Northern Dimension
Partnership in Public Health
and Social Well-being
www.ndphs.org

Folkhälsomyndigheten

NorthernGLASS

Sharing experiences from a collaborative project on early implementation of the Global Antimicrobial Resistance Surveillance System (GLASS) in the Northern Dimension Partnership in Public Health and Social Well-being

NorthernGLASS

Sharing experiences from a collaborative project on early implementation of the Global Antimicrobial Resistance Surveillance System (GLASS) in the Northern Dimension Partnership in Public Health and Social Well-being

This title may be ordered from the Public Health Agency of Sweden's printing service, e-mail: publikationsservice@folkhalsomyndigheten.se.
It may also be downloaded from: www.folkhalsomyndigheten.se/publicerat-material/.

Article number: 18020

Preface

At the World Health Assembly 2015, the WHO Member States adopted a resolution on a Global Action Plan to contain antimicrobial resistance. Among the five strategic objectives in the plan, one is to increase knowledge and evidence through surveillance. For this purpose a harmonized Global antimicrobial resistance surveillance system, GLASS, was developed by the WHO and launched for enrolment in 2016.

The purpose of this report is to share experiences from eight countries in the framework of the Northern Dimension Partnership in Public Health and Social Well-being (NDPHS); Finland, Germany, Latvia, Lithuania, Norway, Poland, Russian Federation and Sweden, which agreed to collaborate around early implementation of GLASS in a project named NorthernGLASS.

The aim of the project was to provide feedback on the supportive material for early implementation of GLASS developed by the WHO, and on the countries' process of the early implementation of the surveillance system as such. A summary of findings reported in the project protocol and discussions during the final workshop are presented in this main report.

The experience from NorthernGLASS may be of interest for the WHO, the ECDC and other Member States who are about to join GLASS, particularly countries who already have some surveillance of antimicrobial resistance in place.

The project was coordinated at the Public Health Agency of Sweden by Johan Struwe, chair AMR-EG, Sonja Löfmark, director WHO Collaborating Center for AMR containment, Sanja Cabric and Emily Sellström, ITA, AMR-EG.

Public Health Agency of Sweden, April 2018

Malin Grape
Head of Unit for Antibiotics and Infection Control

Table of contents

Contributors

Contributors

Project focal points in participating countries

Finland: Jari Jalava, National Institute for Health and Welfare

Germany: Muna Abu Sin, Robert Koch Institute

Latvia: Uga Dumpis, Pauls Stradiņš Clinical University Hospital

Lithuania: Rolanda Valinteliene, Institute of Hygiene

Norway: Gunnar Skov Simonsen, University Hospital of North Norway

Poland: Danuta Lis, Institute of Occupational Medicine and Environmental Health

Russian Federation: Roman Kozlov, Institute of Antimicrobial Chemotherapy, Smolensk State Medical University

Sweden: Barbro Mäkitalo, Public Health Agency of Sweden

WHO European Regional Office

Danilo Lo Fo Wong and Saskia Nahrgang

ECDC

Liselotte Diaz-Högberg

Funding

Swedish Institute.

Abbreviations

AMR	Antimicrobial resistance
AMR-EG	Expert group on antimicrobial resistance (within the NDPHS partnership)
AST	Antimicrobial susceptibility testing
CAESAR	Central Asian and Eastern European Surveillance of Antimicrobial Resistance
CLSI	Clinical and Laboratory Standards Institute
EARS-Net	European Antimicrobial Resistance Surveillance Network
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EQA	External quality assessment
EUCAST	The European Committee on Antimicrobial Susceptibility Testing
EURO	WHO Regional Office for Europe
FWD-net	European Food- and Waterborne Diseases and Zoonoses Network
GLASS	Global Antimicrobial Resistance Surveillance System
HIS	Hospital information system
ITA	International technical adviser
LIS	Laboratory information system
M&E	Monitoring and evaluation
MoH	Ministry of health
NCC	National coordinating centre (in GLASS)
NDPHS	Northern Dimension Partnership in Public Health and Social Well-being
NRL	National reference laboratory (in GLASS)
WHO	World Health Organization
VITEK	Automated instrument for bacterial ID/AST testing

Executive summary

One of the goals related to antimicrobial resistance (AMR) in the NDPHS action plan is "More representative and comparable AMR surveillance systems developed for implementation in the NDPHS Partner Countries". To address this, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russian Federation and Sweden, agreed to collaborate around early implementation of the WHO **Gl**obal **A**ntimicrobial Resistance **S**urveillance **S**ystem, GLASS, in a project named NorthernGLASS.

