

Antimicrobial resistance: national action plans

IACG Discussion Paper¹

Disclaimer: This document reflects the discussions of IACG subgroup responsible for national action plans so far and will be subject to change as the discussions continue. It does not necessarily reflect the views of the IACG as a whole.

Key messages

- In most countries, the greatest challenge is not writing a NAP but implementing it and demonstrating sustained action.
- Five factors in particular make implementing NAPs a challenge for many countries: awareness and political will, finance, coordination, monitoring and data and technical capacity.
- AMR action is much more likely to be extended and sustained if it is mainstreamed into broader health, agricultural and environmental projects.
- In the long term, mainstreaming AMR means that governments will have to resource implementation of their NAPs, building it into national and local budgets and planning cycles to ensure sustainability.
- Putting resources into stopping AMR now is one of the highest-yield investments countries can make.
- Increased regional cooperation can improve the efficiency and effectiveness of implementation of NAPs and is essential to ensure that a lack of action in one area does not undermine progress in others.

1. Introduction

In 2015, the WHA adopted the [Global Action Plan on Antimicrobial Resistance \(GAP\)](#),² which included the goal that all Member States would have, by 2017, a national action plan (NAP) aligned with the GAP objectives. By the end of March 2018, 100 countries had prepared a NAP, and a further 67 had plans in progress.

This discussion paper, published by the Ad-hoc Interagency Coordination Group (IACG) on AMR, draws on recent work by the tripartite organizations (FAO, OIE and WHO) and others to identify challenges in implementing NAPs and invites discussion on how to address them.

We encourage all stakeholders to consider the questions posed in sections 3.1–3.3 below and to submit their perspectives to the IACG at iacg-secretariat@who.int. All submissions will be used to inform the subgroup's deliberations and proposals to the IACG.

¹ This paper was written by IACG members in consultation with colleagues from OIE, FAO, WHO and UNEP.

² Global action plan on antimicrobial resistance (GAP). Geneva: World Health Organization; 2015 (www.who.int/antimicrobial-resistance/publications/global-action-plan/en/, accessed 28 March 2018).

2. Gaps and challenges

Data from the [tripartite's monitoring of country progress in addressing AMR](#)³ indicate that countries fall into four broad categories in developing and implementing their AMR plans:

- a. countries with no plan or strategy on AMR (including very fragile and very small states);
- b. countries preparing a plan or having it approved;
- c. countries with a plan but having difficulty in implementing it, because they:
 - have no mechanism for implementation or coordination;
 - have logistical, technical or institutional challenges in sustaining and scaling up action, particularly across sectors; or
 - cannot access enough resources to finance the plan's activities, such as for the capacity and means for better infection prevention and control (in humans and animals) and resources for outreach, access to clean water, sanitation and hygiene (WASH), human and animal, waste management and building and equipping microbiological laboratories; and
- d. countries with a plan or strategy that are implementing it well.

These categories offer a potential framework for assessing and providing the support Member States require to advance their NAPs. Several tools are available to help countries, including [manuals, checklists, templates and discussion forums created by the tripartite](#)⁴ and [practical advice, case studies and online repositories compiled by ReAct](#).⁵ Many provide methodological and technical support, with guidelines, practical advice and case studies on preparing and implementing NAPs; however, there is little support to help low- and middle-income countries (LMICs) to identify and access the finance they need.

In most countries, the greatest challenge is not writing a NAP but implementing it and demonstrating sustained action. The use of standard templates and tools has sometimes resulted in “boiler plate” NAPs, and, to implement them effectively, many countries must undertake a pragmatic strategic review to prioritize actions on the basis of what is feasible at local and national levels (including within existing programmes) and which actions likely to have the greatest impact on their own citizens and communities.⁶

Five factors in particular make implementing NAPs a challenge for many countries: awareness and political will; finance; coordination; monitoring; and data and technical capacity (see Fig. 1 and sections 2.1–2.5 below). The significance of each depends, in part, on national income. For example, in high-income countries, the greatest barriers to operationalizing NAPs are often lack of political support by the whole of government, excessive bureaucracy and weak implementation procedures. In LMICs, political will is still important but it is often overshadowed by major infrastructure and staffing deficits in the health system, a lack of triangular cooperation and insufficient funding.

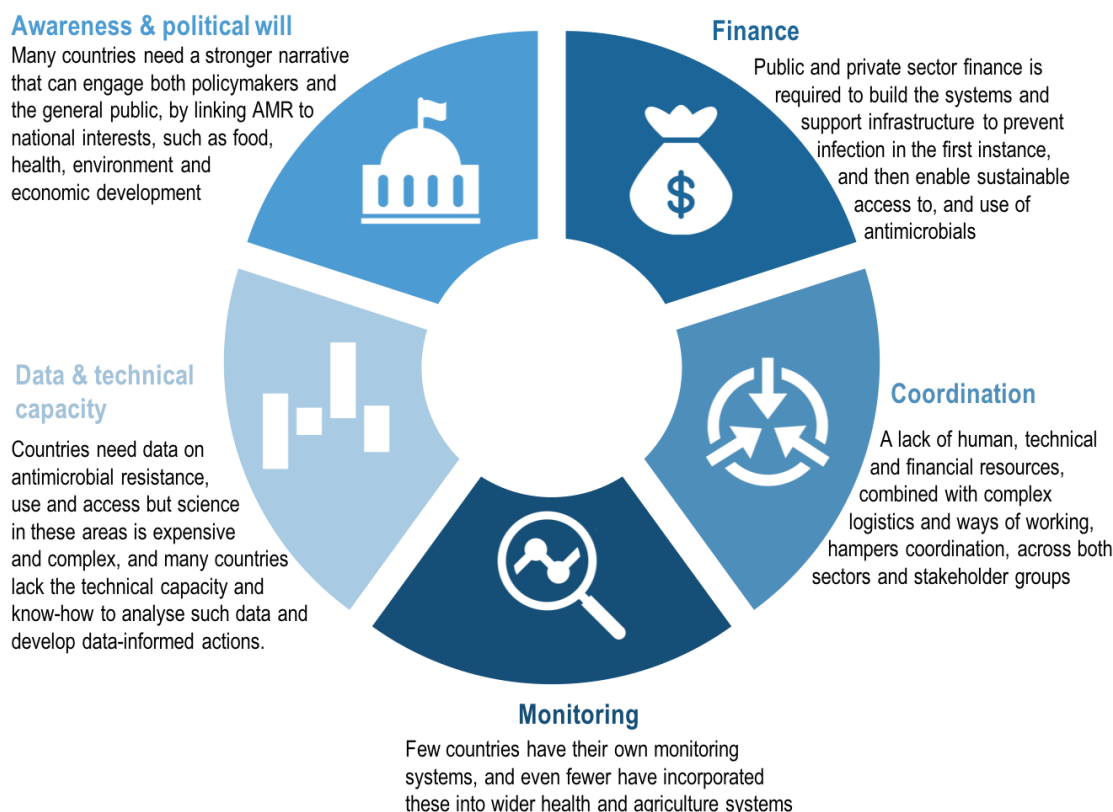
³ Country progress in the implementation of the global action plan on antimicrobial resistance: WHO, FAO and OIE global tripartite database. In: WHO/Antimicrobial Resistance [website]. Geneva: World Health Organization; 2018 (www.who.int/antimicrobial-resistance/global-action-plan/database/en, accessed 28 March 2018).

