

# Situational Analysis on **Antimicrobial Resistance** in the South-East Asia Region

Report 2016



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# CONTENTS

List of acronyms	5
Foreword	7
Background	9
Global Action Plan	11
High level of advocacy in 2016	12
» High-level meeting on AMR	12
» International meeting on combating AMR	12
» Bi-regional technical consultation on AMR	12
» South-East Asia Regional Committee 2016	13
Regional roadmap for strengthening national AMR prevention and containment programmes	14
» Phases of implementation	15
» Resolutions and declarations	16
Methodology	17
» Situation analysis to assess programmes for Containment of AMR: pre-requisite for development of the NAP	17
» Tool for situation analysis and monitoring of AMR in the South-East Asia Region (in-country)	17
Results	20
» Overall findings from the situation analysis conducted in the Region with the tool developed by the Regional Office	20
1. NAP in line with the GAP-AMR	20
2. Awareness-raising	20
3. National AMR surveillance system	21
4. Rational use of antimicrobials and surveillance of use/sale (community-based)	21
5. Infection prevention and control, and AMR stewardship programme	23
6. Research and innovation	24
7. One-Health engagement	24



## List of acronyms

AMR	: antimicrobial resistance
AMS	: AMR stewardship
AMSP	: AMR stewardship programme
AMU	: antimicrobial use
API	: active pharmaceutical ingredient
DRA	: drug regulatory authority
EQA	: external quality assessment
HAI	: health-care-associated infection
IPC	: infection prevention and control
OTC	: over the counter
GAP	: global action plan
GAP-AMR	: global action plan for antimicrobial resistance
GLASS	: Global Antimicrobial Resistance Surveillance System
EQA	: external quality assessment
FAO	: Food and Agriculture Organization
M&E	: monitoring and evaluation
NAP	: national action plan
NAP-AMR	: national action plan for AMR
NGO	: Nongovernmental organization
NRA	: national regulatory authority
OIE	: World Organization for Animal Health
R&D	: research and development
SEA	: South-East Asia
SDG	: sustainable development goal
SOP	: standard operating procedures
UN	: United Nations
WCO	: WHO Country Office
WHA	: World Health Assembly
WHO	: World Health Organization
WPRO	: Western Pacific Regional Office







## Foreword



It is my pleasure to present the Report of Situational Analysis on Antimicrobial Resistance (AMR) in the South-East Asia Region. Building national capacity to prevent and combat AMR is one of the Region's Flagship Priority Areas. We have made significant progress in this area.

Since 2010 the South-East Asia Region has recognized antimicrobial resistance as a serious threat to public health. Regional Committee sessions and other high-level forums have adopted and issued several resolutions and declarations on its prevention and containment. Of note is resolution SEA/RC/63/R4 adopted at the Sixty-third session of the Regional Committee in Bangkok, Thailand, in 2010, and the Jaipur Declaration on Antimicrobial Resistance by the Health Ministers of the Region issued in 2011.

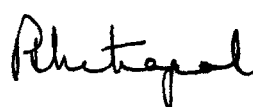
At the global level, the Sixty-eighth World Health Assembly in May 2015 endorsed the Global Action Plan (GAP) on Antimicrobial Resistance. Countries committed to have in place by May 2017 national action plans (NAP) that are aligned with the GAP. Ten of the South-East Asia Region's 11 Member States now have a NAP in place.

This is vitally important. It is estimated that by 2050, ten million lives a year will be at risk from drug-resistant infections if preventive action is not taken. Given AMR's risk profile, the issue was taken up by the High-level Panel at the UN General Assembly in September 2016. Earlier that year participants of the G20 Health Ministers' Meeting and the G20 Heads of State Meeting expressed their support for action.

This report is an account of the Region's progress in developing and implementing NAPs. The report provides a platform to track what is going well, and to identify areas where extra efforts are needed. In the report, the regional roadmap for strengthening national AMR prevention and containment programmes is analysed with a specific methodology. The results gathered have been compiled to contribute to country profiles which make the report more useful.

I thank staff in the ministries of health, and the WHO regional and country offices, for working together to compile the relevant data and information in a systematic and meaningful way.

I am confident this report will pave the way for greater multisectoral support for future action aimed at preventing and combating AMR.



Poonam Khetrappal Singh  
Regional Director  
WHO South-East Asia Region





## Background

In September 2016, the United Nations recognized the global rise of AMR as a threat to global health and human development; however, the magnitude of the rise is still unclear. The problem is complicated to assess, as AMR corresponds to a range of combinations of clinical condition, antibiotic, etiological agent and location. It is estimated that if no proactive action is taken now to slow down the rise of AMR, then by 2050, 10 million lives a year and a cumulative US\$ 100 trillion of economic output are at risk due to the rise in drug-resistant infections<sup>1</sup>.

A recent World Bank report on drug-resistant infections also states that the annual costs could be as large as those of the global financial crisis that started in 2008<sup>2</sup>. Most of the direct and much of the indirect impacts of AMR will be felt in low- and middle-income countries. The WHO South-East Asia (SEA) Region has 11 Member States: Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia,

Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste. The majority of these countries are low- and middle-income countries. The burden of AMR in the SEA Region is high<sup>3</sup> and countries need to take immediate actions to contain AMR, and mitigate its economic and health costs.

The WHO SEA Region has recognized AMR as a serious public health threat and, since 2010, adopted several Regional Committee resolutions on the prevention and containment of AMR. In 2011, the Regional Office organized a meeting in Jaipur, India wherein all health ministers of the Region committed to take intensive action by adopting the Jaipur Declaration on Antimicrobial Resistance<sup>4</sup>. In 2014, AMR was included as a Regional Flagship Priority by the Regional Director. The Regional Director called for building national capacity to combat AMR, with a focus on achieving clear deliverables at both the regional and country levels.

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<sup>1</sup> Review on antimicrobial resistance. Tackling drug resistant infections globally: final report and recommendations. Chaired by Jim O Neil. May 2016 ([https://amr-review.org/sites/default/files/160518\\_Final%20paper\\_with%20cover.pdf](https://amr-review.org/sites/default/files/160518_Final%20paper_with%20cover.pdf), accessed 2 July 2017).

<sup>2</sup> Final report. Drug-resistant infections: a threat to our economic future. Washington, DC: The World Bank; September 2016 (<http://documents.worldbank.org/curated/en/323311493396993758/pdf/114679-REVISED-v2-Drug-Resistant-Infections-Final-Report.pdf>, accessed 2 July 2017).

<sup>3</sup> Chereau F, Apotowski L, Tourdjman M, Vong S. Antibiotic resistance in SEA Region: Risk Assessment. British Medical Journal 2017 (publication in press).

<sup>4</sup> Jaipur Declaration on Antimicrobial Resistance. New Delhi: World Health Organization Regional Office for South-East Asia; 2011 ([http://www.searo.who.int/entity/antimicrobial\\_resistance/rev\\_jaipur\\_declaration\\_2014.pdf?ua=1](http://www.searo.who.int/entity/antimicrobial_resistance/rev_jaipur_declaration_2014.pdf?ua=1), accessed 2 July 2017).

AMR poses a multidimensional challenge. It has social, economic and environmental dimensions that encompass the food production system as well as human and animal health. The One Health concept captures this scope, by recognizing the interdependence of human health, agriculture and animal health, and the

environment.<sup>5</sup> The Sixty-eighth World Health Assembly of 2015 endorsed the Global Action Plan to contain AMR based on the One Health approach, which is expected to translate into national action plans (NAPs) by each country<sup>6</sup>. All Member States agreed during the Health Assembly in 2015 to develop their NAPs by May 2017.

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<sup>5</sup> Resolution WHA 68.7. Global action plan on antimicrobial resistance. In: 68th World Health Assembly, Geneva, 18–26 May 2015. Resolution and decisions, annexes. Geneva: WHO; 2015 ([http://apps.who.int/gb/ebwha/pdf\\_files/WHA68/A68\\_R7-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/WHA68/A68_R7-en.pdf), accessed 2 July 2017).

<sup>6</sup> Global action plan on antimicrobial resistance. Geneva: WHO; 2015 (<http://www.who.int/antimicrobial-resistance/publications/global-action-plan/en/>, accessed 2 July 2017).



## Global Action Plan

The global action plan (GAP) on AMR, adopted at the World Health Assembly in 2015 by Member States, proposes a way forward. The GAP was prepared by WHO with regular consultation with the Food and Agriculture Organization (FAO) and World Organization for Animal Health (OIE), as part of the tripartite collaboration to ensure a One Health approach for containment of AMR.

The GAP identifies five strategic objectives:

1. to improve awareness and understanding of AMR through effective communication, education and training;
2. to strengthen the knowledge and evidence base through surveillance and research;
3. to reduce the incidence of infection through effective

sanitation, hygiene and infection prevention measures;

4. to optimize the use of antimicrobial medicines in human and animal health;
5. to develop the economic case for sustainable investment, which takes account of the needs of all countries, and to increase investment in new medicines, diagnostic tools, vaccines and other interventions.

This action plan emphasizes the need for an effective One Health approach involving coordination among stakeholders in various areas, including human and veterinary medicine, agriculture, environment, food scientists, finance, well-informed consumers and the international sector. Governments of all Member States committed to have in place, by May 2017, a NAP on AMR that is aligned with the GAP.



## High level of advocacy in 2016

### High-level meeting on AMR

At the United Nations (UN) General Assembly in September 2016, the President of the UN General Assembly convened a one-day high-level meeting at the UN Headquarters on AMR, with the participation of Member States, nongovernmental organizations (NGOs), representatives of civil society, the private sector and academic institutions.

The primary objective of the meeting was to summon and maintain strong national, regional and international political commitment in addressing AMR. The meeting emphasized the important role and the responsibilities of governments, as well as the roles of non-State actors, the private sector and relevant intergovernmental organizations, particularly the World Health Organization (WHO), FAO and OIE in establishing, implementing and sustaining a cooperative global, multisectoral and cross-sectoral approach.


### International meeting on Combating AMR

The Government of India together with WHO South-East Asia (SEA) Regional Office organized a high-level three-day international meeting on “Combating Antimicrobial Resistance: Public Health Challenge and Priority”, on 23–25 February


2016 at New Delhi. Ministers of health from Member States and international experts attended the meeting. The Regional Director called for stronger commitment to building momentum within countries of the Region to reverse AMR. This high-level meeting helped in further getting the political commitment for multisectoral involvement in developing and implementing NAPs. The meeting advocated for the development of NAPs aligned with the GAP, and would be owned across ministries by May 2017. A situation analysis to identify the challenges and needs would be conducted in each Member State of the South-East Asia Region before developing the NAP. The NAP should incorporate three essential components of the GAP, including: (i) a comprehensive multisectoral approach; (ii) an operational plan with adequate budgeting; and (iii) an embedded monitoring and evaluation (M&E) system. Time frames on deliverables for implementing the NAP will be adapted to each country’s context and circumstances.

### Bi-regional technical consultation on AMR

The second high-level meeting of two regions – South-East Asia and Western Pacific, entitled “Bi-regional Technical Consultation on Antimicrobial Resistance in Asia” was held on 14–16 April 2016 at Tokyo, Japan. The discussions



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focused on moving forward with comprehensive policies and actions to implement NAPs on AMR appropriate to each country context, and utilize opportunities for strengthened regional collaboration.

