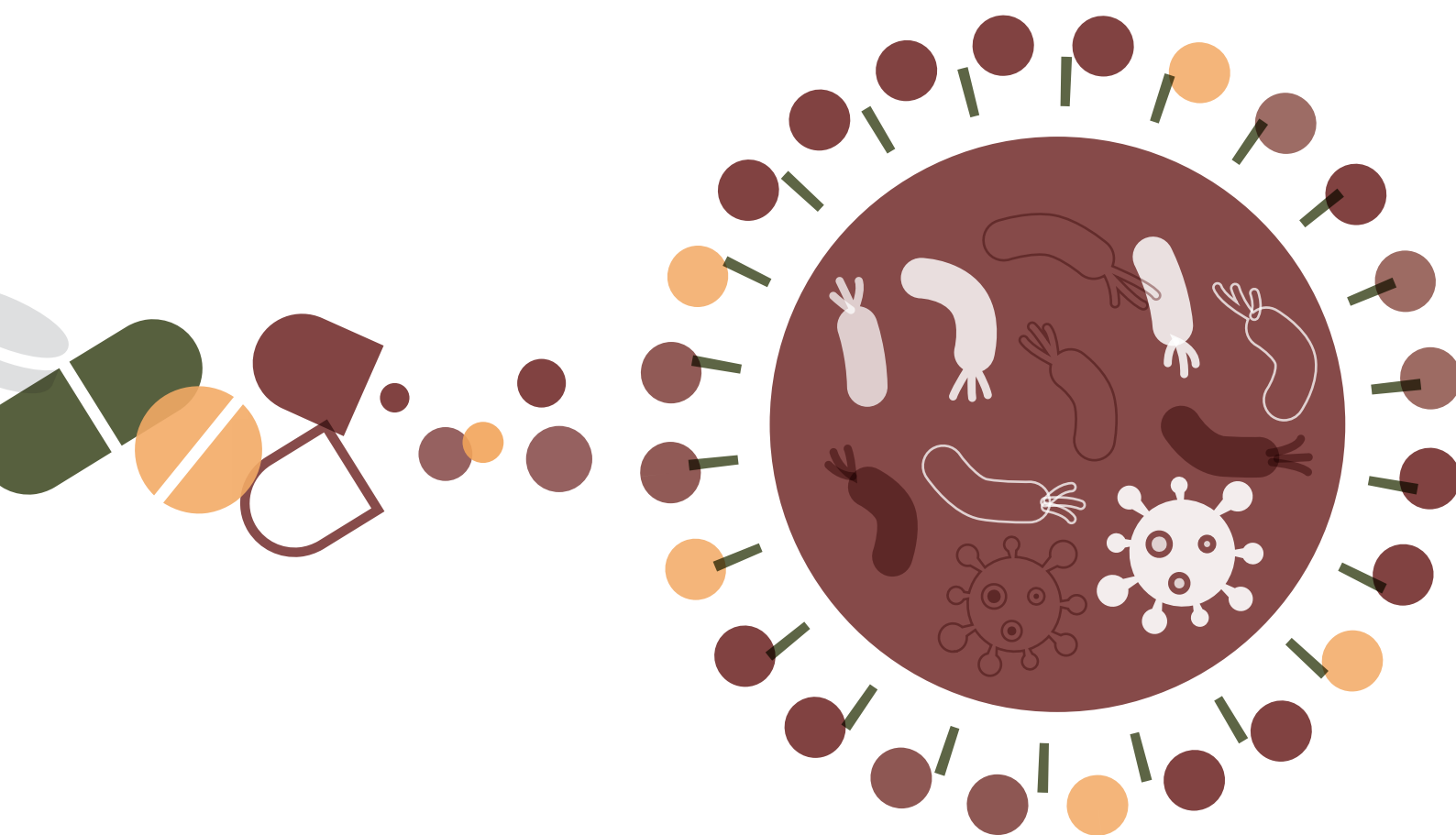
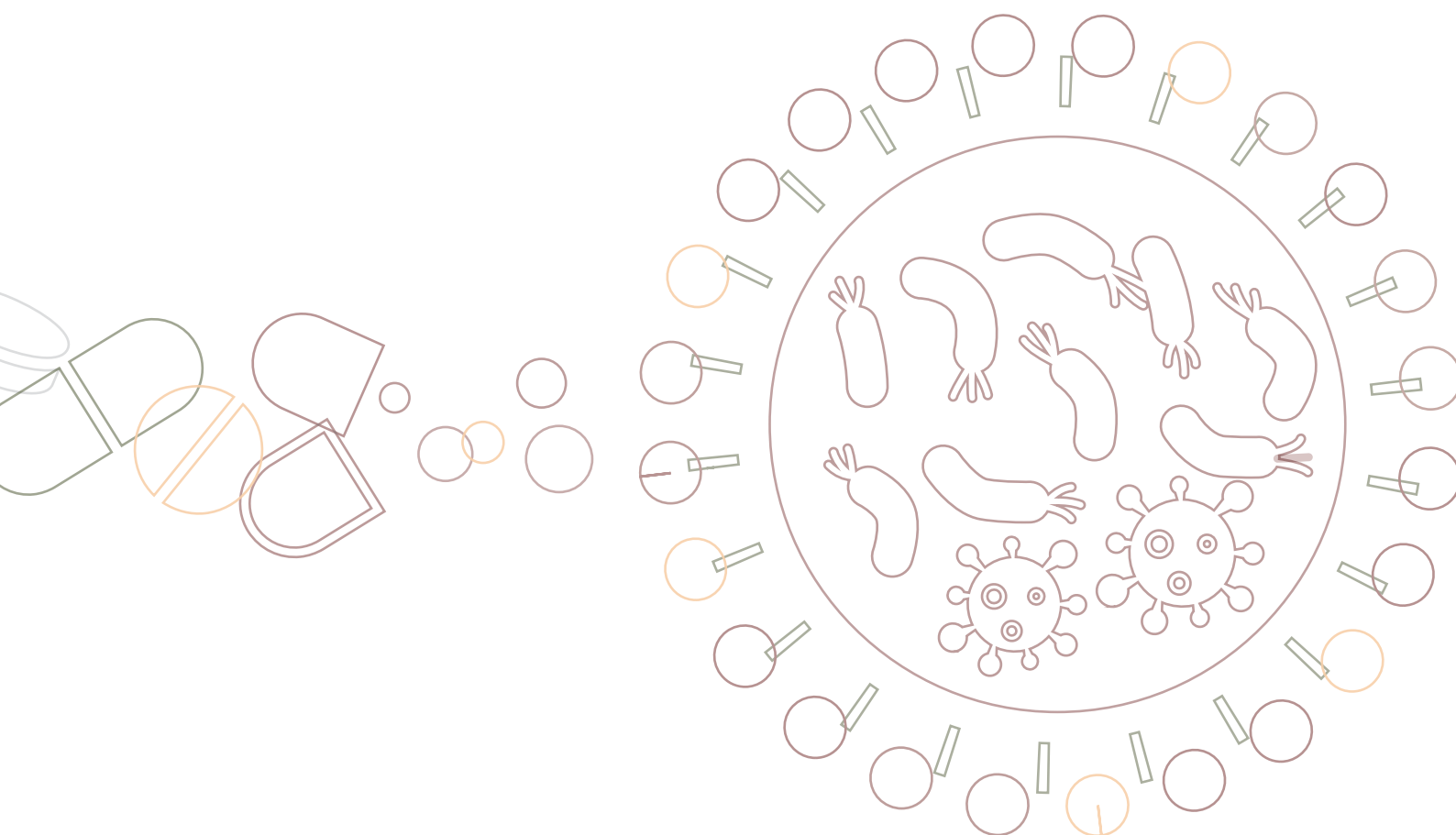


