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Follow-up to the political declaration of the high-level meeting of the General Assembly on antimicrobial resistance

Report of the Secretary-General

Summary

The present report was prepared in response to General Assembly resolution [71/3](#), adopted in 2016, in which the Assembly requested the Secretary-General to submit to Member States a report on the implementation of the political declaration of the high-level meeting of the General Assembly on antimicrobial resistance and on recommendations emanating from the ad hoc inter-agency coordination group on antimicrobial resistance.

The report highlights progress made by Member States and the Tripartite Organizations, comprising the World Health Organization, the Food and Agriculture Organization of the United Nations and the World Organisation for Animal Health, in addressing antimicrobial resistance on the basis of the global action plan on antimicrobial resistance. Urgent support and investments are required to scale up responses at the national, regional and global levels.



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I. Introduction

1. Antimicrobial resistance is a global threat to health, livelihoods and the achievement of the Sustainable Development Goals. Antibiotics, antivirals, antiparasitic agents and antifungals are increasingly ineffective owing to resistance developed through their excessive or inappropriate use, with serious consequences for human and animal health, and possibly for plant health, and negative impacts on food, the environment and the global economy.

2. The present report provides an update on the implementation of General Assembly resolution 71/3, in which the Assembly adopted, in 2016, the political declaration of the high-level meeting of the General Assembly on antimicrobial resistance, and on the recommendations of the ad hoc inter-agency coordination group on antimicrobial resistance.

3. The report provides a review of action taken by Governments at the national level and action taken by the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO) and the World Organisation for Animal Health (OIE), referred to in the present report as the Tripartite Organizations, at the global level, along with action taken by other stakeholders to implement the global action plan on antimicrobial resistance.

II. Update on the implementation of the political declaration

A. Implementation of national action plans

4. On the basis of tools developed by the Tripartite Organizations, countries have begun implementing their national action plans. In order to measure progress on the implementation of the plans, the Tripartite Organizations have been conducting an annual country self-assessment survey on antimicrobial resistance since 2016. Responses from the surveys are published in an open-access database.¹ Self-assessment data should be interpreted with caution owing to the potential for reporting bias and varying national data-collection standards, which affect data quality.

5. All the tables in the present report were developed on the basis of data received from 158 countries² (representing approximately 92 per cent of the world's population) in their responses to the 2018/19 self-assessment survey. Findings from the survey indicated an increase in countries' participation in the development of national action plans, especially in low-income countries, and progress made in the establishment of national multisectoral working groups. As at March 2019, 116 countries of the 158 surveyed had developed national action plans (see table 1), reflecting an increase from the 79 countries that had reported having done so in the 2016/17 survey.

¹ See <https://amrcountryprogress.org>.

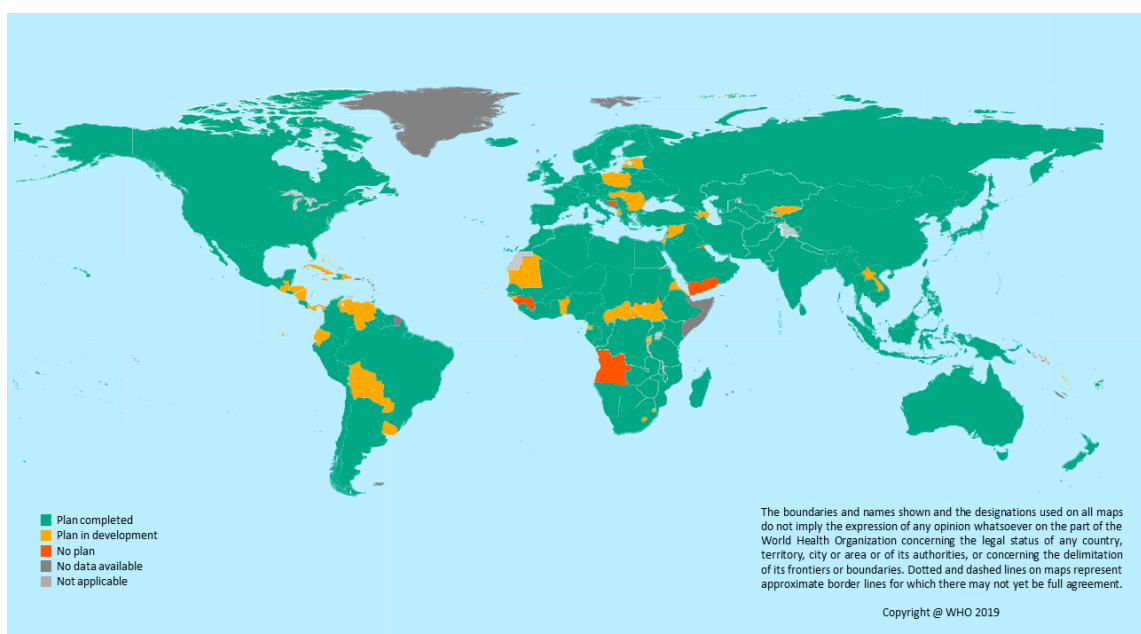
² A total of 194 States members of WHO were sent the survey, and responses were received from 158 countries, as listed in the annex to the present report. The responding countries listed in the tables, according to World Bank income category, therefore refer to WHO member States.

Table 1
Development of national action plans on antimicrobial resistance (2018/19)

2019 World Bank income category (number of countries that responded in each category)	Countries with national action plans	
	Number	Percentage
High-income (52)	42	81
Upper-middle-income (48)	32	67
Lower-middle-income (33)	25	76
Low-income (25)	17	68
Total (158)	116^a	73

^a WHO regional offices report that 129 out of the 194 States members of WHO have developed national action plans (see figure I).

Figure I
Progress made in the development of national action plans



Source: Reporting by WHO regional offices and on the basis of the 2018/19 country self-assessment survey on antimicrobial resistance of the Tripartite Organizations.

Table 2
Multisectoral coordination mechanisms based on the “One Health” approach (2018/19)

2019 World Bank income category (total countries that responded in each category)	Countries with functional multisectoral working groups	
	Number	Percentage
High-income (52)	36	69
Upper-middle-income (48)	21	44
Lower-middle-income (33)	10	30
Low-income (25)	7	28
Total (158)	74	47

6. The emergence of antimicrobial resistance within and across sectors, including human, animal (terrestrial and aquatic) and plant health, the environment, trade and finance, must be addressed using the “One Health” approach.³ As can be seen in table 2, despite early progress in developing national action plans, only 74 out of 158 responding countries reported having functional multisectoral coordination mechanisms, although that number does represent an increase from the 30 countries that reported having such mechanisms in the 2016/17 survey. The findings reveal the need to enhance multisectoral action.

7. Having acknowledged those gaps, the Tripartite Organizations are assisting national partners in the human, animal and plant health, food and environmental sectors to fully engage in the implementation of national action plans using the “One Health” approach through the following targeted tools:

(a) OIE has established the performance of veterinary services pathway,⁴ a process that entails evaluating national veterinary services, assisting them with planning and providing them with support on the basis of OIE international standards. In May 2018, the latest edition of the tool included the new critical competency II-9, which covers antimicrobial resistance and antimicrobial use;

(b) WHO has shared resource materials and guidance on implementation, multisectoral engagement and gender and equity issues in order to foster effective country-level implementation of national action plans;⁵

(c) FAO is piloting the progressive management pathway, which enables countries and sectors to identify where and how to make step-by-step improvements for the optimal use of antimicrobials;

(d) Following a two-year consultation process, the Tripartite Organizations have developed a monitoring and evaluation framework⁶ for the global action plan on antimicrobial resistance, including a harmonized list of indicators for monitoring at the national and global levels;

(e) FAO has designed a methodology for assessing national legislation related to antimicrobial resistance, including legislation aimed at preventing the contamination of food and the environment.⁷

8. Examples of capacity-building support provided to countries by the Tripartite Organizations are highlighted below:

(a) FAO is strengthening multi-stakeholder engagement (in the fields of aquaculture, plants and animals) in the development of national action plans in more than 40 lower-middle-income countries⁸ by expanding technical capabilities on awareness, surveillance, disease prevention and control and regulatory frameworks. In order to address the national need for prioritization and resource efficiency in the

³ See www.who.int/features/qa/one-health/en.

