Global antibiotic resistance surveillance report 2025

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Abbreviations

AMR	antimicrobial (or antibiotic) resistance
AMU	antimicrobial (or antibiotic) use
AST	antimicrobial (or antibiotic) susceptibility testing
AWaRe	Access, Watch, Reserve antibiotics
CrI	credible interval
ESBL	extended-spectrum beta-lactamase
GLASS	Global Antimicrobial Resistance and Use Surveillance System
LMIC	low- and middle-income countries
MRSA	methicillin-resistant *Staphylococcus aureus*
SDG	Sustainable Development Goal
UHC	universal health coverage
WHO	World Health Organization

Summary

At a glance

1. Country participation in the World Health Organization's *Global Antimicrobial Resistance and Use Surveillance System* has increased four-fold since 2016, although regional gaps persist.
2. Global levels of antibiotic resistance are high and unevenly distributed across regions.
3. Increasing antibiotic resistance trends in Gram-negative bacterial pathogens pose a growing threat.
4. Countries with limited surveillance often report higher levels of antibiotic resistance.
5. Antibiotic resistance disproportionately affects low- and middle-income countries and countries with weak health systems.

Eniyoha had been abandoned. She had sepsis. The first antibiotics the doctors tried didn't work, so they attempted even stronger drugs. Her parents left her at the hospital after they were asked to pay the bill. Babies like Eniyoha rely on nurses like Ibezim to survive.

Introduction

Antimicrobial resistance (AMR) is compromising the effectiveness of life-saving treatments, posing a serious, growing threat to global health and undermining the foundations of modern medicine. In response, World Health Organization (WHO) established the Global Antimicrobial Resistance and Use Surveillance System (GLASS) to strengthen evidence on AMR through standardized data collection, analysis, sharing and reporting. Launched in 2015 to monitor AMR and extended in 2020 to include antimicrobial use (AMU), the system receives data on AMR from the human health sector on infections of both hospital and community origin.

This report is based on over 23 million bacteriologically confirmed infections reported by 104 countries. Statistical modelling was used to generate adjusted estimates of resistance to 22 antibiotics used to treat eight common bacterial pathogens (*Acinetobacter* spp., *Escherichia coli*, *Klebsiella pneumoniae*, *Neisseria gonorrhoeae*, non-typhoidal *Salmonella* spp., *Shigella* spp., *Staphylococcus aureus* and *Streptococcus pneumoniae*). These pathogens are responsible for four types of infection under surveillance in GLASS – bloodstream, gastrointestinal, urinary tract and urogenital gonorrhoea – resulting in 93 infection type–pathogen–antibiotic combinations. The modelled estimates account for national differences in population structure and surveillance coverage and also for the distribution of AMR among patient groups over time, providing a reliable picture of resistance at national, regional and global levels.

To assess the maturity of AMR surveillance systems, this report includes examination of whether national AMR surveillance coverage has improved over time in different world regions and introduces a scoring framework to evaluate the completeness of data reported to GLASS. When reported in full, such data provide a comprehensive picture of a country's surveillance system, comprising alignment with core system components, the extent of health system coverage and the representativeness of AMR data. The scores also capture the availability and volume of AMR data for each infection type–pathogen–antibiotic combination and whether relevant patient demographic, clinical and epidemiological details were available, which improve interpretation of national estimates of resistance.

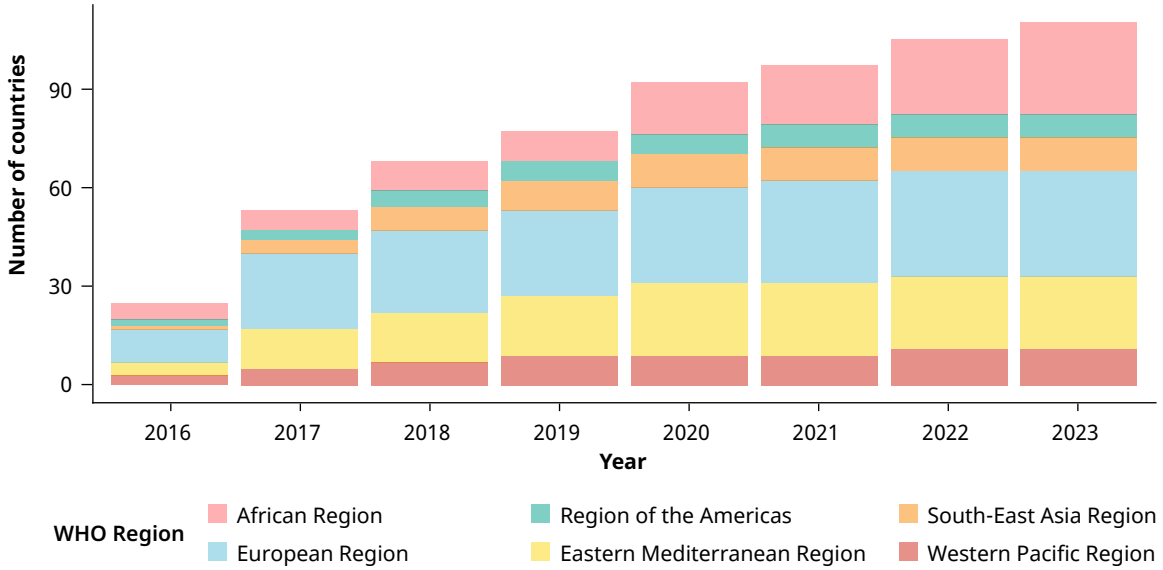
The findings are concerning. Resistance to essential antibiotics – particularly among Gram-negative bacteria – is widespread, increasing and unevenly distributed. The effectiveness of first-choice treatments for common infections of the bloodstream, urinary tract and gastrointestinal tract is increasingly compromised. The burden is highest in low- and middle-income countries (LMICs), where coverage of AMR surveillance and microbiological diagnostic capacity and access to effective alternative treatment may be limited, resulting in a syndemic of resistance and weak health systems that disproportionately impacts the most vulnerable populations.