African Union Framework for **Antimicrobial Resistance Control 2020–2025**



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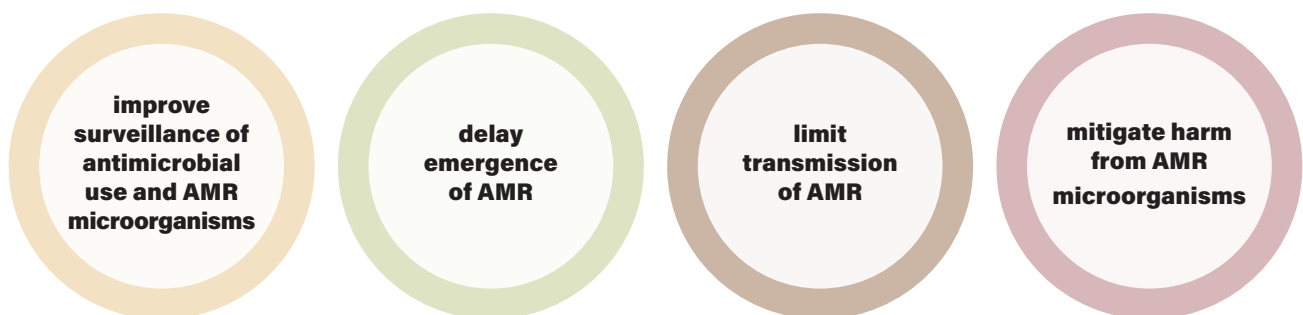
Abbreviations

Africa CDC	Africa Centres for Disease Control and Prevention
AMR	antimicrobial resistance
ATLASS	FAO Assessment Tool for Laboratories and Antimicrobial resistance Surveillance systems
AU	African Union
CLSI	Clinical Laboratory Standards Institute
CAC	Codex Alimentarius Commission
EUCAST	European Committee on Antimicrobial Susceptibility Testing
FAO	Food and Agriculture Organisation of the United Nations
GLASS	Global Antimicrobial Resistance Surveillance System
HIV	human immunodeficiency virus
IACG	Interagency Coordinating Group
IAPSC	Inter-African Phytosanitary Council
IBAR	Inter-African Bureau for Animal Resources
IPPC	International Plant Protection Convention
ISPM	International Standards for Phytosanitary Measures
MDR	multidrug resistance
NEPAD	New Partnership for Africa's Development
NPHI	National Public Health Institutes
NPPO	National Plant Protection Organizations
OIE	World Organization for Animal Health
PANVAC	African Union's Pan-African Vaccine Centre
PATTEC	Pan African Tsetse and Trypanosomiasis Eradication Campaign
RCC	Regional Collaborating Centre
RAHN	Regional Animal Health Network
TB	tuberculosis
USD	United States Dollars
WHO	World Health Organization

1 Executive summary

Reports of antimicrobial-resistant (AMR) microorganisms are increasing globally, threatening to render existing treatments ineffective against many infectious diseases. In Africa, AMR has already been documented to be a problem for human immunodeficiency virus (HIV) and the pathogens that cause malaria, tuberculosis (TB), typhoid, cholera, meningitis, gonorrhoea and dysentery. Recognizing the urgent need for action, the 2016 United Nations (UN) General Assembly approved a resolution to ensure sustained and effective global action to address AMR. Three global agencies – the World Health Organization (WHO), the World Organization for Animal Health (OIE) and the Food and Agricultural Organization of the United Nations (FAO) – released global strategies for AMR control, and have established a formal tripartite collaboration along with the UN Environment Programme (UNEP). In accordance with the UN approach, and to meet the specific needs of African nations, the African Union (AU) established a Task Force on Antimicrobial Resistance in 2018. This Task Force represents the AU agencies involved in human, animal and plant health sectors that collaborate to measure, prevent and mitigate harms from AMR microorganisms.

Within the next five years, the AU will work to:



To achieve these goals, the AU will:



advocate for policies, laws, good governance and capacity building to enable long-term prevention and control of AMR;



engage civil society organizations;



develop skilled human resources;



enhance awareness and understanding of AMR and foster implementation of international standards;



strengthen knowledge through research.