⁴ See www.oie.int/solidarity/pvs-pathway/.

⁵ See the following documents from WHO: “Resource materials for in-country development and implementation of antimicrobial resistance national action plans”, January 2019; “Turning plans into action for antimicrobial resistance (AMR)”, Working paper 2.0: implementation and coordination, Geneva, 2019; “Tackling antimicrobial resistance (AMR) together”, Working paper 1.0: multisectoral coordination, Geneva, 2018; and “Tackling antimicrobial resistance (AMR) together”, Working paper 1.0: enhancing the focus on gender and equity, Geneva, 2018.

⁶ See www.who.int/antimicrobial-resistance/global-action-plan/monitoring-evaluation/tripartite-framework/en.

⁷ See the FAOLEX database, available at www.fao.org/faolex/en/.

⁸ See www.fao.org/antimicrobial-resistance/projects/completed/project-4/en; www.fao.org/antimicrobial-resistance/projects/ongoing/project-2/en/; and www.fao.org/antimicrobial-resistance/projects/ongoing/project-3/en/.

design and implementation of national action plans using the “One Health” approach, FAO is working with local communities of farmers, sellers of medical products and health workers to identify risks and prioritize interventions for improving food production and farmers’ livelihoods;

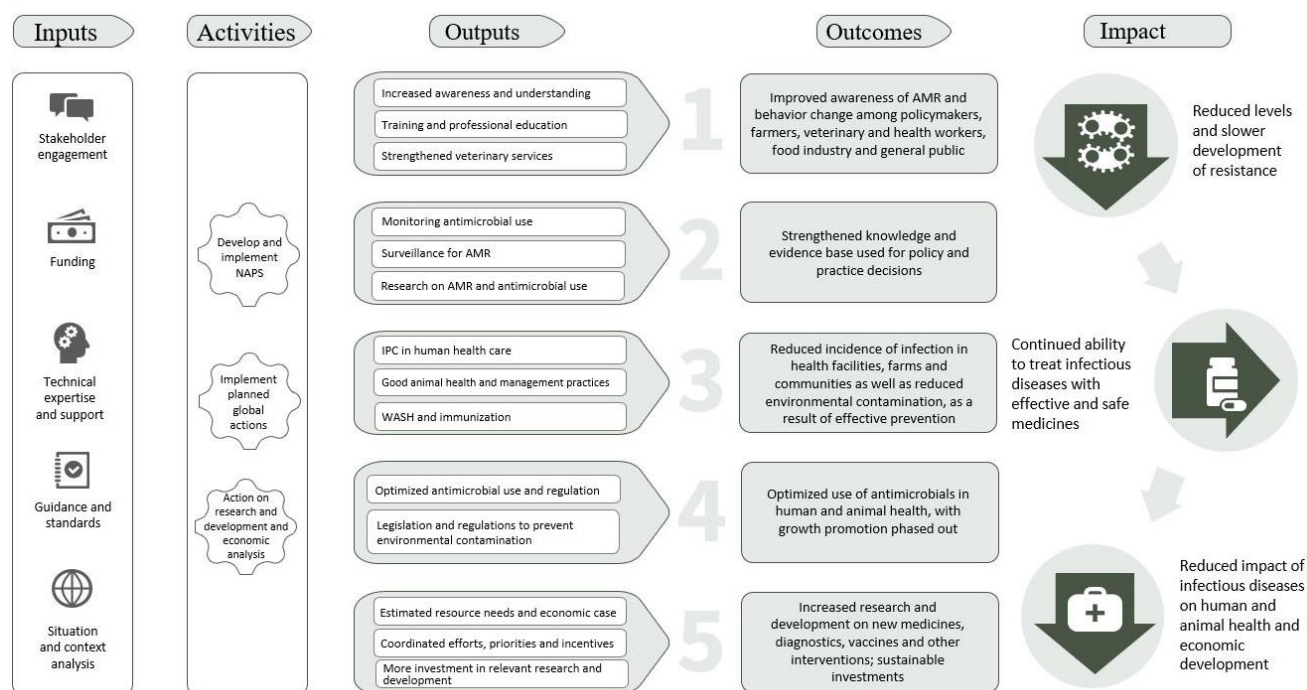
(b) OIE national focal point training sessions on veterinary products, delivered through 52 regional and subregional seminars, are focused on: antimicrobial stewardship and the quality of veterinary drugs (including antiparasitic drugs and antimicrobial resistance); the use of antimicrobials; the traceability of antimicrobials (including falsified and substandard veterinary medicines); the harmonization of regional veterinary drug registration systems; and the implementation of the programme for international cooperation on the harmonization of technical requirements for the registration of veterinary medicinal products;

(c) In order to strengthen country-level coordination on antimicrobial resistance across sectors, WHO and OIE are conducting national bridging workshops using the “One Health” approach on international health regulations and on the performance of veterinary services pathway.

B. Global action

9. The Tripartite Organizations, in cooperation with partners and Governments, are providing support in various forms and conducting activities in accordance with the global action plan on antimicrobial resistance. The process is monitored through a results chain (see figure II) developed for the global action plan monitoring and evaluation framework.

Figure II
Global action plan on antimicrobial resistance results chain



Abbreviations: AMR, antimicrobial resistance; IPC, infection prevention and control; NAP, national implementation plan; WASH, water, sanitation and hygiene.

1. Awareness-raising, behaviour change and training

10. World Antibiotic Awareness Week, launched by WHO in 2015, has become a global campaign led by the Tripartite Organizations. In the past two years, more than 130 countries have participated, with over 500 events held worldwide. The Tripartite Organizations are also supporting countries by providing multimedia communications material in multiple languages, available through an interactive platform⁹ that includes resources and a learning experience on the responsible use of antibiotics. Sector-specific information and communication toolkits have been made available by FAO, OIE and WHO and through a platform managed by the Tripartite Organizations.¹⁰

Table 3

Awareness-raising campaigns (2018/19)

2019 World Bank income category (total countries that responded in each category)	Countries with targeted nationwide campaigns	
	Number	Percentage
High-income (52)	42	81
Upper-middle-income (48)	36	75
Lower-middle-income (33)	28	85
Low-income (25)	18	72
Total (158)	124	78

11. As shown in table 3, 124 out of 158 responding countries reported having established targeted campaigns to raise awareness of antimicrobial resistance.

12. The “We need you” communication campaign by OIE is the first global campaign dedicated to raising awareness of antimicrobial resistance in the animal health sector. The campaign, focused on the careful handling of antibiotics, was used to develop a toolkit for national veterinary services, policymakers, veterinarians, veterinary students, farmers, the pharmaceutical industry, wholesale and retail distributors and animal feed manufacturers. The campaign resulted in a twofold increase in the number of OIE member countries planning targeted antimicrobial resistance communications, reaching a total of 79 countries in 2018.

13. As part of efforts to share best practices with member countries and support their implementation of the OIE strategy on antimicrobial resistance and the global action plan on antimicrobial resistance, OIE brought together 530 participants from 95 member countries at the second OIE global conference on antimicrobial resistance and the prudent use of antimicrobials in animals, with the theme “Putting standards into practice”, held in Marrakech, Morocco, in 2018.

14. As a way to encourage awareness-raising, WHO and FAO initiated a programme known as “Smartphone for change” to empower health, pharmacy and veterinary students to take an active role in promoting the responsible use of antibiotics.

15. Noting that countries have called for greater knowledge exchange in order to accelerate progress and build capacity, FAO, OIE and WHO have taken the following steps:

⁹ See <http://oms-platform.onebigrobot.com/>.

¹⁰ See the OIE “We need you” campaign (<https://oie-antimicrobial.com/>) and the joint FAO, OIE and WHO platform (<https://trello.com/b/tBoXeVae>).

