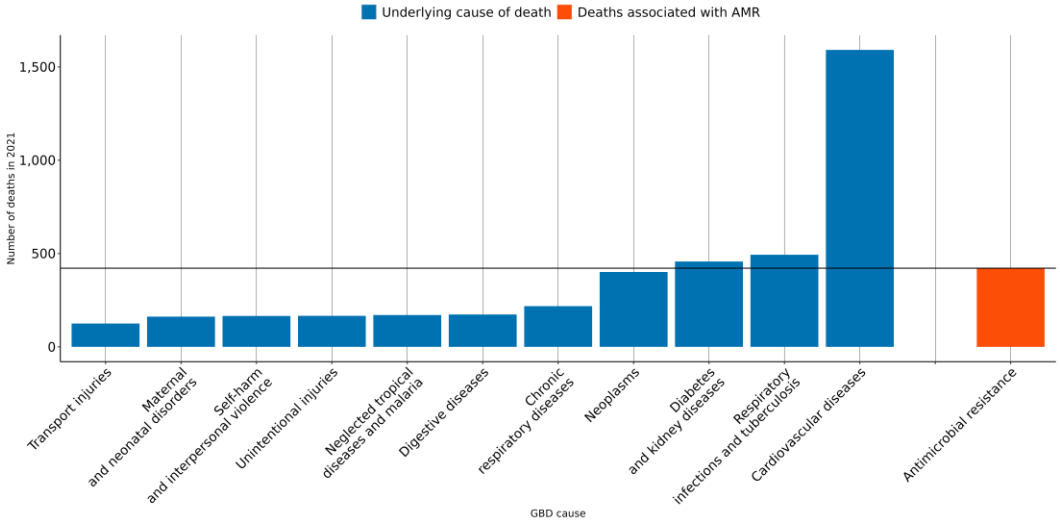
The burden of antimicrobial resistance (AMR) in the Solomon Islands

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **90 lives** have been lost each year since 1990 in the Solomon Islands due to AMR.
- In 2021, there were an estimated **98 UI (70-126)** deaths attributable to AMR and **421 UI (318-525)** 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 *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



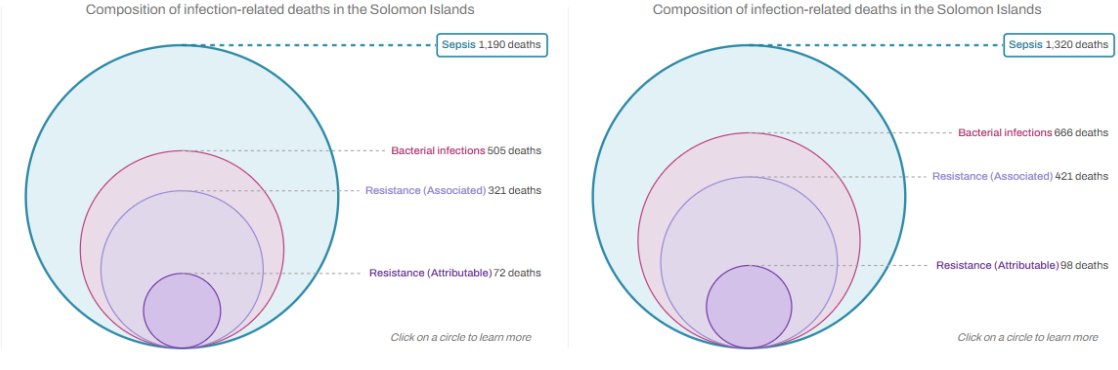
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 the Solomon Is., a 10% reduction means to decrease the number of deaths associated with AMR to **387**, but currently the trend for this country could reach up to **478 UI [335-657]** AMR-associated deaths in 2030.

AMR in the Solomon Islands

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 the Solomon Islands between 1990 and 2019.



- To look at these and more visualization interactively visit Measuring Infectious Causes and Resistance Outcomes for Burden Estimation (MICROBE)
- In **the Solomon Islands** in 2021, there were an estimated **98 UI (70-126)** deaths attributable to AMR and **421 UI (318-525)** 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, **the Solomon Islands has the 31st 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	Streptococcus pneumoniae 123 UI (99-148)	Streptococcus pneumoniae 106 UI (83-130)	Streptococcus pneumoniae 21 UI (14-28)
2	Klebsiella pneumoniae 99 UI (79-119)	Klebsiella pneumoniae 75 UI (57-92)	Klebsiella pneumoniae 18 UI (13-23)
3	Mycobacterium tuberculosis 80 UI (60-101)	Escherichia coli 47 UI (35-58)	Acinetobacter baumannii 16 UI (13-20)
4	Staphylococcus aureus 72 UI (57-87)	Pseudomonas aeruginosa 43 UI (32-54)	Pseudomonas aeruginosa 11 UI (7-14)
5	Pseudomonas aeruginosa 69 UI (56-83)	Staphylococcus aureus 43 UI (28-57)	Escherichia coli 10 UI (7-13)
6	Escherichia coli 54 UI (42-65)	Acinetobacter baumannii 42 UI (32-51)	Staphylococcus aureus 9 UI (5-14)
7	Acinetobacter baumannii 47 UI (37-57)	Enterobacter spp. 10 UI (8-12)	Enterobacter spp. 3 UI (2-4)
8	Group B Streptococcus 18 UI (14-21)	Serratia spp. 9 UI (7-10)	Serratia spp. 2 UI (2-3)
9	Haemophilus influenzae 14 UI (11-17)	Haemophilus influenzae 8 UI (3-13)	Haemophilus influenzae 2 UI (1-3)
10	Enterobacter spp. 13 UI (10-16)	Group B Streptococcus 6 UI (5-8)	Proteus spp. 1 UI (1-1)

