

GLOBAL
HEALTH
SECURITY

EPIDEMIC
ALERT &
RESPONSE

Antimicrobial Resistance Surveillance

*Questionnaire for Assessment of
National Networks*



World Health
Organization

DEPARTMENT OF COMMUNICABLE DISEASE
SURVEILLANCE AND RESPONSE

Acknowledgements

The World Health Organization (WHO) wishes to acknowledge with gratitude the financial support of the United States Agency for International Development.

WHO also wishes to acknowledge the technical assistance of Dr J. Stelling, Brigham and Women's Hospital, Boston, MA, USA, and Dr G. S. Simonsen, University Hospital of Tromsø, Norway.

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Introduction

Comprehensive quality systems are essential in order to ensure the validity of results from microbiological investigations and epidemiological analyses in antimicrobial resistance (AMR) surveillance. To be effective such systems should:

- be focused on the organisms of greatest public health importance (i.e. with high mortality and/or morbidity, and where therapeutic options may be severely limited by antimicrobial resistance);
- include organisms that are readily transmissible (i.e. may give rise to outbreaks and epidemics);
- provide information for action at the local, intermediate and national levels.

The laboratories involved must be suitably staffed and equipped in order to produce meaningful antimicrobial resistance data. The work must be organized in a way that will detect unacceptable levels of random and systematic errors and initiate remedial actions. The primary clinical objective of antimicrobial susceptibility testing is to guide the clinician in the treatment of individual patients. This requires the transmission of valid information to the decision-maker in a timely manner with appropriate interpretation for the non-expert. For antimicrobial resistance surveillance networks it is equally important to realize that data generated for clinical purposes will need to be adapted for epidemiological use. This includes a precise definition of the population from which the samples are collected. It is also desirable to include mechanisms to avoid duplicates and to be able to sort isolates according to specific properties such as specimen type, gender, age, hospital versus community acquisition of infection, etc. No surveillance programme can fulfil all the suggested criteria, but a description of the programme needs to address these issues.

The present questionnaire is only one component of a strategy for quality assessment. The aim is to provide a means for laboratory networks currently active in antimicrobial resistance surveillance to assess the status of the individual laboratories in the network (Component I) with respect to basic laboratory capacity and infrastructure (Part 1), the ability to isolate and identify bacterial isolates (Part 2), and the performance of antimicrobial susceptibility testing (Part 3). Component II is a tool for evaluation of the network coordinating centre and the overall functioning of the surveillance network. A comprehensive description of quality systems specifically tailored for AMR surveillance is presently being prepared by WHO.

Date ___ / ___ / ___

Component I
Laboratories in the network

Part 1: BASIC LABORATORY CAPABILITY AND INFRASTRUCTURE

Laboratory
Address
Name and title of principal laboratory representative
Telephone
Fax
E-mail
Web-site
Does the laboratory have access to the internet?

General information		
Level of the laboratory	Peripheral/local	
	District	
	Provincial/state/regional	
	National/reference	
Affiliation of the laboratory	Public	
	Private	
	Academic institution	
	NGO or religious institution	
Physical location of the laboratory	Free-standing building	
	Part of larger structure	
Is the laboratory connected to (a) hospital service(s)?	Yes	
	No	
How many hospitals and/or other health care facilities does the laboratory regularly serve?	Hospitals	
	Long-term health care facilities	
	Outpatient clinics	
	Primary health care offices	
	Others	
Activities at the laboratory	Bacteriology	
	Virology	
	Mycobacteriology	
	Parasitology	
	Mycology	

Laboratory equipment and maintenance	Present	Function
Refrigerator		
Freezing at -20°C		
Freezing at -70°C		
Lyophilisation		
Scale or balance		
Candle jars		
Other anaerobe jar		
Magnifying lens		
Loop/needle handles		
Multipoint inoculator		
0.01 and 0.001ml calibrated loops		
Bunsen burner		
If no Bunsen burner, heater or lamp to sterilize loops and needles		
Petri dishes (glass)		
Petri dishes (disposable)		
Test tube racks		
Vortex mixer		
Staining facilities - sink and slide rack		
Adequate glassware for media preparation (flasks, cylinders, etc.)		
Wash bottles		
pH paper		
pH meter		
Manual pipettes (e.g., Eppendorf)		
Water distillation system		
Low-speed centrifuge (hand or electrically powered)		
Autoclave - manually controlled		
Autoclave - electrically controlled		
Hot air oven		
Electrically powered waterbath		
Warm air incubator		
CO ₂ incubator		
CO ₂ tanks		
Microscope with oil-immersion objective		
Slides and coverslips		
Inverted microscope		
Fluorescent microscope		
Colorimeter		
ELISA plate reader		
Safety cabinet - level 1 (Protects operator from contamination: open-fronted, unrecirculated airflow away from operator).		
Safety cabinet - level 2 (Protects operator and material from contamination: open-fronted, filtered supply and exhaust air).		
Safety cabinet - level 3 (Protects operator, material and environment from contamination: enclosed, negative pressure, HEPA filtered air supply and exhaust).		