The short-term objectives of NorthernGLASS were to share experiences from the national implementation process with regard to identifying bottlenecks, gaps and using the supportive material developed by WHO, and to identify needs for additional supporting material to facilitate implementation of GLASS.

With regard to the developed supportive WHO material, it was considered that there were too many documents with focus on countries with no national surveillance, and less of guidance for countries which already have national surveillance, giving too little focus on how such countries should move towards alignment with GLASS. Still, available documents were generally perceived to be clearly written. In particular, the participants found that there was a lack of material addressing challenges with and arguments for trying to deliver some non-available information to GLASS from countries with laboratory-based national surveillance systems which may have been in operation for decades; what is the value to do more? To improve surveillance comes at a cost.

Several countries reported shortage of human resources and financing as obstacles to expand present surveillance of blood isolates according to EARS-Net and CAESAR-methodology to include other specimen types and pathogens according to GLASS methodology.

Specific challenges with GLASS methodology that were encountered during early implementation were the concept of a surveillance site (as most existing surveillance is laboratory based), IT-related issues (e.g. to extract data on antimicrobial susceptibility testing (AST) from laboratory information systems, to obtain denominator data and to retrieve some core patient data and merge them with AST results). It was also suggested that it should be better defined what information is wanted in GLASS at local, national and global levels and what is needed to achieve this. Finally, it was emphasized that it is absolutely necessary to coordinate data calls between GLASS, EARS-Net and CAESAR to avoid double work.

Despite some of these challenges, several countries pointed at opportunities for added value with implementing GLASS, both at local and national levels, for improving and expanding existing surveillance. Participants also agreed that the purpose of, and need for, global data collection should be further elaborated on in

coming updates of the manual and any future GLASS documentation. This is to increase awareness and understanding of the system and its goals to further inform allocation of adequate resources also for improvement of national surveillance.

Background

Antimicrobial resistance (AMR) is increasing rapidly as consequences of inappropriate use of antibiotics in human medicine and food production, combined with global movement of people, animals and foods. Thus, the AMR problem cannot be solved nationally, but calls for concerted global action in all sectors. Hence, a Global Action Plan (GAP) on antimicrobial resistance was adopted by the WHO member states at the 2015 World Health Assembly. According to the GAP, surveillance of AMR is a cornerstone for increasing knowledge and informing interventions in order to combat AMR at national, regional and global level. For this reason, a Global Antimicrobial Resistance Surveillance System, GLASS, has been developed by the WHO and was launched 2016 to be implemented in Member States.

Eight countries in the Northern Dimension Partnership in Public Health and Social Well-being (NDPHS) antimicrobial resistance expert group (AMR-EG) agreed to collaborate around early implementation of GLASS in a project named NorthernGLASS: Finland, Germany, Latvia, Lithuania, Norway, Poland, Russian Federation and Sweden. NorthernGLASS worked as a tool to reach the goals outlined in the NDPHS strategy 2020 and its accompanying Action Plan.

Countries in Northern Europe and republics in the Russian Federation participating in the NDPHS partnership (dark). All but Denmark and Estonia participated in the project.

At the beginning of NorthernGLASS all EU-countries were participating in EARS-Net since many years and the Russian federation participated in CAESAR. Several countries also had national laboratory-based surveillance with additional objectives and different methodologies, which in many cases had been operating for many years and were well-established before the WHO GLASS initiative.

