

Resources for in-country development and implementation of national action plans to address antimicrobial resistance following the people-centred core package of interventions

2025 Update



World Health
Organization

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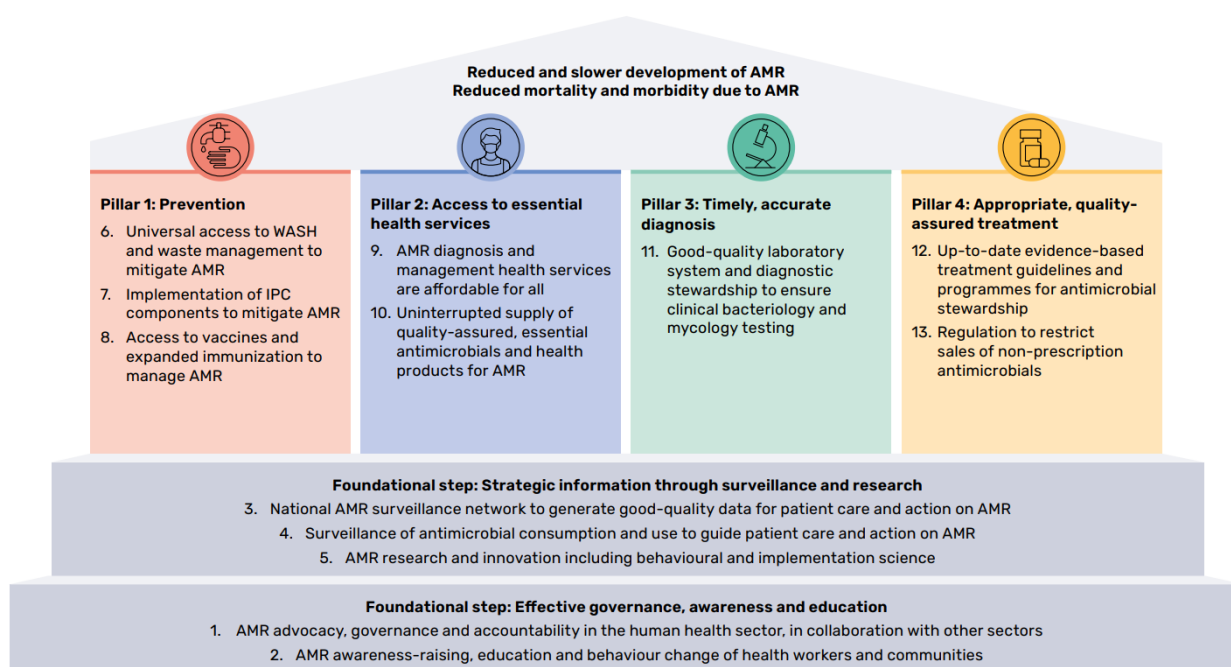
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What's new in the 2025 update of the AMR Resource Pack?

The 2025 AMR Resource Pack provides useful resources for the development and implementation of national action plans (NAPs) on AMR. In this version, the documents are now listed following the core package of 13 AMR interventions of the "[People-centred approach to addressing antimicrobial resistance in human health: WHO core package of interventions to support national action plans](#)" (Figure 1). The people-centred interventions can be used as a basis to prioritize and select activities to be included in NAPs on AMR following a programmatic approach that considers the challenges and health system barriers people face when accessing health services as well as the interdependencies between AMR interventions.

Figure 1: The 13 interventions of the people-centred approach for addressing antimicrobial resistance.



The following table provides a list of the resources that were newly published and added in this version.

Section	New resources
General AMR resources	<p>Political Declaration of the high-level meeting of the General Assembly on antimicrobial resistance (79th United Nations General Assembly, UNGA, 2024). Available from: https://www.un.org/pga/wp-content/uploads/sites/108/2024/09/FINAL-Text-AMR-to-PGA.pdf.</p> <p>World Health Organization. 'Antimicrobial resistance: accelerating national and global responses' (77th WHA, A77/A/CONF./1, 2024). Available from: https://apps.who.int/gb/ebwha/pdf_files/WHA77/A77_ACONF1-en.pdf.</p> <p>Ferdinand AS, McEwan C, Lin C, et al. Development of a cross-sectoral antimicrobial resistance capability assessment framework. <i>BMJ Global Health</i>. 2024;9:e013280. https://doi.org/10.1136/bmjgh-2023-013280.</p>

	<p>Naghavi, Mohsen, et al. Global burden of bacterial antimicrobial resistance 1990–2021: a systematic analysis with forecasts to 2050. <i>The Lancet</i> 404.10459 (2024): 1199-1226. https://doi.org/10.1016/S0140-6736(24)01867-1.</p> <p>McDonnell A, et al. Forecasting the Fallout from AMR: Economic Impacts of Antimicrobial Resistance in Humans – A Report from the EcoAMR Series. Paris: World Organisation for Animal Health and World Bank; 2024. Available from: https://doi.org/10.20506/ecoAMR.3539.</p>
<p>AMR advocacy, governance and accountability</p>	<p>World Bank. Stopping the Grand Pandemic: A Framework for Action – Addressing Antimicrobial Resistance through World Bank Operations. Washington, DC: World Bank; 2024. Available from: https://hdl.handle.net/10986/41533.</p> <p>World Health Organization. Addressing gender inequalities in national action plans on antimicrobial resistance: guidance to complement the people-centred approach. Geneva: World Health Organization; 2024. https://iris.who.int/handle/10665/378639.</p> <p>World Health Organization. People-centred approach to tackling antimicrobial resistance: key principle of the roadmap on antimicrobial resistance for the WHO European Region 2023–2030; 2024. Copenhagen: WHO Regional Office for Europe. Available from: https://iris.who.int/handle/10665/376459.</p> <p>World Health Organization. Resource guide for the implementation of the roadmap on antimicrobial resistance for the WHO European Region 2023–2030. Copenhagen: WHO Regional Office for Europe; 2024. Available from: https://iris.who.int/handle/10665/379407.</p> <p>World Health Organization, Food and Agriculture Organization of the United Nations, United Nations Environment Programme & World Organisation for Animal Health. Implementing the global action plan on antimicrobial resistance: first quadripartite biennial report. World Health Organization; 2023. Available from: https://iris.who.int/handle/10665/375008.</p> <p>World Health Organization. Regional Office for the Western Pacific. Health and economic impacts of antimicrobial resistance in the Western Pacific Region, 2020-2030. WHO Regional Office for the Western Pacific; 2023. https://iris.who.int/handle/10665/368654.</p> <p>World Health Organization. Roadmap on antimicrobial resistance for the WHO European Region 2023–2030. Copenhagen: WHO Regional Office for Europe; 2023. Available from: https://iris.who.int/bitstream/handle/10665/372503/73wd07e-AMR-Roadmap-230574.pdf?sequence=5.</p> <p>AMR External Funding Resource Inventory for Research and NAP Implementation Across All Sectors. Available from: https://www.qjsamr.org/about-us/resources – scroll down to bottom of page to find link to the table.</p> <p>An introduction to the people-centred approach to addressing antimicrobial resistance in human health. WHO Academy e-learning course.</p> <p>Monitoring and evaluation of national action plans on antimicrobial resistance. WHO Academy e-learning course.</p>
<p>AMR awareness-raising, education and behaviour change</p>	<p>World Health Organization. Photo book stories of AMR: antimicrobial resistance. 2024. Available from: https://iris.who.int/handle/10665/378983.</p> <p>World Health Organization. Regional Office for Europe. 2024. Stories of AMR: antimicrobial resistance. World Health Organization. Regional Office for Europe. Available from: https://iris.who.int/handle/10665/378983.</p> <p>FAO, UNEP, WHO, WOA. Antimicrobial resistance: toolkit for media engagement. 2024. Available from: https://www.qjsamr.org/about-us/resources.</p>

	<p>FAO, UNEP, WHO, WOA, Antimicrobial resistance: toolkit for youth engagement. 2024 Available from: https://www.who.int/publications/b/74011.</p> <p>World Health Organization Regional Office for Europe. People’s knowledge, attitudes, and behaviours pertaining to antimicrobial resistance: cross-sectional survey of 14 Member States in the WHO European Region. 2024. Available from: https://iris.who.int/handle/10665/378984.</p> <p>World Health Organization. Action against antimicrobial resistance requires a One Health approach. Geneva: WHO; 2024. Available from: https://iris.who.int/handle/10665/376479.</p> <p>World Health Organization. Action against antimicrobial resistance and noncommunicable diseases. Geneva: WHO; 2024. Available from: https://iris.who.int/handle/10665/376408.</p> <p>World Health Organization. Ensuring access to medicines in the fight against antimicrobial resistance. Geneva: WHO; 2024. Available from: https://iris.who.int/handle/10665/373969.</p> <p>World Health Organization. The fight against antimicrobial resistance and investing in infection prevention and control. Geneva: WHO; 2024. Available from: https://iris.who.int/handle/10665/374984.</p> <p>World Health Organization. Action against antimicrobial resistance through the preservation of the environment. Geneva: WHO; 2024. Available from: https://iris.who.int/handle/10665/378911.</p> <p>World Health Organization. Action against antimicrobial resistance and fungal infections. Geneva: WHO; 2024. Available from: https://iris.who.int/handle/10665/379434.</p> <p>World Health Organization. Meaningful engagement of patients, survivors and carers in addressing antimicrobial resistance. Geneva: World Health Organization; 2024. Available from: https://www.who.int/publications/m/item/meaningful-engagement-of-patients--survivors-and-carers-in-addressing-antimicrobial-resistance.</p> <p>World Health Organization. ‘AMR is invisible. I am not.’ Awareness campaign. Available from: https://www.who.int/campaigns/world-amr-awareness-week/2024/amr-is-invisible-i-am-not</p> <p>World Health Organization. Antimicrobial resistance curriculum assessment tool for medical education. Geneva: World Health Organization; 2024. Available from: https://iris.who.int/handle/10665/379237.</p>
Antimicrobial resistance surveillance	<p>World Health Organization. Enhanced gonococcal antimicrobial surveillance programme (EGASP): surveillance report 2022. Geneva: World Health Organization; 2024. https://iris.who.int/handle/10665/375892.</p> <p>World Health Organization. Guidance on establishing national and local AMR surveillance systems in the Western Pacific region. Geneva: World Health Organization; 2024. Available from: https://www.who.int/westernpacific/publications/i/item/9789290620365.</p> <p>One Health Global Leaders Group on Antimicrobial Resistance. Integrated surveillance of antimicrobial resistance and use: a pocket guide for political decision-makers. 2023. Available at: https://www.amrleaders.org/resources/m/item/integrated-surveillance-of-antimicrobial-resistance-(amr)-and-use-(amu)-a-pocket-guide-for-political-decision-makers.</p>
Antimicrobial use surveillance	
AMR research and innovation	<p>World Health Organization. Global research agenda for antimicrobial resistance in human health. Geneva: World Health Organization; 2024. Available from: https://iris.who.int/handle/10665/379825.</p>

