Detection of resistance and monitoring for its spread requires laboratory-based surveillance. A workshop was organized to assist national authorities in building their laboratory capacity for efficient surveillance of emergence and spread of antimicrobial resistance (AMR) through use of WHO recommended laboratory techniques for determination of antimicrobial resistance and WHO software for antimicrobial data analysis. This report also briefly outlines the status of laboratory-based surveillance of antimicrobial resistance in the WHO South-East Asia Region and summarizes the progress made in implementation of the Jaipur Declaration (2011) on Antimicrobial Resistance.
Laboratory-based Surveillance of Antimicrobial Resistance

Report of the Regional Workshop
Chennai, India, 17–21 June 2013
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1. Background

During the past six decades, antimicrobial agents have played a critical role in reducing the burden of communicable diseases all over the world. The emergence of resistance and its rapid spread is negating the impact of these drugs, obstructing progress towards achievement of the Millennium Development Goals (MDGs) and hindering effective application of modern technologies in mitigating human misery. While appearance of resistance is a continuous phenomenon in microorganisms, its amplification and spread is through an array of practices conducted by human beings. Improper use of antimicrobial agents especially in high disease-burden settings and also antibiotics use for non-therapeutic reasons as in the veterinary sector result in strong selection pressure that allows the resistant strain to grow and rapidly replace the susceptible isolates. Detection of resistance and monitoring its spread require laboratory-based surveillance.

Recognizing that diseases due to resistant organisms take a longer period to heal, require expensive and at times toxic drugs for longer periods, often making the disease untreatable, and these resistant organisms can also move across countries through travel and trade, there is a growing global concern about this problem. Combating the problem of antimicrobial resistance (AMR) warrants concerted efforts at national and international levels to preserve the available antimicrobial agents. An effective response to AMR is possible through treatment policies such as combination therapy, rational prescription, patient adherence, strong regulatory mechanism and educational activities, along with an efficient surveillance system.

To facilitate these activities at the country level, the WHO Regional Office for South-East Asia has developed a strategy that is simple, practical and easy to scale up. The regional strategy aims to give particular attention to interventions involving the introduction of legislation and policies governing the use of antimicrobial agents, establishing laboratory-based networks for surveillance of resistance and ensuring the rational use of these drugs at all levels of health-care settings. In addition, Asia Pacific Strategy for Strengthening Health Laboratory Services (2010–2015) was developed
jointly for South-East Asia (SEA) and the Western Pacific (WP) Regions. Building laboratory capacity and addressing AMR are two of the key elements of this strategy.

At the 63rd session of the Regional Committee, a resolution on the prevention and containment of AMR was endorsed. This resolution requests the Regional Director to assist national authorities in building their laboratory capacity for efficient surveillance of the emergence and spread of AMR. A biregional workshop on laboratory surveillance of AMR was organized in 2011 in accordance with the request made by the Member States. During the “Regional Workshop on Assessment of IHR (2005) Core Capacity” in November 2012, participants from Member States requested for a similar workshop again to build and strengthen capacity for laboratory surveillance of AMR in line with IHR.

Acknowledging the growing global importance of AMR, the health ministers of all Member States of the WHO South-East Asia Region (SEAR) adopted the “Jaipur Declaration on Antimicrobial Resistance 2011”. The Declaration recognizes that it is imperative that the national governments accord utmost priority to this problem to preserve efficacy of antibiotics in the fight against microbial diseases.

The aim of the present planned workshop is to enhance the gathered momentum and provide an opportunity for information/experience sharing, reviewing the status of laboratory surveillance of AMR and further strengthening the laboratory capacity of AMR surveillance.

The agenda of the workshop is in Annex 1 and the list of participants in Annex 2.