2 The threat of antimicrobial-resistant infections

Antimicrobial agents, of which antibiotics are one subset, have saved hundreds of millions of lives from infectious diseases. Antimicrobials remain an essential tool in the treatment, prevention and control of agricultural pests and diseases, and are important to ensuring productivity, food safety and nutrition security. Reports of antimicrobial-resistant (AMR) microorganisms are increasing globally, threatening to render existing treatments ineffective against many infectious diseases in humans, animals and plants. Drug-resistant strains of bacteria, fungi, parasites and viruses prolong illness, increase case fatality, facilitate transmission, increase treatment costs and, at a population level, increase food safety risks and nutrition insecurity. The World Health Organization (WHO) and other programmes have demonstrated increasing drug resistance across the African region, particularly for human immunodeficiency virus (HIV) and the pathogens that cause malaria, tuberculosis (TB), typhoid, cholera, meningitis, gonorrhoea and dysentery. There is also an increasing recognition that delayed diagnosis and treatment of AMR infections can lead to sepsis, an under-appreciated cause of human mortality across Africa. The health and economic costs of AMR are significant and further compounded by a growing global population with rising food demands. Globally, drug resistance causes an estimated 700,000 human deaths each year. If current trends continue, AMR could result in over 10 million deaths per year and over USD 100 trillion in lost output globally by 2050. Economic analyses indicate that AMR control interventions ultimately save money because of the return on investment from averting and curing infections.

Many factors contribute to the emergence, persistence and transmission of AMR. Although AMR strains arise naturally due to genetic changes in microorganisms, their emergence is accelerated by inappropriate use of antimicrobial agents in humans, animals and the environment. This includes: self-treatment of illness by individuals; unnecessary and/or non-indicated administration by health care providers; unregulated use in animal feed; and for pest control in crops. AMR emergence may be further amplified by substandard or falsified antibiotics, which impair treatment of existing infections and may help select for AMR strains; contamination of the environment from unmanaged agricultural or industrial waste; and contamination of food with antimicrobial residue. Transmission of AMR is also accelerated by inadequate infection prevention and control in health care facilities, by impaired access to potable water, and by limitations in public health prevention programmes including immunization, sanitation and sexual health. In animal husbandry and crop production, transmission is accelerated by inadequate hygiene and biosecurity and by contamination of the food and/or water supply with AMR microorganisms. Recognizing the urgent need for action, the 2016 United Nations (UN) General Assembly approved a resolution to ensure sustained and effective global action to address AMR. Three global agencies – WHO, the World Organization for Animal Health (OIE) and the Food and Animal Organization of the UN – released global strategies for AMR control and established a formal Tripartite collaboration along with the UN Environment Programme (UNEP). The UN resolution mandated the creation of an Interagency Coordinating Group (IACG) on AMR, which presented its findings to the UN Secretary General in April 2019.

Common themes across the UN agencies' action plans and the IACG recommendations include a need to:

1. act now;
2. involve all agencies involved in human, animal and plant health;
3. improve routine monitoring about use of antimicrobials and prevalence of AMR;
4. ensure strict adherence to guidelines for appropriate antimicrobial use;
5. strengthen measures for limiting transmission among and between humans, animals and plants.

3 African Union response to AMR

In response to the urgent threat of AMR and reflecting the UN consensus on priorities, the AU established a Task Force on AMR in 2018. The Task Force includes all agencies of the AU involved in human, animal and plant health, including:

- AU Chairperson's office.
- Department of Human Resources, Science and Technology.
- Department of Rural Economy and Agriculture:
 - Division of Environment, Climate Change, Water and Land Management.
 - Inter-African Bureau for Animal Resources (IBAR).
 - Inter-African Phytosanitary Council (IAPSC).
 - Pan African Tsetse and Trypanosomiasis Eradication Campaign (PATTEC).
 - Pan African Veterinary Vaccine Centre (PANVAC).
- Department of Social Affairs:
 - Africa Centres for Disease Control and Prevention (Africa CDC).
 - Division of Social Welfare and Drug Control.
 - Division of AIDS, TB, Malaria and Other Infectious Diseases.
- Department of Medical Services.
- The Civil Society Division.
- The New Partnership for Africa's Development (NEPAD).

The Task Force seeks to strengthen AMR control activities among the AU agencies, support Member States and Regional Economic Communities, and coordinate with partners, including UN agencies, research and academia, industry, development partners, donors and non-governmental agencies.

Within the next five years, the African Union will work to:

1. improve surveillance of antimicrobial use and AMR microorganisms;
2. delay emergence of AMR;
3. limit transmission of AMR;
4. mitigate harm from AMR microorganisms.

To achieve these goals, the African Union will:

1. advocate for policies, laws, good governance and capacity building to enable long-term prevention and control of AMR;
2. engage civil society organizations;
3. develop skilled human resources;
4. enhance awareness and understanding of AMR and foster implementation of international standards;
5. strengthen knowledge through research.

4 Collaboration and integration with existing initiatives

Many organizations have mobilized resources to help address AMR. WHO, FAO and OIE directly support national governments to develop and implement national action plans on AMR. Many research networks and academic centres are conducting studies to assess the burden of AMR and how to reduce transmission. Non-governmental organizations, such as ReACT and the Global Antimicrobial Resistance Partnership, have gathered data, synthesized evidence, issued reports, recommended policy changes, educated the public, mobilized partners, and advocated with stakeholders at all levels of government, industry and the global health community.

The AU Task Force serves as the primary coordinator for AMR control on the African continent, creating an environment that facilitates the work of Member States, UN agencies, and other organizations. The Task Force prioritizes continent-wide efforts to increase political commitment, mobilize resources and promote policies that improve AMR control across human, animal and plant sectors.

5 Improving surveillance of antimicrobial use and AMR microorganisms

Understanding the full extent of AMR and its impact in Africa is prevented by a lack of continent-wide antimicrobial use and AMR surveillance data, especially for pathogens that require complex testing methods. Nevertheless, measuring antimicrobial use has the advantage that it is quantifiable and, when adjusted for population or other characteristics, allows comparisons across populations and sectors. The challenge is that data can be difficult to collate and access because it is derived from records across different government agencies, private companies, and/or facilities. For AMR surveillance, WHO has established the Global Antimicrobial Resistance Surveillance System (GLASS). In animal health, FAO has established the Assessment Tool for Laboratories and AMR Surveillance Systems (ATLASS). Although gains have been made in collecting data on AMR, several challenges remain, including inadequate: demand by clinicians and veterinarians for diagnostic testing; laboratory infrastructure; resources to continuously collect, transport and test specimens for AMR surveillance; use of standardized protocols and quality assurance; and collaboration between human, animal, food, environment and plant sectors.