	<p>World Health Organization. WHO bacterial priority pathogens list, 2024: bacterial pathogens of public health importance, to guide research, development and strategies to prevent and control antimicrobial resistance. Geneva: World Health Organization; 2024. Available from: https://iris.who.int/handle/10665/376776.</p> <p>Bertagnolio S., Dobрева Z., Centner C. M., Olaru I. D., Donà D., Burzo S., et al. (2024). WHO global research priorities for antimicrobial resistance in human health. <i>The Lancet Microbe</i>. https://doi.org/10.1016/s2666-5247(24)00134-4.</p> <p>One Health Global Leaders Group on Antimicrobial Resistance. GLG recommendations to address the antibiotic pipeline and access crisis in human health. 2024. Available from: https://www.amrleaders.org/resources/m/item/igl-recommendations-to-address-the-antibiotic-pipeline-and-access-crisis-in-human-health.</p> <p>World Health Organization. 2023 antibacterial agents in clinical and preclinical development: an overview and analysis. Geneva: WHO; 2024. https://iris.who.int/handle/10665/376944.</p> <p>World Health Organization. Antibacterial pipeline trends and recommendations to enhance research and development: policy brief. Geneva: WHO; 2024. Available from: https://iris.who.int/handle/10665/378316.</p>
<p>Water, sanitation and hygiene</p>	<p>World Health Organization & United Nations Children's Fund (UNICEF). Universal water, sanitation, hygiene, waste and electricity services in all health care facilities to achieve quality care: global framework for action 2024-2030. Geneva: World Health Organization; 2024. Available at: https://iris.who.int/handle/10665/377776.</p> <p>World Health Organization & United Nations Children's Fund. Knowledge portal on WASH in healthcare facilities. Available from: https://www.washinhcf.org.</p> <p>World Health Organization & United Nations Children's Fund. WASHFIT portal. Available from: https://washinhcf.org/wash-fit/.</p> <p>The World Health Organization & United Nations Children's Fund Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP). Available from: https://washdata.org.</p> <p>World Health Organization & United Nations Children's Fund (UNICEF). WASH in health care facilities 2023 data update: special focus on primary health care. Geneva: WHO & UNICEF; 2024. Available at: https://washdata.org/reports/jmp-2024-wash-hcf.</p> <p><i>Environmental dimensions of AMR</i></p> <p>Antimicrobial Resistance in the Environment: Key Concepts and Interventions. WHO Academy e-learning course.</p> <p>World Health Organization. Guidance on wastewater and solid waste management for manufacturing of antibiotics. Geneva: World Health Organization; 2024. Available at: https://iris.who.int/handle/10665/378471.</p>
<p>Infection prevention and control (IPC)</p>	<p>World Health Organization. Global report on infection prevention and control 2024. Geneva: World Health Organization; 2024. Available at: https://www.who.int/publications/i/item/9789240103986.</p> <p>World Health Organization. WHO training package on environmental cleaning: evaluation methodology guide. Geneva: World Health Organization; 2024. Available at: https://iris.who.int/handle/10665/379551.</p> <p>Global action plan and monitoring framework on infection prevention and control (IPC), 2024–2030. Available from: https://www.who.int/teams/integrated-health-services/infection-prevention-control/draft-global-action-plan-and-monitoring-framework-on-ipc.</p>

	<p>Infection prevention and control in-service education and training curriculum. Geneva: World Health Organization; 2023. Available from: https://iris.who.int/handle/10665/376810.</p> <p>Surveillance of health care-associated infections at national and facility levels. Geneva: World Health Organization; 2023. Available from: https://iris.who.int/handle/10665/379248.</p> <p>My 5 Moments for Hand Hygiene game: https://5mgame.lxp.academy.who.int/.</p>
Immunization	<p>Estimating the impact of vaccines in reducing antimicrobial resistance and antibiotic use: Technical report. Geneva: World Health Organization; 2024. https://www.who.int/publications/i/item/9789240098787.</p> <p>World Health Organization. Quick tips for health workers: how to use vaccines to reduce antimicrobial resistance. Geneva: World Health Organization; 2024. Available from: https://cdn.who.int/media/docs/default-source/immunization/product-and-delivery-research/who-mateusz-the-role-of-vaccines-in-reducing-amr_summary-report Qt-for-health-workers_031024_lc.pdf?sfvrsn=bb5f53f3_1.</p> <p>World Health Organization. Quick tips for community representatives: how to use vaccines to reduce antimicrobial resistance. Geneva: World Health Organization; 2024. Available from: https://cdn.who.int/media/docs/default-source/immunization/product-and-delivery-research/who-mateusz-the-role-of-vaccines-in-reducing-amr_summary-report Qt-for-community-rep_091024_lc.pdf?sfvrsn=87d12e73_1.</p>
AMR diagnosis and management health services are affordable for all	
Uninterrupted supply of quality-assured, essential health products for AMR	<p>World Health Organization & Global Antibiotic Research and Development Partnership (GARDP). Policy and regulatory interventions to address antibiotic shortages in low and middle-income countries. Geneva: World Health Organization; 2024. Available from: https://iris.who.int/handle/10665/379625.</p>
Laboratory system and diagnostic stewardship	<p>World Health Organization. Antimicrobial resistance diagnostic initiative: strengthening bacteriology and mycology diagnostic capacity, laboratory systems and service delivery. Geneva: World Health Organization; 2023. Available from: https://iris.who.int/handle/10665/377962.</p>
Antimicrobial stewardship	<p>Operational approach to antimicrobial stewardship in the WHO Eastern Mediterranean Region. Cairo: WHO Regional Office for the Eastern Mediterranean; 2024. Available from: https://applications.emro.who.int/docs/WHOEMCSR801E-eng.pdf?ua=1.</p> <p>Moja L., Zanichelli V., Mertz D., Gandra S., Cappello B., Cooke G. S., et al. (2024). WHO's essential medicines and AWaRe: recommendations on first- and second-choice antibiotics for empiric treatment of clinical infections. <i>Clinical Microbiology and Infection</i>, 30(Suppl 1), S1–S51. https://doi.org/10.1016/j.cmi.2024.02.003.</p>

	<p>Shamas N., Stokle E., Ashiru-Oredope D., Wesangula E. (2023). Challenges of implementing antimicrobial stewardship tools in Low- to Middle-Income Countries (LMICs). <i>Infection Prevention in Practice</i>, 5(4), 100315. https://doi.org/10.1016/j.infpip.2023.100315.</p> <p>World Health Organization. Regional Office for Europe. Review of antibiotics in National Medicines Selection Lists in eastern Europe and central Asia. Copenhagen: World Health Organization. Regional Office for Europe; 2023. Available at: https://iris.who.int/handle/10665/365989.</p>
Regulation to restrict sales of non-prescription antimicrobials	<p>Melles-Brewer M. M., Chiara F., Mosissa D., Mathew P. (2024). Over-the-counter sales of antibiotics: a call to action to ensure access and prevent excess. <i>The Lancet Global Health</i>, 12(8), e1227–e1228. https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(24)00215-8/fulltext.</p>
Other guidance	<p>World Health Organization. Regional Office for Africa. Technical guidance and aide-mémoire on good manufacturing practice inspection of pharmaceutical manufacturing facilities with focus on reducing the incidence of antimicrobial resistance. Geneva: World Health Organization; 2024. Regional Office for Africa. Available at: https://iris.who.int/handle/10665/376690.</p> <p>World Health Organization (WHO). WHO list of medically important antimicrobials: a risk management tool for mitigating antimicrobial resistance due to non-human use. Geneva: World Health Organization; 2024. Available from: https://cdn.who.int/media/docs/default-source/gcp/who-mia-list-2024-lv.pdf?sfvrsn=3320dd3d_2.</p> <p>Food and Agriculture Organization (FAO). The International FAO Antimicrobial Resistance Monitoring (InFARM) System: https://openknowledge.fao.org/items/ea38939f-5fc0-4052-87f8-d9187b38addf.</p> <p>World Health Organization (WHO). Prevention and Control of Antimicrobial Resistance in the Food Chain: Guidance for Food Safety Authorities in Europe. Geneva: World Health Organization; 2024. Available from: https://iris.who.int/handle/10665/375901.</p>

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Please note that WHO is in the process of migrating all its current e-learning courses from the OpenWHO platform to [WHO Academy](#) and access to these courses will become available gradually.

General AMR resources

- World Health Organization. Antimicrobial resistance Fact Sheet. Geneva: WHO, 2023. Available from: <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>.
- World Health Organization. Antimicrobial resistance [Web page]. Available from: <https://www.who.int/health-topics/antimicrobial-resistance>.
 - AFRO: <https://www.afro.who.int/health-topics/antimicrobial-resistance>
 - AMRO: <https://www.paho.org/en/topics/antimicrobial-resistance>
 - EMRO: <http://www.emro.who.int/health-topics/antimicrobial-resistance/index.html>
 - EURO: https://www.who.int/europe/health-topics/antimicrobial-resistance#tab=tab_1
 - SEARO: <https://www.who.int/southeastasia/health-topics/antimicrobial-resistance>
 - WPRO: <https://www.who.int/westernpacific/health-topics/antimicrobial-resistance>
- World Health Organization. Quarterly AMR Newsletter. Available from: <https://www.who.int/news-room/events/detail/2021/01/30/default-calendar/quarterly-newsletter-who-antimicrobial-resistance-division>.
- Strategic and Technical Advisory Group for Antimicrobial Resistance (STAG-AMR). Available from: <https://www.who.int/groups/strategic-and-technical-advisory-group-on-antimicrobial-resistance>.
- Antimicrobial Resistance Multi-Partner Trust Fund. Available from: <https://mptf.undp.org/fund/amr00>.
- Quadripartite Joint Secretariat on AMR. Available from: <https://www.qjsamr.org/>.
- Ferdinand AS, McEwan C, Lin C, et al. Development of a cross-sectoral antimicrobial resistance capability assessment framework. *BMJ Global Health*. 2024;9:e013280. <https://doi.org/10.1136/bmjgh-2023-013280>.
- Naghavi, Mohsen, et al. Global burden of bacterial antimicrobial resistance 1990–2021: a systematic analysis with forecasts to 2050. 2024. *The Lancet* 404.10459 (2024): 1199-1226. [https://doi.org/10.1016/S0140-6736\(24\)01867-1](https://doi.org/10.1016/S0140-6736(24)01867-1).
- McDonnell A, et al. Forecasting the Fallout from AMR: Economic Impacts of Antimicrobial Resistance in Humans – A Report from the EcoAMR Series. Paris: World Organisation for Animal Health and World Bank; 2024. Available from: <https://doi.org/10.20506/ecoAMR.3539>.
- Antimicrobial Resistance Collaborators. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *Lancet*. 2022. Available from: <https://pubmed.ncbi.nlm.nih.gov/35065702/>.
 - Animation: https://www.youtube.com/watch?v=xyv_QrroYZM.
 - Social media graphics: <https://cloud.ihme.washington.edu/s/6M2fNj3raArEFMX>.
 - GRAM report launch video: <https://vimeo.com/675487510>.
 - Website: <https://www.healthdata.org/research-analysis/health-risks-issues/antimicrobial-resistance-amr>.
- Pan American Health Organization. Antimicrobial resistance, fueled by the COVID-19 pandemic: policy brief. Washington, DC, 2021. Available from: <https://iris.paho.org/handle/10665.2/55864>.
- World Bank. Pulling together to beat superbugs: knowledge and implementation gaps in addressing antimicrobial resistance. Washington, DC, 2019. Available from: <https://openknowledge.worldbank.org/handle/10986/32552>.
- The WHO AMR Surveillance and Quality Assessment Collaborating Centres Network. Available from: <https://www.who.int/initiatives/glass/network>.

