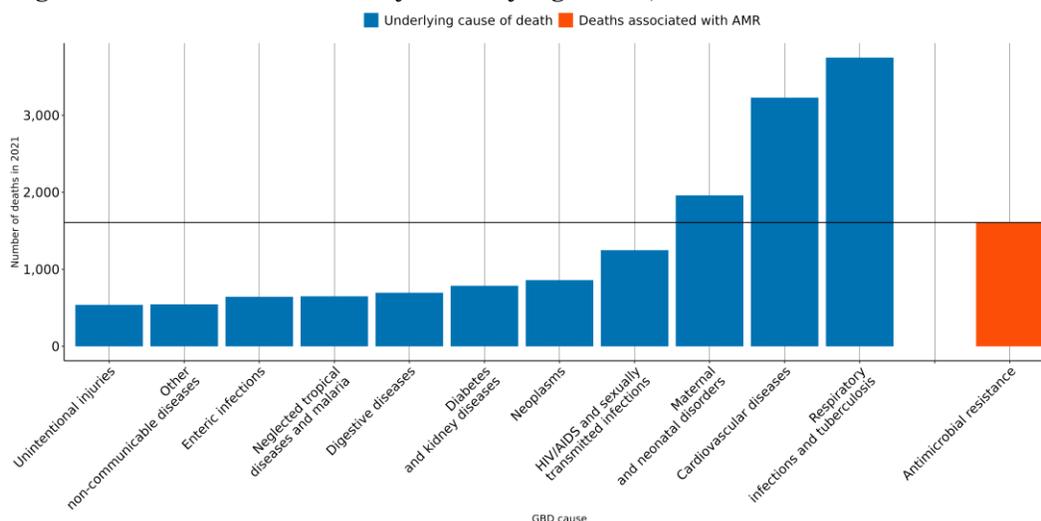


# The burden of antimicrobial resistance (AMR) in Gambia

## Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **400 lives** have been lost each year since 1990 in Gambia due to AMR.
- In 2021, there were an estimated **329 UI (235-422)** deaths attributable to AMR and **1,610 UI (1,240-1,980)** deaths associated with AMR in this location.
- The largest number of deaths associated with AMR in 2021 occurred among those aged **under 5** in the country.
- Among the most deadly pathogen-drug combinations in 2021 were *Staphylococcus aureus* resistant to methicillin, *Klebsiella pneumoniae* resistant to beta lactam / beta-lactamase inhibitors and *Klebsiella pneumoniae* resistant to trimethoprim-sulfamethoxazole.

Figure 1 Number of deaths by underlying cause, and those associated with AMR in 2021



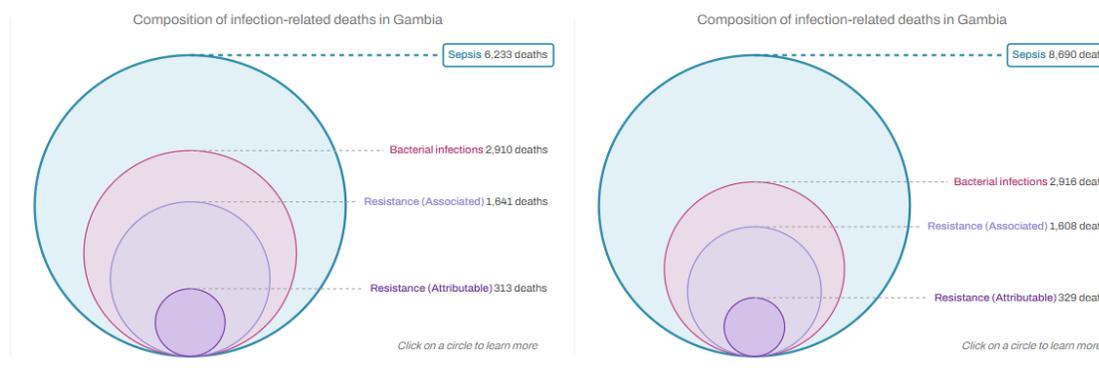
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying cause of death by itself.
- At the [2024 United Nations General Assembly high level meeting on antimicrobial resistance](#), country members agreed to aim for a **10% reduction** compared to 2019 baseline (**from 4.95 to 4.45 million**) in the global number of deaths associated with AMR by 2030. But [our forecast](#) indicates that in absence of concerted action, deaths associated with AMR could reach **5.5 million** (UI 4.8 - 6.2) if current trends continue. For Gambia, a 10% reduction means to decrease the number of deaths associated with AMR to **1,610**, but currently the trend for this country could reach up to **1,560 UI [1,180-2,140]** AMR-associated deaths in 2030.

## AMR in Gambia

### Key takeaways

- Antimicrobial Resistance (AMR) is a major global health threat, over *a million lives* have been lost each year since 1990.
- Globally, 4.71 (95% Uncertainty Interval (UI) 4.2-5.2) million deaths were associated with bacterial drug-resistant infections in 2021.
- And 1.14 (UI 1 - 1.3) million deaths were attributable to bacterial drug-resistant infection in the same year.
- *39 (UI 33 - 46) million deaths* directly attributable to bacterial AMR are projected to occur between 2025-2050 unless concerted action is taken. This equates to three deaths every minute.

