

Follow-up to the high-level meetings of the United Nations General Assembly on health-related issues

Antimicrobial resistance

Report by the Director-General

1. The Executive Board at its 144th session considered and noted an earlier version of this report and adopted resolution EB144.R11.¹ The current version of the report reflects the latest developments and takes account of Member States' comments.
2. This report provides an update on the implementation of resolution WHA68.7 (2015) concerning the global action plan on antimicrobial resistance and of United Nations General Assembly resolution 71/3 (2016) concerning the political declaration of the high-level meeting of the General Assembly on antimicrobial resistance, in addition to key ongoing challenges and emerging threats.
3. The political declaration reaffirmed the global action plan and its five overarching objectives, which were developed by WHO in collaboration with, and subsequently adopted by, FAO and OIE.
4. The sections below provide a summary of WHO's actions at all three levels of the Organization, as well as through collaboration with FAO, OIE and other stakeholders to support the implementation of the commitments made in the political declaration and in resolution WHA68.7.

COUNTRY-LEVEL PROGRESS IN COMBATING ANTIMICROBIAL RESISTANCE

5. Based on guidance and tools developed jointly by WHO, FAO and OIE, Member States have developed and started implementing national action plans for combating antimicrobial resistance. As of January 2019, 117 countries have finalized their national action plans and another 62 are in the process of developing theirs; these countries represent all regions and all levels of income and development.
6. In order to gauge progress, WHO, FAO and OIE have jointly administered a tripartite annual antimicrobial resistance country self-assessment survey since 2016, with questions structured around the strategic objectives of the global action plan. Of WHO's 194 Member States, 154 representing 91% of the world's population, responded to the 2017–2018 survey, while nearly 40% have progressed to implementing their action plans after receiving government approval, establishing monitoring

¹ See document EB144/19 and the summary records of the Executive Board at its 144th session, fifteenth meeting, section 4, sixteenth meeting, section 1 and seventeenth meeting, section 2.

arrangements, engaging all relevant sectors and identifying specific funding for implementation. Responses from the surveys are published in an open-access database,¹ offering scope for in-country review with civil society and other stakeholders.

7. Key findings of the second round of the antimicrobial resistance country self-assessment survey conducted in 2017–2018 include the following:²

- (a) some 50% of responding countries have established a multisectoral antimicrobial resistance working group, with representatives from the human, animal and plant health, food safety, food production and environment sectors; these working groups are functional in 53 countries;
- (b) while 125 countries have conducted awareness campaigns about the risks of antimicrobial resistance in human health, additional nationwide efforts are needed; in the animal health and other non-human sectors, one third of countries have conducted awareness campaigns;
- (c) although 105 (68%) countries report that they have a national antimicrobial resistance surveillance system for some common bacterial pathogens in humans, not all are currently enrolled in the Global Antimicrobial Surveillance System (GLASS); close to 40% of countries are conducting surveillance in the animal and food sectors;
- (d) a total of 90 countries report that they have a national infection prevention and control programme for health care facilities, with national guidelines; in the animal and food production sectors, far fewer countries report national programmes for infection prevention and control;
- (e) while 123 countries have policies requiring a prescription for antibiotic use in humans, 64 have limited the use of critically important antimicrobials for human medicine for growth promotion in animal food production.

8. Although these self-assessment surveys have limitations, their results are broadly consistent with data from the joint external evaluations conducted under the International Health Regulations (2005) between 2016 and 2018. In the context of strengthening global health security, one of the key technical areas being evaluated in the joint external evaluations is whether Member States have a functional system for the national response to combat antimicrobial resistance through a One Health approach.

9. In order to ensure the long-term sustainability of country-level actions to combat antimicrobial resistance and build resilient systems to prevent and treat infections at scale, countries would benefit from integrating antimicrobial resistance initiatives in their national strategies for universal health coverage and health security.

¹ Global database for antimicrobial resistance: country self-assessment (<https://amrcountryprogress.org/>, accessed 26 February 2019).

² The third round of the country self-assessment survey (2018–2019) will close on 15 March 2019, and the initial results will be made available in <https://amrcountryprogress.org>.

