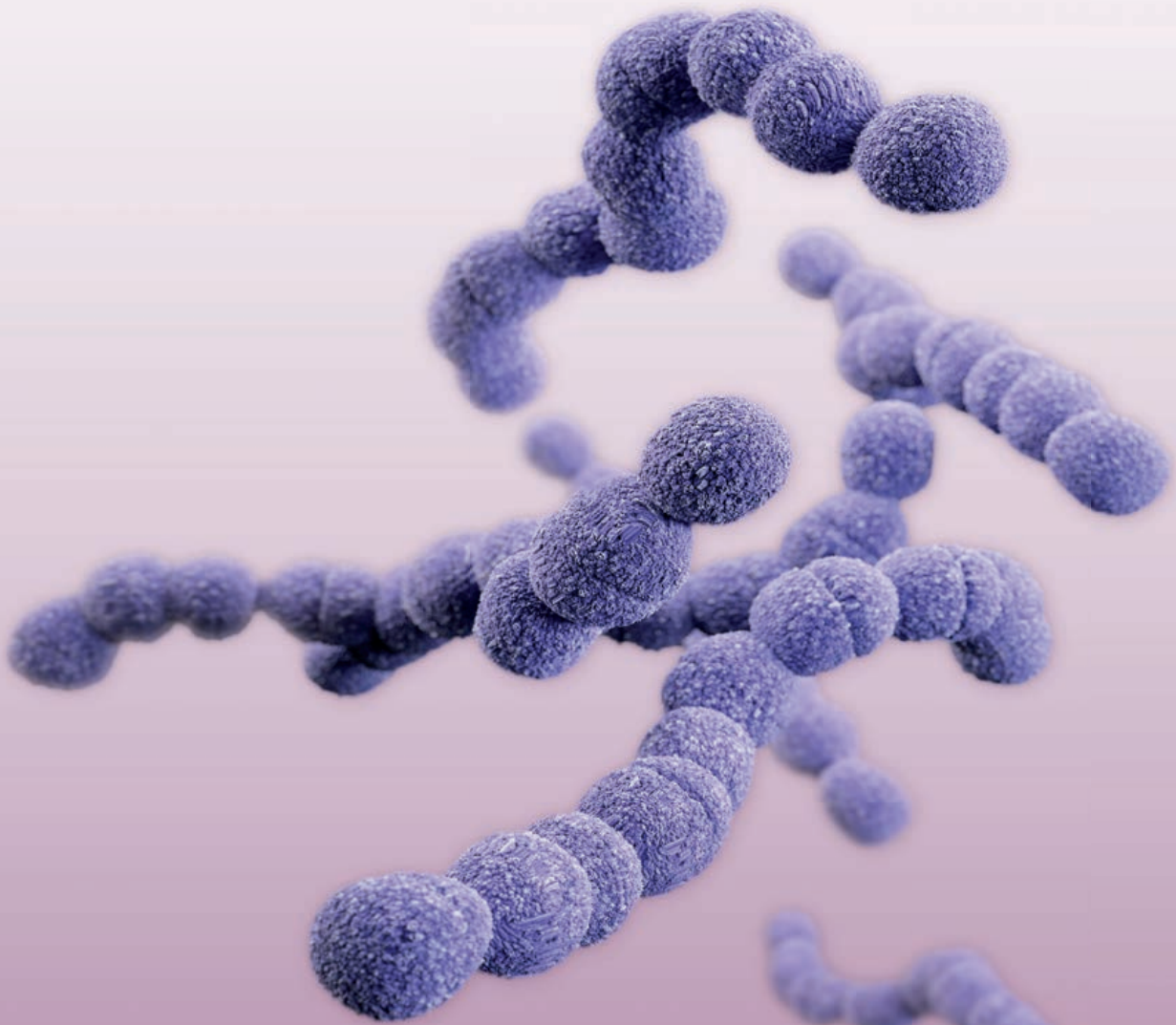


Action Agenda for **Antimicrobial Resistance** in the Western Pacific Region



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ABBREVIATIONS

AMR	antimicrobial resistance
AMS	antimicrobial stewardship
APEC	Asia-Pacific Economic Cooperation
API	active pharmaceutical ingredients
ASEAN	Association of Southeast Asian Nations
CSA	country situation analysis
ESBL	extended-spectrum beta-lactamase
IPC	infection prevention and control
MDR	multidrug-resistant
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
NDM	New Delhi metallo-beta-lactamase
OXA	oxacillinase
TB	tuberculosis
WHO	World Health Organization
XDR	extensively drug-resistant

FOREWORD

Antimicrobial resistance threatens great achievements in modern medicine and public health. Alarming levels of resistance to common hospital and community-acquired pathogens have been reported across the world. Microorganisms, especially bacteria, are becoming increasingly resistant to second- and third-line antibiotics. Some bacteria are already fully resistant to existing antibiotics.

Without access to effective medication, the world is heading towards a post-antibiotic era in which simple surgical procedures would be life-threatening due to the risk of untreatable infections.

To strengthen containment efforts in the Western Pacific Region, Member States adopted a resolution on antimicrobial resistance at the sixty-fifth session of the WHO Regional Committee for the Western Pacific in October 2014. The resolution endorsed the *Action Agenda for Antimicrobial Resistance in the Western Pacific Region*. The agenda provides action-oriented guidance to Member States on the containment of antimicrobial resistance, in alignment with the global action plan.

The agenda focuses on regional specific actions to strengthen national plans, raising awareness of antimicrobial resistance across all sectors, improving surveillance and strengthening the capacity of health systems to contain resistance.

Regional collaborations are needed to collate and share evidence on the trends of drug-resistant infections and the use of antimicrobials. In addition, regulation must be strengthened to ensure access to effective, safe and quality antimicrobials, and to improve infection prevention and control and antimicrobial stewardship programmes, as well as the rational use of antimicrobials.

Working together, we can slow the spread of antimicrobial resistance in the Region. We must take action now to preserve these miracles of modern medicine for future generations before it is too late.



Shin Young-soo, MD, Ph.D.

Regional Director

EXECUTIVE SUMMARY

The rapid emergence and spread of antimicrobial resistance (AMR) presents health-care systems with serious challenges and threatens their ability to effectively treat severe bacterial infections.