5.1 Increasing the number of Member States conducting surveillance for antimicrobial use

Few African countries collect high-quality data on the amounts of antimicrobials used in humans, animals, plants and the environment. One possible approach is to measure aggregate data from imports, sales, distribution or facilities, also known as 'consumption' data. Another potential approach is to collect data at the unit of a person or animal, including drug, dosage, duration and indication.

For human health, antimicrobials can be further classified into 'access', 'watch' and 'reserve' categories, in accordance with the WHO *Essential Medicines List*. While protocols for both consumption and use surveillance have been developed by international organizations, these must be extensively adapted to conform to the laws and available records in Member States.

The African Union will:

1. Advocate for Member States and regions to conduct surveillance for antimicrobial use and to share data publicly.
2. Identify barriers to Member States conducting surveillance for antimicrobial use and work to mobilize political commitment, resources and technical support to address barriers.

5.2 Increasing the number of tests for AMR microorganisms

The first step to continuously monitor the burden of AMR is to increase the number of persons, animals, food and plants tested for pathogens and, if a pathogen is identified, tested for resistance patterns. In human health, this can be achieved through diagnostic stewardship, which involves making high-quality diagnostic tests readily available, appropriately using such tests, and using test results to make patient care safer and more effective. WHO has published guidelines on diagnostic stewardship for facilities that participate in GLASS. In animal health, OIE and FAO have also published standards for laboratories to test AMR microorganisms. While national governments and other organizations are working to increase and improve diagnostic testing in African countries, substantial gaps remain.

Susceptibility testing for bacteria and other pathogens requires personnel and infrastructure that, while not particularly expensive, is insufficiently supported by governments. For some diseases, unique opportunities exist to integrate related data. Some human and animal facilities may already collect AMR data for bacteria in a laboratory information management system. Newer devices, designed primarily for diagnosis of TB and HIV, can continuously transmit data on usage and test results via mobile phone networks. AMR is a potential problem for all infectious microorganisms and is clearly established as a problem for some. In each region, the African Union will work with partners:

1. To support mapping of human, animal, food, plant and environmental testing sites, particularly those that perform bacteriology (e.g. culture, antimicrobial susceptibility testing).
2. In helping to identify and address legal, technological, policy, administrative, logistical and financial barriers to expansion of diagnostic testing.
3. To advocate for increased testing of food-producing animals, food products and their immediate environments.
4. Engaging directly with the agricultural private sector to make a strong business case for expanded testing.

5.3 Increasing the proportion of laboratories with quality assurance programmes and international accreditation

Only a small proportion of laboratories in Africa are certified as compliant with international standards for quality assurance. Since AMR testing for bacteria and other pathogens occurs at both public and private laboratories, the AU Task Force will need to advocate strongly for policies and practices that promote high-quality testing at all facilities. National and other referral laboratories will play an increasingly essential role in the quality assurance systems and procedures used in diagnostic laboratories. To perform these roles, national and referral laboratories must strive to achieve international accreditation, particularly if their data is used for GLASS, ATLASS and other global surveillance systems.

The African Union will work across human, animal, food, environment and plant sectors to:

1. Promote quality assurance systems that can be used across multiple sectors to improve quality of AMR testing, consistent with GLASS, ATLASS, ISO and other international standards.
2. Define a continent-wide approach to assessing human, veterinary and plant health laboratories' adherence to quality standards, using established international approaches.
3. Consider the designation of AMR supra-national reference laboratories to provide specialty testing, training and capacity building in national laboratories, including through twinning approaches.
4. Collaborate with Member States to assess adherence of public health laboratories to appropriate standards.
5. Promote proficiency testing programmes for laboratories focused on susceptibility testing of high-priority pathogens.

5.4 Increasing the number of national laboratories conducting surveillance for AMR using standardized protocols

Producing valid data about the burden of AMR requires that laboratories adhere to standardized protocols. Critical challenges to achieving this include lack of agreement about: pathogens to be monitored for AMR; methods for identifying pathogens and AMR status (e.g. culture vs molecular testing approaches); antimicrobial agents to test for susceptibility; methods for susceptibility testing; and interpretation of susceptibility test results. In human health, WHO GLASS has promoted unified approaches to these challenges, but wider adoption is needed. Reference laboratories at multiple levels (including supra-national level) are required to confirm identification and susceptibility testing, perform genotyping, and provide surge capacity.

The African Union will work with a diverse group of partners in each region to:

1. Develop consensus regarding a specific set of pathogens and, for each pathogen, antimicrobial agents that should be continuously monitored, recognizing that some important pathogens may not be included.
2. Collaborate with WHO, FAO and OIE, laboratory standards organizations (e.g. the Clinical Laboratory Standards Institute (CLSI) or the European Committee on Antimicrobial Susceptibility Testing (EUCAST)) and other partners, in order to harmonize susceptibility testing and interpretation.
3. Adopt and adapt standardized training materials and conducting training through Africa CDC Regional Collaborating Centres and Regional Animal Health Networks.

5.5 Increasing the number of Member States that continuously collect, analyse, report and disseminate data

The final – and arguably most vital – step in AMR surveillance is disseminating data to policy-makers to increase their awareness and helping translate awareness into action. Protocols must be harmonized to permit valid comparisons, and institutions must agree on approaches to sharing, interpreting and publishing data.

Given the estimated substantial delay until coverage of testing is high enough to yield representative results, the AU Task Force will work with partners to synthesize existing data from surveillance records, laboratories, research studies and other sources, to provide periodic estimates of AMR prevalence on the continent. The AU Task Force may also consider working with partners to harmonize protocols for special surveys to provide point-prevalence estimates.

The African Union will:

1. Develop and maintain agreements for sharing of specimens, isolates, other materials and data across countries and between regions.
2. Convene partners periodically in each region and annually at the continental level to review protocols for data sharing, interpretation and authorship.
3. Mobilize resources for sufficient staffing, infrastructure, administrative and policy support, and funding for surveillance and data dissemination.
4. Support a comprehensive, continuously updated, and publicly available database of AMR on the African continent.
5. Assist Member States with interpreting AMR surveillance data and revising treatment guidelines or other policies appropriately.