Key findings

1. Country participation in GLASS has increased four-fold since 2016, but regional gaps persist.

Since 2016, 110 countries, including three territories and areas, have submitted AMR data to GLASS. In 2023, 104 countries reported data, an increase of over 300% compared to the 25 countries that reported in 2016, the first year of data collection (Fig. 1). GLASS has now reached a level of maturity that allows generation of global estimates. The upward trend reflects increased awareness in countries of the value of sharing data from AMR surveillance as a common public health good. Despite progress, major gaps remain. In 2023, participation among Member States was lowest in the Region of the Americas (20.0%, 7 of 35 countries) and the Western Pacific Region (37.0%, 10 of 27 countries), and only slightly over half of countries in the African (57.4%, 27 of 47 countries) and European (58.5%, 31 of 53 countries) regions reported data to GLASS. Participation was highest in the South-East Asia (90.9%, 10 of 11 countries) and Eastern Mediterranean (76.2%, 16 of 21 countries) regions.

Figure 1. Numbers of countries that reported AMR data to GLASS, by WHO region, 2016–2023[1]



Numbers of countries include three territories and areas

Contribution to global efforts on AMR surveillance has been steadily growing since 2016. By the end of 2024, 130 countries, including three territories and areas, were enrolled in GLASS. Of these, 104 countries, covering over 70% of the world's population, reported AMR data for 2023 – a more than 300% increase from only 25 countries in 2016.

National AMR surveillance coverage has also increased. Between 2016 and 2023, the number of infections with antimicrobial susceptibility test (AST) results reported to WHO per million population rose globally for three of the four infection types. National AMR surveillance data pointed to an annual median increase in AST reports for urinary tract infections of 26.0% (95% credible interval [CrI]: 17.3, 35.4), bloodstream infections of 20.0% (13.4, 26.8) and gastrointestinal infections of 11.4% (3.0, 20.4). These increases suggest that more countries are either conducting AST more frequently in routine clinical care or extending surveillance to additional health-care facilities.

Progress nevertheless remains uneven. GLASS coverage of urogenital gonorrhoea remained low in 2023. Global AMR estimates are vulnerable to bias because of differences in regional reporting. In addition, more than half of the reporting countries still lack the basic infrastructure necessary to generate reliable, comprehensive AMR data, posing a challenge to global monitoring of AMR. Only 46.2% (48 of 104) of countries reported that they had all WHO-recommended core components of a robust national surveillance system, including quality assurance for both a national reference laboratory and the broader surveillance laboratory network as well as adherence to international AST standards. The overall global score for national data completeness was only 53.8% among the 104 countries that reported AMR data in 2023, reflecting ongoing challenges in capturing the full scope and context of AMR. In addition, large parts of sub-Saharan Africa, Central Asia and Latin America still report limited or no data to GLASS, leaving major gaps in regional coverage and indicating persistent inequity in access to diagnostics.

Extension of surveillance coverage is an achievement that reflects growing global commitment to addressing AMR. To sustain this progress and to ensure that surveillance data are used in forming evidence-based policies,

[1]In accordance with resolution *WHA78.25* (2025), Indonesia was reassigned to the WHO Western Pacific Region as of 27 May 2025. The data analysis for this report was completed prior to the reassignment; therefore, Indonesia is included in the South-East Asia Region in all analyses and reporting presented herein.

countries must reinforce their surveillance systems to make them more representative. These include sustained investment in high-quality, comprehensive digital infrastructure for reliable data collection, management and reporting. Strengthening electronic systems will ensure that AMR surveillance can guide timely public health action.

2. Global resistance is extensive, with wide regional variations.

In 2023, approximately one in six laboratory-confirmed bacterial infections worldwide were caused by bacteria resistant to antibiotics. Median resistance was most common in urinary tract infections (approximately 1 in 3) and bloodstream infections (1 in 6) and less so in gastrointestinal (1 in 15) and urogenital gonorrhoeal infections (1 in 125). Resistance was most frequent in the South-East Asia and Eastern Mediterranean regions (almost 1 in 3 infections), followed by the African Region (1 in 5), all above the global median (Fig. 2). Resistance was less frequent in the European Region (1 in 10) and least frequent in the Western Pacific Region (1 in 11), indicating wide regional disparity.