PROGRESS IN IMPLEMENTING THE GLOBAL ACTION PLAN

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

10. Every November since 2015, World Antibiotic Awareness Week has been a major campaign in all regions to improve awareness of antimicrobial resistance and urge action towards the responsible use of antimicrobials across the human, animal, food and environment interface. FAO and OIE also participate actively in the week-long “Antibiotics: Handle with Care” campaign. In 2017, 131 countries participated in the campaign. Preliminary data for 2018 indicate strong engagement by countries from all six regions, with nearly 500 events reported globally.

11. Technical consultations with experts in behaviour change to share knowledge on changing behaviour around the use of antibiotics were held in 2017 and 2018, with the participation of staff from FAO and OIE in addition to key stakeholders. Based on these consultations, a number of country-based pilot projects will be defined and developed in 2020.

12. WHO has developed a competency framework¹ with a menu of core and additional knowledge, skills and attitudes, in order to enable health workers to address antimicrobial resistance effectively in policy and practice settings in the field of human health. The framework includes guidance relevant to key occupational groups, including antimicrobial prescribers, health system managers and public health officers. It is targeted at pre-service and in-service health education and training institutions and may be used to plan for auditing and strengthening antimicrobial resistance competencies and to optimize antimicrobial stewardship roles or functions. A training module on the role of infection prevention and control to combat antimicrobial resistance has also been finalized and implemented.

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

13. GLASS, which was 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 against which treatment options are increasingly limited owing to the emergence of antimicrobial resistance; it also seeks to monitor the status of existing or newly developed national antimicrobial resistance surveillance systems. The second annual GLASS report was issued in January 2019,² including information from 68 enrolled countries as at 31 July 2018, (10 low-income countries, 16 lower-middle-income countries, 15 upper-middle-income countries, 27 high-income countries). Sixty-seven countries provided information on their national antimicrobial resistance surveillance systems, while 48 also provided antimicrobial resistance data. In comparison with 2017, in 2018 there was a 57% increase in country enrolment in GLASS and almost twice the number of countries submitted antimicrobial resistance data. There is continued progress in country participation and as at 12 February 2019, 73 countries are enrolled in GLASS.

14. GLASS is providing support and developing tools, especially for countries with limited resources. It has also facilitated synergies between WHO surveillance initiatives related to antimicrobial resistance.

¹ WHO Competency Framework for Health Workers' Education and Training on Antimicrobial Resistance (document WHO/HIS/HWF/AMR/2018.1). Available at <https://www.who.int/hrh/resources/WHO-HIS-HWF-AMR-2018.1/en/> (accessed 1 April 2019).

² Global antimicrobial resistance surveillance system (GLASS) report: early implementation 2017–2018 (<https://apps.who.int/iris/bitstream/handle/10665/279656/9789241515061-eng.pdf?ua=1>, accessed 27 February 2019).

New modules within the GLASS information technology platform are being built to facilitate further integration of analysis and reporting. In addition, the GLASS Emerging Antimicrobial Resistance Reporting (GLASS-EAR) component was launched in 2018 to support the detection, early warning and risk assessment capacities of national antimicrobial resistance surveillance programmes and to strengthen global health security.

15. Next year, at the end of the initial phase (2015–2019), GLASS will be revised. New targets and datasets will be included, while emerging threats such as carbapenem-resistant Enterobacteriaceae will be addressed in a more comprehensive manner.

16. GLASS is promoting innovative approaches to foster antimicrobial resistance surveillance globally in order to improve understanding of the impact of antimicrobial resistance on human health. The development and application of new technologies such as whole genome sequencing could help detect the early emergence and spread of antimicrobial resistance and further inform timely policy development on antimicrobial resistance control. Sequencing data emanating from antimicrobial resistance surveillance may provide key information to guide the development of rapid diagnostic tools, such as point-of-care diagnostic methods, for better and more rapid characterization of antimicrobial resistance.