Without effective antimicrobials, the success of modern medicine in organ transplantation, cancer chemotherapy and major surgery could be compromised. Immediate and coordinated measures must be taken by Member States in the Western Pacific Region and globally to safeguard the effectiveness of antimicrobials and facilitate the development of new antimicrobial medicines.

AMR was first addressed by the World Health Assembly in 1998, with resolution WHA51.17 and numerous other resolutions highlighting this problem and potential solutions. However, there has been limited progress in slowing the emergence and spread of drug resistance in key pathogenic microorganisms. The need for urgent actions to combat AMR was highlighted again at the Sixty-seventh World Health Assembly with resolution WHA67.25.

In 2002, the Regional Committee for the Western Pacific identified AMR as a regional priority, which was re-emphasized in 2011 with resolution WPR/RC62.R3 on antibiotic resistance. The resolution urged Member States to adopt the 2011 WHO six-point policy package to combat AMR and develop comprehensive national plans. However, AMR continues to spread and is an increasing public health threat in the Region.

WHO released its first global report on antimicrobial resistance surveillance in 2014, *Antimicrobial Resistance: Global Report on Surveillance*. The report found that resistance to common bacteria is reaching very high levels with few effective treatment options.

A country situation analysis conducted in 2013 and 2014 on AMR highlighted major gaps and challenges in addressing AMR in the Western Pacific Region. These include: 1) poor awareness and lack of national comprehensive policies for AMR; 2) a lack of national and regional surveillance systems to monitor AMR and antimicrobial use; and 3) poor regulation and implementation of health systems responses to AMR.

Following a technical consultation in 2013 and a regional consultation with Member States in 2014, the *Action Agenda for Antimicrobial Resistance in the Western Pacific Region* was developed for review and endorsement at the sixty-fifth session of the Regional Committee in October 2014.

The priority actions of the agenda are:

1. Strengthen development and implementation of comprehensive national plans to contain AMR and raise awareness in multiple sectors.

- Increase awareness, leadership and financial commitments to contain AMR in all relevant sectors.
- Change attitudes and behaviours of the general public through intensified public education campaigns on AMR and responsible use of antimicrobials.
- Develop and implement comprehensive, multisectoral policies and actions for containment of AMR at local and national levels supported by regional and global strategies and collaborations.

2. Improve surveillance of AMR and monitoring of antimicrobial use.

- Develop and implement harmonized standards and methodologies for improved monitoring of AMR and antimicrobial use in human and emerging pathogens, in alignment with globally agreed approaches, and guidance of regional coordinating mechanisms.
- Incorporate the use of reliable evidence to inform policy and action through coherent, national systems and regional networks and collect, analyse, share and disseminate data generated from monitoring of AMR and antimicrobial use through these networks.
- Develop and strengthen national surveillance systems including laboratory capacity to monitor trends of AMR and antimicrobial use, supported by regional surveillance networks.

3. Strengthen health system capacity to contain AMR.

- Adapt and institute good practices regarding effective regulation and enforcement to ensure availability of effective, safe and quality antimicrobials.
- Implement antimicrobial stewardship programmes with full national coverage to improve prescribing practices of health-care providers and responsible antibiotic use.
- Ensure equitable and universal access to “prioritized” antimicrobials by strengthening financing and procurement mechanisms for antimicrobials.

- Implement infection prevention and control programmes at all health-care and key-congregate settings.
- Enhance education in health-care settings for good hygiene and infection prevention and control practices and ensure access to infrastructure, such as washing and waste disposal facilities.