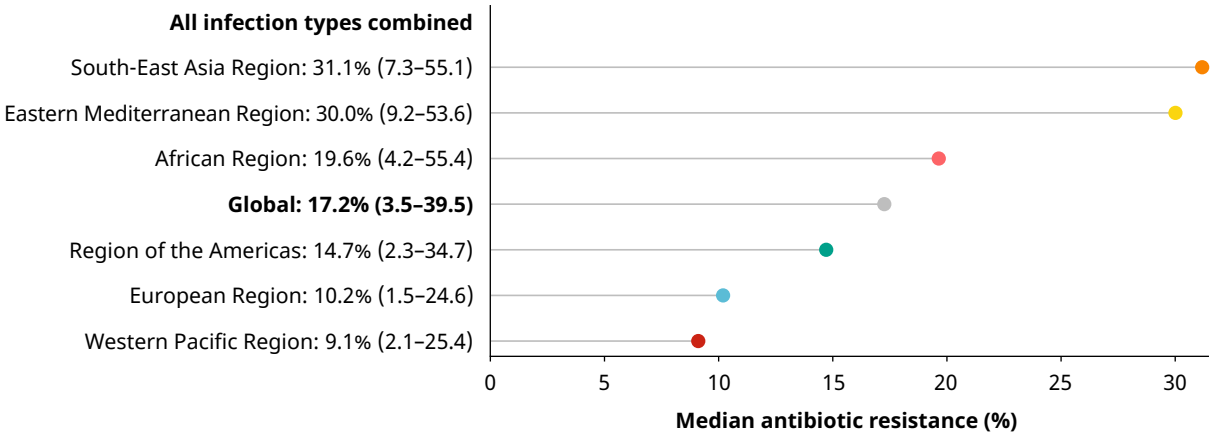
Analysis of the extent of resistance in 93 infection type–pathogen–antibiotic combinations indicates a global pattern of AMR characterized by widespread resistance to essential first-choice, second-choice and last-resort antibiotics, but with substantial variation among pathogens and regions.

In bloodstream infections, the most frequently reported drug-resistant pathogens globally were Gram-negative bacteria such as *E. coli* and *K. pneumoniae* resistant to fluoroquinolones and third-generation cephalosporins. Resistance to third-generation cephalosporins was reported in 44.8% (95% CrI: 39.3, 50.4) of infections with *E. coli* and 55.2% (48.5, 61.7) of those with *K. pneumoniae*. In the African Region, the extent of resistance was especially concerning, exceeding 70% for both pathogens.

Global resistance to essential broad-spectrum "Watch" antibiotics such as carbapenems was 54.3% (49.3, 59.2) in *Acinetobacter* spp., while, in the South-East Asia Region, the frequency of resistance of *K. pneumoniae* bloodstream infections to carbapenems reached 41.2% (30.3, 53.1).

Methicillin-resistant S. *aureus* (MRSA) remains a problem, with a global level of resistance in bloodstream infections of 27.1% (23.5, 31.0), highest in the Eastern Mediterranean Region at

Figure 2. Median AMR in 93 infection type–bacterial pathogen–antibiotic combinations, by WHO region, 2023



The median and interquartile ranges are useful summaries for comparing the percentage of resistance among regions, but they do not reflect the full variation in resistance in specific infection–pathogen–antibiotic combinations. For example, for urogenital gonorrhoea, the level of global resistance to four of the six commonly used antibiotics, including ceftriaxone (0.3%), is low (< 1.0%), but it is much higher to azithromycin (12.6%) and ciprofloxacin (75.0%).

Bilal, 22, has just been discharged from hospital after a bout of drug-resistant typhoid. Doctors said that typhoid was once an illness that you could cure with pills but is now leading to hospital admissions. Bilal's typhoid could be treated only with an antibiotic called meropenem, which is reserved for the most serious infections. It is also expensive – and it sold at a price families like his struggle to afford.

50.3% (39.8, 60.8). The percentage resistance of non-typhoidal *Salmonella* spp. in bloodstream infections to ciprofloxacin was 18.0% (13.9, 22.9) globally, highest in the European Region, at 36.2% (29.0, 44.2).

In gastrointestinal infections, resistance to fluoroquinolones in *Shigella* spp. was widespread globally, at 29.7% (22.9, 37.5), reaching 75.5% (58.1, 87.3) in the South-East Asia Region.

In urinary tract infections caused by *E. coli and K. pneumoniae*, resistance to commonly used antibiotics, including third-generation cephalosporins, fluoroquinoloes and co-trimoxazole was typically higher than 30% globally.

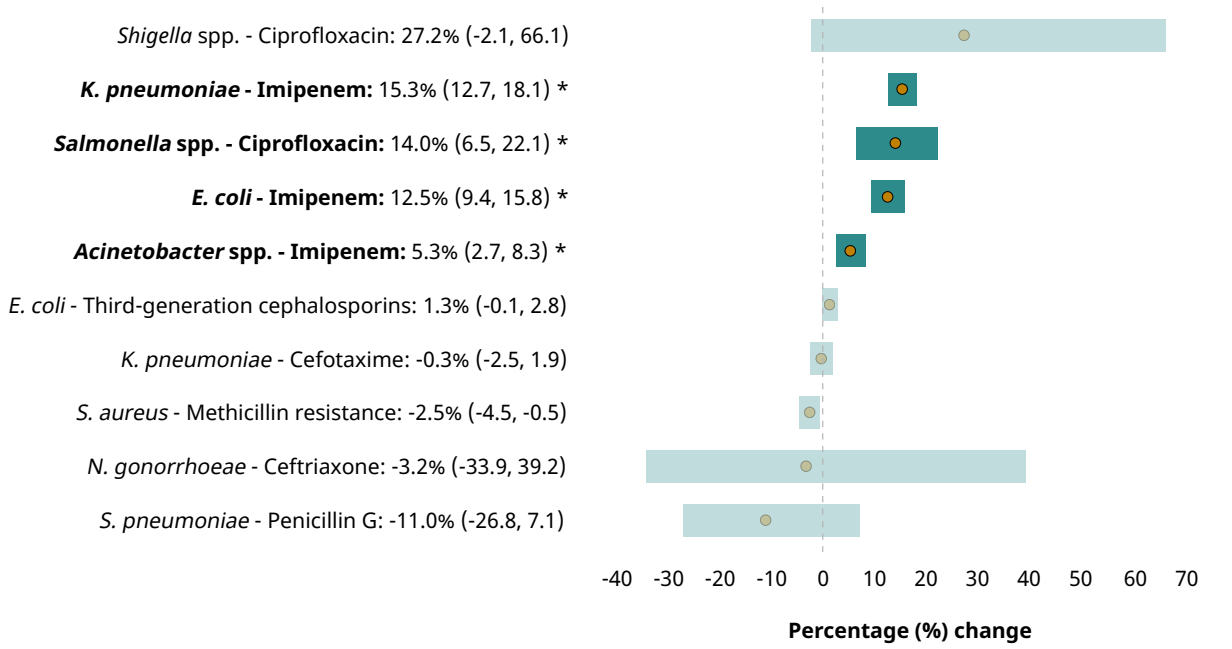
Fluoroquinolone resistance in *N. gonorrhoeae* was almost universal, at 75.0% (70.9, 78.8) globally. Although the level of resistance to ceftriaxone remained low, at 0.3% (0.1, 0.6), its emergence, particularly in the Eastern Mediterranean Region (2.5%, 0.8, 7.7), threatens the last effective empirical treatment for gonorrhoea.