Effective governance, awareness and education (foundational step 1):

1. AMR advocacy, governance and accountability (intervention 1)

a) Advocacy and governance

- World Health Organization. 'Antimicrobial resistance: accelerating national and global responses' (77th WHA, A77/A/CONF./1, 2024). Available from: https://apps.who.int/gb/ebwha/pdf_files/WHA77/A77_ACONF1-en.pdf.
- Political Declaration of the high-level meeting of the General Assembly on antimicrobial resistance (79th United Nations General Assembly, UNGA, 2024). Available from: <https://www.un.org/pga/wp-content/uploads/sites/108/2024/09/FINAL-Text-AMR-to-PGA.pdf>.
- World Health Organization. Tackling antimicrobial resistance together. Working paper 1.0: Multisectoral coordination. 2022. Available from: <https://www.who.int/publications/i/item/tackling-antimicrobial-resistance-together-working-paper-1.0-multisectoral-coordination>.
- WHO Strategic Priorities on Antimicrobial Resistance, Preserving antimicrobials for today and tomorrow, 2021 WHO. Available from: <https://iris.who.int/bitstream/handle/10665/351719/9789240041387-eng.pdf>.
- World Health Organization. Thematic brief: Multisectoral action to tackle AMR. 2021. Available from: <https://apps.who.int/iris/handle/10665/346539>.
- Global Leaders Group on Antimicrobial Resistance. A pocket guide for ministers across sectors: how to respond to antimicrobial resistance. 2020. Available from: <https://www.amrleaders.org/resources/m/item/pocket-guide>.
- World Health Organization. Turning plans into action for antimicrobial resistance (AMR). Working Paper 2.0: Implementation and coordination. 2019. Available from: <https://apps.who.int/iris/handle/10665/311386>.
- United Nations. Follow-up to the political declaration of the high-level meeting of the General Assembly on antimicrobial resistance. Report of the Secretary-General. 2019. Available from: <https://undocs.org/en/A/73/869>.
- World Health Organization. No time to wait: securing the future from drug-resistant infections. IACG report to the Secretary-General of the United Nations. 2019. Available from: <https://www.who.int/publications/i/item/no-time-to-wait-securing-the-future-from-drug-resistant-infections>.

b) Development and implementation of national action plans

- World Bank. Stopping the Grand Pandemic: A Framework for Action – Addressing Antimicrobial Resistance through World Bank Operations. Washington, DC: World Bank; 2024. Available from: <https://hdl.handle.net/10986/41533>.
- World Health Organization. Addressing gender inequalities in national action plans on antimicrobial resistance: guidance to complement the people-centred approach. Geneva: World Health Organization; 2024. <https://iris.who.int/handle/10665/378639>.
- World Health Organization. People-centred approach to tackling antimicrobial resistance: key principle of the roadmap on antimicrobial resistance for the WHO European Region 2023–2030; 2024. Copenhagen: WHO Regional Office for Europe. Available from: <https://iris.who.int/handle/10665/376459>.

- World Health Organization. Resource guide for the implementation of the roadmap on antimicrobial resistance for the WHO European Region 2023–2030. Copenhagen: WHO Regional Office for Europe; 2024. Available from: <https://iris.who.int/handle/10665/379407>.
- World Health Organization. Roadmap on antimicrobial resistance for the WHO European Region 2023–2030. Copenhagen: WHO Regional Office for Europe; 2023. Available from: <https://iris.who.int/bitstream/handle/10665/372503/73wd07e-AMR-Roadmap-230574.pdf?sequence=5>.
- World Health Organization. Kenya national action plan on antimicrobial resistance: review of progress in the human health sector. 2023. Available from: <https://www.who.int/publications/i/item/9789240062689>.
- World Health Organization. Malawi national action plan on antimicrobial resistance: review of progress in the human health sector. 2023. Available from: <https://www.who.int/publications/i/item/9789240056848>.
- World Health Organization, World Bank. Sustaining action against antimicrobial resistance: a case series of country experiences. 2023. Available from: <https://openknowledge.worldbank.org/handle/10986/38162?sequence=1&isAllowed=y>.
- World Health Organization. AMR national action plan support tools. 2023. Available from: <https://www.who.int/activities/supporting-countries-with-national-action-plan-implementation>.
- World Health Organization. Library of national action plans. 2023. Available from: <https://www.who.int/teams/surveillance-prevention-control-AMR/national-action-plan-monitoring-evaluation/library-of-national-action-plans>.
- World Health Organization. Mali national action plan on antimicrobial resistance: review of progress in the human health sector. 2022. Available from: <https://www.who.int/publications/i/item/9789240065468>.
- World Health Organization. People-centred approach to addressing antimicrobial resistance in human health: WHO core package of interventions to support national action plans. 2022. Available from: <https://www.who.int/publications-detail/people-centred-approach-to-addressing-amr>.
- World Health Organization. WHO implementation handbook for national action plans on antimicrobial resistance: guidance for the human health sector. 2022. Available from: <https://www.who.int/publications/i/item/9789240041981>.
 - [6 steps for sustainable implementation of national action plans on antimicrobial resistance](#). WHO Academy e-learning course.
 - Infographic: 6 steps for sustainable implementation of national action plans on antimicrobial resistance. 2022. Available from: <https://www.who.int/multi-media/details/6-steps-for-sustainable-implementation-of-national-action-plans-on-antimicrobial-resistance>.
- World Health Organization. Burkina Faso national action plan on antimicrobial resistance: review of progress in the human health sector. 2021. Available from: <https://www.who.int/publications/i/item/9789240040410>.
- World Health Organization. Comprehensive Review of the WHO Global Action Plan on Antimicrobial Resistance and its Annex. Geneva: WHO Evaluation Office; 2021. Available from: https://cdn.who.int/media/docs/default-source/documents/about-us/evaluation/gap-amr-final-report-v2.pdf?sfvrsn=1db7e8b0_1&download=true https://cdn.who.int/media/docs/default-source/documents/about-us/evaluation/gap-amr-final-annexes-v2.pdf?sfvrsn=d7c23fe7_1&download=true.

- World Health Organization. Tackling antimicrobial resistance (AMR) together. Working paper 5.0: Enhancing the focus on gender and equity. 2020. Available from: <https://apps.who.int/iris/handle/10665/336977>.
- World Health Organization. WHO AMR community exchange platform. 2020. Available from: <https://amrcommunityexchange.org/>.
- World Health Organization. Antimicrobial resistance: a manual for developing national action plans. 2016. <https://www.who.int/publications/i/item/antimicrobial-resistance-a-manual-for-developing-national-action-plans>.
- World Health Organization. Global action plan on antimicrobial resistance. 2015. Available from: <https://www.who.int/publications/i/item/9789241509763>.
 - Political Declaration of the high-level meeting of the General Assembly on antimicrobial resistance (United Nations A/71/L.2 General Assembly 22 September, adopted on 5 October 2016). Available from: <https://digitallibrary.un.org/record/845917>.
- WHO Webinar Series to Support Implementation of National Action Plans on Antimicrobial Resistance. Available from: <https://www.who.int/teams/surveillance-prevention-control-AMR/who-webinar-series-to-support-implementation-of-national-action-plans-on-antimicrobial-resistance>.

c) Costing, budgeting and resource mobilization

- WHO costing and budgeting tool for national action plans on antimicrobial resistance:
 - [WHO AMR Costing and Budgeting Tool](#) (EN, FR, SP)
 - [WHO costing and budgeting tool for national action plans on antimicrobial resistance: user guide](#) (EN, FR, SP)
 - [WHO costing and budgeting tool for national action plans on antimicrobial resistance](#). WHO Academy e-learning course.
- AMR External Funding Resource Inventory for Research and NAP Implementation Across All Sectors. Available from: <https://www.qjsamr.org/about-us/resources> – scroll down to bottom of page to find link to the table.
- World Health Organization. Regional Office for the Western Pacific. Health and economic impacts of antimicrobial resistance in the Western Pacific Region, 2020-2030. WHO Regional Office for the Western Pacific; 2023. <https://iris.who.int/handle/10665/368654>.
- AMR External Funding Resource Inventory for Research and NAP Implementation across all sectors. 2022. Available from: <https://qjsamr.org>.
- Global Leaders Group on Antimicrobial Resistance. Financing to address antimicrobial resistance: information note. Available from: <https://www.amrleaders.org/resources/m/item/financing-to-address-antimicrobial-resistance>.

d) Monitoring and evaluation of national action plans

- World Health Organization, Food and Agriculture Organization of the United Nations, United Nations Environment Programme & World Organisation for Animal Health. Implementing the global action plan on antimicrobial resistance: first quadripartite biennial report. World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/375008>.

- World Health Organization. Tracking AMR country self-assessment survey (TrACSS) 2024 results. 2024. Available from: <https://new.amrcountryprogress.org/>.
- World Health Organization. [Monitoring and evaluation of national action plans on antimicrobial resistance](#). WHO Academy e-learning course.
- World Health Organization. Guidance to facilitate monitoring and evaluation for antimicrobial resistance national action plans. 2021. Available from: <https://www.who.int/publications/i/item/9789240069763>.
- World Health Organization. Tripartite monitoring and evaluation (M&E) framework for the Global Action Plan on Antimicrobial Resistance, with methodology sheets for recommended indicators. 2021. Available from: <https://www.who.int/publications/i/item/monitoring-and-evaluation-of-the-global-action-plan-on-antimicrobial-resistance>.

2. AMR awareness-raising, education and behaviour change (intervention 2)

a) Health workforce AMR education resources

- World Health Organization. Photo book stories of AMR: antimicrobial resistance. 2024. Available from: <https://iris.who.int/handle/10665/378983>.
- [Reducing AMR of curable sexually transmitted infections \(STIs\) in antenatal care \(ANC\) settings](#). WHO Academy e-learning course.
- World Health Organization. Online course: Surgical site infections. Please visit [WHO Academy](#).
- World Health Organization. Online course: WHO policy guidance on integrated antimicrobial stewardship activities. Please visit [WHO Academy](#).
- World Health Organization. Online course: WHO practical toolkit for antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries. Please visit [WHO Academy](#).
- [Antimicrobial stewardship: a competency-based approach](#). WHO Academy e-learning course.
- World Health Organization Regional Office for the Western Pacific. Responding to outbreaks of antimicrobial-resistant pathogens in health-care facilities: guidance. 2022. Available from: <https://apps.who.int/iris/handle/10665/363498>.
- World Health Organization Regional Office for Europe. Antimicrobial stewardship interventions: a practical guide. 2021. Available from: <https://apps.who.int/iris/bitstream/handle/10665/340709/9789289054980-eng.pdf>.
- World Health Organization, Public Health England. Health workers' education and training on antimicrobial resistance: curricula guide. 2019. Available from: <https://apps.who.int/iris/bitstream/handle/10665/329380/9789241516358-eng.pdf>.
- World Health Organization. WHO competency framework for health workers' education and training on antimicrobial resistance. 2018. Available from: <http://apps.who.int/iris/bitstream/handle/10665/272766/WHO-HIS-HWF-AMR-2018.1-eng.pdf>.

b) General awareness-raising resources

- World Health Organization. Meaningful engagement of patients, survivors and carers in addressing antimicrobial resistance. Geneva: World Health Organization; 2024. Available from:

<https://www.who.int/publications/m/item/meaningful-engagement-of-patients--survivors-and-carers-in-addressing-antimicrobial-resistance>.