17. WHO is also engaged in developing, promoting and coordinating the implementation of the national integrated and multisectoral surveillance system on antimicrobial resistance taking the One Health approach, based on the guidance of the WHO Advisory Group on Integrated Surveillance of Antimicrobials Resistance. In order to facilitate the implementation of this system by Member States, WHO and the Advisory Group are developing a global integrated surveillance protocol for antimicrobial resistance in humans, the food chain and the environment by focusing on one indicator, namely, extended spectrum beta-lactamases-producing *Escherichia coli*, in what is known as the ESBL Ec Tricycle Project. The protocol is in a pilot phase and will be included as a new function under GLASS once the developmental phase is concluded. Discussions are also under way to collaborate with FAO and OIE on the development of a single portal linking data on antimicrobial resistance rates and antimicrobial consumption from human, animal (terrestrial and aquatic) and plant sectors. A tripartite advisory group for intersectoral support on antimicrobial resistance is expected to become operational by the end of 2019 to support the efforts of WHO, FAO and OIE to promote integrated surveillance.

18. WHO is working with other relevant United Nations agencies to improve understanding of the role of inadequate access to water, sanitation and hygiene (WASH) and environmental contamination with antimicrobials residues and resistant microbes as drivers of antimicrobial resistance and its impact on health. In this regard, WHO supports the Global Sewage Surveillance Project and the publication of its results. Technical assistance is also being provided in order to facilitate the integration of environmental surveillance modalities into GLASS.

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

19. Prevention of infections is critical to reducing the need for antibiotics and controlling the spread of resistant microorganisms. Following the issuance of the new WHO evidence-based recommendations on core components of effective programmes on infection prevention and control in 2016,¹ further specific technical guidelines were issued in 2017 on the prevention and control of carbapenem-resistant

¹ See <https://www.who.int/infection-prevention/publications/core-components/en/> (accessed 13 March 2019).

Enterobacteriaceae, *Acinetobacter baumannii* and *Pseudomonas aeruginosa* in health care facilities.¹ The global guidelines on the prevention of surgical site infection were also issued in 2016, with relevant recommendations for improving the use of antibiotics in surgical services;² a new section on surgical antibiotic prophylaxis has also been added to the 2019 update of the Essential Medicines List. In order to bridge the gap between the implementation and monitoring of programmes and the infection prevention and control practices demonstrated by various surveys, WHO has produced a broad range of practical tools and resources building on evidence and country examples.³ Over the past year, intensive support has been provided through collaboration across the three levels of WHO to more than 40 countries for the assessment and implementation of core components of infection prevention and control, including strong linkages to antimicrobial resistance, WASH and health emergencies national action plans, and to quality of care improvement in the context of universal health coverage. Furthermore, over the period 2017–2018 WHO also conducted a survey on national infection prevention and control programmes and launched a global survey aimed at providing a situational analysis of the progress made in infection prevention and control and hand hygiene programmes in health care facilities around the world.⁴ This initiative is being promoted by WHO in the context of the 5 May 2019 “Save Lives: Clean Your Hands” campaign, and the data generated will help to inform local improvement plans and overall progress in infection prevention and control measures in health care facilities.

20. Adequate access to safely managed WASH and the safe reuse of excreta in food production are crucial for infection prevention at the societal level. WHO is providing technical support on strengthening environmental components within national action plans for tackling antimicrobial resistance, with a focus on monitoring and strengthening the availability of basic WASH services in health care facilities, waste water treatment, health care waste management and surveillance. Based on evidence gathered in the 2017 report of the WHO/UNICEF Joint Monitoring Programme,⁵ the report on WASH services in health care facilities and other studies, the linkage between WASH and antimicrobial resistance has been highlighted in the new WHO WASH strategy 2018–2025. There will be greater collaboration with UNEP and other United Nations agencies on these issues. The Expert Committee on Specifications for Pharmaceutical Preparations also acknowledged, at its fifty-third meeting held in Geneva, 22–26 October 2018, the challenge of antimicrobial resistance and supported the need for additional technical inputs to address waste management in the production of antibiotics.

21. WHO is promoting the expanded use of vaccines, primarily to avoid preventable infections but also to reduce antibiotic prescription. Expanding the use of existing vaccines will reduce infections from pathogens typically treated with antibiotics, such as *Streptococcus pneumoniae*, which is responsible for most cases of community-acquired pneumonia, in addition to viral infections such as influenza, which are also associated with inappropriate antibiotic use.

¹ See <https://www.who.int/infection-prevention/publications/guidelines-cre/en/> (accessed 27 February 2019).

² See <https://www.who.int/infection-prevention/publications/ssi-guidelines/en/> (accessed 13 March 2019).