A systematic review of peer-reviewed literature conducted for this report corroborated the high resistance observed in GLASS. Published studies often reported resistance levels that are even higher than those found in AMR surveillance data, probably reflecting a bias towards data collected in tertiary hospitals.

3. Trends in AMR indicate an increasing threat from Gram-negative bacterial pathogens.

AMR has increased in 40% of the pathogen–antibiotic combinations monitored for global temporal trends between 2018 and 2023, with annual relative increases ranging from 5% to 15%, depending on the combination (Fig. 3). Resistance to "Watch" antibiotics in the AWaRe (Access, Watch, Reserve antibiotics) system *(1)* – particularly carbapenems and fluoroquinolones – is increasing among key Gram-negative pathogens, including *Acinetobacter* spp., *E. coli, K. pneumoniae and Salmonella* spp. This is a concern, as these antibiotics are essential for the treatment of severe infections. Rising AMR is limiting empirical therapeutic choices and driving a shift from oral to intravenous treatments, including greater reliance on second-choice and last-resort antibiotics.

Figure 3. Trends of AMR: median annual change in percentage, 2018–2023



Population-weighted median annual percentage change in AMR between 2018 and 2023, represented by a dot, with 95% CrI. An asterisk (*) indicates a statistically meaningful trend. When trends were available for several infection types, only that with the highest annual percentage change is shown in the figure.

The frequency of resistance to carbapenems is increasing among the three leading Gram-negative pathogens responsible for serious bloodstream infections: *E. coli, K. pneumoniae* and *Acinetobacter* spp. At the same time, resistance to fluoroquinolones in non-typhoidal *Salmonella* spp. is increasing in frequency globally.

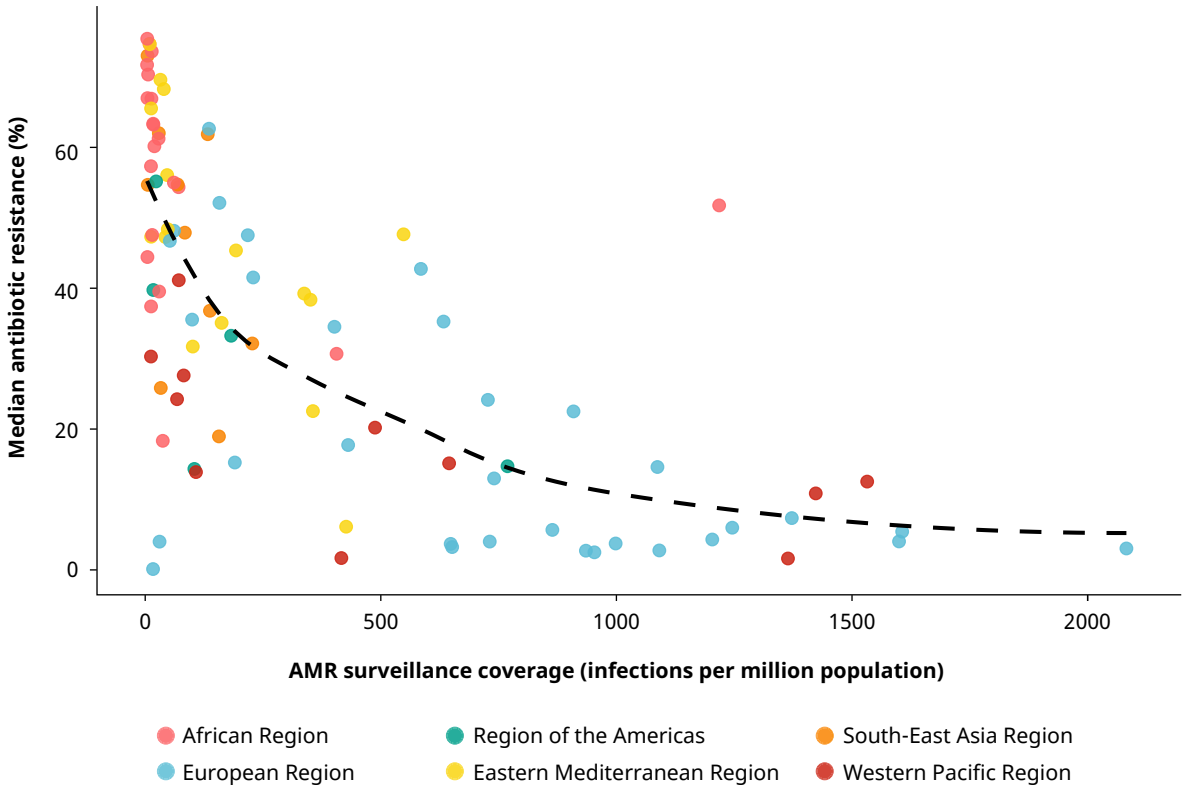
Many drug-resistant pathogens are associated with severe clinical outcomes and limited therapeutic options. Some, such as carbapenem-resistant *K. pneumoniae* and *Acinetobacter* spp., are associated with high fatality, exceeding 30% *(2)*. Others, including third-generation cephalosporin-resistant *E. coli* and MRSA, are characterized by high incidence and morbidity, with more than 10 000 cases and 1.5 years lived with disability per million population *(2).*