Laboratory equipment and maintenance (cont.)		
If any of the items in the list do not function properly , please indicate which one(s) and specify whether the equipment is malfunctioning or does not function at all		
Is the functioning of all electrical or mechanical equipment routinely monitored and recorded (e.g., microscope calibration, temperatures of refrigerators/incubators, pipette calibration, autoclave function, etc.)?	Yes	
	No	
Are calibration, maintenance and service records kept?	Yes	
	No	
Are calibration, maintenance and service records reviewed?	Yes	
	No	
If yes, who will perform the review?	Technicians at the laboratory level	
	Technicians at the institution level	
	External technical staff	
	Others (specify)	
How often are calibration, maintenance and service records reviewed?	times a year	
Does the laboratory have procedures for taking remedial actions when technical equipment malfunctions or stops functioning altogether?	Yes	
	No	
Does the laboratory have procedures for control and calibration of technical equipment after repair or maintenance before the equipment is taken into use again?	Yes	
	No	

Reagents and materials		
Does the laboratory have problems obtaining and maintaining most supplies of essential reagents and materials?	Yes	
	No	
If yes, what are the most important reasons?	Lack of information	
	Long delay ordering / delivery	
	Lack of funds	
	Inconsistent demand from physicians	
Does the laboratory keep records of deliveries of reagents and materials?	Yes	
	No	
Does the laboratory have a system for regular monitoring of stocks so that there is warning if stocks are becoming low?	Yes	
	No	
What proportion of the reagents are obtained from the following sources?	A commercial supplier	%
	Another laboratory	%
	Prepared in-house	%
What proportion of reagents are labelled with the name of the reagent, the date of delivery, the date of opening, and the date of expiry?	%	

Laboratory staff		
Please give the number of staff in each category	Medical supervisors	
	Technical supervisors	
	Technologist / technical	
	Laboratory assistants	
	Clerical	
	Other (specify)	
What is the highest level of microbiology training achieved by technical staff performing diagnostic tests?	Degree level	
	Diploma course or specific training	
	In-laboratory training only	
	Other (briefly describe)	
Indicate the type of training and the number of staff trained	Formal training in the laboratory	
	Formal training at another laboratory	
	Formal training at reference laboratory	
	International training	

Supervision and management		
Who usually decides which tests to perform when the samples first arrive in the laboratory?	The requesting clinician	
	The technician	
	Microbiologist/supervisor	
	Laboratory protocol	
Who makes decisions about further testing if indicated?	The technician	
	Microbiologist/supervisor	
Are all tests reviewed before results sent for reporting?	Yes	
	No	
If yes, who reviews the results?	The technician performing the test	
	Another member of the technical staff	
	A supervisor/medical microbiologist	
Does the technical staff have access to written protocols for performing each test?	Yes	
	No	
What proportion of specimens received are labelled with the patient's name and unique identifiers?		%
Do request forms provide details that enable you to contact the patient?	Yes	
	No	
Do request forms contain all of the following patient information: specimen source, date and time of collection, type of test requested?	Yes	
	No	
If no, please indicate the information usually available on the request forms		
Are specimens stored after testing?	Yes	
	No	
If yes, for how long?		
Are standard criteria used for discarding specimens with prolonged transit times (time of collection to time of processing in laboratory)?	Yes	
	No	

Reporting procedures		
Are records kept of the number and type of tests performed and results?	Yes	
	No	
Does the laboratory use standardized forms to report laboratory results?	Yes	
	No	
Does the laboratory have a list of diseases that should be reported to the Ministry of Health?	Yes	
	No	
If not, does the laboratory staff know which diseases should be reported?	Yes	
	No	
Do you keep register of persons with notifiable diseases?	Yes	
	No	
If yes, is the register computerized?	Yes	
	No	
If computerized, are back-up copies (hard copies or disc) of data made and archived?	Yes	
	No	
Is information gathered about laboratory turn-around times for specimens (time from receipt of specimen to issue of the report)?	Yes	
	No	
If yes, how is this information used?		