6 Delay emergence of AMR microorganisms

6.1 Increasing the proportion of physicians and other human health providers adhering to antimicrobial use guidelines

In human health, extensive studies have been conducted in the United States, Europe and other industrialized settings on approaches to promoting prudent antibiotic prescribing – an approach known as ‘antimicrobial stewardship’. Few studies have demonstrated a substantial, sustained response when antimicrobial stewardship only focuses on awareness. Even though physicians seem to understand the potentially negative consequences of prescribing antibiotics when they are not indicated and/or of prescribing antibiotics with an overly broad spectrum of coverage, this awareness does not consistently change their behaviour. Greater success has been achieved when stewardship programmes include structural changes and behavioural modification techniques (e.g. posting guidelines and antibiotic prescribing pledges inside examination rooms, providing alternatives to antibiotic prescribing for physicians to give to patients, limiting access to second-line or reserve antibiotics, and providing feedback to clinicians about non-judicious antibiotic prescribing patterns by them in comparison to their peers. Economic incentives vary by country but can be particularly problematic when health care facilities rely on antibiotic sales to fund operations, when physicians sell antibiotics themselves, and when physicians receive additional reimbursement for selling antibiotics. There are limited studies about the effectiveness or essential components of antimicrobial stewardship programmes in Africa and other resource-limited settings.

In many settings, people obtain antibiotics directly from pharmacies with no evaluation by or prescription from a physician. More work needs to be done to understand whether those who staff pharmacies (whether they are trained pharmacists or not) are more responsive to training and behavioural modification than physicians and whether regulatory approaches are essential.

It is important to note that prudent and responsible antibiotic use is also likely to improve patient outcomes. Most treatment is empiric, i.e. symptoms and examination but no laboratory confirmation. When based on best available evidence, guidelines for prudent and responsible antibiotic use can potentially improve individual outcomes and delay emergence of resistance.

The African Union will:

1. Convene experts to review existing AMR surveillance data from Africa and disseminate Africa-specific antimicrobial treatment and stewardship guidelines for facilities and providers in human health.
2. Collaborate with partners working on access to care for serious infectious conditions – such as TB, HIV, malaria, pneumonia, and sepsis – to ensure that guidance on antimicrobial use considers problems of access and excess.
3. Collaborate through the (currently developing) African Medicines Agency to develop an *African Union Formulary* consistent with the *WHO Essential Medicines List* and the access, watch, reserve antibiotic classification system. The formulary could also delineate drugs for use by authorized non-physician prescribers.
4. Promote adoption of national-level policies, potentially through an African Union statute, for formularies and stricter control of reserve antimicrobial agents.

6.2 Increasing the proportion of veterinarians, veterinary para-professionals, and food producers adhering to prudent antimicrobial use guidelines

Prudent use of antimicrobial agents for therapeutic use is an essential element of animal health management. However, inappropriate use in animals, particularly food-producing animals is a major driver of AMR. Promoting prudent antimicrobial use is particularly challenging, because food producers have a strong economic incentive to use antimicrobials for disease prevention where risk is not indicated and to use for growth promotion; food providers have little economic incentive to use therapeutic antimicrobials prudently. In a number of countries, veterinary antimicrobials can be purchased on the open market and added to feed with the negative public health consequences effectively invisible to the food producer. Furthermore, little data exist about the individual prescribing practices of veterinarians in Africa. It is reasonably assumed that most animal consumption of antimicrobials occurs during food production, rather than through prescriptions to treat illness. Use of antimicrobials in plants may also be contributing to the emergence of human fungal infections (such as aspergillosis) resistant to azoles. The AU has made a high-level commitment to food safety, engaging partners from multiple sectors, including the food industry. The AU can leverage this commitment by making policy-makers more aware of the link between food production, AMR emergence and foodborne illness.

The African Union will:

1. Convene a broad set of stakeholders from government, agriculture industry, veterinary health and consumers, to review current practices and barriers to prudent antimicrobial use.
2. Collaborate with relevant partners working on food safety to develop antimicrobial use guidelines for specific agriculture industries, such as poultry, and advocate among large- scale producers and governments for their adoption.
3. Develop and encourage adoption of model regulations for sale and distribution of antimicrobials to the animal and plant production sectors.
4. Advocate for capacity building in prudent use of antimicrobials for the treatment of animal diseases and periodic testing of antimicrobial drug residues in food.
5. Encourage and consider policies that promote procurement of food-producing animals and animal products only from producers who adhere to prudent antimicrobial use guidelines.

6.3 Reducing availability and sales of sub-standard and falsified antimicrobials

Sub-standard and falsified antimicrobials are widely available in Africa and have a substantial negative impact on health. Sub-standard antimicrobials can promote AMR by containing levels of an agent sufficient to exert selective pressure for resistant microorganisms but insufficient level to kill or prevent multiplication of those microorganisms. Both sub-standard and falsified antimicrobials can delay correct treatment of an infection, prolonging illness and worsening case-fatality, promoting spread of pathogens, and, for patients who eventually receive a higher level of care, necessitating use of reserve medications. Most countries lack sufficient resources to evaluate and approve drugs and to withdraw substandard drugs from the market. Countries also need to implement policies that ensure that drugs that are procured or donated meet standards for quality, that this quality is not unduly compromised during storage, and that drugs are used for appropriate purposes.

The African Union will:

1. Collaborate through the (currently developing) African Medicines Agency to promote a common scheme for prohibiting sale of non-standard antimicrobials and post-marketing surveillance.
2. Strengthen laboratories for drug quality control and promote education of pharmacists in identifying sub-standard or falsified drugs and using innovative tests to measure drug quality.
3. Encourage policies that promote availability of genuine, safe and effective products at competitive prices.
4. Collaborate with governmental and non-governmental partners (including community groups) to increase awareness by clinicians, veterinarians, pharmacists, veterinary paraprofessionals, animal and crop producers and patients of sub-standard and falsified antimicrobials.
5. Support Member States to reinforce regulations on sale of antimicrobial agents, improve post-marketing surveillance, and strengthen regulatory enforcement on the manufacture and distribution of sub-standard or falsified medicines in Africa.
6. Collaborate through the (currently developing) African Medicines Agency, international partners, and multilateral organizations to impose penalties on entities that manufacture and distribute sub-standard or falsified agents in Africa.