The treatability of infections by many of these resistant pathogens, including carbapenem-resistant *Acinetobacter* spp. and carbapenem-resistant *E. coli*, remains low to moderately low *(2).* Prevention of these infections is often difficult. Infections with fluoroquinolone-resistant non-typhoidal *Salmonella* spp. are particularly challenging to control due to widespread transmission. Meanwhile, the antibiotic development pipeline remains weak and is unlikely to deliver effective alternatives in the near future for several of the most pressing threats *(2).*

4. Settings with lower AMR surveillance coverage report higher levels of AMR.

The frequency of AMR is highest in countries with low surveillance coverage. In fact, there is a strong inverse correlation between a country's AMR surveillance coverage and its reported median AMR (Pearson correlation coefficient, r = –0.74, P < 0.0001, Fig. 4). This pattern may reflect both genuinely higher resistance in settings with limited national surveillance capacity, possibly paired with poor clinical practices, weak public health interventions and biases in the data, such as selective sampling in tertiary hospitals or of severe cases only.

Figure 4. Median national percentage of AMR in bloodstream infections by AMR surveillance coverage, 2023



The figure presents the relation, for each of 95 countries, between the median percentage resistance of all bacterial pathogen–antibiotic combinations reported for bloodstream infections and the number of infections for which AST results were reported per million population.

The relation between AMR surveillance coverage and reported resistance levels is shaped by both epidemiological realities and systemic limitations. In countries with limited surveillance infrastructure, data on resistance are often derived from a small number of tertiary hospitals, where patients typically present with more severe infections, multiple treatment failures, or treatment-resistant pathogens. This sampling bias can lead to overestimates of prevalence and limit the generalizability of findings to the broader population, thereby reducing the utility of AMR surveillance data for guiding national and global empirical treatment.

Insufficient diagnostic capacity limits both the generation of representative, reliable data on resistance, and the implementation of evidence-based infection prevention, control, and antibiotic stewardship. In sub-Saharan Africa, only 1.3% of clinical laboratories are designated to perform bacteriological testing and, of those, only 18% have access to automated AST systems *(3)*. Molecular diagnostics, which are essential for detecting resistance mechanisms and can help guide appropriate use of antibiotics, are largely inaccessible in many low-resource settings. In the absence of diagnostic infrastructure to assess bacterial susceptibility to antibiotics, clinicians must rely solely on empirical treatment, which may not align with individual or local resistance patterns. This diagnostic gap not only increases the risk of inappropriate prescribing and treatment failure but also undermines surveillance by reducing the accuracy and representativeness of data on resistance. Consequently, essential broad-spectrum “Watch” antibiotics such as carbapenems – intended exclusively for severe, hard-to-treat infections caused by multidrug-resistant pathogens and requiring careful monitoring to prevent overuse – are often used

as a precautionary measure to compensate for gaps in diagnostic and surveillance capacity, despite uncertainty about their efficacy and safety in such contexts. Addressing these challenges requires investment in both diagnostic capacity and surveillance systems to ensure that data on resistance are both actionable and reflect real-world clinical settings.

5. Antibiotic resistance disproportionately affects LMICs and fragile health systems, forming a syndemic.

Socioeconomic factors and the strength of health systems are key determinants of the AMR burden, with the frequency of AMR increasing when health systems are weaker. In fact, there was a strong inverse correlation between the universal health coverage (UHC) service coverage index *(4)* (a measure of access to essential health services), income classification, and the median percentage of AMR in bloodstream infections (Pearson r = -0.77, P <0.0001, Fig. 5). This pattern points to a syndemic, in which AMR disproportionately affects countries with weaker health systems and lower income levels.