2. Objectives

The objectives of the workshop were as follows:

- to enhance national capacity for laboratory-based surveillance of AMR;
- to share the experiences and review the status of implementation of regional strategy on the prevention and
containment of the AMR/Jaipur Declaration (2011) on antimicrobial resistance in SEAR Member States;

- to orient and train participants on WHO-recommended laboratory techniques for the determination of AMR and WHONET, WHO software for AMR data analysis;
- to develop follow-up actions at country levels for the establishment of national laboratory based surveillance systems for quality lab diagnosis of AMR and implementation of regional strategy on the prevention and containment of AMR and Jaipur Declaration (2011) on antimicrobial resistance.

3. **Inaugural session**

The inaugural session of the workshop was held in the auditorium at Sankara Nethralaya, Chennai, India, and Dr H.N. Madhavan (Director, Vidyasagar Institute of Biomedical Technology and Science and VRF referral lab) delivered the welcome address. This was followed by an address by Dr S S Badrinath (Chairman Emeritus, Sankara Nethralaya) who also spoke about the achievements of Sankara Nethralaya. Dr Aparna Singh Shah, Regional Adviser – Blood Safety and Laboratory Technology, delivered Dr Samlee Plianbangchang’s (Regional Director – WHO Regional Office for South-East Asia) address on the occasion, which discussed WHO initiatives to contain AMR and hoped that all 19 participants from SEA countries shall benefit from the workshop proceedings. Dr Lily Therese (Head of Microbiology, Sankara Nethralaya) proposed the vote of thanks.

4. **Proceedings of the workshop**

The workshop included presentations of country reports to review the current status of AMR in countries, presentations and discussions to disseminate recommended techniques for antimicrobial susceptibility testing and antimicrobial susceptibility data compilation, and hands-on training for antimicrobial susceptibility testing and WHONET.
4.1 Plenary sessions

The plenary sessions included an overview of the regional strategy on the prevention and containment of AMR and a review of the national laboratory-based surveillance of AMR in the SEA Member States. While some of the Member States have well-functioning National Antimicrobial Resistance Surveillance Programmes, remaining Member States are still in the process of planning or implementation. It is expected that this workshop would enhance the momentum built and would act as a good catalyst in AMR country initiatives.

The status of AMR in the SEA Region showed AMR to be a major problem, especially in hospital-associated infections and two of the three diseases included in MDGs, viz. tuberculosis (TB) and malaria. The participants agreed that the regional strategy developed by the Regional Office was a practical document and a useful tool.

Various mechanisms that confer resistance to organisms were discussed. Special focus was on methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococci (VRE), extended-spectrum beta-lactamases (ESBL) and metallo-beta-lactamases (MBL) producing Gram-negative bacteria.

The WHO-approved method of determination of antimicrobial susceptibility – the modified Kirby–Bauer technique with breakpoints developed by Clinical and Laboratory Standards Institute (CLSI) of the United States of America – was explained. Possible variables that influence results of testing using this method were also discussed and key variables were explained.

To analyse the data on AMR rapidly and accurately, WHO has a freely downloadable software called WHONET. Participants were given tutorials on WHONET. Copies of the software along with other WHO resources on AMR were shared with the participants.
4.2 Current status

**Status of AMR in the South-East Asia Region**

Dr Aparna Singh Shah provided an overview of the status of AMR in the South-East Asia Region. She highlighted the salient points of the regional strategy on the containment and prevention of AMR.

She spoke about the need to act now to ensure the availability of effective antibiotics for future generations. The movement to contain AMR needs collaboration between governments with all stakeholders to address this public health problem.

**Country reports**

**Bhutan**

Bhutan recognizes AMR as a challenging problem and has minimal national data, which are collected from national referral hospitals. ESBLs, MRSA, multidrug-resistant (MDR) *Acinetobacter* and *Pseudomonas*, MDR-TB, drug-resistant *Neisseria gonorrhoeae* and Salmonella have been reported.

There are only three laboratories in the country doing routine culture and AST. These laboratory have the capacity to culture and identify common organisms up to the species level and also perform AST by the CLSI method. All these laboratories use the WHONET software for data entry and interpretation, but the application is not very satisfactory at present because the users have not been fully trained on its use.