This bi-regional Consultation on AMR mainly prioritized the roadmap for development of NAPs and the associated AMR agenda in tandem with the UN sustainable development goals (SDGs).

## South-East Asia Regional Committee 2016

During the Regional Committee meeting held in Colombo, Sri Lanka on 5–9 September 2016, a high-level meeting with a special session on AMR was held. Member States committed again to developing NAPs with WHO's support.

### Role and actions recommended for Member States

- (1) Continue the development of NAPs aligned with the GAP and its implementation to meet the May 2017 deadline for having such plans in place, participate in the situation analysis process and establish baseline data against which progress will be measured.
- (2) Provide inputs to the United Nations General Assembly Political Declaration on AMR and support activities such as participating at the high-level session of the United Nations General Assembly.
- (3) Continue to support the development of multisectoral collaboration aimed at operationalizing the One Health approach.

### Role and actions for WHO

- (1) Continue to support situation analysis activities across the Region in line with efforts to develop NAPs aligned with the GAP.
- (2) Provide specific technical support needed in the areas of surveillance, laboratory capacity, human resources, and research and development (R&D).
- (3) Develop and implement a strategy on One Health for the Region aligned with the efforts already under way in several countries.
- (4) Provide information and facilitate support for efforts to further the global development and stewardship framework for antimicrobial medicines.

# Regional roadmap for strengthening national AMR prevention and containment programmes

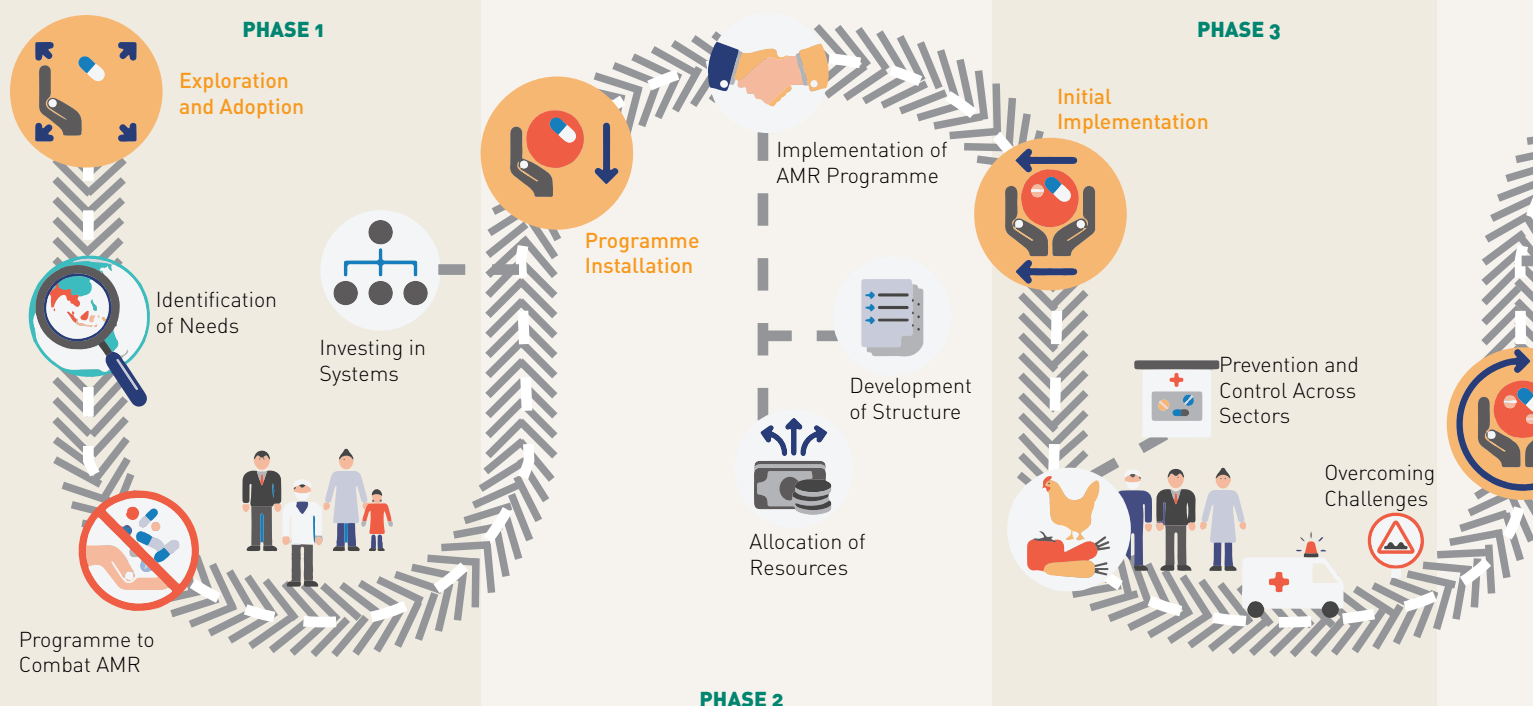
The Regional Office developed a regional roadmap to guide Member States in developing their national AMR prevention and containment programmes and implement the NAP. The roadmap proposed five phases of development, which are based on the activities and actions implemented as part of the NAP.

- Phase 1: phase of exploration and adoption
- Phase 2: phase of programme installation
- Phase 3: phase of initial implementation
- Phase 4: phase of full operation
- Phase 5: phase of sustainable operation.

Each of the five specific objectives of the GAP and development of a GAP-aligned NAP is put under one of the five phases, depending upon the

actions and activities implemented in each country. Fig. 1 describes the details of the five phases and activities of the roadmap for actions on AMR.

**Figure 1: Roadmap for action on AMR**





## Phases of implementation

### Phase 1: exploration and adoption

The country initiates design of a programme to combat AMR, Activities to aid in its implementation may include: the identification of needs, options and resources; the identification of potential barriers; investment in systems; and/or the identification of structures (both in policy making and implementation frameworks).

### Phase 2: programme installation

The country decides to implement an AMR programme after completing a set of core activities. The country is focused on the development of structures and the allocation of resources to implement the AMR programme with the potential to scale nationally.

### Phase 3: initial implementation

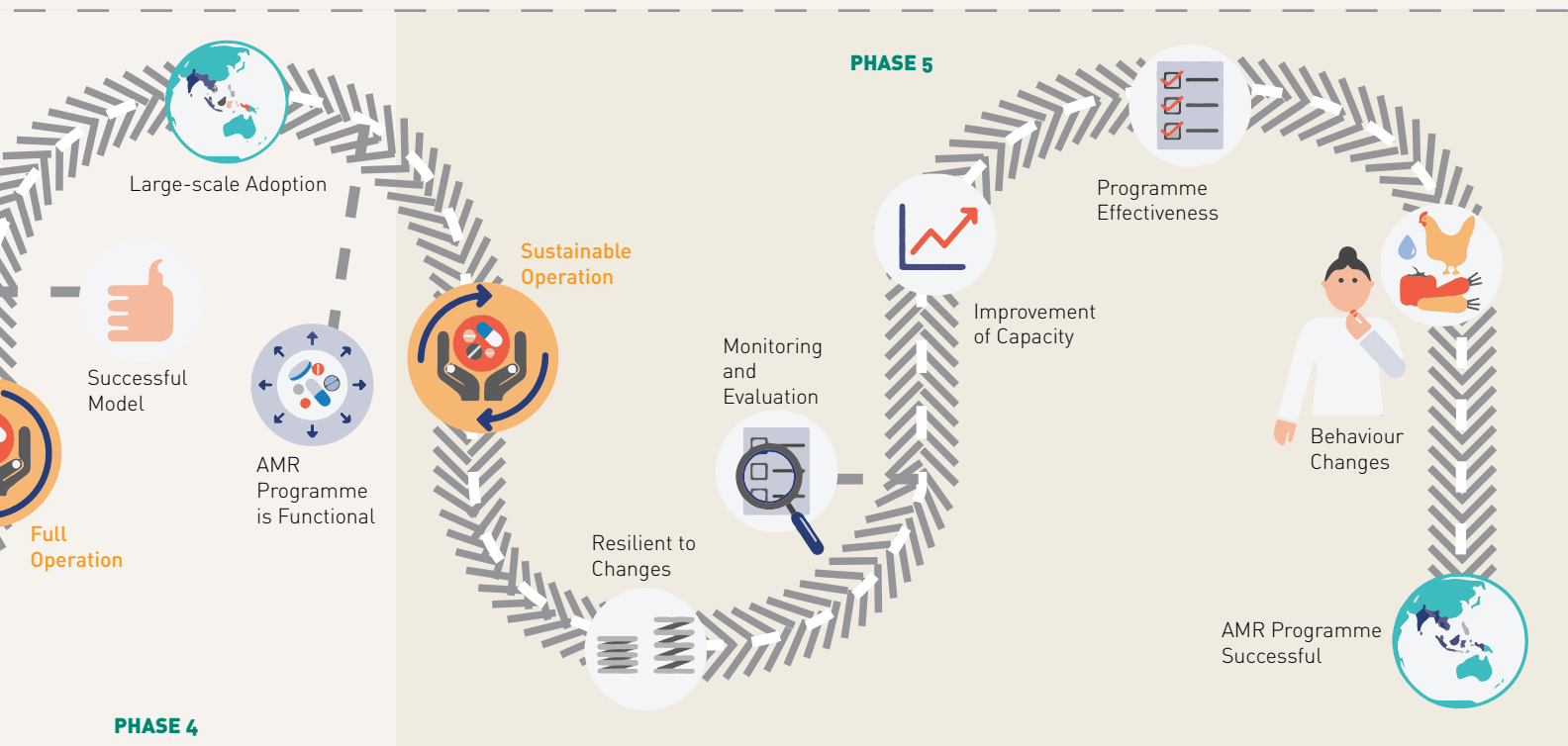
The country initiates and implements an AMR prevention and control programme at the national level. During this phase, a functional model of the AMR programme is developed, but in limited scale.

### Phase 4: full operation

The country scales up to a successful model of an AMR programme that utilizes accepted prevention and control practices. Further, there is nationwide or large-scale adoption of the programme. There is evidence that the AMR programme is functional and regularly generates outcomes.

### Phase 5: sustainable operation

The country operates its AMR programme efficiently, and there is indication of programme sustainability. The programme is resilient to changes and other external factors. Through M&E mechanisms, there is systematic improvement of capacity. Indicators for programme effectiveness in human and animal sectors are developed, which may also be used to assess AMR resistance trends, antimicrobial use trends, and behaviour changes in the community and amongst practitioners.



## Resolutions and declarations

**2010:** Regional Committee (RC) for SEAR endorses the Regional Strategy for Prevention and Containment of AMR in the Region [SEA/RC64/R5].

