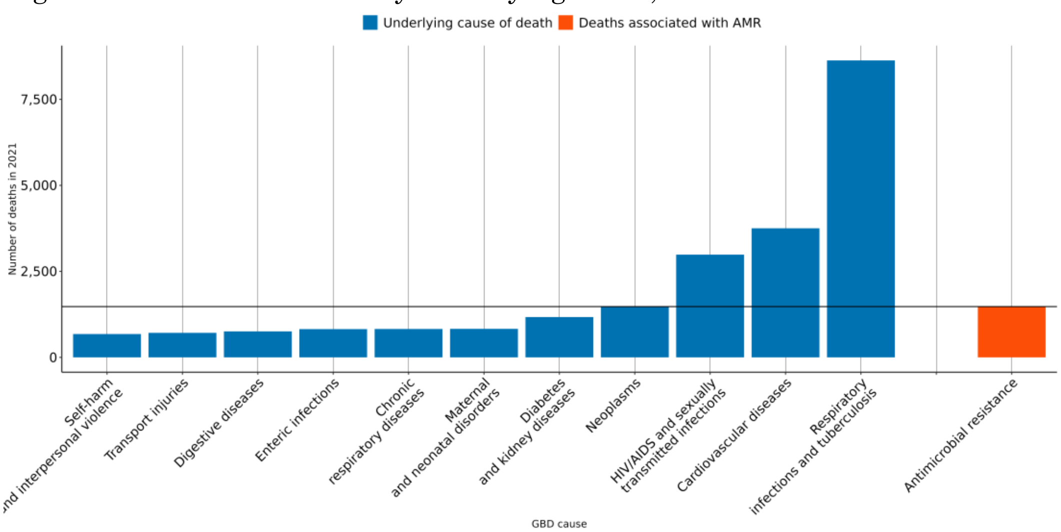
The burden of antimicrobial resistance (AMR) in Namibia

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **300 lives** have been lost each year since 1990 in Namibia due to AMR.
- In 2021, there were an estimated **308 UI (182-434)** deaths attributable to AMR and **1,480 UI (1,010-1,940)** 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 multi-drug resistant *Mycobacterium tuberculosis* (excluding extensive drug-resistance), *Klebsiella pneumoniae* resistant to trimethoprim-sulfamethoxazole and *Streptococcus pneumoniae* resistant to carbapenems.

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



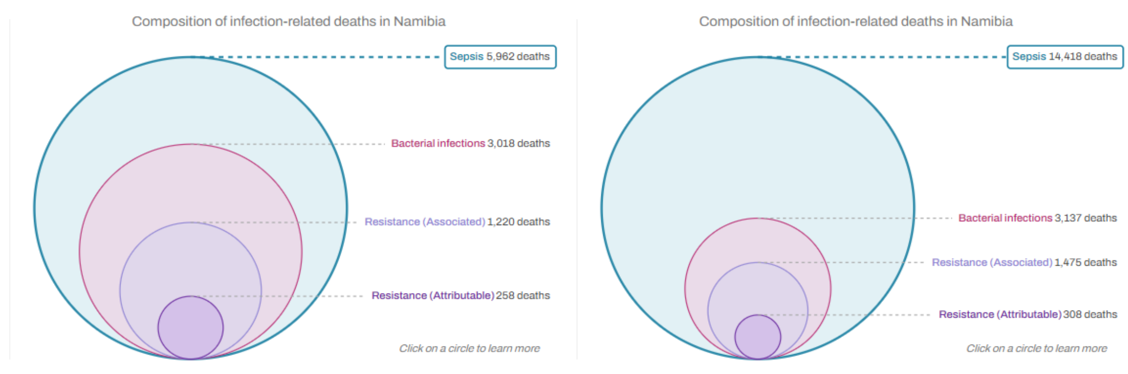
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Namibia, a 10% reduction means to decrease the number of deaths associated with AMR to **1,450**, but currently the trend for this country could reach up to **1,680 UI [1,100-2,450]** AMR-associated deaths in 2030.

AMR in Namibia

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 Namibia between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation (MICROBE)]
- In **Namibia** in 2021, there were an estimated **308 UI (182-434)** deaths attributable to AMR and **1,480 UI (1,010-1,940)** 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, **Namibia has the 49th 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	
1	Mycobacterium tuberculosis 1,000 UI (621-1,380)	↓	Streptococcus pneumoniae 275 UI (180-370)	↓	Streptococcus pneumoniae 53 UI (30-76)	↓
2	Streptococcus pneumoniae 369 UI (259-480)	↓	Klebsiella pneumoniae 238 UI (173-302)	↑	Klebsiella pneumoniae 44 UI (29-60)	↑
3	Klebsiella pneumoniae 293 UI (217-369)	↑	Escherichia coli 232 UI (164-300)	↑	Mycobacterium tuberculosis 42 UI (0-135)	↑
4	Staphylococcus aureus 283 UI (211-354)	↑	Staphylococcus aureus 167 UI (96-238)	↑	Escherichia coli 41 UI (26-56)	↑
5	Escherichia coli 265 UI (202-329)	↑	Mycobacterium tuberculosis 125 UI (41-270)	↑	Acinetobacter baumannii 38 UI (28-48)	↑
6	Pseudomonas aeruginosa 225 UI (169-282)	↑	Acinetobacter baumannii 108 UI (78-139)	↑	Staphylococcus aureus 30 UI (15-45)	↑
7	Acinetobacter baumannii 143 UI (107-178)	↑	Pseudomonas aeruginosa 98 UI (63-134)	↑	Pseudomonas aeruginosa 23 UI (14-32)	↑
8	Shigella spp. 69 UI (29-108)	↓	Shigella spp. 36 UI (10-62)	↑	Serratia spp. 8 UI (6-10)	↓
9	Group B Streptococcus 64 UI (46-82)	↑	Serratia spp. 30 UI (22-38)	↓	Enterobacter spp. 6 UI (4-8)	↓
10	Enterobacter spp. 55 UI (41-68)	↑	Enterobacter spp. 25 UI (17-33)	↓	Shigella spp. 4 UI (0-8)	↑