(a) FAO has launched an antimicrobial resistance case study series¹¹ to support countries in tackling antimicrobial resistance in food and agriculture, is developing a global expert network and a repository of resources and is piloting a holistic approach to combating antimicrobial resistance through behaviour-change projects in Africa and Asia;

(b) With participation from WHO and FAO, OIE¹² has conducted training sessions for national focal points on antimicrobial risk communication and behaviour change and OIE standards to support country-level implementation of national action plans in the animal health and welfare sector, through which professionals from 136 OIE member countries have been trained to date;

(c) WHO has developed a competency framework¹³ and an online course¹⁴ covering the knowledge, skills and attitudes that enable health workers to address antimicrobial resistance, adapted for both pre-service and in-service health education.

2. Strengthening knowledge and evidence through surveillance

16. Through the global action plan on antimicrobial resistance, WHO was called upon to implement a global programme for the surveillance of antimicrobial resistance in human health and to work with FAO and OIE to support integrated surveillance and the reporting of antimicrobial resistance in humans, animals, plants and the environment. The prevalence of national surveillance systems for antimicrobial resistance as indicated in the results of the 2018/19 self-assessment survey is shown in table 4.

17. The WHO global antimicrobial resistance surveillance system, launched in October 2015, provides a standardized approach to the collection, analysis and sharing of antimicrobial resistance data by countries for selected bacteria that cause common infections in humans, for which treatment options are limited owing to the emergence of antimicrobial resistance; the number of countries participating in the system has increased annually.

Table 4

National surveillance systems for antimicrobial resistance (2018/19)

<i>2019 World Bank income category (total countries that responded in each category)</i>	<i>Countries with a national surveillance system for antimicrobial resistance</i>			
	<i>in humans</i>		<i>in food (animal and plant origin)</i>	
	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
High-income (52)	44	85	39	75
Upper-middle-income (48)	33	69	24	50
Lower-middle-income (33)	16	49	14	42
Low-income (25)	13	52	6	24
Total (158)	106^a	67	83	53

^a A total of 74 countries have registered in the WHO global antimicrobial resistance surveillance system.

¹¹ See www.fao.org/antimicrobial-resistance/resources/publications-archive/case-studies-series/.

¹² OIE, "Building national capacities in risk communication and behaviour change", November 2018.

¹³ WHO, "WHO competency framework for health workers' education and training on antimicrobial resistance", document WHO/HIS/HWF/AMR/2018.1.

¹⁴ See <https://openwho.org/courses/AMR-competency>.

18. The second annual report on the global antimicrobial resistance surveillance system,¹⁵ issued by WHO in January 2019, includes information from 68 countries (10 low-income, 16 lower-middle-income, 15 upper-middle-income and 27 high-income countries), 67 of which provided information on their national antimicrobial resistance surveillance systems, while 48 provided antimicrobial resistance data. Compared with 2017, there was a 57 per cent increase in the number of countries that registered in the system in 2018, and almost twice as many countries submitted antimicrobial resistance data. The number of surveillance sites generating data that provided their data to the system increased from 729 to 6,015 (an eightfold increase), and the number of patients being monitored as part of the surveillance increased from 507,923 to 1,686,461 (a threefold increase).

19. In order to enhance the detection, early warning and risk-assessment capacities of national antimicrobial resistance surveillance programmes, a framework for reporting emerging antimicrobial resistance was launched by WHO in 2018 as part of the global surveillance system. Also as part of the system, WHO is promoting whole-genome sequencing and rapid diagnostic tools to inform policy development. In addition, WHO is providing technical assistance to facilitate the integration of environmental surveillance and to better understand the risks and impact of waste from antimicrobial production facilities. A global protocol, known as the “ESBL Ec tricycle project”, is being finalized for the integrated surveillance of antimicrobial resistance in humans, the food chain and the environment using extended-spectrum beta-lactamases producing *Escherichia coli* as an indicator.

20. In 2015, at its eighty-third General Session, the World Assembly of Delegates of the World Organisation for Animal Health unanimously adopted resolution No. 26, in which it officially mandated OIE to gather data¹⁶ annually on the use of antimicrobial agents in animals worldwide; 130 member countries provided data in the first round, increasing to 155 in the third round, in 2017.¹⁷ Of those 155 member countries, 118 (76 per cent) provided quantitative data that covered one or more years between 2015 and 2017. In its third annual report on the subject, published in 2019, OIE describes the global use of antimicrobial agents adjusted for animal biomass for 2015 and provides a global and regional analysis for the period 2015–2017. The global estimate of antimicrobial agents used in animals in 2015, as reported to OIE by 91 member countries, ranged between 168.75 mg/kg and 172.39 mg/kg, based on an estimated global biomass coverage of 71 per cent.

21. Surveillance has resulted in efforts to promote collaborative action to address antimicrobial resistance in the treatment of tuberculosis, HIV/AIDS, malaria, neglected tropical diseases¹⁸ and sexually transmitted infections. The following are examples of steps taken by WHO to address the issue:

(a) In its *Global Tuberculosis Report 2018*, WHO estimated that in 2017, 558,000 people worldwide had developed tuberculosis that was resistant to rifampicin, the most effective first-line drug, 82 per cent of whom had developed multidrug-resistant tuberculosis. As a result, in 2018, WHO issued updated

¹⁵ WHO, *Global Antimicrobial Resistance Surveillance System (GLASS) Report: Early Implementation 2017–2018*, (Geneva, 2018).

¹⁶ A global database was created in compliance with chapter 6.9 of the *Terrestrial Animal Health Code* and chapter 6.3 of the *Aquatic Animal Health Code*, on monitoring the quantities and usage patterns of antimicrobial agents used in food-producing animals and aquatic animals, respectively.

¹⁷ OIE, *OIE Annual Report on Antimicrobial Agents Intended for Use in Animals: Better Understanding of the Global Situation – Third Report* (Paris, 2018).

¹⁸ See, for example, the WHO report *Tuberculosis, HIV, Malaria and Neglected Tropical Diseases: Strengthening Collaboration to Prevent and Manage Antimicrobial Resistance*.

recommendations for the treatment of multidrug- and rifampicin-resistant tuberculosis;¹⁹

(b) In its *HIV Drug Resistance Report 2017*, WHO noted that pre-treatment HIV drug resistance, detected in people starting antiretroviral therapy, continued to increase in several countries. Consequently, WHO has developed a global action plan on HIV drug resistance for the period 2017–2021²⁰ and issued new treatment guidelines²¹ in that regard;

(c) The World Health Assembly adopted the Global Technical Strategy for Malaria 2016–2030, which calls for monitoring the efficacy of antimalarial medicines so that the most appropriate treatments can be selected for national policies;

(d) As a result of the fact that the resistance of sexually transmitted infections to antibiotics has increased rapidly, with gonorrhoea, in particular, showing a decreased susceptibility to last-line treatment options, WHO has issued new treatment guidelines for sexually transmitted infections.²²

22. FAO has developed an assessment tool for laboratories and antimicrobial resistance surveillance systems. From 2016 to 2018, 19 countries hosted assessment missions drawing from OIE standards on terrestrial and aquatic animal health. FAO is building a country-level community of assessors to serve as technical resources to enhance antimicrobial resistance surveillance in food, agriculture and the environment.

23. At the global level, the Tripartite Organizations are working with more than 30 leading academic and research institutions that are reference centres for antimicrobial resistance to support surveillance and ensure the quality of antimicrobials. FAO convened expert meetings, in collaboration with WHO and OIE, to discuss priority areas for action with regard to antimicrobial resistance, including the role of the environment, biocides and their use in food production and foods of plant origin; the summary reports of those meetings are publicly available.²³

24. Recognizing the need to link initiatives to collect antimicrobial surveillance data across sectors, the Tripartite Organizations have been working towards an integrated surveillance system on antimicrobial resistance, starting with the establishment of a platform to link initiatives and work towards a standardized data-sharing methodology.

