Resource materials for in-country development and implementation of national action plans to address antimicrobial resistance

2024 UPDATE
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What’s new in the AMR Resource Pack 2024 update

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<tr>
<th>Section</th>
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| **General** | • A pocket guide for ministers across sectors: How to respond to antimicrobial resistance [A pocket guide for ministers across sectors (amrleaders.org)](https://amrleaders.org)  
  • [Health and economic impacts of antimicrobial resistance in the Western Pacific Region, 2020-2030](https://who.int)  
  • [Antimicrobial resistance](https://who.int) Fact Sheet (updated 2023) |
| **Awareness** | • AMR Quiz - WHO/Europe - RC73 (EN, GER, RU) [No time to wait (who.int)](https://www.who.int) |
| **Surveillance** | • [GLASS manual for antimicrobial resistance surveillance in common bacteria causing human infection](https://www.who.int)  
  • Antimicrobial resistance surveillance in Europe 2023 – 2021 data [https://www.who.int/europe/publications/i/item/9789289058537](https://www.who.int/europe/publications/i/item/9789289058537) |
| **Laboratory strengthening** | • See Section 7 for all new resources added |
| **AMR national action plan implementation resources** | • People-centred approach to addressing antimicrobial resistance in human health: WHO core package of interventions to support national action plans [People-centred approach to addressing antimicrobial resistance in human health (who.int)](https://www.who.int)  
  • WHO AMR NAP costing & budgeting tool now available in SP and FR  
  • [Mali national action plan on antimicrobial resistance: review of progress in the human health sector](https://www.who.int) (EN, FR)  
  • [Kenya national action plan on antimicrobial resistance: review of progress in the human health sector](https://www.who.int) (who.int)  
  • WHO/World Bank. [Sustaining Action Against Antimicrobial Resistance: A Case Series of Country Experiences](https://www.who.int) |
| **Infection prevention and control** | • WHO [Global Strategy for Infection Prevention and Control](https://www.who.int)  
  • WHO Global report on infection prevention and control: executive summary [EN, FR](https://www.who.int)  
  • E-learning course [Infection Prevention and Control in Maternal and Neonatal Care](https://openwho.org)  
  • [My 5 Moments for Hand Hygiene game](https://5mgame.lxp.academy.who.int/)  
  • New IPC in primary care section |
| **Water, sanitation & hygiene** | • [A field guide to improving small drinking-water supplies: water safety planning for rural communities](https://www.who.int)  
  • Water, sanitation and hygiene in health-care facilities: a practical tool for situation assessment and improvement planning [Water, sanitation and hygiene in health-care facilities: a practical tool for situation assessment and improvement planning](https://www.who.int)  
  • Countries Posters from the Global Summit on WASH and Waste in Healthcare Facilities June 2023 [All-countries-posters-in-Global-Summit-.pdf](https://washinhcf.org) |
| **Immunization** | • Global and regional burden of attributable and associated bacterial antimicrobial resistance avertable by vaccination: modelling study [bmj.com](https://www.bmj.com)  
  • WHO repository of recommendations for use of vaccines: [https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/position-papers](https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/position-papers) |
| AMR & essential medicines and products | • WHO Model List of Essential Medicines - 23rd list, 2023 [WHO Model List of Essential Medicines - 23rd list, 2023](https://www.who.int/publications/i/item/WHO-MP-1-23-1) |
| AMR & essential medicines and products | • WHO Model List of Essential Medicines for children – 9th list, 2023 [WHO EMLc 9th List (2023)](https://apps.who.int/iris/handle/10665/365237) |
| AMR & essential medicines and products | • 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) [https://www.who.int/publications/i/item/WHO-MHP-RQ-REG-2022.01](https://www.who.int/publications/i/item/WHO-MHP-RQ-REG-2022.01) |
| AMR & essential medicines and products | • The WHO Member State mechanism on substandard and falsified medical products [https://www.who.int/publications/i/item/WHO-MHP-RPQ-REG-2022.01](https://www.who.int/publications/i/item/WHO-MHP-RPQ-REG-2022.01) |
| AMR & essential medicines and products | • WHO global surveillance and monitoring system: Substandard and Falsified medical products [https://www.who.int/publications/i/item/9789241513425](https://www.who.int/publications/i/item/9789241513425) |
| iLearn | • Training on substandard/falsified (SF) medical products, Module 1: Introduction & overview [https://apps.who.int/iris/handle/10665/365237](https://apps.who.int/iris/handle/10665/365237) |
| iLearn | • Training on substandard/falsified (SF) medical products, Module 2: Responding to incidents [https://apps.who.int/iris/handle/10665/365237](https://apps.who.int/iris/handle/10665/365237) |
| Antimicrobial stewardship | • The WHO AWaRe (access, watch, reserve) antibiotic book: [https://apps.who.int/iris/handle/10665/365237](https://apps.who.int/iris/handle/10665/365237) |
| Antimicrobial stewardship | • Infographics: [https://apps.who.int/iris/handle/10665/365135](https://apps.who.int/iris/handle/10665/365135) |
| Antimicrobial stewardship | • Mobile App: [WHO AWaRe Antibiotic Book (firstline.org)](https://www.firstline.org) |
| Antimicrobial stewardship | • AWaRe classification of antibiotics for evaluation and monitoring of use, 2023 [who.int](https://www.who.int/publications/i/item/9789241513425) |
| Monitoring | • TrACSS 2023 results [https://apps.who.int/iris/handle/10665/365237](https://apps.who.int/iris/handle/10665/365237) |
| Monitoring | • TrACSS 2022 country reports [https://apps.who.int/iris/handle/10665/365237](https://apps.who.int/iris/handle/10665/365237) |
| Monitoring | • Guidance to facilitate monitoring and evaluation for antimicrobial resistance national action plans [who.int](https://www.who.int/publications/i/item/9789241513425) |
| One Health | • [Animal Health and Welfare and Antimicrobial Resistance and Use (amrleaders.org)](https://www.amrleaders.org) |
| One Health | • Implementation of WOAH standards: the Observatory Annual Report, First edition 2022 [https://apps.who.int/iris/handle/10665/365237](https://apps.who.int/iris/handle/10665/365237) |
| One Health | • The Lancet Series on One Health and Global Health Security [https://apps.who.int/iris/handle/10665/365237](https://apps.who.int/iris/handle/10665/365237) |
| One Health | • 1st Global Joint Summit of Human and Veterinary Medicines Regulatory Authorities to Preserve Antimicrobials [Summit Report](https://www.who.int/publications/i/item/9789240057685) |
| One Health | • WHO global strategy for food safety 2022-2030: towards stronger food safety systems and global cooperation. [https://iris.who.int/bitstream/handle/10665/363475/9789240057685-eng.pdf?sequence=1](https://iris.who.int/bitstream/handle/10665/363475/9789240057685-eng.pdf?sequence=1) |
| Research (new section) | • WHO fungal priority pathogens list to guide research, development and public health action [https://www.who.int/publications/i/item/9789240060241](https://www.who.int/publications/i/item/9789240060241) |
| Research (new section) | • Global research agenda for antimicrobial resistance in human health [Global research agenda for antimicrobial resistance in human health (who.int)](https://apps.who.int/iris/handle/10665/370279) |
| Research (new section) | • A one health priority research agenda for antimicrobial resistance. 2023 [https://apps.who.int/iris/handle/10665/370279](https://apps.who.int/iris/handle/10665/370279) |
| IHR/Pandemic preparedness | • [Responding to outbreaks of antimicrobial-resistant pathogens in health-care facilities: guidance for the Western Pacific region (who.int)](https://apps.who.int/iris/handle/10665/370279) |