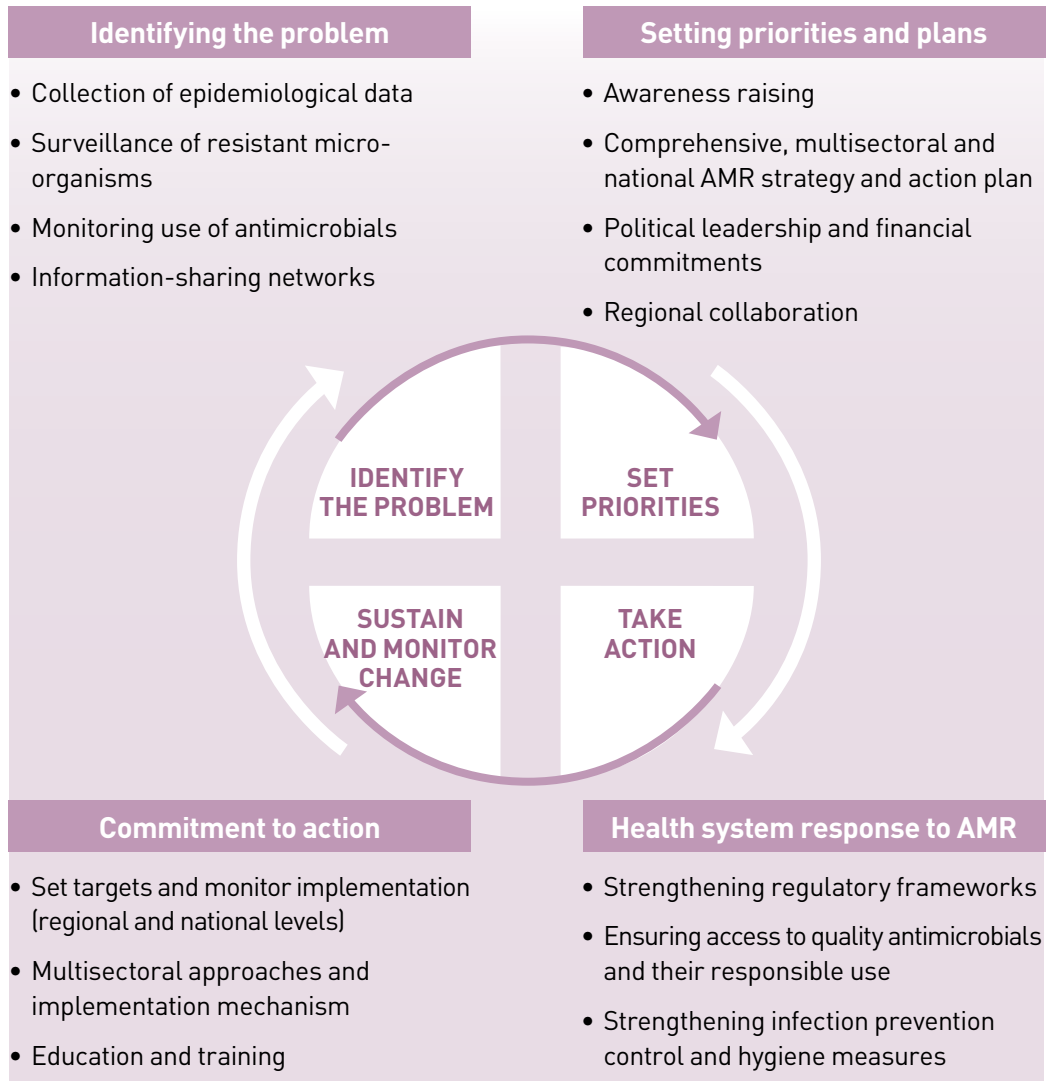
1. Introduction

The rapid emergence of antimicrobial resistance (AMR), together with the lack of new antimicrobial medicines, presents health-care systems with serious challenges and threatens their ability to treat serious bacterial infections effectively. In the Western Pacific Region, AMR is an increasing public health threat. This action agenda provides a brief summary of the situation, gaps and challenges that limit containment of AMR in the Region.

To respond effectively and prevent further emergence and spread of drug-resistant infections, reliable information is needed on the scale, contributing factors and consequences of AMR. Reliable information can help to identify effective national strategies and inform national, regional and global actions to contain the spread of AMR. Information can also strengthen health system responses as well as responses by other sectors, such as animal health, agriculture and environment. To achieve and sustain the changes needed to reverse trends on the spread of drug-resistant diseases and prolong the effectiveness of antimicrobials, monitoring of these changes will be critical. Monitoring and evaluation are also necessary to assess and improve interventions. As identified in figure 1, surveillance of AMR and antimicrobial use are essential for the containment of AMR at global, regional and national levels.

AMR surveillance must be strengthened in all sectors. In conjunction with surveillance, there is a need to monitor antimicrobial consumption and use, particularly in human health, agriculture and animal husbandry. Surveillance of AMR and the need for a strong health systems response to contain AMR, including ensuring responsible antibiotic use and effective regulations, and infection prevention and control (IPC), are discussed in *Antimicrobial Resistance in the Western Pacific Region: a Review of Surveillance and Health Systems Response*.

FIGURE 1. Priority actions for containment of antimicrobial resistance



2. The global threat of antimicrobial resistance

AMR is the ability of a microorganism, including bacteria, fungi, viruses and parasites, to withstand attack by antimicrobial medicines, such as antibacterials, antifungals, antivirals and antimalarials, so that standard treatment becomes ineffective.

Infections caused by resistant microorganisms often fail to respond to standard treatment; there may be prolonged illness, risk of spread of resistant microorganisms to others, and a higher risk of death. The death rate for patients with serious infections caused by resistant bacteria treated in hospitals is about twice that in patients with infections caused by non-resistant bacteria.⁽¹⁾

The achievements of modern medicine are put at risk by AMR. Many infectious diseases are now at risk of becoming untreatable and uncontrollable, which could derail progress made towards reaching the targets of the health-related United Nations Millennium Development Goals.⁽²⁾

When infections become resistant to first-line medicines, more expensive therapies must be used. The longer duration of illness and treatment, often in hospitals, increases health-care costs and the economic burden to families and societies. Without effective antimicrobials to prevent and treat infections, the success of therapies such as organ transplantation, cancer chemotherapy and major surgery could be compromised. The growth of global trade and travel allows resistant microorganisms to spread rapidly across countries and continents through humans, animals and food.

3. WHO's response to antimicrobial resistance

3.1 WHO's global response

WHO has identified AMR as a global public health threat. World Health Assembly resolutions over the past 28 years have also highlighted the threat of AMR and called for immediate efforts to contain AMR on local, national, regional and global scales.

There have been numerous World Health Assembly resolutions addressing AMR, including the most recent resolutions, combating AMR (WHA67.25), substandard/spurious/falsely-labelled/falsified/counterfeit medical products (WHA65.19), and prevention and control of multidrug-resistant tuberculosis and extensively drug-resistant tuberculosis (WHA62.15). Resolutions on progress in the rational use of medicines (WHA60.16), prevention and control of sexually transmitted infections (WHA59.19), improving the containment of AMR and AMR as a global health threat (WHA58.27 and WHA58.14), emerging and other communicable diseases, and resolutions WHA47.13 and WHA39.27 on the rational use of drugs have all highlighted the global health threat of AMR.

The 2001 WHO *Global Strategy for Containment of Antimicrobial Resistance* presented 87 prioritized recommendations oriented towards clinicians, laboratory and infection control staff, industry, researchers, media, patients' representatives and national authorities, along with a package of technical and advocacy materials to support action.⁽³⁾ The Global Strategy identified two fundamental priorities: (1) national commitment to containment of AMR as a public health priority; and (2) surveillance to generate the data required to support the development, implementation and evaluation of resistance-containment efforts.

In 2010, WHO identified AMR as an Organization-wide priority and the theme of World Health Day 2011 was the slogan “Antimicrobial Resistance – No action today, No cure tomorrow”.⁽⁴⁾ The WHO six-point policy package to combat AMR, published on World Health Day 2011, asked Member States to:

1. commit to a comprehensive, financed national plan with accountability and civil society engagement;
2. strengthen surveillance and laboratory capacity;
3. ensure uninterrupted access to essential medicines of assured quality;
4. regulate and promote rational use of medicines, including in animal husbandry, and ensure proper patient care;
5. enhance infection prevention and control; and
6. foster innovations and research and development for new tools.

A major WHO report was released in April 2014: *Antimicrobial Resistance: Global Report on Surveillance*.⁽⁵⁾ The report found that resistance to common bacteria has reached alarming levels and that in some settings, few, if any, of the available treatments options remain effective for common infections.

3.2 WHO’s response in the Western Pacific Region

The WHO Regional Office for the Western Pacific was the first regional office to implement the recommendations of the 1982 WHO Consultation Group for Surveillance of Antimicrobial Resistance.⁽⁶⁾ In 1985, the Region initiated a series of regional AMR workshops, which led to the establishment of a regional AMR surveillance network from 1990 through 2000.