**Initiatives taken for AMR activities since 2011**

In response to the call for action for the control of AMR in the Jaipur Declaration of 2011, Bhutan has taken significant steps as follows:

- designation of a National Focal Point for AMR;
- creating awareness of the problems of AMR to the clinicians, other health workers and the public through the celebration of
World Health Day 2011 in all health centres, giving public education talk shows on national television;

- talks initiated between officials of the human and animal health sectors for a joint national action plan against AMR;
- revision of the national antibiotic guidelines and national infection control guidelines;
- conducted a refresher training for laboratory technicians on CLSI and basic usage of WHONET;
- conducted refresher training for antimicrobial surveillance of gonorrhoea;
- started basic operational researches on antimicrobials at hospital level;
- started prescription auditing;
- discussed and strengthened antibiotic prescription control by drug regulatory authority;
- started communication of antimicrobial susceptibility testing (AST) reports to physicians of the hospitals every six months.

**Action plan for the future**

- Meetings will be conducted between officials from the human health sector and animal health sector, involving administrative and technical people from both sectors to form a national steering committee.
- A comprehensive national action plan will be drawn by the committee.
- All staff from the three hospitals will be trained on Clinical laboratory Standard Institute (CLSI) standards and WHONET.
- A system of regular data collection and dissemination will be instituted.
- Distribution of the updated (2012) National Antibiotic Guideline and training thereof for all physicians and health assistants will be done.
- Development of antibiotic policy for both human and animal usage and their control will be made.
- Inclusion of AMR activities with a comprehensive school health programme and incorporation in their annual activity will be made.

**The Democratic People’s Republic of Korea**

AMR has been accorded priority in the Democratic People’s Republic of Korea. The country plans to form national alliance, steering committee, and national policy on AMR. AMR data are available only from the central level hospital. There is no mechanism for nationwide data collection on AMR. In central level hospitals, standard guidelines and protocols are used to perform antimicrobial susceptibility testing for commonly isolated organisms. Countrywide strengthening of laboratory surveillance of AMR is being planned. Regular AMR training and education system for health-care workers (HCWs)/community exist to some extent. Prescription audits are being done. Standard treatment guidelines for some diseases are available. There are plans to strengthen infection prevention control mechanism at different levels.

**India**

Antibiotic resistance caused due to rampant use has been increasing steadily in recent years. As per some reports from India, 60–80% of cholera cases were resistant to furazolidone and cotrimoxazole and 80–90% cases were resistant to Nalidixic acid. In enteric fever cases, the reported resistance to chloramphenicol, ampicillin and cotrimoxazole was around 30–50% and fluoroquinolone resistance was around 30%. Around 50–80% strains of *N. gonorrhoeae* were resistant to penicillin. Approximately, 20–80% of these strains were resistant to ciprofloxacin.

Some of the challenges associated with controlling antibiotic resistance in India are as follows:

- increased sales of antibiotics/irrational use of drugs;
- low public and private spending on health-care sector in the country;
increase in the percentage of patients with hospital-acquired infections;

availability of practically all the antimicrobials over the counter, meant for human, animal and industrial consumption.

**Interventions to combat AMR**

- A multisectoral national steering committee was constituted in 2010.

- The National Centre for Disease Control (NCDC) has been designated as the focal point for AMR in the country.

- A National Antibiotic Policy has been developed and disseminated to all government hospitals and can be accessed through the NCDC web site (www.ncdc.gov.in) and Ministry of Health web site (www.mohfw.nic.in).

- A laboratory-based surveillance plan for “Containment of Antimicrobial Resistance” in various geographical locations has been included in the Twelfth five-year plan with the following activities:
  - establishment of Quality Assured 30 Lab Network for AMR surveillance;
  - surveillance of antibiotic usage and operational research;
  - working group meetings;
  - technical advisory group meetings;
  - rational use of antibiotics;
  - development and implementation of national infection control guidelines;
  - training and capacity building of professionals in relevant sectors;
  - (Information Education and Communication) IEC material for the dissemination of information about rational use of antibiotics;
  - development of a repository of strains at NCDC.
Availability of reliable data from India on AMR is an essential prerequisite for developing/modifying appropriate guidelines for the use of antimicrobials. The above interventions would help reduce the spread of antibiotic resistance, improve public health directly, benefit the populace and reduce pressure on the health-care system.