- World Health Organization. 'AMR is invisible. I am not.' Awareness campaign. Available from: <https://www.who.int/campaigns/world-amr-awareness-week/2024/amr-is-invisible-i-am-not>
- World Health Organization. Antimicrobial resistance curriculum assessment tool for medical education. Geneva: World Health Organization; 2024. Available from: <https://iris.who.int/handle/10665/379237>.
- FAO, UNEP, WHO, WOA. Antimicrobial resistance: toolkit for media engagement. 2024. Available from: <https://www.qjsamr.org/about-us/resources>
- FAO, UNEP, WHO, WOA, Antimicrobial resistance: toolkit for youth engagement. 2024 Available from: <https://www.who.int/publications/b/74011>.
- World Health Organization Regional Office for Europe. People's knowledge, attitudes, and behaviours pertaining to antimicrobial resistance: cross-sectional survey of 14 Member States in the WHO European Region. 2024. Available from: <https://iris.who.int/handle/10665/378984>.
- World Health Organization. Action against antimicrobial resistance requires a One Health approach. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/376479>.
- World Health Organization. Action against antimicrobial resistance and noncommunicable diseases. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/376408>.
- World Health Organization. Ensuring access to medicines in the fight against antimicrobial resistance. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/373969>.
- World Health Organization. The fight against antimicrobial resistance and investing in infection prevention and control. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/374984>.
- World Health Organization. Action against antimicrobial resistance through the preservation of the environment. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/378911>.
- World Health Organization. Action against antimicrobial resistance and fungal infections. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/379434>.
- World Health Organization. AMR Quiz - WHO/Europe. 2023. Available from: <https://amrquiz.euro.who.int/#/quiz/1>.
- World Health Organization. WAAW materials (for GPs and leaflet). 2023. Available from: <https://who.canto.global/v/LI33QQ5N04/album/SO8B9?viewIndex=0>.
- World Health Organization. World AMR Awareness Week. 2023. Available from: <https://www.who.int/campaigns/world-amr-awareness-week>.
- World Health Organization. The fight against antimicrobial resistance requires a focus on the health workforce (EN, [RU](#)). Geneva: WHO; 2023. Available from: <https://apps.who.int/iris/handle/10665/359109>.
- World Health Organization. The fight against antimicrobial resistance supports efforts towards child and adolescent health (EN, [RU](#)). Geneva: WHO; 2023. Available from: <https://apps.who.int/iris/handle/10665/359106>.
- World Health Organization. Tailoring Antimicrobial Resistance programmes (TAP) Process Poster. 2022. Available from: <https://who.canto.global/v/l6NL4P77JP/album/IB2K9?viewIndex=0> (EN, RU, GRE, GER, FR).
- World Health Organization. The TAP manual: an in-depth guide for planning and implementing tailoring antimicrobial resistance programmes. 2022. Available from: <https://apps.who.int/iris/handle/10665/363136>.

- Food and Agriculture Organization. Africa Regional Strategy on antimicrobial resistance communications and advocacy. 2022. (EN, [FR](#)). Available from: <https://openknowledge.fao.org/items/3fcac97f-c821-4d89-bb9f-af808eb05f9e>.
- World Health Organization. The fight against antimicrobial resistance is significant for cancer prevention and treatment. 2022. Available from: <https://apps.who.int/iris/handle/10665/337511>.
- World Health Organization. Tuberculosis and the fight against antimicrobial resistance (EN, [RU](#)). Geneva: WHO; 2022. Available from: <https://apps.who.int/iris/handle/10665/352460>.
- World Health Organization. Behavioural and cultural insights and the fight against antimicrobial resistance (EN,[RU](#)). Geneva: WHO; 2022. Available from: <https://apps.who.int/iris/handle/10665/352458>.
- World Health Organization. The fight against antimicrobial resistance requires a focus on gender (EN, [RU](#)). Geneva: WHO; 2022. Available from: <https://apps.who.int/iris/handle/10665/352456>.
- World Health Organization. Tailoring Antimicrobial Resistance programmes (TAP) Quick Guide. 2021. Available from: <https://apps.who.int/iris/handle/10665/341631>.
 - Spanish: <https://iris.paho.org/handle/10665.2/55628>
- World Health Organization. Tailoring Antimicrobial Resistance programmes (TAP) Toolbox. 2021. Available from: <https://apps.who.int/iris/handle/10665/341632> (EN, RU, GRE, GER, FR , SP).
 - SP: <https://iris.paho.org/handle/10665.2/55629>
- World Health Organization Regional Office for the Americas. El proceso de adaptación de intervenciones a medida contra la resistencia a los antimicrobianos. 2021. Available from: <https://iris.paho.org/handle/10665.2/55627>.
- World Health Organization. Stop the COVID-19 pandemic from becoming an AMR catastrophe. 2021. (EN, [RU](#)). Available from: <https://apps.who.int/iris/handle/10665/337513>.
- World Health Organization Regional Office for the Americas. Handbook for communication on the rational use of antimicrobials for the containment of resistance. 2020. (ENG, [SP](#)). Available from: <https://iris.paho.org/handle/10665.2/54995>.
- World Health Organization. Regional Office for Europe. The fight against antimicrobial resistance with evidence-informed policy-making. 2020. (EN, [RU](#)). Available from: <https://iris.who.int/handle/10665/337527>.
- Wellcome Trust. Toolkit on communicating antimicrobial resistance. 2019. Available from: <https://wellcome.ac.uk/reports/reframing-antimicrobial-resistance-antibiotic-resistance>.
- World Health Organization. Regional Office for Europe. Food safety and the fight against antimicrobial resistance. 2020. (EN, [RU](#)). Available from : <https://iris.who.int/handle/10665/337525>.
- World Health Organization. Regional Office for Europe. Immunization strengthens the fight against Antimicrobial Resistance. 2020. (EN, [RU](#)) Available from: <https://apps.who.int/iris/handle/10665/337523>.
- World Health Organization. Regional Office for Europe. (2020). The fight against antimicrobial resistance supports efforts towards better labs for better health. World Health Organization. Regional Office for Europe. (EN, [RU](#)). Available from: <https://iris.who.int/handle/10665/337515>.
- World Health Organization. The fight against antimicrobial resistance supports migrant health (EN, [RU](#)). Geneva: WHO; 2020. Available from: <https://apps.who.int/iris/handle/10665/337521>.
- World Health Organization. The fight against antimicrobial resistance is closely linked to the Sustainable Development Goals (EN, [RU](#)). Geneva: WHO; 2020. Available from: <https://apps.who.int/iris/handle/10665/337519>.

- World Health Organization. Bacteria can make us ill. Antibiotics then (usually) help. (EN, [RU](#)). Geneva: WHO; 2020. Available from: <https://apps.who.int/iris/handle/10665/337517>.
- Huttner B, Saam M, Moja L, et al. How to improve antibiotic awareness campaigns: findings of a WHO global survey. *BMJ Global Health*. 2019;4. Available from: <https://gh.bmj.com/content/4/3/e001239.long>.

Strategic information through surveillance and research (PCA foundational step 2):

3. AMR surveillance (intervention 3)

a) Global guidance, reports and initiatives

- World Health Organization. Global Antimicrobial Resistance and Use Surveillance System (GLASS) Dashboard. Geneva: WHO. Available from: <https://worldhealthorg.shinyapps.io/glass-dashboard>.
- World Health Organization. Global Antimicrobial Resistance Surveillance System (GLASS) Reports – All Reports. [GLASS Resource Centre \(who.int\)](#).
- World Health Organization. Enhanced gonococcal antimicrobial surveillance programme (EGASP): surveillance report 2022. Geneva: World Health Organization; 2024. <https://iris.who.int/handle/10665/375892>.
- One Health Global Leaders Group on Antimicrobial Resistance. Integrated surveillance of antimicrobial resistance (AMR) and use (AMU): a pocket guide for political decision-makers. 2023. Available at: [https://www.amrleaders.org/resources/m/item/integrated-surveillance-of-antimicrobial-resistance-\(amr\)-and-use-\(amu\)-a-pocket-guide-for-political-decision-makers](https://www.amrleaders.org/resources/m/item/integrated-surveillance-of-antimicrobial-resistance-(amr)-and-use-(amu)-a-pocket-guide-for-political-decision-makers).
- World Health Organization. GLASS Manual for Antimicrobial Resistance Surveillance in Common Bacteria Causing Human Infection. Geneva: World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/372741>.
- World Health Organization. Methodological Principles of Nationally Representative Surveys as a Platform for Global Surveillance of Antimicrobial Resistance in Human Bloodstream Infections. Geneva: World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/366150>.
- World Health Organization. WHO integrated global surveillance on ESBL-producing *E. coli* using a “One Health” approach: implementation and opportunities. Geneva: World Health Organization; 2021. Available from: <https://iris.who.int/handle/10665/340079>.
- World Health Organization. Enhanced gonococcal antimicrobial surveillance programme (EGASP): general protocol. Geneva: World Health Organization; 2021. <https://iris.who.int/handle/10665/341333>.
- Global Leaders Group on Antimicrobial Resistance. Surveillance of Antimicrobial Resistance and Use: Information Note of the Global Leaders Group on Antimicrobial Resistance. 2021. Available from: <https://www.amrleaders.org/resources/m/item/surveillance-of-antimicrobial-resistance-and-use>.
- World Health Organization. GLASS: the detection and reporting of colistin resistance, 2nd ed. Geneva: World Health Organization; 2021. Available from: <https://iris.who.int/handle/10665/343654>.
- World Health Organization. GLASS whole-genome sequencing for surveillance of antimicrobial resistance. Geneva: World Health Organization; 2020. <https://iris.who.int/handle/10665/334354>.

- World Health Organization. GLASS guidance for national reference laboratories. Geneva: World Health Organization; 2020. <https://iris.who.int/handle/10665/334290>.
- World Health Organization. GLASS method for estimating attributable mortality of antimicrobial resistant bloodstream infections. Geneva: World Health Organization; 2020. <https://iris.who.int/handle/10665/332457>.
- World Health Organization. Molecular Methods for Antimicrobial Resistance (AMR) Diagnostics to Enhance the Global Antimicrobial Resistance Surveillance System. Geneva: World Health Organization; 2019. Available from: <https://iris.who.int/handle/10665/310993>.
- World Health Organization. GLASS Early Implementation Protocol for the Inclusion of Candida spp. (EN, SP). Geneva: WHO; 2019. Available from: <https://www.who.int/publications/i/item/WHO-WSI-AMR-2019.4>.
- World Health Organization. Emerging antimicrobial resistance reporting framework: August 2018. Geneva: World Health Organization; 2018. <https://iris.who.int/handle/10665/274956>.
- World Health Organization. Proof-of-Principle Antimicrobial Resistance Routine Diagnostics Surveillance Project (PoP Project): Protocol: Version 2.0. Geneva: WHO; 2018. Available from: <https://apps.who.int/iris/handle/10665/346076>.
- World Health Organization. National Antimicrobial Resistance Surveillance Systems and Participation in the Global Antimicrobial Resistance Surveillance System (GLASS): A Guide to Planning, Implementation, and Monitoring and Evaluation. Geneva: World Health Organization; 2016. Available from: <https://www.who.int/publications/i/item/WHO-DGO-AMR-2016.4>.
- World Health Organization. Diagnostic Stewardship: A Guide to Implementation in Antimicrobial Resistance Surveillance Sites. Geneva: World Health Organization; 2016. Available from: <https://www.who.int/publications/i/item/WHO-DGO-AMR-2016.3>.

b) Regional guidance and other resources

- World Health Organization. Guidance on Establishing National and Local AMR Surveillance Systems in the Western Pacific Region. Geneva: World Health Organization; 2024. Available from: <https://www.who.int/westernpacific/publications/i/item/9789290620365>.
- World Health Organization. Antimicrobial Resistance Surveillance in Europe 2023 – 2021 Data. Copenhagen: WHO Regional Office for Europe; 2023. Available from: <https://www.who.int/europe/publications/i/item/9789289058537>.
- World Health Organization. Antimicrobial Resistance in the WHO African Region: A Systematic Literature Review. Geneva: World Health Organization; 2021. Available from: <https://apps.who.int/iris/handle/10665/349223>.
- Pan American Health Organization. Surveillance of Bacterial Pneumonia and Meningitis in Children Aged Under 5 Years: Field Guide, 2nd Edition. Washington, DC: PAHO; 2021. Available from: <https://iris.paho.org/handle/10665.2/54637>.
- World Health Organization. Central Asian and European Surveillance of Antimicrobial Resistance (CAESAR) Manual, Version 3. Geneva: WHO; 2019. Available from: <https://apps.who.int/iris/handle/10665/346572>.
- Pan American Health Organization. Procedimientos para el Diagnóstico de Neumonías y Meningitis Bacterianas y la Caracterización de Cepas de Streptococcus pneumoniae y Haemophilus influenzae, 2nd Edition. Washington, DC: PAHO; 2012. Available from: <https://www.paho.org/es/node/51879>.