Safety		
What protective clothing/equipment is available to laboratory staff?	Gloves - latex	
	Gloves - other	
	Laboratory coats	
	Safety glasses/visors	
	Other (specify)	
Does the laboratory staff receive training in laboratory safety?	Yes	
	No	
Is there a safety manual easily accessible to the laboratory staff?	Yes	
	No	
What methods are used for solid waste disposal?	Autoclaving	
	Incineration	
	Burial with no pre-treatment	
	Other (specify)	
What methods are used for liquid waste disposal?	Discarded with no pre-treatment	
	Autoclaving	
	Chemical disinfection	
	Other (specify)	

Date ___ / ___ / ___

**Component I
Laboratories in the network**

Part 2: ISOLATION AND IDENTIFICATION OF BACTERIAL ISOLATES

Media production		
Does the laboratory produce its own media for bacterial cultures?	Yes	
	No	
If no, indicate the source of media for bacterial cultures	Another laboratory	
	Commercial supplier	
Does the laboratory have written standard internal operating procedures or flow charts for assuring the quality of media for bacterial cultures?	Yes	
	No	
If yes, what is the origin of the written procedure/flow chart?	Published	
	Developed in-house	
If present, please enclose a copy of the standard internal operating procedure for production of media for bacterial cultures		
Does the laboratory use specific bacterial control strains to assure the quality of media for bacterial cultures?	Yes	
	No	
If yes, please indicate the control strains used and the media they are used to control	Control strain	Media
What type of blood is used in the blood agars?	Sheep	
	Horse	
	Rabbit	
	Human	
	Other (specify)	

Processing of specimens		
Approximately how many bacterial cultures are set up each month from the respective materials?	Blood cultures	
	Faeces	
	Urine	
	Cerebrospinal fluid	
	Wounds/surgical sites	
	Genital	
	Sputum/throat/nasopharynx	
	Total	
Does the laboratory have standard internal operating procedures for processing of samples for bacterial culture?	Yes	
	No	
If yes, is there a written procedure or flow chart in use for processing specimens for bacterial cultures?	Yes	
	No	
If yes, what is the origin of the written procedure/flow chart?	Published	
	Developed in-house	
If present, please enclose a copy of the standard internal operating procedures for processing of samples for bacterial culture		
Does the laboratory ever refuse to process specimens?	Yes	
	No	
If yes, what are the usual reasons?	Compromised sterility of container	
	Wrong type of transport medium	
	Prolonged transit time	
	Incomplete information about patient and/or specimen	
	Inappropriate source of specimen	
	Other (specify)	
If specimens are rejected without processing, approximately how many each month?		
If the laboratory accepts all submissions, state why		
If specimens are sent to the laboratory from external facilities, what is the average transit time needed for the specimens to reach the laboratory?		hours

Isolation of bacterial isolates		
Does the laboratory have standard internal operating procedure for assuring the quality of culture performance?	Yes	
	No	
If yes, is there a written procedure or flow chart in use for the isolation of bacterial isolates?	Yes	
	No	
If yes, what is the origin of the written procedure/flow chart?	Published	
	Developed in-house	
If present, please enclose a copy of the standard internal operating procedures for isolation of bacterial isolates		
Does the laboratory participate in any external quality assessment system for isolation of bacterial isolates?	Yes	
	No	
If yes, please write the name(s) of the external quality assessment system(s) and the period(s) of participation by the laboratory		