**Indonesia**

The number of cases with antibiotic resistance isolates in Indonesia is high. Almost all bacteriology laboratories in hospitals and district laboratories carry out antimicrobial susceptibility testing. Several hospitals regularly compile their antibiogram every six months for their own use. However, data have not been integrated yet. Severe acute respiratory infection (SARI)/influenza-like illness (ILI) sentinel surveillance programmes at places use WHONET to collect and analyse data. Some teaching hospitals also use this software. WHONET has been included in the curriculum of the clinical microbiology programme. The focal point for AMR in Indonesia is the Director-General (DG) of Pharmaceutical and Medical Device Services. There is no legislation that regulates the production, distribution, sale and prescription of antimicrobial agents, but the National Agency of Drug and Food Control (NADFC) issued a regulation for the production of antibiotics and Certification of Good Manufacturing Practice. There is no specific national policy for the use of antibiotics in animals. National guidelines for the treatment of a few infectious diseases and infection control guidelines in hospitals are available.

Several campaigns, such as paper and presentation competition in primary school, mailing list and Mothers Active Learning Method, have been launched for creating awareness among communities.

The National Institute of Health Research and Development (NIHRD) is a research institution under the Ministry of Health of the Republic of Indonesia. The microbiology laboratory is a referral laboratory for outbreaks and also a research laboratory for several infectious diseases such as TB, diarrhoea, cholera and diphtheria. Currently, laboratory-based surveillance of AMR in Indonesia is not established. They have difficulties in the networking of hospitals, district laboratories and research centres, but they are planning to establish AMR surveillance in the country.
**Maldives**

Reported AMR is relatively low in Maldives. Ampicillin resistance has increased over the years, but co-amoxiclav and amikacin still have a good sensitivity. The commonly isolated organisms include *Escherichia coli*, *S. aureus* and *Pseudomonas* sp. Around one or two MRSA isolates are reported annually. Indira Gandhi Memorial Hospital laboratory in Malé is the main laboratory situated in the capital city. It works as the reference laboratory for four of the main hospitals that also have the facility to perform antimicrobial susceptibility testing. Trained personnel and maintenance of ATCC strains are some of the difficulties faced in AMR laboratory surveillance. Monitoring of AMR is needed since Maldives has migrant population and also temporary residents from different countries. In Maldives, government hospitals cannot sell antibiotics without prescription. But private pharmacies sell antibiotics without prescription. To create awareness among communities, some educational products such as posters, television messages advocating for rational use of antibiotics have been developed. Some treatment guidelines are available for infectious diseases such as HIV, TB and Dengue Hemorrhagic fever (DHF). Based on little data available, it is found that resistance rate to ampicillin, amoxicillin and cephalosporins is on the rise.

Major challenges in laboratory surveillance of AMR are as follows:

- lack of an AMR surveillance system in the country;
- lack of trained staff
- difficulty and problems in the procurement and supply of laboratory reagents.

**Myanmar**

Laboratory-based surveillance is being carried out in the bacteriology section of the National Health Laboratory, Yangon. Samples include urine, sputum, nasopharyngeal swabs and wound swabs. *S. aureus*, *Pseudomonas* sp. and *Klebsiella* sp. are some of the common isolates from the samples received by the National Health Laboratory in Yangon. The least resistance is observed against amikacin and imipenem. *Vibrio cholerae* O1 that are isolated are resistant to cotrimoxazole, ampicillin and tetracycline, and are sensitive to norfloxacin, ciprofloxacin, chloramphenicol and gentamicin.
Sensitivity to tetracycline varies with the serotype – Inaba serotype shows 70% resistance, but Ogawa serotype exhibits only 20% resistance. *Neisseria meningitidis* isolated in 2010 is still sensitive to penicillin and chloramphenicol.