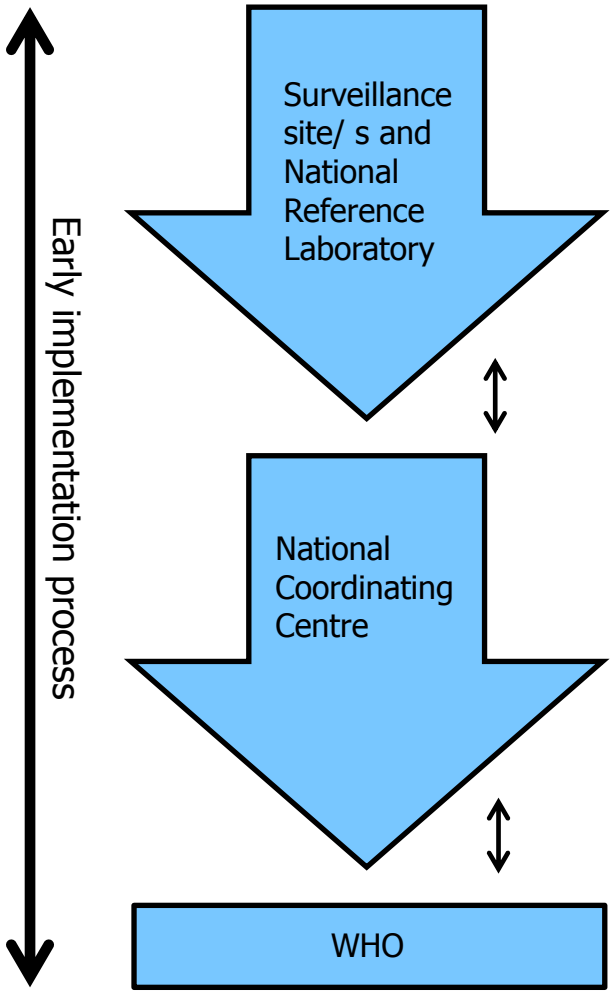
Purpose

The overarching aim of the NorthernGLASS project in the context of the NDPHS partnership was to initiate collaboration in the Baltic Sea Region on surveillance of antimicrobial resistance according to the standards outlined in GLASS. The expansion of ongoing surveillance in the European region i.e. EARS-Net (EU and EEA countries, coordinated by the ECDC) and CAESAR (non-EU countries, coordinated by WHO EURO), to also include additional indicators of great importance for public health as clinical information is often lacking in present surveillance, will inform treatment guidelines and guide necessary interventions to contain AMR. As this will be among the first efforts of regional collaboration and evaluation on early implementation of GLASS in the world, a secondary aim of the project was to share and document experiences and lessons learned from the implementation process. Another aim was to identify bottlenecks, gaps and additional needs for supporting material specifically developed for the purpose of early implementation. These experiences will hopefully be of use for further implementation of GLASS in the Baltic region, in Europe and beyond. Thus, a specific evaluation of the implementation material and other supportive material developed by the WHO was done. A continuous dialogue was kept with theWHO EURO and the ECDC during the course of the project.

Project outline and milestones

GLASS is a surveillance system, which during early implementation is based on routine clinical samples obtained to guide individual patient treatment at the surveillance site. The difference between GLASS and NorthernGLASS is that while GLASS collect data on resistance and implementation progress, NorthernGLASS looks at the implementation process as such, including the usefulness of the implementation supporting material developed by the WHO. In NorthernGLASS experiences from enrolment and early implementation were shared between participating countries.

Information flow in GLASS



Documents for early implementation of GLASS evaluated in NorthernGLASS

- GLASS manual for early implementation
- Guide to enrolment for antimicrobial resistance national focal points
- Guide to completing the GLASS implementation questionnaire
- Implementation questionnaire Global Antimicrobial Resistance Surveillance System (GLASS)
- A guide to planning, implementation, and monitoring and evaluation
- Global Antimicrobial Resistance Surveillance System (GLASS). A guide to uploading aggregated AMR data
- Global Antimicrobial Resistance Surveillance System (GLASS). A guide to preparing aggregated AMR data files
- Diagnostic stewardship. A guide to

Method

Data were collected by the country representatives via a protocol (Appendix 1 "NorthernGLASS project protocol") addressing the following parts:

1. Enrolment in GLASS
2. Setting up a national surveillance system and its core components and monitoring and evaluation
3. National coordinating centre (NCC)
4. National reference laboratory/ies (NRL)
5. Surveillance site/s
6. National workshops
7. General comments and suggestions

and through the discussions at the national workshops or seminars and the final international workshop. Activities and project timeline are shown in the following two tables:

