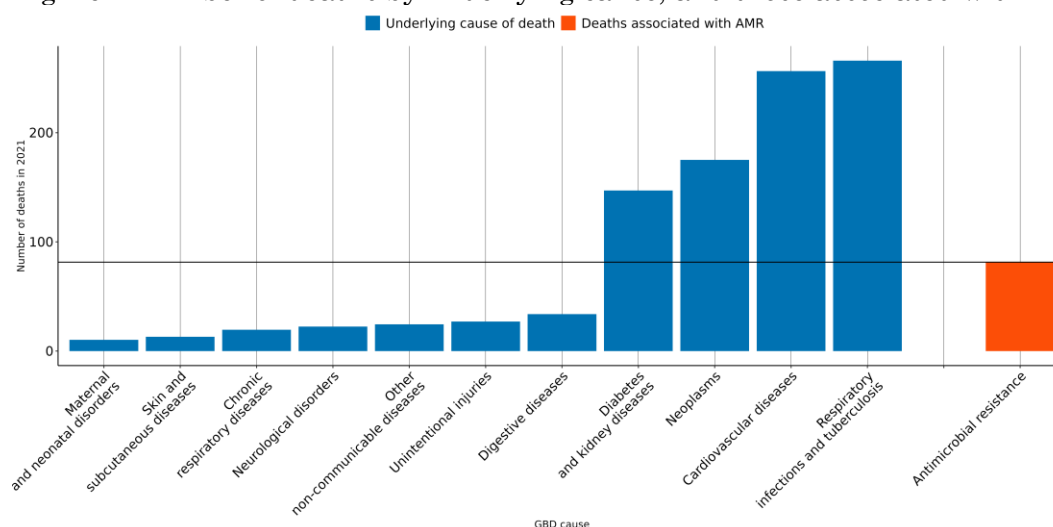


The burden of antimicrobial resistance (AMR) in Grenada

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **20 lives** have been lost each year since 1990 in Grenada due to AMR.
- In 2021, there were an estimated **21 UI (16-27)** deaths attributable to AMR and **81 UI (65-98)** 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, *Acinetobacter baumannii* resistant to carbapenems and *Streptococcus pneumoniae* resistant to carbapenems.

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



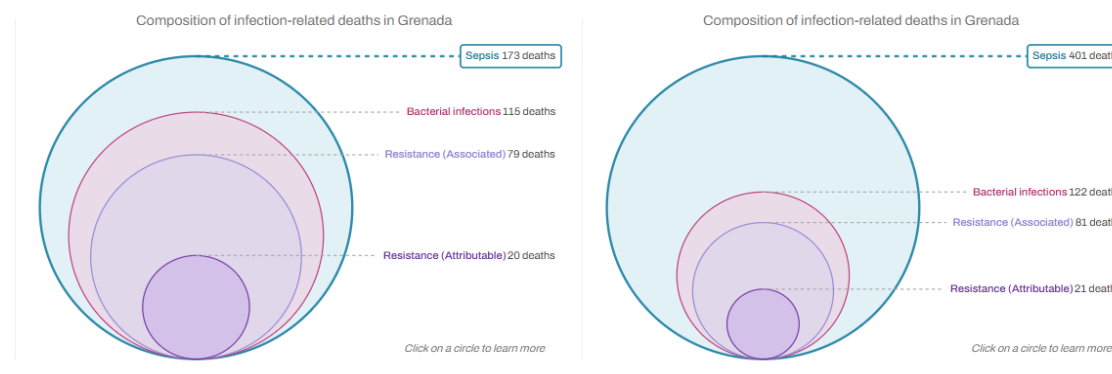
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Grenada, a 10% reduction means to decrease the number of deaths associated with AMR to **77**, but currently the trend for this country could reach up to **102 UI [78-126]** AMR-associated deaths in 2030.

AMR in Grenada

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 Grenada between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#)
- In **Grenada** in 2021, there were an estimated **21 UI (16-27)** deaths attributable to AMR and **81 UI (65-98)** 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, **Grenada has the 63rd 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	
	Staphylococcus aureus 21 UI (19-24)	↑	Acinetobacter baumannii 14 UI (12-16)	↑	Acinetobacter baumannii 6 UI (5-6)	↑
	Streptococcus pneumoniae 19 UI (17-21)	↓	Streptococcus pneumoniae 13 UI (10-17)	↓	Streptococcus pneumoniae 4 UI (2-5)	↓
	Acinetobacter baumannii 14 UI (13-16)	↑	Staphylococcus aureus 13 UI (9-17)	↑	Staphylococcus aureus 3 UI (2-5)	↑
	Klebsiella pneumoniae 14 UI (12-15)	↓	Klebsiella pneumoniae 10 UI (8-12)	↓	Klebsiella pneumoniae 2 UI (2-3)	↑
	Pseudomonas aeruginosa 13 UI (12-15)	↑	Escherichia coli 10 UI (7-12)	↑	Pseudomonas aeruginosa 2 UI (1-3)	↑
	Escherichia coli 13 UI (11-14)	↑	Pseudomonas aeruginosa 8 UI (7-10)	↑	Escherichia coli 2 UI (1-3)	↑
	Group A Streptococcus 5 UI (4-5)	↑	Enterobacter spp. 3 UI (3-3)	↑	Enterobacter spp. 1 UI (1-1)	↑
	Enterococcus faecalis 4 UI (3-4)	↑	Enterococcus faecalis 2 UI (2-3)	↑	Enterococcus faecalis 0 UI (0-1)	↑
	Enterobacter spp. 4 UI (3-4)	↑	Proteus spp. 2 UI (1-2)	↑	Serratia spp. 0 UI (0-0)	↓
	Proteus spp. 3 UI (2-3)	↑	Enterococcus faecium 2 UI (1-2)	↑	Enterococcus faecium 0 UI (0-0)	↑