Isolation of bacterial isolates (cont.)		
If available, please enclose charts indicating the performance of the laboratory in the external quality assessment system(s) mentioned above		
Specify which media are used for <u>primary culture</u> of the specimens listed below		
Blood cultures	Chocolate agar	
	Aerobic blood agar	
	Anaerobic blood agar	
	MacConkey agar	
	Others (specify)	
Faeces	Blood agar	
	SS agar	
	TCBS	
	Alkaline peptone broth	
	Selenite F broth	
	MacConkey agar	
	Others (specify)	
Urine	Blood agar	
	MacConkey agar	
	Chrome agar	
	Others (specify)	
Cerebrospinal fluid	Chocolate agar	
	Blood agar	
	Broth enrichment	
	Others (specify)	
Wounds/surgical sites	Chocolate agar	
	Aerobic blood agar	
	Anaerobic blood agar	
	MacConkey agar	
	Others (specify)	
Genital	Chocolate agar	
	Blood agar	
	GC isolation medium (specify)	
	MacConkey agar	
	Others (specify)	
Sputum / Throat / Nasopharynx	Chocolate agar	
	Blood agar	
	MacConkey agar	
	Others (specify)	
Does the laboratory maintain logs for culture results?		Yes
		No
If yes, are culture results matched with patient data and specimen information?		Yes
		No
What format is used for storage of culture results?	Log books	
	Data report sheets	
	Computer files	
	Other	

Identification of bacterial isolates		
Does the laboratory have standard internal operating procedure for assuring the quality of identification procedures for bacterial isolates?	Yes	
	No	
If yes, is there a written procedure or flow chart in use for the identification of bacterial isolates?	Yes	
	No	
If yes, what is the origin of the written procedure/flow chart?	Published	
	Developed in-house	
If present, please enclose a copy of the standard internal operating procedures for identification of bacterial isolates		
Does the laboratory participate in any external quality assessment system for identification of bacterial isolates?	Yes	
	No	
If yes, please write the name(s) of the external quality assessment system(s) and the period(s) of participation by the laboratory		
If available, please enclose charts indicating the performance of the laboratory in the external quality assessment system(s) mentioned above		
Specify which tests are used for identification of the bacterial species listed below		
<i>Staphylococcus aureus</i>	Catalase	
	Coagulase	
	DNAase	
	Others (specify)	
<i>Streptococcus pneumoniae</i>	Optochin disks	
	Latex agglutination	
	Others (specify)	
<i>Streptococcus pyogenes</i>	Bacitracin disk	
	Latex agglutination	
	Others (specify)	
<i>Enterococcus</i> spp.	Gram	
	Catalase	
	Latex agglutination	
	Others (specify)	
<i>Haemophilus influenzae</i>	Gram	
	X, V, XV factors	
	Satellite growth	
	Serogrouping	
	Others (specify)	
<i>Moraxella catarrhalis</i>	Gram	
	Oxidase	
	Sugar fermentation	
	Others (specify)	
<i>Neisseria meningitidis</i>	Gram	
	Oxidase	
	Superoxo	
	Sugar fermentation	
	Serogrouping	
	Others (specify)	

Identification of bacterial isolates (cont.)		
<i>Neisseria gonorrhoeae</i>	Gram	
	Oxidase	
	Superoxo	
	Sugar fermentation	
	Co-agglutination	
	Others (specify)	
<i>Escherichia coli</i>	Urea/indole	
	Sugar fermentation	
	Motility	
	Others (specify)	
<i>Klebsiella</i> spp.	Urea/indole	
	Sugar fermentation	
	Motility	
	Others (specify)	
<i>Salmonella typhi</i>	Urea/indole	
	Sugar fermentation	
	Motility	
	Serotyping	
	Others (specify)	
<i>Salmonella</i> spp.	Urea/indole	
	Sugar fermentation	
	Motility	
	Serotyping	
	Others (specify)	
<i>Shigella</i> spp.	Urea/indole	
	Sugar fermentation	
	Motility	
	Serotyping	
	Others (specify)	
<i>Campylobacter</i> spp.	Growth requirements	
	Gram	
	Hippurate test	
	Others (specify)	
<i>Pseudomonas aeruginosa</i>	Gram	
	Oxidase	
	Pseudoscreen	
	Others (specify)	

Date ___ / ___ / ___

Component I
Laboratories in the network

Part 3: ANTIMICROBIAL SUSCEPTIBILITY TESTING (AST)

