference laboratories. In addition, evaluation of laboratories (particularly national reference laboratories (NRLs)) was performed using assessment tools developed by a working group. A questionnaire was carried out last year to identify the needs of laboratories in all regions, which highlighted challenges relating to obtaining accurate data, and procurement. AMR training was also delivered in Nigeria to their NRL, and Prof Perovic acknowledge support received from Dr. Jean Patel (USA-281). Experience gained from these activities has highlighted the need for web-based training to be accompanied by hands on training.

TP2: Tools for strengthening NRLs to support AMR surveillance

Dr Jean Patel (USA-281):

Dr Patel summarized key activities for TP2, including developing a document describing minimum requirements for an NRL, and a lab supplies and equipment list. Dr Patel highlighted the need to create resources for laboratories going forward, which may include standard operating procedures (SOPs), and quality management system (QMS) guidance.

TP3: Detection and reporting of colistin resistance

Dr Pessoa-Silva further explained that the main TP was to provide guidance on the detection of colistin resistance, which is a moving area. The technical note was published in December,[5] and will need continuous updates as things evolve. Thus, the TP was completed and will require updating.

TP 4: Guidance on use of molecular methods to foster surveillance implementation

Prof Monica Lahra (AUS-72):

Prof Lahra summarized progress on the development of the guidance on molecular methods to foster surveillance implementation, which was published in February 2019.[6] Prof Lahra's update included discussion around the costs and benefits of existing molecular methods, sustainability, challenges due to the high level of cost, and potential for pilot testing and data sharing.

Prof Kozlov shared experience from a meeting in Ghana this year, suggesting WGS may be available faster than previously expected. Dr Pessoa-Silva underscored the need in 2019 to outline the application of WGS to support AMR surveillance, which is a very fast moving area.

TP 5: Technical assistance to countries

Dr Jonas Fuks (SWE-66):

Dr Fuks summarized key activities related to both training materials and training. There has been work started to map and collect materials, including for webinars, available on SharePoint. With regards to training curricula, a concept note was developed, circulated to the Network for feedback, revised, and will be further developed. Face to face trainings have been carried out, in addition to four webinars, including one on data entry for WHONET, two on diagnostic stewardship, and one on data interpretation, which are published on the Public Health Agency of Sweden website.[7] There are three additional webinars in development for 2019, including one on detection of colistin resistance. A toolbox for key training tools is also under development. In addition to these activities, there is ongoing country capacity building, and assistance with the development of regional AMR surveillance reports.

TP 6: Strategies and operational research to inform sustainable implementation of AMR surveillance in limited resource settings

Prof Magnus Unemo (SWE-62):

Prof Unemo's CC is focused on *Neisseria gonorrhoeae* (*N. gonorrhoeae*), which he has been working closely on with Prof Lahra. Prof Unemo summarized the Gonococcal Antimicrobial Surveillance Programme (GASP), and the challenges of harmonizing existing surveillance with GLASS. He also highlighted the need to gain new countries through GLASS, and keep old countries participating in GASP. Prof Unemo summarized

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[5] https://apps.who.int/iris/bitstream/handle/10665/277175/WHO-WSI-AMR-2018.4-eng.pdf?ua=1

[6] Molecular methods for antimicrobial resistance (AMR) diagnostics to enhance the Global Antimicrobial Resistance Surveillance System. At https://www.who.int/glass/resources/publications/molecular-methods-for-amr-diagnostics/en/.

[7] www.amrsweden.se

existing surveillance on *N. gonorrhoeae*, but highlighted that data are very limited for some regions, especially EMRO and AFRO, where they are trying to strengthen surveillance by engaging with sentinel countries. Prof Unemo also reported on EGASP (Enhanced Gonococcal Antimicrobial Surveillance Programme), which has been rolled out in Thailand and the Philippines, with ongoing work to collect data in Africa and Latin America/Caribbean.

Dr Rachel Smith (USA-281):

Dr Smith summarized their collaborations with and technical support to 10 countries for GLASS implementation, including NAP assistance, lab assessments and capacity building, surveillance evaluations, and prevention activities. A key example of their work is implementation of the ECHO approach, providing remote support to laboratories from a hub of technical experts. They are also examining how AMR data are being collected, the quality of AMR data, and infection prevention and control (IPC) activities and stewardship at the country level. Key work has also included: the development of healthcare-associated infections (HAI) surveillance protocols for BSIs, UTIs, and SSIs for limited resource settings, and how they can be linked to AMR surveillance systems; lab assessment tools in 10 countries to guide capacity building; and the development of a more advanced database to operationalize how countries can create workplans and measure change. Dr Smith also summarized a point prevalence study of Extended-spectrum Beta-lactamase (ESBL) and carbapenem resistant *Enterobacteriaceae* (CRE) colonization. She summarized Antibiotic Resistance in Communities and Hospitals (ARCH), and that ESBL/CRE colonization protocols are underway or planned in five countries. They have also published core elements of antibiotic stewardship programmes in resource limited settings at the national and facility level,[8] and collaborated with the Center for Disease Dynamics, Economics & Policy (CDDEP) around economic modelling, costing analyses for NAP implementation (including surveillance), cost-effectiveness of WASH (water, sanitation, and hygiene) interventions to improve IPC, for which a manuscript is in preparation, and the cost-effectiveness of IPC to prevent CRE transmission.

Prof Wing Hong Seto (CHN-120):

Prof Seto summarized his work relating to diagnostic stewardship, which has led to the development of tools and webinars (including a WHO AMR surveillance and quality assessment CC Network webinar series on diagnostic stewardship[9,10]). Such resources can be translated and utilized globally, and adapted for low resource settings. Prof Seto is also working to update a guide to diagnostic stewardship implementation in AMR surveillance sites.[11] He also reported on three recent reviews on diagnostic stewardship.[12,13,14]

At the end of this session, Dr Grape reminded participants of the SharePoint, and encouraged them to utilize it in their work. Dr Pessoa-Silva also noted that the latest GLASS report (Early implementation 2017-2018) has been published,[15] and that other key reports (e.g. CAESAR,[16] AMC[17]) are available too.