Figure 2 Comparing 30 years of infection related deaths, and those associated with and attributable to AMR in Gambia between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#)
- In **Gambia** in 2021, there were an estimated **329 UI (235-422)** deaths attributable to AMR and **1,610 UI (1,240-1,980)** deaths associated with AMR. Here “*attributable deaths*” are considered to be those that would have been prevented had the drug-resistant bacteria causing the infections not been drug-resistant. “*Associated deaths*” are considered to be those that would not have occurred had the infections been prevented entirely.
- Across 204 countries, **Gambia has the 29th highest** age-standardized mortality rate associated with AMR in 2021.
- *Table 1* shows the bacteria which caused most deaths in 2021 (↑ indicates an increasing estimated annual rate between 1990-2021, ↓ indicates a decreasing annual trend), and *table 2* shows the pathogen-drug combinations which caused most deaths in 2021.

Table 1. Bacteria which cause most deaths in 2021 (Number of deaths in parenthesis)

Burden rank	Overall susceptible and resistant		Associated		Attributable	
	UI (range)	Change	UI (range)	Change	UI (range)	Change
1	Mycobacterium tuberculosis 568 UI (339-797)	↑	Klebsiella pneumoniae 322 UI (261-382)	↑	Klebsiella pneumoniae 68 UI (50-87)	↑
2	Klebsiella pneumoniae 346 UI (283-410)	↑	Escherichia coli 268 UI (211-326)	↑	Escherichia coli 50 UI (34-66)	↑
3	Escherichia coli 292 UI (234-349)	↓	Streptococcus pneumoniae 208 UI (144-271)	↓	Acinetobacter baumannii 47 UI (37-57)	↓
4	Streptococcus pneumoniae 286 UI (231-340)	↓	Staphylococcus aureus 187 UI (128-246)	↑	Staphylococcus aureus 35 UI (19-50)	↑
5	Staphylococcus aureus 265 UI (215-315)	↑	Pseudomonas aeruginosa 135 UI (98-172)	↑	Pseudomonas aeruginosa 32 UI (21-43)	↑
6	Pseudomonas aeruginosa 241 UI (197-285)	↑	Acinetobacter baumannii 127 UI (98-157)	↓	Streptococcus pneumoniae 30 UI (17-44)	↓
7	Acinetobacter baumannii 148 UI (119-178)	↓	Group B Streptococcus 51 UI (35-67)	↑	Serratia spp. 13 UI (9-17)	↑
8	Group B Streptococcus 124 UI (93-155)	↑	Serratia spp. 49 UI (35-63)	↑	Enterobacter spp. 12 UI (7-16)	↑
9	Non-typhoidal Salmonella 116 UI (60-171)	↓	Enterobacter spp. 45 UI (36-54)	↑	Mycobacterium tuberculosis 8 UI (0-28)	↑
10	Serratia spp. 74 UI (58-90)	↑	Shigella spp. 32 UI (10-54)	↓	Citrobacter spp. 7 UI (5-8)	↑

Annualized rate of change (1990-2021): <-3% (dark blue), -3% to -1.5% (medium blue), -1.5% to 0% (light blue), 0% to 1.5% (pink), 1.5% to 3% (red), 3% to 5% (orange), >5.0% (dark red)

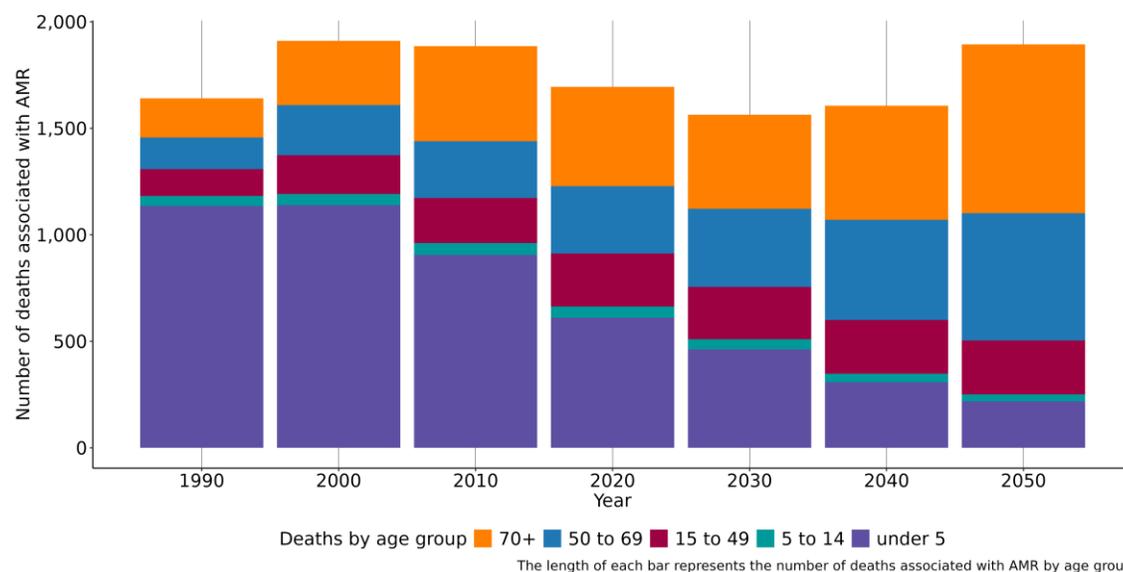
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

