Antimicrobial Resistance

A MANUAL FOR DEVELOPING NATIONAL ACTION PLANS

Version 1

February 2016

Food and Agriculture Organization of the United Nations

WORLD ORGANISATION FOR ANIMAL HEALTH

World Health Organization

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Abbreviations

AMR	antimicrobial resistance
AMU	antimicrobial use
FAO	Food and Agriculture Organization of the United Nations
M&E	monitoring and evaluation
MCG	multisectoral coordinating group
NAP	national action plan
OIE	World Organisation for Animal Health
STD	Sexually transmitted disease(s)
UN	United Nations
WHA	World Health Assembly
WHO	World Health Organization

Preface

This manual for developing national action plans to address antimicrobial resistance has been developed at the request of the World Health Assembly to assist countries in the initial phase of developing new, or refining existing national action plans in line with the strategic objectives of the Global Action Plan. It proposes an incremental approach that countries can adapt to the specific needs, circumstances and available resources of each individual country. Details of actions to be taken will vary according to national contexts.

A series of supporting tools have also been developed by WHO, in collaboration with FAO and OIE, to accompany this manual. These include sample terms of reference for suggested coordination mechanisms, a generic template for a national action plan, a sample plan for monitoring and evaluation, and a checklist. Other tools will be added as the needs arise.

It is expected that countries' experiences in developing national action plans, particularly during the initial phase in 2016, will become a valuable source in helping to refine and adapt this manual. It is therefore anticipated that this manual will be revised in 2017 in order to reflect this experience and better serve the needs of countries.

Background

For the past few decades, antimicrobial resistance (AMR) has been a growing threat to effective treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi. AMR results in reduced efficacy of antibacterial, antiparasitic, antiviral and antifungal drugs, making the treatment of patients difficult, costly or even impossible. The impact is felt particularly by vulnerable patients, as it can result in prolonged illness and increased mortality. The magnitude of the problem worldwide and its impact on animal and human health, on costs for the relevant sectors and in wider society are still largely unknown.[1]

In continuing the response to this serious public health issue, a global action plan on antimicrobial resistance was drafted,[2] and, at the Sixty-eighth World Health Assembly in May 2015, Member States adopted a resolution to implement the plan. Notably, Member States agreed on the importance of developing national action plans (NAPs) aligned with the global plan and incorporating the same five strategic objectives. One objective of the resolution is to ensure that all Member States have a national action plan in place by May 2017:

[1] Antimicrobial resistance. Global report on surveillance. Geneva: WHO; 2014.
[2] Global action plan for antimicrobial resistance (World Health Assembly document A68/20, 27 March 2015) (http://www.who.int/drugresistance/global_action_plan/en/).

(3) to have in place, by the Seventieth World Health Assembly, national action plans on antimicrobial resistance that are aligned with the global action plan on antimicrobial resistance and with standards and guidelines established by relevant intergovernmental bodies;

The resolution also noted the importance of Member States working together to ensure synergy in attaining the five strategic objectives of the global action plan:

3. INVITES international, regional and national partners to implement the necessary actions in order to contribute to the accomplishment of the five objectives of the global action plan on antimicrobial resistance;[3]

The World Assembly of Delegates of the World Organisation for Animal Health (OIE), also held in May 2015, adopted a resolution for Member Countries to follow the guidance of the global action plan by developing national action plans in respect of the use of antimicrobial agents in animals and ensuring their close collaboration with public health officials.[4] In June 2015, the Thirty-ninth Conference of the Food and Agriculture Organization of the United Nations (FAO) adopted a resolution and status report on AMR. The FAO resolution urges members to 'develop or strengthen national plans, strategies and international collaboration for the surveillance, monitoring and containment of antimicrobial resistance in food, agriculture and the environment, in close coordination with related plans for human health'. [5]

Purpose, aim and intended readership

The purpose of this manual is to provide guidance to countries in preparing NAPs that are aligned with the global action plan, thereby contributing to combating AMR worldwide. This manual is intended primarily for national policy-makers, programme managers and partners responsible for strategic planning, development and implementation of national plans and AMR activities in all relevant sectors. The readers may include government and ministry representatives, intergovernmental partners (such as FAO, OIE and WHO) and other public and private associations and foundations working in the field. The "One Health" approach, in which human and animal health, agriculture and food production sectors work together, is fundamental for containing the spread of AMR.

This manual is intended for use by countries in preparing a plan, conducting situational analyses, setting objectives and priorities, strategic planning and budgeting for

[3] Global action plan for antimicrobial resistance (World Health Assembly document A68/20, 27 March 2015) (http://www.who.int/drugresistance/global_action_plan/en/).

[4] Combating AMR and promoting the prudent use of antimicrobial agents in animals (Resolution No. 26). Paris: OIE; 2015 (http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/AMR/A_RESO_AMR_2015.pdf)

[5] Status report on antimicrobial resistance C 2015/28). 39th Conference. Rome: FAO; 2015 (http://www.fao.org/3/a-mm736e.pdf).

implementation of AMR activities. It describes the steps and stages of the process and proposes essential elements for implementation.

