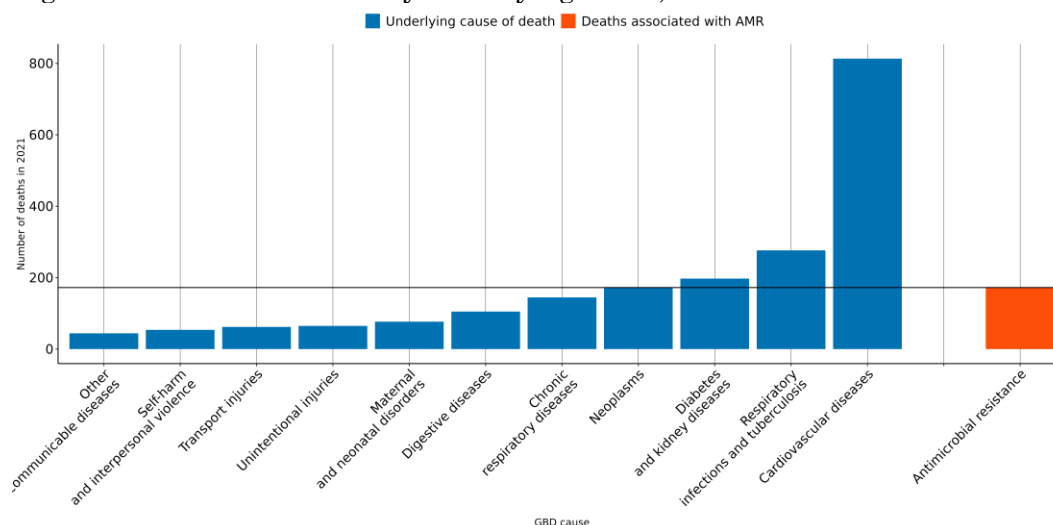


The burden of antimicrobial resistance (AMR) in Vanuatu

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **40 lives** have been lost each year since 1990 in Vanuatu due to AMR.
- In 2021, there were an estimated **43 UI (33-52)** deaths attributable to AMR and **172 UI (143-201)** deaths associated with AMR in this location.
- The largest number of deaths associated with AMR in 2021 occurred among those aged **50 to 69** in the country.
- Among the most deadly pathogen-drug combinations in 2021 were *Acinetobacter baumannii* resistant to carbapenems, *Acinetobacter baumannii* resistant to fluoroquinolones and *Streptococcus pneumoniae* resistant to carbapenems.

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



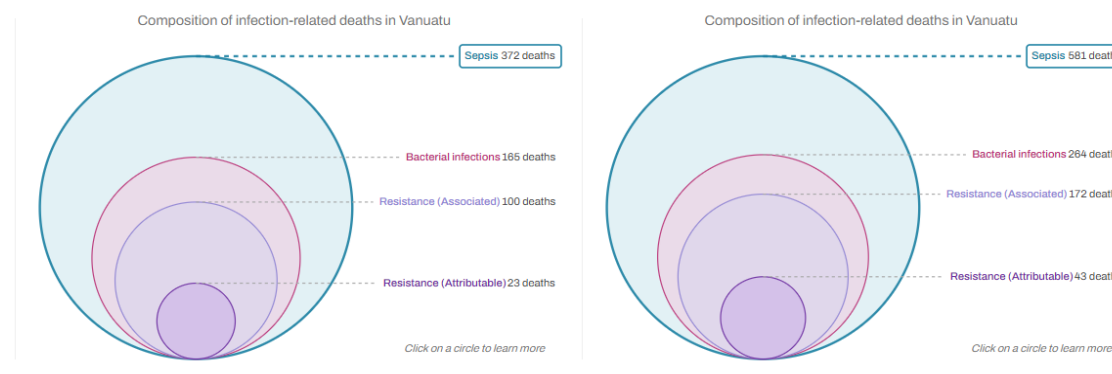
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Vanuatu, a 10% reduction means to decrease the number of deaths associated with AMR to **159**, but currently the trend for this country could reach up to **207 UI [163-258]** AMR-associated deaths in 2030.

AMR in Vanuatu

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 Vanuatu between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#)
- In **Vanuatu** in 2021, there were an estimated **43 UI (33-52)** deaths attributable to AMR and **172 UI (143-201)** 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, **Vanuatu has the 51st 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)