Annualized rate of change (1990-2021)

<-3% -1.5% to 0% 1.5% to 3% >5.0%
 -3% to -1.5% 0% to 1.5% 3% to 5%

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

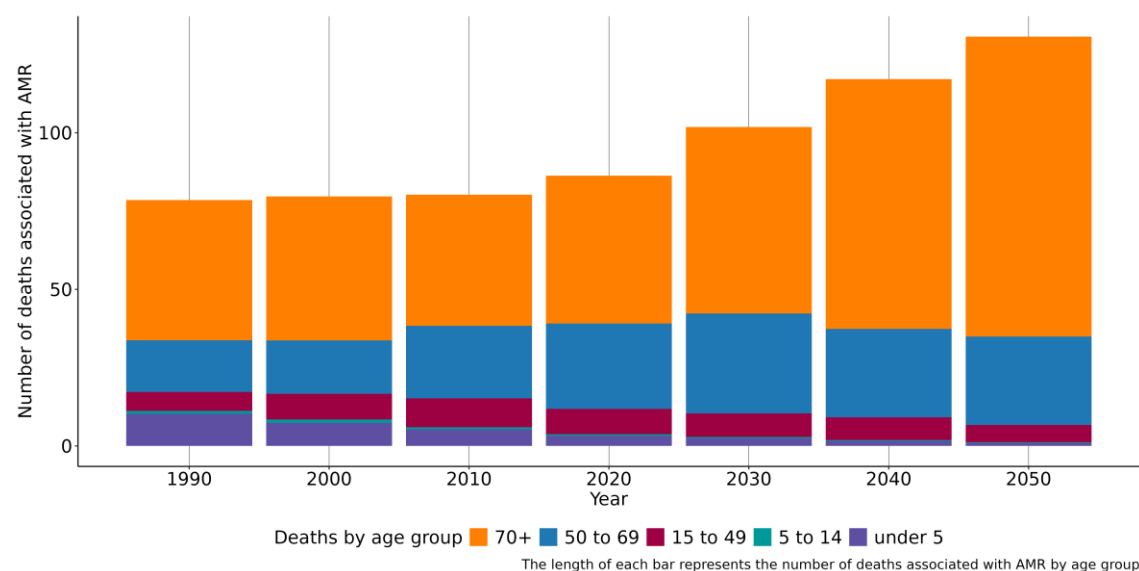
Burden Rank	Associated			Attributable		
	Acinetobacter baumannii 4GC	14 UI (12-16)	↑	Streptococcus pneumoniae Carbapenems	3 UI (2-4)	↓
	Acinetobacter baumannii 3GC	14 UI (12-16)	↑	Acinetobacter baumannii Carbapenems	3 UI (2-3)	↑
	Acinetobacter baumannii Anti-pseudomonal	12 UI (10-14)	↑	Staphylococcus aureus Methicillin	2 UI (1-3)	↑
	Acinetobacter baumannii Carbapenems	12 UI (9-14)	↑	Acinetobacter baumannii Fluoroquinolones	1 UI (1-2)	↑
	Acinetobacter baumannii Beta-Lactam/Lactamase Inhib.	11 UI (9-13)	↑	Acinetobacter baumannii Aminoglycosides	1 UI (1-1)	↓
	Acinetobacter baumannii Aminoglycosides	11 UI (9-13)	↓	Klebsiella pneumoniae Fluoroquinolones	1 UI (1-1)	↑
	Acinetobacter baumannii Fluoroquinolones	10 UI (9-12)	↑	Escherichia coli 3GC	1 UI (0-1)	↓
	Streptococcus pneumoniae Carbapenems	10 UI (7-13)	↓	Acinetobacter baumannii 4GC	1 UI (0-1)	↓
	Staphylococcus aureus Macrolides	10 UI (7-12)	↑	Escherichia coli Fluoroquinolones	1 UI (0-1)	↑
	Klebsiella pneumoniae Fluoroquinolones	9 UI (7-11)	↑	Pseudomonas aeruginosa Fluoroquinolones	1 UI (0-1)	↑

Annualized rate of change (1990-2021)

<-3% -1.5% to 0% 1.5% to 3% >5.0%
 -3% to -1.5% 0% to 1.5% 3% to 5%

- 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) (62 UI (55-69)), bloodstream infections (56 UI (50-62)), infections of the skin and subcutaneous systems (18 UI (15-20)), peritoneal and intra-abdominal infections (10 UI (9-12)) and urinary tract infections and pyelonephritis (10 UI (8-11)).

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



- In Grenada, 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 44 UI (35-52), whereas the mortality rate per 100,000 was 739 UI (592-886).

Data sources for Grenada

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 Grenada by source type

Source type	Years	Sample size	Sample size units
Literature studies	2010-2021	11,243	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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