Burden Rank	Associated			Attributable		
	UI (range)	Change	UI (range)	UI (range)	Change	
1	Klebsiella pneumoniae TMP-SMX 315 UI (256-374)	↑	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib. 18 UI (6-29)	↓		
2	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib. 283 UI (222-345)	↑	Klebsiella pneumoniae TMP-SMX 15 UI (8-23)	↑		
3	Escherichia coli Aminopenicillin 255 UI (180-330)	↑	Staphylococcus aureus Methicillin 15 UI (4-26)	↑		
4	Escherichia coli TMP-SMX 233 UI (184-282)	↓	Klebsiella pneumoniae Fluoroquinolones 12 UI (8-17)	↑		
5	Escherichia coli Beta-Lactam/Lactamase Inhib. 189 UI (148-230)	↓	Escherichia coli Beta-Lactam/Lactamase Inhib. 12 UI (2-22)	↓		
6	Klebsiella pneumoniae Fluoroquinolones 179 UI (126-232)	↑	Pseudomonas aeruginosa Fluoroquinolones 12 UI (8-17)	↑		
7	Klebsiella pneumoniae Aminoglycosides 179 UI (132-225)	↑	Streptococcus pneumoniae Fluoroquinolones 12 UI (4-19)	↓		
8	Streptococcus pneumoniae TMP-SMX 169 UI (109-229)	↓	Escherichia coli TMP-SMX 11 UI (7-16)	↑		
9	Staphylococcus aureus Macrolides 126 UI (92-161)	↑	Klebsiella pneumoniae Aminoglycosides 11 UI (7-15)	↑		
10	Escherichia coli Aminoglycosides 121 UI (63-179)	↓	Acinetobacter baumannii 4GC 11 UI (9-13)	↑		

Annualized rate of change (1990-2021): <-3% (dark blue), -3% to -1.5% (medium blue), -1.5% to 0% (light blue), 0% to 1.5% (pink), 1.5% to 3% (red), 3% to 5% (orange), >5.0% (dark red)

- Independently of antimicrobial resistance, the infectious syndromes accounting for the most deaths in 2021 were as follows (estimated thousands of deaths in parenthesis) lower respiratory infection (excl. COVID) (1,490 UI (1,200-1,780)), bloodstream infections (1,400 UI (1,090-1,710)), tuberculosis (568 UI (339-797)), diarrhea (498 UI (302-693)) and meningitis (235 UI (162-308)).

Figure 3. Number of deaths associated with AMR by age group between 1990-2020 and 2050 projection



- In Gambia, people aged under 5 saw the largest number of deaths associated with AMR both in 1990 and 2021, which indicates that under 5 continues to be particularly vulnerable to infections which are resistant to antibiotics. In 2021, the number of deaths associated with AMR among the under 5 was 565 UI (391-739), whereas the mortality rate per 100,000 was 971 UI (737-1,200).

### Data sources for Gambia

In total, 520 million individual records or isolates covering 19,513 study-location-years were used as input data to our estimation process. The subset of input data for this country is shown below.

Table 3. Data inputs for Gambia by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2021	2,626	Study-year datapoints
Microbial or laboratory data without outcome	1990-2021	86	Isolates
Microbial or laboratory data with outcome	1990-2021	121	Isolates
Literature studies	1990-2021	1,549	Cases/isolates/susceptibility tests

## More information

### *About GRAM:*

The purpose of the Global Research on AntiMicrobial resistance (GRAM) project is to **generate accurate and timely estimates of the magnitude and trends in antimicrobial resistance (AMR) burden** across the world, which can be used to inform treatment guidelines and agendas for decision-making and research, detect emerging problems and monitor trends to inform global strategies, as well as facilitate the assessment of interventions over time.

GRAM is the flagship project of the University of Oxford–IHME Strategic Partnership. GRAM was launched with support from the United Kingdom Department of Health and Social Care’s Fleming Fund, and the Wellcome Trust.

### *All resources:*

For all resources on AMR analysis at IHME, visit <https://www.healthdata.org/antimicrobial-resistance>.

To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#).

### *Data sources:*

To download the list of data input sources by country, and AMR results by region, visit the [Global Health Data Exchange \(GHDx\)](#).

### *Contact us:*

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- **LinkedIn:** <https://www.linkedin.com/company/institute-for-health-metrics-and-evaluation>