Examples of existing NAPs are available online at: www.who.int/entity/drugresistance/action-plans/library/en/index.html

Guiding principles

Consistency and compliance with existing guidance and policies

International strategic guidelines and regional operational frameworks provide guidance on best practice in formulating action plans. This manual builds on existing publications (e.g. WHO guidance documents, OIE standards, Codex Alimentarius standards and United Nations documentation) and principles that can form the basis for AMR NAPs. Some countries may already have strategies and policies in relevant sectors, which should be taken into consideration in formulating the AMR NAP to ensure alignment. Consistency with the guiding principles and alignment with the strategic objectives of the global action plan is of primary importance to ensure synergy and address the global issues of AMR. The problem requires a "One Health" approach, in which actions in all relevant sectors are implemented synergistically in order to successfully combat AMR.

"One Health"

> *Recognizing that the main impact of antimicrobial resistance is on human health, but that both the contributing factors and the consequences, including economic and others, go beyond health, and that there is a need for a coherent, comprehensive and integrated approach at global, regional and national levels, in a "One Health" approach and beyond, involving different actors and sectors such as human and veterinary medicine, agriculture, finance, environment and consumers.*[6]

In a tripartite approach, FAO, OIE and WHO recognize that addressing health risks at the human–animal-plant-ecosystems interfaces requires strong partnerships among entities that may have different perspectives and different levels of resources. Such partnerships, which could include international organizations, governments, private sector, civil society, private sector and donors, must be coordinated to minimize the burden on Member States of multiple monitoring, reporting and delivery systems and to avoid duplication of effort and fragmented outcomes. In this regard, the standards and guidelines developed by the FAO/WHO Codex Alimentarius commission may be useful.

[6] Resolution WHA68.7. Geneva: WHO; 2015.

A framework for collaboration is therefore needed at national and international levels, with clear roles and responsibilities. Furthermore, plant, animal and human health institutions and partnerships should also be strengthened in the management of existing and emerging plant, animal and zoonotic diseases in order to reduce the use of antimicrobials in livestock production, aquaculture and agriculture.[7]

Alignment with AMR global action plan

The goal of the AMR global action plan is: "To ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality-assured, used in a responsible way, and accessible to all who need them".

Its five strategic objectives are:

Objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.

Objective 2: Strengthen the knowledge and evidence base through surveillance and research.

Objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures.

Objective 4: Optimize the use of antimicrobial medicines in human and animal health.

Objective 5: Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new medicines, diagnostic tools, vaccines and other interventions.

NAPs should contribute to these strategic objectives on the basis of current situational analyses of the local context.

In particular, all NAPs should reflect the principles identified in the global action plan:[8]

- whole-of-society engagement, including "One Health" approach;
- prevention first;
- ensuring access while avoiding excess;
- sustainability of interventions; and
- incremental targets for implementation.

[7] The FAO-OIE-WHO Collaboration, a tripartite concept note. Geneva: WHO; 2010 (http://www.who.int/influenza/resources/documents/tripartite_concenpt_note_hanoi_042011_en.pdf)

[8] Global action plan for antimicrobial resistance (World Health Assembly document A68/20, 27 March 2015) (http://www.who.int/drugresistance/global_action_plan/en/).

Prioritisation and step-wise approach

As Member States are at different stages in combating AMR, there is flexibility in activity planning and target setting to meet both local requirements and global priorities. The feasibility and appropriateness of activities within the national context should be considered, while setting realistic, achievable, effective plans. Countries differ in the availability of coordinating mechanisms, existing legislation, their laboratory capacity and data on the impact of AMR on society. The drivers such as use of antimicrobials and the systems and structures available to prevent and control the emergence and spread of AMR may also vary. The status of each of these factors will influence decisions in planning, target-setting and prioritisation. Notably, implementation of AMR activities should be built on existing systems, policies and programmes where available.

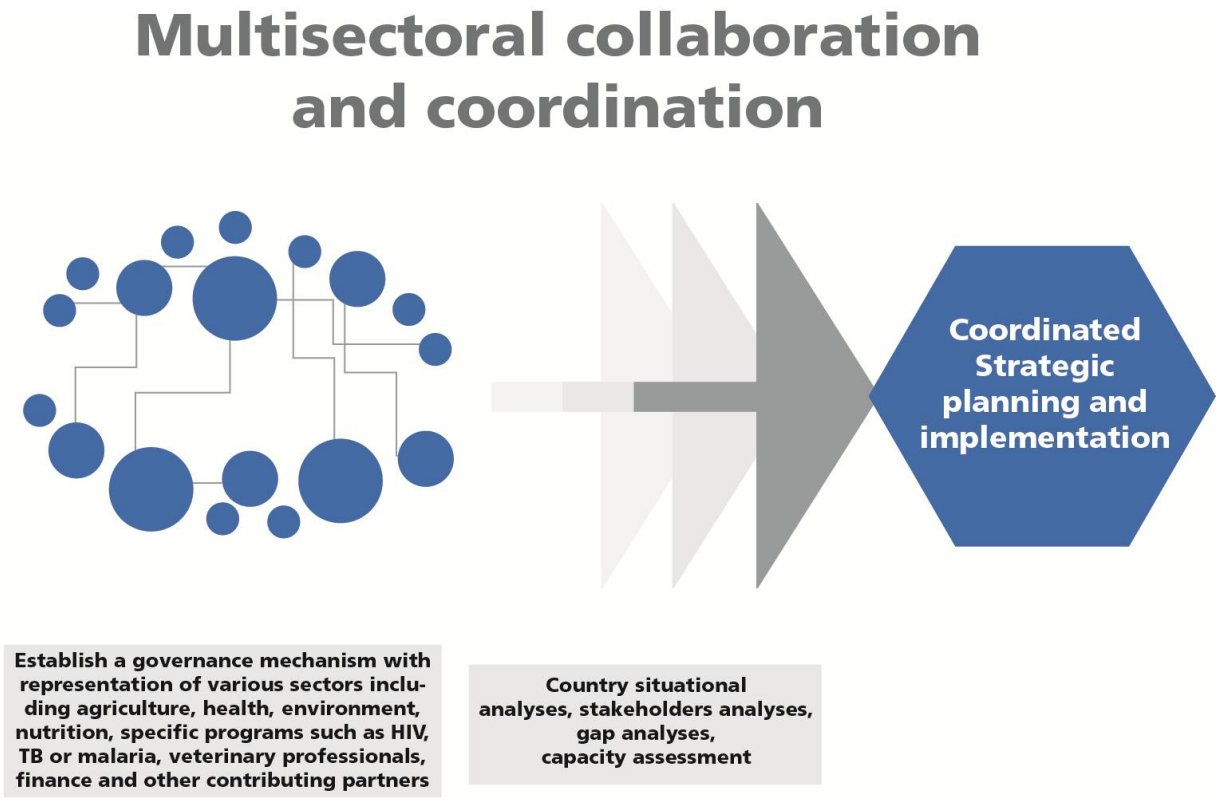
Multisectoral systems approach (multisectoral coordination engagement)