The publication *Global Strategy for Containment of Antimicrobial Resistance* ⁽³⁾ was followed by a regional resolution WPR/RC53.R5 of the fifty-third session of the Regional Committee in 2002, which identified AMR as a regional priority. The 2005 bi-regional workshop on antimicrobial resistance surveillance and containment in Asia and the Pacific defined national and regional priorities for action, including collaborative strategies to advance AMR containment in the WHO South-East Asia and Western Pacific regions.⁽⁷⁾

In August 2010, the cross-divisional Antimicrobial Resistance Working Group was formed at the Regional Office for the Western Pacific. Its terms of reference include

information-sharing, providing technical support, identifying linkages to increase synergies and impact, recommending future activities, conducting advocacy and resource mobilization efforts, and liaising with stakeholders.

The Regional Committee resolution WPR/RC62.R3 on antibiotic resistance in 2011 (8) urged Member States:

1. to take urgent steps to address the issues and challenges of antibiotic resistance;
2. to use the policy package, as appropriate; and
3. to develop and implement comprehensive and effective national and subnational plans for preventing and controlling antibiotic resistance, as appropriate.

The resolution also requested the Regional Director:

1. to take urgent steps to address the issues and challenges of antibiotic resistance;
2. to provide technical cooperation to Member States upon request to prevent and control antibiotic resistance and its consequences; and
3. to monitor and assess the antibiotic resistance situation across the Region and report regularly thereon.

4. Antimicrobial resistance in the Western Pacific Region

4.1 Prevalence of antimicrobial resistance in the Region

AMR is becoming an increasingly urgent challenge for the Region. A wide variety of infectious pathogens are showing resistance to single and multiple antimicrobials.

Penicillin- and macrolide-resistant *Streptococcus pneumoniae*, as well as methicillin-resistant *Staphylococcus aureus* (MRSA) and multidrug-resistant (MDR) enteric pathogens are among the community-acquired pathogens that cause the greatest concern in Asian countries. MRSA, glycopeptide-resistant *S. aureus*, glycopeptide-resistant enterococci and extended-spectrum beta-lactamase (ESBL)-producing Enterobacteriaceae are responsible for nosocomial infections.

An increasing prevalence of New Delhi metallo-beta-lactamase (NDM)-producing Enterobacteriaceae has been reported in countries through the global spread associated with international travel, medical tourism, and exposures in the Balkan region and the Indian subcontinent. NDM-1 containing Enterobacteriaceae were first reported in the Western Pacific Region.⁽⁹⁾ In 2011, an *Escherichia coli* isolate carrying the NDM-1 producer was identified in the Philippines.

ESBL-producing pathogens are also on the rise, with the first report of expanded-spectrum oxacillinase (OXA)-48 carbapenemase-producing *Klebsiella pneumoniae* and *E. coli* isolated in Japan in 2012 from a patient returning from South-East Asia.⁽¹⁰⁾

There is a high prevalence of antibiotic resistance among clinical *S. pneumoniae* isolates in Asia. Resistance to erythromycin is high in the Region, with China (96.4%)

and Viet Nam (80.7%) reporting the highest rates in 2012.⁽¹¹⁾ *S. pneumoniae* isolates have been found to be increasingly resistant to fluoroquinolones and multiple drugs, and extensively drug-resistant (XDR) *S. pneumoniae* isolates also on the rise.⁽¹¹⁾

In 2010, reduced susceptibility and resistance to quinolones was reported in more than 90% of isolates of *Neisseria gonorrhoeae* examined in Brunei Darussalam, Cambodia, China, the Republic of Korea, the Philippines and Viet Nam.⁽¹²⁾ Japan, Malaysia and Singapore reported resistance rates of 68–90%, though lower rates were observed in Australia, Mongolia and New Zealand. Less than 11% of isolates were resistant to quinolones in Fiji and New Caledonia.⁽¹²⁾

Resistance of *N. gonorrhoeae* to penicillin and ciprofloxacin is widespread in the Western Pacific Region, with 99% and 96% resistance reported from China and Viet Nam, respectively (mean resistance 57%).⁽¹³⁾ Susceptibility to ceftriaxone is also decreasing, with 6.7% resistance reported from the Region.⁽¹³⁾

The prevalence of hospital-acquired MRSA varies throughout the Western Pacific Region. Lower rates were reported in the Philippines (38.1%) compared to the Republic of Korea and Viet Nam, which showed very high prevalence rates of MRSA; 77.6% and 74.1%, respectively.⁽¹¹⁾

Other hospital-acquired pathogens showing increasing rates of resistance are *Pseudomonas aeruginosa* and *Acinetobacter baumannii*. In a surveillance study in the Asia-Pacific region, 29.8% of *P. aeruginosa* and 73.0% of *A. baumannii* isolates were not susceptible to any carbapenems.⁽¹⁴⁾ The resistance of *P. aeruginosa* isolates to ceftazidime, cefepime, piperacillin-tazobactam, imipenem and ciprofloxacin is also rising. In China, 56.9% of *P. aeruginosa* isolates tested was resistant to imipenem. *Acinetobacter* spp. with high rates of imipenem resistance have been reported from Malaysia (86.7%) and China (58.9%).⁽¹⁵⁾

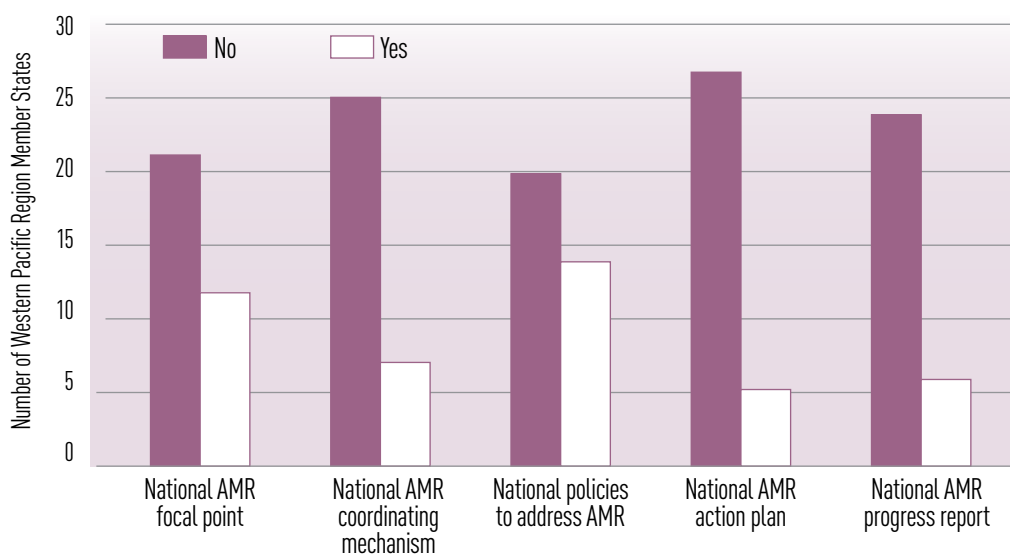
4.2 Gaps and challenges identified to contain antimicrobial resistance in the Region

The WHO Global Task Force identified country situation analysis (CSA) on AMR as a priority action to initiate and enhance policy dialogue at the Member State level, and to provide an overview of the AMR situation in Member States. The CSA, using a WHO rapid assessment tool was completed by 35 out of the 37 countries in the Western Pacific in 2013 and 2014.