4. Antimicrobial use surveillance (intervention 4)

- World Health Organization. Global Antimicrobial Resistance and Use Surveillance System (GLASS) Dashboard: Global AMC data. Available from: <https://worldhealthorg.shinyapps.io/glass-dashboard/ w 813ce85b/ w 34dc23ad/#!/amu>.
- WHO Regional Office for Europe. Antimicrobial Medicines Consumption (AMC) Network: AMC data, 2022. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/378747>.
- WHO Collaborating Centre for Drug Statistics Methodology. ATC/DDD Index 2023. Available from: https://www.whocc.no/atc_ddd_index/.
- World Health Organization. Training on GLASS methodology for national surveillance of antimicrobial consumption. Geneva: WHO; 2022. Available from: <https://apps.who.int/iris/handle/10665/354258>.
- World Health Organization. Antimicrobial consumption in the WHO Western Pacific Region: early implementation of the Western Pacific Regional Antimicrobial Consumption Surveillance System (WPRACSS). Geneva: WHO; 2022. Available from: <https://iris.who.int/handle/10665/351130>.
- World Health Organization. GLASS methodology for surveillance of national antimicrobial consumption. Geneva: WHO; 2020. Available from: <https://www.who.int/publications/i/item/9789240012639>.
- World Health Organization. GLASS manual on the management of antimicrobial consumption data. Geneva: WHO; 2020. (EN, [FR](#)). Available from: <https://iris.who.int/handle/10665/336216>.
- World Health Organization. GLASS guide for national surveillance systems for monitoring antimicrobial consumption in hospitals. Geneva: WHO; 2020. (EN, [FR](#), [POR](#), [RU](#), [SP](#)). Available from: <https://apps.who.int/iris/handle/10665/336182>.
- European Centre for Disease Prevention and Control. Antimicrobial consumption in the EU/EEA (ESAC-Net) Annual Epidemiological Report for 2020. Available from: <https://www.ecdc.europa.eu/sites/default/files/documents/ESAC-Net%20AER-2020-Antimicrobial-consumption-in-the-EU-EEA.pdf>.
- World Health Organization. GLASS Methodology for Point Prevalence Survey for Antibiotic Use in Hospitals. Geneva: WHO; 2019. Available from: <https://iris.who.int/handle/10665/280063>.
- World Health Organization. Assessing non-prescription and inappropriate use of antibiotics. Geneva: WHO; 2019. Available from: <https://apps.who.int/iris/handle/10665/312306>.
- World Health Organization. Introduction to drug utilization research. Geneva: World Health Organization; 2003. (EN, [RU](#)). Available from: <https://apps.who.int/iris/handle/10665/42627>.
- WHO Regional Office for Europe. European Health Information Gateway: Antibiotic Consumption (%). Available from: https://gateway.euro.who.int/en/indicators/epw_1-antibiotic-consumption/#id=36842.

5. AMR research and innovation (intervention 5)

- World Health Organization. Global research agenda for antimicrobial resistance in human health. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/379825>.
- World Health Organization. Antibacterial pipeline trends and recommendations to enhance research and development: policy brief. Geneva: WHO; 2024. Available from: <https://iris.who.int/handle/10665/378316>.

- Bertagnolio S., Dobрева Z., Centner C. M., Olaru I. D., Donà D., Burzo S., et al. (2024). WHO global research priorities for antimicrobial resistance in human health. *The Lancet Microbe*. [https://doi.org/10.1016/s2666-5247\(24\)00134-4](https://doi.org/10.1016/s2666-5247(24)00134-4).
- Global Leaders Group. Recommendations to address the antibiotic pipeline and access crisis in human health. 2024. Available from: <https://www.amrleaders.org/resources/m/item/glg-recommendations-to-address-the-antibiotic-pipeline-and-access-crisis-in-human-health>.
- World Health Organization. 2023 antibacterial agents in clinical and preclinical development: an overview and analysis. Geneva: WHO; 2024. <https://iris.who.int/handle/10665/376944>.
- World Health Organization. A One Health priority research agenda for antimicrobial resistance. Geneva: WHO; 2023. Available from: <https://apps.who.int/iris/handle/10665/370279>.
- World Health Organization. Global research agenda for antimicrobial resistance in human health. Geneva: WHO; 2023. Available from: <https://www.who.int/publications/m/item/global-research-agenda-for-antimicrobial-resistance-in-human-health>.
- World Health Organization. WHO fungal priority pathogens list to guide research, development, and public health action. Geneva: WHO; 2022. Available from: <https://iris.who.int/handle/10665/363682>.
- World Health Organization. Paediatric drug optimization for antibiotics: meeting report, 30 November, 5-7 December 2022. Available from: <https://iris.who.int/bitstream/handle/10665/366533/9789240068933-eng.pdf>.

Prevention of infection (pillar 1)

6. Water, sanitation & hygiene (WASH) resources (intervention 6)

Webpages

- World Health Organization. WHO Water sanitation hygiene webpage. Available from: <https://www.who.int/health-topics/water-sanitation-and-hygiene-wash>.
- World Health Organization & United Nations Children's Fund. Knowledge portal on WASH in healthcare facilities. Available from: <https://www.washinhcf.org>.
- World Health Organization & United Nations Children's Fund. WASHFIT portal. Available from: <https://washinhcf.org/wash-fit/>.
- The World Health Organization & United Nations Children's Fund Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP). Available from: <https://washdata.org>.
- [Antimicrobial Resistance in the Environment: Key Concepts and Interventions](#). WHO Academy e-learning course.

Standards and guidelines

- World Health Organization. Guidance on wastewater and solid waste management for manufacturing of antibiotics. Geneva: World Health Organization; 2024. Available at: <https://iris.who.int/handle/10665/378471>.
- World Health Organization & United Nations Children's Fund. Universal water, sanitation, hygiene, waste and electricity services in all health care facilities to achieve quality care: global framework for action

2024-2030. Geneva: World Health Organization; 2024. Available at:
<https://iris.who.int/handle/10665/377776>.

- World Health Organization. Understanding barriers to quality of care: an approach for conducting a situational analysis of WASH and quality in healthcare facilities. Geneva: WHO; 2021. Available from: <https://apps.who.int/iris/handle/10665/340297>.
- World Health Organization & United Nations Children's Fund. Water, sanitation, hygiene, and waste management for SARS-CoV-2, the virus that causes COVID-19: interim guidance, 29 July 2020. Geneva: WHO, 2020. Available from: <https://iris.who.int/handle/10665/333560>.
- World Health Organization, Food and Agriculture Organization of the United Nations & World Organisation for Animal Health. Technical brief on water, sanitation, hygiene, and wastewater management to prevent infections and reduce the spread of antimicrobial resistance. Geneva: WHO; 2020. Available from: <https://iris.who.int/handle/10665/332243>.
- World Health Organization. Achieving quality health services for all, through better water, sanitation, and hygiene: Lessons from three African countries. Geneva: WHO; 2020. Available from: <https://iris.who.int/handle/10665/333783>.
- World Health Organization. Burden of disease attributable to unsafe drinking-water, sanitation, and hygiene: 2019 update. Geneva: WHO; 2019. Available from: <https://iris.who.int/handle/10665/370026>.
- World Health Organization. Overview of technologies for the treatment of infectious and sharp waste from health care facilities. Geneva: WHO, 2019. (AR, EN, FR, SP). Available from: <https://iris.who.int/handle/10665/328146>.
- World Health Organization. Guidelines on sanitation and health. Geneva: WHO, 2018. (AR, EN, FR, RU, SP). Available from : <https://iris.who.int/handle/10665/274939>.
- World Health Organization. Safe management of wastes from health-care activities: a summary. Geneva: WHO; 2017. (EN, RU, FR, ES). Available from: <https://iris.who.int/handle/10665/259491>.

Monitoring

- World Health Organization & United Nations Children's Fund. Universal water, sanitation, hygiene, waste and electricity services in all health care facilities to achieve quality care: global framework for action 2024-2030. Geneva: WHO; 2024. Available at: <https://iris.who.int/handle/10665/377776>.
- World Health Organization & United Nations Children's Fund (UNICEF). WASH in health care facilities 2023 data update: special focus on primary health care. Geneva: WHO & UNICEF; 2024. Available at: <https://washdata.org/reports/jmp-2024-wash-hcf>.
- World Health Organization & United Nations Children's Fund. Country tracker: progress on WASH in healthcare facilities. Available at: <https://washinhcf.org/country-progress-tracker/#country-progress-tracker>.
- World Health Organization & United Nations Children's Fund. Progress on WASH in health care facilities 2000–2021: special focus on WASH and infection prevention and control. Geneva: WHO & UNICEF; 2023. Available at: <https://iris.who.int/handle/10665/366657>.
- World Health Organization & United Nations Children's Fund. Water, sanitation, hygiene, waste and electricity services in health care facilities: progress on the fundamentals: 2023 global report. Geneva: WHO; 2023. Available at: <https://iris.who.int/handle/10665/368975>.
- WHO Regional Office for Europe. Drinking-water, sanitation and hygiene in the WHO European Region: highlights and progress towards achieving Sustainable Development Goal 6 (2022). Available at: <https://washdata.org/report/who-2022-regional-highlights-euro>.

- World Health Organization & United Nations Children's Fund. Global progress report on WASH in healthcare facilities: fundamentals first. Geneva: World Health Organization; 2020. (AR, EN, FR, SP). Available at: <https://iris.who.int/handle/10665/337604>.
- World Health Organization & United Nations Children's Fund. WASH in health care facilities: global baseline report 2019. Geneva: WHO; 2019. (AR, EN, FR, RU, SP). Available at : <https://iris.who.int/handle/10665/311620>.
- World Health Organization & United Nations Children's Fund. Progress on household drinking water, sanitation and hygiene 2000-2017: special focus on inequalities. Geneva: World Health Organization; 2019. (AR, EN, FR, RU, SP). Available at: <https://iris.who.int/handle/10665/329370>.
- World Health Organization & United Nations Children's Fund. Core questions and indicators for monitoring WASH in health care facilities in the Sustainable Development Goals. Geneva: World Health Organization; 2018. Available at: <https://iris.who.int/handle/10665/275783>.

Tools

- World Health Organization & United Nations Children's Fund. WASH FIT: A practical guide for improving quality of care through water, sanitation and hygiene in health care facilities. Second edition. Geneva: World Health Organization; 2022. Available at: <https://iris.who.int/handle/10665/353411>.
- World Health Organization & United Nations Children's Fund. WASH FIT Manual for Trainers. Geneva: World Health Organization; 2022. Available at: <https://iris.who.int/handle/10665/353805>.
 - [Water and Sanitation for Health Facility Improvement Tool \(WASH FIT\) for improved quality of care](#). WHO Academy e-learning course.
 - World Health Organization. WASH FIT all technical modules. <https://www.washinhcf.org/wash-fit-training-modules/>.
 - World Health Organization & United Nations Children's Fund. WASH FIT Fact Sheets. Available at: <https://www.washinhcf.org/wash-fit-fact-sheets/>.
- Countries Posters from the Global Summit on WASH and Waste in Healthcare Facilities. 2023. Available from: <https://www.washinhcf.org/wp-content/uploads/2023/06/All-countries-posters-in-Global-Summit-.pdf>.
- World Health Organization. Regional Office for Europe. A field guide to improving small drinking-water supplies: water safety planning for rural communities. World Health Organization. Regional Office for Europe; 2022. (EN, RU). Available at: <https://iris.who.int/handle/10665/363510>.
- World Health Organization. Regional Office for Europe. Water, sanitation and hygiene in health-care facilities: a practical tool for situation assessment and improvement planning. World Health Organization. Regional Office for Europe; 2022. (EN, RU). <https://iris.who.int/handle/10665/363511>.
- World Health Organization. Water, sanitation, hygiene and health: a primer for health professionals. Geneva: World Health Organization; 2019. Available at: <https://apps.who.int/iris/bitstream/handle/10665/330100/WHO-CED-PHE-WSH-19.149-eng.pdf>
- World Health Organization & United Nations Children's Fund. Water, sanitation, and hygiene in health care facilities: practical steps to achieve universal access for quality care. Geneva: World Health Organization; 2019. (EN, FR, RU, SP). Available at: <https://iris.who.int/handle/10665/311618>.
- World Health Organization, United Nations Children's Fund & WaterAid. Combatting antimicrobial resistance through water, sanitation and hygiene and infection prevention and control in healthcare. Available at: <https://www.who.int/docs/default-source/wash-documents/wash-in-hcf/combating-antimicrobial-resistance.pdf>.