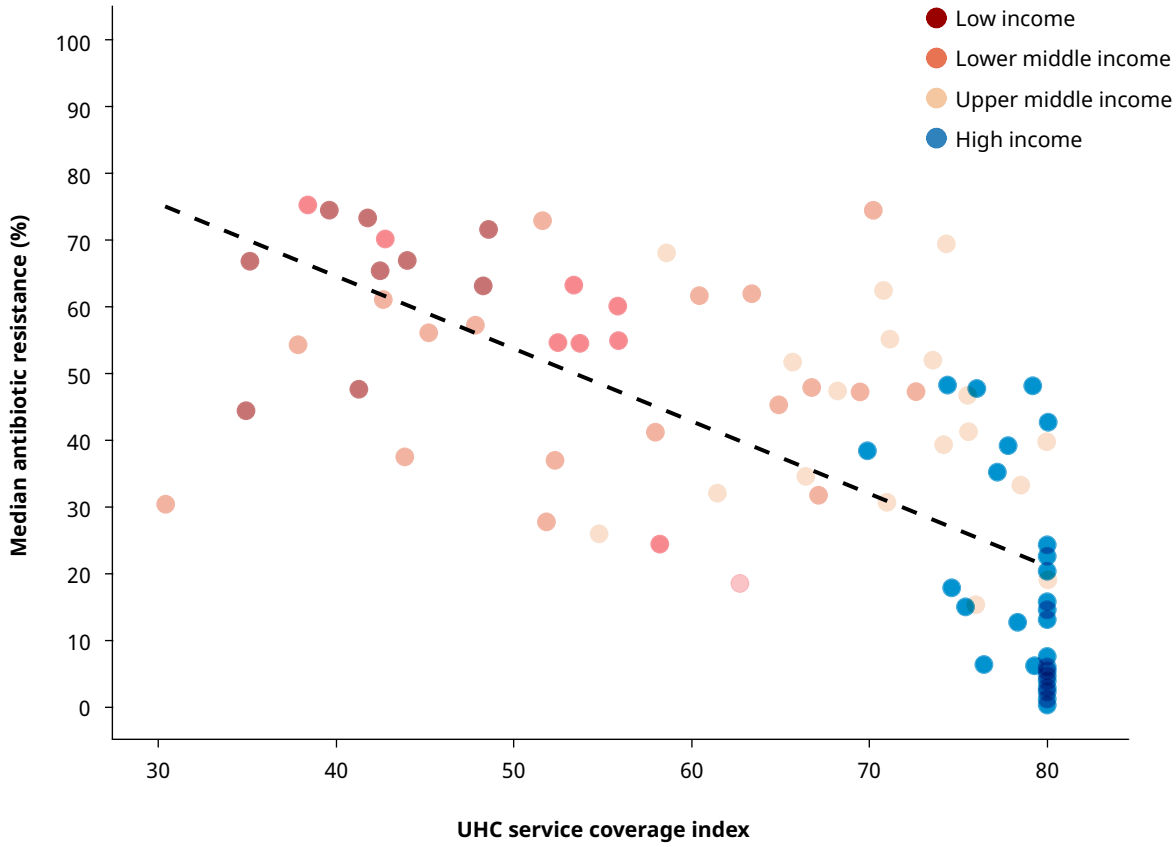
On 13 December 2021, Dr Adeyeye examines a slide under a microscope at the microbiology laboratory in the Department of Medical Microbiology and Parasitology at the Obafemi Awolowo University Teaching Hospitals.

The burden of AMR is not evenly distributed. It is heaviest in countries with weaker health systems, limited diagnostic capacity and restricted access to effective essential antibiotics, creating a syndemic of under-treatment and poor outcomes *(5).* The clinical implications are particularly concerning in intensive care units, neonatal wards and surgical settings, where infections caused by carbapenem-resistant *K. pneumoniae* and *Acinetobacter* spp. are increasingly common, and treatment options are limited. These challenges are particularly acute in many LMICs.

Disproportionate reliance on broad-spectrum antibiotics in the "Watch" group is a major driver of AMR. According to WHO's Global surveillance of AMU *(6),* "Access" antibiotics – recommended as first-choice treatments – comprised only 52.7% of global use in 2022. This proportion falls far short of the target of the political declaration of the United Nations General Assembly in 2024, which calls for at least 70% of antibiotics used in human health to be in the Access group by 2030 *(7).* Meanwhile, "Watch" antibiotics accounted for 45.3% of use, exceeding 70% of total antibiotic consumption in nearly one third of countries. "Reserve" antibiotics were seldom used, at only 0.3% *(6).* These patterns indicate an urgent need to strengthen antibiotic stewardship and ensure equitable access to effective essential antibiotics at all levels of care.

As resistance to widely used, lower-cost antibiotics such as third-generation cephalosporins continues to rise, clinicians are increasingly compelled to consider prescribing carbapenems. When resistance to carbapenems is encountered, however, treatment options for Gram-negative pathogens are often limited to antibiotics in the AWaRe "Reserve" group, which are frequently unaffordable, inconsistently available and require diagnostic confirmation

Figure 5. Median national percentage of AMR in bloodstream infections (2023), by income classification and universal health coverage (UHC) service coverage index



Relations between median resistance of bloodstream infections to antibiotics and two indicators, income classification and the 2021 UHC service coverage index, in 95 countries. Resistance is expressed as the median percentage in all reported pathogen–antibiotic combinations. The service coverage index (0–100), part of Sustainable Development Goal (SDG) indicator 3.8.1, is a measure of access to essential health services based on 14 indicators in four domains: reproductive, maternal, newborn and child health; infectious diseases; noncommunicable diseases; and service capacity and access. Service coverage must be assessed alongside SDG indicator 3.8.2, which measures catastrophic health spending, to monitor progress toward UHC, where people receive the high-quality care they need without financial hardship. Country service coverage index values of 80 and above are shown as "80" due to the index's limited ability to distinguish between countries with very high levels of service coverage. Income classification is based on the World Bank classification released in 2023, which reflects gross national income per capita for 2022. Each dot represents a country, colour-coded by income group.

that is rarely feasible in resource-limited settings. Global surveillance data on AMU show that many LMICs report no use of "Reserve" antibiotics *(6)*, due not to lack of clinical need but because of systemic barriers to access.

Priorities for action

The 2025 GLASS report presents a comprehensive, data-based assessment of the global AMR landscape. Messages and priorities for action in the control of AMR are summarized below.

1. National participation in WHO's GLASS has increased four-fold since 2016, although regional gaps persist.

Countries should overcome structural and operational barriers to data collection, improve the coverage and representativeness of their national AMR surveillance system, use the data for decision-making, and ensure timely sharing of national AMR data to GLASS by 2030, in line with the commitments made in the 2024 United Nations General Assembly political declaration

on AMR *(7).* Priority should be given to increasing participation in underrepresented regions by expanding the number of contributing facilities and strengthening core surveillance infrastructure to close gaps in global coverage.