All relevant sectors in addition to human health, such as animal health, plant production and environmental health, should have a sense of "ownership" of the plan, keeping in mind that food security and food safety and economic development need to be considered when developing plans to contain AMR. Leadership and governance should be established early in order to coordinate the strategic planning and ensure implementation of activities. Support to farmers/producers should be provided in order to adopt good animal husbandry and health, management and biosecurity practices to reduce the need for antimicrobial drugs in animal production. All sectors should be involved in preparing and implementing an action plan and thus should include the engagement of the following:

- all relevant ministries
- high-quality laboratories
- plant protection
- medical and veterinary professions and statutory bodies
- research and academic institutes
- civil society and farmer organizations
- food and pharmaceutical industries, and
- wholesale and retail distributors.

The experience of other national programmes with strategies for controlling drug resistance, such as for HIV, tuberculosis and malaria, should be used in coordination with these programmes.

The schema below is a visual representation of the process described for the development and implementation of national action plans on AMR.



Process for development and implementation

The process is proposed as a framework or guiding principle for development and implementation of National Action Plans addressing AMR, and countries are encouraged to adjust their process to adapt to local context and constraints.

Steps in development and implementation

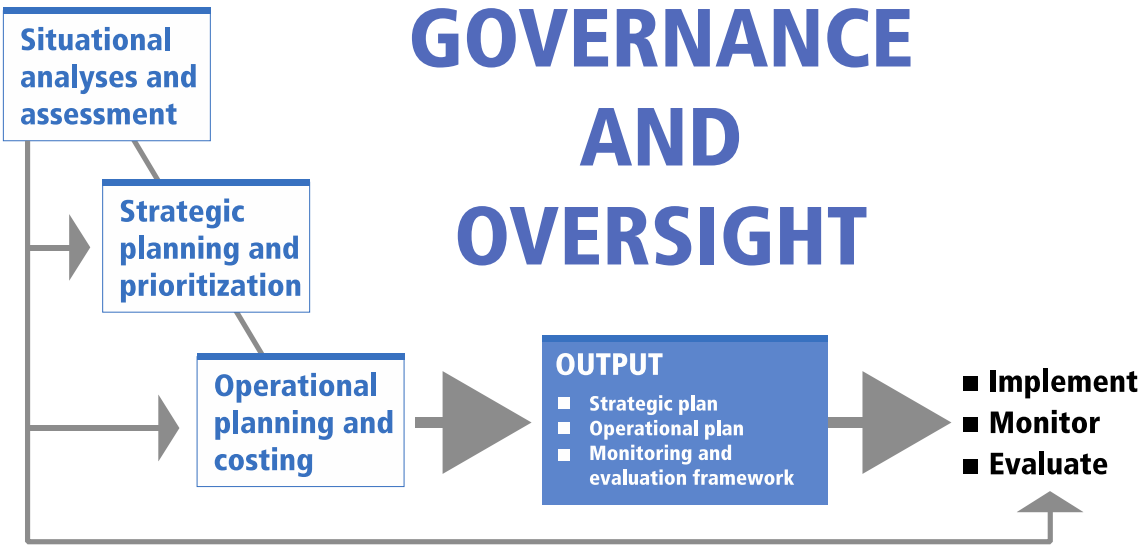
- **Establish a governance mechanism**
  - establish a functional multisectoral coordinating group (MCG)
  - establish technical working group(s)
  - ensure participation of national focal points on AMR in the human and animal health and agriculture sectors.
- **Conduct thorough situational analyses**
  - collect data and available information
  - analyse data
  - assess capacities and identify gaps, opportunities and threats.
- **Planning**
  - define strategic priorities
  - elaborate an operational plan and budget
  - prepare a plan for monitoring and evaluation (M&E).
- **Initiate implementation**
  - submit core documents for validation by appropriate national authorities
  - conduct activities
- **Conduct periodic reviews, and incorporate lessons learnt**

Governance

National policies, strategies and plans are more robust and more likely to be implemented effectively when the development is inclusive of all relevant competent authorities and stakeholders.[9] Sound, transparent governance and oversight are essential at all stages of the preparation and sustainable implementation of national strategies. The following suggestions are offered for the establishment and maintenance of sound governance.