**Acknowledgements:** We gratefully acknowledge the contributions of WHO headquarters technical teams and WHO regional AMR focal points.
1. General AMR resources

- Antimicrobial resistance [who.int] Fact Sheet (updated 2023)
- Global action plan on antimicrobial resistance [https://www.who.int/publications/i/item/9789241509763](https://www.who.int/publications/i/item/9789241509763)
  - Animation: [https://www.youtube.com/watch?v=xyv_QroYZM](https://www.youtube.com/watch?v=xyv_QroYZM)
  - Social media graphics: [https://cloud.ihme.washington.edu/s/6M2fNj3raArEFMX](https://cloud.ihme.washington.edu/s/6M2fNj3raArEFMX)
  - GRAM report launch video, [https://vimeo.com/675487510](https://vimeo.com/675487510)
- A pocket guide for ministers across sectors: How to respond to antimicrobial resistance [A pocket guide for ministers across sectors (amrleaders.org)](https://amrleaders.org)
- WHO antimicrobial resistance webpage (also in Arabic, Chinese, French, Russian & Spanish) [https://www.who.int/health-topics/antimicrobial-resistance](https://www.who.int/health-topics/antimicrobial-resistance)
- Financing to Address Antimicrobial Resistance - Information note of the Global Leaders Group on Antimicrobial Resistance [https://www.amrleaders.org/resources/m/item/financing-to-address-antimicrobial-resistance](https://www.amrleaders.org/resources/m/item/financing-to-address-antimicrobial-resistance)
- Health and economic impacts of antimicrobial resistance in the Western Pacific Region, 2020-2030 [who.int](https://www.who.int/health-topics/antimicrobial-resistance)

2. AMR National action plan implementation resources

- WHO AMR community exchange platform: [https://amrcommunityexchange.org/](https://amrcommunityexchange.org/)
- Antimicrobial resistance: [A manual for developing national action plans](https://amrleaders.org/resources/m/item/financing-to-address-antimicrobial-resistance)
- People-centred approach to addressing antimicrobial resistance in human health: WHO core package of interventions to support national action plans [People-centred approach to addressing antimicrobial resistance in human health (who.int)](https://www.who.int/health-topics/antimicrobial-resistance)
• WHO implementation handbook for national action plans on antimicrobial resistance: guidance for the human health sector. (AR, CH, EN, FR, RU, SP). https://www.who.int/publications/i/item/9789240041981
  o eLearning course: https://openwho.org/courses/AMR-NAP-6steps-for-implementation
  o Infographic : 6 steps for sustainable implementation of national action plans on antimicrobial resistance. https://www.who.int/multimedia/details/6-steps-for-sustainable-implementation-of-national-action-plans-on-antimicrobial-resistance

• WHO costing and budgeting tool for national action plans on antimicrobial resistance
  o WHO AMR Costing and Budgeting Tool (EN, FR, SP)
  o WHO costing and budgeting tool for national action plans on antimicrobial resistance: user guide (EN, FR, SP)
  o eLearning course https://openwho.org/courses/AMR-NAP-costing-tool