2. Global levels of resistance are high and unevenly distributed across regions.

Countries should implement integrated intervention packages that include infection prevention and control, water, sanitation and hygiene, vaccination, antimicrobial stewardship, and strengthening of laboratory services aligned with WHO's people-centred approach *(8).* These interventions should be implemented in the context of multi-sectoral national AMR action plans, which should be updated regularly, costed, implemented and aligned with international targets. The diverse, localized nature of AMR requires comprehensive, context-specific responses; interventions should be tailored to local resistance patterns and health system capacity, avoiding a one-size-fits-all approach.

3. Increasing resistance trends in Gram-negative bacterial pathogens pose a growing threat.

Countries should reduce use of AWaRe "Watch" antibiotics and increase use of "Access" antibiotics to at least 70% by 2030, to meet the target set in the 2024 political declaration on AMR *(7).* At the same time, they should also organize the next recourse to treatment by extending access – while ensuring prudent use – of "Reserve" antibiotics in settings with documented multidrug resistance. Greater investment in research and development of new antibiotics is an urgent priority, particularly against carbapenem-resistant *Acinetobacter* spp. and Enterobacterales, as indicated in the WHO list of priority bacterial pathogens in 2024 *(2).* Scaling-up of diagnostics for targeted antibiotic therapy is essential to preserve the efficacy of treatment.

4. Countries with limited surveillance often report higher resistance levels.

Countries must improve their capacity to conduct AMR surveillance, including enhancing representativeness and strengthening laboratories and data systems.

First, countries should integrate surveillance into routine clinical practice and develop nationally representative AMR surveillance systems for both community- and hospital-acquired infections, covering all levels of the health-care system and all geographical regions. Surveillance should be standardized according to GLASS recommendations, with patient-level, disaggregated reporting by pathogen and infection type *(9).*

Second, countries should strengthen access to quality-assured diagnostics for bacteriology and mycology at every tier of the health care system to ensure the capacity to test all bacterial and fungal pathogens prioritized by GLASS for resistance *(9).* This is essential to meet the target set in the 2024 political declaration on AMR, which calls for at least 80% of countries to achieve such diagnostic capacity by 2030 *(7).*

Third, countries should invest in robust digital information systems with standardized data formats, harmonized terminology and interoperable platforms to ensure that surveillance data are useful for setting treatment guidelines, guiding procurement decisions (e.g. essential medicines lists), supporting stewardship and monitoring the impact of interventions.

5. AMR disproportionately affects LMICs and countries with weak health systems.

Countries should address AMR through broader strategies that strengthen health systems, enhance resilience, and expand social protection, such as UHC and multisectoral initiatives, with equity and access at the core. These efforts should be supported primarily through domestic funding, complemented by global financing mechanisms such as the Pandemic Fund and the Global Fund.

Table 1. Global percentage AMR in 2023 and trends (2018–2023) in selected critical and high-priority pathogen–antibiotic combinations

Pathogen characteristic	AMR and trends
Carbapenem-resistant *Acinetobacter* spp. *	
Frequently implicated in ventilator-associated pneumonia and hospital-acquired bloodstream infections, particularly in critically ill and immunocompromised patients. Because of its environmental persistence and ability to survive on surfaces, it can spread rapidly in health-care settings. It is often resistant to nearly all antibiotic classes, leaving "Reserve" antibiotics such as colistin and tigecycline as last-resort treatment options.	**AMR in 2023:** The percentage resistance to imipenem in bloodstream infections was 54.3% (49.3, 59.2) globally and was highest in the Eastern Mediterranean Region, at 66.5% (58.1, 73.9). **Trends:** Resistance to imipenem in bloodstream infections is increasing globally, at 5.3% annually (2.7, 8.3).
Third-generation cephalosporin-resistant *E. coli* *	
Major cause of community- and hospital-acquired urinary tract and bloodstream infections. Resistance is due largely to production of extended-spectrum beta-lactamases (ESBL), which limit the effectiveness of commonly used antibiotics. Resistance complicates empirical treatment, especially in outpatient settings, and often necessitates use of intravenous carbapenems ("Watch" group) or "Reserve" group antibiotics.	**AMR in 2023:** The percentage resistance to third-generation cephalosporins in bloodstream infections was 44.8% (39.3, 50.4) globally and was highest in the African Region, at 70.7% (62.3, 78.0). The percentage resistance to cefotaxime in urinary tract infections was 39.8% (33.9, 46.0) globally and highest in the South-East Asia Region, at 60.4% (51.8, 68.4). **Trends:** Resistance to third-generation cephalosporins in bloodstream infections and to cefotaxime in urinary tract infections is stable globally.
Carbapenem-resistant *E. coli* *	
Reported increasingly in both community and hospital settings, contributing to a substantial clinical burden. Although current resistance levels are relatively low, the upward trend is concerning. Carbapenem resistance limits treatment options, and "Reserve" antibiotics may be required. Its ubiquity and potential for gene transfer make it a critical target pathogen for surveillance and stewardship.	**AMR in 2023:** The percentage resistance of *E. coli* to imipenem in bloodstream infections was 2.4% (1.8, 3.3) globally and was highest in the South-East Asia Region, at 17.5% (12.4, 24.2). The percentage resistance of *E. coli* to imipenem in urinary tract infections was 2.6% (2.0, 3.5) globally and 16.3% (13.1, 20.2) in the South-East Asia Region. **Trends:** Resistance to imipenem in *E. coli* is increasing globally, at 12.5% annually (9.4, 15.8) in bloodstream infections and at 8.5% (6.1, 11.0) in urinary tract infections.