³ See <http://www.who.int/infection-prevention/en/> (accessed 27 February 2019).

⁴ See <https://www.who.int/infection-prevention/campaigns/ipc-global-survey-2019/en/> (accessed 27 February 2019).

⁵ See https://apps.who.int/iris/handle/10665/258617?search-result=true&query=Progress+on+Drinking+Water%2C+Sanitation+and+Hygien&scope=&rpp=10&sort_by=score&order=desc (accessed 12 March 2019).

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

22. In its most recent *Model List of Essential Medicines (2017)*, WHO adopted a new classification for antibiotics to guide optimal use of antibiotics and reduce resistance, comprising three groups:

- (a) **Access** antibiotics: these should be available at all times, affordable and quality-assured, and represent first and second choice antibiotics for the empirical treatment of most common and/or severe bacterial infections and syndromes;
- (b) **Watch** antibiotics (including most of the highest priority antimicrobials listed by WHO as critically important for human medicine¹): recommended only for specific, limited indications;
- (c) **Reserve** antibiotics: for situations when all alternative antibiotics have failed or where a response is needed to a microbiologically driven problem.

WHO anticipates that the introduction of the “AWaRe” framework will reduce the use of antibiotics in the Watch and Reserve groups, while the accessibility of those in the Access group will expand. Furthermore, all newly registered antibiotics will be reviewed and classified in AWaRe categories to guide stewardship programmes and define research gaps in the definition of their role in therapy.

23. WHO is providing technical support for the establishment and strengthening of antimicrobial stewardship programmes in countries in order to optimize the use of antimicrobials in human health. A draft toolkit to support the implementation of antimicrobial stewardship programmes in hospitals in low- and middle-income countries is being finalized.

24. The first WHO report on surveillance of antibiotic consumption, published in November 2018,² presents data on the consumption of systemic antibiotics from 65 countries. The report describes WHO’s approach to monitoring antimicrobial consumption and its methodology for data collection and highlights challenges and future steps in monitoring antimicrobial consumption. In early 2019, WHO published a new tool for conducting surveys on antibiotic use in hospitals. In the future, the Organization will provide support to countries conducting national surveys on antibiotic use and surveillance of antimicrobial consumption to better understand the use of these medicines in countries.

25. In order to advance the establishment of a global framework for development and stewardship to combat antimicrobial resistance, the Tripartite WHO/FAO/OIE partners in collaboration with UNEP held a second consultation with Member States, relevant international organizations and non-State actors on 1 and 2 October 2018, at which a concept for the overarching framework was presented and discussed. Member States noted the need for additional consultations to adjust the process and scope of the framework, including consideration of the work of the ad hoc Interagency Coordination Group on Antimicrobial Resistance.

26. In 2017, WHO updated its list of critically important antimicrobials for human medicine, which ranks antimicrobial agents for risk management of antimicrobial resistance due to non-human use, and

¹ Critically important antimicrobials for human medicine – 5th rev. (<https://apps.who.int/iris/bitstream/handle/10665/255027/9789241512220-eng.pdf?sequence=1>, accessed 27 February 2019).

² See <https://apps.who.int/iris/bitstream/handle/10665/277359/9789241514880-eng.pdf?ua=1> (accessed 27 February 2019).

disseminated relevant guidelines.¹ A further updated list is forthcoming in 2019. In addition, in collaboration with FAO, WHO is contributing to the revision and further development of the relevant Codex Alimentarius standards and related texts to reduce antimicrobial resistance in the food chain by providing evidence-based guidance to the Codex Alimentarius Commission.

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

27. The Global Antibiotic Research and Development Partnership, a joint initiative of WHO and the Drugs for Neglected Diseases *initiative*, aims to develop new treatments for bacterial infections. Since its incubation, the Partnership has launched programmes addressing sepsis in newborns through an observational study in 11 countries and a partnership to develop a new first-in-class treatment for drug-resistant gonorrhoea that is entering clinical phase 3. Another programme focuses on recovering the knowledge, data and assets of forgotten or abandoned antibiotics and identifying new treatments.