TP7: One Health AMR Surveillance

Prof Jaap Wagenaar (NET-71):

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[8] https://www.cdc.gov/antibiotic-use/healthcare/pdfs/18-295875-A-ASP-CE-Web-508.pdf
[9] https://www.youtube.com/watch?v=ed_QHnl5k-Q
[10] https://www.youtube.com/watch?v=p-Z9dgtZT0g
[11] https://apps.who.int/iris/bitstream/handle/10665/251553/WHO-DGO-AMR-2016.3-eng.pdf?sequence=1&isAllowed=y
[12] Madden GR, Weinstein RA, Sifri CD. Diagnostic stewardship for healthcare-associated infections: opportunities and challenges to safely reduce test use. Infection Control & Hospital Epidemiology. 2018;39(2):214-8
[13] Patel R, Fang FC. Diagnostic Stewardship: Opportunity for a laboratory–infectious diseases partnership. Clinical Infectious Diseases. 2018;67(5):799-801.
[14] Morgan DJ, Malani P, Diekema DJ. Diagnostic stewardship—leveraging the laboratory to improve antimicrobial use. Jama. 2017;318(7):607-8
[15] https://apps.who.int/iris/bitstream/handle/10665/279656/9789241515061-eng.pdf?ua=1
[16] http://www.euro.who.int/__data/assets/pdf_file/0005/354434/WHO_CAESAR_AnnualReport_2017.pdf?ua=1
[17] https://apps.who.int/iris/bitstream/handle/10665/277359/9789241514880-eng.pdf?ua=1

Prof Wagenaar summarized the Extended Spectrum Beta-Lactamase *Escherichia coli* (ESBL-Ec) Tricycle project to collect surveillance data across humans, animals, food, and the environment. Key progress has included the development and validation of a draft protocol, which is almost finalized, with six countries included in the pilot phase. Key activities in this TP also included training courses in Jordan and Utrecht, Netherlands.

TP 8: Development of IT and data management Tools

Dr John Stelling (USA-433):

Dr Stelling provided an update on progress in the development, training, and support of IT data management strategies. Dr Stelling summarized key activities around the identification, description, and development of data management tools (e.g. guidelines, manuals, case studies, presentations, tutorials, and videos), including an e-mail survey to over 3,000 people. This year, four regional trainings, 14 national trainings, and 21 country visits were undertaken. The development, improvement, and translation of training materials is ongoing, in addition to expanding the roster of potential individuals for IT training and technical support. Technical support was also provided, including IT situation analyses, and assessments of lab systems were carried out, including in four hospitals and two laboratories in Peru. Dr Stelling discussed the strengths and weaknesses of these systems, and the challenges of IT data management in low resource settings. He also summarized other key work in TP8, including: an inventory of lab information systems, EQA systems, and secure data sharing tools and web management systems such as the Japan Nosocomial Infections Surveillance (JANIS), which they have piloted in Mongolia, Thailand, and Vietnam; the ongoing development of WHO and WHO-affiliated surveillance and data analysis systems; data standards for data elements and code sets; and the possibility of an access database for EQA.

Dr Pessoa-Silva added that an IT module under GLASS for individual line listed data has been developed, which will enable any country that wishes to have line list data to have more reporting and analytical capacities.

TP 9: Framework for early detection and information sharing of unusual types of AMR

Dr Jean Patel (USA-281):

Dr Patel reported that this year the GLASS-EAR (Emerging Antimicrobial Resistance Reporting component within GLASS) network portal went live, yielding critical reports, including the detection of *Candida auris* for the first time in Thailand, data on multidrug resistant (MDR) *Salmonella* Typhi, and new ceftazidime-avibactam resistance in CRE. Key next steps should focus on promoting use of the portal so that novel findings are reported and can be acted upon.

Dr Grape contributed that showcasing the usefulness of the portal is a key way to promote it.

TP 10: Guidance on detection and reporting of antifungal resistance in selected invasive fungal disease

Dr Shawn Lockhart (USA-417):

Dr Lockhart reported that his CC has designed a survey on lab capacity, though to date, susceptibility testing is not common practice in fungi. *Candida* blood stream infections were chosen as the most common fungal infection where significant AMR is seen. A key priority to facilitate surveillance will be increasing laboratory capacity.

Dr Nienke Bruinsma (AMRO/PAHO):

Dr Bruinsma also reported on PAHO/AMRO activities to establish a fungal surveillance network in the region, as an early implementation effort towards a global implementation. Key activities included the development of the GLASS early implementation protocol, which has been circulated for discussion at the meeting, and was developed in collaboration with the WHO CC USA-417 and IND-99. Once it is finalized and translated into Spanish, the protocol will be implemented by around 10 countries in the PAHO region, with good hopes of success, as these countries are already active in surveillance on mycology.

TP 11: Increase understanding of impact of AMR

Dr Marlieke De Kraker (SWI-60):

Dr De Kraker began by reporting on an expert meeting in Geneva in January 2018 where a review by Prof Evelina Tacconelli on methodological challenges in evaluating the health impact of infections due to antibiotic resistant bacteria was discussed. Significant work has also been undertaken to develop protocols for

estimating the burden of AMR in collaboration with WHO HQ. Once these protocols are finalized, the next step is pilot testing.

Dr Tornimbene also summarized the three protocols developed to support the epidemiological approach. Dr Pessoa-Silva acknowledged that the group of individuals collaborating on these protocols is large, including CCs, mathematical modelers, and academics, but that there are still key issues that need to be addressed before finalizing the first protocol and piloting it in the second part of this year.

WHO Regional Offices and HQ

Speakers: Dr Sheick Oumar Coulibaly, Dr Nienke Bruinsma, Dr Maha Talaat, Dr Danilo Lo Fo Wong, Dr Aparna Sing Shah

Objectives achieved: Collective understanding of RO work on AMR surveillance and need for support by CC Network

AFRO

Dr Sheick Oumar Coulibaly:

36% of countries in the African Region are enrolled in GLASS. Ongoing activities in the Region include: the ESLB-Ec Tricycle Project in Ghana and other AGISAR projects in four countries; evaluation of EQA programmes; and strengthening of laboratory and surveillance capacity, including a project in Mali (KOICA project). Dr Coulibaly highlighted that this year, six additional countries enrolled in GLASS, and five countries are implementing AMR surveillance in line with a One Health approach. Work is also being done to strengthen regional initiatives, and the regional action plan was proposed during the 1st AFRO Strategic and Technical Advisory Group (STAG) meeting. Other activities within the region include: capacity building on the newly created online platform to monitor availability and prices of medicines (APRAMED); capacity building on antimicrobial consumption/use; the evaluation of the revised microbiology EQA programme, which is aligned with GLASS; and follow up of a proposal on surveillance of HAIs in Madagascar. National Focal Points (NFPs) from 14 countries were also trained on the review of the Essential Medicines List (EML), taking into consideration the new AWaRe (Access-Watch-Reserve) categorization. 30 NFPs from 13 countries were also trained on WHO methodologies for PPSs of antibiotic use in hospitals, and 70 NFPs from 22 countries received training on antimicrobial consumption.

