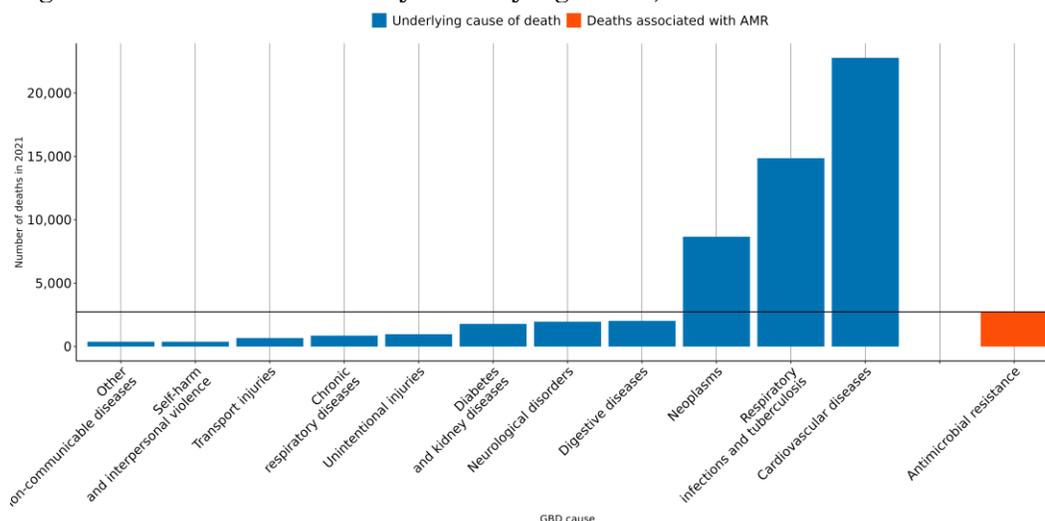


# The burden of antimicrobial resistance (AMR) in Georgia

## Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **700 lives** have been lost each year since 1990 in Georgia due to AMR.
- In 2021, there were an estimated **624 UI (497-751)** deaths attributable to AMR and **2,740 UI (2,220-3,250)** deaths associated with AMR in this location.
- The largest number of deaths associated with AMR in 2021 occurred among those aged **70+** in the country.
- Among the most deadly pathogen-drug combinations in 2021 were *Staphylococcus aureus* resistant to methicillin, *Klebsiella pneumoniae* resistant to aminoglycosides and *Acinetobacter baumannii* resistant to carbapenems.

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



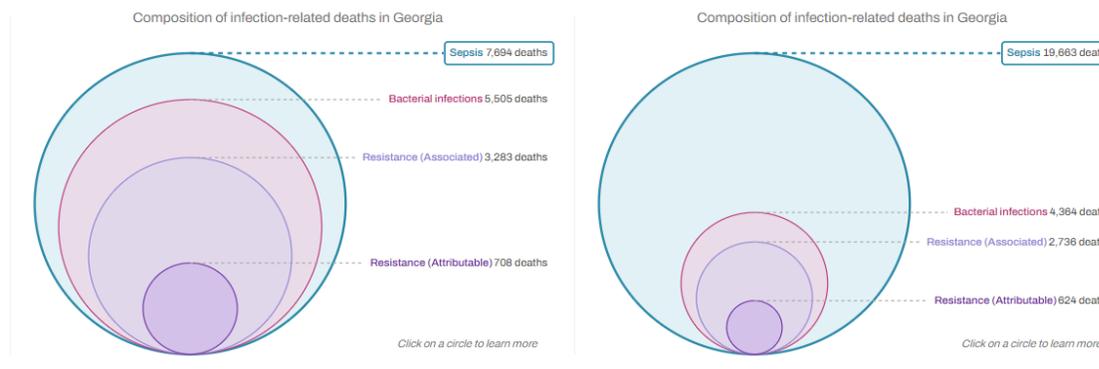
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Georgia, a 10% reduction means to decrease the number of deaths associated with AMR to **2,700**, but currently the trend for this country could reach up to **2,900 UI [2,260-3,580]** AMR-associated deaths in 2030.

## AMR in Georgia

### 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 Georgia between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#)
- In **Georgia** in 2021, there were an estimated **624 UI (497-751)** deaths attributable to AMR and **2,740 UI (2,220-3,250)** 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, **Georgia has the 83rd lowest** 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	
	Bacteria	Annualized rate of change (1990-2021)	Bacteria	Annualized rate of change (1990-2021)	Bacteria	Annualized rate of change (1990-2021)
	Staphylococcus aureus 901 UI (815-987)	↑	Staphylococcus aureus 477 UI (334-621)	↑	Klebsiella pneumoniae 106 UI (90-123)	↑
	Streptococcus pneumoniae 690 UI (621-759)	↓	Streptococcus pneumoniae 417 UI (290-543)	↓	Acinetobacter baumannii 99 UI (87-111)	↓
	Pseudomonas aeruginosa 502 UI (452-551)	↓	Escherichia coli 401 UI (336-466)	↑	Staphylococcus aureus 88 UI (59-117)	↓
	Klebsiella pneumoniae 487 UI (439-535)	↓	Klebsiella pneumoniae 398 UI (346-449)	↑	Escherichia coli 78 UI (61-95)	↑
	Escherichia coli 479 UI (430-528)	↑	Pseudomonas aeruginosa 296 UI (247-346)	↓	Pseudomonas aeruginosa 75 UI (58-92)	↓
	Acinetobacter baumannii 257 UI (231-284)	↓	Acinetobacter baumannii 245 UI (219-270)	↓	Streptococcus pneumoniae 72 UI (41-102)	↓
	Enterococcus faecalis 132 UI (118-146)	↓	Enterococcus faecalis 92 UI (79-105)	↓	Mycobacterium tuberculosis 20 UI (0-47)	↑
	Enterobacter spp. 132 UI (119-145)	↓	Enterococcus faecium 74 UI (64-84)	↑	Enterococcus faecalis 19 UI (12-27)	↓
	Mycobacterium tuberculosis 120 UI (104-136)	↓	Proteus spp. 67 UI (51-83)	↑	Enterococcus faecium 16 UI (12-20)	↑
	Enterococcus faecium 98 UI (88-109)	↑	Enterobacter spp. 63 UI (50-77)	↓	Enterobacter spp. 15 UI (13-18)	↓