- Ensure transparency in planning and decision-making in NAP development.
- Ensure representation of appropriate ministries, including those responsible for human health, animal health, plant health, food safety, the environment and agriculture; regulatory authorities or agencies; funding organizations and national and subnational bodies.
- Agree on a timeframe, and determine the lead ministry or ministries and their roles and responsibilities for governance.
- Identify new or contact already nominated national focal points in animal health, human health and plant health.
- Form a national MCG with representation of all relevant ministries and other stakeholders, including industry. (see Annex)
- Establish technical working groups as needed.
- Establish a secretariat to support the coordinating group.
- Solicit the input of members of the group to consultation meetings throughout the process.
- Monitor progress continuously, including during implementation.

[9] A framework for national health policies, strategies and plans. Geneva: WHO; 2010:4.



Situational analyses and assessment

Situational analyses are essential in developing a strategic vision and operational plan, as they provide background information and an overview of the current status of antimicrobial resistance factors and drivers in the country. Assessment of these determinants and of existing policies, activities, systems, active partners, AMR plans, data on AMU and AMR and case studies will provide the basis for setting priorities and strategic planning of activities. The global action plan can be used as a framework to indicate the aspects that should be considered in situational analyses. A checklist based on the global action plan framework is available to assist with the assessment of existing national initiatives leading to the development of the NAP or to review existing NAPs.

A more thorough list of tools and available resources has also been prepared to support NAP development (Annex). Tools are available to stimulate discussions and aid decisions for activity planning. Not all information will be available in every country setting.

A robust situational analysis involves assessment and analysis of information on:

- current AMR-related activities and structures in the country;
- capacity and structures to conduct surveillance of antimicrobial use and resistance:
  - description of existing surveillance systems;
- known rates, such as:
  - AMR burden,
  - resistance to antiretroviral drugs,
  - rate of multi-drug-resistant tuberculosis.
- Perceptions and behaviour related to known drivers of AMR, such as:

  - limited knowledge of the risk for AMR;
  - inappropriate use of antibiotics in humans, animals and plants, including over-prescribing and dispensing; and
  - incomplete treatment courses (patients who do not finish a full treatment course);
- antimicrobial use in:
  - human health (in communities, hospitals, other health care settings and for specific conditions such as sexually transmitted infections, HIV infection, tuberculosis and malaria)
  - animal health (companion animals, livestock, aquaculture, veterinary practice)
  - animal production
  - plant production and health
  - other environmental settings, and
  - other situations;
- the availability of alternatives to antimicrobials, including vaccines and others;
- the status of known factors that promote the emergence of AMR, such as;
  - weak quality assurance of manufactured and/or imported pharmaceuticals
  - unregulated access to antimicrobials;
- current capacity of country systems to regulate and enforce regulations on antimicrobial use, including for HIV infection, tuberculosis, malaria, in veterinary medicine and in crop production;
- existence and enforcement of policies and legal frameworks on the use of and resistance to antimicrobial agents in human health, animal health, plant production, environment, trade and commerce, such as:
  - national and subnational laws
  - multinational or international agreements, including regional agreements for AMR interventions, the global action plan, OIE standards and the Codex Alimentarius standards, and
  - bilateral agreements for AMR interventions;
- relevant stakeholders, including active donors and implementation partners.

Analysis of these factors will help to clarify the nature and extent of the problem in the country, as well as its impact at the national level. It will also provide information on the available systems, capacity and resources. A description of the results and achievements of previous activities, remaining challenges and gaps and anticipated needs for the next planning period should be included.

Various tools and methods can be used for conducting situational analyses.[10] (see Annex) For example, analysis of strengths, weaknesses, opportunities and threats (SWOT), a method used in marketing and business studies, can be used in analysing systems.[11] Such analyses allow an opportunity to describe appropriately the AMR situation and the factors including legal and governance structures that influence it (Table 1).

Table 1. Example of a SWOT analysis of AMR

		+	-
Internal Factors	External Factors	**Strengths**	**Weaknesses**
		▪ A global action plan endorsed by all Member States ▪ Strong political commitment from ministries of Agriculture, Health and department of environment ▪ Adopted international accords on use of antimicrobials	▪ Segmented surveillance systems for data of isolate resistance ▪ Insufficient public awareness of antimicrobial resistance ▪ Insufficient resources for implementation
		Opportunities	**Threats**
		▪ Enhanced coordination across sectors ▪ Development of a coordinated global surveillance system ▪ Increased interest and funding from international sources	▪ Resource mobilization may not meet needs for full implementation ▪ Emergence of resistant strains accelerate faster than response

[10] OIE Evaluation of Performance of Veterinary Services : http://www.oie.int/en/support-to-oie-members/pvs-pathway/

[11] Toolkit to develop a national strategic plan for TB prevention, care and control. Methodology on how to develop a national strategic plan. Geneva: WHO; 2015: 22–23.

An evaluation of the drivers of AMR may also identify the stakeholders that should be included in the programme in order to focus interventions. Stakeholder mapping, possibly in parallel with setting up governance structures, is another important aspect of planning, as it provides information needed to define responsibilities in strategic planning and activities.

Planning

Once a systematic, transparent, multi-stakeholder process has been established and various analyses and assessments have been conducted, the next step is to convert the information into a strategic plan. Priorities should be set to fill the gaps identified in the situational analyses and assessments, in accordance with the strategic objectives of the global action plan. The information should be consolidated into a strategic plan, an operational plan, a budget and an M&E plan (details are provided below). The strategic plan should be aligned with the global action plan and any existing regional action plan for AMR.