Dr Coulibaly underscored the need for commitment and participation from CCs in GLASS countries to assess needs and capabilities, and provide tools. Training of focal points is also needed, in addition to support to establish sentinel surveillance systems in the region. AFRO is the largest region, with 47 countries. Key challenges include: language and the need for translation of tools so that they are accessible to all countries; limited capacity of laboratories for national surveillance, which requires support to build national surveillance systems and strengthen NRLs; support to establish national EQA; and limited awareness of activities being carried out by other partners and sectors, pointing to the need to strengthen communication and coordination. There is also a need to tailor surveillance to the region, and to achieve consensus on a plan of activities to strengthen surveillance and the sustainability of these systems. Dr Coulibaly summarized that there are no new requests to CCs, but that work should continue to finalize and implement current plans, and involve the RO in their country support activities.

Dr Grape concurred that the need for coordination and communication is representative for all regions.

AMRO/PAHO

Dr Nienke Bruinsma:

Dr Bruinsma summarized the missions and meetings conducted in the past year, including the Latin American Surveillance Network of Antimicrobial Resistance (ReLAVRA) biennial meeting. Dr Bruinsma reported that not many countries have enrolled in GLASS in the Americas region yet, but several countries are progressing with the needed political and technical steps. She also underscored that the ReLAVRA surveillance network is very active in the region, including recently in the Caribbean, where a large multi-country workshop was held on AMR surveillance and laboratory training to also facilitate participation in GLASS. She briefly summarized the previously discussed work on fungal AMR surveillance, and ongoing

country laboratory assessments and training linked to WHONET. She noted their interest in working with more collaborating centres in relation to their web activities, data management, and analysis. Dr Bruinsma also acknowledged Dr Alejandra Corso and the Malbrán Institute, a new incoming CC attending the meeting, noting their role as the reference laboratory in the region, and their support of EQA, with plans to expand EQA activities in the Caribbean. Dr Bruinsma also summarized their ongoing work, including ongoing country laboratory assessments, ongoing laboratory and WHONET trainings, WebEx training modules on AMR for capacity building and updates, ongoing PPS surveys, the National AMR surveillance KOICA project in Peru, and assistance in AMR related outbreak investigations. She described collaborations with other CCs including a pilot project for isolate level data collection with 13 countries in Latin America and the Caribbean, and the *N. Gonorrhoeae* protocol. Key needs going forward include experts to support data management training, and the development of an AMR surveillance manual for the Americas (as a product of the above described pilot) to support participation in GLASS.

EMRO

Dr Maha Talaat:

Dr Talaat began by reporting that their team is growing, with more epidemiologists and microbiologists, as well as an intern. She highlighted their desire to support countries in the region to develop and implement NAPs, participate in GLASS, and generate, analyze, and utilize high quality representative data. They have provided training in five priority countries to support surveillance on AMR and antibiotic use, conducted point prevalence surveys (PPSs) in 30 hospitals from five countries to measure antibiotic use among hospitalized patients, examined healthcare facility level antimicrobial consumption in three countries, and supported training for the ESBL-Ec Tricycle project in five countries in the region. Current activities include laboratory capacity building as a foundation for AMR, national and regional workshops on SOPs and laboratory quality management systems for GLASS countries, and review and improvement of national EQA programmes. Key challenges raised are the link between the healthcare facility and national level, the integration of epidemiological and clinical data, and data management systems, with significant gaps in knowledge of AMR, antimicrobial consumption (AMC), and antimicrobial use (AMU), or standardized approaches to collect or interpret data. It is hoped that national AMR surveillance data will be available for 3-4 countries in 2019, which will be used to inform interventions. Guidance and support are needed from the CCs to build capacity for public health laboratories, develop SOPs, improve EQA reporting, strengthen molecular techniques, develop interventions, and improve diagnostic stewardship.

EURO

Dr Danilo Lo Fo Wong:

Dr Lo Fo Wong began by summarizing expanding AMR surveillance across Europe, and the status of data in relation to the Central Asian and Eastern European Surveillance of Antimicrobial Resistance (CAESAR) network. CAESAR activities include strengthening national AMR reference laboratories (NRLs), providing external quality assessment, and data management training. Dr Lo Fo Wong described that through efforts to strengthen national surveillance, CAESAR also supports countries to set up national surveillance, with benefits at the country and patient level. Dr Lo Fo Wong described the tiered system within CAESAR for classifying levels of data:

Level A countries: high quality and representative data

Level B countries: high quality data, but data may not be representative

Level C countries: neither high quality nor representative data

Dr Lo Fo Wong acknowledged key challenges, including low sampling frequency and gaps in data, alongside limited laboratory capacity, lack of standard methodology, and limited access to quality reagents, which may be attributed to a lack of routine AST in many countries. Data management training is also important once data are available. A key focus of CAESAR is on NRLs to train those laboratories to strengthen capacity to support the development of a national surveillance network, and support countries to utilize the data generated. Dr Lo Fo Wong highlighted the need for training and curriculum development, and the benefit of learning from each other, for example through twinning or mentoring.

SEARO

Dr Aparna Singh Shah:

Dr Shah started by summarizing the makeup of the region, which includes 11 Member States and two WHO CCs. Enrollment in glass is 91% (9/11). She described key activities in the region, including situation analyses in five countries to identify gaps and strengthen NRLs, AMR laboratory network strengthening, the development of evidence-based national laboratory strategies (the national AMR laboratory strategy has been drafted), preparation of SOPs, and establishment of sustainable EQAs. Mycology laboratory training has also been conducted in several provinces, and there is ongoing work to support resistance testing in fungi. Dr Shah highlighted the ESBL-Ec tricycle project they have started in three countries in the region, and described the importance of surveillance between human, animal, and environmental health sectors, and the need for capacity building in non-human sectors. There is a need for more funding, technical expertise, and awareness raising among policy makers. CC support will also be helpful for providing training and onsite technical assistance to produce standardized quality assured data. Key needed areas of support include technical assistance for data management, harmonization, and interpretation, and capacity building to facilitate enrollment and data reporting in GLASS.

GLASS update and challenges

Objectives achieved: Update on GLASS, challenges faced, and areas for further development

Dr Sergey Eremin (WHO AMR Secretariat):

Dr Eremin reported on updates and challenges for GLASS, summarizing the early implementation phase of GLASS, and that we are at the end of the first five-year cycle. He acknowledged the achievements made, the unprecedented level of data on AMR collected, and the support provided to develop national AMR surveillance systems, thanking participants for their support. To date, GLASS has 74 participating countries, and in the second GLASS report published in January,[18] there was a 64% increase in country enrolment, and twice the number of countries who submitted data. 13 countries who had previously only provided data on the status of AMR surveillance, also provided AMR data this year, highlighting how fast the transition can be. In addition, 11 LMICs reported data, and 12 countries (compared to five in the previous year) submitted data on the total sampled population. This shows incredible progress, but is also associated with important challenges accompanying the commitment to support the development and implementation of national surveillance systems, alongside limited capacity, resources, or political will.