Main activities

Activity	**Short-term project objective**	**Expected project outputs**
Preparation	Common view	Application seed-funding Project protocol Communication plan Workshop with partners
International workshop	Introduce GLASS/ NorthernGLASS with focus on national institutions Present WHO materials Present project and project protocol	Basis for road map in national early implementation, Project outline Understanding of the project protocol
National workshops/ webinars (as desired)	Introduce GLASS/ NorthernGLASS with focus on national organisation (existing networks and surveillance sites)	Strengthen national network (community"), outline national road-map Continuously document process in project protocol Feed-back on WHO material
International workshop	Share lessons from national early implementation Submission of project protocol	Feed-back on WHO material
Write report		Report

Project timeline

Dates 2017	Place/ country	Activity	Responsible partner	Invited participants
Jan	Solna/ Sweden	Kick-off workshop	PHAS	National NCC, NRL, project partners, MoH, WHO, ECDC
Spring	Each country, respectively	National workshop	Project FP with NCC PHAS may facilitate	National stakeholders, surveillance site/s
Dec	Copenhagen/ Denmark	Second workshop to share experiences	PHAS	National NCC, NRL, project partners, MoH, WHO, ECDC
Dec-Jan		Compile, write and circulate draft report	PHAS	Project partners
Feb- March 2018		Finalize report	PHAS	Submit report to SI and feed-back on material to WHO

Abbreviations: PHAS=Public Health Agency of Sweden, NCC=National Coordinating Centre, NRL=National Reference Laboratory, MoH=Ministries of Health, WHO=World Health Organization, ECDC=European Centre for Disease prevention and Control, FP=Focal point, SI= Swedish Institute.

Findings

Some topics, which were addressed in several sections in the project protocol, have been grouped as much as possible in the following presentation. Specific notes from participants are reported in Appendix 2 "Compilation of comments in NorthernGLASS".

1. Enrolment in GLASS

By the end of the project all eight countries had enrolled for registration to GLASS with the GLASS secretariat. Seven countries had completed their enrolment, while the last country was still waiting for a decision at the ministry level in order to be able to submit the completed enrolment questionnaire.

In 5/8 responding countries a national focal point for GLASS with a mandate to share national data to GLASS had been appointed. In the remaining three countries this function was within the remit of appointed national agencies.

Answers to questions about the related WHO material:

	Yes/ answers
• The guidance to completing the GLASS implementation questionnaire is clear	8/8
• The questions in the "WHO Implementation questionnaire" are clear	7/8
• There is enough and clear explanation how to access the GLASS IT platform	7/8

One country commented that there might be more than one NRL (an answer which is not accepted in the web questionnaire) and that it was not clearly defined at this stage what "GLASS standards" stands for.

Participants suggested that questions related to the time before GLASS implementation on the national level and participation in international networks should be added to acknowledge the fact that in some countries surveillance programs did exist before GLASS and have been running successfully for many years.

2. Setting up a national AMR surveillance system, its core components, and monitoring and evaluation

About setting up a national AMR surveillance system

The following answers were obtained:

The description in the WHO-materials of

	Yes/ answers
• how to set up a national AMR surveillance system and the core components is clear	8/8
• a country setting up a national AMR-surveillance is clear	8/8
• to develop or adapt national protocols is clear	8/8
• objectives for national surveillance is clear	8/8
• National surveillance protocols have been disseminated and implemented?	6/8
• Balanced geographical, demographic and socio-economic distribution have been considered?	3/8

Most participating countries have laboratory-based surveillance built on convenience sampling which has been gradually expanded. Only one country has 100 percent population coverage and participation from all laboratories including the private ones. Only one country is building their surveillance on surveillance sites. The GLASS protocol requirements for enhanced case based surveillance at specific surveillance sites were not seen as feasible or relevant in the context of ongoing surveillance in remaining countries.

The fact that the surveillance is laboratory-based implies different challenges:

- The laboratories catchment areas are often not strictly geographical, meaning it is difficult to identify population covered.
- Clinical information, particularly regarding origin of sample (hospital vs community), is usually missing in the information on the laboratory request.
- Some laboratories/ countries have difficulties to merge AST-data from LIS with other core patient data from HIS.

It was also proposed to have some more narrative how alignment of national surveillance will inform and promote global efforts as outlined in the GLASS manual.