The results from the CSA of the 37 countries and areas in the Western Pacific Region highlight the gaps and challenges in containing AMR. There is a need to develop a comprehensive, multisectoral national plan to contain AMR, including all relevant sectors through a “One Health” approach that brings together human and animal health, and the agriculture and environment sectors. This approach includes the facilitated exchange of information, and Region-wide analysis of trends and drivers of antibiotic resistance.

The CSA found that active, comprehensive, national programmes and policies to combat AMR are lacking in many parts of the Western Pacific Region (Fig. 2).

FIGURE 2. CSA results on the commitment to a comprehensive national plan on AMR in the Western Pacific Region



Source: World Health Organization. Unpublished data, 2013.

Other gaps and challenges identified are as follows:

- Lack of national AMR surveillance programmes

Fifty per cent of the 25 responding countries in the Western Pacific Region reported having an AMR surveillance report in the past five years and 69% reported having an active AMR surveillance system for bacteria.

- **Lack of awareness of AMR among the general public and among all sectors**

Only 10% of 29 responding countries identified politicians as having a high awareness of AMR; whereas, 31% of 32 responding countries indicated that health-care workers had a high level of awareness (Fig. 3).

- **Lack of national policies on antibiotic use in all sectors**

Only half of the 32 responding countries in the Western Pacific Region reported recent monitoring of antimicrobial use in humans, and 29% in animal husbandry and/or the food industry (Australia, Malaysia, New Zealand, Singapore and Viet Nam).

- **Unregulated distribution and sales of antimicrobials**

Thirty per cent of countries reported that antimicrobials were frequently or always sold over the counter, without a prescription.

- **Lack of a comprehensive IPC programmes**

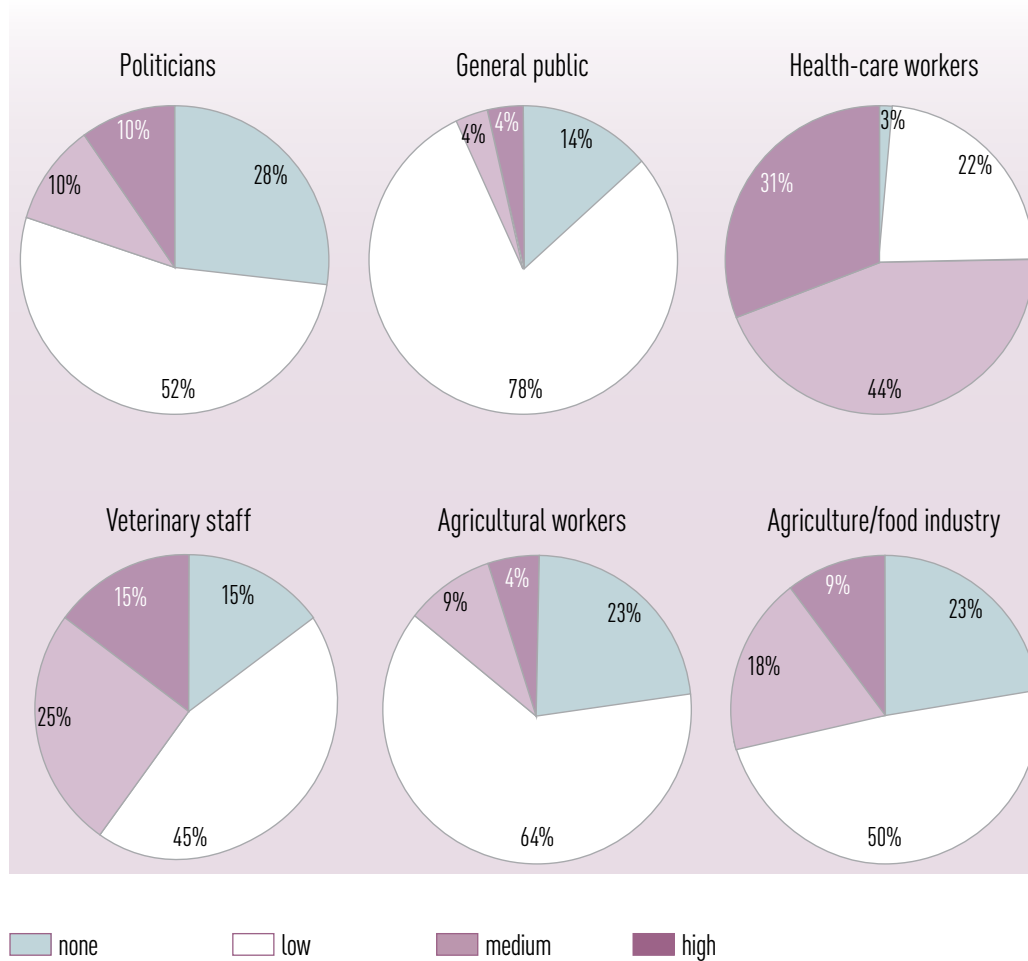
While 60% of 35 responding countries have national IPC programmes, and 74% (of 31 respondents) have specific measures to control AMR in hospital-level IPC programmes, IPC policies are lacking in the animal husbandry sector (only 32% of the 28 responding countries have IPC policies for animal husbandry).

Current financial investment for AMR surveillance and containment are limited. Only Malaysia, New Caledonia and Singapore reported in the CSA that they had dedicated funds for an AMR containment plan.