**2011:** Jaipur Declaration – SEAR Health Ministers adopt the Jaipur Declaration on AMR.

**2014:** AMR becomes one of seven key flagship priorities for the WHO-SEAR.

**2015:** World Health Assembly (WHA) adopts Resolution 68.7 to develop a GAP to combat AMR.

**2015:** Regional Committee for SEAR reviews WHA Resolution 68.7 and Member States commit to implementing NAPs in accordance with the GAP and SEAR priorities [SEA/RC68/R3].

**2016:** During the Combating AMR: Public Health Challenge and Priority conference in New Delhi in February, Member States outline a roadmap identifying key elements for converting the GAP-AMR into NAPs.

**2016:** Tokyo Communique – Launch of Asia Pacific One Health Initiative on AMR reaffirms commitment to ending AMR and emphasizes a coordinated, multisectoral One Health approach.

**2016:** During the United Nations General Assembly, AMR High-Level Meeting, countries focus on mobilizing necessary technical and financial resources across sectors for implementation of the WHO GAP on AMR by all countries.



## Priority Areas

- Improving awareness and understanding of AMR
- Strengthening surveillance in human health, animal health and agriculture sectors
- Strengthening infection prevention and control (IPC) practices in health-care facilities
- Promoting rational use of antimicrobial across sectors
- Promoting investments in AMR and related research



## Methodology

### Situation analysis to assess programmes for containment of AMR: pre-requisite for development of the NAP

All Member States are expected to develop NAPs based on the principles outlined in the GAP by May 2017. There is wide variation across countries in the capacity to respond to the call to develop a comprehensive and holistic NAP. Consequently, to tailor a NAP to address the challenges in the setting of a particular Member State, it is essential to conduct a comprehensive situation analysis, which would inform the subsequent steps of the process. In response to the need to conduct such a situation analysis, the Regional Office has developed a tool to conduct a systemwide analysis of AMR prevention and containment programmes and their related activities.

### Tool for situation analysis and monitoring of AMR in the South-East Asia Region (in-country)

The tool has indicators that are aligned with each focus (priority) area of the specific objectives of the GAP. The tool evaluates the progress made in each of the Member States over five years (2016–2020). Apart from being used to conduct a situation analysis in the country, this tool will be used for reporting on the development, implementation, monitoring and evaluation of the

NAP-AMR. The situation analysis can identify vulnerabilities in the system, and the stage of implementation of GAP-AMR-related comprehensive activities, and assess the progress made over time.

The tool has seven focus areas that are consistent with the five strategic objectives of the GAP-AMR (Annex I). The seven focus areas are:

1. national AMR action plan;
2. awareness-raising;
3. national AMR surveillance system;
4. rational use of antimicrobials and surveillance of use/sale (community based);
5. infection prevention and control and AMR stewardship programme;
6. research and innovation ; and
7. One Health engagement.

Each of the focus area indicators has a list of subcategory indicators (Annex 1). Each subcategory indicator is graded on five levels to show the incremental extent of implementation of the AMR programme. These five levels or phases are:

- Phase 1: exploration and adoption;
- Phase 2: programme installation;

- Phase 3: initial implementation;
- Phase 4: full operation;
- Phase 5: sustainable operation. The tool has details for each subfocus area of these five phases (Annex 1).

The first phase of exploration and adoption indicates that the process of designing an AMR containment programme has been initiated. Once the decision to implement the programme has been made, systems progress to the second phase, that of programme installation. The third phase, of initial implementation, is one of the most challenging phases for programmes in developing countries. Once the early implementation barrier is overcome and the programme is scaled up, the fourth phase, full operation, is achieved. Once the programme starts to function at the highest grade of operational efficiency and sustainability, the fifth and final stage of sustainable operation is reached. Phases 1 and 2 relate to policy development and planning but no implementation; phases 3–5 are related to different levels of implementation, including initial implementation, phase of full operation, and phase of sustainable operation. These phases from 3 to 5 are considered to be the strengths of the system. Sustainable operation is considered best practice and defined here as an operation that incorporates an M&E system, including analysis of the M&E and implementation of changes based on M&E findings.

### **Assessment methodology using the tool**

The situation analysis is proposed to be performed by a joint team of the National AMR Control Committee members of the country, various stakeholders in the country for the

five specific objectives of the GAP/NAP, and officials/consultants from the SEA Regional Office and WHO Country Office. The role of the latter two stakeholders is to facilitate the process and reach a consensus regarding the findings. National stakeholders assess themselves and provide evidence and justification for their findings. WHO facilitates the process and helps in reaching a consensus regarding the grading through guided discussions. Core questions trigger the discussions on each focus area. The functional system is defined as a system that shows sound procedures, interdepartmental interactions, leadership, governance and funding capacity, and outputs. A thematic situation analysis is conducted based on the outcome of the multistakeholder review. A combination of the review for capacity and functionality describe at which stage the AMR containment programme is positioned in the country for each focus area.

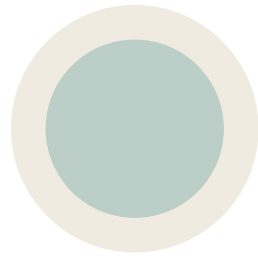
Using the tool and the methodology mentioned above, situation analyses were conducted in ten Member States of the SEA Region during May 2016–December 2016. The situation analysis in each Member State focused on how well developed the AMR programme was in terms of governance, policy and system. The review focused on broad system analysis rather than assessing the quality of policies and documents.

The country profile of each Member State where situation analysis was conducted is shown in Annex II. The scores mentioned for each indicator of the seven focus areas are from 1 to 5, based on the level of development of the AMR programme. The situation analysis

for the AMR programme was conducted for each country using the tool as per the methodology. For seven Member States – Bhutan, Bangladesh, Maldives, Myanmar, Nepal, Thailand and Timor-Leste – in addition, a workshop was conducted at Bangkok and a consensus was reached for the grading in each focus area. All

countries are continuously working on the development of NAPs and activities are ongoing, hence each country is moving ahead with various activities under each indicator. The Regional Office is providing technical and other assistance to all Member States in finalizing the NAP document and operation of the activities.

Note: Data on DPR Korea is not yet included as the arrangements for conducting the situation analysis in country were finalized only for August 2017.



## Results

The section below presents the overall findings for each focus area indicator with the subcategory indicators for the ten countries (Table 1-pg 31). Please note that these findings may not depict the situation at present, and the scoring may be different as countries are working on different activities for containment of AMR.

### Overall findings from the situation analysis conducted in the Region with the tool developed by the Regional Office

#### 1. NAP in line with the GAP-AMR

The first focus area has one subcategory indicator: (i) national AMR action plan.

- i. For the indicator on national AMR action plan, eight countries were in phase 2 (programme installation), indicating that each of these countries had established an AMR working group and a NAP was under way. One country, Thailand, had a NAP that was aligned with GAP-AMR, including operational plan with defined activities (phase 3, initial implementation). However, one country was in phase 1; though the AMR committee was established but formalization/endorsement of the members was pending.

As a word of caution, the information reported here on the development

of NAP dates back to the time when the situation analysis was conducted in 2016. At that time, only one country had finalized its NAP and a few countries had initiated its development. However, as of June 2017, all but one country in the Region have developed or are in the process of finalizing the NAP for the containment of AMR. As part of the monitoring of progress to be conducted in 2018, the Regional Office will review all finalized NAPs and their alignment with the GAP.

#### 2. Awareness-raising

This focus area consists of two subindicators: (i) awareness campaigns for the public, and (ii) education and training strategies for professionals.

- i. For awareness campaigns for the public, seven countries had some government-led activities in parts of the country to raise awareness about AMR, and had conducted some actions to address the issue (phase 2, programme installation). However, three countries were in phase 3, that is initial implementation, wherein nationwide government-led antibiotic awareness campaigns had also been conducted.
- ii. The second subindicator is on education and training strategies for professionals; for this subindicator, there was no policy or strategy in four countries. They were in phase 1, pertaining to

exploration and adoption. In four other countries, relevant policies had been developed but not for all concerned professions, and ad-hoc training courses had been held for a few disciplines (phase 2, programme installation). Only Thailand and Indonesia were in phase 3 of initial implementation, where AMR was included in some pre-service training courses.

### **3. National AMR surveillance system**

For the third focus area, there are three subindicators: (i) national human AMR surveillance, (ii) national laboratory network strengthening, and (iii) early warning systems.

- i. For human AMR surveillance, all the countries except Timor-Leste had developed guidelines, though not all had fully implemented them and a few had limited quality data and analysis. Six countries were in phase 2 (programme installation). Three countries, Nepal, Sri Lanka and Thailand, had moved to phase 3 with standardized national AMR surveillance in place but of these three, two countries had a limited number of operational sites.
- ii. The second subindicator for this focus area is national laboratory network strengthening. For this indicator, Indonesia, Maldives and Timor-Leste were in phase 1 with no national laboratory network developed. Four countries had planned for a national laboratory network with testing according to international standards (phase 2), and two countries were in phase 3 (initial implementation), where a national reference laboratory had been identified and quality-assured laboratory networks

developed at a few surveillance sites. Thailand had a national network of health laboratories with external quality assessment (EQA) developed in most surveillance sites (phase 4).

- iii. For the third subindicator of early warning systems, there was no system in place or planned at the time of conducting the situation analysis in six countries (phase 1). In Indonesia, this subindicator was not surveyed. Three countries, Bhutan, India and Nepal, were in phase 2 (programme installation), that is the system was planned in keeping with international standards but was still not implemented. Notably WHO is yet to define what the standards are regarding the objectives and modalities of an early warning system for AMR.

### **4. Rational use of antimicrobials and surveillance of use/sale (community-based)**

The fourth focus area indicator is rational use of antimicrobials and surveillance of use/sale in the community. This indicator has five subindicators: (i) a national AMR containment policy for control of human use of antimicrobials; AMR stewardship (AMS); (ii) national regulatory authority (NRA) or drug regulatory authority (DRA); (iii) surveillance of antimicrobial use and sales in humans; (iv) regulation of finished antibiotics and active pharmaceutical ingredients (APIs); (v) regulation of pharmacies on over-the-counter (OTC) sale and inappropriate sale of antibiotics and APIs.