The major challenges faced in surveillance of AMR include:

- lack of use of standard guidelines for antimicrobial susceptibility testing like those from CLSI and absence of commercial supply of antibiotics discs;
- difficulties in purchasing basic culture media;
- difficulty in accessing computers due to financial constraints;
- lack of dedicated data entry operators for AST data;
- no standard systems (such as WHONET) being used.

**Nepal**

The National Public Health Laboratory (NPHL) is the apex body for AMR activities in Nepal. Since 1999, it has gradually gained ground and has conducted surveillance for several organisms such as ESBL, *E. coli*, *Salmonella*, *Shigella*, *Vibrio cholerae*, *Streptococcus pneumoniae*, *Haemophilus influenzae* and *N. gonorrhoeae*. Currently, there are around 17 participating laboratories, which include laboratories of government hospitals, medical colleges and private institutions. Participation is voluntary and terms of reference of both National Public Health laboratories and participating laboratories are well defined.

Besides surveillance work, NPHL has also been conducting annual training to enhance AMR lab surveillance capacity, quality assurance and data management. The National Intersectoral Steering Committee for AMR is yet to be framed. There is no legislation that regulates the production, distribution, sale and prescription of antimicrobial agents and over-the-counter supply of drugs is rife. There is no national policy for the use of antibiotics in humans and animals.

National guidelines for the treatment of a few infectious diseases are available. Steps are being taken to educate the community on AMR and also to educate school children.
The National Health Laboratory Policy has been drafted and will be implemented soon. Once implemented, it will give more impetus to AMR activities.

**Sri Lanka**

Antimicrobial resistance is a major issue that hinders effective patient care with a negative influence on overall clinical outcomes in the health-care delivery system in the country. There are many factors attributed to this situation in Sri Lanka and therefore the remedial measures are multidimensional and involve many sectors. Lab-Based Antimicrobial Resistance Surveillance has provided valuable information about the current situation in the country. Many steps have been taken on the basis of information gathered through the project, including the establishment of a national steering committee for AMR, initiating a laboratory accreditation process, advisory committee to strengthen infection control activities and many other policy initiatives.

AMR surveillance activities in the country are coordinated through the AMR focal point and implemented through the College of Microbiologists where the capacity is developed and constantly expanded through training other categories of staff and also fortified by formulation of guidelines and SOPs. Action has been taken to improve logistic aspects of the surveillance activities and necessary supplies of reagents, consumables and other relevant laboratory supplies. Dissemination of information related to AMR and sharing and management of information are a priority. Newsletters, periodicals and many other modes of publications were used in this regard. Furthermore, a strong regulatory mechanism is in place through the Drug Regulatory Authority of Sri Lanka to ensure the quality, safety and efficacy of antimicrobials used in the country and also to control their abuse. A mechanism to regulate and monitor prescribing practices at all levels needs to be addressed. Moreover, some progress is noted in the area of community empowerment in AMR where Sri Lanka has launched programmes to educate the public through the Health Education Bureau. Active involvement of school children would be encouraged with the coordination of the Department of Education to make children aware about the impending threat.
There is a scope for the expansion of AMR activities in the country by means of strengthening the legal and regulatory frameworks and also formulating effective policy environments to combat AMR to provide safer, cost-effective and rational usage of antibiotics in patient care services.

**Thailand**

Thailand has established the National Antimicrobial Resistance Surveillance (NARST) since 1998, starting with 23 participating hospitals and then expanding to 33 hospitals in 2000 and 60 hospitals in 2005. The 28 hospitals from 28 provinces have regularly submitted the AST data through the WHONET to WHO CC AMR. Each year, approximately 150,000–200,000 isolates were reported. AST data of 28 hospitals from 2000 to 2012 showed the increasing trend of drug-resistant pathogens. Some of drug-resistant pathogens include MRSA, penicillin-resistant *Streptococcus pneumoniae* (PRSP), Imipenem-resistant *Acinetobacter* spp., ESBL-producing GNB and ESBL-producing enterobacteriaceae such as *Klebsiella pneumoniae*, *E. coli* and Carbapenem-resistant enterobacteriaceae (CRE).