7. Infection prevention and control (IPC) resources (intervention 7)

WHO IPC home page <https://www.who.int/teams/integrated-health-services/infection-prevention-control> contains resources on: hand hygiene, Core components, AMR, bloodstream infections, surgical site infection, injection safety, sepsis, basic IPC and primary care.

- World Health Organization. Global report on infection prevention and control 2024. Geneva: World Health Organization; 2024. Available at: <https://www.who.int/publications/i/item/9789240103986>.
- World Health Organization. WHO training package on environmental cleaning: evaluation methodology guide. Geneva: World Health Organization; 2024. Available at: <https://iris.who.int/handle/10665/379551>.
- World Health Organization. Global strategy on infection prevention and control. Geneva: World Health Organization; 2023. Available at: <https://iris.who.int/handle/10665/376751>.
- Global action plan and monitoring framework on infection prevention and control (IPC), 2024–2030. Available from: <https://www.who.int/teams/integrated-health-services/infection-prevention-control/draft-global-action-plan-and-monitoring-framework-on-ipc>.
- Infection prevention and control in-service education and training curriculum. Geneva: World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/376810>.
- Surveillance of health care-associated infections at national and facility levels. Geneva: World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/379248>.
- Guidelines for the prevention of bloodstream infections and other infections associated with the use of intravascular catheters: part I: peripheral catheters. Geneva: World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/376722>.
- Understanding accelerators and overcoming barriers: the journey for developing or adapting an infection prevention and control guideline. Copenhagen: WHO Regional Office for Europe; 2023. Available from: <https://www.who.int/europe/publications/m/item/understanding-accelerators-and-overcoming-barriers--the-journey-for-developing-or-adapting-an-infection-prevention-and-control-guideline--an-easy-to-follow-country-approach>.
- World Health Organization. Global report on infection prevention and control: executive summary. Geneva: World Health Organization; 2022. (EN, FR). Available at: <https://iris.who.int/handle/10665/354553>.
- Understanding accelerators and overcoming barriers - the journey for developing or adapting an infection prevention and control guideline; 2022. Available at: <https://www.who.int/europe/publications/m/item/understanding-accelerators-and-overcoming-barriers--the-journey-for-developing-or-adapting-an-infection-prevention-and-control-guideline--an-easy-to-follow-country-approach>.

IPC and antimicrobial resistance (AMR) page [Infection prevention and control \(who.int\)](#) contains the following key documents:

- World Health Organization. Implementation manual to prevent and control the spread of carbapenem-resistant organisms at the national and health care facility level: interim practical manual supporting implementation of the Guidelines for the prevention and control of carbapenem-resistant Enterobacteriaceae, Acinetobacter baumannii and Pseudomonas aeruginosa in health care facilities. Geneva: World Health Organization; 2019. Available from: <https://iris.who.int/handle/10665/312226>.

- World Health Organization. Guidelines for the prevention and control of carbapenem-resistant Enterobacteriaceae, Acinetobacter baumannii and Pseudomonas aeruginosa in health care facilities. Geneva: World Health Organization; 2017. Available from: <https://iris.who.int/handle/10665/259462>.

The following e-learning courses might be of interest:

- Prevention of antimicrobial resistance and infection prevention and control. Please visit [WHO Academy](#).
- Health-care associated infection surveillance. Please visit [WHO Academy](#).
- Catheter-associated urinary tract infections. Please visit [WHO Academy](#).
- [Prevention of vascular catheters-associated bloodstream infections](#). WHO Academy e-learning course.

Hand Hygiene

Tabs on this [page](#) for [Guidelines and evidence](#), [Implementation tools](#), [Training tools](#) and [Monitoring tools](#). You will also find an alcohol-based handrub planning and costing tool, leaflets on glove use, multimodal improvement and tools for creating an institutional safety climate.

- WHO e-learning course, Standard precautions: Hand hygiene. Please visit [WHO Academy](#).
- [My Five Moments of Hands Hygiene](#). WHO Academy e-learning course.
- My 5 Moments for Hand Hygiene game: <https://5mgame.lxp.academy.who.int/>.

Guidelines and evidence

- World Health Organization. Hand hygiene in outpatient and home-based and long-term care facilities: a guide to the application of the WHO multimodal hand hygiene improvement strategy. Geneva: World Health Organization; 2012. Available from: <https://iris.who.int/handle/10665/78060>.
- World Health Organization & WHO Patient Safety. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009. Available from: <https://iris.who.int/handle/10665/44102>.

Implementation Tools

- World Health Organization & United Nations Children's Fund. Hand hygiene acceleration framework tool. Geneva: World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/366967>.
- World Health Organization. Hand hygiene for all initiative: improving access and behaviour in health care facilities. Geneva: World Health Organization; 2020. Available from: <https://iris.who.int/handle/10665/336023>.
- World Health Organization. Guide to local production: WHO-recommended handrub formulations. Geneva: World Health Organization; 2010. <https://iris.who.int/handle/10665/332005>.
- World Health Organization & WHO Patient Safety. A guide to the implementation of the WHO multimodal hand hygiene improvement strategy. Geneva: World Health Organization; 2009. Available from: <https://iris.who.int/handle/10665/70030>.
- [Training tools](#): At this tab, you will find training and education resources on the importance of hand hygiene, the "My 5 Moments for Hand Hygiene" approach and the correct procedures for hand rubbing and handwashing.
- [Monitoring tools](#): resources to support evaluation of hand hygiene practices among health-care workers.

IPC Core Components

- World Health Organization. Minimum requirements for infection prevention and control programmes. Geneva: World Health Organization; 2019. Available at: <https://iris.who.int/handle/10665/330080>.
- World Health Organization. Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. Geneva: World Health Organization; 2016. (ES, FR, RU, POR). Available at: <https://iris.who.int/handle/10665/251730>.
- Interactive core components: <http://www.developers-maraltro.com/who/4/>.
- WHO e-learning course on IPC core components and multimodal strategies. Please visit [WHO Academy](#).

Surgical Site Infection

Here you will find guidelines as well as implementation resources, training tools, and monitoring tools for the prevention of SSIs, including the following key publications:

- World Health Organization. Global guidelines for the prevention of surgical site infection, 2nd ed.. Geneva: World Health Organization; 2019. Available at: <https://iris.who.int/handle/10665/277399>.
- World Health Organization. Implementation manual to support the prevention of surgical site infections at the facility level: turning recommendations into practice: interim version. Geneva: World Health Organization; 2018. Available at: <https://iris.who.int/handle/10665/330071>.
- Decontamination and reprocessing of medical devices for health-care facilities <https://www.who.int/publications/i/item/9789241549851>.
- WHO e-learning course on surgical site infections. Please visit [WHO Academy](#).

Injection safety

- Several injection safety resources are available [here](#), including guidelines, a toolkit, videos and leaflets.
- WHO online course. Standard precautions: Injection safety and needle-stick injury management. Please visit [WHO Academy](#).

Sepsis

There are several links to relevant sepsis resources available [here](#), including:

- World Health Organization. Global report on the epidemiology and burden of sepsis: current evidence, identifying gaps and future directions. Geneva: World Health Organization; 2020. <https://iris.who.int/handle/10665/334216>.

Primary Care

- New website for Basic IPC and primary care: <https://www.who.int/teams/integrated-health-services/infection-prevention-control/basic-ipc-and-primary-care>.
- World Health Organization. Standard precautions for the prevention and control of infections: aide-memoire. Geneva: World Health Organization; 2022. Available at: <https://iris.who.int/handle/10665/356855>.
- World Health Organization. Transmission-based precautions for the prevention and control of infections: aide-memoire. Geneva: World Health Organization; 2022. Available at: <https://iris.who.int/handle/10665/356853>.

- World Health Organization. Decontamination and reprocessing of medical devices for health-care facilities: aide-memoire. Geneva: World Health Organization; 2022. Available at: <https://iris.who.int/handle/10665/364587>.
- World Health Organization. Strengthening infection prevention and control in primary care: a collection of existing standards, measurement and implementation resources. Geneva: World Health Organization; 2021. Available at: <https://iris.who.int/handle/10665/345276>.
- Surgical site infection prevention in the primary health care setting – Infographic: <https://www.who.int/multi-media/details/surgical-site-infection-prevention-in-the-primary-health-care-setting>.

Monitoring/Assessment tools

- World Health Organization. Assessment tool on infection prevention and control minimum requirements for primary health care facilities. Geneva: World Health Organization; 2023. <https://iris.who.int/handle/10665/367505>.
- World Health Organization. Joint external evaluation tool: International Health Regulations (2005), 3rd ed. Geneva: World Health Organization; 2022. <https://iris.who.int/handle/10665/357087>.
- World Health Organization. International Health Regulations (2005): state party self-assessment annual reporting tool, 2nd ed. Geneva: World Health Organization; 2021. Available at: <https://iris.who.int/handle/10665/350218>.
- World Health Organization. Assessment tool of the minimum requirements for infection prevention and control programmes at the national level. 2021. Available at: <https://www.who.int/publications/m/item/assessment-tool-of-the-minimum-requirements-for-infection-prevention-and-control-programmes-at-the-national-level>.
- World Health Organization. National Infection Prevention and Control Assessment tool 2 (IPCAT2). Geneva: World Health Organization; 2019. Available from: <https://iris.who.int/handle/10665/330078>.
- World Health Organization. Infection Prevention and Control Assessment Framework (IPCAF). Geneva: World Health Organization; 2019. Available from: <https://apps.who.int/iris/handle/10665/330072>.

Additional IPC and AMR resources:

- World Health Organization. Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the health care facility level. Geneva: World Health Organization; 2023. Available from: <https://apps.who.int/iris/handle/10665/361522>.
- World Health Organization Regional Office for the Western Pacific. Responding to outbreaks of antimicrobial-resistant pathogens in health-care facilities: guidance for the Western Pacific Region. Geneva: World Health Organization; 2023. Available from: <https://apps.who.int/iris/handle/10665/363498>.
- World Health Organization. Environmental cleaning and infection prevention and control in health care facilities in low- and middle-income countries: trainer's guide. Geneva: World Health Organization; 2022. Available at: <https://iris.who.int/handle/10665/366379>.
- World Health Organization. Environmental cleaning and infection prevention and control in health care facilities in low- and middle-income countries: modules and resources. Geneva: World Health Organization; 2022. Available at: <https://iris.who.int/handle/10665/366380>.

- World Health Organization. IPC for AMR advocacy document: The essential role of infection prevention and control to curb antimicrobial resistance. Geneva: World Health Organization; 2022. Available from: [https://cdn.who.int/media/docs/default-source/integrated-health-services-\(ihs\)/amr/ipc_amr_a4.pdf?sfvrsn=ede4a5cd_7](https://cdn.who.int/media/docs/default-source/integrated-health-services-(ihs)/amr/ipc_amr_a4.pdf?sfvrsn=ede4a5cd_7).
- World Health Organization. Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the national level. Geneva: World Health Organization; 2021. Available at: <https://apps.who.int/iris/handle/10665/345251>.
- World Health Organization Regional Office for Europe. Infection prevention and control: guidance to action tools. 2021. Available from: <https://apps.who.int/iris/handle/10665/341107>.
- World Health Organization Regional Office for Europe. Aide-memoire: respiratory and hand hygiene. In: Infection prevention and control: guidance to action tools. 2021. Available from: <https://apps.who.int/iris/handle/10665/341418>.
- World Health Organization Regional Office for Europe. Aide-memoire: personal protective equipment. In: Infection prevention and control: guidance to action tools. 2021. Available from: <https://apps.who.int/iris/handle/10665/341417>.
- World Health Organization Regional Office for Europe. Aide-memoire: environmental cleaning, waste, and linen management. In: Infection prevention and control: guidance to action tools. 2021. Available from: <https://apps.who.int/iris/handle/10665/341416>.