• Kenya national action plan on antimicrobial resistance: review of progress in the human health sector (who.int)

• Mali national action plan on antimicrobial resistance: review of progress in the human health sector (EN, FR) https://www.who.int/publications/i/item/9789240065468

• Burkina Faso national action plan on antimicrobial resistance: review of progress in the human health sector. (EN, FR) https://www.who.int/publications/i/item/9789240040410

• Malawi national action plan on antimicrobial resistance: review of progress in the human health sector. https://www.who.int/publications/i/item/9789240056848


• Turning plans into action for antimicrobial resistance (AMR). Working Paper 2.0: Implementation and coordination https://apps.who.int/iris/handle/10665/311386

• Thematic brief: Multisectoral action to tackle AMR https://apps.who.int/iris/handle/10665/346539

• Tackling antimicrobial resistance (AMR) together. Working Paper 5.0: Enhancing the focus on gender and equity https://apps.who.int/iris/handle/10665/336977
3. Health workforce AMR education resources

- OpenWHO: New Antimicrobial Resistance channel [Antimicrobial Resistance (openwho.org)]
- Online course: Reducing AMR of curable Sexually Transmitted Infections (STIs) in Antenatal Care (ANC) settings [https://openwho.org/courses/amr-sti-anc]
- Online course: Surgical site infections. [https://openwho.org/courses/IPC-SSI-EN]
- Online course: WHO Policy Guidance on Integrated Antimicrobial Stewardship Activities. [https://openwho.org/courses/policy-guidance-on-AMS]
- Online course: WHO practical toolkit for antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries. [https://openwho.org/courses/practical-toolkit-for-AMS]
- WHO EURO Antimicrobial Stewardship: A competency-based approach Open Online Course(EN, FR, IT, Macedonian, RU, SP). [https://openwho.org/courses/AMR-competency]
- Antimicrobial stewardship interventions: a practical guide. WHO Regional Office for Europe 2021, (EN,RU, POL, GEO, TUR, SP, CRO, FR) [https://apps.who.int/iris/bitstream/handle/10665/340709/9789289054980-eng.pdf]
- Responding to Outbreaks of Antimicrobial-resistant Pathogens in Health-care Facilities: Guidance for the Western Pacific Region (EN, CHN) [https://apps.who.int/iris/handle/10665/363498]

4. Awareness, communications and behaviour change

- World AMR Awareness Week [World AMR Awareness Week (who.int)]
- AMR Quiz - WHO/Europe - RC73 (EN, GER, RU) [No time to wait (who.int)]
- Trello board for Quadripartite WAAW resources [https://trello.com/b/tBoXeVae/world-amr-awareness-week-toolkit-fao-unep-who-woah]
- WAAW materials (for GPs and leaflet) (EN, RU) [https://who.canto.global/v/LI33QQ5N04/album/SO8B9?viewIndex=0]
• The TAP manual: an in-depth guide for planning and implementing tailoring antimicrobial resistance programmes  
https://apps.who.int/iris/handle/10665/363136

• Tailoring Antimicrobial Resistance programmes (TAP) Quick Guide  
https://apps.who.int/iris/handle/10665/341631 , EN, SP, GRE, FR, RUS, GER  
  ○ Spanish: https://iris.paho.org/handle/10665.2/55628

• Tailoring Antimicrobial Resistance programmes (TAP) Toolbox  
https://apps.who.int/iris/handle/10665/341632 (EN, RU, GRE, GER, FR, SP)  
  ○ SP: https://iris.paho.org/handle/10665.2/55629

• Tailoring Antimicrobial Resistance programmes (TAP) Process Poster  
https://who.canto.global/v/l6NL4P771P/album/IB2K9?viewIndex=0 (EN, RU, GRE, GER, FR)

• El proceso de adaptacion de intervenciones a medida contra la resistencia a los antimicrobianos  
  ○ https://iris.paho.org/handle/10665.2/55627

• Handbook for Communication on the Rational Use of Antimicrobials for the Containment of Resistance  
  (ENG, SP) https://iris.paho.org/handle/10665.2/54995

• Africa Regional Strategy on Antimicrobial Resistance Communications and Advocacy (fao.org) (EN, FR)

• Wellcome Trust. Toolkit on communicating Antimicrobial Resistance  
https://wellcome.ac.uk/reports/reframing-antimicrobial-resistance-antibiotic-resistance


• The fight against Antimicrobial Resistance is significant for cancer prevention and treatment , EN,RU  
https://apps.who.int/iris/handle/10665/337511

• Stop the COVID-19 pandemic from becoming an AMR catastrophe (EN, RU)  
https://apps.who.int/iris/handle/10665/337513

• The fight against Antimicrobial Resistance with Evidence-informed policy-making (EN, RU)  
https://apps.who.int/iris/handle/10665/337527

• Food Safety and the fight against Antimicrobial Resistance (EN, RU)  
https://apps.who.int/iris/handle/10665/337525

• Immunization strengthens the fight against Antimicrobial Resistance (EN, RU)  
https://apps.who.int/iris/handle/10665/337523

• The fight against Antimicrobial Resistance supports efforts towards Better Labs for Better Health (EN, RU)  
https://apps.who.int/iris/handle/10665/337515