Thailand has a national focal point for AMR; a multisectoral steering committee has been constituted to steer national efforts against AMR. As described earlier, NARST is the national network for AMR surveillance. Infection control guidelines are available. There has been a reduction in the use of antimicrobials and also there has been a reported reduction/stability in resistance to antimicrobials. Research projects are being supported to develop new antibiotics. Operational projects are also being undertaken to ascertain the impact of AMR on public health. The significant increase in MDR pathogens has caused increased awareness and concern on the rational use of antibiotics in the country.

**Timor-Leste**

Timor-Leste is committed to combating drug resistance and preserving the effectiveness of existing antibiotics for future generations. The importance of the rational use of antimicrobials in humans and animals, formulation of a legislation governing the use of antimicrobials and formation of national alliance and development of a national policy are on the agenda. Guidelines on the treatment of some infectious communicable diseases are
available. There is a need to build and strengthen laboratory capacity to support AMR surveillance, train personnel and improve infrastructure.

**Follow-up of the Jaipur Declaration on AMR by health ministers of SEA Region**

In 2011, the health ministers of WHO SEA Region articulated their commitment to combat AMR through the Jaipur Declaration on AMR (Annex 3). Since then, there has been a growing awareness in all Member States that containment of AMR depends on coordinated interventions that simultaneously target the behaviour of providers and patients and change important features of the environment in which they interact. Accordingly, Member States have initiated the establishment of a coherent, comprehensive and integrated national approach to combat AMR to be backed by strong legislative and regulatory mechanisms. National focal points are being designated to implement the national programmes which are mostly being coordinated by national steering committees.

Drafting and finalization of the National Antibiotic Policy is on the agenda of the Member States, although several national treatment guidelines are now available to promote rational use of antimicrobial agents. Regional and national training courses have been organized to build capacity for undertaking laboratory-based surveillance of AMR. This would be utilized not only in generating evidence-based treatment guidelines, but also in understanding the impact of the national efforts on mitigating AMR. Few operational research studies have already commenced.

Special attention is being paid to reduce health-care-associated infections by improving infection control practices. Building capacity of the prescribers for rational and evidence-based use of antimicrobial agents in humans as well as in animals is also under consideration of the Member countries.

A summary of the progress made is shown in Table 1.
Table 1: **Progress made in implementation of the Jaipur Declaration on Antimicrobial Resistance in WHO South-East Asia Region countries**

<table>
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<tr>
<th>Key element</th>
<th>Failure</th>
<th>Jaipur Declaration Action Point</th>
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<th>BHU</th>
<th>DPRK</th>
<th>IND</th>
<th>INO</th>
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Y: Available; N: Not available; NA: Information not available; P: Under Process

*This table is completed with the help of inputs obtained from the participants during this meeting, from country focal points of AMR and also from the previous report of the Regional Workshop on Antimicrobial Resistance, Bangkok, Thailand, 6–10 August 2012.*
4.3 Hands-on training – laboratory techniques for AST

Participants prepared the MacFarland standards for adjusting turbidity and validated their preparations using the ELISA reader. They also practised the antimicrobial susceptibility testing as per the modified Kirby–Bauer technique with Clinical laboratory Standards (CLSI) institute breakpoints for the control and test strains.

The detection of MRSA and beta-lactamase screening (using Nitrocefin disk test) was demonstrated before all participants did it practically, using oxacillin salt agar, disk diffusion and Etest. Glycopeptide resistance was practised using Vancomycin screen agar, Etest and disk diffusion.

The ESBL and MBL were detected using the double disk test, Etest and the modified Hodge's test. The molecular techniques for AMR for the detection of MRSA and ESBL were also demonstrated.