- i. The first subindicator is national AMR containment policy and

- AMS. Five countries mentioned that the AMS programme had been planned but was under development (phase 2), and three countries agreed that there was no/weak national policy for regulation of antimicrobial use and availability (phase 1). India and Indonesia mentioned that a national AMS programme had been developed (phase 3). In Indonesia, it was implemented by relevant institutions, and regulations for antimicrobial use and availability were implemented in a limited manner (phase 4).
- ii. The second subindicator is about the DRA. Timor-Leste was in phase 1 of exploration and adoption as the country has a DRA with limited capacity. In two countries, there were DRAs with limited capacity but strategic planning was in place for capacity-building and appropriate budgeting, that is phase 2 of programme installation. Three countries were in phase 3 of initial implementation, as they had mentioned that the system was set up for oversight but had not been fully implemented. India and Indonesia had functional DRAs with tools for quality assurance and registration of antibiotics. Inspection was also carried out but their capacity for enforcement of policies and regulations was limited (phase 4). Bhutan was the only country in phase 5, with a competent and functional DRA, with the capacity to ensure and enforce antibiotic quality standards. It could take measures against substandard products and inspect pharmacies.
  - iii. The third subindicator is about surveillance of antimicrobial use and sales in humans. Three countries had no guidelines for surveillance of use/or sales of antimicrobials (phase 1); in four countries, the national policy and plan on surveillance of antimicrobials was under development or developed but not implemented, so they were in phase 2 of programme installation. Only three countries (India, Indonesia and Nepal) monitored antimicrobial use but this was limited to a few facilities that were not representative, and monitoring was done irregularly, that is initial implementation of the programme (phase 3).
  - iv. The fourth subindicator is on regulation of finished antibiotic products and APIs. Six countries had regulation with limited capacity, but strategic planning was in place for capacity-building and appropriate budgeting (phase 2). One country, Bangladesh, had a regulatory authority and system set up for oversight with limited functional capacity (phase 3). Bhutan and India had regulatory authorities and systems in place, and conducted inspections but had limited capacity for enforcement of policies and regulations (phase 4). This indicator was introduced later after pilot phase and as such was not surveyed in Indonesia.
  - v. The fifth subindicator is about regulation of pharmacies on OTC sales and inappropriate sale of antibiotics and APIs. One country (Timor-Leste) did not have any official regulation



on OTC sales and inappropriate sale of antibiotics (phase 1). Four countries had regulation with limited capacity but had strategic planning in place (phase 2). Bangladesh and Nepal were in phase 3 of initial implementation; a regulatory authority and system set up for oversight had limited functional capability. India had a regulatory authority and system in place, and conducted inspection but had limited capacity for enforcement of regulation (phase 4). Bhutan mentioned that the country has a regulatory authority and system in place and regulation is fully and effectively implemented (phase 5). This indicator was introduced later after pilot phase and as such was not surveyed in Indonesia.

## 5. Infection prevention and control, and AMR stewardship programme

The fifth focus area indicator is about infection prevention and control (IPC) and the AMR stewardship programme (AMSP). It has four subindicators: (i) AMSP in health-care settings; (ii) IPC programme in health-care settings; (iii) national health-care-associated infections (HAI) and related AMR surveillance; and (iv) sanitation, hygiene and vaccination.

i. The first subindicator is on the AMSP in health-care settings. Three countries had no national AMSP or plan available or approved (phase 1). Four countries had a national IPC/AMR policy but weak standard operating procedures (SOPs), and guidelines and protocols were not available in all hospitals (phase

2 of programme installation). Three countries (India, Indonesia and Thailand) had implemented policies in a limited number of health facilities, so these three countries were in phase 3.

ii. The second subindicator under this focus area is on the IPC programme in health-care settings. Two countries had no national IPC policy, guidelines or action plans to mandate IPC in health-care settings (phase 1). Three countries indicated that the IPC programme and capacity-building programme were developed with SOPs, guidelines and protocols but not implemented (phase 2). Five other countries were in phase 3 of initial implementation – IPC programme and capacity-building plans had been implemented in selected health-care settings.

iii. The third subindicator for national HAI and related AMR surveillance showed that three countries had no policies or a limited plan and guidelines to mandate HAI surveillance in hospitals (phase 1). Five countries reported programme installation (phase 2), and that HAI surveillance had been started in few public and private facilities but data were not centralized at the national level. India had initiated surveillance in a few public and private facilities and data were shared at the national level (phase 3), while Bhutan mentioned that centralized data on HAI from several hospitals were collected but that data analysis and detection capacity was limited (phase 4).

- iv. The fourth subindicator about sanitation, hygiene and vaccination showed countries at different levels, one country with no formal campaign (phase 1), and three with formal campaigns being developed (phase 2). Two countries had formal campaigns to enhance sanitation, hygiene and vaccination implemented on a small scale (phase 3), and two countries had implemented formal campaigns on a large scale (phase 4). One country, Bhutan, mentioned that a formal campaign had been implemented on a large scale with an M&E system (phase 5). In Indonesia, this indicator was not surveyed as at that time the tool did not have this subindicator.

## 6. Research and innovation

The sixth focus area indicator on research and innovation has one subindicator (i) research and development (R&D) and innovation, including research funding for AMR prevention and containment.

- i. Five countries mentioned that there were no policies fostering a research environment, although a few countries had the capacity for research (phase 1). An equal number of countries mentioned that they had policies planned and the existing structural plan to foster research and innovation on AMR (phase 2).

## 7. One-Health engagement

The seventh and the last focus area indicator is on One-Health engagement and has four subindicators: (i) a national AMR containment policy and regulatory framework for control of antibiotic use in animals, and registration

for use; (ii) national surveillance for AMR, and use and sale of antimicrobials at the national level in the veterinary sector; (iii) IPC in the animal sector; and (iv) AMR awareness generation and education in the animal sector.

- i. For the first subindicator, seven countries agreed that there was a national policy and plan with a regulatory framework for control of use in animals and registration for use, but the policy had still not been implemented (phase 2: programme installation). Sri Lanka was the only country in phase 3, where a policy and plan had been implemented but with limited capacity for monitoring the use and quality of the drugs. Two countries (Myanmar and Timor-Leste) mentioned that they had no national policy and plan to reduce the use of antibiotics in the animal sector (phase 1).
- ii. For the second subindicator, five countries had no or weak national policy in the country (phase 1 of exploration and adoption). Four countries had limited capacity for surveillance of sales, AMR and antimicrobial use (AMU), placing them in phase 2 of programme installation. One country (Maldives) mentioned that it had some capacity and data could be generated from sales for AMU (phase 3).
- iii. For the third subindicator, three countries mentioned that there was no policy and they had not developed national guidelines for biosecurity to reduce infection rates in food for both large and small scale producers

(phase 1). However, six countries mentioned that they had policies and national guidelines in line with international standards, including a vaccination policy and Codex Alimentarius standards, indicating that in these countries, programme installation had been done and they were in phase 2. One country (Indonesia) had limited implementation of the policy, particularly for large producers (phase 3).

- iv. For the fourth subindicator, six countries were in phase 1 as there were no policies or strategies for this programme. However, four countries mentioned that policies or strategies had been developed for awareness generation and education, but AMR and containment of AMR was still not included in education and training (phase 2).




## Global monitoring of country progress in addressing AMR using the global monitoring tool

Globally, WHO with FAO and OIE have developed a questionnaire to be administered to each country to review and summarize country progress on the development and implementation of a NAP, which provides information for reporting at the global level<sup>7</sup>. The questionnaire was sent to the ministries of health of all Member States via WHO country offices. The responses obtained by each Member State are the country self-assessment survey reports. It asked countries to assess their progress in multisectoral working on AMR, developing a national AMR action plan and implementing key actions to address AMR. The questionnaire is aligned with the specific objectives of the GAP-AMR and includes questions on progress in human health, animal health, crop production, food safety and the environment. This questionnaire collects information on country progress on AMR for inclusion in the report to the World Health Assembly and for global reporting to other organizations. The country responses will also be used to guide follow-up

actions and provide assistance and support. Global monitoring using this tool is to be repeated annually to show progress over time and identify areas for action. This questionnaire was sent to all eleven Member States of the SEA Region and all the eleven countries have responded.

Both the tools, one developed by the Regional Office for the SEA Region and the other by WHO (with FAO and OIE) for global surveys, monitor the current situation and progress made over time by countries on development and implementation of a NAP and its alignment with the GAP-AMR. However, there are some differences in the details of the subindicators and in the assessment methodology between the two tools.

The methodology followed for the global monitoring tool is self-assessment by the country to assess their progress in having a multisectoral working group on AMR. The Regional Office's tool, however, relies on a joint review of national programmes that is

  
This questionnaire collects information on country progress on AMR for inclusion in the report to the World Health Assembly and for global reporting to other organizations.

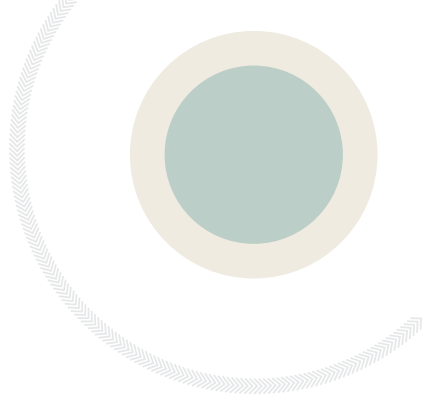


<sup>7</sup> FAO, OIE, WHO. Global monitoring of country progress on addressing antimicrobial resistance (AMR): country self-assessment questionnaire (version one). Geneva: WHO; 2016 (<http://www.who.int/antimicrobial-resistance/national-action-plans/AMR-country-questionnaire-1.1-English.pdf?ua=1> , accessed 3 July 2017).

inclusive of in-country stakeholders responsible for the five specific objectives, representatives from various professional associations and academicians, and an official/consultant from the Regional Office and WHO country office (FAO partners will be requested to participate next year). The joint team is involved in a workshop. During the workshop, each subindicator is discussed by the entire group, facilitated by the WHO team, and a consensus is reached on scoring (grading) for each focus area indicator and subindicator through guided discussion. For each country, the situation analysis was done in their country and a separate workshop was conducted in Bangkok where seven countries presented the findings and jointly agreed to the score for each subindicator of the seven focus area indicators. There could be some differences in appreciation obtained by the two tools, as the Regional Office tool relies on consensual findings and discussions on feasible recommendations and potential support from WHO. The interactive session with a large group involving many stakeholders has advantages: (i) it emphasizes among multidisciplinary participants that they are all equally important and a comprehensive One Health approach is needed to contain AMR in their country; (ii) by highlighting the common challenges among various sectors (human and animal), it provides a sense of direction for building systems among all concerned groups and stakeholders; and (iii) the group recognized at what level their country was for all the seven focus area indicators, and that the cooperation of all stakeholders

is needed to attain phase 5, a “sustainable operation” of national programmes, which requires funded programme operations, including an M&E mechanism for detecting, measuring and interpreting changes over a period of time.

The tool developed by the Regional Office has an extensive set of subindicators under each focus area indicator. Some of the subindicators provide insight into comprehensive governance, policy and system analysis that can be applied at the community level as well as at the system level. For example, the focus area indicator “National AMR surveillance system” has “national laboratory network strengthening” and “early warning systems”. For the focus area on “Rational use of antimicrobials and surveillance of use/sale”, a few subindicators such as “national AMR stewardship”, “national regulatory authority”, and “regulation of pharmacies on OTC and inappropriate sale of antibiotics and APIs” are included. Similarly, for other focus area indicators on “IPC and AMSP” and “One Health engagement” a few additional subindicators are provided than in the global monitoring tool. The indicator for research and innovation is monitored by the Regional Office tool. On the other hand, the global monitoring tool measures the legislation and regulations to prevent contamination of the environment with antimicrobials, which is not included in the Regional Office tool. The latter can be adapted or altered to expand its scope and be more inclusive of our regional tripartite partners, that is FAO and OIE in the future.