General information		
Since when has the laboratory participated in this AMR network?		
How many of the laboratory staff perform AST and what percentage of these persons work full time?		persons %
Does the laboratory keep records which demonstrate the number of ASTs performed each month?		Yes
		No
If yes, please indicate the average monthly number of ASTs performed for each of the following organisms	<i>Staphylococcus aureus</i>	
	<i>Streptococcus pneumoniae</i>	
	<i>Streptococcus pyogenes</i>	
	<i>Enterococcus spp.</i>	
	<i>Haemophilus influenzae</i>	
	<i>Moraxella catarrhalis</i>	
	<i>Neisseria meningitidis</i>	
	<i>Neisseria gonorrhoeae</i>	
	<i>Escherichia coli</i>	
	<i>Klebsiella spp.</i>	
	<i>Salmonella typhi</i>	
	<i>Salmonella spp.</i>	
	<i>Shigella spp.</i>	
<i>Campylobacter spp.</i>		
<i>Pseudomonas aeruginosa</i>		
Which organisms are susceptibility tested from the specimen sources listed below?		
Blood cultures	All organisms	
	Organisms generally considered clinically significant	
	Organisms considered clinically significant in the individual patient	
Faeces	All organisms	
	Organisms generally considered clinically significant	
	Organisms considered clinically significant in the individual patient	
Urine	All organisms	
	Organisms generally considered clinically significant	
	Organisms considered clinically significant in the individual patient	

General information (cont.)			
Cerebrospinal fluid	All organisms		
	Organisms generally considered clinically significant		
	Organisms considered clinically significant in the individual patient		
Wounds/surgical sites	All organisms		
	Organisms generally considered clinically significant		
	Organisms considered clinically significant in the individual patient		
Genital	All organisms		
	Organisms generally considered clinically significant		
	Organisms considered clinically significant in the individual patient		
Sputum/throat/ nasopharynx	All organisms		
	Organisms generally considered clinically significant		
	Organisms considered clinically significant in the individual patient		
If AST is performed based on general considerations of clinical significance, are these considerations included in a written laboratory manual or other document available in the laboratory?		Yes	
		No	
If present, please enclose a copy of the laboratory manual for selection of bacterial isolates for AST			
If AST is performed on the basis of considerations of clinical significance in the individual patient, who will generally decide whether AST will be performed?	Technician performing the AST		
	Technical supervisor		
	Microbiologist		
	Requesting clinician		
	Others (specify)		

Performance of AST			
What proportion of the laboratory's antibiotic disks or solutions are obtained from the following sources?	International commercial supplier	%	
	National commercial supplier	%	
	Another laboratory	%	
	Prepared in-house	%	
Does the laboratory have problems with maintaining	Sufficient supplies for the estimated volume of ASTs	Yes	
		No	
	Adequate quality of reagents/supplies to permit reliable testing	Yes	
		No	
Storage of supplies and reagents for adequate preservation	Yes		
	No		
If yes, what are the principle obstacles faced?			
Does the laboratory have internal standard operating procedure for assuring the quality of AST?		Yes	
		No	
If yes, is there a written procedure or flow chart in use for the performance of AST?		Yes	
		No	
If yes, what is the origin of the written procedure/flow chart?	Published		
	Developed in-house		
If present, does the internal standard operating procedure include regular AST of quality control strains?		Yes	
		No	
If yes, please indicate the control strains used and their frequency of use	Control strain	Frequency of use (weekly/monthly etc.)	
If present, are the internal quality control results reviewed?		Yes	
		No	
If review is performed, at what intervals does this take place?			
If review is performed, who reviews the internal quality control results?	Technician performing the test		
	Technical supervisor		
	Microbiologist		
	Others (specify)		
What remedial actions are taken if unacceptable errors are discovered during review?			
Does the laboratory participate in any external quality assessment program for AST <u>not</u> run by the AMR surveillance network?		Yes	
		No	
If yes, please write the name(s) of the external quality assurance program(s) and the period(s) of participation by the laboratory			

Performance of AST (cont.)		
Please indicate the frequency of AST proficiency tests in the external quality assurance program (average number of tests per year)	tests per year	
How often is feedback given to the laboratory on its proficiency test results (for each test/monthly/annually)?		
Over time, have the reports from the external quality assurance programme demonstrated an increasing capability to conduct AST?	Yes	
	No	
If available, please enclose charts indicating the performance of the laboratory in the external quality assurance programme(s) above		
What AST method(s) are most frequently used in the laboratory? (indicate by numbers in descending order of frequency)	Disk diffusion	
	MIC broth microdilution (specify if automated system is used)	
	MIC agar dilution	
	Etest®	
	Others (specify)	
If MICs are used, which testing range is applied?	Breakpoint (2 dilutions)	
	Limited range (3-4 dilutions)	
	Full range (≥ 5 dilutions)	
Are any of the following guidelines used for AST interpretation?	NCCLS (USA)	
	CA-SFM (France)	
	DIN (Germany)	
	BSAC (UK)	
	MENSURA (Spain)	
	CZECH (Czech Republic)	
	GREECE (Greece)	
	CRG (The Netherlands)	
	SRGA (Sweden)	
	NWGA (Norway)	
	Others (specify)	