The draft plan should be reviewed and the final version validated and endorsed by the relevant national authorities to ensure political engagement and the participation of the identified stakeholders. A template has been prepared to support development of NAPs (see Annex).

Implementation and periodic review

The validated NAP should be implemented in collaboration with multisectoral partners. M&E provides information on progress towards the goals and objectives. National contributions to implementation of the NAP should be incorporated and validated in the fiscal year budget. During implementation, periodic reviews should be conducted in order to incorporate new information and lessons learnt, with adjustments to the NAP if required. Table 2 summarizes these steps.

Table 2. Steps in developing a NAP on AMR

STEP		IMPLEMENTING STRUCTURE
Governance	Establish or adapt MCG and technical working group or groups	Lead ministry/ies or other nominated structure
	Map stakeholders	Technical Working Group(s)
Situational analyses	Assess AMU and other AMR drivers in the country	Technical Working Group(s)
	Analyse capacity and gaps	Technical Working Group(s)
Planning	Determine strategic priorities, objectives and interventions	Technical Working Group(s) to draft, MCM to define/validate
	Determine operational plan (activities, timetable, implementation arrangements, and responsible stakeholders)	Technical Working Group(s) to draft, MCM to define/validate
	Draw up detailed budget and costing	Finance/accounting expert with technical working group(s)
	Draft NAP	Technical Working Group(s)
	Validate key documents	Appropriate national authorities and relevant stakeholders
Plan activation	Implement planned activities	Relevant responsible entities
	M&E	Relevant responsible implementers

Core components of a NAP

Summary of key components

- **Strategic plan**
  - goals and objectives
  - priorities and interventions
- **Operational plan**
  - activities, implementation arrangements, timetable, responsible entities
  - detailed budgeting and costing
- **M&E plan**
  - performance indicators
  - targets and timelines
  - data collection and reporting methods

Strategic Plan

The strategic plan is a description of the country's vision of AMR prevention and control. The plan should include clearly defined goals that will contribute significantly to reaching the aim of the national policy to control AMR and clearly specified objectives. The plan should provide all the elements and rationale to justify the choice of goals, objectives and strategic interventions. The links between goals and objectives should be established. The plan should demonstrate that its objectives are:

- logical with respect to the capacity and gaps identified and the priorities established;
- compatible with the strategic interventions defined; and
- specific, measurable, achievable, relevant and time-bound (SMART) (Table 3).

Table 3. Characteristics of SMART objectives

Criterion	Characteristics	Questions related to the criterion
Specific (S)	Clear, unambiguous	What do we wish to accomplish? Why have we chosen this specific goal? What are the purpose and reason? Who benefits? Who is involved? Where will the activity be implemented? What are the requirements and constraints?
Measurable (M)	Countable, observable, can be analysed, tested or challenged	How much or how many? How will we know when an objective has been attained? What are the criteria for measuring progress?
Achievable (A)	Realistic, attainable	How may the objective be accomplished? How realistic is the objective, given the known constraints?
Relevant (R)	Pertinent, related to the purpose, meaningful to the outcome	Are the measure and the outcome aligned?
Time-bound (T)	Linked to a timeframe, target date or deadline	When will the indicator be measured? How frequently?

Periodic M&E can provide the basis for sound situation and gap analyses, lead to identification of goals and new objectives and define strategic interventions, so that the NAP can be revised or updated if necessary (Annex).[12]

[12] Toolkit to develop a national strategic plan for TB prevention, care and control. Methodology on how to develop a national strategic plan. Geneva: WHO; 2015:14-15.

Operational Plan

- **Activity work plan**
  - implementation arrangements
  - timetable
- **Detailed budget and costing**
  - well-defined unit costs
  - transparent assumptions

The operational plan lists the activities to be implemented. It must be fully consistent with the strategic plan, the budget and the M&E plan. Where relevant activities are already being implemented, the challenge is to identify these activities and incorporate them into the plan. The activities and sub-activities must be listed under the strategic interventions and objectives to which they are linked. A good operational plan shows precisely how the activities and sub-activities will be implemented. It should provide sufficient information for implementation, by specifying detailed information on the activities and sub-activities to be implemented at least during the first year of the period covered by the NAP. The activities for the remaining years of the NAP can be detailed subsequently. The details should include who, what, when and how the activity will be implemented.

The planning cycle of the operational plan should be in line with plans of the national authorities, AMR plans at intermediate health levels and those of other human, animal and plant health programmes, to ensure synergy.

The following information should be provided for each activity and sub-activity at the beginning of each cycle and subsequently on a regular basis:

- the dates or the period during which it will be implemented;
- the setting in which it will be implemented;
- the person, sector or institution that will be responsible for implementation;
- the cost of implementation as calculated in the budget plan;
- the source of funding to cover the cost; and
- the indicator(s), milestones and targets that will be used to monitor implementation of the activity or sub-activity.

Implementation arrangements, including technical assistance, should be fully specified in the operational plan. The following information should be provided for each strategic intervention or activity:

- if technical assistance is required, brief terms of reference, including specification of deliverables and the expertise needed to conduct the activities;
- the entity responsible for implementation of the intervention or activity;
- the timetable;
- the estimated cost of technical assistance (including consultancy fee, travel, per diem) as calculated in the budget plan;
- source of funding, if available; and
- the funding gap if there is no financial source to cover the cost of technical assistance.