## Methodology limitations

The methodology for using the tool developed by the Regional Office to conduct a situation analysis in a country on the NAP-AMR has some limitations. First, the results are just a snapshot of the programme at the time of conducting the workshop; the status of each activity could be different or outdated after some time as the activities of AMR containment are dynamic and can and should change with time. These baseline analyses should be seen as the first of a long process of a WHO-led monitoring of NAP alignment and implementation rather than a one-shot analysis. The tool's approach gives a chance for actors of the programmes to share their perceptions of the challenges and needs; discuss justifications

of grading with external partners such as WHO and propose feasible recommendations. Second, the situation analysis focuses only on how well developed the AMR programme is in terms of governance, policy and system. The findings are based on a broad review of system functioning, structures and organizations rather than on an assessment of the quality of documents and direct observations of performance of the systems. Performance of the programme in terms of effectiveness of the interventions is of paramount importance and will complete the monitoring of NAP implementation. WHO is currently developing performance indicators to measure the effectiveness or impact of interventions.



## Conclusions and the way forward

The growing global health threat of AMR has now shifted from a technical problem to a much higher level; it is a visible political issue that is increasingly being prioritized. All Member States of the SEA Region have adopted the One Health approach by forming a multisectoral coordination group that includes policy-makers, practitioners and professionals from diverse fields who can address various aspects of the AMR containment programme.

**Development of a NAP:** As of June 2017, all but one country in the Region have developed or are in the process of finalizing the NAP for the containment of AMR. Of these, seven countries were willing to share publicly their NAPs via WHO's online library<sup>8</sup>. The last country that is yet to develop the NAP will be initiating the process by August 2017 with WHO's technical support. Despite this achievement, countries acknowledged that challenges with respect to aligning their NAP with the GAP still remain. These challenges are as follows:

- Many NAPs are solely endorsed by the Ministry of Health, although they recognize that AMR is a complex and multisectoral issue that will

need a higher-level governance structure. It is presumed that the latter condition is needed to govern the multisectoral coordination group, which has members from many different sectors, including different ministries in addition to the Ministry of Health, and representatives from civil society and private industries. The situation analysis conducted revealed that the initiative for development of a NAP has begun and the working group for combating AMR has representatives from different ministries in addition to the Ministry of Health, and representatives from other concerned stakeholders.

- Obtaining a complete and comprehensive operational plan with adequate budgeting will remain a challenge for years to come across the Region. One may reckon that the completeness of this criterion for GAP alignment should be taken as providing a sense of direction rather than an ultimate goal. Measuring the progress of the operational plan implementation will be an important monitoring task for WHO.

<sup>8</sup> Library of national action plans. In: World Health Organization: antimicrobial resistance (website) (<http://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>, accessed 3 July 2017).

- Having an M&E system embedded in the AMR containment programme is a new concept in many countries. The system was encouraged and included in most NAPs; however, it remains to be seen how the M&E system will operate.

As a word of caution, information reported in the country profile (Annex II and Table 1) with respect to the development of the NAP dated back to the time when the situation analysis was conducted in 2016. Interestingly, it is important to highlight that in 2016, only one country had finalized its NAP and a few countries had initiated its development.

Currently, the majority of Member States are in the early phases of NAP implementation; so far, the situation analysis tool has identified gaps and challenges in each focus area. The tool provides a combination of functionality and capacity assessment, and can be applied repeatedly over time to assess progress. The situation analysis conducted in ten countries of the Region has identified the priority areas where each country needs to work urgently. Overall, all countries need to address at least four priority areas for both the human and animal sectors: (i) surveillance of AMR; (ii) surveillance of antimicrobial use and consumption; (iii) strengthening of the DRA; and (iv) a comprehensive awareness-raising strategy at the national level for the general public and professionals.

WHO is committed to supporting all Member States in developing and implementing a NAP on containment of AMR. The WHO Regional Office for South-East Asia supported

the development of NAPs that are aligned with the World Health Assembly-endorsed GAP on AMR, and is committed to monitoring the implementation and progress made in the activities of NAPs. The Regional Office has established baseline data for national AMR control programmes to measure progress.

The Regional Office has adopted many strategies and activities to support Member States in developing NAPs. During the Sixty-ninth Regional Committee meeting held in Colombo, Sri Lanka, on 5–9 September 2016, the Regional Office proposed strategic actions to be taken to minimize the morbidity and mortality due to antibiotic-resistant infections and preserve the effectiveness of antibiotics for the treatment of common bacterial infections. The main strategic actions by WHO are providing advocacy, capacity-building and technical assistance, as well as supporting resource mobilization and leveraging other resources and partnerships.

The Regional Office will:

- provide support through evidence-based technical guidance, that is tailor-made support, to each SEA Region Member State following the AMR situation analysis results;
- document technical support to Member States and seek opportunities to document proof of evidence for advocacy and fundraising;
- strengthen collaboration and information-sharing with partners and WHO collaborating centres;



- identify and collaborate with Member States willing to undertake interventions within the NAP, which will demonstrate measurable outcomes or impact;
- develop the One-Health regional strategy in collaboration with OIE, FAO and other partners to take the AMR-related agenda ahead.

**Table 1. Phases for the seven focus areas with their sub-indicators of Member States of the South-East Asia Region during the situation analysis (May–December 2016)**

Focus area and sub-indicators	BAN	BHU	IND	INO	MAL	MMR	NEP	SRL	THA	TL
<b>1. National AMR action plan</b>										
(i) NAP in line with GAP-AMR <sup>a</sup>	2	3	2	3	2	2	2	3	3	2
<b>2. Awareness-raising</b>										
(i) awareness campaigns for the public	3	3	2	3	2	2	2	2	2	2
(ii) education and training strategies for professionals	1	2	2	3	1	2	2	1	3	1
<b>3. National AMR surveillance system</b>										
(i) national human AMR surveillance	2	2	2	2	2	2	3	3	3	1
(ii) national laboratory network strengthening	2	3	2	1	1	2	3	2	4	1
(iii) early warning systems	1	2	2	-	1	1	2	1	1	1
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>										
(i) a national AMR containment policy for control of human use of antimicrobials; AMR stewardship	1	2	3	4	2	1	2	2	2	1
(ii) NRA or DRA	3	5	4	4	3	3	3	2	2	1
(iii) surveillance of antimicrobial use and sales in humans	2	1	3	3	2	2	3	1	2	1
(iv) regulation of finished antibiotics and APIs	3	4	4	-	2	2	2	2	2	2
(v) regulation of pharmacies on OTC sales and inappropriate sale of antibiotics and APIs	3	5	4	-	2	2	3	2	2	1
<b>5. IPC and AMR stewardship programme</b>										
(i) AMR stewardship programme in health-care settings	2	2	3	3	1	2	2	1	3	1
(ii) IPC programme in health-care settings	2	3	3	3	2	3	1	3	2	1
(iii) national HAI and related AMR surveillance	2	4	3	2	2	1	1	2	2	1
(iv) sanitation, hygiene and vaccination	1	5	4	-	2	3	2	4	3	2

Focus area and sub-indicators	BAN	BHU	IND	INO	MAL	MMR	NEP	SRL	THA	TL
<b>6. Research and innovation</b>										
(i) R&D and innovation on AMR prevention and containment, including research funding	2	2	2	2	1	2	1	1	1	1
<b>7. One Health engagement</b>										
(i) a national AMR containment policy and regulatory framework for control of antibiotic use in animals, and registration for use	2	2	2	2	2	1	2	3	2	1
(ii) national surveillance of AMR, and use and sales of antimicrobials at the national level in the veterinary sector	2	1	1	2	3	1	2	1	2	1
(iii) IPC in the animal sector	2	2	2	3	1	2	1	2	2	1
(iv) AMR awareness generation and education in the animal sector	2	2	2	1	1	1	1	1	2	1

Note: 1. Phase of exploration and adoption (phase 1); 2. Phase of programme installation (phase 2); 3. Phase of initial implementation (phase 3); 4. Phase of full operation (phase 4); 5. Phase of sustainable operation (phase 5).

<sup>a</sup>Updated on 24 May 2017 based on WHO's review of existing NAPs

# Annex I: Situation analysis tool (WHO Regional Office for South-East Asia)

Instrument for situation analysis and monitoring of AMR in the South-East Asia Region (in-country)

Focus areas	Indicators/Phases	Exploration and adoption 1	Programme installation 2	Initial implementation 3	Full operation 4	Sustainable operation 5
1 National AMR action plan	<b>NAP in line with GAP-AMR</b>	No action plan or no national multisectoral committee or AMR committee established but includes only one ministry	AMR working group established and national action plan under way	GAP-aligned action plan*, including operational plan with defined activities and respective budgets available	Action plan includes operational plan being rolled out and scaled up with defined activities and respective budgets	Action plan actively implemented in multiple areas with a monitoring framework in place
	<b>Awareness campaigns for the public</b>	Government not involved in awareness-raising activities on antibiotic resistance	Some government-led activities in parts of the country to raise awareness about AMR and actions to address it	Nationwide, government-led antibiotic awareness campaign targeting the general public OR professionals**	Nationwide, government-led antibiotic awareness campaign targeting the public AND professionals	Impact of government-led awareness campaigns assessed regarding behaviour changes in the public and professionals
2. Awareness raising	<b>Education and training strategies for professionals</b>	No policy or strategy	Relevant policies developed but ad-hoc training courses in some disciplines	AMR in some pre-service training and/or some special courses OR Continuous professional development and regular audit of learning	AMR in some pre-service training and/or some special courses AND Continuous professional development and regular audit of learning	AMR incorporated into pre-service training for all relevant cadres Regular continuing professional development

\* Multisectoral or one-health;

\*\* Specific groups (e.g. doctors, nurses, pharmacists, farmers, veterinarians)

Focus areas	Indicators/Phases	Exploration and adoption 1	Programme installation 2	Initial implementation 3	Full operation 4	Sustainable operation 5
3. National AMR surveillance system	<b>National human AMR surveillance</b>	No capacity for AMR laboratory and/or limited reporting; or no surveillance guidelines	Guidelines developed but not fully implemented – limited quality data and analysis, and representativeness	Standardized national AMR surveillance in place and representative of country but limited number of operational sites	Surveillance in place and functional for monitoring AMR trends accurately and in time but no contributing data to Global Antimicrobial Resistance Surveillance System (GLASS)	National AMR surveillance regularly assessed and adjusted; and contributing to GLASS
	<b>National laboratory network strengthening</b>	No national network developed	A national network with testing according to international standards is planned	National reference lab identified and quality-assured laboratory networks developed only at a few surveillance sites	A national network of health laboratories that underwent EQA developed in most/ALL surveillance sites	Lab network established, EQA measures in place, and demonstrated capacity of reference lab for research
	<b>Early warning systems</b>	No system in place or planned	System planned, in keeping with international standards	System implemented in pilot mode, or if implemented on a national scale, not fully functional (not sensitive to reportable events)	Demonstrated functional capacity: data centralized and analysed with reports	Demonstrated functional capacity and proof of response from detection