Monitoring and evaluation (M&E)

Four out of eight countries reported they had a procedure for monitoring and evaluation of the national AMR surveillance, although the approach was different between the countries. Five out of five who responded to the question had

considered the proposed indicators for M&E (Annex 1). (The role for the NCC with regard to M&E is presented in next section).

National protocols for AMR surveillance; alignment with GLASS

None out of eighth countries reported that their national protocols for AMR surveillance were fully aligned with GLASS. Rather, it was assessed what could be extracted from national systems and reported to GLASS.

3. National Coordinating Centre (NCC)

A national coordinating center (NCC) had been appointed by the MoH in 7/8 countries and a focal point for GLASS in 7/8 countries. The focal point for GLASS was the same as for EARS-Net/CAESAR in 4/8 countries.

Answers to questions about the usefulness of the WHO material:

	Yes/ answers
• How to establish a NCC; relevant	7/8
• The expected role and mandate for the NCC; clear	7/8
• The sample terms of reference for the NCC; useful	7/8
• Description how to define surveillance objectives; clear	8/8
• Description how to identify surveillance sites; clear	8/8
• Surveillance site/s, which can combine patient and laboratory data of assured quality have been selected	3/8
• The role for the NCC regarding data collection is clear	7/8
• NCC has personnel trained	
○ in collecting, analyzing and reporting data	6/8
○ how to disseminate protocols	8/8
• The role for the NCC regarding	
○ reporting data on AMR situation is clear	7/8
○ how to disseminate protocols and tools and train staff in their use is clear	8/8
• About the data management, capacity exist at the national level (NCC) to:	
○ collect data from participating sites	6/8
○ validate data	6/8
○ analyse and compile national reports	6/8
○ feed-back national data to relevant stakeholders	6/8
○ aggregate data and submit to WHO?	6/8
○ translate material (if needed)	5/7
• Monitoring and evaluation; the role for the NCC regarding	
○ how to arrange monitoring and evaluation is clear	8/8
○ application of the indicators in Annex 1 is clear	8/8
○ the sample indicators in Annex 1 are clear and relevant?	7/8

According to the national workshops and final discussions, a major challenge for the NCC is to expand present surveillance according to EARS-Net or CAESAR to GLASS standards due to shortage of human resources for management and validation of data reported from surveillance sites. This becomes even more obvious if data calls for EARS-Net/CAESAR are not synchronized with GLASS data calls.

The challenges with identifying and recruiting surveillance sites are further discussed in Section 5.

With regard to the indicators for monitoring and evaluation, a few countries meant that they were clear but not relevant to them.

4. National Reference Laboratory (NRL)

At least one NRL for GLASS was appointed in 7/8 countries. AST standards were harmonized and EUCAST is used in 7/8 countries, while there was a mix of EUCAST and CLSI in one country.

Answers to questions about the usefulness of the WHO material:

	Yes/ answers
• How to establish a NRL, clear?	7/8
• The expected role and mandate for the NRL clearly described?	7/8
• Sample terms of reference for the NRL useful and clear?	6/8
• Personnel trained in collecting, analyzing and reporting laboratory data are available?	5/8
• The role for the NRL to disseminate protocols and tools and train staff is clear?	7/8
• The need for capacity to verify unexpected or new AMR organisms is clear?	6/7
• Awareness of the freely available WHO/EUCAST videos?	7/7

5. Surveillance site/s

Laboratories providing data to EARS-Net or CAESAR were appointed as surveillance sites for GLASS in most countries.

Answers to questions about the usefulness of the WHO material:

	Yes/ answers
• If more than one surveillance site has been designated, has balanced geographical, demographic and socio-economic distribution been considered in the selection?	3/8

- The sample terms of reference for the surveillance site(s) are useful/clear? 8/8
- The role for the surveillance site/s is clear? 8/8
- Expected role for the surveillance site laboratory is clear? 8/8
- Does the laboratories at the selected surveillance site/s
    - participate in EQA? 8/8
    - have internal quality management? 8/8
- Information on core patient information to be collected is clear? 7/8
- Can the requested core patient data be merged with AST data? 3/8
- Is the description on how to promote "Diagnostic stewardship" clear? 8/8
- A guide to Implementation of Diagnostic stewardship is clear and relevant? 8/8
- Can data, as requested by GLASS, be electronically transferred to NCC? 6/8
- Do the selected surveillance site/s use WHONET 6/8

As can be seen from the replies, the information was generally considered to be clear, but there were technical problems with regard to the concept of surveillance sites and problems with merging some core patient information with AST results.