⁴ National action plans (NAP): supporting documents and tools. In: WHO/Antimicrobial Resistance [website]. Geneva: World Health Organization; 2018 (www.who.int/antimicrobial-resistance/national-action-plans/supporting-documents-tools/en, accessed 28 March 2018).

⁵ National action plans. In: ReAct [website]. Uppsala: ReAct; 2018 (www.reactgroup.org/?s=national+action+plans, accessed 28 March 2018).

⁶ Where is the action in the national action plans? Report for STAG 2018 on national action plans and monitoring. Geneva: World Health Organization; 2017.

Fig. 1. Key challenges in implementing NAPs



2.1. Awareness and political will

Experience in Ethiopia, Kenya, the Philippines and Thailand show that political commitment and leadership are critical to drive the AMR agenda forward and mobilize and allocate resources appropriately.⁷ Although there is high political will at global level (for example, in the United Nations [Political declaration of the high-level meeting of the General Assembly on antimicrobial resistance](#)⁸), there may be a lack of governance structures, including targets and lines of accountability, in a country to turn will into action.

In practice, political will can take a country only so far. For real engagement with and uptake of a NAP, the general public must also understand it and want to implement it. Building coalitions is a tried and tested method⁹ of building consensus among diverse stakeholders to raise awareness in the general public, advocate for policy and regulatory change and lead antimicrobial stewardship on the ground.

⁷ IACG subgroup 2. Working paper 1.0: Building sustainable multi-sectoral collaboration. Geneva: World Health Organization; in press.

⁸ Resolution A/RES/71/3 adopted by the United Nations General Assembly. Political declaration of the high-level meeting of the General Assembly on antimicrobial resistance. New York City (NY): United Nations; 2016 (https://digitallibrary.un.org/record/842813/files/A_71_L-2-EN.pdf, accessed 28 March 2018)

⁹ Joshi MP, Chintu C, Mpundu M, Kibuule D, Hazemba O, Andualem T et al. Multidisciplinary and multisectoral coalitions as catalysts for action against antimicrobial resistance: Implementation experiences at national and regional levels. *Global Public Health*. 2018. doi: 10.1080/17441692.2018.1449230

2.2. Public and private sector financing

Implementing a NAP requires long-term investment and funds to build the systems and support infrastructure for sustainable access to and appropriate use of antimicrobials. More than anything else, this means investing in the tools and tactics required to prevent infection in both humans and animals and strengthening biosecurity in communities, hospitals, farms and other animal treatment and production centres. Antibiotics cannot, in the long term, continue to be used as a substitute for good hygiene and care. The GAP suggests that basic infection prevention and control is the main priority – as well as the most cost-effective intervention – for tackling AMR in all countries.¹⁰ Ensuring the provision of WASH is critical, not least in health care settings, where WASH plays a key role in reducing the incidence of resistant infections by ensuring handwashing and cleaning of toilets, surfaces, bedding and medical equipment.¹¹

Public and private sector finance is also required to establish and sustain effective surveillance, manage supply chains, develop and implement stewardship programmes and increase public awareness and professional education and training. Investment must follow a One Health approach, extending across the human, animal (both aquatic and terrestrial), plant and environmental health sectors. For example, the infrastructure should enable surveillance of the use of antimicrobials and the prevalence of AMR in people, animals, food chains and the environment.

Such integrated surveillance is both complex and expensive, often beyond the reach of LMICs. Of the 146 countries that responded to the annual OIE survey on the use of antimicrobials in animals, 107 (73%) could provide quantitative data. The countries reported that barriers to data submission included lack of regulatory frameworks or enforcement, lack of cooperation between national authorities and with the private sector and lack of tools and human resources.¹² Monitoring resistance is even more complicated, and, in many LMICs, is further hampered by lack of laboratory and surveillance capacity. The FAO Assessment tool for laboratory and AMR surveillance system (ATLASS) assessments in 13 countries in Africa and Asia show that they lack basic laboratory capacity for surveillance in food and agriculture and fragmentation of work among different groups.¹³ WHO has supported capacity building projects in 30 LMICs but scaling and sustaining these is a challenge. Supported by The Fleming Fund and WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance (WHO-AGISAR), the “ESBL Ec Tricycle AMR surveillance project” seeks to address the lack of data on the contribution of the environment. It also seeks to overcome the barriers to integrated surveillance in LMICs by focusing on a single indicator: extended-spectrum β -lactamase *Escherichia coli*. The project remains in early stages of implementation.¹⁴

¹⁰ Global action plan on antimicrobial resistance (GAP). Geneva: World Health Organization; 2015 (www.who.int/antimicrobial-resistance/publications/global-action-plan/en/, accessed 28 March 2018).