Other key challenges and limitations include a lack of sampling strategy and challenges in collecting denominator data, variability in completeness and quality of data, data aggregation, the inclusion of surveillance on AMC and AMU, and integration of such data with AMR data. Other activities include special studies to assess the burden of AMR, EGASP, AMR surveillance of invasive *Candida* infection, the ESBL-Ec Tricycle project, the development of the Tripartite Integrated Surveillance System on AMR and AMU (TISSA) in collaboration with the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization (FAO), and special studies to assess the burden of AMR. Going forward, there is a need to build national surveillance systems, improve country participation, and global collaboration and coordination between partners. In addition, work will be carried out to improve the quality and representativeness of data and generated results, utilize modern technologies, and translate data to inform policy and interventions. As part of this revision process, a key focus must be identifying both what is feasible and needed, and gaining support and commitment to facilitate implementation.

Dr Pessoa-Silva highlighted new developments in GLASS, including AMC, led by Dr Arno Muller who has developed a methodology for consumption as well as use of antibiotics, and Dr Jorge Mathieu-Alvarez's work to develop the ESBL-Ec Tricycle project.

Dr Muller described that they are working on developing a protocol for a survey on antibiotic consumption at the hospital level, which should be published this year. They are also planning to start developing tools for surveillance on the use of antibiotics in the community, and are working to produce a guidance document on how to use consumption data, and link consumption and resistance data at a national level.

[18] https://apps.who.int/iris/bitstream/handle/10665/279656/9789241515061-eng.pdf?ua=1

Dr Matheu-Alvarez described that the ESBL-Ec Tricycle project pilots are working well across the regions, and it is hoped that 16-17 countries will be enrolled this year. This is the first integrated surveillance system, and work is being done to develop an IT module for GLASS.

Dr Pessoa-Silva concluded the session by highlighting the increasing number of countries participating in GLASS, and the key challenges, underscoring the need for communication and coordination, and the commitment and support of the ROs and CCs. She reiterated that key areas of focus will be developing and providing training, tools, and technical support, and that the key revisions identified during the meeting will outline the work to be done by all participants over the coming year. A major point was also on the need to focus on consolidating and improving the existing approach of GLASS, rather than introducing too many new functionalities, which may discourage countries from enrolment.

Session III - Parallel breakout sessions to follow up on the progress in achieving the target products & planning ahead

Speakers: Dr Nandini Shetty, Dr Paula Cray, Dr Marlieke De Kraker, Dr Danilo Lo Fo Wong

Objectives achieved: Follow up on progress in achieving the target products and planning ahead; common understanding of discussions, and suggestions on way forward from the working groups

Breakout sessions

Breakout sessions were held to follow up on progress in achieving the target products and planning ahead.

Feedback from parallel breakout sessions

During this session, each breakout group reported on their discussions, and outlined points for follow up, and updates for the workplan.

Group I – Laboratory related target products

Dr Nandini Shetty (UNK-105):

Dr Shetty summarized Group I's discussions on TPs 1-4, in addition to WGS. For TP 1, key next steps are to revise training based on identified gaps, conduct on-site assessments of laboratories or by self-applied questionnaire, and collaborate on EQA programmes. The group reported that methods documents for the detection of colistin resistance have been developed and published,[19] but require further iterations, including guidance for all polymyxins. The group also discussed molecular markers for surveillance, including whether using molecular markers enhances surveillance, and how this would be reported to GLASS. Clear guidelines are needed on how this should be reported to GLASS. The group acknowledged that not all countries have capacity or funding, but for those that do not, enhanced training, EQA, and reporting should be supported by CCs through WHO. The group also discussed reporting of new resistance phenotypes within GLASS-EAR, and that reporting of genotypes should be included as well, for example through PPSs.

Prof Wing Hong Seto highlighted the importance of diagnostic stewardship for the laboratory related target products, and Dr Grape acknowledged the overlaps between TPs, and opportunities to discuss coordination.

Group II – Capacity building/technical support

Dr Paula Cray (USA-449):

The group highlighted the benefit of educational specialists to support the development of resources, which must be accessible and applicable from the national to local level, taking into account diverse challenges and differences in capacity and expertise. Key proposed steps for developing curricula include: 1) a working group, 2) educationalists, and 3) a review group.

Dr Cray also discussed the need to strengthen the toolbox by integrating documents, linked to the work with the curricula, including for IT, reporting, and analysis, as well as other areas, and developing guidance to support the use of these documents. Key next steps should include: 1) a systematic review and mapping to identify key needs; 2) a repository of documents and information, and definition of use and users; and 3)

[19] https://apps.who.int/iris/bitstream/handle/10665/277175/WHO-WSI-AMR-2018.4-eng.pdf?ua=1

continuing with webinars to complement face to face training, and address existing gaps, including EQA, epidemiology, how to work with data and GLASS, stewardship, analysis and interpretation of data, rapid testing for diagnostics, data collection, WHONET, and Proof of Principle (POP) studies. Action points included: 1) the development of a schedule for webinars for 2019 and 2020; 2) a simple internal evaluation tool for webinars to assess value and identify target audiences and dissemination strategies.

Dr Sonja Löfmark reiterated the need for more expertise in the educational field, and the importance of both the toolbox as well as webinars. Key discussion points going forward will be defining target groups, how to reach them, and best approaches for disseminating information.

Dr Shetty also added that a competency framework has been created and is published on the WHO site for different groups of workers,[20] and that a detailed AMR curriculum is also close to being launched. Dr Bruinsma also offered AMRO/PAHO's support with the development and translation of the curricula. Dr Pessoa-Silva further discussed the curricula is specifically for skills for AMR surveillance, including IT, data management, and epidemiology, acknowledging other initiatives also being undertaken in these areas, which should be included in the new phase of curriculum development.

Group III – Assessment of AMR burden of disease

Dr Marlieke De Kraker (SWI-60):

This group discussed the assessment of AMR burden of disease (BOD), and the GLASS draft for BOD methodology for blood stream infections (BSIs). Dr De Kraker summarized the three different protocols, including methods to generate representative AMR estimates, estimating sampling bias for BSIs, and estimating mortality related to antibiotic resistant BSIs. Comments included the need for more clarity on how the protocols are related, and whether countries need to implement all three protocols at the same time, or in a specific order. Participants also suggested that a light protocol might be beneficial for countries with limited capacity. De Kraker also reported on potential interest in including other pathogens or syndromes (e.g. urinary tract infections (UTIs)) in addition to BSIs, based on what is relevant and feasible in each country context, and examining the economic impact of AMR. She also highlighted that laboratory capacity in many countries is still limited, and there is lack of information in some countries on the catchment area or patient population of samples, which may limit the feasibility of implementing these protocols. Dr De Kraker summarized that there is a timeline that has been established with WHO, with hopes the protocols can be implemented before the end of the year.