8. Immunization resources (intervention 8)

- World Health Organization. Estimating the impact of vaccines in reducing antimicrobial resistance and antibiotic use: Technical report. Geneva: World Health Organization; 2024. Available from: <https://iris.who.int/handle/10665/379116>.
- World Health Organization. Quick tips for health workers: how to use vaccines to reduce antimicrobial resistance. Geneva: World Health Organization; 2024. Available from: https://cdn.who.int/media/docs/default-source/immunization/product-and-delivery-research/who-mateusz-the-role-of-vaccines-in-reducing-amr_summary-report qt-for-health-workers_031024_lc.pdf?sfvrsn=bb5f53f3_1.
- World Health Organization. Quick tips for community representatives: how to use vaccines to reduce antimicrobial resistance. Geneva: World Health Organization; 2024. Available from: https://cdn.who.int/media/docs/default-source/immunization/product-and-delivery-research/who-mateusz-the-role-of-vaccines-in-reducing-amr_summary-report qt-for-community-rep_091024_lc.pdf?sfvrsn=87d12e73_1.
- World Health Organization. Estimating the impact of vaccines in reducing antimicrobial resistance and antibiotic use: visualisation dashboard. Geneva: World Health Organization; 2023. Available from: <https://www.who.int/teams/immunization-vaccines-and-biologicals/product-and-delivery-research/anti-microbial-resistance>.
- World Health Organization. Snapshots of key findings and recommendations from the report to estimate the value of vaccines in reducing antimicrobial resistance for researchers and developers, funders, policy makers, and programme implementers. Geneva: World Health Organization; 2023. Available from: <https://www.who.int/teams/immunization-vaccines-and-biologicals/product-and-delivery-research/anti-microbial-resistance>.

- Kim C, Holm M, Frost I, Hasso-Agopsowicz M, Abbas K. Global and regional burden of attributable and associated bacterial antimicrobial resistance avertable by vaccination: modelling study. *BMJ Glob Health*. 2023;8(7). Available from: <https://gh.bmj.com/content/8/7/e011341>.
- World Health Organization & United Nations Children's Fund. Estimates of national immunization coverage. Geneva: World Health Organization; 2023. Available from: <https://worldhealthorg.shinyapps.io/wuenic-trends-2023/>.
- World Health Organization. WHO Immunization dashboard. Geneva: World Health Organization; 2023. Available from: <https://immunizationdata.who.int/>.
- World Health Organization. Bacterial vaccines in clinical and preclinical development 2021: an overview and analysis. Geneva: World Health Organization, 2022. <https://iris.who.int/handle/10665/359172>.
- World Health Organization. Immunization Agenda 2030. Geneva: World Health Organization; 2021. Available from: <https://www.immunizationagenda2030.org/>.
- World Health Organization. Annex to Immunization Agenda 2030: leveraging vaccines to reduce antibiotic use and prevent antimicrobial resistance: an action framework. Geneva: World Health Organization; 2020. Available from: https://cdn.who.int/media/docs/default-source/immunization/product-and-delivery-research/action-framework-draft.pdf?sfvrsn=2a63f53e_5&download=true.
- World Health Organization. Intervention guidebook for implementing and monitoring activities to reduce missed opportunities for vaccination. Geneva: World Health Organization; 2019. Available from: <https://iris.who.int/handle/10665/330101>.
- World Health Organization. WHO repository of recommendations for use of vaccines. Available from: <https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/position-papers>.

Access to essential health services (pillar 2)

9. AMR diagnosis and management health services are affordable for all (intervention 9)

- World Health Organization. WHO Model List of Essential Medicines - 23rd list, 2023. Geneva: World Health Organization. Available at: <https://www.who.int/publications/i/item/WHO-MHP-HPS-EML-2023.02>.
- World Health Organization. WHO Model List of Essential Medicines for children – 9th list, 2023. Geneva: World Health Organization. Available at: <https://iris.who.int/bitstream/handle/10665/371091/WHO-MHP-HPS-EML-2023.03-eng.pdf>.
- Tariq RA, Figueiras A, Rafique I, et al. 2022. Exposure to World Health Organization's AWaRe antibiotics and isolation of multidrug-resistant bacteria: a systematic review and meta-analysis. Available at: <https://www.sciencedirect.com/science/article/pii/S1198743X22001537>.
- World Health Organization. Selection of essential medicines at country level: using the WHO Model List of Essential Medicines to update a national essential medicines list. Geneva: World Health Organization; 2020. Available at: <https://apps.who.int/iris/bitstream/handle/10665/330898/9789241515443-eng.pdf>.

Resources specific to Latin America:

- Pan American Health Organization. Lista de productos del Fondo Estratégico. 2021. (EN, [SP](#)) Available at: <https://www.paho.org/en/node/58472>.

- Pan American Health Organization. El acceso y uso racional de los medicamentos y otras tecnologías estratégicas de alto costo. Washington, DC: PAHO; 2016. Available at: http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=36189&Itemid=270&lang=es.
- Pan American Health Organization. El acceso a los medicamentos de alto costo en las Américas. Washington, DC: PAHO; 2009. Available at: <http://www1.paho.org/hq/dmdocuments/2009/Alto%20Costo%20Americas.pdf>.

10. Uninterrupted supply of quality-assured, essential health products for AMR (intervention 10)

a) Substandard and falsified medical products

- World Health Organization & Global Antibiotic Research and Development Partnership (GARDP). Policy and regulatory interventions to address antibiotic shortages in low and middle-income countries. Geneva: World Health Organization; 2024. Available from: <https://iris.who.int/handle/10665/379625>.
- World Health Organization. The WHO Member State mechanism on substandard and falsified medical products. Geneva: World Health Organization; 2022. Available at: <https://www.who.int/publications/i/item/WHO-MHP-RPQ-REG-2022.01>.
- World Health Organization. WHO global surveillance and monitoring system for substandard and falsified medical products. Geneva: World Health Organization; 2017. Available at: <https://iris.who.int/handle/10665/326708>.
- iLearn resources:
 - World Health Organization. [Training on substandard/falsified \(SF\) medical products, Module 1: Introduction & overview](#).
 - World Health Organization. [Training on substandard/falsified \(SF\) medical products, Module 2: Responding to incidents](#)

b) Quality of antimicrobials

- World Health Organization. TRS 1025 - Annex 7: Good storage and distribution practices for medical products (EN, FR). Geneva: World Health Organization; 2020. (EN, [FR](#)). Available at: <https://www.who.int/publications/m/item/trs-1025-annex-7>.
- World Health Organization. TRS 961 - Annex 10: Procedure for prequalification of pharmaceutical products. Geneva: World Health Organization; 2011. Available at: <https://www.who.int/publications/m/item/annex-10-trs-961>.
- World Health Organization, United Nations Development Programme, United Nations Population Fund, World Bank & United Nations Children's Fund (UNICEF). A model quality assurance system for procurement agencies : recommendations for quality assurance systems focusing on prequalification of products and manufacturers, purchasing, storage and distribution of pharmaceutical products. Geneva: World Health Organization; 2007. <https://iris.who.int/handle/10665/69721>.
- World Health Organization. Operational principles for good pharmaceutical procurement. Geneva: World Health Organization; 1999. (EN, [FR](#), [SP](#)). Available at: <https://apps.who.int/iris/handle/10665/66251>

Timely, accurate diagnosis (pillar 3)

11. Laboratory system and diagnostic stewardship (intervention 11)

a) National policy and strategy

- World Health Organization. The selection and use of essential in vitro diagnostics: report of the fourth meeting of the WHO Strategic Advisory Group of Experts on In Vitro Diagnostics, 2022 (including the fourth WHO model list of essential in vitro diagnostics). Geneva: World Health Organization; 2023. Available at: <https://iris.who.int/handle/10665/373322>.
- World Health Organization Regional Office for Europe. Development of National Laboratory Policies: Best Practices Document and Facilitators' Guide. Copenhagen: WHO Regional Office for Europe; 2017 (EN, [RU](#)). Available from: <https://apps.who.int/iris/handle/10665/355631>.
- World Health Organization Regional Office for Europe. Developing a National Laboratory Strategic Plan: Best Practices Document and Facilitators' Guide. Copenhagen: WHO Regional Office for Europe; 2017 (EN, [RU](#)). Available from: <https://apps.who.int/iris/handle/10665/353746>.

b) Quality management and assurance

- World Health Organization. LQMS Training Toolkit (EN, [FR](#), [RU](#)). Available from: <https://extranet.who.int/hslp/content/LQMS-training-toolkit>.
- World Health Organization. Laboratory Quality Stepwise Implementation Tool ([FR](#), [RU](#), [SP](#), [Turkish](#)). Available from: <https://extranet.who.int/lqsi/>.
- World Health Organization Regional Office for Africa. Guide for the Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA) in the WHO African Region – Revision 2 (EN, [FR](#), [PT](#)). Brazzaville: WHO Regional Office for Africa; 2020. Available from: <https://iris.who.int/handle/10665/333129>.
- World Health Organization. Quality Manual Template. Geneva: World Health Organization; 2014 (EN, [FR](#), [RU](#), [SP](#)). Available from: <https://www.who.int/publications/m/item/laboratory-quality-manual>.
- World Health Organization Regional Office for South-East Asia. Quality Assurance in Bacteriology and Immunology, 3rd Edition. New Delhi: WHO Regional Office for South-East Asia; 2012. Available from: <https://apps.who.int/iris/handle/10665/205730>.
- World Health Organization. Laboratory quality management system : handbook, Version 1.1. Geneva: World Health Organization; 2011 ([FR](#), [RU](#), [SP](#)). Available at: <https://iris.who.int/handle/10665/44665>.

c) Biosafety

- World Health Organization. Regional Office for South-East Asia. (2023). A guide for the practical implementation of the WHO laboratory biosafety manual fourth edition. World Health Organization. Regional Office for South-East Asia. <https://iris.who.int/handle/10665/376329>.
- World Health Organization. Laboratory biosafety manual, 4th ed. Geneva: World Health Organization; 2020. Available at: <https://iris.who.int/handle/10665/337956>.