25. In order to assist their member countries in monitoring the quantities and use patterns of antimicrobial agents in animals, OIE and FAO have facilitated the mapping of antimicrobial supply chains in South-East Asia. The mapping process has led to enhanced collaboration between OIE national focal points on veterinary products and stakeholders on data collection and to the identification of gaps in legislative frameworks.

26. In order to gain a better understanding of the risks of antimicrobial resistance in aquaculture, and of the availability of data in that regard, FAO conducted a scoping exercise²⁴ in November 2018, drawing on a wide range of international expertise.

¹⁹ WHO, *WHO Consolidated Guidelines on Drug-resistant Tuberculosis Treatment* (Geneva, 2019).

²⁰ WHO, *Global Action Plan on HIV Drug Resistance 2017–2021* (Geneva, 2017).

²¹ Available at www.who.int/hiv/pub/guidelines/ARV2018update/en.

²² See www.who.int/en/news-room/detail/30-08-2016-growing-antibiotic-resistance-forces-updates-to-recommended-treatment-for-sexually-transmitted-infections.

²³ See www.fao.org/antimicrobial-resistance/news-and-events/news/news-details/en/c/1144999.

²⁴ See www.fao.org/fishery/nems/41098/ar.

3. Prudent and responsible use of antimicrobials

27. In its 2017 Model List of Essential Medicines,²⁵ WHO introduced the “access, watch and reserve antibiotics framework”²⁶ to guide the optimal use of antibiotics for human medicine to reduce resistance. The three categories of antibiotics are defined below:

(a) Access antibiotics, which refer to first- and second-choice antibiotics used to treat most bacterial infections and syndromes and should be affordable, quality-assured and available at all times;

(b) Watch antibiotics, which include most of the highest priority critically important antimicrobials according to the WHO list of critically important antimicrobials for human medicine and are recommended only for limited indications;

(c) Reserve antibiotics, which are used in situations in which all alternative antibiotics have failed or in which the illness is caused by resistant pathogens shown to be sensitive only to reserve antibiotics.

28. WHO anticipates that this new framework will reduce the use of antibiotics in the “watch” and “reserve” categories, while the accessibility of antibiotics in the “access” category will need to be expanded given that populations in many countries do not have access to quality, safe, efficacious and affordable antibiotics. All newly registered antibiotics will be reviewed and classified into those categories so as to guide stewardship and define research gaps. WHO is providing technical support to countries for the establishment and strengthening of antimicrobial stewardship programmes. A toolkit to support the implementation of those programmes in low- and middle-income countries is being finalized.

29. In order to contribute to the risk management of antimicrobial resistance due to non-human use, WHO updates its list of critically important antimicrobials for human medicine²⁷ and guidelines on the use of medically important antimicrobials in food-producing animals²⁸ every two years.

Table 5
National monitoring systems for consumption and use of antimicrobials (2018/19)

2019 World Bank income category (total countries that responded in each category)	Countries with a national monitoring system			
	for the consumption and use of antimicrobials in human health		for the sale and use of antimicrobials intended to be used in animals	
	Number	Percentage	Number	Percentage
High-income (52)	41	79	42	81
Upper-middle-income (48)	24	50	22	46
Lower-middle-income (33)	11	33	14	42
Low-income (25)	3	12	3	12
Total (158)	79	50	81	51

30. As shown in table 5, greater progress needs to be made in monitoring the consumption and use of antimicrobials in human health. Since 2016, WHO has

²⁵ See www.who.int/medicines/publications/essentialmedicines/en.

²⁶ See www.who.int/news-room/detail/06-06-2017-who-updates-essential-medicines-list-with-new-advice-on-use-of-antibiotics-and-adds-medicines-for-hepatitis-c-hiv-tuberculosis-and-cancer.

²⁷ See www.who.int/foodsafety/areas_work/antimicrobial-resistance/cia/en.

²⁸ See www.who.int/foodsafety/areas_work/antimicrobial-resistance/cia_guidelines/en.

provided technical support to build capacity for the monitoring of antimicrobial consumption in over 70 countries. In 2018, WHO published its first *Report on Surveillance of Antibiotic Consumption* to monitor antibiotic consumption in humans, which includes data from 65 countries. The data indicated wide intraregional and interregional variation in the amount and choice of antibiotics consumed: overall, the consumption ranged from 4.4 to 64.4 defined daily doses per 1,000 inhabitants per day. To supplement the data, WHO launched a new tool for conducting point prevalence surveys on antibiotic use in hospitals.

31. The OIE global standards related to the prudent use of antimicrobials are contained in the *Terrestrial Animal Health Code* and *Aquatic Animal Health Code*. The standards, which are recognized by the World Trade Organization, focus on: (a) the harmonization of national antimicrobial surveillance and monitoring programmes; (b) the monitoring of the quantities and usage patterns of antimicrobial agents in food-producing animals; (c) the responsible and prudent use of antimicrobial agents in veterinary medicine; and (d) risk analysis arising from the use of antimicrobial agents in animals. In 2018, at its eighty-sixth General Session, the World Assembly of Delegates of OIE adopted new definitions²⁹ of “veterinary medical use of antimicrobial agents” (including the definitions of “to treat”, “to control” and “to prevent”), “non-veterinary medical use of antimicrobial agents” and “growth promotion”.

32. In its third annual report on antimicrobial agents intended for use in animals, OIE stated that 110 member countries providing data (71 per cent) were not using antimicrobial agents for growth promotion in animals as at 2017, regardless of the presence or absence of legislation related to growth promotion. The remaining 45 member countries (29 per cent) reported using antimicrobials for growth promotion; of these, 18 countries (40 per cent) had a regulatory framework that either listed antimicrobials authorized for use as growth promoters or listed antimicrobials prohibited for use as growth promoters. Barriers in reporting quantitative data included a lack of national regulatory frameworks, of data analysis tools and of human and financial resources.

33. In 2018, OIE member countries endorsed updates to the *Terrestrial Animal Health Code* and the OIE list of antimicrobial agents of veterinary importance in order to ensure the prudent and responsible use of antimicrobials. The updates contain new recommendations, in which OIE emphasizes that the antimicrobial classes in the WHO category of highest priority critically important antimicrobials should be treated as the highest priorities by countries in their phasing out of the use of antimicrobial agents as growth promoters. In its updated list, OIE states that third and fourth generation cephalosporins, fluoroquinolones and colistin should: (a) not be used as preventive treatment in feed or water or in the absence of clinical signs in the animals to be treated; (b) not be used as first-line treatment, unless justified on the basis of bacteriological test results; (c) only be used as extra-label or off-label drugs when no alternatives are available; and (d) be urgently prohibited in terms of their use as growth promoters.

34. The Tripartite Organizations are providing scientific guidance to the Codex Alimentarius Commission by contributing to the revision and development of Codex Alimentarius standards and related texts with the aim of reducing antimicrobial resistance in the food chain. FAO hosts the Codex Alimentarius secretariat, and WHO and FAO provide independent scientific advice to the Commission.

²⁹ See www.oie.int/for-the-media/press-releases/detail/article/oie-general-session-three-new-steps-in-the-fight-against-antimicrobial-resistance/.

35. FAO is working in low- and middle-income countries³⁰ to analyse stakeholder practices and implement interventions that promote the responsible use of antimicrobials and better production practices. A technical paper on animal nutrition strategies to reduce the use of antibiotics in animal husbandry will be published in 2019.

36. Guidelines³¹ on the prudent use of antimicrobials in the treatment of poultry and swine are being developed. FAO is also developing community-level guidelines related to antimicrobial resistance in line with OIE standards for aquaculture and fisheries. A publication is being prepared on the responsible management of bacterial diseases in aquaculture, along with brochures on biosecurity for aquaculture species that are important for food security especially in low- and middle-income countries, such as carp, tilapia and shrimp.

37. FAO, in partnership with the Istituto Zooprofilattico Sperimentale delle Venezie, in Italy, is conducting a project to gather data on bee health and antimicrobial use, and the results of a global survey will be promoted during World Bee Day.