Dr Pessoa-Silva underscored the desire and need for information globally on the impact of AMR. Whilst GLASS has some denominator data for people sampled, and the frequency of AMR in those sampled, it is not representative data. The first protocol is thus focused on the representativeness of data, though this is challenging, particularly in countries that do not have UHC or health insurance coverage. The second protocol is key for understanding blood sampling practices, and how this may influence estimates of frequencies. The third protocol is essential for estimating mortality attributed to MDR-BSIs, and ultimately, the burden of disease. Dr Pessoa-Silva addressed the query regarding the relatedness of the three protocols, advising that a tiered approach should be pursued with all countries, with an initial target of implementing at least the first protocol. She also highlighted the need to work with the scientific community and collaborating centres. She underscored that whilst these protocols are ambitious, it is important to emphasize it is a tiered approach, and that the data these protocols would generate is essential to guide policy and interventions.

Group IV – WHO AMR surveillance coordination

Dr Danilo Lo Fo Wong (EURO):

Dr Lo Fo Wong reported on the group's discussions around governance structures, summarizing the origins of GLASS, and highlighting the priority to have strong HQ and RO representation, and capture the needs of countries. Dr Lo Fo Wong described the role of the CC Network for providing technical support and guidance to WHO.

[20] https://apps.who.int/iris/bitstream/handle/10665/272766/WHO-HIS-HWF-AMR-2018.1-eng.pdf?ua=1

Dr Coulibaly also reported on the group's discussions around EQA, and an EQA providers meeting was proposed for the fourth quarter of this year.

Dr Pessoa-Silva added that the key change going forward will be the creation of a WHO GLASS coordinating group composed by one focal point from each RO and one or two people from HQ.

Session IV – Breakout sessions on GLASS revision

Speakers: Dr Monica Lahra, Dr Peng Wu, Dr Sara Tomczyk, Dr Carmem Pessoa-Silva

Objectives achieved: Consider the topics and related options proposed in the GLASS revision document; provide guidance to GLASS Secretariat on proposed areas for revision; common understanding of discussions and suggestions on way forward from the working groups

Feedback from parallel breakout sessions

Four breakout sessions were held to discuss the GLASS revision. Each breakout group reported on their discussions, outlining proposed revisions.

Group I – Microbiological markers and new molecular technologies

1. Inclusion of new specimen types: it was suggested that the inclusion of new specimen types could be optional for participating countries.
2. Inclusion of new bacterial pathogens: the group agreed with inclusion of *P. aeruginosa* and *Salmonella* Typhi and Paratyphi in the next cycle (2020-2024), and that other suggested bacterial pathogens could be considered for the mid-term.
3. Inclusion of fungal pathogens: the group agreed that *Candida* spp. in blood would be included in the next cycle, and that other fungal pathogens could be considered in the mid- to long-term.
4. Antimicrobial markers: the group agreed that antimicrobial markers should be reviewed every cycle.
5. Type of phenotypic data: it was agreed that quantitative AST should be included as possible in the mid- to long-term. The group did not support the collection of data on full antibiotic susceptibility profiles in addition to the current approach of reporting susceptibility to each of the antibiotics of interest separately.
6. Inclusion of selected molecular tests. The group elected not to include molecular targets for the next cycle, they will be considered for the mid- and long-term. The group also agreed that a repository database for molecular markers for priority pathogens could be important.
7. Whole genome sequencing: the group highlighted the need to define the role of WGS to support global and national surveillance. A landscape analysis will be carried out by WHO in 2019. In parallel with this, WHO will be looking at this to determine a corporate position on data sharing for all data on genome sequencing.

Groups II and III – Surveillance strategies

1. Inclusion of individual data and new variables: it was reiterated that guidelines are needed to support countries willing to report individual information, and ensure it is clear what data are requested and why. The group discussed identifying possible risk groups in the data such as patient status (e.g. ICU, cancer, sepsis, immunocompromised). There was consensus that such data may not be needed in the context of aggregate data, however it could be included in line list format as an example of good practice or to validate aggregate data. The group also discussed the potential need for spatial or geographic data to support capacity building and inform national strategies, though this may not be needed for global estimates.
2. Metrics: new variables could be introduced for denominator estimation (e.g. patient admissions and patient days) for the mid-term. The group also agreed that new indicators to assess sampling practices could also be included in the GLASS report.
3. Sampling strategies: the group discussed the need to better define target population, and the selection of surveillance sites for national representativeness. The group also suggested to collect information on indicators such as types of facilities or reporting coverage. The group also discussed surveillance strategy in countries in which tests may not be affordable for each patient with a clinical indication, and the importance of UHC for effective AMR surveillance was highlighted.

4. Special studies: The group discussed both BOD studies and national PPSs, suggesting that data on AMR, AMU, and HAI be collected together in healthcare settings. Outpatient PPSs may be more difficult, but could perhaps be carried out at selected sites in the future.
5. Guidance to countries on national and local AMR surveillance: the group proposed development of tiered guidelines for countries to move from existing laboratory-based surveillance to better representativeness and guidance on using AMR data for policy making. Also, the need to introduce levels of evidence for reporting was highlighted. The group also suggested that both AMR and AMU/AMC surveillance should be addressed in the guidance.
6. New GLASS modules: the group reported on updates for GASP and EGASP, and the development of an EGASP module for the GLASS IT platform. The importance of linking GASP and GLASS was highlighted, and possible approaches discussed. The group reported progress of the ESBL-Ec Tricycle project. The group also discussed development of the strategy for integrated analysis and reporting of global AMR and AMC. The group acknowledged that there is a high level of complexity within this type of analysis, requiring careful consideration of how the data are interpreted and reported.
7. Additional sources of data: the group discussed the inclusion of non-official sources of data. It was highlighted that the inclusion of non-official sources of data can be valuable in contexts where data are limited, e.g. for humanitarian settings, displaced populations, etc. Member States will be consulted on this and inclusion of other non-official sources during the next meeting.
8. Developing forecasting tools: Dr Cray reported on the development of a robust forecast model where artificial intelligence (AI) and digital sequence technology could be applied in the wider framework of GLASS.