Focus areas	Indicators/Phases	Exploration and adoption 1	Programme installation 2	Initial implementation 3	Full operation 4	Sustainable operation 5
4. Rational use of antimicrobials and surveillance of use/sale (community-based)	<b>A national AMR containment policy for control of human use of antimicrobials AMS</b>	No/weak national policy and plan, regulations for antimicrobial use and availability	National AMSP planned and under development	National AMSP developed, including tools to implement and monitor AMS progress and impact	AMSP implemented by relevant institutions Regulations for antimicrobial use and availability implemented in limited capacity	A national AMSP for control of human use of antimicrobials implemented and enforced > 2 years
	<b>NRAs or DRAs</b>	No official NRA/DRA or if existing, has limited capacity	NRA/DRA with limited capacity but strategic planning in place for capacity-building and appropriate budgeting	NRA/DRA system set up for oversight but not fully functional	Tools for quality assurance and registration of antibiotics in place and inspection implemented but limited capacity for enforcement of policies and regulation	Competent and functional NRA/DRA with capacity to ensure/enforce antibiotic quality standards and take measures against substandard products and inspect pharmacies
	<b>Surveillance of AMU and sales in humans</b>	No guidelines for surveillance of use and/or sales of antimicrobials	National policy and plan on surveillance of use of antimicrobials under development or developed and approved but not implemented (surveillance in individual facilities and national-level sales)	Monitoring sales of antimicrobials at national level not implemented Monitoring of use irregular and limited to a few facilities that are not representative	On a regular basis (every year/two years) sales data collected at national level Data on use are collected from a small and not representative sample of individual health-care facilities No established analysis with national AMR lab-based surveillance	On a regular basis (every year/two-years) sales data at national level are collected and AMU surveys are conducted in a representative sample of facilities and translated into action Links with national AMR surveillance data analysed and reported

Focus areas	Indicators/Phases	Exploration and adoption 1	Programme installation 2	Initial implementation 3	Full operation 4	Sustainable operation 5
	<b>Regulation of finished antibiotic products and APIs</b>	No official regulation on import, export, production, distribution and use of finished antibiotic products and APIs or existing with limited capacity	Regulation with limited capacity but strategic planning in place for capacity-building and appropriate budgeting	Regulatory authority and system set up for oversight with limited functional capability	Regulatory authority and system in place and inspected but implemented but limited capacity for enforcement of policies and regulation	Regulatory authority and system in place and are fully and effectively implemented
	<b>Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs</b>	No official regulation on OTC sale and inappropriate sale of antibiotics and APIs	Regulation with limited capacity but strategic planning in place for capacity-building and appropriate budgeting	Regulatory authority and system set up for oversight with a limited functional capability	Regulatory authority and system in place and inspected but implemented but limited capacity for enforcement of regulation	Regulatory authority and system in place and are fully and effectively implemented

Focus areas	Indicators/Phases	Exploration and adoption 1	Programme installation 2	Initial implementation 3	Full operation 4	Sustainable operation 5
5. IPC & AMS programme	<b>AMS programme in health-care settings</b>	No national AMS policy or operational plan available or approved	A national IPC/AMR policy, or operational plan, is available but weak SOPs, guidelines and protocols not available to all hospitals (limited updates)	National IPC/AMR plan-aligned IPC/AMR plans implemented in limited number of health-care settings	National IPC/AMR plan-aligned IPC/AMR plans are implemented in almost all health-care settings	IPC/AMR measures and their effectiveness are widely implemented and regularly evaluated and shared
	<b>IPC programme in health-care settings</b>	No national IPC policy, guidelines or action plans to mandate IPC in health-care settings	A national capacity-building programme, or operational plan, is developed; SOPs, guidelines and protocols developed and available but not implemented	IPC programme and capacity-building plans implemented in selected health-care settings	IPC programme and capacity-building plans implemented nationwide	IPC capacity-building and programme effectiveness are regularly evaluated and shared
	<b>National HAI and related AMR surveillance</b>	No policies, limited national plan and guidelines to mandate hospitals to conduct HAI surveillance	A few public and private facilities have HAI surveillance but data not centralized at national level	A few public and private facilities have HAI surveillance and share data with the national level	Centralized data on HAI from several hospitals but with limited data analysis and detection capacity	Monitoring and response frameworks established to identify critical HAI events, especially related to emergence of AMR indicator bacteria against critical drugs
	<b>Sanitation, hygiene and vaccination</b>	No formal campaign on sanitation, hygiene and vaccination	Formal campaign to enhance sanitation, hygiene and vaccination being developed	Formal campaign to enhance sanitation, hygiene and vaccination implemented on a small scale	Formal campaign to enhance sanitation, hygiene and vaccination implemented on a large scale	Formal campaign to enhance sanitation, hygiene and vaccination implemented on a large scale and associated with M&E system

Focus areas	Indicators/Phases	Exploration and adoption 1	Programme installation 2	Initial implementation 3	Full operation 4	Sustainable operation 5
6. Research and innovation	<b>R&amp;D and innovation on AMR prevention and containment (+ research funding)</b>	No policies fostering research environment, although capacity exists for research	Policies planned and existing structure with a plan to foster research and innovation on AMR	Presence of policies and investments to foster research and innovation on AMR	Research consortium, dynamic research programmes are ongoing thanks to government-led agenda	Government-led research outputs related to AMR global research agenda
	<b>A national AMR containment policy and regulatory framework for control of antibiotic use in animals, and registration for use</b>	No national policy and plan to reduce the use of antibiotics	National policy and plan on use of antimicrobials developed and approved, or Regulatory framework for control of use in animals, and registration for use developed but not implemented	Implementation of policy and plan but limited capacity for monitoring use and quality of drugs	Policy and plan implemented with some capacity for monitoring but limited capacity for enforcement	Policy and plan implemented with proper capacity for monitoring and increased capacity for enforcement
7. One Health engagement	<b>National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector</b>	No/weak national policy and guidelines	Limited capacity for surveillance in any of sales of antimicrobial use	Some capacity and data generated from sales, AMR or antimicrobial use	Some comparative analysis of surveillance data between AMR and antimicrobial use	Comprehensive approach to surveillance with coordinated analysis between humans and animals



Focus areas	Indicators/Phases	Exploration and adoption 1	Programme installation 2	Initial implementation 3	Full operation 4	Sustainable operation 5
7. One Health engagement	<b>IPC in the animal sector</b>	No policy and national guidelines developed for biosecurity to reduce infection rates in food and both large and small scale producers	Policies and national guidelines in line with international standards, including vaccination policy and Codex Alimentarius standards	Limited implementation, particularly in large scale producers	Full implementation, particularly in large scale producers	Fully implemented in multiple areas with a monitoring framework in place
	<b>AMR awareness generation and education in the animal sector</b>	No policies or strategies or only planned	Policies or strategies developed	AMR included in some pre-service training and/or some special courses OR continuous professional development and regular audit of learning	AMR included in some pre-service training and/or some special courses AND continuous professional development and regular audit of learning	Impact of education programme assessed from behaviour changes



## Annexure II: Country profiles

### Bangladesh\*

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	2	AMR working group established and NAP under way
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	3	Nationwide, government-led antibiotic awareness campaign targeting the general public
	2.2 Education and training strategies for professionals	1	No policy or strategy
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	2	Guidelines developed but not fully implemented – limited quality data and analysis, and representativeness
	3.2 National laboratory network strengthening	2	A national network with testing according to international standards is planned
	3.3 Early warning systems	1	No system in place or planned
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	1	No/weak national policy and plan, regulations for antimicrobial use and availability
	4.2 NRA or DRA	3	NRA/DRA system set up for oversight but not fully functional
	4.3 Surveillance of AMU and sales in humans	2	National policy and plan on surveillance of use of antimicrobials under development or developed and approved but not implemented (surveillance in individual facilities and national-level sales)
	4.4 Regulation of finished antibiotic products and APIs	3	Regulatory authority and system set up for oversight with limited functional capability
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	3	Regulatory authority and system set up for oversight with a limited functional capability

Focus area	Indicators	Phase	Justification/Comment
<b>5. IPC, and AMS programme</b>	5.1 AMS programme in health-care settings	2	A national IPC/AMR policy or operational plan is available but weak SOPs, guidelines and protocols, which are not available in all hospitals (limited updates)
	5.2 IPC programme in health-care settings	2	A national capacity-building programme or operational plan is developed; SOPs, guidelines and protocols developed and available but not implemented
	5.3 National HAI and related AMR surveillance	2	A few public and private facilities have HAI surveillance but data not centralized at the national level
	5.4 Sanitation, hygiene and vaccination	1	No formal campaign on sanitation, hygiene and vaccination
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	2	Policies planned and existing structure has a plan to foster research and innovation on AMR
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	2	National policy and plan on use of antimicrobials developed and approved or Regulatory framework for control of use in animals, and registration for use developed but not implemented
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	2	Limited capacity for surveillance in any of sales in large and small scale producer
	7.3 IPC in the animal sector	2	Policies and national guidelines in line with international standards planned, including vaccination policy and Codex Alimentarius standards
	7.4 AMR awareness generation and education in the animal sector	2	Policies or strategies developed

\*Country profile as per the country representative's presentation at the NAP Development Workshop in Bangkok, 31 August 2016

**Status as per the situation analysis conducted by the country (Bangladesh) with the tool and guidance of the Regional Office**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR		✓			
AMR-related awareness-raising		✓			
National AMR surveillance		✓			
Rational use of antimicrobials and surveillance of use/sale (community)		✓			
IPC programme and AMS programme in health-care settings		✓			
Research and innovation		✓			
One Health engagement		✓			

## Bhutan\*

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	2	AMR working group established and NAP under way
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	3	Nationwide, government-led antibiotic awareness campaign targeting the general public OR professionals
	2.2 Education and training strategies for professionals	2	Relevant policies developed but ad-hoc training courses only in some disciplines
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	2	Guidelines developed but not fully implemented – limited quality data and analysis, and representativeness
	3.2 National laboratory network strengthening	3	National reference laboratory identified and quality-assured laboratory networks developed only at a few surveillance sites
	3.3 Early warning systems	2	System planned, in keeping with international standards
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	2	National AMSP planned and under development
	4.2 NRA or DRA	5	Competent and functional NRA/DRA with capacity to ensure/enforce antibiotic quality standards and take measures against substandard products and inspect pharmacies
	4.3 Surveillance of AMU and sales in humans	1	No guidelines for surveillance of use and/or sales of antimicrobials
	4.4 Regulation of finished antibiotic products and APIs	4	Regulatory authority and system in place and inspection implemented, but limited capacity for enforcement of policies and regulation
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	5	Regulatory authority and system in place, and are fully and effectively implemented

Focus area	Indicators	Phase	Justification/Comment
<b>5. IPC, and AMS programme</b>	5.1 AMS programme in health-care settings	2	A national IPC/AMR policy or operational plan is available but weak SOPs; guidelines and protocols not available in all hospitals (limited updates)
	5.2 IPC programme in health-care settings	3	IPC programme and capacity-building plans implemented in selected health-care settings
	5.3 National HAI and related AMR surveillance	4	Centralized data on HAI from several hospitals but with limited data analysis and detection capacity
	5.4 Sanitation, hygiene and vaccination	5	Formal campaign to enhance sanitation, hygiene and vaccination is implemented on a large scale and associated with M&E system
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	2	Policies planned and existing structure has a plan to foster research and innovation on AMR
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	2	National policy and plan on use of antimicrobials developed and approved or Regulatory framework for control of use in animals, and registration for use developed but not implemented
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	1	No/weak national policy and guidelines
	7.3 IPC in the animal sector	2	Policies and national guidelines in line with international standards planned, including vaccination policy and Codex Alimentarius standards
	7.4 AMR awareness generation and education in the animal sector	2	Policies or strategies developed