¹¹ Rainey R, Weinger, M. The role of water, sanitation and hygiene (WASH) in healthcare settings to reduce transmission of antimicrobial resistance. In: AMR Control [website]. Suffolk: AMR Control; 2016 (<http://resistancecontrol.info/2016/infection-prevention-and-control/the-role-of-water-sanitation-and-hygiene-wash-in-healthcare-settings-to-reduce-transmission-of-antimicrobial-resistance/>, accessed 3 May 2018).

¹² OIE Annual report on antimicrobial agents intended for use in animals. Paris: World Organisation for Animal Health; 2017 (http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/AMR/Annual_Report_AMR_2.pdf, accessed 18 April 2018).

¹³ FAO. Assessment tool for laboratory and AMR surveillance system (ATLASS). Rome: Food and Agriculture Organization; in press.

¹⁴ Matheu J, Aidara-Kane A, Andreumont A. The ESBL tricycle AMR surveillance project: A simple, One Health approach to global surveillance. In: AMR Control [website]. Suffolk: AMR Control; 2017 (<http://resistancecontrol.info/2017/the-esbl-tricycle-amr-surveillance-project-a-simple-one-health-approach-to-global-surveillance/>, accessed 3 May 2018).

There is rarely enough finance, from either government ministries or development partners, to put AMR plans into action, partly because the plans are not yet embedded in government planning or budgeting cycles. Development start-up funds and projects are difficult to access because AMR is not seen as a development priority. In all cases, lack of adequate evidence about the cost of doing nothing means that donors and investors do not prioritize AMR. LMICs urgently need tools and resources to both present the case for investment in AMR and identify potential sources of funding, including from international assistance.

Some experts have called for a global fund to provide transitional financial and technical support to the poorest LMICs to build the capacity and programmes necessary to implement their NAPs (for example, in surveillance, public awareness, people capabilities and infection prevention).¹⁵

AMR should not be financed only by the public sector. Countries should ensure the right investment and regulatory environment for, and develop partnerships with, the private sector to ensure that it contributes fairly to the cost of antimicrobial production and clean up (be it antibiotic agents, private health care provision or the food industry).

2.3. Coordination across sectors and stakeholders

AMR is a cross-sectoral issue: it has its roots in multiple sectors and it can traverse ecological and geographical boundaries. Tackling it effectively requires managed, coordinated action across the human health sector and with other complex sectors, including animal health, plant health, food chains and environment. Cross-sectoral coordination is, however, problematic in many countries (particularly LMICs), because the governance structures and mechanisms to bridge sectors, not only within government but also with nongovernment partners and programmes, remain fragmented, inflexible or absent. Few countries have mechanisms or policies designed specifically to enable coordination. Those that do are often constrained by rigid structures and bureaucracy, so that things move very slowly. Countries vary significantly in the roles and responsibilities assigned to competent authorities, making it difficult to design a single solution to coordination. Some agendas, such as the environment are still evolving, and it is not yet clear what the priority actions for countries are, so whilst the involvement of the environment is critical to the multisectoral approach, it is not yet always clear who should be involved, and what the focus should be.

Strengthening cooperation between government agencies and United Nations organizations at national level could provide some of the methodological support required for cross-sectoral coordination, especially in LMICs. The tripartite organizations and partners already support national One Health initiatives in several countries^{16,17,18}. They have various tools (for example, [International Health Regulations – Performance of Veterinary Services \(PVS\) pathway national bridging](#)

¹⁵ Mendelson M, Dar OA, Hoffman SJ, Laxminarayan R, Mpundu MM, Røttingen JA et al. A global antimicrobial conservation fund for low- and middle-income countries. *Int J Infect Dis.* 2016;51:70–2.

¹⁶ New Myanmar One Health (OH) strategy. In: Animal production and health: emergency prevention system [website]. Rome: Food and Agriculture Organization of the United Nations; 2018 (http://www.fao.org/AG/AGAInfo/programmes/en/empres/news_170316b.html, accessed 6 May 2018).

¹⁷ Developing a One Health platform governance manual in Liberia. In: Preparedness & Response [website]. Bethesda (MD): United States Agency for International Development; 2018 (<http://preparednessandresponse.org/news/developing-one-health-platform-governance-manual-liberia/>, accessed 6 May 2018).

¹⁸ One Health in Viet Nam. Rome: Food and Agriculture Organization of the United Nations; undated (<http://www.fao.org/3/a-az116e.pdf>, accessed 6 May 2018).

[workshops](#)¹⁹) to help national institutions identify synergies among sectors and build bridges for stronger One Health relations and governance. It is important that all these initiatives incorporate AMR.

Even if good governance structures are in place, they require significant human, technical and financial resources to function. Few LMICs have even one person working full time on AMR coordination, and they have often been promoted from a laboratory or pharmacy, with no training in networking, communication or governance, which are required for AMR coordination. Logistical challenges, including differences in information systems, office structures and ways of working among ministries, may also pose significant barriers to collaboration, particularly in resource-constrained settings. Coordination in LMICs is further complicated by limited capacity to regulate or influence the informal private sector, where most health services and food production occur.

None of these governance, institutional and resourcing constraints is unique to AMR or is likely to be solved by a single intervention. Integrating AMR into interventions for policy harmonization and regulatory and institutional reform is more likely to be effective.

2.4. Monitoring and evaluation systems

In order to specify targets, track progress over time and ensure accountability, countries should have a robust, workable system for monitoring and evaluating NAPs. Establishing even a simple system can, however, be difficult, given the complexity of the AMR agenda and the lack of systems and capacity in many countries. Even where systems are available and functional, changes in governments or in governance systems at various levels can threaten their sustainability.