Group IV – Enablers: Actions by WHO Secretariat

Dr Pessoa-Silva reiterated that a defined coordinating group for GLASS is being constituted with defined national, RO, and HQ focal points to improve coordination.

1. Revision of the dataset on the status of national AMR surveillance: progress of national surveillance systems is monitored every year to foster development. However, there is a need to better account for large countries with multiple NRLs, and several national focal points. The need to revise the information collected from countries on national surveillance systems was discussed, in addition to the usefulness of collecting data on the geographical location of surveillance sites in countries.
2. Introduce levels of evidence for reporting: the ROs agreed on alignment of levels of evidence for reporting with CAESAR categories.
3. Revising the reporting process:
   3.1 Harmonize reporting of AMR and AMC: from this year onwards, AMC and AMR will be reported to the GLASS platform. The group discussed how to present AMR and AMC data to avoid misinterpretations of any correlation between the two.
   3.2 Revised data call time line: the group discussed aligning the GLASS report with WAAW, but decided to keep the current timeline. However, there could be a compromise between keeping the same cycle for the data call, but having online publication as data are made available.
   3.3 Revised format (on-line interactive only, interactive on-line country profiles with PDF summaries/updates, etc.): the importance and political weight of a document were highlighted, but the need for making the document lighter as an increasing number of countries enroll in GLASS was also emphasized. The group also discussed the need to improve the visualization of the data in the report and online.
   3.4 Policy briefs based on the GLASS reports: the group proposed having a 1-2 page summary document, which would function as a briefing note for higher policy levels.
4. Link to other AMR surveillance: possible links to several types of AMR related surveillance were discussed, including WHO surveillance networks on diarrhea in children, surveillance of health care associated infections, and some others. Dr Pessoa-Silva summarized inclusion of GLASS data in the Tripartite Integrated Surveillance System on AMR (TISSA) platform, describing that this platform is being developed to report data collected by OIE, FAO, and WHO.
5. Actions to improve quality of laboratory data: the need to strengthen and harmonize global EQA was highlighted. Over 2019, there will be internal discussions on how to approach this and improve interactions between institutions providing EQA to the regions, including the provision of results and

the ability to act upon results. This could involve the provision of support from reference laboratories to institutions providing EQA. Dr Pessoa-Silva called on the CC Network to indicate their abilities and capacities to contribute to the revised workplan.

6. Address Member State concerns about data protection: it was noted that GLASS collects aggregated data, so doesn't fall into WHO personal data protection. However, the option of anonymised line list data was discussed with Member States. A key area being discussed in relation to data protection issues is having a harmonized approach for all data being collected across WHO. When this is implemented, GLASS will need to conform to this.
7. Business case for the next 5 years of GLASS: There is the need for a strong business case for the GLASS secretariat, which is not sustainable without rapidly strengthening human resources. A business case is also needed for implementation in the least resourced countries. The cost for LMICs is something that hasn't been developed, and a tool is needed for resource estimation. The tiered approach could be used to estimate the costs for countries to progress between levels. There is also a need for a return on investment case for GLASS as part of fundraising for this initiative.

Session V - Moving forward: ways of working together

Speakers: Dr Pessoa-Silva, Dr Sergey Eremin,

Objectives achieved: Defined activities and timelines for the GLASS review; revised CC Network workplan for the period 2019-2020

Workplan revision

Dr Pessoa-Silva opened by summarizing the direction of the GLASS revision. The meeting has generated many suggestions for what to incorporate into GLASS, and Dr Pessoa-Silva emphasized both the need to evolve and to keep the end users and the participating countries in mind. During the early implementation phase of GLASS, many countries were and are still just beginning to implement the proposed methods, and there is a need for consolidating the implementation. Feasibility and needs must be a focus in the revision of GLASS to ensure participating countries are not left behind, which is why the revision plan has short- and mid-term targets. However, there are several potential areas for improvement that should be discussed with participating countries going forward.

Dr Pessoa-Silva acknowledged the significant support provided by the CC Network, noting the huge amount of work contained in the workplan and the contributions that will be required from CCs to support countries in developing AMR surveillance.

Dr Eremin presented the revised CC Network workplan for the period 2019-2020. The meeting participants provided their input for all the target products and planned activities. The updated version is included above.

Dr Pessoa-Silva concluded this session by highlighting that this workplan is the masterplan for everyone to follow. The GLASS manual will be reviewed, and then submitted for consultation with the countries participating in GLASS. The expected timeline for finalization of the revised manual will be end of 2020 or early 2021.

CC Network modus operandi

Dr Sonja Löfmark (SWE-66):

Sweden has been coordinating the CC Network since 2016. Dr Löfmark thanked everyone for their work during this time, highlighting the progress that has been achieved. She then handed over to the next coordinator for the Network, Dr Jean Patel and Collaborating Centre USA-281.

Dr Jean Patel (USA-281):

Dr Patel thanked the Swedish Collaborating Centre for leading and establishing a robust Network. She noted she is looking forward to the Network's input on how to continue with this work, and move the GLASS programme forward.

Dr Carmem Pessoa-Silva (WHO AMR Secretariat):

Dr Pessoa-Silva reiterated her thanks to Dr Löfmark, and welcomed Dr Patel as the new coordinator.

Dr Pessoa-Silva summarized the first Network meeting in December 2016, when Collaborating Centres agreed on TORs. When created, it was heavily supported by the legal department and WHO CC Secretariat to ensure the TORs complied with norms and regulations for CCs, and each CC's TORs for their respective partners. The main objectives of the TORs for this Network have been met over the last two years. She asked the CCs to review the TORs and suggest revisions, which will be discussed with the legal department and CC Secretariat.

Dr Pessoa-Silva then discussed areas for improvement. To improve support for countries, she identified the need to define CC capacities, to ensure they can be targeted based on the needs of specific countries or activities. She also noted the need for reasonable planning schedules, which will be facilitated by having a matrix of needs and capacities CCs and ROs can use to address requests from countries. Dr Pessoa-Silva noted that the emphasis is on CCs supporting ROs, and facilitating these connections.

Dr Lo Fo Wong acknowledged the importance of mapping capacities, but also emphasized that not all capacity had to be within the CC itself, but that capacity within their wider networks can be included. He also noted that planning is always tentative due to logistical and financial challenges. The idea is to plan as far ahead as possible with these constraints, which will be supported by strengthening communication. Dr Talaat acknowledged that there is a need for more communication to enhance collaboration with CCs, but that it takes a lot of time, underscoring that the more participants in the Network work together, the easier it will be.