- World Health Organization. Tuberculosis Laboratory Biosafety Manual. Geneva: Geneva: World Health Organization; 2013. Available from: <https://www.who.int/publications/i/item/9789241504638>.

d) Cross-cutting laboratory tools and guidance

Global guidance

- World Health Organization. Antimicrobial resistance diagnostic initiative: strengthening bacteriology and mycology diagnostic capacity, laboratory systems and service delivery. Geneva: World Health Organization; 2023. Available from: <https://iris.who.int/handle/10665/377962>.
- World Health Organization. WHO laboratory manual for the diagnosis of diphtheria and other related infections. Geneva: World Health Organization; 2021. Available from: <https://apps.who.int/iris/handle/10665/352275>.
- World Health Organization. Guidance on regulations for the transport of infectious substances. Geneva: World Health Organization; 2021. Available from: <https://www.who.int/publications/i/item/9789240019720>.
- World Health Organization. Laboratory diagnosis of sexually transmitted infections, including human immunodeficiency virus. Geneva: World Health Organization; 2021. Available from: <https://apps.who.int/iris/rest/bitstreams/304701/retrieve>.
- World Health Organization. Laboratory Methods for the Diagnosis of Meningitis Caused by Neisseria meningitidis, Streptococcus pneumoniae, and Haemophilus influenzae: WHO Manual, 2nd Edition. Geneva: WHO; 2011. Available from: <https://apps.who.int/iris/handle/10665/70765>.
- World Health Organization. Laboratory Assessment Tool: 1 tool to assess the system, 1 tool to assess the facility (FR, RU, SP). Geneva: WHO; 2012. Available from: <https://www.who.int/publications/i/item/WHO-HSE-GCR-LYO-2012.2>.
- World Health Organization & Pan American Health Organization. Maintenance manual for laboratory equipment, 2nd ed. World Health Organization; 2008. Available from: <https://iris.who.int/handle/10665/43835>.
- World Health Organization. Manual of basic techniques for a health laboratory, 2nd Edition. Geneva: World Health Organization; 2003. Available from: <https://www.who.int/publications/i/item/9241545305>.
- World Health Organization, Centers for Disease Control and Prevention, United States Agency for International Development. Manual for the laboratory identification and antimicrobial susceptibility testing of bacterial pathogens of public health importance in the developing world. Geneva: World Health Organization; 2003. Available from: <https://apps.who.int/iris/handle/10665/68554>.
- World Health Organization. Basic laboratory procedures in clinical bacteriology, 2nd Edition. Geneva: WHO; 2003. Available from: <https://apps.who.int/iris/handle/10665/42696>.

Regional guidance and other resources

- Centers for Disease Control and Prevention. Laboratory assessment of antibiotic resistance testing capacity (LAARC) toolkit. Atlanta: CDC; 2017. Available from: <https://www.cdc.gov/antimicrobial-resistance/php/toolkit/index.html>.
- World Health Organization Regional Office for South-East Asia. Laboratory manual for diagnosis of fungal opportunistic infections in HIV/AIDS patients. New Delhi: WHO Regional Office for South-East Asia; 2009. Available from: <https://iris.who.int/handle/10665/205404>.

- Pan American Health Organization. Microbiología: lo esencial y lo práctico. Washington, DC: PAHO; 2005. Available from: <https://iris.paho.org/handle/10665.2/51601>.
- World Health Organization Regional Office for South-East Asia. Guidelines on standard operating procedures for microbiology. New Delhi: WHO Regional Office for South-East Asia; 2000. Available from: <https://apps.who.int/iris/handle/10665/205200>.
- World Health Organization Regional Office for the Eastern Mediterranean. Specimen collection and transport for microbiological investigation. Alexandria: WHO Regional Office for the Eastern Mediterranean; 1995. Available from: <https://apps.who.int/iris/handle/10665/119529>.

Appropriate, quality-assured treatment (pillar 4)

12. Antimicrobial stewardship (intervention 12)

- Operational approach to antimicrobial stewardship in the WHO Eastern Mediterranean Region. Cairo: WHO Regional Office for the Eastern Mediterranean; 2024. Available from: <https://applications.emro.who.int/docs/WHOEMCSR801E-eng.pdf?ua=1>.
- Moja L., Zanichelli V., Mertz D., Gandra S., Cappello B., Cooke G. S., et al. (2024). WHO's essential medicines and AWaRe: recommendations on first- and second-choice antibiotics for empiric treatment of clinical infections. *Clinical Microbiology and Infection*, 30(Suppl 1), S1–S51. <https://doi.org/10.1016/j.cmi.2024.02.003>.
- Shamas N., Stokle E., Ashiru-Oredope D., Wesangula E. (2023). Challenges of implementing antimicrobial stewardship tools in Low- to Middle-Income Countries (LMICs). *Infection Prevention in Practice*, 5(4), 100315. <https://doi.org/10.1016/j.infpip.2023.100315>.
- World Health Organization. Infographics: AWaRe antibiotic classification. Geneva: World Health Organization; 2023. Available at: <https://apps.who.int/iris/handle/10665/365135>.
- World Health Organization. AWaRe classification of antibiotics for evaluation and monitoring of use. Geneva: World Health Organization; 2023. Available at: <https://www.who.int/publications/i/item/9789240025530>.
- World Health Organization. Regional Office for Europe. Review of antibiotics in National Medicines Selection Lists in eastern Europe and central Asia. Copenhagen: World Health Organization. Regional Office for Europe; 2023. Available at: <https://iris.who.int/handle/10665/365989>.
- World Health Organization. EVIPNet evidence brief for policy: Tackling antimicrobial resistance in primary health care through promoting the appropriate use of antibiotics - Estonia. Geneva: World Health Organization; 2022. Available at: <https://apps.who.int/iris/handle/10665/351528>.
- World Health Organization. The WHO AWaRe (access, watch, reserve) antibiotic book. Geneva: World Health Organization; 2022. ([FR](#) , [SP](#) , [Bahasa Indonesian](#)). Available at: <https://iris.who.int/handle/10665/365237>.
- World Health Organization. WHO AWaRe Antibiotic Book. Mobile app available at: <https://firstline.org>.
- World Health Organization. WHO's AWaRe Framework - WHO Antibiotics Portal. Available at: <https://essentialmeds.org>.

- World Health Organization. COVID-19 Clinical management: living guidance, 23 November 2021. Geneva: World Health Organization; 2021. Available at: <https://www.who.int/publications/i/item/WHO-2019-nCoV-clinical-2021-2>.
- World Health Organization. WHO policy guidance on integrated antimicrobial stewardship activities. Geneva: World Health Organization; 2021. (EN, [FR](#), [ES](#), [RU](#)). Available at: <https://iris.who.int/handle/10665/341432>.
- World Health Organization. Online course: WHO policy guidance on integrated antimicrobial stewardship activities. Please visit [WHO Academy](#).
- WHO Regional Office for Europe. Antimicrobial stewardship interventions: a practical guide. Copenhagen: WHO Regional Office for Europe; 2021. Available at: <https://apps.who.int/iris/handle/10665/340709>.
- [Antimicrobial stewardship: a competency-based approach](#). WHO Academy e-learning course.
- World Health Organization. Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries: a WHO practical toolkit. Geneva : World Health Organization, 2019. ([AR](#), EN, [FR](#), [RU](#), [SP](#)) Available at: <https://iris.who.int/handle/10665/329404>.
- World Health Organization. Online course: WHO practical toolkit for antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries. Please visit [WHO Academy](#).
- WHO Regional Office for Europe. Assessing non-prescription and inappropriate use of antibiotics. Copenhagen: WHO Regional Office for Europe; 2019. Available at: <https://apps.who.int/iris/handle/10665/312306>.
- bioMérieux. Virtual Antimicrobial Stewardship Escape Room Game. Available at: <https://www.biomerieuxer.com>.
- Pan American Health Organization. Recommendations for Implementing Antimicrobial Stewardship Programs in Latin America and the Caribbean: Manual for Public Health Decision-Makers. Washington, DC: PAHO; 2018. (EN, [SP](#)). Available at: <https://www.paho.org/en/documents/recommendations-implementing-antimicrobial-stewardship-programs-latin-america-and>.
- World Health Organization. Methods to analyse medicine utilization and expenditure to support pharmaceutical policy implementation. (EN, [RU](#)). Geneva: World Health Organization; 2018. Available at: <https://apps.who.int/iris/handle/10665/274282>.
- World Health Organization. Drug and Therapeutics Committees - A Practical Guide (EN, FR, SP). Geneva: World Health Organization; 2003. (EN, [FR](#), [SP](#)). Available at: <https://apps.who.int/iris/handle/10665/68553>.

13. Regulation to restrict sales of non-prescription antimicrobials (intervention 13)

- Melles-Brewer M. M., Chiara F., Mosissa D., Mathew P. (2024). Over-the-counter sales of antibiotics: a call to action to ensure access and prevent excess. *The Lancet Global Health*, 12(8), e1227–e1228. [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(24\)00215-8/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(24)00215-8/fulltext).

14. Other useful resources

a) One Health

- World Health Organization. Capturing the Evidence on Access to Essential Antibiotics in Refugee and Migrant Populations. Geneva: WHO; 2022. Available from: <https://iris.who.int/handle/10665/362815>.
- World Health Organization. Strategic Framework for Collaboration on Antimicrobial Resistance: Together for One Health. Geneva: WHO; 2022. Available from: <https://www.who.int/publications/i/item/9789240045408>.
- Centers for Disease Control and Prevention. Covid-19: U.S. Impact on Antimicrobial Resistance - 2022 Special Report. Atlanta, GA: CDC; 2022. Available from: <https://www.cdc.gov/drugresistance/pdf/covid19-impact-report-508.pdf>.
- Global Leaders Group on Antimicrobial Resistance. Antimicrobial Resistance and the Climate Crisis: Information Note of the Global Leaders Group on Antimicrobial Resistance; 2021 (AR, CH, EN, FR, RU, ES). Available from: <https://www.amrleaders.org/resources/m/item/antimicrobial-resistance-and-the-climate-crisis>.
- World Health Organization. TB, HIV, Malaria and Neglected Tropical Diseases: Strengthening Collaboration to Prevent and Manage Antimicrobial Resistance. Geneva: WHO; 2019. Available from: <https://apps.who.int/iris/bitstream/handle/10665/311689/9789241515450-eng.pdf>.
- World Health Organization. Antimicrobial Resistance and Primary Health Care: Technical Series on Primary Health Care. Geneva: WHO; 2018. Available from: <https://apps.who.int/iris/handle/10665/326454>. Short version available at: http://www.who.int/docs/default-source/primary-health-care-conference/amr.pdf?sfvrsn=8817d5ba_2.

b) Other

- World Health Organization. Regional Office for Africa. Technical guidance and aide-mémoire on good manufacturing practice inspection of pharmaceutical manufacturing facilities with focus on reducing the incidence of antimicrobial resistance. Geneva: World Health Organization; 2024. Regional Office for Africa. Available at: <https://iris.who.int/handle/10665/376690>.
- World Health Organization. Regional Office for Europe. Prevention and control of antimicrobial resistance in the food chain: guidance for food safety authorities in Europe. World Health Organization. Regional Office for Europe; 2024. Available at: <https://iris.who.int/handle/10665/375901>.
- AMR Community Exchange Platform. Available from: <https://amrcommunityexchange.org>.
- British Society for Antimicrobial Chemotherapy (BSAC), including GASPH. Available from: <https://bsac.org.uk/>.
- Center for Infectious Disease Research and Policy. Antimicrobial Stewardship Project Newsletter. Available from: <http://www.cidrap.umn.edu/newsletter>.
- Global Antibiotic Research and Development Partnership (GARDP). Antimicrobial Encyclopaedia. Available from: <https://revive.gardp.org/resources/encyclopaedia/>.
- Gulf–Middle East–North Africa Educational Collaborative. Antimicrobial Stewardship Resources and Forum. Available from: <http://mena-ams.com/>.
- JAC – Antimicrobial Resistance (JAC-AMR) - an open-access journal that publishes academic content and peer-reviewed commentary on stewardship resources. <https://academic.oup.com/jacamr>.

- Open University, Fleming Fund. Online Learning: Tackling Antimicrobial Resistance Courses. Available from: <https://www.open.edu/openlearncreate/course/index.php?categoryid=415>.
- ReAct Group. ReAct ToolBox. Available from: <https://www.reactgroup.org/toolbox/>.
- TEACH AMS. Telementoring, Equity and Advocacy Collaboration for Health through Antimicrobial Stewardship. iECHO platform. Available from: <https://allteachecho.org>.
- Cross cutting topics:
 - Health security. Available from: https://www.who.int/health-topics/health-security#tab=tab_1.
 - Universal Health Coverage. Available from: https://www.who.int/health-topics/universal-health-coverage#tab=tab_1.

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