28. In 2017, WHO published a global priority list of antibiotic-resistant bacteria that pose the greatest threat to human health.² The list is intended to guide research, discovery and development of new antibiotics and is a factor in prioritizing new vaccine development. WHO will update the prioritization of pathogens to further catalyse public and private funding for research and development and to accelerate global research and development strategies for the discovery of new antibacterial agents to treat multidrug-resistant tuberculosis and drug-resistant bacterial infections.

29. In 2019, WHO published a comprehensive analysis of the clinical antibacterial and anti-tuberculosis pipeline,³ which reviews all new antibacterial treatments currently being developed and assesses the extent to which they are expected to have some activity against at least one WHO priority pathogen. WHO will continue to monitor the clinical pipeline on an annual basis and undertake a review of the pre-clinical pipeline.

30. WHO encourages the development of new diagnostic tools relevant to antimicrobial resistance. A landscape analysis of available technologies and promising products for low- and middle-income countries, conducted to identify gaps in the diagnostics needed, forms the basis of the WHO research and development priority list of antimicrobial resistance diagnostics. The list, scheduled for publication in spring 2019, will be used to develop target product profiles for the highest priority diagnostics for antimicrobial resistance by end 2019.

31. Furthermore, WHO is formulating models that will enable evidence-based prioritization of research into and the development of new vaccines to address pathogens associated with antibiotic resistance, as well as those associated with high levels of antibiotic consumption. This exercise will provide guidance to those funding research and development and entities on which vaccines will have the greatest impact on health in the light of expanding antimicrobial resistance.

¹ WHO guidelines on use of medically important antimicrobials in food-producing animals (https://www.who.int/foodsafety/areas_work/antimicrobial-resistance/cia_guidelines/en/, accessed 27 February 2019).

² See https://www.who.int/medicines/publications/WHO-PPL-Short_Summary_25Feb-ET_NM_WHO.pdf?ua=1 (accessed 27 February 2019).

³ Analysis of the clinical antibacterial and antituberculosis pipeline. *Lancet Infect Dis* 2019 Feb; 19(2):e40-e50. doi 10.1016/S1473-3099(18)30513-9.

Antimicrobial resistance: HIV, tuberculosis, malaria, neglected tropical diseases and sexually transmitted infections

32. According to the *Global tuberculosis report 2018*, drug-resistant tuberculosis continues to be a public health crisis. The best estimate is that, worldwide in 2017, 558 000 people developed tuberculosis that was resistant to rifampicin, the most effective first-line drug, of whom 82% had multidrug-resistant tuberculosis. Among cases of multidrug-resistant tuberculosis in 2017, 8.5% were estimated to have extensively drug-resistant tuberculosis. In July 2018, the latest evidence of the treatment of drug-resistant tuberculosis was reviewed by an independent panel of experts convened by WHO. A rapid communication on key changes to recommendations for the treatment of multidrug- and rifampicin-resistant tuberculosis was issued by WHO in August 2018 and outlined the reprioritization of medicines used in treatment, including the use of bedaquiline and replacing toxic injectables, with all-oral regimens as the standard of care.

33. The global technical strategy for malaria 2016–2030 calls on countries and global malaria partners to monitor the efficacy of antimalarial medicines so that the most appropriate treatments can be selected for national policies. Monitoring the efficacy of antimalarial drugs has resulted in regular policy updates in countries affected by resistance; these reviews are outlined in the annual WHO status reports on artemisinin resistance and the efficacy of artemisinin-based combination therapy. WHO continues to update the global database on antimalarial drug efficacy and resistance, which serves as the source for the therapeutic efficacy studies summary tables, the Malaria Threats Map and the WHO World malaria report.

34. The elimination of AIDS as a public health threat calls for expansion of the coverage and quality of treatment and antiretroviral therapy services. This expansion needs to be balanced by efforts to ensure that the risks and impact of HIV drug resistance are minimized. WHO's HIV drug resistance report 2017 highlights trends of concern in the levels of HIV drug resistance across several regions. Pretreatment HIV drug resistance, detected in people starting antiretroviral therapy, is increasing in low- and middle-income countries. The global action plan on HIV drug resistance 2017–2021, launched in July 2017, outlines key actions for country and global stakeholders to prevent, monitor and respond to HIV drug resistance and to protect ongoing progress towards achieving the global targets for epidemic control by 2030. In July 2018, WHO released a report¹ summarizing progress achieved in implementing the global action plan in the initial year, as well as remaining challenges. The monitoring of early warning indicators for HIV drug resistance emphasized in 2016² will be further strengthened. WHO has also linked the results of the reports on increasing pretreatment HIV drug resistance to new treatment guidelines which support the use of dolutegravir rather than efavirenz as part of the three-drug first-line treatment for HIV.³