In the Western Pacific Region, the CSA reported major pathogens and infectious diseases as posing serious public health challenges included dengue, HIV/AIDS, malaria, tuberculosis (TB) and MDR-TB, influenza, microorganisms causing sexually transmitted infections, leptospirosis, filariasis and diarrhoea (caused by *Shigella* spp., *Salmonella* spp., etc.), MRSA, carbapenem-resistant Enterobacteriaceae and vancomycin-resistant *Enterococcus* spp. Many of these pathogens are now drug resistant, and are a major public health concern.

It is important to note that the CSA only provided brief information from self-reporting. Therefore, it is essential that actual practices or implementation of policies are more accurately monitored and measured by countries, and data regularly shared to better understand the real situation and identify areas where most urgent actions are needed.

FIGURE 3. Awareness of AMR in the Western Pacific Region from the CSA on AMR



Source: World Health Organization. Unpublished data, 2013.

5. The action agenda

5.1 Regional priority actions to contain antimicrobial resistance

The World Health Assembly resolution WHA67.R25 recognizes that the main impact of AMR is on human health. It also recognizes that a coherent, comprehensive and integrated response is needed at global, regional and national levels through a multi-agency, cross-sectional “One Health” approach.

Urgent actions are needed to reduce the impact of AMR on morbidity, mortality and related direct and indirect costs and burden on health systems. During the Consultation for Priority Actions on Antimicrobial Resistance in the Western Pacific held at the WHO Regional Office in 2014, Member States identified three priority areas: 1) strengthen development and implementation of comprehensive national plans to contain antimicrobial resistance and raise awareness in multiple sectors; 2) improve surveillance of AMR and monitoring of antimicrobial use; and 3) strengthen health systems capacity to contain AMR.

PRIORITY ACTION 1

Strengthen development and implementation of comprehensive national plans to contain AMR and raise awareness in multiple sectors.

- Increase awareness, leadership and financial commitments to contain AMR in all relevant sectors.
- Change attitudes and behaviours of the general public through intensified public education campaigns on AMR and responsible use of antimicrobials.
- Develop and implement comprehensive, multisectoral policies and actions to contain AMR at local and national levels supported by regional and global strategies and collaborations.

The implementation steps, milestones and, where applicable, key indicators for PRIORITY ACTION 1 are listed below.

STEP 1. Increase awareness, political leadership and financial commitment on AMR in all relevant sectors.

Year 1: Convene national AMR working group or coordinating mechanism, have high-level multisectoral national meetings. Identify resources required for adequate national AMR plans.

Year 2: Develop 1) strategy, 2) legislation, and 3) funding mechanism to implement national multisectoral AMR plans.

Year 3: Develop specific national implementation plan to contain AMR, assign responsibilities to key stakeholders and allocate resources.

Years 4–5: Implement and monitor national multisectoral AMR plan.

Indicators

- Percentage of Member States with multisectoral AMR strategy and designated budget for AMR plans.
- Percentage of Member States with active implementation of national multisectoral AMR plans.

STEP 2. Increase AMR awareness and change attitudes and behaviours of the general public through public education campaigns on AMR.

Year 1: Undertake a needs assessment survey and develop national campaign strategies.

Year 3: Campaigns implemented.

Year 5: Evaluate, revise and update strategies and campaigns.

Indicators

- Percentage of Member States implementing campaigns.
- Percentage of Member States evaluating campaigns.

STEP 3. Develop regional plans and actions to contain AMR based on regional and global strategies and collaborations.

Year 1: Hold regional meeting to develop regional AMR strategy. Define feasible plans and actions to contain AMR within a regional collaborative network.

Years 3–5: Implement agreed regional AMR strategy and monitor results.

Indicators

- Percentage of Member States with defined policies and actions linked to regional strategies.
- Inclusion of AMR on agenda of international forums (APEC, ASEAN).

PRIORITY ACTION 2

Improve surveillance of AMR and monitoring of antimicrobial use.

- Develop and implement harmonized standards and methodologies for improved monitoring of AMR and antimicrobial use in humans and emerging pathogens in alignment with globally agreed approaches, and guidance of regional coordinating mechanisms.
- Incorporate the use of evidence to inform policy and action through coherent, national systems and regional networks to collect, analyse, share and disseminate data generated from monitoring AMR and antimicrobial use.
- Develop and strengthen national surveillance systems including laboratory capacity to monitor trends of AMR and antimicrobial use supported by regional surveillance networks.

The implementation steps, milestones and, where applicable, key indicators for PRIORITY ACTION 2 are listed below.

STEP 1. Develop and strengthen laboratory capacity, and establish harmonized standards and methodology, as well as quality assurance for AMR surveillance testing.

Year 1: Identify national laboratory focal points and champions for AMR surveillance.

Year 3: Establish internal and external quality assurance of at least one reference laboratory through regional support from established AMR networks in the region (establish minimum capacity to test for key AMR pathogens).

Year 5: Establish a regional AMR surveillance system.

Indicators

- Percentage of Member States identifying focal points.
- Percentage of Member States establishing minimum laboratory capacity for AMR surveillance.
- Percentage of Member States in the regional AMR surveillance system.

STEP 2. Set up a coordinating network to collect, analyse, share and disseminate AMR surveillance data at the national and regional levels.

Year 1: Identify national focal points.

Year 3: Establish national coordinating mechanism.

Year 5: Establish regional coordinating mechanism.

Indicators

- Percentage of Member States reaching the milestones.
- Regional AMR surveillance coordinating mechanism is in place.

STEP 3. Conduct a situational analysis of antimicrobial use in humans and animal husbandry and monitor antimicrobial use using harmonized standards and methodologies.

Year 1: Baseline report from Member States on existing data on antimicrobial use in all relevant sectors. Establish methodology working group for monitoring antimicrobial use to agree on common methodology.

Year 2: Adopt methodology and build capacity to monitor antimicrobial use in Member States.

Year 3: Implementation of monitoring of antimicrobial use in human, animal husbandry and agriculture sectors.

Year 5: Establishment of a regional reporting mechanism.

Indicators

- Percentage of Member States completing the baseline report.
- Percentage of Member States adopting common methodology and monitoring antimicrobial use.
- Percentage of Member States in the regional reporting system.

STEP 4. Generate and link AMR surveillance and antimicrobial use data with additional epidemiological and economic data to assess the health impact and economic burden, and increase awareness and influence policy.

Year 1: Develop tools to assess the prevalence and economic burden of AMR.