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%

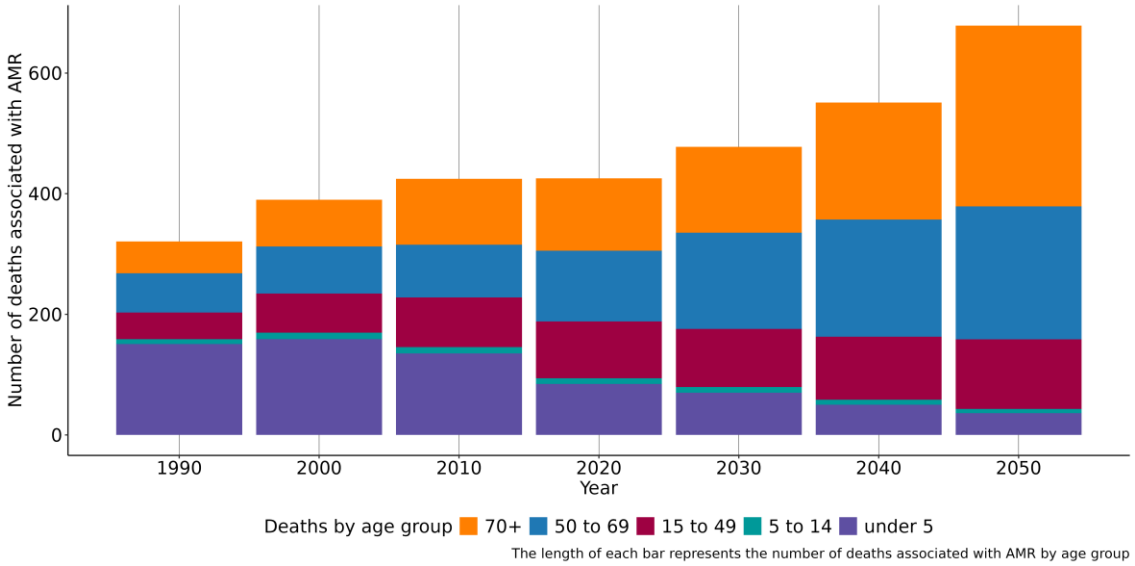
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

Burden Rank	Associated		Attributable	
1	Streptococcus pneumoniae Macrolides	90 UI (69-111)	Streptococcus pneumoniae Carbapenems	10 UI (6-14)
2	Streptococcus pneumoniae TMP-SMX	77 UI (51-102)	Acinetobacter baumannii Carbapenems	8 UI (5-10)
3	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	65 UI (46-83)	Acinetobacter baumannii Fluoroquinolones	5 UI (4-6)
4	Klebsiella pneumoniae TMP-SMX	60 UI (44-76)	Staphylococcus aureus Methicillin	5 UI (1-8)
5	Streptococcus pneumoniae Beta-Lactam/Lactamase Inhib.	52 UI (30-74)	Pseudomonas aeruginosa Carbapenems	5 UI (3-7)
6	Klebsiella pneumoniae 3GC	44 UI (33-55)	Pseudomonas aeruginosa Fluoroquinolones	3 UI (2-5)
7	Escherichia coli Aminopenicillin	42 UI (23-60)	Klebsiella pneumoniae Carbapenems	3 UI (2-4)
8	Klebsiella pneumoniae Aminoglycosides	41 UI (30-53)	Escherichia coli 3GC	3 UI (2-5)
9	Acinetobacter baumannii 4GC	40 UI (31-50)	Streptococcus pneumoniae Macrolides	3 UI (2-5)
10	Streptococcus pneumoniae Carbapenems	38 UI (22-54)	Klebsiella pneumoniae 3GC	3 UI (2-5)

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) (528 UI (422-634)), bloodstream infections (237 UI (187-287)), tuberculosis (80 UI (60-101)), diarrhea (69 UI (43-95)) and infections of the skin and subcutaneous systems (36 UI (25-46)).

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



- In the Solomon Islands, 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 120 UI (93-146), whereas the mortality rate per 100,000 was 905 UI (705-1,100).

Data sources for the Solomon Islands

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 the Solomon Islands by source type

Source type	Years	Sample size	Sample size units
Single drug resistance profile data	1990-2009	34	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:

- For inquiries about the analysis and questions from government officials, health departments, or research institutions: engage@healthdata.org
- For media-related inquiries: media@healthdata.org
- **Bluesky**: @ihmeuw.bsky.social
- **Twitter**: @IHME_UW
- **Facebook**: https://www.facebook.com/IHMEUW
- **LinkedIn**: https://www.linkedin.com/company/institute-for-health-metrics-and-evaluation