4.4 Hands-on training – WHONET

WHONET is a free software developed by the WHO Collaborating Centre for Surveillance of Antimicrobial Resistance for laboratory-based surveillance of infectious diseases and AMR.

The principal goals of the software are:

- to enhance local use of laboratory data;
- to promote national and international collaborations through the exchange of data.

WHONET can be used by individual laboratories or as part of a national and international surveillance network. At present, the software, available in 17 languages, is used in over 80 countries around the world managing data from over 1000 clinical, public health, veterinary and food laboratories.

WHONET analytical tools facilitate the following:

- understanding of the local epidemiology of microbial populations;
- selection of antimicrobial agents;
- identification of hospital and community outbreaks;
- recognition of quality assurance problems in laboratory testing.
All participants were taught on the installation of the WHONET program. They also practised how to configure the WHONET laboratory database as per their requirements and needs.

Extensive hands-on exercises were done using AST data sheets. Participants acquired the skills to use WHONET to enter AST data, and they also discussed the establishment of a national surveillance system for AMR in their countries using WHONET.

5. Conclusions and Recommendations

For Member States to:

- accord priority to AMR, given its serious consequences for clinical care as well as public health actions;
- establish national alliances, designate national focal points for AMR and identify/establish/strengthen national reference laboratories;
- establish national laboratory-based surveillance of AMR in a step-by-step manner;
- build capacity of laboratories to carry out quality testing of AMR, build capacity for the analysis of AMR and provide reliable data for the utilization at local level as well as for national guidelines.

For Participants to:

- initiate/strengthen standard laboratory testing of AMR;
- strengthen the quality system in their laboratories;
- strengthen data collection and analyses and be proactive in teaching/replicating learnt knowledge during this workshop to fellow users and health administrators.

For WHO to:

- advocate with national authorities for establishing national surveillance programmes for AMR;
- facilitate an external quality assessment scheme for AMR for members of the AMR network.
Annex 1

Agenda

- Inauguration and introduction
- Overview and experience sharing on lab-based surveillance of AMR and Jaipur Declaration
- Hands-on training on WHO-recommended methods of lab techniques for the determination of AMR
- Training on WHO NET5
- Possible mechanism for the establishment of national surveillance for monitoring of drug resistance
- Development of key follow-up action points for laboratory-based surveillance of AMR
- Recommendations
- Closing session
Annex 2

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WHO Secretariat
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Department of Communicable Diseases

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Blood Safety and Laboratory Technology
Department of Communicable Diseases
Annex 3

Jaipur Declaration on Antimicrobial Resistance

We, the Health Ministers of Member States of the WHO South-East Asia Region participating in the Twenty-ninth Health Ministers’ Meeting in Jaipur, India, appreciate the efforts being made by Member States and partners in the South-East Asia Region to adopt a holistic and multidisciplinary approach towards prevention and containment of antimicrobial resistance to improve public health. We also recognize that it is imperative that national governments accord utmost priority to this hitherto neglected problem to preserve efficacy of the antimicrobial agents in our fight against microbial diseases.

Concerned that emergence and spread of antimicrobial resistance is negating the achievements made in protecting human life and health from microbial diseases; especially newly emerging infectious diseases;

Aware that the most important driver of antimicrobial resistance is irrational use of antimicrobial agents;

Recognizing that antimicrobial resistance can be a critical impediment in global efforts towards achieving UN Millennium Development Goals (MDG), specially MDG 6 that addresses containment of HIV/AIDS, tuberculosis, malaria and other diseases;

Considering that while antimicrobial resistance is a global public health problem, its major brunt is being borne by people in the developing countries;

Acknowledging that in spite of significant technological advances, development of new antimicrobial agents is negligible;

Aware that non-therapeutic use of antimicrobial agents in the veterinary and fishery sectors has a profound effect on emergence of resistance in microorganisms and their spread to human beings through the food chain;
Noting that health care facilities featuring the combination of highly susceptible patients, intensive and prolonged antimicrobial use, and inadequate infection control practices are potential “hot spots” for the emergence of highly resistant micro-organisms;