Dr Pessoa-Silva highlighted the need to avoid work being developed in silos, and the importance of improving information sharing so other CCs can see what is being done and provide input. She also called on the Network to promote information sharing when there are important developments in AMR surveillance. She noted the bilateral work being done by CCs, and emphasized that ROs and COs should be informed to promote alignment and collaboration. She also noted that the ROs will be responsible for contacting COs, so CCs should communicate directly with ROs. She encouraged CCs to provide input in terms of the information they need from the Secretariat, and to visit the SharePoint to share news and activities.

Dr Pessoa-Silva then discussed the need for the Network's support to advocate for GLASS, but also that it is important there is advocacy for the CC Network itself, and that any new document should acknowledge the Network and the specific CCs that have led the work. Dr Löfmark reported that a position paper on the Network has been drafted over the past year with some valuable input from contributors. She also encouraged participants to think about how to better improve and use the website, and update it for external communication and advocacy. Dr Balkhy noted that their subgroup discussed the website, and that a lot of work on GLASS is posted there, but people may not be able to access it. It was also suggested that educational materials such as webinars could be linked to specific editorials so that they are seen and referenced by the scientific community. The other suggestion is to publish papers in peer-reviewed journals on the GLASS tools and methods, which would allow them to be disseminated and cited. Dr Pessoa-Silva agreed this would be wonderful, but noted that resources are limited to do this, and suggested that perhaps this could be an activity for CCs with interest in pursuing this.

Dr Pessoa-Silva then discussed the financial needs to support the CC Network and achievement of the TPs, asking for the CCs' assistance with resource mobilization, both for the TPs, and to support CCs in developing their work, particularly those in LMICs or without a defined budget for GLASS activities from their respective institutions. This could include applying jointly for grants to support the work, but she would be keen to have other suggestions for participation of CCs in resource mobilization.

Closing remarks

Dr Pessoa-Silva concluded by recognizing the significant work and relationships that have been developed, thanking the participants for their contributions. She also thanked EMRO and Dr Talaat for hosting the meeting, SWE-66 for coordinating the CC Network, and her team in the WHO AMR Secretariat. Dr Grape also thanked the participants for the contributions and work during the meeting. Dr Pessoa-Silva closed by summarizing the intention to have the third Member State Consultation in the third quarter of next year, followed by the next CC Network meeting, and asking for the support of the Network to facilitate the third Member State Consultation.

Annex 1

List of participants

The meeting included participants representing the CC members of the Network, WHO Regional Offices, WHO Headquarters, and the GLASS Secretariat.

WHO Collaborating Centres		
Australia	WHO Collaborating Centre for STI and AMR (AUS-72)	Prof Monica Lahra
China	WHO Collaborating Centre for Infectious Disease Epidemiology and Control (CHN-120)	Prof Wing Hong Seto Dr Ben Cowling Dr Peng Wu
Germany	WHO Collaborating Centre for Emerging Infections and Biological Threats Epidemiology (DEU-135)	Dr Tim Eckmanns Dr Sara Tomczyk
The Netherlands	WHO Collaborating Centre for Campylobacter (NET-71)	Prof Jaap A. Wagenaar
	WHO Collaborating Centre for Antimicrobial Resistance Epidemiology and Surveillance (NET-89)	Dr Katherine Kooij Dr Susan Van Den Hof
Russia Federation	WHO Collaborating Centre for Capacity Building on Antimicrobial Resistance Surveillance and Research (RUS-126)	Prof Roman Kozlov
Kingdom of Saudi Arabia	WHO Collaborating centre for Infection Prevention Control and Antimicrobial Resistance (SAA-23)	Dr Hanan Balkhy
South Africa	WHO Collaborating Centre for Antimicrobial Resistance (SOA-43)	Prof Olga Perovic
Sweden	WHO Collaborating Center for Gonorrhea and Other Sexually Transmitted Infections (SWE-62)	Prof Magnus Unemo
	WHO Collaborating Centre for Antimicrobial Resistance Containment (SWE-66)	Dr Malin Grape Dr Sonja Löfmark Dr Johan Struwe Dr Jonas Fuks
Switzerland	WHO Collaborating Centre for Antimicrobial Resistance containment (SWI-60)	Dr Marlieke De Kraker
Thailand	WHO Collaborating Centre for Antimicrobial Resistance Surveillance and Training (THA-71)	Dr Wantana Paveenkittiporn
	WHO Collaborating Centre for Antimicrobial Resistance Prevention and Containment (THA-76)	Dr Visanu Thamlikitkul
United Kingdom	WHO Collaborating Centre for Reference and Research on Antimicrobial Resistance and Healthcare Associated Infections (UNK-105)	Dr Nandini Shetty
USA	WHO Collaborating Centre for International Monitoring of Bacterial Resistance to Antimicrobial Agents (USA-281)	Dr Jean Patel Dr Rachel Smith
	WHO Collaborating Centre for Surveillance Epidemiology and Control of Salmonella and other Foodborne Diseases (USA-417)	Dr Shawn Lockhart Dr Dawn Sievert
	WHO Collaborating Centre for Surveillance of Antimicrobial Resistance (USA-433)	Dr John Stelling
	WHO Collaborating Centre for Global One Health and Antimicrobial Resistance Initiatives (USA-449)	Dr Paula Cray
Argentina	National and Regional Laboratory for Antimicrobial Resistance ANLIS "Dr Carlos G. Malbrán"	Dr Alejandra Corso
WHO Regional Offices		
AFRO		Dr Sheick Oumar Coulibaly
AMRO/PAHO		Dr Nienke Bruinsma Dr Marcelo Fabian

EMRO		Dr Rana Hajjeh Dr Maha Talaat Dr Frank Konings Dr Bassim Zayed
EURO		Dr Danilo Lo Fo Wong Dr Saskia Nahrgang
SEARO		Dr Aparna Singh Shah
WHO Headquarters	Health Security and Innovation	Dr Arno Muller Birgitta Schweickert
	Non Communicable Diseases	Dr Jorge Matheu-Alvarez
	WHO AMR Secretariat	Dr Carmem Lucia Pessoa-Silva Dr Sergey Eremin Dr Tong Ryoung Jung Dr Sapna Manglani Dr Barbara Tornimbeme
Rapporteur	United Kingdom	Dr Laura Nellums

Annex 2

Agenda

SUNDAY, 17 FEBRUARY 2019

SESSION I: - Kuwait Hall		**Target outcome**	**Background Documents**
08:30-09:00	**Registration**		
09:00-09:15	**Opening Address** **(by Dr Ahmed Al Mandhari, WHO EMRO Regional Director)** **Welcome and introductions** **Meeting format, objectives and desired outcomes** • Meeting rules and procedures (C Pessoa) • Selection of chair (C Pessoa >>> elected Chair) • Format and desired outcomes	Welcome remarks Get to know each other (brief) Common understanding of - CP: Meeting rules - CP: Procedures (mtg report to be issued on WHO web page) - Chair: Format of the Meeting: open discussion - Chair: what is being targeted: GLASS revision, review CC Network work plan	• Meeting concept note (doc 1) • Meeting agenda (doc 2) • List of participants (doc 3)