The concept of surveillance sites was one of the major challenges for all countries but one. This was due to the fact that these countries gradually had expanded their AMR surveillance based on laboratory data since many years. Thus it was difficult for many to define catchment population and coverage for each laboratory. The countries with laboratory based surveillance saw no obvious solutions to transfer into a more distinct "surveillance site" approach, and also questioned whether it was worthwhile and could justify the cost.

Since the laboratories provided the surveillance data, problems with merging core patient information with AST results was foreseen in several countries, particularly to capture whether the specimen was derived from a hospitalized patient, i.e. who either had been admitted for more than 2 calendar days when the specimen was taken, or had been admitted to the health care facility for <2 calendar days but transferred from another health-care facility where he or she was admitted for ≥2 calendar days.

During the national workshops some surveillance site laboratories and NCCs reported difficulties with extracting and forwarding desired data from existing laboratory information systems and/ or to merge these with core patient data from administrative systems. This was particularly true when the laboratory is located outside a hospital where information such as gender and date of hospitalization are not available. During the discussions it became evident that most of these problems were due to that the latest versions of WHONET/ BacLink had not been installed or needed translation. These issues were solved at least in one country after

consultation with the WHO Collaborating Centre for Surveillance of Antimicrobial Resistance at Brigham´s Hospital, Boston, USA. WHO EURO further informed that they on request can assist with solving WHONET/ BacLink-related issues.

6. National workshops

National workshops on early implementation of GLASS were held in conjunction with the NorthernGLASS project in 5/8 countries. The workshops took place either by specific invitation of relevant stakeholders at local (surveillance site) and national levels (3 countries), or in conjunction with annual national surveillance meetings or seminars (2 countries).

The impression from these meetings was that in a few countries who had completed their enrolment to join GLASS, some decisions still had to be made about responsibilities on national surveillance.

The discussions during the workshops were quite similar in all countries and were grouped around the following topics, as previously outlined:

1. How to implement the concept of surveillance sites (also see previous section).
2. All countries participating in EARS-Net have laboratory-based surveillance, while the country participating in CAESAR has surveillance sites. For most EARS-Net countries national coverage is easier to grasp than surveillance site population. There were no plans in these countries to transform to surveillance sites as systems have been running for many years and no added value could be seen to justify the costs.
3. How to extract and merge AST and patient data from existing LIS and HIS.
4. How to collect data requested by GLASS, specifically:
    1. Denominator data; total number of samples per specimen type and number of negative results. For blood-cultures this seemed doable for most countries, while it seemed to be a great challenge with other specimen types, where there is no clear guidance or definition in GLASS.
    2. Deduplication was also quite a challenge for most, but not for all.
    3. Data on origin (hospital vs community) was not available in most places, but could be available in the future.
5. Shortage of human resources and lack of funding for data management and validation. Most reported shortage in human resources capacity already at existing work, and the addition of more data sets would impose quite a

constrain. The necessity to synchronize with EARS-Net and CAESAR was emphasized to minimize need for additional capacity.

It was also mentioned that national AMR surveillance workshops, seminars or similar take place with representatives from participating laboratories in at least 5 countries.

7. General comments

Four out of eight countries responded they could see an added value with implementing GLASS in their country:

At the national level:

- New types of data on resistance provide additional information.
- Implementing GLASS favor the development and improvement of the existing AMR surveillance system.
- GLASS provides an excellent opportunity to expand existing AMR surveillance network and to support the link/communication with disease-specific programmes, such as gonorrhoeae and FWD-net on AMR thereby optimizing use of resources.
- GLASS standards facilitate process to form and unify local data collection system
- GLASS supports the need for meaningful denominator data which has been challenging so far.

At the local level the GLASS-methodology will provide:

- a possibility for interesting sub-analysis of the data
- an opportunity to push antibiotic stewardship, harmonize laboratory performance and data collection system.

GLASS also supports a closer collaboration and communication between laboratories and clinicians and therefore reinforce ongoing antibiotic stewardship activities.