In 2016, the tripartite organizations sent countries [a questionnaire](#)²⁰ to assess their progress in preparing their NAPs, working with many sectors and addressing AMR. The self-assessment provided a useful indicator of progress at a global level, but few countries have set up their own monitoring systems, and even fewer have incorporated them into wider health and agriculture systems.

The tripartite is now preparing [a monitoring and evaluation framework](#)²¹ to help countries select performance indicators for tracking and communicating progress in achieving the GAP goals. The framework focuses on the global picture, and more work is needed to help countries to build AMR into their own monitoring and evaluation systems, develop an efficient system of data collection to support the global framework and minimize the burden of extra data requirements. Any resources raised or earmarked for monitoring and evaluation must be for both global and local efforts.

¹⁹ World Health Organization, World Organisation for Animal Health. International Health Regulations–PVS pathway national bridging workshops. In: WHO-OIE operational framework for good governance at the human–animal interface. Geneva; World Health Organization; 2014:part 2/2 (www.who.int/ihr/publications/WHO-OIE_Operational_Framework/en/, accessed 28 March 2018).

²⁰ Country progress in the implementation of the global action plan on antimicrobial resistance: WHO, FAO and OIE global tripartite database. In WHO/Antimicrobial Resistance [website]. Geneva: World Health Organization; 2018 (www.who.int/antimicrobial-resistance/global-action-plan/database/en, accessed 28 March 2018).

²¹ FAO, OIE, WHO. Monitoring and evaluation of the Global Action Plan on Antimicrobial Resistance: proposed approach. Rome: Food and Agricultural Organization of the United Nations; 2017 (www.fao.org/3/a-i7711e.pdf, accessed 28 March 2018).

2.5. Data and technical capacity

Data on AMR and access to and use of antimicrobials are useful for implementing NAPs at various levels. Robust data provide the evidence required to persuade politicians and policy-makers to take action. They are important for understanding local contexts, including environmental pathways and sectoral attribution, and they are essential for tracking progress, indicating changes in NAPs and designing and prioritizing interventions on the basis of their proven impact. AGISAR pilot projects, in addition to building capacity for integrated surveillance and fostering multisectoral collaboration, are an opportunity to generate data at country level to raise awareness and inform policy using locally-generated data.

To implement NAPs, countries require reliable data specifically on:

- the local burden of AMR in humans, animals, food chain and plants (including levels of resistance, morbidity, mortality and financial costs);
- access to antibiotics (classified according to the “access, watch and reserve” categories defined in the [WHO Model list of essential medicines](#)²²);
- the prevalence of health care-associated infections;
- the sale and use of antimicrobials for humans, animals and plants;
- monitoring of AMR and residues of antibiotics at environmental risk points, such as effluent flows from health facilities, animal and crop production sites and pharmaceutical manufacturing sites, or in metropolitan sewage;
- behaviour in the use of antimicrobials and its drivers; and
- the probable impact and cost-effectiveness of interventions in specific settings (including implementation research to ensure that global imperatives are translated into workable, sustainable approaches in low-income contexts and case studies of approaches that work).

Research in these areas is often complex and expensive, and most LMICs lack the systems and technical knowledge or capacity to collect these types of data or to analyse them and use them to make data-based decisions. Most are also already overwhelmed by other requests for data for multiple, overlapping indicators. A clear and evidence-based set of prioritised activities is needed for issues such as the environment, so that countries can focus their data collection activities in a consistent way on those issues that matter most.

National systems for environmental and epidemiological monitoring and surveillance for AMR must be strengthened. When resources are scarce, however, spending on surveillance is rarely a priority, particularly if the resulting data are seen as an international public good rather than of direct use for management at national level. Therefore, it is even more important to link data collection to local development issues, particularly when knowledge about AMR can contribute to positive outcomes, such as increasing people’s access to animal protein.

A globally coordinated effort, directed by a clear plan to fill in gaps in epidemiology (i.e. point prevalence studies on AMR and use of and access to antimicrobials, residues and bacteria in the environment) that can be translated into national contexts, may be necessary.

²² WHO model list of essential medicines. 20th list. Geneva: World Health Organization; 2017 (www.who.int/medicines/publications/essentialmedicines/en/, accessed 28 March 2018).

3. Enabling implementation

In response to the gaps and challenges outlined above and in consideration of the IACG mandate to “provide practical guidance for approaches needed to ensure sustained effective global action to address antimicrobial resistance,... including options to improve coordination, taking into account the [GAP]”,²³ the IACG is exploring options in three areas: mainstreaming, financing and regional cooperation. The section that follows presents a summary of current thinking in the on each of these areas, followed by a series of open questions to refine the discussion. All stakeholders are encouraged to consider the questions raised below and to submit their perspectives to the IACG at iacg-secretariat@who.int.