Concerned at the impact of resistant organisms in the efficient utilization of modern technological and scientific advances in improving human health through complex surgeries and transplantation procedures;

Further noting the inadequate regulatory mechanisms that allow unauthorized prescription of antimicrobial agents;

Aware of extensive irrational prescription of these medicines by physicians and poor adherence by the communities themselves; and

Recognizing that resistance in microorganisms leads to loss of lives, long-term suffering, disability, reduced productivity and earnings, and also threatens to undermine the effectiveness of health delivery programmes in all Member States;

We, the Health Ministers of Member States of the WHO South-East Asia Region agree to:

- acknowledge antimicrobial resistance as a major global public health issue;
- institute a coherent, comprehensive and integrated national approach to combat antimicrobial resistance;
- develop national antibiotic policy and formulate multisectoral national alliances against antimicrobial resistance;
- advocate for a multidisciplinary approach by all sectors of the government, with the private health sector providing desired information and following national guidelines;
- study the emergence and spread of antimicrobial resistance and assess accurately its impact on public health;
- regulate the use of antimicrobial agents, both in public and private sectors to prolong and preserve their efficacy;
strengthen legislation to prevent the manufacture, sale and distribution of spurious and substandard/not-of-standard-quality and poor quality antimicrobial agents and the sale of antibiotics;

promote behavioural change in prescribers and communities through continuous training, educational campaigns with process and outcome measures for rational use of antimicrobial agents and emphasizing antimicrobial resistance in medical, dental, veterinary and pharmacy curricula;

build increased capacity for efficient surveillance of antimicrobial resistance and its effective use in modifying antibiotic policy;

strengthen diagnostic facilities for microbial diseases to facilitate evidence-based antimicrobial prescription;

strengthen infection control practices in health care facilities to reduce the burden of microbial diseases and health-care associated infections;

ensure use of antimicrobial agents included in National Essential Drugs List, regulate non-therapeutic use of antimicrobial agents and irrational use in the veterinary and fishery sectors;

encourage basic and operational research in areas that enhance application of various measures to combat antimicrobial resistance;

support research and development of new antimicrobial agents especially for neglected tropical diseases and facilitate their cost-effective production in the public sector and making them affordable for the poor;

advocate healthy lifestyle, cost-effective and essential immunization and other non-pharmaceutical measures to reduce the disease burden due to microbial diseases;

develop national and regional mechanisms for regular data sharing, regulating cross-border transfer of infectious materials and bacterial isolates, sharing best practices of laboratory-based surveillance of antimicrobial resistance and practices promoting rational use of antibiotics;
➢ set up a regional mechanism for sharing of mutually agreed antimicrobial resistance data of public health importance relevant to policy making; and

➢ develop a regional mechanism for a regular intercountry consultative process for reviewing issues related to antimicrobial resistance including tracking of international movement of resistant organisms both within the Region and among regions.

We, the Health Ministers of Member States of the WHO South-East Asia Region, urge all other WHO Member States as well as the Director-General and the Regional Director to continue to provide leadership and technical support in building partnerships between governments, the United Nations agencies and the relevant global health initiatives and with academia, professional bodies, nongovernmental organizations, related sectors, the media and civil society, to jointly advocate and effectively follow-up on all aspects of this Jaipur Declaration on Antimicrobial Resistance.

6 September 2011
Detection of resistance and monitoring for its spread requires laboratory-based surveillance. A workshop was organized to assist national authorities in building their laboratory capacity for efficient surveillance of emergence and spread of antimicrobial resistance (AMR) through use of WHO recommended laboratory techniques for determination of antimicrobial resistance and WHO software for antimicrobial data analysis. This report also briefly outlines the status of laboratory-based surveillance of antimicrobial resistance in the WHO South-East Asia Region and summarizes the progress made in implementation of the Jaipur Declaration (2011) on Antimicrobial Resistance.