4. Infection prevention and control measures

38. In 2016, WHO issued new recommendations on core components of effective infection prevention and control programmes and global guidelines on the prevention of surgical-site infection, including recommendations for improving the use of antibiotics in surgical services. WHO issued technical guidelines in 2017 on the prevention and control of emerging threats such as carbapenem-resistant Enterobacteriaceae, *Acinetobacter baumannii* and *Pseudomonas aeruginosa* in health-care facilities.³² A section on surgical antibiotic prophylaxis was added to the 2019 update of the Model Lists of Essential Medicines. Building on evidence and country examples, WHO produced a range of tools and resources, through which it provided support to more than 40 countries in implementing effective infection prevention and control measures. See table 6 for data on countries implementing those programmes.

Table 6
National infection prevention and control programmes (2018/19)

2019 World Bank income category (total countries that responded in each category)	Countries with national infection prevention and control programmes for human health care	
	Number	Percentage
High-income (52)	40	77
Upper-middle-income (48)	25	52
Lower-middle-income (33)	21	64
Low-income (25)	11	44
Total (158)	97	61

³⁰ See www.fao.org/antimicrobial-resistance/projects/ongoing/project-2/en; www.fao.org/antimicrobial-resistance/projects/ongoing/project-5/en; and www.fao.org/antimicrobial-resistance/projects/ongoing/project-3/en.

³¹ See www.fao.org/europe/news/detail-news/en/c/1095497/.

³² WHO, *Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level* (Geneva, 2016); WHO, *Global Guidelines for the Prevention of Surgical Site Infection* (Geneva, 2018); WHO, *Guidelines for the Prevention and Control of Carbapenem-resistant Enterobacteriaceae, Acinetobacter Baumannii and Pseudomonas Aeruginosa in Health Care Facilities* (Geneva, 2017).

39. WHO is promoting an expanded use of vaccines to avoid preventable infections and reduce antibiotic prescription. Expanding the use of existing vaccines will reduce infections from pathogens that are typically treated with antibiotics, such as *Streptococcus pneumoniae*, which is responsible for the majority of community-acquired pneumonia, and viral infections associated with inappropriate antibiotic use, such as influenza.

Table 7

Good health, management and hygiene practices in animal husbandry (terrestrial and aquatic) (2018/19)

2019 World Bank income category (total countries that responded in each category)	Countries with good health, management and hygiene practices in animal husbandry	
	Number	Percentage
High-income (52)	25	48
Upper-middle-income (48)	11	23
Lower-middle-income (33)	8	24
Low-income (25)	2	8
Total (158)	46	29

40. As can be seen in table 7, there are gaps in animal husbandry practices. The sanitary measures in the OIE terrestrial and aquatic animal health codes should be used by the competent authorities of importing and exporting OIE member countries for the early detection, reporting and control of pathogenic agents in animals and to prevent their spread through the international trade in animals and their products, while avoiding unjustified sanitary barriers to trade. The codes include standards for animal welfare and the use of antimicrobial agents in animals. OIE developed a world animal health information system³³ in 2005 as a global tool to support the control of transboundary animal diseases, including zoonosis, by providing access to animal health data.

41. OIE has convened two ad hoc groups tasked with developing prioritized lists of diseases in animals for which the availability of vaccines could reduce antimicrobial use. The groups aimed to raise awareness of the potential of vaccines as alternatives to antimicrobials for controlling animal diseases and to guide research on vaccine development. The groups³⁴ considered the need for vaccines in pigs, poultry and farmed fish, cattle, sheep and goats. As part of a new Can\$27.9 million partnership known as “InnoVet-AMR” to fund new research on innovative veterinary solutions for antimicrobial resistance, the International Development Research Centre of Canada and the Department of Health and Social Care of the United Kingdom of Great Britain and Northern Ireland are considering those diseases identified as priorities to target research investments.

42. FAO has developed worldwide awareness campaigns to promote disease prevention at the farm level, including good husbandry practices for terrestrial and aquatic animals and guidance on feed and food safety and quality.³⁵

³³ See www.oie.int/animal-health-in-the-world/the-world-animal-health-information-system/the-world-animal-health-information-system/.

³⁴ See www.oie.int/standard-setting/specialists-commissions-working-ad-hoc-groups/ad-hoc-groups-reports.

³⁵ See www.fao.org/antimicrobial-resistance/key-sectors/animal-health/en; www.fao.org/antimicrobial-resistance/key-sectors/fishery-and-aquaculture/en/; www.fao.org/antimicrobial-resistance/key-sectors/animal-feeding/en/; and www.fao.org/food/food-safety-quality/home-page/en/.

43. The link between water, sanitation and hygiene and antimicrobial resistance is highlighted in the *WHO Water, Sanitation and Hygiene Strategy 2018–2025*. Adequate access to water, sanitation and hygiene and the safe use of excreta in food production are key for infection prevention. WHO is providing technical support to strengthen environmental components within national action plans, including support for monitoring and enhancing the availability of basic water, sanitation and hygiene services in health-care facilities, treating wastewater, managing health-care waste and conducting surveillance.

44. The disposal of antibiotics and the release of antimicrobial drugs, related contaminants and resistant bacteria into the environment represent an unknown risk. To further global knowledge on the potential environmental impacts of antimicrobial resistance, FAO and the International Atomic Energy Agency are collaborating to develop an isotopic analytical toolbox that provides information on the movements of antibiotics through soil and water.

45. The International Plant Protection Convention plays an important role in preventing the spread of pests in plants and plant products and promoting their control. Reducing pests decreases the need for pesticides, some of which are antimicrobials. In order to help countries prevent the spread of pests, the Commission on Phytosanitary Measures has adopted the International Standards for Phytosanitary Measures. By harmonizing national measures with these international standards, countries can prevent the introduction of pests, reducing the need for pesticides that can lead to antimicrobial resistance.

46. Emerging evidence indicates that antimicrobials in the environment pose a risk to human and animal health. The United Nations Environment Programme (UNEP) highlighted this challenge in its report *Frontiers 2017: Emerging Issues of Environmental Concern*.

5. Strengthening regulatory frameworks

47. In the global action plan on antimicrobial resistance, the World Health Assembly called upon WHO member States to establish enforceable regulation and governance for the licensing, distribution, use and quality assurance of antimicrobial medicines in human and animal health, including a regulatory framework for the preservation of new antibiotics, and to adopt policies on the use of antimicrobial agents in terrestrial and aquatic animals and agriculture.

48. The OIE veterinary legislation support programme³⁶ and the Development Law Service of FAO are collaborating to strengthen the regulatory framework on antimicrobial resistance. Of the 135 OIE member countries assessed through the performance of veterinary services pathway up to November 2018, many did not have legislation or accompanying compliance programmes to ensure the appropriate import, manufacturing, distribution and use of veterinary medicinal products, including antimicrobial agents. In a review of 61 reports on the identification of veterinary legislation in specific countries, it was found that, in 23 of those reports, weaknesses regarding the use of antibiotics had been identified.

³⁶ Established in 2008, the veterinary legislation support programme, which is one component of the performance of veterinary services pathway, provides assistance to member countries in recognizing and addressing their need for modern and comprehensive veterinary legislation.

Table 8
Policies and regulations on antimicrobial use (2018/19)

2019 World Bank income category (total countries that responded in each category)	Countries with laws or regulations on the prescription and sale of antimicrobials				Countries with laws or regulations prohibiting the use of antibiotics for growth promotion in the absence of risk analysis	
	Human use		Animal use		Animal use	
	Number	Percentage	Number	Percentage	Number	Percentage
High-income (52)	51	98	45	87	43	83
Upper-middle-income (48)	43	90	31	65	19	40
Lower-middle-income (33)	29	88	17	51	19	58
Low-income (25)	18	72	13	52	6	24
Total (158)	141	89	106	68	87^a	55

^a Other data from the OIE global database on antimicrobial agents intended for use in animals indicate a total of 110 countries.