\*Country profile as per the country representative's presentation at the NAP Development Workshop in Bangkok, 31 August 2016

**Status as per the situation analysis conducted by the country (Bhutan) with the tool and guidance of the Regional Office**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR		✓			
AMR-related awareness-raising			✓		
National AMR surveillance		✓			
Rational use of antimicrobials and surveillance of use/sale (community)			✓		
IPC programme and AMS programme in health-care settings				✓	
Research and innovation		✓			
One Health engagement		✓			

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	2	AMR working group established and NAP under way
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	2	Some government-led activities in parts of the country to raise awareness about AMR and actions to address it
	2.2 Education and training strategies for professionals	2	Relevant policies developed but ad-hoc training courses in some disciplines
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	2	Guidelines developed but not fully implemented – limited data analysis and/or representativeness
	3.2 National laboratory network strengthening	2	National reference lab identification and designation under process
	3.3 Early warning systems	2	System planned, in keeping with international standards
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	3	National policy for containment of AMR 2011 in place and National AMSP planned and under development
	4.2 NRA or DRA	4	Tools for quality assurance and registration of antibiotics in place and inspection implemented but limited capacity for enforcement of policies and regulation
	4.3 Surveillance of AMU and sales in humans	3	Monitoring sales of antimicrobials at national level not implemented. Monitoring of use irregular and limited to a few facilities that are not representative
	4.4 Regulation of finished antibiotic products and APIs	4	Regulatory authority and system in place and inspection implemented but limited capacity for enforcement of policies and regulation
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	4	Regulatory authority and system in place and inspection implemented but limited capacity for enforcement of regulation



Focus area	Indicators	Phase	Justification/Comment
<b>5. Infection prevention and control (IPC), and AMR stewardship programme</b>	5.1 AMS programme in health-care settings	3	National IPC/AMR plan being developed; aligned IPC/AMR plans implemented in a limited number of health-care settings
	5.2 IPC programme in health-care settings	3	IPC programme and capacity-building plans implemented in selected health-care settings
	5.3 National HAI and related AMR surveillance	3	A few public and private facilities have HAI surveillance and share data with the national level
	5.4 Sanitation, hygiene and vaccination	4	Formal campaign to enhance sanitation, hygiene and vaccination is implemented on a large scale
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	2	Policies planned and existing structure with a plan to foster research and innovation on AMR
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	2	National policy and plan on use of antimicrobials developed and approved or Regulatory framework for control of use in animals, and registration for use developed but not implemented
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	1	No national policy or guidelines
	7.3 IPC in the animal sector	2	Policies and national guidelines in line with international standards planned, including vaccination policy and Codex Alimentarius standards
	7.4 AMR awareness generation and education in the animal sector	2	Limited awareness, although veterinarians have some training

\* Data for India compiled using data from country progress in the implementation of the global action plan on antimicrobial resistance (WHO, FAO and OIE global tripartite database), available at <http://who.int/antimicrobial-resistance/global-action-plan/database/en/> (accessed on 17 March 2017)

**Status as per the situation analysis conducted by the country (India) with the tool and guidance of the WHO Regional Office for South-East Asia**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR		✓			
AMR-related awareness-raising		✓			
National AMR surveillance		✓			
Rational use of antimicrobials and surveillance of use/sale (community)				✓	
IPC programme and AMS programme in health-care settings			✓		
Research and innovation		✓			
One Health engagement		✓			

## Indonesia\*

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	2	AMR working group established and NAP under way
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	3	Nationwide, government-led antibiotic awareness campaign targeting the general public OR professionals
	2.2 Education and training strategies for professionals	3	AMR in some pre-service training and/or some special courses
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	2	Guidelines developed but not fully implemented – limited quality data and analysis and representativeness
	3.2 National laboratory network strengthening	1	No national network developed
	3.3 Early warning systems	-	NA
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	4	AMSP implemented by relevant institutions Regulations for antimicrobial use and availability implemented but capacity limited for enforcement
	4.2 NRA or DRA	4	Tools for quality assurance and registration of antibiotics in place and inspection implemented but limited capacity for enforcement of policies and regulation
	4.3 Surveillance of AMU and sales in humans	3	Monitoring sales of antimicrobials at national level not implemented. Monitoring of use irregular and limited to few facilities that are not representative
	4.4 Regulation of finished antibiotic products and APIs	-	NA
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	-	NA

Focus area	Indicators	Phase	Justification/Comment
<b>5. Infection prevention and control (IPC), and AMR stewardship programme</b>	5.1 AMS programme in health-care settings	3	National IPC/AMR plan-aligned IPC/AMR plans implemented in a limited number of health-care settings
	5.2 IPC programme in health-care settings	3	IPC programme and capacity-building plans implemented in selected health-care settings
	5.3 National HAI and related AMR surveillance	2	A few public and private facilities have HAI surveillance but data not centralized at the national level
	5.4 Sanitation, hygiene and vaccination	-	NA
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	2	Policies planned and existing structure with a plan to foster research and innovation on AMR
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	2	National policy and plan on use of antimicrobials developed and approved or Regulatory framework for control of use in animals, and registration for use developed but not implemented
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	2	Limited capacity for surveillance in any of sales in large and small scale producer
	7.3 IPC in the animal sector	3	Limited implementation, particularly among large scale producers
	7.4 AMR awareness generation and education in the animal sector	1	No policies or strategies or only planned

\*Country profile as per the country representative's presentation at the NAP Development Workshop in Indonesia, 18–20 May 2016

**Status as per the situation analysis conducted by the country (Indonesia) with the tool and guidance of the WHO Regional Office for South-East Asia**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR		✓			
AMR-related awareness-raising			✓		
National AMR surveillance		✓			
Rational use of antimicrobials and surveillance of use/sale (community)				✓	
IPC programme and AMS programme in health-care settings			✓		
Research and innovation		✓			
One Health engagement		✓			

## Maldives\*

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	2	AMR working group established and NAP under way
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	2	Some government-led activities in parts of the country to raise awareness about AMR and actions to address it
	2.2 Education and training strategies for professionals	1	No policy or strategy
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	2	Guidelines developed but not fully implemented – limited quality data and analysis and representativeness
	3.2 National laboratory network strengthening	1	No national network developed
	3.3 Early warning systems	1	No national network developed
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	2	National AMSP planned and under development
	4.2 NRA or DRA	3	NRA/DRA system set up for oversight but not fully functional
	4.3 Surveillance of AMU and sales in humans	2	National policy and plan on surveillance of use of antimicrobials under development or developed and approved but not implemented (surveillance in individual facilities and national-level sales)
	4.4 Regulation of finished antibiotic products and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building and appropriate budgeting
<b>5. Infection prevention and control (IPC), and AMR stewardship programme</b>	5.1 AMS programme in health-care settings	1	National AMS policy or operational plan is not available
	5.2 IPC programme in health-care settings	2	A national capacity-building programme or operational plan is developed; SOPs, guidelines and protocols developed and available but not implemented
	5.3 National HAI and related AMR surveillance	2	A few public and private facilities have HAI surveillance but data not centralized at the national level
	5.4 Sanitation, hygiene and vaccination	2	Formal campaign to enhance sanitation, hygiene and vaccination being developed

Focus area	Indicators	Phase	Justification/Comment
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	1	No policies fostering a research environment, although capacity exists for research
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	2	National policy and plan on use of antimicrobials developed and approved or Regulatory framework for control of animal use, and registration for use developed but not implemented
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	3	Some capacity and data generated from sales, AMR or AMU
	7.3 IPC in the animal sector	1	No policy and national guidelines developed for biosecurity to reduce infection rates in food and both large and small scale producers
	7.4 AMR awareness generation and education in the animal sector	1	No policies or strategies or only planned

\*Country profile as per the country representative's presentation at the NAP Development Workshop in Bangkok, 31 August 2016

**Status as per the situation analysis conducted by the country (Maldives) with the tool and guidance of the WHO Regional Office for South-East Asia**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR		✓			
AMR-related awareness-raising		✓			
National AMR surveillance	✓				
Rational use of antimicrobials and surveillance of use/sale (community)		✓			
IPC programme and AMS programme in health-care settings		✓			
Research and innovation	✓				
One Health engagement		✓			



## Myanmar\*

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	2	AMR working group established and NAP under way
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	2	Some government-led activities in parts of the country to raise awareness about AMR and actions to address it
	2.2 Education and training strategies for professionals	2	Relevant policies developed but ad-hoc training courses in some disciplines
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	2	Guidelines developed but not fully implemented – limited quality data and analysis and representativeness
	3.2 National laboratory network strengthening	2	A national network with testing according to international standards is planned
	3.3 Early warning systems	1	No national network developed
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	1	No/weak national policy and plan, regulations for antimicrobial use and availability
	4.2 NRA or DRA	3	NRA/DRA system set up for oversight but not fully functional
	4.3 Surveillance of AMU and sales in humans	2	National policy and plan on surveillance of use of antimicrobials under development or developed and approved but not implemented (surveillance in individual facilities and national-level sales)
	4.4 Regulation of finished antibiotic products and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building and appropriate budgeting

Focus area	Indicators	Phase	Justification/Comment
<b>5. Infection prevention and control (IPC), and AMR stewardship programme</b>	5.1 AMS programme in health-care settings	2	A national IPC/AMR policy or operational plan is available but weak SOPs, guidelines and protocols, and not available at all hospitals (limited updates)
	5.2 IPC programme in health-care settings	3	IPC programme and capacity-building plans implemented in selected health-care settings
	5.3 National HAI and related AMR surveillance	1	No policies, limited national plan and guidelines to mandate hospitals for conducting HAI surveillance
	5.4 Sanitation, hygiene and vaccination	3	Formal campaign to enhance sanitation, hygiene and vaccination is implemented on a small scale
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	2	Policies planned and existing structure has a plan to foster research and innovation on AMR
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	1	No national policy and plan to reduce the use of antibiotics
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	1	No/weak national policy and guidelines
	7.3 IPC in the animal sector	2	Policies and national guidelines in line with international standards planned, including vaccination policy and Codex Alimentarius standards
	7.4 AMR awareness generation and education in the animal sector	1	No policies or strategies or only planned

\*Country profile as per the country representative's presentation at the NAP Development Workshop in Bangkok, 31 August 2016

**Status as per the situation analysis conducted by the country (Myanmar) with the tool and guidance of the WHO Regional Office for South-East Asia**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR		✓			
AMR-related awareness-raising		✓			
National AMR surveillance		✓			
Rational use of antimicrobials and surveillance of use/sale (community)		✓			
IPC programme and AMS programme in health-care settings		✓			
Research and innovation		✓			
One Health engagement	✓				