Discussion and conclusions

With regard to the WHO material for early implementation of GLASS, there were few comments on writings and it was considered to be clearly written, although some points were not relevant to all countries. Some participants said that there were too many separate documents from WHO and that it was difficult to understand with which one to start, particularly if there are already surveillance systems in place which have been operating for many years. It was suggested to have one main document, then hyperlinks to detailed sections.

Surprisingly the focal point for GLASS was the same as for EARS-Net/CAESAR only in 4/8 countries. A very close link and communication between these roles is necessary, and as resources are scarce, lesson learned at the national level from participation in the successful regional surveillance systems are important.

Several countries encountered technical issues and room for improvement regarding IT-management; this related both to the written materials and instructions for use of BacLink/ WHONET. Information and instructions for use of the latter did not seem to have been well enough communicated. Specifically templates for standard reports and availability of standard reporting/print-report were missed. WHO EURO clarified during the final workshop that consultation for IT/WHONET training for the CAESAR/non EU countries is ongoing, but is available for the whole region. Likewise, the regional WHO representatives clarified that they could be contacted if translation of any material is necessary but if capacity is lacking, to see if this can be solved in collaboration with the WHO Country Offices.

Although national data analysis is a national responsibility, it was raised that some support from the WHO would be much appreciated with regard, particularly for countries with limited human resources in the field.

Finally, it was emphasized that it is key to coordinate data calls between GLASS, EARS-Net and CAESAR to avoid double work. Specifically there is insufficient capacity for data validation at the NCCs.

Regarding the surveillance system GLASS, it was mentioned that surveillance systems existed before GLASS, which should be acknowledged, perhaps in a preface. The absence of a discussion of adaptation of existing national surveillance systems, or building capacity to deliver data requested in GLASS, was one of the main objections to the entire system. Some meant that the approach of GLASS is too ambitious in relation to other regional networks and initiatives. There is too little focus in the provided material why a change is meaningful for countries with well-established surveillance; what is the value to do more? To improve surveillance comes at a cost. It was pointed out that it should be better defined what

is wanted at local/national/ global levels to support GLASS and what is needed to achieve this. There is a need to learn from experiences in the regional networks, i.e. also ECDC tried to get information on denominator data/other indicators such as blood cultures taken/patient days, but experienced considerable difficulties with collecting those data.

Several countries also reported that they lacked discussions and guidance how a change in existing laboratory surveillance can be introduced for improvement of national surveillance. Specifically how to collect denominator data, how to make de-duplication possible, how to introduce routine monitoring and evaluation and, finally, how to separate information on hospital versus community acquired infections, was felt to be missing in the material.

At the detailed level it was specifically mentioned that some core patient data (in particular "origin") is still difficult to obtain in a majority of countries. It was also suggested to exclude colistin from the list of antibiotics due to difficulties in testing. According to WHO EURO this can be brought up during the evaluation of the first early phase of GLASS (2015-2019).

Another major issue was that the concept of surveillance sites is difficult to implement in countries with ongoing laboratory-based surveillance.

Appendix

The appendixes indicated by paperclips below are embedded in this file. To access them we recommend using Adobe Acrobat Reader.

Appendix 1 Project protocol

Appendix 2 Compilation of participants´ comments

Supporting the Global Action Plan on antimicrobial resistance, a Global Surveillance System, GLASS, was launched 2016.

In this report Finland, Germany, Latvia, Lithuania, Norway, Poland, Russian Federation and Sweden share their experiences from early implementation of GLASS.

Major findings were that there were too many supportive documents developed by the WHO and that existing documents is focused on countries with no national surveillance, while there was less guidance for countries which already have national surveillance, and how such countries should move towards alignment with GLASS.

Despite this several countries pointed at opportunities for an added value with implementing GLASS, both at local and national levels, for improving and expanding existing surveillance.

The report may be of interest for decision-makers and health-care officials organizing national AMR surveillance and for countries in the rest of Europe and beyond preparing early implementation of GLASS

The Public Health Agency of Sweden is an expert authority with responsibility for public health issues at a national level. The Agency develops and supports activities to promote health, prevent illness and improve preparedness for health threats.

Our vision statement: a public health that strengthens the positive development of society.