• The fight against Antimicrobial Resistance supports migrant health (EN, RU)  
https://apps.who.int/iris/handle/10665/337521
5. Surveillance resources

a) Antimicrobial resistance surveillance


- Global antimicrobial resistance surveillance system (GLASS) reports – all reports. GLASS Resource Centre (who.int)

- GLASS manual for antimicrobial resistance surveillance in common bacteria causing human infection (who.int)

- Methodological principles of nationally representative surveys as a platform for global surveillance of antimicrobial resistance in human bloodstream infections https://www.who.int/publications/i/item/9789240067004

- Antimicrobial Resistance in the WHO African Region: a systematic literature review https://apps.who.int/iris/handle/10665/349223

- Antimicrobial resistance surveillance in Europe 2023 – 2021 data https://www.who.int/europe/publications/i/item/9789289058537
• GLASS whole-genome sequencing for surveillance of antimicrobial resistance. Sept 2020
  https://www.who.int/publications/i/item/9789240011007

• GLASS guidance for national reference laboratories. Sept 2020
  https://www.who.int/publications/i/item/9789240010581

• GLASS method for estimating attributable mortality of antimicrobial resistant bloodstream infections.
  https://www.who.int/publications/i/item/9789240000650

• WHO integrated global surveillance on ESBL-producing E. coli using a “One Health” approach.
  Implementation and opportunities: 2021
  https://www.who.int/publications/i/item/9789240021402

• National antimicrobial resistance surveillance systems and participation in the Global Antimicrobial
  Resistance Surveillance System (GLASS): A guide to planning, implementation, and monitoring and
  evaluation  http://apps.who.int/iris/bitstream/10665/251554/1/WHO-DGO-AMR-2016.4-eng.pdf?ua=1

• Diagnostic stewardship: A guide to implementation in antimicrobial resistance surveillance sites
  http://apps.who.int/iris/bitstream/10665/251553/1/WHO-DGO-AMR-2016.3-eng.pdf?ua=1

• Emerging antimicrobial resistance reporting framework (GLASS-EAR).
  https://www.who.int/publications/i/item/9789241514590

• The detection and reporting of colistin resistance. 2nd edition: 2021
  https://apps.who.int/iris/bitstream/handle/10665/343654/9789240019041-eng.pdf

• Proof-of-principle antimicrobial resistance routine diagnostics surveillance project (PoP project): protocol:
  version 2.0: https://apps.who.int/iris/handle/10665/346076

• Molecular methods for antimicrobial resistance (AMR) diagnostics to enhance the Global Antimicrobial

• Global Antimicrobial Resistance Surveillance System (GLASS) early implementation protocol for the

• GLASS Resource Centre https://www.who.int/initiatives/glass/resource-centre

• Central Asian and European Surveillance of Antimicrobial Resistance CAESAR Manual Version 3, 2019 (EN,
  RU) https://apps.who.int/iris/handle/10665/346572

• Surveillance of Antimicrobial Resistance and Use - Information note of the Global Leaders Group on
  Antimicrobial Resistance
  ○ https://www.amrleaders.org/resources/m/item/surveillance-of-antimicrobial-resistance-and-use

• Surveillance of Bacterial Pneumonia and Meningitis in Children Aged Under 5 Years: Field Guide, 2nd ed.,
  PAHO: https://iris.paho.org/handle/10665.2/54637
• Procedimientos para el diagnóstico de Neumonías y Meningitis Bacterianas y la caracterización de cepas de Streptococcus pneumoniae y Haemophilus influenzae, 2nd ed., PAHO: https://www.paho.org/es/node/51879

• Enhanced Gonococcal Antimicrobial Surveillance Programme (EGASP): general protocol, WHO: https://www.who.int/publications/i/item/9789240021341

b) Antimicrobial consumption surveillance

• Global Antimicrobial Resistance and Use Surveillance System (GLASS) Dashboard: Global AMC data WHO GLASS Dashboard (shinyapps.io)

• Training on GLASS methodology for national surveillance of antimicrobial consumption. World Health Organization 2022. https://apps.who.int/iris/handle/10665/354258

• GLASS methodology for surveillance of national antimicrobial consumption, World Health Organization; 2020 (EN, FR) https://www.who.int/publications/i/item/9789240012639

• GLASS manual on the management of antimicrobial consumption data, World Health Organization; 2020 (EN, FR) https://www.who.int/publications/i/item/9789240010192

GLASS guide for national surveillance systems for monitoring antimicrobial consumption in hospitals, World Health Organization; 2020 https://apps.who.int/iris/handle/10665/336182 (EN, FR, POR, RU, SP)


• Antimicrobial consumption in the WHO Western Pacific Region: early implementation of the Western Pacific Regional Antimicrobial Consumption Surveillance System (WPRACSS) (2022): https://www.who.int/publications/i/item/9789290619543


• WHO Collaborating Centre for Drug Statistics Methodology: ATC/DDD Index 2023 https://www.whocc.no/atc_ddd_index/

• Introduction to drug utilization research (EN, RU) https://apps.who.int/iris/handle/10665/42627

6. Research

- WHO fungal priority pathogens list to guide research, development and public health action. 2022
  https://www.who.int/publications/i/item/9789240060241
- Global research agenda for antimicrobial resistance in human health. 2023
  https://www.who.int/publications/m/item/global-research-agenda-for-antimicrobial-resistance-in-human-health
- A one health priority research agenda for antimicrobial resistance. 2023
  https://apps.who.int/iris/handle/10665/370279