Performance of AST (cont.)															
Please indicate the antimicrobial agents (AA) routinely tested for the following organisms, including the AST methods used. Use the generic name of the active substance. (DD=Disk Diffusion, BD=Broth Microdilution, AD=Agar Dilution, E=Ettest, O=Others (specify))															
Organisms	Antimicrobial Agents														
	AA1 =	AA2 =	AA3 =	AA4 =	AA5 =	AA6 =	AA7 =	AA8 =	AA9 =	AA10 =	AA11 =	AA12 =	AA13 =	AA14 =	AA15 =
<i>Staphylococcus aureus</i>															
<i>Streptococcus pneumoniae</i>															
<i>Streptococcus pyogenes</i>															
<i>Enterococcus spp.</i>															
<i>Haemophilus influenzae</i>															
<i>Moraxella catarrhalis</i>															
<i>Neisseria meningitidis</i>															
<i>Neisseria gonorrhoeae</i>															
<i>Escherichia coli</i>															
<i>Klebsiella spp.</i>															
<i>Salmonella typhi</i>															
<i>Salmonella spp.</i>															
<i>Shigella spp.</i>															
<i>Campylobacter spp.</i>															
<i>Pseudomonas aeruginosa</i>															

Evaluation and reporting of AST results			
Does the laboratory review its AST data for meaningfulness?		Yes	
		No	
If yes, who conducts this review?	Technician performing the test		
	Technical supervisor		
	Microbiologist		
	Others (specify)		
What remedial actions are taken if unacceptable errors are discovered during review?			
How are AST results reported to the health care provider?	Quantitatively (zone diameters/MIC)		
	Qualitatively (Resistant, Intermediate, Susceptible)		
	Both		
For which organisms are the AST results reported to the clinician?	All organisms		
	Organisms generally considered clinically significant		
	Organisms considered clinically significant in the individual patient		
If AST test results are reported on the basis of general considerations of clinical significance, are these considerations included in a written laboratory manual or other document available in the laboratory?		Yes	
		No	
If yes, please enclose a copy of the laboratory manual for reporting of AST results			
If AST test results are reported on the basis of considerations of clinical significance in the individual patient, who will generally decide whether AST results will be reported?	Technician performing the AST		
	Technical supervisor		
	Microbiologist		
	Requesting clinician		
	Others (specify)		
Does the laboratory maintain permanent records of its AST results?		Yes	
		No	
If yes, what format is used for storage of AST results?	Log books		
	Data report sheets		
	Computer files		
	Other (specify)		
Are AST results stored in a format that allows for elimination of duplicate isolates in database outputs?		Yes	
		No	
Are AST results stored in a format that allows for sorting by specimen types in database outputs?		Yes	
		No	
Are AST results stored in a format that allows for sorting according to date of sampling?		Yes	
		No	
Are AST results stored in a format that allows for sorting according to where the infecting organism was acquired? (hospital/community, etc.)		Yes	
		No	
Are AST results stored in a format that allows the laboratory to link its AST results with patient treatment and clinical outcome information?		Yes	
		No	

Evaluation and reporting of AST results (cont.)		
If a computer is used in the laboratory, does it have Windows capability?	Yes	
	No	
Does the computer have software for analysing AST data?	Yes	
	No	
If yes, provide name of software		
Has the laboratory experienced difficulty using the software?	Yes	
	No	
If yes, please describe the problems encountered		

Communication of AST data to network and local data users		
Does the laboratory regularly submit data reports to the network?	Yes	
	No	
If yes, how many times per year does the laboratory submit data to the network?		
If yes, what means are used to submit reports to the network?	Verbal reports	
	Written reports by public mail	
	Written reports by special courier	
	E-mail	
	Computer file	
	Other (specify)	
If no, what have been the significant obstacles faced by the laboratory in getting its data reports to the network?	Lack of personnel	
	Don't know where to send it	
	Disruptions in mechanism for sending reports	
	Other (specify)	
Is the laboratory aware of any changes made in antibiotic usage based on the AST data provided by the laboratory?	Yes	
	No	
Has the laboratory been able to communicate directly with the other laboratories in the network about AMR surveillance findings and questions?	Yes	
	No	
Has the laboratory received any feedback reports from the network on the data submitted?	Yes	
	No	
If yes, has the laboratory used these reports to strengthen its AST capability?	Yes	
	No	