35. The Working Group on Monitoring of Neglected Tropical Diseases Drug Efficacy was established by WHO in 2011 due to the high treatment coverage rates for neglected tropical diseases in

¹ See <http://apps.who.int/iris/bitstream/handle/10665/273049/WHO-CDS-HIV-18.12-eng.pdf?ua=1> (accessed 1 April 2019).

² Technical report: Global report on early warning indicators of HIV drug resistance. Geneva: World Health Organization; July 2016 (<http://apps.who.int/iris/bitstream/handle/10665/246219/9789241511179-eng.pdf?sequence=1>, accessed 1 April 2019).

³ See Updated recommendations on first-line and second-line antiretroviral regimens and post-exposure prophylaxis and recommendations on early infant diagnosis of HIV: interim guidelines. Supplement to the 2016 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection (<http://www.who.int/hiv/pub/guidelines/ARV2018update/en/>, accessed 1 April 2019).

sub-Saharan Africa and South-East Asia. These high rates are expected eventually to contribute to the emergence of resistance to anthelmintic medicines; the Working Group's seventh meeting in 2018 articulated such concerns in relation to resistance to treatment for soil-transmitted helminthiases. While anthelmintic resistance is problematic within the veterinary sector, the full scope of the problem in human helminthiasis is being studied; however, alternative anthelmintic medicines, for use alone or in combination, are needed in order to prevent resistance developing.

36. Resistance of sexually transmitted infections, in particular gonorrhoea (estimated at 78 million new infections per year), to antibiotics has increased rapidly in recent years and reduced treatment options. The emergence of decreased susceptibility of gonorrhoea to the last-line treatment option – namely, oral and injectable cephalosporins – combined with antimicrobial resistance already shown to penicillins, sulfonamides, tetracyclines, quinolones and macrolides, make gonorrhoea a multidrug-resistant organism. WHO has issued new treatment guidelines for syphilis, gonorrhoea and chlamydia in order to address the problem of resistance to antibiotics.¹

MULTISECTORAL COLLABORATION: FAO/OIE/WHO TRIPARTITE PARTNERSHIP

37. The members of the FAO/OIE/WHO tripartite partnership have worked together since 2010. Since 2016, they have strengthened their collaboration in order to implement the five strategic objectives of the global action plan, including in the areas of: communication and raising awareness; strengthening the evidence base and surveillance; infection prevention and control measures; monitoring the consumption of antimicrobials; optimizing the use of antimicrobials in human, animal and plant health; national regulations and policies; development of a global stewardship framework; monitoring progress in countries through surveys; development of a global monitoring and evaluation framework; and support for research and development in new medicines, diagnostic tools, vaccines and other interventions.

38. In order to formalize their collaboration, the heads of the partner agencies of the Tripartite (with UNEP) signed a memorandum of understanding in May 2018. This was followed by the development of a tripartite workplan (with the collaboration of UNEP) on antimicrobial resistance for 2019–2020. The workplan, due to be published in early 2019, focuses on five areas, namely: awareness and behaviour change; integrated surveillance of antimicrobial resistance and antimicrobial use; fostering research and development, access to antimicrobials, stewardship and establishing a tripartite advisory group; implementation of national action plans and guidance on regulatory options; monitoring and evaluation. In addition, it specifies some 20 outputs, which can only be implemented through multisectoral collaboration. Furthermore, it recognizes the need for collaboration with UNEP in order to address the various environmental issues associated with the emergence and spread of resistance pathogens. The engagement of UNEP also builds on the 2017 memorandum of understanding signed between WHO and UNEP that specifies antimicrobial resistance as one thematic area for collaboration.

39. In order to finance the implementation of the joint workplan for 2019–2020, the FAO/OIE/WHO tripartite partners and UNEP are exploring the establishment of a multipartner trust fund under the UNDP trust fund mechanism. Without sustained and reliable additional resources, the majority of the outputs listed in the workplan cannot be implemented effectively.