7. WHO laboratory strengthening tools

a) National policy and strategy

- Development of National Laboratory Policies: Best practices document and facilitators’ guide (EN, RU):
  https://apps.who.int/iris/handle/10665/355631
- Developing a national laboratory strategic plan: Best practices document and facilitators’ guide (EN, RU):
  https://apps.who.int/iris/handle/10665/353746

b) Quality management and assurance

- Laboratory quality management system: handbook (FR, RU, SP).
  https://www.who.int/publications/i/item/9789241548274
- Quality Manual template (EN, FR, RU, SP) https://www.who.int/publications/m/item/laboratory-quality-manual
- Quality assurance in bacteriology and immunology, 3rd ed., SEARO:
  https://apps.who.int/iris/handle/10665/205730
- LQMS training toolkit (EN, FR, RU) https://extranet.who.int/hslp/content/LQMS-training-toolkit
- Laboratory Quality Stepwise Implementation tool (FR, RU, SP, Turkish). https://extranet.who.int/lqsi/
c) Biosafety

- Laboratory Biosafety Manual, 4th edition
  https://www.who.int/publications/i/item/9789240011311

- Tuberculosis laboratory biosafety manual, WHO:
  https://www.who.int/publications/i/item/9789241504638

d) Tools and guidance

- Laboratory Assessment Tool
  2 tools: 1 to assess the system, 1 to assess the facility. (FR, RU, SP)
  https://www.who.int/publications/i/item/WHO-HSE-GCR-LYO-2012.2

- Manual of basic techniques for a health laboratory, 2nd ed, WHO:
  https://apps.who.int/iris/handle/10665/42295

- Maintenance manual for laboratory equipment, 2nd ed., WHO:
  https://www.who.int/publications/i/item/9789241596350

- Manual for the Laboratory Identification and Antimicrobial Susceptibility Testing of Bacterial Pathogens of Public Health Importance in the Developing World, WHO, CDC, USAID:
  https://apps.who.int/iris/handle/10665/68554

- Laboratory methods for the diagnosis of meningitis caused by Neisseria meningitidis, Streptococcus pneumoniae, and Haemophilus influenzae: WHO manual, 2nd ed:
  https://apps.who.int/iris/handle/10665/70765

- Microbiología: lo esencial y lo práctico, PAHO: https://iris.paho.org/handle/10665.2/51601

- Basic laboratory procedures in clinical bacteriology, 2nd ed. WHO:
  https://apps.who.int/iris/handle/10665/42696

- Guidelines on standard operating procedures for microbiology, SEARO:
  https://apps.who.int/iris/handle/10665/205200

- Laboratory diagnosis of sexually transmitted infections, including human immunodeficiency virus, WHO:
  https://apps.who.int/iris/rest/bitstreams/304701/retrieve

- Specimen collection and transport for microbiological investigation, EMRO:
  https://apps.who.int/iris/handle/10665/119529

- WHO laboratory manual for the diagnosis of diphtheria and other related infections:
  https://apps.who.int/iris/handle/10665/352275

- Laboratory manual for diagnosis of fungal opportunistic infections in HIV/AIDS patients, SEARO:
  https://apps.who.int/iris/handle/10665/205404

- Diagnostic stewardship: a guide to implementation in antimicrobial resistance surveillance sites:
  https://www.who.int/publications/i/item/WHO-DGO-AMR-2016.3
• Guidance on regulations for the Transport of Infectious Substances
  https://www.who.int/publications/i/item/9789240019720

• GLASS whole-genome sequencing for surveillance of antimicrobial resistance
  https://www.who.int/publications/i/item/9789240011007

• GLASS guidance for national reference laboratories
  https://www.who.int/publications/i/item/9789240010581

• Molecular methods for antimicrobial resistance diagnostics to enhance the GLASS
  https://www.who.int/publications/i/item/WHO-WSI-AMR-2019.1

• GLASS: the detection and reporting of colistin resistance, 2\textsuperscript{nd} ed.

8. Prevention of Infection

a) Infection prevention and control (IPC) resources

WHO IPC home page https://www.who.int/teams/integrated-health-services/infection-prevention-control

This page provides resources on

• Hand hygiene
• Core components
• AMR
• Surgical site infection
• Injection safety
• Sepsis
• Basic IPC and primary care

Newest publications are highlighted on this page

• WHO Global Strategy for Infection Prevention and Control

• E-learning courses are found on the IPC channel on OpenWHO: https://openwho.org/channels/ipc

• Global report on infection prevention and control https://www.who.int/publications/i/item/9764

• WHO Global report on infection prevention and control: executive summary (EN, FR)
• Understanding accelerators and overcoming barriers - the journey for developing or adapting an infection prevention and control guideline, 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)

Key documents on this page include:

• Guidelines for the prevention and control of carbapenem-resistant Enterobacteriaceae, Acinetobacter baumanii and Pseudomonas aeruginosa in health-care facilities. https://www.who.int/teams/integrated-health-services/infection-prevention-control/ipc-and-antimicrobial-resistance

• Implementation manual to prevent and control the spread of carbapenem-resistant organisms at the national and health care facility level. https://apps.who.int/iris/bitstream/handle/10665/312226/WHO-UHC-SDS-2019.6-eng.pdf?ua=1

Of interest related to this topic are the following courses on OpenWHO:

• Catheter-associated urinary tract infections https://openwho.org/courses/IPC-CAUTI-EN and
• Bloodstream infections https://openwho.org/courses/BSI-EN

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.