Budgeting

The budget for AMR activities will likely be across multiple departments and sectors and a coordinated view of full implementation may be complex to establish. Budgeting for AMR activities should be based on national and institutional policies and follow best practice in local markets. The costing should be transparent and verifiable, including definitions, sources of data (both qualitative and financial), assumed cost and methods used for calculation. The budget should be consistent with budgetary exercises in other services and allow comparison of costs over time.

The budget should be consistent with and directly linked and aligned to the strategic plan, operational plan and M&E plan. Appropriate finance or accounting expertise should be engaged in preparing the NAP budget, particularly with regard to procurement, supply and costing.

The source and timeline of funding should be clearly indicated, including:

- the source of funding for each intervention;
- the contributions of the government (including loans) and of each international partner;
- the expected funding gap, i.e. the difference between the funds required and those available; and
- the activities and strategic interventions required to achieve NAP objectives that are not funded.

Various budgetary guidelines and costing methods, including tools for allocating resources, are available (see Annex).[13]

[13] Gap analysis tool (http://www.oie.int/en/support-to-oie-members/pvs-gap-analysis/pvs-gap-analysis-tool/)

Monitoring and evaluation plan

Monitoring and evaluation (M&E) are essential managerial functions in any health plan. The plan should include the indicators, targets, baselines, data collection methods and responsible entities and provide a comprehensive framework for:

- (M)onitoring the progress made in implementing planned activities and in delivery of services, usually on a continuous basis; and
- (E)valuating the progress made in achieving the intended goal(s), objectives and targets, which could in many circumstances be a periodic process (e.g. once per quarter or once per year).

M&E framework must be established for the relevant elements in the strategic plan early during planning and must be fully consistent with the other components of the NAP. Countries should use standard principles of M&E and formulate country-specific SMART indicators pertinent to the context determined in situational analyses and strategic planning. When already available, existing indicators and systems should be used. A sound M&E plan should clearly identify and define the indicators, which provide a basis for assessing achievements or for evaluating an outcome. In the early stages of planning, programmes are likely to use SMART indicators of input or process and higher-level output, outcome and impact indicators. The targets for input and process indicators may be "yes/no", such as the existence of an NAP.

For each indicator of achievement of a goal, objective, strategic intervention or activity, the following elements should be specified:

- the purpose of the indicator (input, output, outcome and impact);
- the procedure used for calculation (e.g. absolute figure, proportion, ratio, rate, index);
- the sources of information (for a rate, ratio or proportion, the sources of information for both the numerator and the denominator);
- the periodicity (and timeliness) of data collection; and
- the entity responsible for collecting the information.

Examples of input, output, outcome and impact indicators are given in the conceptual M&E framework (see Annex). Details of sound M&E practices and indicators have been published.[14]

[14] Monitoring, evaluation and review of national health strategies. A country-led platform for information and accountability. Geneva: International Health Partnership, WHO; 2011 (http://www.who.int/healthinfo/country_monitoring_evaluation/1085_IER_131011_web.pdf?ua=1).

Annex: Selected support tools and other sources of information

This list is not comprehensive. It comprises potential resources for use in preparing national action plans.

National action plan toolkit references

Global action plan for antimicrobial resistance (World Health Assembly document A68/20, 27 March 2015) (http://www.who.int/drugresistance/global_action_plan/en/).

Global strategy for containment of antimicrobial resistance. Geneva: WHO; 2001 (http://www.who.int/drugresistance/WHO_Global_Strategy.htm/en/).

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High-level technical meeting to address health risks at the human–animal–ecosystems interfaces Mexico City, Mexico: 15-17 November 2011 (http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/00F9Fd01.pdf)

Sample terms of reference for a national multisectoral coordinating group, for a national focal point and for a technical working group. WHO; 2015. (http://www.who.int/drugresistance/action-plans/en/)

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Template for a national action plan on antimicrobial resistance. WHO; 2015. (http://www.who.int/drugresistance/action-plans/en/)

Sample conceptual M&E framework for national action plans on antimicrobial resistance. WHO; 2015. (http://www.who.int/drugresistance/action-plans/en/)

General information on AMR

WHO: (http://www.who.int/drugresistance/en/)

FAO: (http://www.fao.org/antimicrobial-resistance/en/)

OIE: (http://www.oie.int/en/for-the-media/amr/)

Open Virtual Learning Community: (http://esgap.escmid.org/?p=1093)

Transatlantic Taskforce on Antimicrobial Resistance (http://www.cdc.gov/drugresistance/tatfar/links.html)

European Commission: (http://ec.europa.eu/health/antimicrobial_resistance/policy/index_en.htm)

ReAct – Action on Antibiotic Resistance: (http://www.reactgroup.org/uploads/who-we-are/africa/ReAct-Africa-Champions-Workshop-Report-2014.pdf)

PEW Charitable Trusts: (http://www.pewtrusts.org/en/projects/antibiotic-resistance-project)

Global Health Dynamics: (http://www.globalhealthdynamics.co.uk/wp-content/uploads/2015/06/AMR2015-June-3.pdf)

Comparative study of national action plans

Bonk MB. Responses to the antimicrobial resistance threat – a comparative study of selected national strategies and policies. Bern: Division of International Affairs, Swiss Federal Office of Public Health; 2015 (http://www.bag.admin.ch/themen/internationales/11287/15615/index.html?lang=en)

WHO: additional global, regional and national strategies and plans, (http://www.who.int/drugresistance/global_action_plan/General_and_national_plans_amr_Dec_2014.pdf?ua=1)

Regional operational framework for implementation of the WHO global action plan on AMR by the countries of the Eastern Mediterranean Region. Cairo: WHO Regional Office for the Eastern Mediterranean; 2015.