Year 3: Assess the impact of AMR at the national level through use of tools.

Year 5: Share findings at national and regional levels on the AMR economic burden and prevalence to increase awareness and influence policy.

Indicators

- Development of the tools.
- Percentage of Member States adopting the tools.
- Percentage of Member States having a report on AMR prevalence and economic burden.

An in-depth discussion of AMR surveillance is provided in *Antimicrobial Resistance in the Western Pacific Region: a Review of Surveillance and Health Systems Response*. The review describes the progress of AMR surveillance in the Region and the gaps in laboratory capacity and the need to monitor antimicrobial use through common methodologies and indicators. This action agenda goes hand in hand with the review to inform policy changes to contain AMR.

PRIORITY ACTION 3

Strengthen health system capacity to contain AMR.

- Adapt and institute good practices regarding effective regulation and enforcement to ensure availability of effective, safe and quality antimicrobials.
- Implement antimicrobial stewardship programmes with full national coverage to improve prescribing practices of health-care providers and promote responsible use of antibiotics.
- Ensure equitable and universal access to “prioritized” antimicrobials by strengthening financing and procurement mechanisms for antimicrobials.
- Implement IPC programmes at all health-care and key-congregate settings.
- Enhance education in health-care settings for good hygiene and IPC practices and ensure access to infrastructure such as washing and waste disposal facilities.

The implementation steps, milestones and where applicable, key indicators for PRIORITY ACTION 2 are listed below.

STEP 1. Strengthen financing, procurement mechanisms and regulatory systems for antimicrobials to ensure equitable and universal access for all.

Years 1–3: Conduct situational analysis of the supply chain, including active pharmaceutical ingredient (API), and regulatory systems of antimicrobials and ensure effective regulation for production and dispensing of antibiotics in human, animal and agricultural sectors (including API).

Year 5: Establish a) national coordinating mechanism to strengthen regulations and regulatory capacity in multiple sectors and b) regional mechanisms to monitor and ensure security of the supply chain for antimicrobials.

Indicators

- Percentage of Member States that have completed the situational analysis.
- Establishment of the regional mechanism.

STEP 2 Review and strengthen guidelines and increase political commitment to procure quality antimicrobials with a monitoring mechanism and clear and transparent guidelines for procurement.

Year 1: Review guidelines.

Year 3: Update guidelines.

Year 5: Monitor the implementation of guidelines by Member States.

Indicator

- Percentage of Member States reaching the target milestones.

STEP 3 Implement antimicrobial stewardship (AMS) programmes with national coverage by increasing awareness and training of health-care professionals to improve prescribing practices and responsible use of antimicrobials.

Year 1: Establish standard module for AMS and convene AMS committees. Survey knowledge of health-care professionals on AMS.

Year 3: National AMS awareness campaign and incorporate AMS in basic and continuing medical education.

Year 5: Develop hospital and primary health-care policies to improve responsible and prudent use of antimicrobials including standardizing a code of conduct on AMS.

Indicator

- Percentage of Member States with AMS programmes, AMS committees and AMS in medical education programmes.

STEP 4 To develop and/or strengthen strategy and implementation of infection, prevention and control (IPC) programmes in health-care facilities.

Year 1: Country Situational Analysis on IPC.

Year 3: Exchange country experiences and formation of national and hospital/institutions plan for IPC with inclusion of WHO eight Core Components for IPC programmes.

Year 5: Implementation and monitoring.

Indicators

- Report on Country Situational Analysis on IPC.
- Survey data to reflect knowledge, attitude and practices among health-care workers and policy-makers.
- Number of Member States with IPC plans.
- Percentage of hospitals and/or institutions with IPC programmes in place.
- Regular reports on the state of the local goals (outcomes and processes) and strategies and the impact of the IPC activities.

The health systems response to AMR varies across the Region. *Antimicrobial Resistance in the Western Pacific Region: a Review of Surveillance and Health Systems Response* highlights the urgency to strengthen regulation of pharmaceutical systems, AMS and IPC to contain AMR in the Region.

A national multisectoral approach must be adopted urgently to implement and monitor this action agenda to contain AMR in the 37 countries and areas of the Western Pacific Region. The action agenda is aligned with the draft WHO global action plan to be submitted for endorsement by the Sixty-eighth World Health Assembly in 2015.

KEY DEFINITIONS

IN ANTIMICROBIAL RESISTANCE

Antimicrobial agent¹

Any substance of natural, synthetic or semi-synthetic origin which at low concentrations kills or inhibits the growth of microorganisms but causes little or no host damage.

Antimicrobial resistance¹

The ability of a microorganism to multiply or persist in the presence levels of therapeutic levels of an antimicrobial agent.

Antimicrobial stewardship²

The use of coordinated interventions to improve and measure the use of antimicrobials by applying appropriate diagnosis and promoting optimal drug regimen, dose, duration and route.

Containment of antimicrobial resistance¹

Infectious disease control measures that minimize the emergence and spread of antimicrobial-resistant microorganisms.

Disease burden²

This includes the economic costs like treatment costs for hospital admissions and the cost to health in terms of mortality and morbidity and the direct patient burden.

Empirical therapy¹

Therapy that is initiated based on observation of clinical symptoms and patient history only, without previous confirmation of diagnosis by laboratory or other methods.

Health-care associated infections²

Infections acquired via the provision of health care in either a hospital or community setting.

“One Health” approach²

Collaborative multidisciplinary work at local, national, and global levels to attain optimal health for humans, animals and the environment.

Monitoring³

Reviewing, on a continuous basis, the degree to which programme activities are completed and performance targets or milestones are being met. Typically monitoring focuses on tracking programme inputs such as funding, staff, facilities, supplies, and training. As such, monitoring is part of the operational management of the programme. Monitoring also tracks outputs such as availability of medicines and supplies, number or percentage of trained staff, and quality of services. Systematic monitoring of inputs and outputs can help identify potential problems and corrective actions can be taken during programme implementation.

National surveillance network/institution⁴

Refers to networks (a group of surveillance sites) doing surveillance within a country, or institutions such as single hospitals, laboratories or similar sites that provide data directly or through national institutions.

Prescribing practices¹

The behaviour of licensed medical or veterinary practitioners regarding their prescription of medicines, including such aspects as high or low propensity to prescribe such medicines, compliance to diagnostic procedures and treatment guidelines and procedural aspects such as readiness to delegate to non-medically-qualified staff decisions on repeat prescriptions and other routine demand.