49. In the country self-assessment survey of the Tripartite Organizations, a majority of countries reported having regulations in place that were applicable to the use of antimicrobials in humans and animals (see table 8). However, much progress can still be made to strengthen existing regulatory frameworks and their enforcement as a means to address antimicrobial resistance.

50. The Development Law Service of FAO has designed a methodology for assessing national legislation relevant to antimicrobial resistance, including regulatory frameworks for antimicrobials, legislation aimed at preventing the contamination of food and the environment with antimicrobials and legislation on improving animal and plant health to minimize the need for antimicrobials. The methodology takes into account legislation on veterinary medicine, food and feed safety, environmental, animal and plant health, pesticides, water and waste, and in particular legislation on the release of antimicrobial residues (including through waste from treated animals) into the environment. OIE also collaborated on the initiative as part of its veterinary legislation support programme. Research conducted in the course of developing the methodology is being used to support comparative legal analysis and capacity development at the global level.

51. FAO is working to identify relevant antimicrobial resistance legislation and policies across countries through its comprehensive database of national laws, regulations and policies on food, agriculture and natural resource management (FAOLEX), so as to facilitate the identification of existing legislation and good practices.

52. National regulatory authorities play a critical role in preventing antimicrobial resistance by ensuring the quality and appropriate use of antimicrobials. In human health, approximately half of the products reported in the Global Surveillance and Monitoring System for substandard and falsified medical products of WHO are antimicrobials.

53. WHO supports national regulatory authorities in combating antimicrobial resistance by:

(a) Strengthening their ability to oversee the development, evaluation, marketing and surveillance of medical products through the objective assessment of regulatory systems against international standards;³⁷

(b) Accelerating the registration and access to pre-qualified, quality-assured medical products for the treatment and prevention of priority infectious diseases;³⁸

(c) Strengthening their ability to prevent, detect and respond to substandard and falsified antimicrobial products, which are a major risk in the development of antimicrobial resistance, including through the Global Surveillance and Monitoring System³⁹ and a member State mechanism on substandard and falsified medical products.⁴⁰

54. WHO has initiated field surveys on the quality of selected antimicrobials covering more than 20 countries. One objective is to understand the impact of substandard and falsified medical products on antimicrobial resistance while building national regulatory capacity. OIE is examining the possibility of applying a similar approach in the animal health sector.

6. Financial resources and the economic case for investments in combating antimicrobial resistance

55. The economic and financial impact of drug resistance will have implications for developed and developing economies, affecting health-care costs, labour supply, productivity, food production, animal welfare, household incomes and national revenues.

56. In a recent study to quantify the projected impact of drug resistance on the global economy between 2017 and 2050, the World Bank conducted economic simulations on the basis of low- and high-impact scenarios of antimicrobial resistance. In the scenarios, low-income countries experienced larger declines in economic growth, thereby further increasing economic inequality and potentially driving an additional 24 million people into extreme poverty by 2030. In the resulting report,⁴¹ the World Bank also highlighted that, by 2050, global increases in health-care costs could range from \$300 billion to more than \$1 trillion per year and a decline in global livestock production could range from 2.6 per cent to 7.5 per cent per year.

57. In the report, the World Bank suggests that addressing antimicrobial resistance should be considered one of the highest-yield development investments. It estimates \$9 billion in annual costs for antimicrobial resistance containment in low- and middle-income countries, with an economic rate of return ranging from 31 per cent to 88 per cent annually based on the proportion of costs avoided. The findings highlight that addressing antimicrobial resistance represents an excellent investment for countries. A study by the Organization for Economic Cooperation and Development (OECD)⁴² supported this idea, demonstrating that investing in public health packages alone could pay for itself in one year and save OECD countries \$4.8 billion per year.

58. Despite progress made by countries in the development of national action plans, resource constraints undermine their full implementation. Ongoing initiatives to combat antimicrobial resistance are supported by multilateral institutions, bilateral development agencies and private philanthropies. A global investment framework for

³⁷ See www.who.int/medicines/regulation/rss/en.

³⁸ See <https://extranet.who.int/prequal>.

³⁹ See www.who.int/medicines/regulation/ssffc/surveillance/en.

⁴⁰ See www.who.int/medicines/regulation/ssffc/mechanism/en.

⁴¹ World Bank Group, *Drug-resistant Infections: A Threat to Our Economic Future – Final Report* (Washington, D.C., March 2017).

⁴² OECD, *Stemming the Superbug Tide: Just a Few Dollars More* (OECD Publishing, Paris, 2018).

antimicrobial resistance, proposed by the World Bank in 2017,⁴³ could help to meet country-level needs with regard to the implementation of national action plans. The framework must be coupled with investments, including from the private sector, in sustainable animal husbandry and plant production and in environmental measures, in particular for water, sanitation and waste management. To secure investments in innovation and new technologies, collaboration across the animal, plant and health sectors is crucial.

59. Multilateral development financing institutions, including the Asian Development Bank and European Investment Bank, have invested in regional multi-country projects to address antimicrobial resistance, such as a Greater Mekong subregion health security project, and have applied innovative financing through instruments such as the InnovFin Infectious Diseases Finance Facility to support research and development of new drugs, vaccines and diagnostic tools. Another successful collaboration aimed at promoting investments to address this issue is the Coalition for Epidemic Preparedness Innovations.

60. Country-specific economic analyses related to antimicrobial resistance, accompanied by the development of an economic case for investment, are needed to maximize the impact of investments.

7. Strengthening public-private partnerships to promote research and development

61. In order to foster investment in new antimicrobials, as well as in safe and effective alternatives to antimicrobials for human, animal and plant health, the private sector, philanthropies and government institutions need to closely coordinate their efforts. The Tripartite Organizations engage in ongoing dialogue with development partners and civil society organizations so as to support antimicrobial resistance initiatives within the broader sustainable development agenda. One such initiative, a global antibiotic research and development partnership, jointly developed by WHO and the Drugs for Neglected Diseases initiative, is aimed at developing new treatments for bacterial infections. Through the partnership, WHO and the Drugs for Neglected Diseases initiative have launched programmes to address sepsis in newborns and to develop a new first-in-class treatment for drug-resistant gonorrhoea, which is entering the third phase of clinical trials.

62. In 2017, WHO issued a global priority list of antibiotic-resistant bacteria that pose the greatest threat to human health.⁴⁴ The list, which is aimed at guiding research into and the discovery and development of new antibiotics, will be updated regularly to catalyse public and private funding for research and development. A comprehensive analysis of the clinical antibacterial and antituberculosis pipeline was published,⁴⁵ in which all new antibacterial treatments in development were reviewed and their impact on at least one WHO priority pathogen was assessed. WHO will continue to monitor the clinical and pre-clinical pipeline on an annual basis.

63. WHO is developing new diagnostic tools relevant to antimicrobial resistance and conducting an analysis of the status of available and promising diagnostic products for low- and middle-income countries. A priority list will be published to help develop product profiles for diagnostics that are deemed the highest priority. WHO is also undertaking modelling to prioritize the research and development of

⁴³ World Bank Group, *Drug-resistant Infections: A Threat to Our Economic Future*.

⁴⁴ WHO, "Global priority list of antibiotic-resistant bacteria to guide research, discovery and development of new antibiotics", Geneva, February 2017.

⁴⁵ Ursula Theuretzbacher and others, "Analysis of the clinical antibacterial and antituberculosis pipeline", *The Lancet*, vol. 19, No. 2 (February 2019).

new vaccines for pathogens associated with antibiotic resistance and those associated with high levels of antibiotic consumption.

64. A European Union-based joint programming initiative on antimicrobial resistance has mapped the funding of research on antimicrobial resistance in relation to therapeutics, diagnostics, surveillance, transmission, the environment and interventions.

65. Research and development in the animal, plant and environmental sectors are less well resourced. In 2016, OIE held its second international symposium on alternatives to antibiotics, on the theme “Challenges and solutions in animal production” and has a third symposium scheduled for 2019. OIE co-hosts the secretariat of a global consortium of funders of animal health research, known as the STAR-IDAZ International Research Consortium, created to improve research coordination and collaboration on priority diseases. The consortium has identified the development of innovative anti-infective approaches and tools for controlling antimicrobial resistance as a high priority and is establishing a working group to identify research gaps and increase global-level coordination.