6.4 Increasing the number of plant producers adhering to good agricultural practices

Over recent decades, agricultural intensification has led to a significant increase in the use of agrochemicals. Pesticides play an important role in reducing losses in crop production, but their misuse can harm farmers, consumers and the environment. Although estimates show that antimicrobial use for crops is substantially less than that used in livestock, use can promote the emergence of AMR fungi and bacteria. Antimicrobials have primarily been used in high-value fruit crops, because of their cost, and AMR bacteria have emerged in these settings. Where the genetic basis for resistance has been examined, AMR in plant pathogens has most often evolved through the acquisition of a resistance determinant via horizontal gene transfer. We do not fully understand the role of commensal microorganisms and the microbiome on the potential for plant pathogens to develop AMR. Such knowledge will be critical to ensuring safe use of antimicrobials in the management of critically important plant diseases.

The 10-year AU-IAPSC strategic framework explicitly supports sustainable agricultural production as one of its four strategic objectives. As part of this wider objective, AU-IAPSC strongly promotes pesticide risk reduction, including an ecological approach known as 'integrated pest management' to reduce reliance on pesticides, while providing effective protection against crop losses from pests. AU-IAPSC works with Member States' National Plant Protection Organizations (NPPOs) to build the capacity of small-holder farmers to grow healthy crops with an understanding of ecological pest management. Regulatory control of pesticides, including compliance with the International Standards for Phytosanitary Measures (ISPM), can also help promote proper use of pesticides.

The African Union will:

1. Develop and assist Member States in implementation of the International Code of Conduct on Pesticide Management. The Code provides guidance to government regulators, private sector, civil society and other stakeholders on best practices in managing pesticides throughout their life cycle. A series of policy and technical guidelines will be developed with other stakeholders to facilitate its implementation. They will work alongside governments on raising awareness and building capacities to regulate, monitor and sustainably manage pesticides. Specific guidelines are under development for strengthening regulation and registration of antimicrobial pesticides, and to minimize risk of antimicrobial resistance.
2. Assist NPPO pesticide registrars with the evaluation of pesticides, using the *Pesticide registration toolkit*, a web-based decision support system for pesticide registrars in developing countries.
3. Support development of harmonized training concepts and approaches at various levels, considering continental, regional, national and local needs and requirements in delaying emergence of AMR in plants.
4. Collaborate with WHO and FAO on setting standards and enforcing maximum residue limits in food and pesticide quality standards to protect consumers' health and environment.

7 Limit transmission of AMR microorganisms

7.1 Increasing the proportion of health care facilities implementing infection prevention and control programmes

Transmission of AMR occurs frequently in health care facilities. Such transmission can have severe consequences, because resistant microorganisms in health care facilities are often resistant to a broader spectrum of agents compared with resistant microorganisms found in the community, and because the hospitalized population is more susceptible to severe illness. Transmission can occur via direct contact, droplet, airborne and injection modes. The basic components of all infection prevention and control programmes include: strong political commitment and dedicated resources; strict adherence to protocols for hand hygiene and for identification, isolation and management of potentially infectious patients; adequate supplies and equipment for patient care; systems for infectious waste management, infrastructure design and maintenance to reduce transmission; and continuous monitoring of process, outcome and impact indicators. The West Africa Ebola response (2013–2016) demonstrated that effective hospital-based infection prevention and control programmes require intensive support to initiate and maintain. Infection prevention and control programmes are essential components of initiatives for universal health coverage, because they are essential to the quality of health care, and are initiatives for health security, because epidemics can be amplified in health care facilities.

The African Union will work to:

1. Advocate for Member States to establish national infection prevention and control programmes that address staffing, supplies, monitoring and in infrastructure design.
2. Develop an AU model public health law or legal framework that Member States can adapt and adopt for improving infection prevention and control in health care facilities.
3. Work with governments and health care delivery partners at all levels to develop and measure a minimum set of indicators to assess adequacy of infection control programmes in health care facilities.
4. Promote education and training at professional schools (e.g. medical, nursing, laboratory technician) and among health care workers in infection prevention and control, particularly hand hygiene, standard precautions and isolation techniques.
5. Collaborate with government and other donors, and with private industry, to ensure a stable supply chain for personal protective equipment, hand hygiene stations, water, safety-engineered injection devices, autoclaves and other essential infection control items.
6. Develop and assess regional and country-specific implementation strategies for procurement, training and education of environmental services, including cleaning and sound waste management.
7. Develop partnerships with global, regional and national organizations already advocating for stricter infection control related to TB, influenza and respiratory viruses, as well as Ebola, and bloodborne infections.

7.2 Strengthening biosecurity, husbandry and vaccination on farms that raise animals for food

In animal husbandry and aquatic animal production, transmission of AMR microorganisms is accelerated by inadequate biosecurity and hygiene, and by contamination of the feed and/or water supply with AMR microorganisms. Limiting transmission of AMR microorganisms requires increased vaccination, improved adherence to biosecurity and good husbandry practices, and improvements in water quality and nutrition. By limiting transmission, these measures will also limit the need for use of antimicrobials, thereby delaying emergence of AMR.

The African Union will work to:

1. Promote implementation of good farming, hygiene and husbandry practices that minimize transmission of AMR microorganisms between animals, to and from humans, and between flocks and herds.
2. Promote access to and implementation of animal husbandry, including aquaculture and livestock farming systems, and feeding regimes that reduce disease occurrence and the need for antimicrobial treatment.
3. Support training on good animal husbandry and animal welfare to reduce disease risk across different sectors of the animal industry.
4. Promote the uptake of vaccination as an animal health measure to prevent infections and reduce subsequent use of antimicrobials.
5. Advocate adherence to antimicrobial 'withdrawal periods' and incentives for farmers to comply.
6. Advocate for the phasing out/termination of the use, for the purpose of growth promotion, of veterinary antimicrobial drugs that belong to classes of antimicrobial agents used (or submitted for approval) in humans and animals in the absence of risk analysis.