Annualized rate of change (1990-2021): <-3%; -3% to -1.5%; -1.5% to 0%; 0% to 1.5%; 1.5% to 3%; 3% to 5%; >5.0%

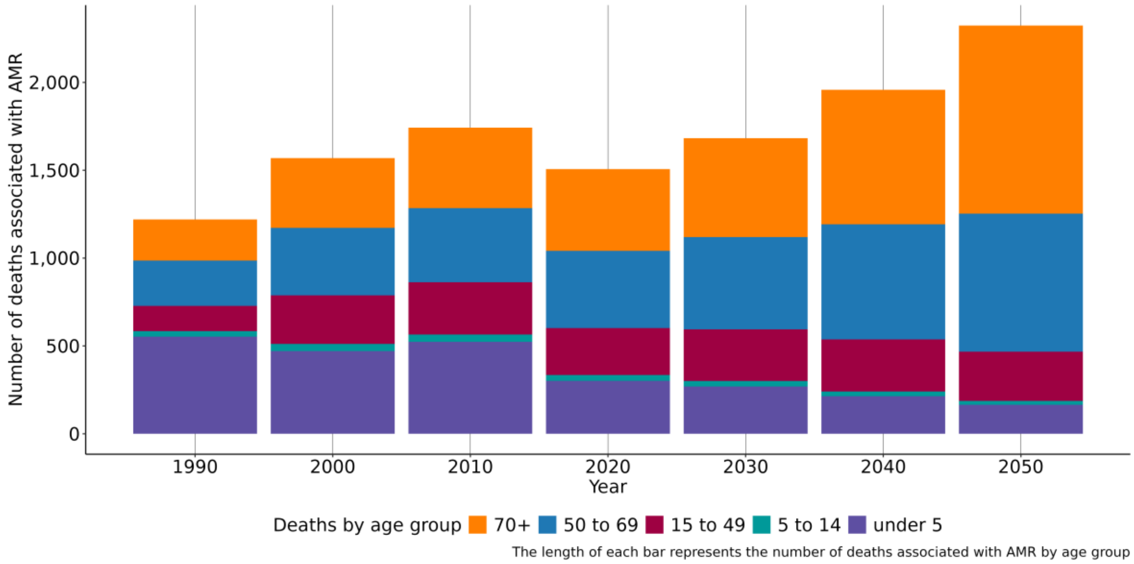
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

Burden Rank	Associated			Attributable		
1	Klebsiella pneumoniae TMP-SMX	233 UI (170-296)	↑	Mycobacterium tuberculosis MDR excluding XDR	41 UI (0-133)	↑
2	Escherichia coli Aminopenicillin	225 UI (144-305)	↑	Streptococcus pneumoniae Carbapenems	26 UI (12-39)	↓
3	Streptococcus pneumoniae Macrolides	192 UI (122-261)	↑	Klebsiella pneumoniae TMP-SMX	16 UI (8-25)	↑
4	Streptococcus pneumoniae TMP-SMX	186 UI (103-270)	↓	Staphylococcus aureus Methicillin	11 UI (1-21)	↑
5	Escherichia coli TMP-SMX	172 UI (124-219)	↑	Acinetobacter baumannii Fluoroquinolones	11 UI (8-14)	↑
6	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	153 UI (96-211)	↑	Staphylococcus aureus TMP-SMX	10 UI (6-15)	↑
7	Escherichia coli Beta-Lactam/Lactamase Inhib.	141 UI (104-179)	↑	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	10 UI (2-19)	↑
8	Streptococcus pneumoniae Beta-Lactam/Lactamase Inhib.	135 UI (68-203)	↑	Escherichia coli Beta-Lactam/Lactamase Inhib.	10 UI (3-17)	↑
9	Mycobacterium tuberculosis MDR excluding XDR	124 UI (41-266)	↑	Acinetobacter baumannii Carbapenems	9 UI (5-13)	↑
10	Staphylococcus aureus TMP-SMX	105 UI (41-170)	↑	Escherichia coli TMP-SMX	9 UI (5-12)	↑

Annualized rate of change (1990-2021): <-3%; -3% to -1.5%; -1.5% to 0%; 0% to 1.5%; 1.5% to 3%; 3% to 5%; >5.0%

- 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) (1,460 UI (1,020-1,890)), bloodstream infections (1,050 UI (778-1,330)), tuberculosis (1,000 UI (621-1,380)), diarrhea (810 UI (479-1,140)) and peritoneal and intra-abdominal infections (163 UI (112-214)).

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



- In Namibia, people aged under 5 experienced the largest number of deaths associated with AMR in 1990 but this changed by 2021 as the largest number of deaths occurred among the 70+. This indicates that prevention of infections among the under 5 has contributed to the reduction in the number of AMR associated deaths. In 2021, the number of deaths associated with AMR among the 70+ was 448 UI (333-564), whereas the mortality rate per 100,000 was 749 UI (556-941).

Data sources for Namibia

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 Namibia by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2021	1,035	Study-year datapoints
Microbial or laboratory data without outcome	1990-2021	6,359	Isolates
Literature studies	1990-2021	297	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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