Regional action plan. Manila: WHO Regional Office for the Western Pacific; 2015.

Animal health

Antimicrobial resistance standards, recommendations and work of the World Organisation for Animal Health. Paris: OIE; 2014 (http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/foll-newAMR-august2015_FINAL.pdf)

OIE: List of antimicrobial agents of veterinary importance (2015) (http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/Eng_OIE_List_antimicrobials_May2015.pdf)

OIE: Terrestrial Animal Health Code, chapters 6.6, 6.7, 6.8, 6.9, 6.10

OIE: Aquatic Animal Health Code, chapters 6.1, 6.2, 6.3, 6.4, 6.5

OIE: Manual of diagnostic tests and vaccines for terrestrial animals, guideline 2.1

OIE: Veterinary legislation: (http://www.oie.int/en/support-to-oie-members/veterinary-legislation/)

Food, food safety and quality

Codex: Code of Practice to Minimize and Contain Antimicrobial Resistance (CAC/RCP 61-2005) (http://www.fao.org/fao-who-codexalimentarius/download/standards/10213/CXP_061e.pdf)

Codex: Guidelines on Risk Analysis of Foodborne Antimicrobial Resistance (CAC/GL 77-2011) (http://www.fao.org/fao-who-codexalimentarius/download/standards/11776/CXG_077e.pdf)

Codex: Code of Hygienic Practice for Meat (CAC/RCP 58-2005) (http://www.fao.org/fao-who-codexalimentarius/download/standards/10080/CXP_054e.pdf)

Codex: Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) (http://www.fao.org/fao-who-codexalimentarius/download/standards/10273/CXP_052e.pdf)

Codex: Code of Practice on Good Animal Feeding (CAC/RCP 54-2004) (http://www.fao.org/fao-who-codexalimentarius/download/standards/10080/CXP_054e.pdf)

Codex: Guidelines for the Design and Implementation of National Regulatory Food Safety Assurance Programmes Associated with the Use of Veterinary Drugs in Food Producing Animals (CAC/GL 71-2009) (http://www.fao.org/fao-who-codexalimentarius/download/standards/11252/CXG_071e_2014.pdf)

Other Codex codes of hygienic practices (for specific products) (http://www.fao.org/fao-who-codexalimentarius/standards/list-standards/en/?no_cache=1)

Codex: General Principles of Food Hygiene (CAC/RCP 1-1969) (http://www.fao.org/fao-who-codexalimentarius/download/standards/73/CXP_015e.pdf)

FAO: Biosecurity guide for live poultry markets (http://www.fao.org/documents/card/en/c/5a3c4d30-efd1-47f2-a805-589676cacfef/)

FAO: Status report on antimicrobial resistance and FAO resolution on AMR, FAO, July 2015, http://www.fao.org/3/a-mm736rev1e

Budgeting

WHO: CHOICE (http://www.who.int/choice/cost-effectiveness/en/ and http://www.who.int/choice/cost-effectiveness/inputs/en/)

WHO: OneHealth tool for costing (http://www.who.int/choice/onehealthtool/en/).

OIE: PVS Gap analyses: (http://www.oie.int/en/support-to-oie-members/pvs-gap-analysis/pvs-gap-analysis-tool/)

M&E

Monitoring, evaluation and review of national health strategies. A country-led platform for information and accountability. Geneva: International Health Partnership, WHO; 2011 (http://www.who.int/healthinfo/country_monitoring_evaluation/1085_IER_131011_web.pdf?ua=1)

OIE:PVS Pathway: (http://www.oie.int/en/support-to-oie-members/pvs-pathway/)

Strategic planning

Objective 1. Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.

- Building local coalitions for containing drug resistance: a guide, chapter 2. This section presents guidance on how to identify stakeholders and mobilize a working group to address the multifaceted factors involved in AMR. The steps include: Identify key stakeholders, start the initiative, organize a working group, establish group procedures, define key issues and begin advocacy. (http://apps.who.int/medicinedocs/documents/s21527en/s21527en.pdf)
- European Antibiotic Awareness Day home page. For inspiration or to use the campaign materials produced for the European Antibiotic Awareness day. Also provides links to materials and initiatives from countries. (http://ecdc.europa.eu/en/eaad/Pages/Home.aspx)
- Get smart: know when antibiotics work. Free materials about antibiotic resistance and appropriate antibiotic use for upper respiratory tract infections, by the United States Centers for Disease Control and Prevention. (http://www.cdc.gov/getsmart/community/materials-references/index.html)
- Toolkit for engaging in social media activities to promote prudent antibiotic use. From the European Centre for Disease Prevention and Control (http://ecdc.europa.eu/en/eaad/antibiotics-plan-campaign/toolkit-social-media/Pages/social-media-guidance.aspx)
- Fighting AMR on the field: (http://www.oie.int/en/for-the-media/amr/documents/)

Objective 2. Strengthen the knowledge and evidence base through surveillance and research

- WHO resources for surveillance of antimicrobial resistance, including the global antimicrobial resistance surveillance system (GLASS) (http://www.who.int/drugresistance/surveillance/en/ http://apps.who.int/iris/bitstream/10665/188783/1/9789241549400_eng.pdf?ua=1
- WHO manual on identifying bacterial pathogens and testing for susceptibility in the laboratory, with a focus on bacteria of public health importance in the developing world (http://www.who.int/drugresistance/Antimicrobial_Detection/en/)
- EUCAST: Step by step, open access information on testing for susceptibility (http://www.eucast.org/ast_of_bacteria/)

- WHO: Antimicrobial resistance: global report on surveillance 2014. Available global evidence on the extent of AMR and the current state of surveillance (http://www.who.int/drugresistance/documents/surveillancereport/en/)

Objective 3. Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures.