3.1. Mainstreaming

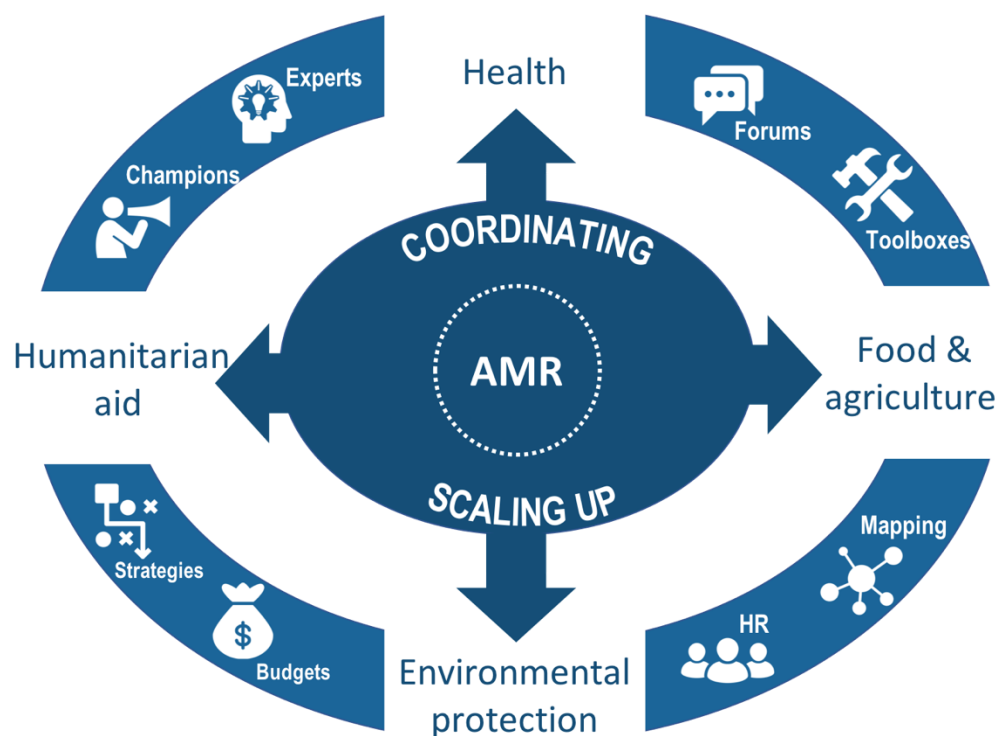
Countries with the highest burden of infectious disease often have the fewest financial and human resources to address it. Many are already overstretched with vertical initiatives and special programmes. In these countries, AMR action is much more likely to be extended and sustained if it is mainstreamed into broader health, agricultural and environmental projects.

Mainstreaming in the context of AMR requires a careful mix of:

- scaling up good public health and animal husbandry by embedding AMR-specific actions into existing health strategies, food and agriculture strategies, environmental protection plans and humanitarian aid priorities (and relevant budgets); and
- deliberately coordinating activities among stakeholder groups (including government, professional organizations, civil society and the private sector) and sectors (including health, agriculture, trade, education and the environment).

²³ Resolution A/RES/71/3 adopted by the United Nations General Assembly on 5 October 2016. Political declaration of the high-level meeting of the General Assembly on antimicrobial resistance. New York City (NY): United Nations; 2016 (https://digitallibrary.un.org/record/842813/files/A_71_L-2-EN.pdf, accessed 29 March 2018).

Fig. 2. Mainstreaming AMR includes scaling up AMR plans into sectoral strategies and budgets and coordinating activities among sectors and stakeholders



In part, scaling up AMR means identifying opportunities to invest in AMR-sensitive²⁴ capacity in healthcare, schools, households and agriculture, including, above all, scaling up infection prevention measures – for example, improving WASH practices, extending vaccination (of people and animals) and increasing food and water safety – to limit the development and spread of resistant microbes and infections.

Scaling up AMR in programmes and projects also requires identifying and strengthening the AMR-specific²⁵ components of health systems, agricultural systems and environmental management systems, such as updating treatment guidelines for doctors or veterinarians²⁶ or tightening existing legislation on sewage and wastewater treatment. It also includes introducing new AMR activities, such as surveillance and stewardship, to catalyse action. For example, extending the scope and capacity of information collection mechanisms to include a monitoring framework for AMR and antimicrobial use.

In all cases, scaling up works by building on existing systems and structures. A first step is to map country activities and identify potential entry points. To ensure full participation, transparency and legitimacy, such mapping should cover both government and nongovernment programmes and

²⁴ AMR-sensitive actions are those that are primarily for other objectives but also indirectly help to contain AMR.

²⁵ AMR-specific actions are those that are specific for reducing AMR.

²⁶ For example, see: FAO. Antimicrobial resistance in Bangladesh: A One Health approach. Video available at http://tv.fao.org/video/index/entryId/1_vjk50sax.

projects. Recent WHO country analyses²⁷ show diverse entry points for AMR initiatives, from infection prevention and control to drug development to plans to combat emerging infectious diseases.

Once the relevant plans and programmes have been mapped, the NAP should establish links to each and assign clear roles and responsibilities for actions that are also aligned with the core mandate of the “host” institution. The NAP in Thailand, for example, is effectively a “plan of plans” that anchors AMR within strategic plans in various sectors in human and animal health.

Given the cross-sectoral nature of AMR, plans should not only be embedded in sectoral strategies but should also be coordinated among sectors (and stakeholders). Effective coordination is both time- and resource-intensive. Anecdotal evidence suggests that it requires dedicated AMR focal points with the capacity, knowledge and skills to coordinate effectively,²⁸ including ensuring that people attend coordination meetings, preparing tailored messages to encourage participation and commitment, engaging diverse stakeholders and effectively communicating the shared benefits.

Both scaling up and coordination require better capability to advocate for and implement actions to combat AMR. Mechanisms that might help include:

- **Expert groups:** national or global pools of experts from the public and private sectors who can provide technical assistance.
- **“Champions”:** individuals and organizations who command respect and have the authority to work among sectors and disciplines could raise the profile of AMR and secure political commitment, liaise with international agencies and advocate for investment (from government and development partners). Some champions have emerged from technical forums (health professionals, researchers or academics). In many countries, civil society institutes, professional groups or faith-based groups have advanced the AMR agenda. For example, the Christian not-for-profit organization Ecumenical Pharmaceutical Network has been influential in tackling AMR in Africa.
- **Knowledge-sharing forums:** Networks, partnerships, discussion forums, workshops and online repositories all serve for exchange of knowledge about what works and why and effective NAP implementation. In 2016, [a global summit hosted by the Wellcome Trust](#)²⁹ called for a global repository of information on implementation of measures against AMR that could be useful to determine the effectiveness of policy interventions and the practicalities of implementation. [ReAct’s online toolbox](#)³⁰ collates “success stories” in AMR control and illustrates how the actions could be adapted to other contexts. Other tools support more direct exchange among stakeholders, such as [WHO’s AMR-NAP discussion forum](#),³¹ which hosts informal peer-to-peer discussions on NAP development and implementation.