Critical (*) classification of antibiotic-resistant pathogens, as defined on the WHO list of priority bacterial pathogens in 2024 *(2)*

Pathogen characteristic	AMR and trends
Third-generation cephalosporin-resistant *K. pneumoniae* *	
Major cause of hospital-acquired infections, particularly in intensive care and surgical settings. Resistance is often due to ESBL or carbapenemase production, severely limiting treatment options. The infections are associated with high mortality and prolonged hospital stays.	**AMR in 2023:** The percentage resistance to cefotaxime in bloodstream infections was 55.2% (48.5, 61.7) globally and was highest in the African Region, at 77.8% (73.1, 81.9). In urinary tract infections, the percentage resistance to cefotaxime was 45.5% (38.6, 52.5) globally and highest in the South-East Asia Region, at 60.1% (54.9, 65.0). **Trends:** Resistance to cefotaxime in bloodstream infections and urinary tract infections is stable globally.
Carbapenem-resistant *K. pneumoniae* *	
Leading cause of hospital-acquired infections, particularly in intensive care units, neonatal units and surgical wards. Infection is associated with high mortality and is often resistant to many other antibiotic classes. Its ability to spread clonally and transfer resistance genes, including carbapenemases, makes it a major threat in health-care settings. Resistance to carbapenems severely limits treatment options, often requiring "Reserve" antibiotics.	**AMR in 2023:** The percentage resistance to imipenem in bloodstream infections was 16.7% (13.9, 19.9) globally and was highest in the South-East Asia Region, at 41.2% (30.3, 53.1). The percentage resistance to imipenem in urinary tract infections was 10.9% (8.7, 13.6) globally and was highest in the South-East Asia Region, at 31.1% (27.0, 35.6). **Trends:** Resistance to imipenem is increasing globally by 15.3% annually (12.7, 18.1) in bloodstream infections and by 12.9% annually (10.6, 15.1) in urinary tract infections.
Methicillin-resistant *Staphylococcus aureus* (MRSA) **	
A major cause of invasive infections, including bloodstream infections, endocarditis and osteomyelitis. MRSA is prevalent in both health-care and community settings, with high transmissibility and significant treatment challenges. Management relies on "Watch" group antibiotics such as vancomycin; when vancomycin cannot be used, "Reserve" agents are frequently used. The emergence of livestock-associated MRSA, particularly in farming communities in Africa, indicates the importance of a One Health approach to controlling zoonotic transmission of MRSA *(10)*.	**AMR in 2023:** The percentage resistance to methicillin in bloodstream infections was 27.1% (23.5, 31.0) globally and was highest in the Eastern Mediterranean Region, at 50.3% (39.8, 60.8). **Trends:** MRSA in bloodstream infections is stable globally and decreasing in the South-East Asia, European and Western Pacific regions.

Critical (*) and high-priority (**) classification of antibiotic-resistant pathogens, as defined on the WHO list of priority bacterial pathogens in 2024 *(2)*

Pathogen characteristic	AMR and trends
Fluoroquinolone-resistant non-typhoidal *Salmonella* spp. **	
Leading cause of foodborne illness and invasive disease, particularly in immunocompromised individuals. Resistance is also driven by antibiotic use in animal farming *(11)*, posing a risk of transfer of resistance genes to typhoidal strains *(12).* This reduces the effectiveness of first-line treatments for enteric fever.	**AMR in 2023:** The percentage resistance to ciprofloxacin in bloodstream infections was 18.0% (13.9, 22.9) globally and was highest in the European Region, at 36.2% (29.0, 44.2). In gastrointestinal infections, resistance to ciprofloxacin was 16.3% (13.8, 19.1) globally and 23.9% (20.0, 28.2) in the European Region. **Trends:** Resistance to ciprofloxacin is increasing globally, at 9.4% annually (3.9, 15.3) in bloodstream infections and 14.0% (6.5, 22.1) in gastrointestinal infections.
Fluoroquinolone-resistant *Shigella* spp. **	
A highly transmissible enteric pathogen, often associated with outbreaks in communities, including among children and displaced populations. Resistance limits oral treatment, complicating the treatment of moderate-to-severe cases and increasing the risk of treatment failure.	**AMR in 2023:** The percentage resistance to ciprofloxacin in *Shigella* spp. gastrointestinal infections was 29.7% (22.9, 37.5) globally and was highest in the South-East Asia Region, at 75.5% (58.1, 87.3). **Trends:** Resistance to ciprofloxacin in gastrointestinal infections is stable globally, although regional data are limited.
Fluoroquinolone-resistant and/or third-generation cephalosporin-resistant *N. gonorrhoeae* **	
Sexually transmitted pathogen with high global incidence. Widespread resistance to fluoroquinolones has rendered ciprofloxacin ineffective for empirical treatment, currently necessitating use of parenteral regimens. Infections are often asymptomatic, especially in women, contributing to undetected transmission.	**AMR in 2023:** The percentage resistance to ciprofloxacin in gonorrhoea urogenital infection was 75.0% (70.9, 78.8) globally and was highest in the South-East Asia Region, at 87.8% (79.3, 93.2). The percentage resistance to ceftriaxone remains low, at 0.3% (0.1, 0.6) globally, with the highest level reported in the Eastern Mediterranean Region, at 2.5% (0.8, 7.7). **Trends:** Resistance to ceftriaxone is stable globally, although surveillance data are limited.

High-priority (**) classification of antibiotic-resistant pathogens, as defined on the WHO list of priority bacterial pathogens in 2024 *(2)*

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World Health Organization
20 Avenue Appia1211
Geneva 27
Switzerland
https://www.who.int/health-topics/antimicrobial-resistance