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

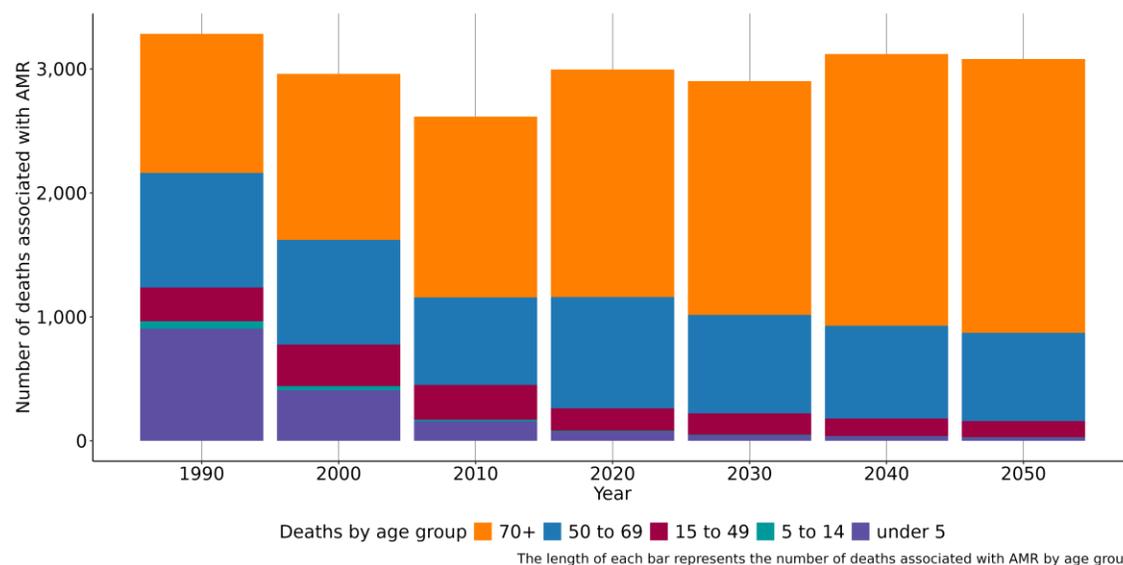
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

Burden Rank	Associated			Attributable		
	Combination	Annualized rate of change (1990-2021)	Rate of change	Combination	Annualized rate of change (1990-2021)	Rate of change
	Escherichia coli Aminopenicillin	393 UI (319-466)	↑	Acinetobacter baumannii Carbapenems	53 UI (42-63)	↑
	Klebsiella pneumoniae Aminoglycosides	369 UI (321-416)	↑	Staphylococcus aureus Methicillin	40 UI (21-58)	↓
	Streptococcus pneumoniae TMP-SMX	329 UI (202-457)	↓	Klebsiella pneumoniae Aminoglycosides	30 UI (23-38)	↑
	Staphylococcus aureus Macrolides	329 UI (249-408)	↑	Acinetobacter baumannii Fluoroquinolones	28 UI (23-33)	↑
	Klebsiella pneumoniae TMP-SMX	296 UI (238-354)	↓	Pseudomonas aeruginosa Carbapenems	27 UI (16-38)	↑
	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	291 UI (221-361)	↑	Klebsiella pneumoniae Carbapenems	26 UI (20-33)	↑
	Klebsiella pneumoniae 3GC	262 UI (221-302)	↑	Streptococcus pneumoniae Carbapenems	25 UI (12-39)	↓
	Klebsiella pneumoniae Fluoroquinolones	260 UI (216-304)	↑	Pseudomonas aeruginosa Fluoroquinolones	22 UI (15-29)	↓
	Acinetobacter baumannii Anti-pseudomonal	237 UI (212-262)	↑	Klebsiella pneumoniae Fluoroquinolones	20 UI (13-26)	↑
	Acinetobacter baumannii Carbapenems	235 UI (209-260)	↑	Streptococcus pneumoniae Beta-Lactam/Lactamase Inhib.	17 UI (7-27)	↑

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

- 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) (2,610 UI (2,300-2,920)), bloodstream infections (2,210 UI (2,000-2,430)), peritoneal and intra-abdominal infections (493 UI (423-564)), urinary tract infections and pyelonephritis (311 UI (252-369)) and infections of the skin and subcutaneous systems (201 UI (158-244)).

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



- In Georgia, people aged 70+ saw the largest number of deaths associated with AMR both in 1990 and 2021, which indicates that 70+ continues to be particularly vulnerable to infections which are resistant to antibiotics. In 2021, the number of deaths associated with AMR among the 70+ was 1,630 UI (1,310-1,960), whereas the mortality rate per 100,000 was 438 UI (350-526).

### Data sources for Georgia

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 Georgia by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2009	37	Study-year datapoints
Microbial or laboratory data without outcome	1990-2021	58	Isolates
Literature studies	1990-2021	2,500	Cases/isolates/susceptibility tests
Single drug resistance profile data	1990-2021	67,775	Antibiotic susceptibility test

## 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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