## Nepal\*

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	2	AMR working group established and NAP under way
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	2	Some government-led activities in parts of the country to raise awareness about AMR and actions to address it
	2.2 Education and training strategies for professionals	2	Relevant policies developed but ad-hoc training courses in some disciplines
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	3	Standardized national AMR surveillance in place and representative of country but limited number of operating sites
	3.2 National laboratory network strengthening	3	National reference laboratory identified and quality-assured laboratory networks developed only at a few surveillance sites
	3.3 Early warning systems	2	System planned, in keeping with international standards
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	2	National AMSP planned and under development
	4.2 NRA or DRA	3	NRA/DRA system set up for oversight but not fully functional
	4.3 Surveillance of AMU and sales in humans	3	Monitoring sales of antimicrobials at national level not implemented. Monitoring of use irregular and limited to a few facilities that are not representative
	4.4 Regulation of finished antibiotic products and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	3	Regulatory authority and system set up for oversight with a limited functional capability
<b>5. Infection prevention and control (IPC), and AMR stewardship programme</b>	5.1 AMS programme in health-care settings	2	A national IPC/AMR policy or operational plan is available but weak SOPs, guidelines and protocols not available at all hospitals (limited updates)
	5.2 IPC programme in health-care settings	1	No national IPC policy, guidelines or action plans to mandate IPC in health-care settings
	5.3 National HAI and related AMR surveillance	1	No policies, limited national plan and guidelines to mandate HAI surveillance in hospitals
	5.4 Sanitation, hygiene and vaccination	2	Formal campaign to enhance sanitation, hygiene and vaccination being developed

Focus area	Indicators	Phase	Justification/Comment
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	1	No policies fostering research environment, although capacity exists for research
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	2	National policy and plan on use of antimicrobials developed and approved or Regulatory framework for control of use in animals, and registration for use developed but not implemented
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	2	Limited capacity for surveillance in any of sales in large and small scale producer
	7.3 IPC in the animal sector	1	No policy and national guidelines developed for biosecurity to reduce infection rates in food both large and small scale producer
	7.4 AMR awareness generation and education in the animal sector	1	No policies or strategies or only planned

\*Country profile as per the country representative's presentation at the NAP Development Workshop in Bangkok, 31 August 2016

**Status as per the situation analysis conducted by the country (Nepal) with the tool and guidance of the WHO Regional Office for South-East Asia**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR		✓			
AMR-related awareness-raising		✓			
National AMR surveillance			✓		
Rational use of antimicrobials and surveillance of use/sale (community)			✓		
IPC programme and AMS programme in health-care settings		✓			
Research and innovation	✓				
One Health engagement		✓			

## Sri Lanka\*

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	2	AMR working group established and NAP under way
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	2	Some government-led activities in parts of the country to raise awareness about AMR and actions to address it
	2.2 Education and training strategies for professionals	1	No policy or strategy
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	3	Standardized national AMR surveillance in place and representative of country but limited number of operating sites
	3.2 National laboratory network strengthening	2	A national network with testing according to international standards is planned
	3.3 Early warning systems	1	No system in place or planned
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	2	National AMSP planned and under development
	4.2 NRA or DRA	2	NRA/DRA with limited capacity but strategic planning in place for capacity-building and appropriate budgeting
	4.3 Surveillance of AMU and sales in humans	1	No guidelines for surveillance of use and/or sales of antimicrobials
	4.4 Regulation of finished antibiotic products and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building and appropriate budgeting
<b>5. Infection prevention and control (IPC), and AMR stewardship programme</b>	5.1 AMS programme in health-care settings	1	No national AMR stewardship policy or operational plan is available or approved
	5.2 IPC programme in health-care settings	3	IPC programme and capacity-building plans implemented in selected health-care settings
	5.3 National HAI and related AMR surveillance	2	A few public and private facilities have HAI surveillance but data not centralized at national level
	5.4 Sanitation, hygiene and vaccination	4	Formal campaign to enhance sanitation, hygiene and vaccination implemented on a large scale

Focus area	Indicators	Phase	Justification/Comment
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	1	No policies fostering research environment, although capacity exists for research
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	3	Implementation of policy and plan but limited capacity for monitoring of use and quality of drugs
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	1	No/weak national policy and guidelines
	7.3 IPC in the animal sector	2	Policies and national guidelines in line with international standards planned, including vaccination policy and Codex Alimentarius standards
	7.4 AMR awareness generation and education in the animal sector	1	No policies or strategies or only planned

\*Country profile as per the situation analysis completed in Colombo, 29–31 August 2016



**Status as per the situation analysis conducted by the country (Sri Lanka) with the tool and guidance of the WHO Regional Office for South-East Asia**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR		✓			
AMR-related awareness-raising		✓			
National AMR surveillance		✓			
Rational use of antimicrobials and surveillance of use/sale (community)		✓			
IPC programme and AMS programme in health-care settings			✓		
Research and innovation	✓				
One Health engagement		✓			

## Thailand\*

Focus area	Indicators	Phase	Justification/Comment
<b>1. National AMR action plan</b>	1.1 NAP in line with GAP-AMR	3	GAP-aligned action plan, including operational plan with defined activities and respective budgets available
<b>2. Awareness-raising</b>	2.1 Awareness campaigns for the public	2	Some government-led activities in parts of the country to raise awareness about AMR and actions to address it
	2.2 Education and training strategies for professionals	3	AMR in some pre-service training and/or some special courses
<b>3. National AMR surveillance system</b>	3.1 National human AMR surveillance	3	Standardized national AMR surveillance in place and representative of country but limited number of operating sites
	3.2 National laboratory network strengthening	4	A national network of health laboratories with EQA developed in most/all surveillance sites
	3.3 Early warning systems	1	No system in place or planned
<b>4. Rational use of antimicrobials and surveillance of use/sale (community-based)</b>	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	2	National AMSP planned and under development
	4.2 NRA or DRA	2	NRA/DRA with limited capacity but strategic planning in place for capacity-building and appropriate budgeting
	4.3 Surveillance of AMU and sales in humans	2	National policy and plan on surveillance of use of antimicrobials under development or developed and approved but not implemented (surveillance in individual facilities and national-level sales)
	4.4 Regulation of finished antibiotic products and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building and appropriate budgeting

Focus area	Indicators	Phase	Justification/Comment
<b>5. Infection prevention and control (IPC), and AMR stewardship programme</b>	5.1 AMS programme in health-care settings	3	National IPC/AMR plan-aligned IPC/AMR plans implemented in limited number of health-care settings
	5.2 IPC programme in health-care settings	2	A national capacity-building programme or operational plan is developed; SOPs, guidelines and protocols developed and available but not implemented
	5.3 National HAI and related AMR surveillance	2	Few public and private facilities have HAI surveillance but data not centralized at the national level
	5.4 Sanitation, hygiene and vaccination	3	Formal campaign to enhance sanitation, hygiene and vaccination is implemented on a small scale
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	1	No policies fostering research environment although capacity exists for research
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	2	National policy and plan on use of antimicrobials developed and approved or Regulatory framework for control of use in animals, and registration for use developed but not implemented
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	2	Limited capacity for surveillance in any of sales in large and small scale producer
	7.3 IPC in the animal sector	2	Policies and national guidelines in line with international standards planned, including vaccination policy and Codex Alimentarius standards
	7.4 AMR awareness generation and education in the animal sector	2	Policies or strategies developed

\*Country profile as per the country representative's presentation at the NAP Development Workshop in Bangkok, 31 August 2016

**Status as per the situation analysis conducted by the country (Thailand) with the tool and guidance of the WHO Regional Office for South-East Asia**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR			✓		
AMR-related awareness-raising			✓		
National AMR surveillance			✓		
Rational use of antimicrobials and surveillance of use/sale (community)		✓			
IPC programme and AMS programme in health-care settings			✓		
Research and innovation	✓				
One Health engagement		✓			

## Timor-Leste\*

Focus area	Indicators	Phase	Justification/Comment
1. National AMR action plan	1.1 NAP in line with GAP-AMR	1	No action plan. National multisectoral committee or AMR task force formed but chairs not formalized from different ministries
2. Awareness-raising	2.1 Awareness campaigns for the public	2	Some government-led activities in parts of the country to raise awareness about AMR and actions to address it
	2.2 Education and training strategies for professionals	1	No policy or strategy
3. National AMR surveillance system	3.1 National human AMR surveillance	1	No capacity for AMR laboratory and/or limited reporting; or no surveillance guidelines
	3.2 National laboratory network strengthening	1	No national network developed
	3.3 Early warning systems	1	No system in place or planned
4. Rational use of antimicrobials and surveillance of use/sale (community-based)	4.1 A national AMR containment policy for control of human use of antimicrobials, AMS	1	No/weak national policy and plan, or regulation for antimicrobial use and availability
	4.2 NRA or DRA	1	NRA/DRA exists with limited capacity
	4.3 Surveillance of AMU and sales in humans	1	No guidelines for surveillance of use and/or sales of antimicrobials
	4.4 Regulation of finished antibiotic products and APIs	2	Regulation with limited capacity but strategic planning in place for capacity-building
	4.5 Regulation of pharmacies on OTC sale and inappropriate sale of antibiotics and APIs	1	No official regulation on OTC sale and inappropriate sale of antibiotics and APIs
5. Infection prevention and control (IPC), and AMR stewardship programme	5.1 AMS programme in health-care settings	1	No national AMS policy, or operational plan is available or approved
	5.2 IPC programme in health-care settings	1	No national IPC policy, guidelines or action plans to mandate IPC in health-care settings  Guidelines on IPC are available, but need to be updated and endorsed by the government
	5.3 National HAI and related AMR surveillance	1	No policies, limited national plan and guidelines to mandate HAI surveillance in hospitals
	5.4 Sanitation, hygiene and vaccination	2	Formal campaign to enhance sanitation, hygiene and vaccination being developed

Focus area	Indicators	Phase	Justification/Comment
<b>6. Research and innovation</b>	6.1 R&D and innovation on AMR prevention and containment (+ research funding)	1	No policies fostering research environment although capacity exists for research
<b>7. One Health engagement</b>	7.1 A national AMR-containment policy and regulatory framework for control of use in animals, and registration for use	1	No national policy and plan to reduce the use of antibiotics
	7.2 National surveillance of AMR, and use and sales of antimicrobials at national level in the veterinary sector	1	No/weak national policy and guidelines
	7.3 IPC in the animal sector	1	No policy and national guidelines developed for biosecurity to reduce infection rates in food both large and small scale producers
	7.4 AMR awareness generation and education in the animal sector	1	No policies or strategies or only planned

\*Country profile as per the country representative's presentation at the NAP Development Workshop in Bangkok, 31 August 2016

**Status as per the situation analysis conducted by the country (Timor-Leste) with the tool and guidance of the WHO Regional Office for South-East Asia**

Focus areas	Exploration & adoption	Programme installation	Initial implementation	Full operation	Sustainable operation
Development of NAP in line with GAP-AMR	✓				
AMR-related awareness-raising		✓			
National AMR surveillance	✓				
Rational use of antimicrobials and surveillance of use/sale (community)	✓				
IPC programme and AMS programme in health-care settings	✓				
Research and innovation	✓				
One Health engagement	✓				

1 \* Multisectoral or one-health; \*\*specific groups (e.g. doctors, nurses, pharmacists, farmers, veterinarians)