66. Other initiatives targeting innovative research and development to combat antimicrobial resistance include: the establishment by the Government of the United States of America of the Division of Research, Innovation and Ventures within the Biomedical Advanced Research and Development Authority, and of a project known as the “Combating antibiotic resistant bacteria biopharmaceutical accelerator”; the creation of a global antimicrobial resistance research and development hub by the Federal Ministry of Education and Research of Germany; the launch of the “Grand challenges” initiative of the Bill and Melinda Gates Foundation; the establishment of a research and development centre for antimicrobial resistance in the United Kingdom; the creation of an antibiotic development platform in the Netherlands; and the creation of a fund known as the “Replenishing and enabling the pipeline for anti-infective resistance impact fund”.

C. Collaboration by the Tripartite Organizations to address challenges

1. Collaboration and the joint workplan of the Tripartite Organizations

67. Members of the Tripartite Organizations have been working together since the 1940s and formalized their collaboration in 2010. Their commitment to implementing the five strategic objectives of the global action plan on antimicrobial resistance was reaffirmed through a memorandum of understanding in 2018.

68. A workplan for 2019 and 2020⁴⁶ was developed by the Tripartite Organizations with five focus areas to be achieved through multisectoral collaboration. The focus areas are: (a) the implementation of national action plans; (b) awareness-raising and behaviour change; (c) the surveillance and monitoring of antimicrobial resistance and use; (d) the stewardship and optimal use of antimicrobials; and (e) monitoring and evaluation. Through the workplan, the Tripartite Organizations also recognize the need for UNEP to join the collaboration.

69. A multi-partner trust fund to secure consistent and coordinated financing for a five-year period is being established by the Tripartite Organizations and administered by the Multi-Partner Trust Fund Office. Resources will be prioritized to support national action plans and implement the workplan.

⁴⁶ See www.who.int/antimicrobial-resistance/publications/tripartite-work-plan/en/.

70. The Tripartite Organizations have also engaged other stakeholders in their efforts. Some examples include:

- (a) The establishment of a community of practice⁴⁷ through WHO to foster discussion, provide feedback and facilitate peer learning on antimicrobial resistance (647 members have joined from 103 countries and territories);
- (b) Collaboration with the United Nations Children's Fund, UNEP and WaterAid on water, sanitation and hygiene services in health-care facilities;
- (c) Work with the United Nations Foundation and the Wellcome Trust in Berlin in 2017 and Accra in 2018, and the development of a report on the mapping of activities by the United Nations and other organizations on antimicrobial resistance;
- (d) A joint analysis with Health for Animals and the World Customs Organization to identify the types and extent of illegal veterinary medicine use.

71. The Tripartite Organizations work with regional bodies to promote the "One Health" approach to antimicrobial resistance. Examples include: the development by the Southern African Development Community of a subregional antimicrobial resistance strategy; the adoption by the European Commission of the new European Union "One Health" action plan against antimicrobial resistance; the establishment by the Africa Centres for Disease Control and Prevention of the African Union of a framework for antimicrobial resistance for the period 2018–2023; and the Association of Southeast Asian Nations leaders' declaration on antimicrobial resistance.

2. Global development and stewardship framework

72. In September 2016, the General Assembly called upon WHO, together with FAO and OIE, to finalize a global development and stewardship framework to combat antimicrobial resistance (resolution 71/3). The WHO Director General submitted options for establishing the framework to the World Health Assembly at its sixty-ninth session.⁴⁸

73. The objectives of the framework include:

- (a) To support research on and the development of affordable antimicrobial medicines, diagnostic tools, vaccines and other interventions for detecting, preventing and controlling antimicrobial resistance;
- (b) To promote affordable access to existing and new antimicrobial medicines, vaccines and diagnostic tools of assured quality;
- (c) To guide stewardship of antimicrobial medicines, including measures to promote their control and distribution as well as their appropriate use.

74. The global framework highlights the need to:

- (a) Optimize the use of antimicrobials in the human and animal health sectors and develop an economic case for sustainable investment that takes into account the needs of all countries;
- (b) Increase investment in new medicines, diagnostic tools, vaccines and other interventions.

75. Following initial consultations in 2017 to advance the establishment of the framework, the Tripartite Organizations, in collaboration with UNEP, held a second consultation with WHO member States, international organizations and non-State

⁴⁷ See <https://ezcollab.who.int/amr-nap>.

⁴⁸ See WHO document A69/24 Add.1.

entities in October 2018. A proposal for the framework⁴⁹ was presented and the member States noted the need for additional discussions to refine its scope.

III. Ad hoc inter-agency coordination group on antimicrobial resistance

A. Mandate and process

76. Further to the request by Member States in General Assembly resolution 71/3, the Secretary-General convened the ad hoc inter-agency coordination group on antimicrobial resistance in May 2017 in consultation with the Tripartite Organizations. The secretariat of the coordination group was hosted by WHO with contributions from FAO and OIE. The coordination group was mandated to provide guidance on approaches to ensuring sustained global action on antimicrobial resistance and report back to the Secretary-General during the seventy-third session of the Assembly, in 2019 (see para. 79 below). The mandate included making recommendations on ways to enhance coordinated action across sectors and countries, build political momentum, plan future governance and mobilize stakeholders.

77. The coordination group analysed critical issues and developed discussion papers for public consultation on: (a) public awareness, behaviour change and communication; (b) national action plans; (c) optimizing the use of antimicrobials; (d) innovation, research, development and access; (e) surveillance and monitoring; and (f) global governance and alignment with the Sustainable Development Goals.

78. The recommendations of the coordination group were informed by consultations with multiple stakeholders, the public and various countries.

B. Summary of recommendations of the coordination group

79. The coordination group has submitted its final report to the Secretary-General.⁵⁰ The 14 recommendations of the coordination group are summarized below:

(a) Accelerate progress in countries:

(i) All Member States are called upon to ensure equitable and affordable access to existing and new quality-assured antimicrobials, as well as alternatives, vaccines and diagnostics, and their responsible and prudent use by competent, licensed professionals across the human, animal and plant health sectors;

(ii) All Member States are called upon to accelerate the development and implementation of national action plans using the “One Health” approach within the context of the Sustainable Development Goals;

(iii) All Member States are called upon to phase out the use of antimicrobials for growth promotion, consistent with guidance from the Tripartite Organizations and the Codex Alimentarius, starting with an immediate end to the use of antibiotics categorized as the highest priority critically important antimicrobial agents on the WHO list of critically important antimicrobials for human medicine;

⁴⁹ FAO, OIE and WHO, “Global framework for development and stewardship to combat antimicrobial resistance: draft road map”, document WHO/EMP/IAU/2017.08.

⁵⁰ Ad hoc inter-agency coordination group on antimicrobial resistance, “No time to wait: securing the future from drug-resistant infections”, April 2019.