²⁷ WHO AMR/NAP. Working paper 1.0: Building sustainable multi-sectoral collaboration. Geneva: World Health Organization; in press.

²⁸ Ibid. (WHO AMR/NAP).

²⁹ Evidence for action on antimicrobial resistance. London: Wellcome Trust; 2016 (<https://wellcome.ac.uk/sites/default/files/evidence-for-action-on-antimicrobial-resistance-wellcome-sep16.pdf>, accessed 30 March, 2018)

³⁰ A guide for national action plans. Uppsala: ReAct; 2018 (www.reactgroup.org/toolbox-a-guide-for-national-action-plans, accessed 30 March, 2018)

³¹ Online discussion forum for developing and implementing national action plans to combat antimicrobial resistance (<https://ezcollab.who.int/amr-nap?ReturnUrl=%2famr-nap%2fdiscussions>).

In all mainstreaming activities, there is a risk that resources are spread so thinly that almost nothing happens or that what does happen is of too poor quality to be helpful. Resourcing is therefore a priority (see section 3.2).

Questions for stakeholders

- What scope is there to incorporate AMR into broader universal health coverage, international health regulations, sustainable development, food system and environment agendas?
- What support do Member States need to build AMR-specific and AMR-sensitive activities into national strategies for public health, animal health, plant health, food security and sustainable economic development?
- What forces maintain national responses to AMR in silos, and how can we overcome them?
- How can international development partners support full integration of the AMR programmes they fund into sustainable initiatives in beneficiary countries?

3.2. Financing³²

All countries should find ways of securing sufficient resources to implement their NAPs. These include resources from the national treasury and government ministries and from other donors and development partners, including other countries, foundations, private donors and others.

Country studies carried out by WHO³³ suggest that donors and development partners have key roles in catalysing action on AMR and supporting activities that are excluded from government plans and budgets. It may, however, be difficult to identify sources of donor support, and there are limited tools available to help LMICs find and access such financial and technical support.

In the long run, mainstreaming AMR means that governments will have to resource implementation of their NAPs, building it into national and local budgets and planning cycles to ensure sustainability.

Factors that can improve financing at national and international levels are illustrated in Fig. 3. First, if governments and donors are to support AMR, they must be convinced of its relevance to their own goals and objectives. They require a strong narrative that clearly links the threat of AMR to fundamental national interests, including health care, food security, environmental sustainability and economic development. The narrative should include consideration of AMR in the context of measures against common infectious diseases such as pneumonia, tuberculosis, HIV infection and malaria.

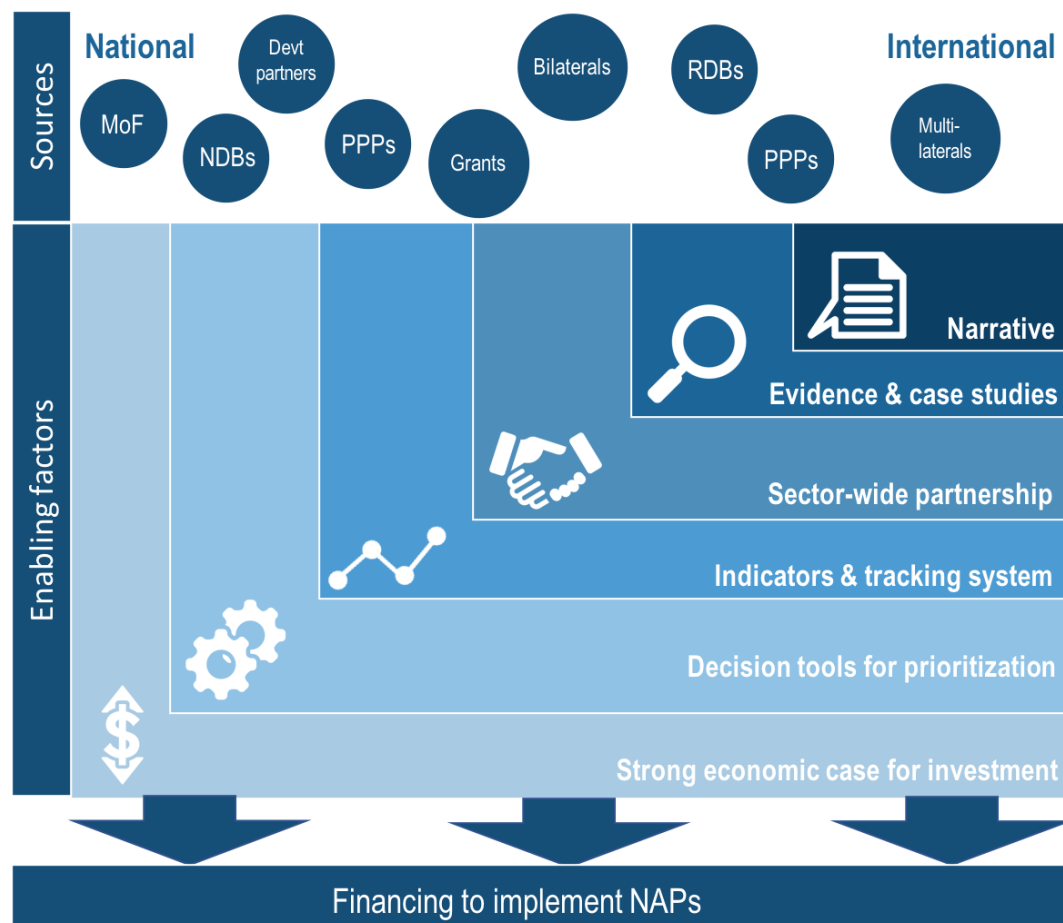
In many LMICs, AMR remains an abstract concept, a complex technical issue that is far removed from most people's day-to-day concerns. Policy-makers must be persuaded that investment in health services (including public health, animal health, plant health and environmental health) is

³² The discussion of financing in this paper excludes investment for research and development, which is covered by a separate IACG subgroup (4).