¹ Links to the new treatment guidelines for these diseases are available at <http://www.who.int/en/news-room/detail/30-08-2016-growing-antibiotic-resistance-forces-updates-to-recommended-treatment-for-sexually-transmitted-infections> (accessed 1 April 2019).

40. The tripartite partners support the work of the WHO Secretariat in managing the activities of the ad hoc interagency coordination group established by United Nations General Assembly resolution 71/3 on antimicrobial resistance. The Secretariat facilitates a platform for inputs into the processes and deliverables of the ad hoc group, including from Member States, civil society and the private sector, as they prepare to provide practical recommendations to ensure sustained effective action to address antimicrobial resistance.

41. The tripartite partners are working together to produce the first biennial global antimicrobial resistance report in 2019. In addition, they will contribute to the Secretary-General's report to the United Nations General Assembly on the implementation of the commitments made in the political declaration of the high-level meeting of the General Assembly on antimicrobial resistance.

ONGOING CHALLENGES

42. The key country-level challenges to the effective implementation of national action plans to combat antimicrobial resistance that have been identified in the past two years and that have an impact on the global response are the following:

(a) **Prioritization and implementation.** In middle- and low-resource settings, implementing action at scale even in a few areas of national plans will represent a major challenge due to scarce technical and financial resources; hence careful prioritization based on risk/reward analysis will be essential in each country.

(b) **Multisectoral working and the One Health approach.** While many countries have established a multisectoral antimicrobial resistance working group, additional strategic guidance, technical support and resources are necessary to make such coordination groups functional and to help implement and monitor national action plans. The provision of these elements will help to strengthen the One Health approach in countries and drive support for non-human sectors, so that they can attain the same level of participation and interest as in the human health sector.

(c) **Monitoring.** It is a challenge to implement a robust monitoring framework with indicators that are valid, reliable, operational, affordable and comparable and can be used across the various sectors in low- and middle-income countries. Following a two-year process of consultations, at the end of 2018 the tripartite partners developed and finalized an antimicrobial resistance global monitoring and evaluation framework, with proposed indicators across the human, animal, plant and environmental sectors, for publication in early 2019. Countries will need assistance to develop the systems and processes needed to produce data consistently and support national and global monitoring.

(d) **Maintaining country-level political buy-in.** It remains a challenge to sustain political buy-in in countries for tackling antimicrobial resistance, while balancing health and broader development interests and allocating scarce national resources. Therefore, the development of an economic case for sustainable investment in tackling antimicrobial resistance is a matter of top priority and needs to be complemented by continuing advocacy. Furthermore, addressing antimicrobial resistance should be closely aligned with the 2030 Agenda for Sustainable Development and seen as contributing to the achievement of the Sustainable Development Goals, in particular Goals, 2, 3, 6 and 12.

- (e) **Enhancing civil society, private sector and stakeholder engagement.** Given the multisectoral nature of tackling antimicrobial resistance, a clear need has been identified to develop a comprehensive civil society, private sector and stakeholder engagement strategy, with specific activities and platforms to encourage their full participation.

EMERGING THREATS

43. One of the most significant threats to public health associated with antimicrobial resistance, which is already prioritized by WHO and recognized by many countries, is the carbapenem-resistant gram-negative bacteria, including carbapenem-resistant Enterobacteriaceae. The remaining treatment options for these bacteria are extremely limited; the infections that they cause are associated with high mortality. Furthermore, they have the potential for widespread transmission of resistance through mobile genetic elements.

44. Addressing the threat posed by carbapenem-resistant Enterobacteriaceae will require the engagement and coordination of the efforts of the relevant WHO departments at all three levels, including to strengthen health systems in the context of universal health coverage; strengthen core country capacity to identify and deal with emerging high-threat infectious pathogens as a health emergency; and address the social and environmental determinants of health, including the impact of non-human sectors, through a multisectoral approach. Coordinated efforts are needed in order to monitor the threat in all countries, scale up more targeted measures for infection prevention and control including WASH in health care facilities, invest in the development of new medicines and support effective measures to optimize the consumption of antibiotics.

ACTION BY THE HEALTH ASSEMBLY

45. The Health Assembly is invited to adopt the draft resolution recommended by the Executive Board in resolution EB144.R11.

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