7.3 Increasing the availability and sales of foods from animals raised with prudent antibiotic use

In the community setting, food products contaminated with AMR microorganisms or antimicrobial residue can increase the burden of AMR infections in humans. Once consumed, AMR microorganisms may not cause human illness, but may exchange genetic components with other microorganisms that do cause human illness. Humans can develop illness themselves due to these microorganisms with newly-acquired resistance or transmit pathogens to others. The presence of antimicrobial residues in food also promotes the development of AMR. As noted above, the challenge with reducing AMR microorganisms in food products is that antimicrobials are essential for treating diseases in food-producing animals. In many situations, these interventions are undertaken without adequate oversight and guidance.

The African Union will:

1. Convene a diverse group of stakeholders to summarize the evidence base and periodically issue reports about this issue.
2. Advocate among African policy-makers to increase awareness about this threat to human health.
3. Promote awareness and enhance knowledge on AMR and prudent antimicrobial use among farmers.

4. Strengthen and promote access to quality animal health delivery systems and support services, especially at the community level.
5. Encourage and consider policies that promote the procurement of animal commodities only from producers who adhere to prudent antibiotic use guidelines.

7.4 Strengthening water, sanitation and hygiene in all settings

Water, sanitation and hygiene programmes play an essential role across the spectrum of AMR control. High-quality water systems and hygiene programmes can prevent infections in humans and animals, reducing the need for antimicrobial use and the transmission of AMR microorganisms. Sanitation systems can further prevent infections and transmission, as well as limit contamination of the environment with antimicrobial agents and/or residues. Contamination of the environment currently occurs through several pathways, including waste from manufacturing of antimicrobials, faeces and urine from humans and animals treated with antimicrobials, water from aquaculture facilities that use antimicrobials, and agents with antimicrobial properties in fruits, vegetables and other plants. Once in the environment, antimicrobials can accelerate the emergence of AMR microorganisms both through direct selection pressure and by alterations in the ecology of microorganisms.

The African Union will:

1. Advocate for laws, policies and other initiatives that strengthen water, sanitation and hygiene in settings at high risk for AMR transmission, including human health care facilities, congregate settings, farms, slaughterhouses, aquaculture facilities and during the industrial manufacturing of pharmaceuticals.
2. Promote treatment of biosolids, wastewater, manure and waste-based fertilizers to reduce inadvertent spread of antimicrobials and transmission of AMR microorganisms into the environment.

8 Mitigate harm from AMR microorganisms

8.1 Increasing the number of health care facilities with quality diagnostic tests for infection and AMR

Efforts described to increase diagnostic testing at clinical and public health laboratories will directly benefit patients by providing information to guide initiation, discontinuation or other changes to antimicrobial therapy. WHO has established procedures for performing susceptibility testing, and health care facilities need to use such standardized procedures to ensure the validity of results for patient care and for AMR surveillance. In addition to conventional approaches to susceptibility testing, health care facilities are increasingly adopting point-of-care diagnostic tests for infectious diseases, specifically HIV, TB and malaria. Platforms for some of these systems, such as GeneXpert, are not limited to a single pathogen and could be adopted for diagnosis of multiple infectious agents. Advantages include speed and accuracy of diagnosis to tailor use (or non-use) of antimicrobial agents. Barriers to adopting multi-platform systems include resources to procure and maintain equipment and reagents, awareness by health care leadership, acceptability of providers, and technical training of staff.

The African Union will:

1. Work with regional and national agencies to develop a continent-wide approach to improve the standardization, sensitivity and reliability of diagnostic tests, including for antimicrobial susceptibility.
2. Collaborate with non-governmental organizations and industry partners to evaluate specific diagnostic tests and, where appropriate, include in AMR guidelines.
3. Identify gaps in regulatory programmes for diagnostic tests at the national level and promote training in regulatory science for health agencies throughout Africa.

8.2 Limiting availability and use of sub-standard diagnostic tests and supplies

Sub-standard diagnostic tests and laboratory supplies remain common across Africa and can lead to AMR when tests lead to unnecessary antibiotic treatment. Limiting their availability will be extremely challenging, given the large number of health care delivery sites that may be using such products.

The African Union will:

1. Work with partners to develop an inventory of the types of tests performed for AMR across the continent and to increase the number of sites testing humans for AMR using quality diagnostics.
2. Support a regulatory framework for diagnostic tests at the continental, regional and national levels, in order to limit sales and use of sub-standard tests and supplies and, if possible, recall tests and supplies already on the market.

8.3 Increasing the proportion of physicians and veterinarians adhering to guidelines for treatment of susceptible and AMR infections

As stated above, the AU will promote stewardship programmes to increase the proportion of physicians and veterinarians adhering to prudent antimicrobial use guidelines. By adhering to guidelines, physicians and veterinarians contribute to delaying emergence of AMR and improving outcomes among humans and animals already infected with AMR microorganisms. Depending on the context in each country, the AU could consider expanding such programmes to include other persons who dispense antimicrobial agents, such as pharmacists, chemists, non-physician clinicians and veterinary para-professionals.

In addition to the steps noted above to increase guidelines adherence, the AU Task Force will:

1. Convene experts to review existing AMR surveillance data from Africa and disseminate guidance regarding prudent antimicrobial use.
2. Collaborate with academic and research institutions, industry, and non-governmental organizations to evaluate patient outcomes for those treated according to guidelines, to help continuously improve treatment approaches.

8.4 Maintaining access to essential antimicrobials

A major ethical dilemma for the AU strategy is to balance antimicrobial access versus excess. Although antimicrobial usage is excessive at a population level, many vulnerable groups lack access to effective antimicrobial treatment, leading to high rates of illness and death from pneumonia, influenza, malaria, TB, HIV infection, typhoid fever, parasitic diseases and other highly treatable infections. Sepsis, for example, remains a major causal pathway for death from many of these infectious diseases, and early empiric antimicrobial treatment can have a major impact on reducing case-fatality. If prescribing authority remains limited to physicians, excess and access cannot be simultaneously addressed for vulnerable groups, for example. Other issues to consider related to access challenges include tariffs, taxation, health insurance schemes and availability of locally-produced generic antimicrobials.

In animal and plant health, veterinarians, crop agriculturalists, and environmentalists should be provided with guidance on situations in which antimicrobials are indicated, as well as guidance on dosage and duration.