³³ WHO AMR/NAP. Working paper 1.0: Building sustainable multi-sectoral collaboration. Geneva: World Health Organization; in press.

essential not only to create AMR-sensitive capacity but also to address other national health and economic priorities.

Fig. 3. Factors to enable financing from national and international agencies and development partners to implement NAPs.



MoF, ministry of finance; NDB, national development bank; PPP, public–private partnership; RDB, regional development bank; Devt, development

The compelling narrative should be accompanied by a much stronger economic case for investing in AMR actions, including financing NAPs, that is based on evidence and case studies (especially from LMICs). The case should show that the benefits far outweigh the costs, reflect the multi-sectoral complexity of AMR and show how costs in one sector will result in savings in another, by quantifying the potential savings from collaboration among sectors (and locations).

The cost of inaction at global level by 2030 has been calculated by the World Bank as US\$ 1–3 trillion each year, with LMICs bearing the greatest impact on socioeconomic development.³⁴ The Bank argues that putting resources into stopping AMR now is one of the highest-yield investments countries can make. It is now on [an investment framework](http://documents.worldbank.org/curated/en/323311493396993758/final-report) to help countries to identify where resources will have the greatest impact. The framework will include rigorous costing of priority AMR

³⁴ Drug-resistant infections: a threat to our economic future. Washington DC: The World Bank Group; 2017 (<http://documents.worldbank.org/curated/en/323311493396993758/final-report>, accessed 2 April 2018).

interventions (at country, regional and global levels) and will be based on the results of assessments of country financing to identify national priorities, needs, gaps and “best-value” interventions.

The investment framework, which will be presented to the United Nations General Assembly in September 2019, is intended for use globally to ensure that AMR finance flows to where it is needed most. The development and implementation of such a framework will require strategic engagement with multiple development partners – particularly multilateral and regional development banks – to encourage their support for long-term delivery of the GAP objectives.

Countries also need decision tools tailored to their context of disease burden, socioeconomic status and available resources. Tailored decision tools allow countries to identify the activities that are easiest to scale up, most cost-effective or potentially have the greatest impact, which in turn, enables governments to prioritize activities and allocate resources effectively and efficiently.

Establishing a clear set of indicators and a monitoring system to track progress against a prioritized plan can attract financing from external donors and development partners. Furthermore, a single, prioritized plan can act as a focus for sector-wide partnerships to coordinate support and action, as illustrated by the [UHC 2030 International Health Partnership](#).

Questions for stakeholders

- What support do countries need to translate information on the global impact of AMR into a country-specific case?
- How can AMR be integrated into the plans and budgets of governments and, where appropriate, development partners?
- What is the role of the international community in supporting international public goods such as AMR surveillance data?
- How can we support decisions to balance the portfolio of investment in AMR-specific and AMR-sensitive interventions, particularly in LMICs that need support in developing public health, animal health, plant health and environmental support services across regulatory and operational domains?
- Which elements of basic scientific understanding most urgently require work to ensure a strong, evidence-based policy and investment platform? (For example, mechanisms of resistance, the One Health epidemiological model of attribution for resistance development and transmission, or the economic model of impact and potential benefit?)

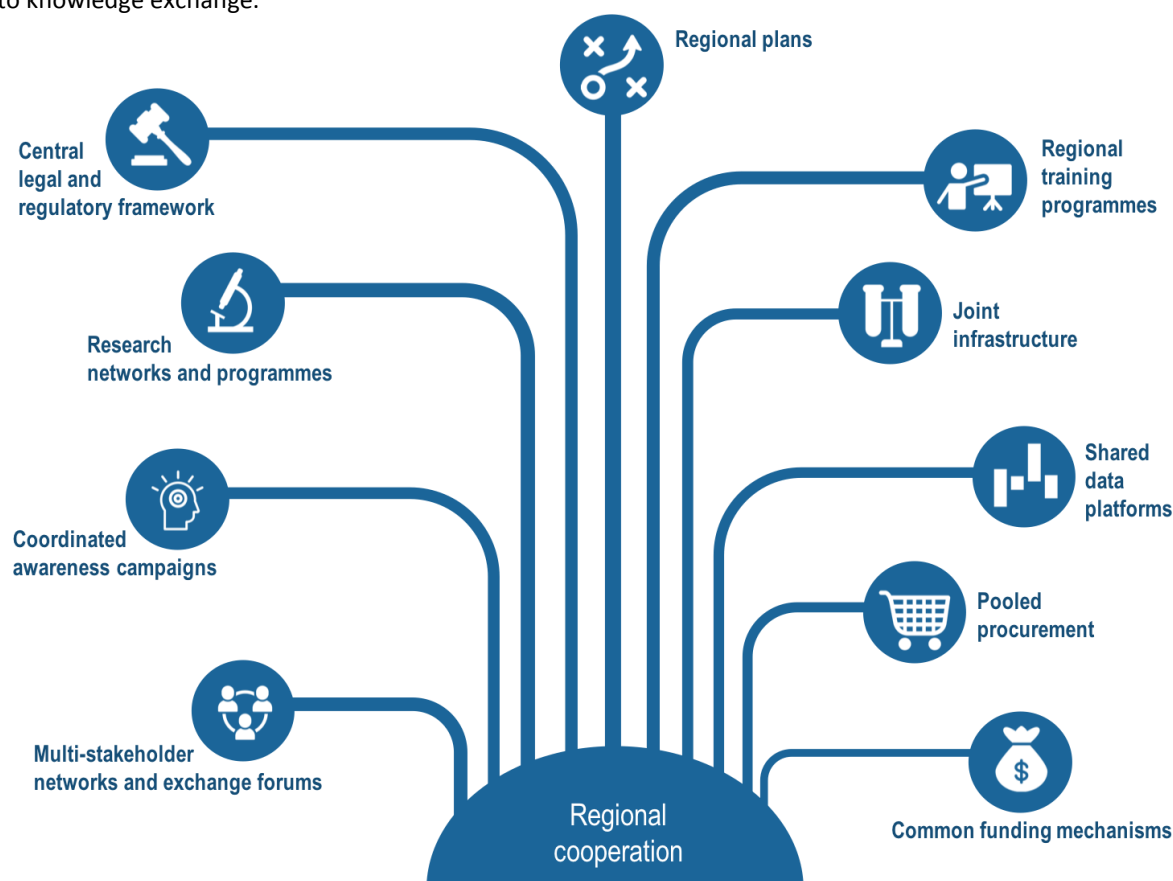
3.3. Regional cooperation

Increased regional cooperation can improve the efficiency and effectiveness of implementation of NAPs and address the cross-border threat of AMR, ensuring that lack of action in one area does not undermine progress in others.