Prudent use of antimicrobials¹

Usage of antimicrobials, which maximizes therapeutic effect and minimizes the development of antimicrobial resistance.

Rational use of medicines⁵

Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community.

Regulatory authority¹

A government agency responsible for codifying and enforcing rules and regulations as mandated by law.

Responsible prescribing¹

The use of antimicrobials in the most appropriate way for the treatment or prevention of infectious diseases.

Stakeholder¹

A person or group of persons, or an industry, association, organization, etc. with an economic or professional interest/responsibility in an area or (involuntarily) affected by the developments in the same area. In the field of antimicrobial usage in food animals the farmers, veterinarians, animal feed manufacturers, food processors and distributors, retailers, relevant government organizations, pharmaceutical companies, consumers, public health officials, academic and other related groups are recognized as stakeholders.

Surveillance⁶

The process of systematic collection, orderly consolidation and evaluation of pertinent data with prompt dissemination of the results to those who need to know, particularly those who are in a position to take action.

Surveillance of antimicrobial resistance⁶

It should involve the collection and collation of both clinical and microbiological data. By establishing surveillance systems that integrate clinical and laboratory data, not only can the necessary data be captured but the strengths of both data sets can be combined.

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1. Adapted from World Health Organization. WHO global principles for the containment of antimicrobial resistance. Geneva: World Health Association. 2000.
 2. Adapted from Department of Health. UK five year antimicrobial resistance strategy 2013 to 2018. London: Crown. 2013
 3. Management Sciences for Health. MDS-3: Managing Access to Medicines and Health Technologies. Arlington, VA: Management Sciences for Health. 2012.
 4. Adapted from World Health Organization. Antimicrobial resistance: global report on surveillance 2014. Geneva: World Health Organization. 2014.
 5. World Health Organization. The rational use of drugs. Report of the conference of experts. Geneva: World Health Organization. 1985.
 6. Adapted from Report of the Technical Discussions at the twenty-first World Health Assembly on National and Global Surveillance of Communicable Diseases, 18 May 1968 – A21/Technical Discussion/5. Geneva: World Health Organization. 1968.
 7. World Health Organization. Surveillance standards for antimicrobial resistance. Geneva: World Health Organization. 2002.

REFERENCES

1. Antimicrobial resistance fact sheet. [website]. World Health Organization. (<http://www.who.int/mediacentre/factsheets/fs194/en/>, accessed 25 July 2014).
2. Millennium Development Goals and beyond 2015 [website]. United Nations (<http://www.un.org/millenniumgoals/>, accessed 21 July 2014).
3. WHO Global strategy for containment of antimicrobial resistance. Geneva: World Health Organization: 2001 (http://www.who.int/drugresistance/WHO_Global_Strategy.htm/en/, accessed 21 July 2014).
4. WHO. World Health Day 2011: policy briefs (<http://www.who.int/world-health-day/2011/policybriefs/en/>, accessed 20 July 2014).
5. Antimicrobial resistance: global report on surveillance 2014. Geneva: World Health Organization; 2014 (<http://www.who.int/drugresistance/documents/surveillancereport/en/>, accessed 21 July 2014).
6. Surveillance of antimicrobial resistance: report of a consultation. Geneva: World Health Organization: 1982 (http://whqlibdoc.who.int/hq/pre-wholis/BVI_PHA_ANT_82.2.pdf, accessed 21 July 2014).
7. Bi-regional workshop on antimicrobial resistance surveillance and containment in Asia and the Pacific. Manila and New Delhi: WHO Regional Offices for the Western Pacific and South-East Asia Region; 2005 (http://www.wpro.who.int/emerging_diseases/documents/FINAL_EDTed_report1/en/, accessed 21 July 2014).
8. Regional Committee for the Western Pacific: Sixty-second session. Resolution WPR/RC62.R3: antimicrobial resistance. (http://www2.wpro.who.int/rcm/en/archives/rc62/rc_resolutions/WPR_RC62_R3.htm, accessed 21 July 2014).
9. Chan HLE, Poon LM, Chan SG, Teo JWP. The perils of medical tourism: NDM-1-positive *Escherichia coli* causing febrile neutropenia in a medical tourist. Singapore Med J. 2011 Apr;52(4):299–302.
10. Nagano N, Endoh Y, Nagano Y, Toyama M, Matsui M, Shibayama K, et al. First report of OXA-48 carbapenemase-producing *Klebsiella pneumoniae* and *Escherichia coli* in Japan from a patient returned from Southeast Asia. Jpn J Infect Dis. 2013;66(1):79–81.

11. Kim SH, Song JH, Chung DR, Thamlikitkul V, Yang Y, Wang H, et al.; ANSORP Study Group. Changing trends in antimicrobial resistance and serotypes of *Streptococcus pneumoniae* isolates in Asian countries: an Asian Network for Surveillance of Resistant Pathogens (ANSORP) study. *Antimicrob Agents Chemother*. 2012;56:1418–26.
12. Lahra MM, Programme WWPaSEAGAS. Surveillance of antibiotic resistance in *Neisseria gonorrhoeae* in the WHO Western Pacific and South East Asian Regions, 2010. *Commun Dis Intell Q Rep*. 2012;36(1):95–100.
13. Lahra MM, Lo YR, Whiley DM. Gonococcal antimicrobial resistance in the Western Pacific Region. *Sex Transm Infect*. 2013;89 Suppl 4:iv19–23.
14. Kiratisin P, Chongthaleong A, Tan TY, Lagamayo E, Roberts S, Garcia J, et al. Comparative in vitro activity of carbapenems against major Gram-negative pathogens: results of Asia-Pacific surveillance from the COMPACT II study. *Int J Antimicrob Agents*. 2012;39(4):311–16.
15. Chung DR, Song JH, Kim SH, Thamlikitkul V, Huang SG, Wang H, et al.; Asian Network for Surveillance of Resistant Pathogens Study Group. High prevalence of multidrug-resistant nonfermenters in hospital-acquired pneumonia in Asia. *Am J Respir Crit Care Med*. 2011;184:1409–17.
16. Sixty-seventh World Health Assembly. Resolution WHA67.25: antimicrobial resistance. (http://apps.who.int/gb/ebwha/pdf_files/WHA67/A67_R25-en.pdf, accessed 23 July 2014).



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