OpenWHO online course, Standard precautions: Hand hygiene: https://openwho.org/courses/IPC-HH-en

My 5 Moments for Hand Hygiene game: https://5mgame.lxp.academy.who.int/

Guidelines and evidence

• WHO guidelines on hand hygiene in health care h
• 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 and the “My Five Moments for Hand Hygiene” approach https://www.who.int/publications/i/item/9789241503372
Implementation Tools

- A guide to the implementation of the WHO multimodal hand hygiene improvement strategy https://www.who.int/publications/i/item/a-guide-to-the-implementation-of-the-who-multimodal-hand-hygiene-improvement-strategy
- Hand hygiene for all initiative: improving access and behavior in health care facilities https://www.who.int/publications/i/item/9789240011618

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 handrubbing and handwashing.

Monitoring tools - resources to support evaluation of hand hygiene practices among health-care workers.

IPC Core Components

- WHO Minimum requirements for infection prevention and control programmes https://www.who.int/publications/i/item/9789241516945
- WHO Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level (also available for download in Spanish). https://www.who.int/publications/i/item/9789241549929

There are several courses on the IPC channel of OpenWHO accessible here: https://openwho.org/channels/ipc. Of specific interest on the topic of core components is IPC core components and multimodal strategies: https://openwho.org/courses/IPC-CC-MMIS-EN

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:

- Global guidelines for the prevention of surgical site infection
- Implementation manual to support the prevention of surgical site infections at the facility level: turning recommendations into practice https://www.who.int/publications/i/item/WHO-HIS-SDS-2018-18
- Decontamination and reprocessing of medical devices for health-care facilities https://www.who.int/publications/i/item/9789241549851
The Surgical site infections online course is also available on OpenWHO Surgical site infections | OpenWHO

Injection safety

Several injection safety resources are available here, including guidelines, a toolkit, videos and leaflets.

OpenWHO online course, Standard precautions: Injection safety and needle-stick injury management (EN, RU) https://openwho.org/courses/IPC-IS-EN

Sepsis

There are several links to relevant sepsis resources available here, including the Global report on the epidemiology and burden of sepsis https://www.who.int/publications/i/item/9789240010789

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
- Strengthening infection prevention and control in primary care: A collection of existing standards, measurement and implementation resources https://www.who.int/publications/i/item/9789240035249

Monitoring/Assessment tools

- National infection Prevention and Control Assessment tool 2 (IPCAT2), https://iris.who.int/handle/10665/330078
- Infection Prevention and Control Assessment Framework (IPCAF), https://apps.who.int/iris/handle/10665/330072
- Assessment tool of the minimum requirements for infection prevention and control programmes at the national level, https://www.who.int/publications/m/item/assessment-tool-of-the-minimum-requirements-for-infection-prevention-and-control-programmes-at-the-national-level
- Assessment tool on IPC minimum requirements for primary health care facilities, https://www.who.int/publications/i/item/WHO-UHL-IHS-IPC-2023.2
• International Health Regulations (2005): state party self-assessment annual reporting tool, 2nd ed. [9789240040120-eng.pdf (who.int)]


Additional IPC and AMR resources:

• Environmental cleaning and infection prevention and control in health care facilities in low- and middle-income countries, 2023
  - Trainers guide [https://www.who.int/publications/i/item/9789240051041](https://www.who.int/publications/i/item/9789240051041)
  - Modules and resources [https://www.who.int/publications/i/item/9789240051065](https://www.who.int/publications/i/item/9789240051065)

• Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the national level, [https://apps.who.int/iris/handle/10665/345251](https://apps.who.int/iris/handle/10665/345251)

• Responding to Outbreaks of Antimicrobial-resistant Pathogens in Health-care Facilities: Guidance for the Western Pacific Region [https://apps.who.int/iris/handle/10665/363498](https://apps.who.int/iris/handle/10665/363498)

• Responding to Outbreaks of Antimicrobial-resistant Pathogens in Health-care Facilities: Guidance for the Western Pacific Region (EN, CHN) [https://apps.who.int/iris/handle/10665/363498](https://apps.who.int/iris/handle/10665/363498)

• Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the health care facility level, [https://apps.who.int/iris/handle/10665/361522](https://apps.who.int/iris/handle/10665/361522)

• IPC for AMR advocacy document: The essential role of IPC to curb AMR, aimed at health policy decision-makers [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)

• Infection prevention and control: guidance to action tools. World Health Organization. Regional Office for Europe. [https://apps.who.int/iris/handle/10665/341107](https://apps.who.int/iris/handle/10665/341107)


• OpenWHO  IPC channel [https://openwho.org/channels/ipc](https://openwho.org/channels/ipc)
b) Water, sanitation & hygiene (WASH) resources

Webpages

- WHO Water sanitation hygiene webpage: [https://www.who.int/health-topics/water-sanitation-and-hygiene-wash](https://www.who.int/health-topics/water-sanitation-and-hygiene-wash)
- WASHFIT portal: [https://washinhcf.org/wash-fit/](https://washinhcf.org/wash-fit/)