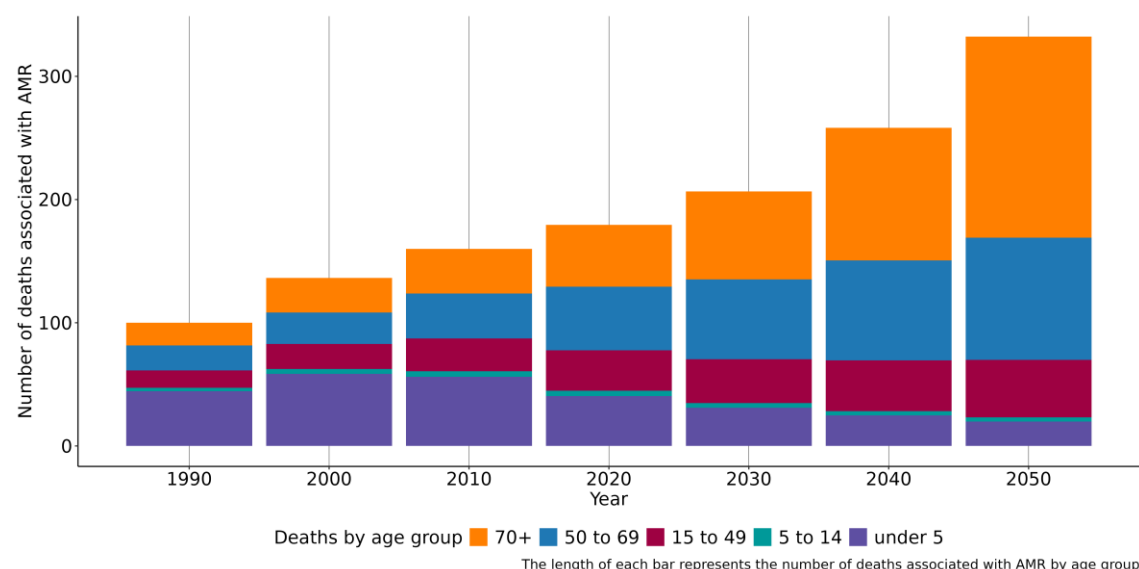
Burden rank	Overall susceptible and resistant			Associated			Attributable		
	Streptococcus pneumoniae 51 UI (44-59)	↑		Streptococcus pneumoniae 47 UI (40-54)	↑		Streptococcus pneumoniae 10 UI (8-13)	↑	
	Mycobacterium tuberculosis 35 UI (21-50)	↑		Klebsiella pneumoniae 26 UI (22-30)	↑		Acinetobacter baumannii 9 UI (8-10)	↑	
	Klebsiella pneumoniae 34 UI (29-38)	↑		Acinetobacter baumannii 23 UI (19-26)	↑		Klebsiella pneumoniae 7 UI (6-8)	↑	
	Staphylococcus aureus 26 UI (23-30)	↑		Escherichia coli 18 UI (14-21)	↑		Pseudomonas aeruginosa 4 UI (3-5)	↑	
	Acinetobacter baumannii 24 UI (21-28)	↑		Pseudomonas aeruginosa 16 UI (13-20)	↑		Escherichia coli 4 UI (3-5)	↑	
	Pseudomonas aeruginosa 24 UI (21-28)	↑		Staphylococcus aureus 16 UI (12-21)	↑		Staphylococcus aureus 3 UI (2-5)	↑	
	Escherichia coli 20 UI (17-23)	↑		Enterobacter spp. 5 UI (4-6)	↑		Enterobacter spp. 1 UI (1-2)	↑	
	Enterobacter spp. 6 UI (5-7)	↑		Enterococcus faecalis 3 UI (3-4)	↑		Serratia spp. 1 UI (1-1)	↑	
	Enterococcus faecalis 5 UI (4-6)	↑		Serratia spp. 3 UI (3-4)	↑		Enterococcus faecium 1 UI (0-1)	↑	
	Serratia spp. 5 UI (4-6)	↑		Enterococcus faecium 3 UI (2-3)	↑		Enterococcus faecalis 1 UI (0-1)	↑	
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		
	Streptococcus pneumoniae Macrolides	42 UI (35-48)	↑	Streptococcus pneumoniae Carbapenems	6 UI (3-8)	↑
	Streptococcus pneumoniae TMP-SMX	38 UI (30-47)	↑	Acinetobacter baumannii Carbapenems	5 UI (4-6)	↑
	Streptococcus pneumoniae 3GC	24 UI (18-30)	↑	Acinetobacter baumannii Fluoroquinolones	3 UI (2-3)	↑
	Klebsiella pneumoniae Aminoglycosides	24 UI (20-28)	↑	Klebsiella pneumoniae Aminoglycosides	2 UI (2-3)	↑
	Streptococcus pneumoniae Beta-Lactam/Lactamase Inhib.	22 UI (13-31)	↑	Klebsiella pneumoniae Carbapenems	2 UI (2-3)	↑
	Acinetobacter baumannii 4GC	21 UI (18-25)	↑	Staphylococcus aureus Methicillin	2 UI (1-3)	↑
	Acinetobacter baumannii Carbapenems	21 UI (18-25)	↑	Streptococcus pneumoniae 3GC	2 UI (1-2)	↑
	Streptococcus pneumoniae Carbapenems	21 UI (14-28)	↑	Streptococcus pneumoniae Macrolides	1 UI (1-2)	↑
	Acinetobacter baumannii 3GC	20 UI (17-24)	↑	Pseudomonas aeruginosa Carbapenems	1 UI (1-2)	↑
	Acinetobacter baumannii Fluoroquinolones	20 UI (17-24)	↑	Pseudomonas aeruginosa Fluoroquinolones	1 UI (1-2)	↑
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) (140 UI (121-159)), bloodstream infections (114 UI (95-132)), diarrhea (36 UI (18-53)), tuberculosis (35 UI (21-50)) and peritoneal and intra-abdominal infections (18 UI (12-23)).

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



- In Vanuatu, 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 50 to 69. 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 50 to 69 was 52 UI (42-63), whereas the mortality rate per 100,000 was 738 UI (617-859).

Data sources for Vanuatu

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 Vanuatu by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2009	21	Study-year datapoints

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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