(b) Innovate to secure the future:

(i) Public, private and philanthropic donors and other funders are called upon to increase investment and innovation in new, quality-assured antimicrobials (in particular antibiotics), novel compounds, diagnostics, vaccines, waste management tools and safe and effective alternatives to antimicrobials for all health sectors, as well as investment in implementation and operational research;

(ii) Existing and future global access initiatives should promote and support equitable and affordable access to existing and new, quality-assured antimicrobials, diagnostics, vaccines, waste management tools and safe and effective alternatives to antibiotics in all health sectors;

(iii) Public, private and philanthropic research funders and other stakeholders are called upon to build upon current research and development efforts and to strengthen implementation and operational research and research coordination and collaboration in a “One Health” context;

(c) Collaborate for more effective action:

(i) Systematic and meaningful engagement of civil society groups and organizations should be undertaken in the “One Health” response to antimicrobial resistance at all levels;

(ii) Systematic and meaningful engagement of and enhanced action by the private sector should be undertaken in the “One Health” response to antimicrobial resistance at all levels;

(d) Invest for a sustainable response:

(i) Governments, global, regional, national, bilateral and multilateral financing and development institutions and banks, and private investors are called upon to systematically apply standards to assess risks and impacts related to antimicrobial resistance when making investments;

(ii) The need for increased investments, including from domestic financing in all countries, is emphasized; existing and future financing mechanisms in human, animal and plant health, food and feed production and the environment are urged to give greater priority to antimicrobial resistance in their resource allocations; and public, private and philanthropic donors are called upon to contribute additional funding, including to support the implementation of national action plans;

(e) Strengthen accountability and global governance:

(i) The Tripartite Organizations, together with UNEP, other United Nations system entities and the World Bank, in the context of United Nations reform, are requested to strengthen joint “One Health” action on the basis of target-setting, country priorities and needs by enhancing their organizational capacity and providing adequate and sustainable core funding for antimicrobial resistance-related activities;

(ii) The urgent establishment of a “One Health” global leadership group on antimicrobial resistance is recommended, supported by a joint secretariat managed by the Tripartite Organizations;

(iii) The Secretary-General is requested, in close collaboration with the Tripartite Organizations, UNEP and other international organizations, to convene an independent panel on evidence for action against antimicrobial resistance to monitor and provide Member States with regular reports on the

science and evidence related to antimicrobial resistance, its impacts and future risks and to recommend options for adaptation and mitigation;

(iv) The Tripartite Organizations and UNEP are urged to expedite the process led by Member States to develop the global development and stewardship framework to combat antimicrobial resistance, in line with the scope described in World Health Assembly resolution 68.7 on antimicrobial resistance. As Member States finalize the process, they should also consider the need for new international instruments.

IV. Conclusion and ways forward

80. The Secretary-General acknowledges the progress made by Member States and the Tripartite Organizations in implementing the political declaration of the high-level meeting of the General Assembly on antimicrobial resistance and acknowledges the strong support and confidence expressed by Member States and other stakeholders for the Tripartite Organizations' global leadership in addressing antimicrobial resistance. Despite early progress, critical challenges remain in terms of the development of national action plans and the establishment of a coordinated response at the global level.

81. Challenges at the national level can be addressed by:

(a) Ensuring national political engagement and support for the human, animal and plant health and environmental sectors to allow for consistent government oversight of multisectoral implementation of national action plans;

(b) Organizing national budget allocation in such a way as to incentivize sustainable engagement across sectors and ministries and to foster awareness-raising and training across all sectors;

(c) Scaling up technical capacity to tackle antimicrobial resistance in the human, animal and plant health and environmental sectors;

(d) Strengthening regulatory frameworks to ensure access to safe, efficacious and quality antimicrobials, prevent the production, distribution and consumption of substandard and falsified medical products for humans and animals and prohibit the use of antimicrobials for growth promotion in the absence of risk analysis.

82. Challenges at the regional and global levels can be addressed by:

(a) Improving coordination among all stakeholders and increasing the engagement of civil society and the private sector;

(b) Ensuring sustainable financing from multilateral institutions and development partners for the implementation of national action plans and research and development, and for the full implementation of the workplan of the Tripartite Organizations through the multi-partner trust fund;

(c) Enhancing the collection, analysis and reporting of comparable high-quality data, in particular by supporting surveillance of resistance and antimicrobial consumption and use, in order to establish baseline estimates and monitor trends;

(d) Providing greater support for research into and the development of new tools, vaccines, diagnostics and medicines through innovative financing mechanisms.

83. The Secretary-General welcomes the recommendations of the coordination group, which could strengthen the efforts of Member States and the Tripartite Organizations to implement national action plans using the "One Health" approach.

84. The Secretary-General notes five critical shifts that emerged from the recommendations of the coordination group:

(a) **Urgency.** While progress has been made, urgent action is needed at the national, regional and global levels to scale up the resourcing, implementation and monitoring of national action plans and to take the global measures necessary to address antimicrobial resistance;

(b) **“One Health” approach.** Along with the human health sector, the full engagement of the animal and plant health and environmental sectors through a “One Health” approach and a functional multisectoral coordination mechanism are urgently needed in each country; national action plans should be reviewed to reflect a comprehensive “One Health” approach;

(c) **Stakeholder engagement.** Greater involvement of Member States, civil society and the private sector, United Nations system entities and national and multilateral organizations is essential to ensure that all stakeholders are actively engaged and contribute their knowledge and technical and financial resources to address this global threat;

(d) **Implementation of national action plans.** Member States need to mobilize additional technical and financial resources, through the engagement of all stakeholders, to implement their national action plans sustainably, and to strengthen government structures to allow country-level oversight and accountability mechanisms to deliver and monitor progress;

(e) **Resource mobilization.** More efficient utilization and the increased allocation of national resources are needed to make progress on national action plan commitments. Scaled up investment from bilateral, multilateral, private and philanthropic institutions is also needed to address financing gaps in the activities of Member States, the Tripartite Organizations, UNEP, other United Nations system entities and other multilateral, national and civil society organizations, including funding to advance research and development.

85. The Secretary-General invites United Nations organizations, the World Bank, all relevant international, regional and national organizations and other stakeholders, including civil society and the private sector, to provide the needed political, technical, advocacy and financial support to assist Member States and the Tripartite Organizations in implementing the global action plan on antimicrobial resistance.

86. The Secretary-General invites the Tripartite Organizations, United Nations organizations, the World Bank and all relevant international, regional and national organizations, partners and other stakeholders, including civil society and the private sector, to assist in implementing the recommendations of the coordination group and to provide Member States with the needed political, technical, advocacy and financial support in that regard.

87. In order to enable the implementation of the recommendations of the coordination group, the Secretary-General calls upon the Tripartite Organizations to establish a joint secretariat and, through the support of the joint secretariat, in close collaboration with UNEP, other United Nations system entities, Member States and other stakeholders, to further define the modalities of implementation in a transparent manner and undertake the required institutional and governance arrangements.

Annex

WHO member States that responded to the 2018/19 country self-assessment survey on antimicrobial resistance of the Tripartite Organizations, classified by 2019 World Bank income group, are listed below.

High-income countries

Antigua and Barbuda, Argentina, Australia, Austria, Bahamas, Bahrain, Belgium, Brunei Darussalam, Canada, Chile, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Oman, Palau, Poland, Qatar, Republic of Korea, Saint Kitts and Nevis, San Marino, Saudi Arabia, Seychelles, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Trinidad and Tobago, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United States of America

Upper-middle-income countries

Albania, Azerbaijan, Belarus, Brazil, Bulgaria, China, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, Fiji, Gabon, Grenada, Guatemala, Guyana, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Lebanon, Libya, Malaysia, Maldives, Marshall Islands, Mauritius, Mexico, Montenegro, Namibia, Nauru, North Macedonia, Paraguay, Peru, Romania, Russian Federation, Saint Lucia, Saint Vincent and the Grenadines, Serbia, South Africa, Suriname, Thailand, Turkey, Turkmenistan, Tuvalu, Venezuela (Bolivarian Republic of)

Lower-middle-income countries

Angola, Bangladesh, Bhutan, Cambodia, Côte d'Ivoire, Egypt, Georgia, Ghana, Honduras, India, Indonesia, Kyrgyzstan, Lao People's Democratic Republic, Lesotho, Mauritania, Mongolia, Morocco, Myanmar, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Philippines, Republic of Moldova, Sri Lanka, Sudan, Timor-Leste, Tunisia, Ukraine, Uzbekistan, Vanuatu, Viet Nam, Zambia

Low-income countries

Afghanistan, Benin, Burkina Faso, Central African Republic, Chad, Comoros, Democratic People's Republic of Korea, Ethiopia, Guinea, Haiti, Liberia, Malawi, Mali, Mozambique, Nepal, Rwanda, Sierra Leone, Syrian Arab Republic, Tajikistan, Togo, Uganda, United Republic of Tanzania, Yemen, Zimbabwe