Date ___ / ___ / ___

Component II
Network centre / co-ordinator

Antimicrobial Resistance Surveillance Network	
Network Co-ordinator	
Institution	
Address	
Telephone	
Fax	
E-mail	
Web-site	

General information		
Since which year has the network been operating?		
How many laboratories currently participate in the network?		
Approximately what percentage of all laboratories in the country does this represent?		%
In general, what percentage of the population served by the network lives in	Large cities	%
	Towns or district centres	%
	Small villages	%
	Rural areas	%
In general, which best describe(s) the patient populations served by the network laboratories?	Hospitalized intensive care units	
	Hospitalized non-intensive care unites	
	Community/outpatients	
	Healthy individuals	
	Others (specify)	
Approximately what percentage of the country's population is covered by the network?		%
What percentage of the country's administrative regions is covered by the network?		%

Collection of data		
Does the network receive regular and complete AMR data reports from all participating laboratories?	Yes	
	No	
If not, how many times a year does the network expect to receive data from the laboratories?	times a year	
What percentage of laboratories regularly submit their data at this frequency?	%	

Quality control		
Does the network monitor the performance of the internal quality control procedures done by the participating laboratories?		Yes
		No
If yes, how is this accomplished?	Review of submitted laboratory records	
	Review of summary reports submitted by laboratories	
	Observations during site visits	
	Other (specify)	
Does the network organize and run an external quality assurance system (EQAS) for network laboratories?		Yes
		No
If yes, what areas are covered by the EQAS?	Bacterial identification	
	Antimicrobial susceptibility testing	
Are EQAS reports available for review?		Yes
		No
Does the network review the EQAS proficiency test reports with the laboratories?		Yes
		No
If available, please enclose a copy of the EQAS reports from the network		
Does the network assist the laboratories in improving their EQAS proficiency testing?		Yes
		No
If yes, how is this accomplished?		
Are laboratory susceptibility test results reviewed by the network for validity and relevance?		
If yes, how is this accomplished?		
Does the network recommend the use of any single published guideline for AST performance and interpretation to the participating laboratories?	NCCLS (USA)	
	CA-SFM (France)	
	DIN (Germany)	
	BSAC (UK)	
	MENSURA (Spain)	
	CZECH (Czech Republic)	
	GREECE (Greece)	
	CRG (The Netherlands)	
	SRGA (Sweden)	
	NWGA (Norway)	
Others (specify)		
If the participating laboratories use different methodologies to generate their data, does the network adjust the data reports into a uniform format for facilitating comparability?		Yes
		No
If yes, how this is achieved?		

Generation of AMR information report		
Does the network centre regularly produce AMR information reports?	Yes	
	No	
If yes, how many times a year does the network produce an AMR information report?	times a year	
Which bacterial pathogens are covered in this report?		
Are susceptibility test results linked to any of the following data categories during data analysis?	Clinical outcome	
	Patient location (hospitalized, community, etc.)	
	Specimen source (blood, CSF, etc.)	
	Geographic location of the laboratory	
	Population served by the laboratory	
	Date of specimen collection	
	Other (specify)	
Does the network centre employ or consult with any of the following specialist(s) when developing the AMR information reports?	Microbiologist	
	Epidemiologist	
	Infectious disease clinician	
	Statistician	
	Others (specify)	

Communication of AMR surveillance results		
Are the results of the AMR surveillance network regularly and effectively communicated to decision-makers in the Ministry of Health or other governing bodies?	Yes	
	No	
If yes, how frequently are the routine AMR information reports sent to decision-makers in the Ministry of Health or other governing bodies?	times a year	
If no, what have been the principle obstacles experienced in distributing the reports to decision-makers?		
Does the network have a mechanism for quickly notifying decision-makers when new or significant resistance patterns are identified?	Yes	
	No	
If yes, please describe this mechanism		
Has the network coordinator seen evidence of the use of the network reports by AMR containment decision-makers?	Yes	
	No	
Does the network provide laboratories with a periodic summary report on the quality of their regularly submitted AST data?	Yes	
	No	
If yes, at what frequency?	times a year	
Does the network provide advice and guidance to the laboratories on improving their AMR surveillance activities?	Yes	
	No	
How is this accomplished?		