- WHO: (http://www.who.int/csr/bioriskreduction/infection_control/en/); (http://www.who.int/gpsc/en/); (http://www.who.int/household_water/en/)
- Gulf Cooperation Council infection prevention and control manual, 2nd edition (2013) (http://www.gdipc.org/ic-manual.html).
- WHO: Core components for infection prevention and control programmes at national level and in health care facilities (http://www.who.int/csr/resources/publications/WHO_HSE_EPR_2009_1/en/)
- International Federation of Infection Control: basic concepts of infection control. The intent of this manual is to provide a scientific foundation for basic infection control principles mainly to countries with limited resources (http://theific.org/basic-concepts-book/)
- European Centre for Disease Prevention and Control. Directory of online resources for prevention and control of AMR and health care-associated infections by international and national agencies and professional societies to support health care professionals, hospital administrators and public health professionals (http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/guidance-infection-prevention-control/Pages/guidance-prevention-control-infections-caused-by-multidrug-resistant-bacteria-and-healthcare-associated-infections.aspx)
- Core components of infection prevention and control programmes: Assessment Tools for IPC programmes (http://apps.who.int/iris/bitstream/10665/70766/1/WHO_HSE_GAR_BDP_2011.3_eng.pdf)
- Core components of infection prevention and control programmes in health care (Aide-mémoire) (http://www.who.int/csr/resources/publications/AM_core_components_IPC/en)
- Standard precautions in health care (Aide-mémoire) (http://www.who.int/csr/resources/publications/EPR_AM2_E7.pdf?ua=1)
- Aide-mémoire for infection prevention and control in a health care facility (http://www.who.int/injection_safety/toolbox/docs/en/AideMemoireInfectionControl.pdf)
- WHO guidelines on hand hygiene in health care (http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf)
- WHO hand hygiene self-assessment framework (http://www.who.int/gpsc/country_work/hhsa_framework.pdf)
- WHO implementation strategy and tools (http://www.who.int/gpsc/5may/tools/en/)
- Guide to local production – WHO-recommended handrub formulations

http://www.who.int/gpsc/5may/Guide_to_Local_Production.pdf

- WHO hand hygiene tools for evaluation and feedback (http://www.who.int/gpsc/5may/tools/evaluation_feedback/en/)
- Alcohol-based hand rub planning and costing tool (http://www.who.int/gpsc/5may/tools/system_change/en/)
- Protocol for evaluation of tolerability and acceptability of alcohol-based hand rub in use or planned to be introduced – methods 1 and 2 (http://www.who.int/gpsc/5may/tools/system_change/en/)
- Local production of alcohol-based hand rub: training workshop report (http://who.int/patientsafety/implementation/apps/events/ABHR-workshop-report.pdf)
- Hand hygiene in outpatient and home-based care and long-term care facilities (http://www.who.int/gpsc/5may/EN_GPSC1_PSP_HH_Outpatient_care/en/)
- WHO best practices for injections and related procedures toolkit (http://apps.who.int/iris/bitstream/10665/44298/1/9789241599252_eng.pdf)
- Injection safety: first do no harm (http://www.who.int/injection_safety/about/en/InjectionSafetyFirstDoNoHarm.pdf)
- Guiding principles to ensure injection device security (http://apps.who.int/medicinedocs/en/d/Js4886e/)
- WHO patient safety curriculum guide (http://www.who.int/patientsafety/education/curriculum/en/)

Objective 4. Optimize the use of antimicrobial medicines in human and animal health.

- WHO has outlined selected components to promote the rational use of medicines at the health care facility and national levels (http://apps.who.int/medicinedocs/en/d/Jh3011e/).
- Interventions to improve antibiotic prescribing practices for hospital inpatients. A Cochrane review of the effectiveness of interventions that alone, or in combination, are promoting prudent antibiotic prescribing to hospital inpatients (http://www.ncbi.nlm.nih.gov/pubmed/16235326)
- Get smart for healthcare. Campaign to improve prescribing practices in inpatient health care facilities (http://www.cdc.gov/getsmart/healthcare/index.html)
- OIE: Terrestrial Animal Health Code: Chapter 6.9. Responsible and prudent use of antimicrobial agents in veterinary medicine (http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_antibio_use.htm)
- OIE: Aquatic Animal Health Code: Chapter 6.2. Principles for responsible and prudent use of antimicrobial agents in aquatic animals (http://www.oie.int/en/international-standard-setting/aquatic-code/access-online/)

Objective 5. Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new medicines, diagnostic tools, vaccines and other interventions.

- Collective responsibility for controlled distribution and use of antibiotics. ReAct policy paper (http://www.reactgroup.org/toolbox/category/rational-use/why-rationa-use/)
- Pew Charitable Trusts: Antibiotics in clinical trials for the US market, pipeline analysis (http://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2014/03/12/tracking-the-pipeline-of-antibiotics-in-development

Food and Agriculture Organization of the United Nations

World Health Organization