Standards and guidelines

- WHO/FAO/WOA (formerly OIE), 2020. Technical brief on water, sanitation, hygiene and wastewater management to prevent infections and reduce the spread of antimicrobial resistance. [https://www.who.int/publications/i/item/9789240006416](https://www.who.int/publications/i/item/9789240006416)
- WHO, 2020. Achieving quality health services for all, through better water, sanitation and hygiene: Lessons from three African countries [https://www.who.int/publications/i/item/9789240009493](https://www.who.int/publications/i/item/9789240009493)
- WHO 2018. Guidelines on sanitation and health [AR, EN, FR, RU, SP] [https://www.who.int/publications/i/item/9789241514705](https://www.who.int/publications/i/item/9789241514705)
- Overview of technologies for the treatment of infectious and sharp waste from health care facilities [AR, EN, FR, SP] [https://www.who.int/publications/i/item/9789241516228](https://www.who.int/publications/i/item/9789241516228)

Monitoring

- WHO/UNICEF 2023 Water, sanitation, hygiene, waste and electricity services in health care facilities: progress on the fundamentals https://www.who.int/publications/i/item/9789240075085

Tools

- WASH FIT Fact Sheets | WASH in Health Care Facilities (washinhcf.org)
- A field guide to improving small drinking-water supplies: water safety planning for rural communities (who.int) (EN, RU)
- Water, sanitation and hygiene in health-care facilities: a practical tool for situation assessment and improvement planning (who.int) (EN, RU)
c) Immunization resources

- Global and regional burden of attributable and associated bacterial antimicrobial resistance avertable by vaccination: modelling study [Global and regional burden of attributable and associated bacterial antimicrobial resistance avertable by vaccination: modelling study](bmj.com)
- Bacterial vaccines in clinical and preclinical development 2021. [https://www.who.int/publications/i/item/9789240052451](https://www.who.int/publications/i/item/9789240052451)
- Immunization Agenda 2030. [https://www.immunizationagenda2030.org/](https://www.immunizationagenda2030.org/)
- WHO Immunization dashboard. [https://immunizationdata.who.int/](https://immunizationdata.who.int/)
- WHO. (2019). Intervention guidebook for implementing and monitoring activities to reduce missed opportunities for vaccination. [https://www.who.int/publications/i/item/9789241516310](https://www.who.int/publications/i/item/9789241516310)
- WHO repository of recommendations for use of vaccines: [https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/position-papers](https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/position-papers)

9. Optimize the use of antimicrobial medicines

a) Antimicrobial selection

WHO Model List of Essential Medicines for children – 9th list, 2023 [WHO EMLc 9th List (2023)]


Exposure to World Health Organization's AWaRe antibiotics and isolation of multidrug resistant bacteria: a systematic review and meta-analysis. [https://www.sciencedirect.com/science/article/pii/S1198743X22001537]

b) Antimicrobial stewardship

- The WHO AWaRe (access, watch, reserve) antibiotic book: [https://apps.who.int/iris/handle/10665/365237]
- Infographics: [https://apps.who.int/iris/handle/10665/365135]
- Mobile App: [WHO AWaRe Antibiotic Book (firstline.org)]
- AWaRe classification of antibiotics for evaluation and monitoring of use, 2023 [who.int]
- [WHO’s AWaRe Framework WHO Antibiotics Portal (essentialmeds.org)]
- WHO policy guidance on integrated antimicrobial stewardship activities (2021) [https://www.who.int/publications/i/item/9789240025530]
- Online course: WHO Policy Guidance on Integrated Antimicrobial Stewardship Activities. [https://openwho.org/courses/policy-guidance-on-AMS]
- Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries: a WHO practical toolkit. WHO 2019. (AR, EN, FR, RU, SP) [https://www.who.int/publications/i/item/9789241515481]
- Online course: WHO practical toolkit for antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries. [https://openwho.org/courses/practical-toolkit-for-AMS]
- Virtual Antimicrobial Stewardship Escape Room Game [https://www.biomerieuxer.com]
- Antimicrobial stewardship interventions: a practical guide. WHO Regional Office for Europe 2021 [https://apps.who.int/iris/bitstream/handle/10665/340709/9789289054980-eng.pdf]
• WHO EURO online course “Antimicrobial Stewardship: A competency-based approach” (EN, FR, IT, RU, SP) https://openwho.org/courses/AMR-competency.


• EVIPNet evidence brief for policy: tackling antimicrobial resistance in primary health care through promoting the appropriate use of antibiotics Estonia https://apps.who.int/iris/handle/10665/351528

• WHO 2018. Methods to analyse medicine utilization and expenditure to support pharmaceutical policy implementation (EN, RU) https://apps.who.int/iris/handle/10665/274282


• 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)

• WHO 2021. The selection and use of essential in vitro diagnostics - TRS 1031 https://www.who.int/publications/i/item/9789240019102

**c) Substandard and falsified medical products**

• The WHO Member State mechanism on substandard and falsified medical products https://www.who.int/publications/i/item/WHO-MHP-RPQ-REG-2022.01

• WHO global surveillance and monitoring system https://www.who.int/publications/i/item/9789241513425

• iLearn resources
  - Training on substandard/falsified (SF) medical products, Module 1: Introduction & overview
  - Training on substandard/falsified (SF) medical products, Module 2: Responding to incidents
d) Quality of antimicrobials