Cooperation improves national, regional and institutional governance in addressing AMR. It supports implementation of rules to tackle AMR and enables a better coordinated One Health response. It can serve as a platform for advocating measures and standards for tackling AMR in trade agreements. It strengthens solidarity and opens the door to knowledge exchange and lesson learning. Particularly for resource-poor nations, participating in shared platforms and joint initiatives offers significant potential economies of scale (see Fig. 4 overleaf).

The European Union is perhaps the most advanced region in cooperation on AMR, with [A European One Health Action Plan against AMR](#)³⁵ that includes all of the types of joint initiative illustrated in Fig 4 and many more. The Association of Southeast Asian Nations ([ASEAN regional strategy on AMR](#)³⁶ is more targeted than that of the European Union, focusing on communication and advocacy for improving the region's primary problem, which is lack of awareness.

Fig. 4. Regional cooperation includes shared platforms and joint initiatives in a range of activities, from funding to knowledge exchange.



³⁵ A European One Health action plan against antimicrobial resistance (AMR). Brussels: European Commission; 2017 (https://ec.europa.eu/health/amr/sites/amr/files/amr_action_plan_2017_en.pdf, accessed 2 April 2018).

³⁶ ASEAN regional strategy on antimicrobial resistance: communication and advocacy. Jakarta: Association of Southeast Asian Nations; 2016 (<http://asean.org/storage/2012/05/15.-ASEAN-Regional-AMR-Communication-and-Strategy.pdf>, accessed 2 April 2018).

Some of the platforms that these two advanced regions use to support cooperation include:

- **Regional plans** in a joint strategy for AMR action, to harmonize efforts and prioritize action across the region, covering a wide range of activities. Examples include both the [European One Health Action Plan against AMR](#) and the [ASEAN regional strategy on AMR](#) and also the [Africa CDC Antimicrobial Resistance Surveillance Networks](#), which emphasizes strengthening national surveillance systems across Africa.
- **Common funding mechanisms** to mobilize resources from various cooperative funding instruments and partnerships, including development funds, to help member countries to develop and implement AMR policies. For example, European Union member states can access AMR funds through the [Structural Reform Support Service](#) and the [European Development Fund](#) for policy initiatives as well as those of their partner countries.
- **Pooled procurement programmes** help small or resource-poor countries to access a sustainable (and cheaper) supply of good-quality antimicrobials, with reduced transaction costs.
- **Shared data platforms** enable a coordinated approach to collecting and analysing information on how antimicrobials are used in different sectors and the prevalence of resistance in human and animal populations. Examples include the collation of data on antibiotic consumption in the community and in hospitals by the [European Centre for Disease Prevention and Control](#); monitoring and analysing AMR in food and animals across Europe by the [European Food Safety Authority](#); collection of data on antimicrobial use in animals by the European Surveillance of Veterinary Antimicrobial Consumption and the [Information Platform for Chemical Monitoring](#), which collates data from monitoring of chemicals in humans and in the environment.
- **Shared infrastructure**, for example regional laboratory facilities, support AMR monitoring and reference laboratory activities in the human health and veterinary sectors.
- **Regional training programmes** build countries' capacities to implement AMR plans and policies effectively. They include workshops led by regional offices of the tripartite organizations and training programmes developed by regional blocs, such as training on European Union legislation for AMR and antimicrobial use for competent authorities (under the [Better Training for Safer Food initiative](#)) and for health professionals through the European Centre for Disease Prevention and Control.
- **Shared regulatory and legal frameworks** are used to coordinate and implement cross-regional rules and standards, including establishing harmonized rules, for example on AMR monitoring in food-producing animals and use of veterinary medicinal products and medicated feed, and regular auditing of their implementation. They ensure policy coherence among sectors, for example, between the European Union's One Health Action Plan against AMR and its upcoming [Strategy on Pharmaceuticals in the Environment](#).³⁷
- **Research networks** support information-sharing and can be used to undertake joint research on region-specific issues.
- **Coordinated awareness campaigns** increase understanding of AMR among stakeholders throughout a region. The ASEAN Strategy on AMR exclusively involves regional cooperation in a range of activities, from stakeholder mapping to development of advocacy and communication materials to networking and information-sharing through country visits and conferences.
- **Multi-stakeholder networks and forums** for knowledge exchange can help countries learn from each other, share ideas, build consensus, compare progress and accelerate national work. For example, the European Union's [AMR One Health network](#) brings together government experts

³⁷ Joining the dots: tackling pharmaceuticals in the environment and AMR in Europe. Brussels: European Public Health Alliance; 2018 (<https://epha.org/wp-content/uploads/2018/03/AMR-minutes-joining-the-dots.pdf>, accessed 2 April 2018).

and scientific agencies in the human health, animal health and environmental sectors across Europe to identify and share best practices and policies.

Questions for stakeholders

- What are the highest priorities for training in Member States with respect to NAP implementation?
- What platforms would be most useful for sharing success stories, examples of best practice and lessons from experience in NAP development and implementation?
- What sensitivities should be considered when encouraging regional cooperation on AMR?
- What role should regional economic communities play in developing regional cooperation platforms? And how can they be supported?