The African Union will:

1. Include at least one patient representative on committees convened to develop policies or guidelines.
2. Assure adequate consultation from community and advocacy groups in the development and implementation of programmes and studies.
3. Convene stakeholder consultations across Africa to identify critical barriers to access, advocate for policies and mobilize resources to enhance access.

9 Implementation

9.1 Advocating policies and laws to enable long-term prevention and control of AMR

Laws and policies play a critical role in framing, enabling and protecting health. The AU Task Force will leverage its stature and authority to advocate for laws and policies to monitor, prevent and mitigate AMR. The AU Task Force will advocate for policies that can be adopted at the continental level, through Regional Economic Communities, in Member States, and, in some situations, at the sub-national level, particularly large urban settings to prevent and control AMR. The AU Task Force will work with partners to review existing laws across the continent, identify gaps, and propose model laws or legal frameworks for Member States. These laws would ideally strengthen and harmonize policies that countries are including in their own AMR national action plans.

The African Union will:

1. Promote adoption and enforcement of regulations related to surveillance of AMR at national and regional levels.
2. Promote adoption and enforcement of regulations that limit inappropriate antimicrobial use in humans, animals and plants.
3. Promote adoption and enforcement of regulations that mandate infection prevention and control in health care facilities and biosecurity on farms.
4. Promote adoption and enforcement of regulations that limit inappropriate disposal of antimicrobial agents into the environment.
5. Support a continent-wide regulatory framework for high-quality AMR diagnostics.
6. Promote adoption of agreements to share data and specimens across human, animal and plant sectors as well as other stakeholders.
7. Support the development of an economic/business case for investment at regional or country levels.

9.2 Engaging civil society on AMR

Large-scale public health efforts can only succeed with the robust involvement of civil society. With HIV, community-based organizations and individual activists played an essential role in mobilizing resources, accelerating access, combating stigma, and enacting laws and policies that have averted infections and saved millions of lives. To date, engagement of civil society on AMR has been challenging, because the science can be complex to explain, the threat is often characterized as distant, patients' stories of illness and death often not told because of under-diagnosis, interventions not readily distilled into high-impact slogans, and public health agencies not invested sufficiently in civil society organizations.

Enacting laws and policies for AMR control depends critically on civil society – including organizations focused on human health, animal welfare, environment and food security – taking a leading role; the demand of its citizens, far more than science alone, will convince governments to take concerted action. Civil society organizations can play a particularly vital role in:

1. Ensuring that excess uses of antimicrobials is curtailed, while critical access is not.
2. Promoting public awareness of the harms of antimicrobial overuse and antimicrobial resistance.
3. Promoting consumer demand for food free from antimicrobial residue and antimicrobial-resistant pathogens.
4. Promoting patient demand for health care that is free from risk of nosocomial infections.

The African Union will:

1. Engage civil society representatives in development of policies and strategies.
2. Develop materials to help build AMR awareness and capacity (e.g. training courses) for civil society organizations involved in human, animal, food and environmental sectors.
3. Develop an electronic communications system to provide information to and receive information from civil society organizations about AMR studies, meetings, policies and other relevant events.

9.3 Developing human resources for AMR surveillance and control

The activities outlined in the current *AU Framework for Antimicrobial Resistance Control* must be supported through adequate human resources. Each country will need leadership and staff that have the adequate education and skills to implement AMR control programmes in the human, animal, plant health and environment sectors. The most pronounced human resources gaps are likely in laboratory services – from bench microbiologists to managers – and in health care infection prevention and control.

The first strategy to address this involves mobilizing resources to support hiring, training and retention of staff. Many countries in Africa already receive substantial external donor assistance for health-related conditions, particularly HIV. By highlighting the urgency and severity of the AMR threat, the AU can advocate for donors and government ministries to review their existing budgets and allocate more funding to laboratory services and infection prevention and control personnel.

A second strategy involves training existing staff at the regional and country levels. Africa CDC, for example, has established an Institute for Workforce Development that hosts online training courses. Training courses should target all sectors and ensure that various audiences (e.g. policy-makers, public health officials, clinicians, microbiologists, veterinarians etc.) develop a common body of knowledge and approach to addressing AMR.

A final strategy will involve the AU Task Force engaging health systems leaders, economists and policy experts in estimating the gap between current and optimal human resource allocations, providing country and sub-national estimates of the cost for filling that gap, building the business case for meeting that gap, and continuously monitoring progress in closing it.

The African Union will:

1. Implement a structured advocacy campaign targeted at policy-makers, donors and private partners from the health care delivery and agricultural sectors to highlight the need for sufficient human resources for AMR surveillance and control.
2. Collaborate with partners on developing standardized online and in-person training courses for all sectors.
3. Continuously monitor government, donor and other resources dedicated to AMR-related activities.

9.4 Strengthen capacity of academic institutions to conduct AMR research

The United Nations Interagency Coordinating Group on AMR specifically recommends that institutions “innovate to secure the future through research and development of new antimicrobials, diagnostics, vaccines, waste management tools and other technologies.” The African Union is strongly committed to strengthening research by Africans for Africans, particularly in areas that can improve health.

The African Union will:

1. Collaborate with partners to develop a list of priority areas for research that can advance public health interventions for AMR control in human, animal, food, environmental and plant sectors.
2. Encourage public, private and philanthropic research funders to support research by Africans in Africa to advance AMR control.

10 Monitoring and evaluation

Monitoring the plan's success will be challenging, because many of the objectives described above do not have sufficient data to establish an accurate baseline nor is there sufficient evidence to indicate how much of an increase in a specific target will have a meaningful impact on preventing or mitigating harm from AMR.

The African Union will work with its partners to develop a dedicated monitoring and evaluation team that will:

1. Compile best available evidence from African countries to estimate baselines for each activity in the plan.
2. Identify five-year targets for each activity that are likely to have a meaningful impact on public health, using expert opinion and established methods of achieving consensus among experts.
3. Produce annual reports of progress toward completing activities and achieving targets.

In addition to the targets specific to each component of the plan, the AU Task Force will also convene experts to identify high-level targets, including:


1. Reduced mortality rate in populations specifically vulnerable to AMR infections, including infants.
2. Reduced percentage of resistant microorganisms for selected high-priority pathogens.
3. Reduced incidence of antibiotic residues in food derived from animals.



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