- Operational principles for good pharmaceutical procurement (EN, FR, SP)  
  https://apps.who.int/iris/handle/10665/66251
- Model quality assurance system for procurement agencies  
  https://apps.who.int/iris/handle/10665/69721
- TRS 1025 - Annex 7: Good storage and distribution practices for medical products (EN, FR)  
  o  https://www.who.int/publications/m/item/trs-1025-annex-7
- TRS 961 - Annex 10: Procedure for prequalification of pharmaceutical products  
  a.  https://www.who.int/publications/m/item/annex-10-trs-961

e) Resources specific to Latin America

- El acceso a los medicamentos de alto costo en las Americas(2009)  
- El acceso y uso racional de los medicamentos y otras TS estrategicos de alto costo (2016)  
- Lista de productos del Fondo Estratégico (EN, SP)  https://www.paho.org/en/node/58472

10. Monitoring

- Tracking AMR Country Self-Assessment Survey (TrACSS) 2023 results
- TrACSS 2022 country reports
- Guidance to facilitate monitoring and evaluation for antimicrobial resistance national action plans (who.int)
- Tripartite Monitoring and Evaluation (M&E) framework for the Global Action Plan on Antimicrobial Resistance, with Methodology sheets for recommended indicator  
11. One Health


- Strategic framework for collaboration on antimicrobial resistance. Together for One Health [https://www.who.int/publications/i/item/9789240045408](https://www.who.int/publications/i/item/9789240045408)

- Global Leaders Group on Antimicrobial Resistance [https://www.amrleaders.org](https://www.amrleaders.org)
  - A pocket guide for ministers across sectors. [https://www.amrleaders.org/resources/m/item/pocket-guide](https://www.amrleaders.org/resources/m/item/pocket-guide)


- Animal Health and Welfare and Antimicrobial Resistance and Use (amrleaders.org)

- Implementation of WOAH standards: the Observatory Annual Report, First edition 2022

- The Lancet Series on One Health and Global Health Security


Food safety & zoonotic diseases


• Guidelines on Integrated Monitoring and Surveillance of Foodborne antimicrobial resistance (2021)  
  https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252Fstandards%252FCXG%252F2021%252FCXG_94e.pdf


• WHO guidelines on use of medically important antimicrobials in food-producing animals, Nov 2017  
  Executive summary in AR, CH, EN, FR, RU, SP.  
  Policy brief in AR, CH, EN, FR, RU, SP.  
  https://www.who.int/publications/i/item/9789241550130

• AGISAR guidance for integrated surveillance of AMR in foodborne bacteria: Application of a One Health approach, 2017.  
  http://apps.who.int/iris/bitstream/10665/255747/1/9789241512411-eng.pdf?ua=1

12. Environment

• Antimicrobial Resistance in the Environment Webinar Series  
  https://www.unep.org/events/webinar/antimicrobial-resistance-environment-webinar-series

• Technical brief on water, sanitation, hygiene (WASH) and wastewater management to prevent infections and reduce the spread of antimicrobial resistance (AMR) (who.int)

• Call to action by the Global Leaders Group on Antimicrobial Resistance on reducing antimicrobial discharges from food systems, manufacturing facilities and human health systems into the environment ( Available in AR, CH, EN, FR, RU, SP)  

• Bracing for Superbugs: Strengthening environmental action in the One Health response to antimicrobial resistance. 2023  
  https://www.unep.org/resources/superbugs/environmental-action

• Summary for Policymakers - Environmental dimensions of antimicrobial resistance  

13. AMR and broader initiatives

• Antimicrobial Resistance and the Climate Crisis - Information note of the Global Leaders Group on Antimicrobial Resistance (AR, CH, EN, FR, RU, SP)  
  https://www.amrleaders.org/resources/m/item/antimicrobial-resistance-and-the-climate-crisis

• TB, HIV, malaria and neglected tropical diseases: Strengthening collaboration to prevent and manage

• Antimicrobial resistance and primary health care. Technical series on primary health care brief on the
  occasion of the Global Conference on Primary Health Care.
  https://apps.who.int/iris/handle/10665/326454?search-result=true&query=primary+health+care&scope=&rpp=10&sort_by=score&order=desc
  ○ Short version: http://www.who.int/docs/default-source/primary-health-care-conference/amr.pdf?sfvrsn=8817d5ba_2

14. Other

• WHO AMR Division online AMR Community Exchange platform. Register at amrcommunityexchange.org

• Global Antibiotic Research & Development Partnership (GARDP) Antimicrobial
  Encyclopaedia https://revive.gardp.org/resources/encyclopaedia/

• ReAct ToolBox https://www.reactgroup.org/toolbox/

• CIDRAP Antimicrobial Stewardship Project Newsletter. Subscribe here
  http://www.cidrap.umn.edu/newsletter

• 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

• Gulf–Middle East–North Africa Educational Collaborative on Antimicrobial Stewardship: a network
  that hosts a discussion forum and a collection of resources. http://mena-ams.com/

• Open University/Fleming Fund Online learning: Tackling Antimicrobial Resistance Courses.

• British Society for Antimicrobial Chemotherapy (BSAC), including GASPH. https://bsac.org.uk/
Any queries contact Breeda HICKEY at amrspe@who.int