SESSION II: GLASS Update & Regional Offices request for help - Kuwait Hall			
09:15-9:45	**GLASS update and challenges** *Sergey Eremin*	Brief update on GLASS, challenges faced and areas for further development	• Slides
09:45-10:15	**Coffee break (if time allows could be taken earlier – from 09:45)**		
10:15-11:30	**WHO Regional Offices asks to Collaborating Centres** *AFRO - Sheick Oumar Coulibaly* *AMRO/PAHO - Nienke Bruinsma* *EMRO - Maha Talaat* *EURO - Danilo Lo Fo Wong* *SEARO – Aparna Shah*	• Collective understanding of what ROs are doing on AMR surveillance and their need for support by the CC Network • [Collation of asks by RO – at end day]	2-3 Slides * 6 ROs ROs to pitch to CCs, followed by discussions: • High level activities in the region and in collaboration with CC in 2018 • What help is needed with specific activities from CCs
11:30 – 12:00	**Breakout sessions dynamics** *Carmem Pessoa*	• Expected dynamics of the breakout sessions	• Distribution of participants per working group (doc 10)
12:00:13:00	**Lunch Break**		

SUNDAY, 17 FEBRUARY 2019

SESSION III: **Parallel breakout sessions follow up on the progress in achieving the target products & planning ahead**		**Target outcome**	**Background Documents**
13:00-15:30 Venue: Kuwait Hall	**Group I –** Laboratory related target products	• Follow up on lab related TP • Outline landscape analysis for WGS for AMR surveillance	• WHO AMR Surveillance and Quality Assessment Collaborating Centres Network workplan updated at 2nd CC network meeting in March 2018 (doc 4) • DRAFT GLASS guidance for national reference laboratories (doc 5) • DRAFT GLASS Pilot Protocol for the inclusion of *Candida* spp. (doc 6) • Scoping the role of WGS for AMR surveillance (doc 7)
13:00-15:30 Venue: Pavilion (Ground floor)	**Group II:** Capacity building/technical support **TP5 -** training activities **TP6 -** Strategy to include mon-official sources of data	• Identify gaps to be addressed with webinars • Outline the schedule for the webinars in 2019 • Outline steps for capturing non-official data source into	• WHO AMR Surveillance and Quality Assessment Collaborating Centres Network workplan updated at 2nd CC network meeting in March 2018(doc 4)
13:00-15:30 Venue: Meeting room on the 3rd floor	**Group III –** Assessment of AMR burden of disease	• Review DRAFT GLASS burden of disease (BOD) methodology for AMR bloodstream infection • Engage in the implementation of the pilot phase	• DRAFT GLASS BOD methodology for AMR bloodstream infection (doc 8)

13:00-15:30 Venue: Meeting room on the 7th floor	**Group IV:** WHO AMR surveillance coordination	• Outline GLASS governance • Understanding of status of regional EQA programmes • Outline the 3rd MS consultation on global AMR surveillance	
15:30 – 16:00	**Coffee break**		
16:00 – 18:00 Kuwait Hall	Feedback Parallel breakout sessions; planning for TP- follow up and update of workplan	• Common understanding of discussions and suggestions on the way forward from the working groups	
17:45	Meeting adjourns		
18:00	***Working dinner***		

MONDAY, 18 FEBRUARY

SESSION IV: **Breakout sessions on GLASS revision**		**Target outcome**	**Background Documents**
8:30 – 13:00	**Group I –** Microbiological markers and new molecular technologies	• Consider the topics and related options proposed in the section 3 in the GLASS revision document	• GLASS early implementation: lessons learnt and proposed steps for further development (doc 9)

Venue: Kuwait Hall		• Provide guidance to GLASS secretariat on the proposed areas for revision	
8:30 – 13:00 Venue: Pavilion (Ground floor)	**Group II:** Surveillance strategies: Topics 1-4	• Consider the topics and related options proposed in the section 3 in the GLASS revision document	• GLASS early implementation: lessons learnt and proposed steps for further development (doc 9)
8:30 – 13:00 Venue: Meeting room on the 3rd floor	**Group III –** Surveillance strategies: Topics 5-8	• Provide guidance to GLASS secretariat on the proposed areas for revision	• GLASS early implementation: lessons learnt and proposed steps for further development (doc 9)
8:30 – 13:00 Venue: Meeting room on the 7th floor	**Group IV:** Enablers – Actions by WHO Secretariat	• Provide guidance to GLASS secretariat on the proposed areas for revision	• GLASS early implementation: lessons learnt and proposed steps for further development (doc 9)

10:00 – 10:30	**Coffee break**		
13:00 - 14:00	**Lunch Break**		
14:00 – 15:30 Kuwait Hall	Feedback Parallel breakout sessions	• Common understanding of discussions and suggestions on the way forward from the working groups	
15:30 – 16:00	**Coffee break**		
16:00 - 18:00 Kuwait Hall	Feedback Parallel breakout sessions (continuation)	• Common understanding of discussions and suggestions on the way forward from the working groups	
18:00	Meeting adjourns		

TUESDAY, 19 FEBRUARY

SESSION V: Moving forward: ways of working together - Kuwait Hall		

8:30 – 10:00 Kuwait Hall	Defined priority for the workplan of network Agreed plan for the revision of GLASS and agreed next steps Agreed framework for the process of follow up and progress reporting	• Defined activities and timelines for the GLASS review • Revised CC Network workplan for the period 2019-2020	• Draft revised CC Network workplan for 2019 (to be drafted during the meeting) • GLASS early implementation: lessons learnt and proposed steps for further development (doc 9) with comments from group discussions
10:00 – 10:30	**Coffee break**		
10:30 – 11:30 Kuwait Hall	**CC Network modus operandi** - Confirm next coordinating CC - CC Network advocacy (position paper) - Coordination - Communications - Finances - Next CC Network meeting	• Improved coordination • Improved communications • Defined next CC Network Meeting • Defined next Coordinating CC	• Terms of Reference WHO AMR Surveillance and Quality Assessment Collaborating Centre Network (doc 11)
11:30 – 12:00	**Closing Remarks / Meeting Adjourns**		

Kuwait Hall	*Chair (TBD) / Carmem Pessoa*		
12:00	**Meeting closes**		