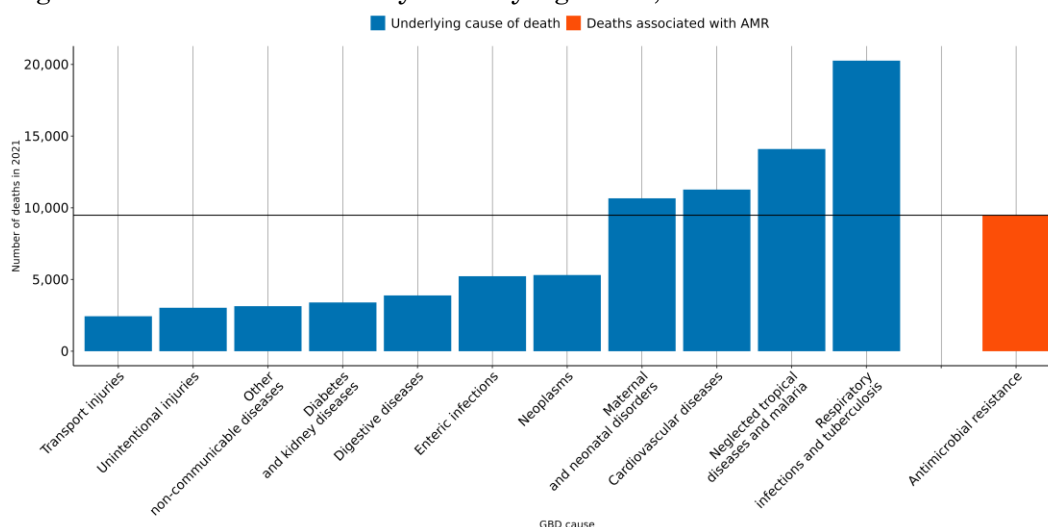


The burden of antimicrobial resistance (AMR) in Burundi

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **3,000 lives** have been lost each year since 1990 in Burundi due to AMR.
- In 2021, there were an estimated **2,160 UI (1,510-2,810)** deaths attributable to AMR and **9,480 UI (7,050-11,900)** deaths associated with AMR in this location.
- The largest number of deaths associated with AMR in 2021 occurred among those aged **under 5** in the country.
- Among the most deadly pathogen-drug combinations in 2021 were multi-drug resistant *Mycobacterium tuberculosis* (excluding extensive drug-resistance), *Escherichia coli* resistant to carbapenems and *Streptococcus pneumoniae* resistant to carbapenems.

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



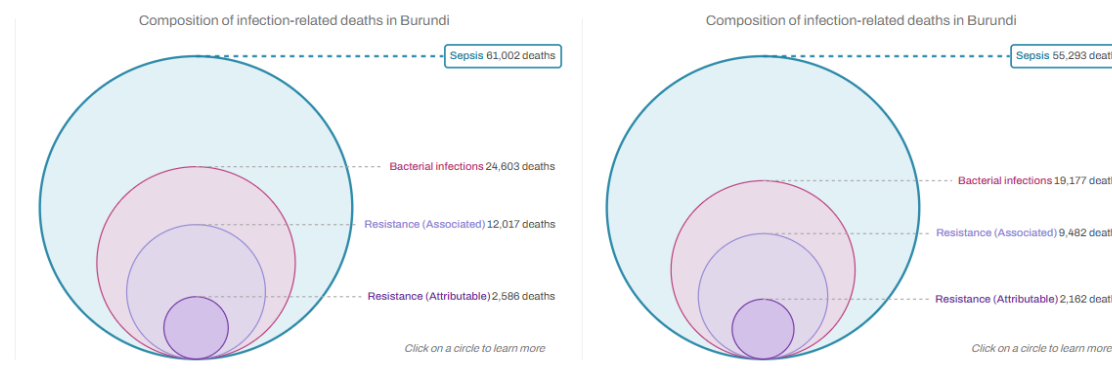
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Burundi, a 10% reduction means to decrease the number of deaths associated with AMR to **8,970**, but currently the trend for this country could reach up to **9,870 UI [6,940-13,500]** AMR-associated deaths in 2030.

AMR in Burundi

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 Burundi between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#)
- In **Burundi** in 2021, there were an estimated **2,160 UI (1,510-2,810)** deaths attributable to AMR and **9,480 UI (7,050-11,900)** 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, **Burundi has the 17th 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		
	Mycobacterium tuberculosis 6,890 UI (4,820-8,950)	↓		Klebsiella pneumoniae 2,020 UI (1,600-2,440)	↑		Klebsiella pneumoniae 463 UI (338-588)	↑	
	Klebsiella pneumoniae 2,180 UI (1,740-2,620)	↓		Escherichia coli 1,530 UI (1,000-2,050)	↓		Escherichia coli 357 UI (206-507)	↑	
	Escherichia coli 1,640 UI (1,100-2,190)	↓		Streptococcus pneumoniae 1,260 UI (925-1,590)	↓		Streptococcus pneumoniae 245 UI (147-343)	↓	
	Streptococcus pneumoniae 1,520 UI (1,190-1,850)	↓		Staphylococcus aureus 904 UI (602-1,210)	↑		Acinetobacter baumannii 228 UI (186-270)	↓	
	Pseudomonas aeruginosa 1,300 UI (1,050-1,560)	↑		Pseudomonas aeruginosa 863 UI (622-1,100)	↑		Pseudomonas aeruginosa 203 UI (136-270)	↓	
	Staphylococcus aureus 1,190 UI (963-1,420)	↑		Acinetobacter baumannii 596 UI (477-715)	↓		Staphylococcus aureus 182 UI (99-265)	↑	
	Group B Streptococcus 770 UI (562-978)	↑		Mycobacterium tuberculosis 498 UI (102-1,290)	↑		Mycobacterium tuberculosis 154 UI (0-459)	↑	
	Acinetobacter baumannii 616 UI (494-738)	↓		Serratia spp. 306 UI (223-388)	↑		Serratia spp. 83 UI (60-106)	↓	
	Shigella spp. 483 UI (120-847)	↓		Group B Streptococcus 255 UI (177-332)	↑		Enterobacter spp. 65 UI (49-80)	↓	
	Serratia spp. 444 UI (335-553)	↑		Enterobacter spp. 214 UI (168-260)	↓		Haemophilus influenzae 32 UI (9-56)	↓	

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% (pink), 3% to 5% (brown)

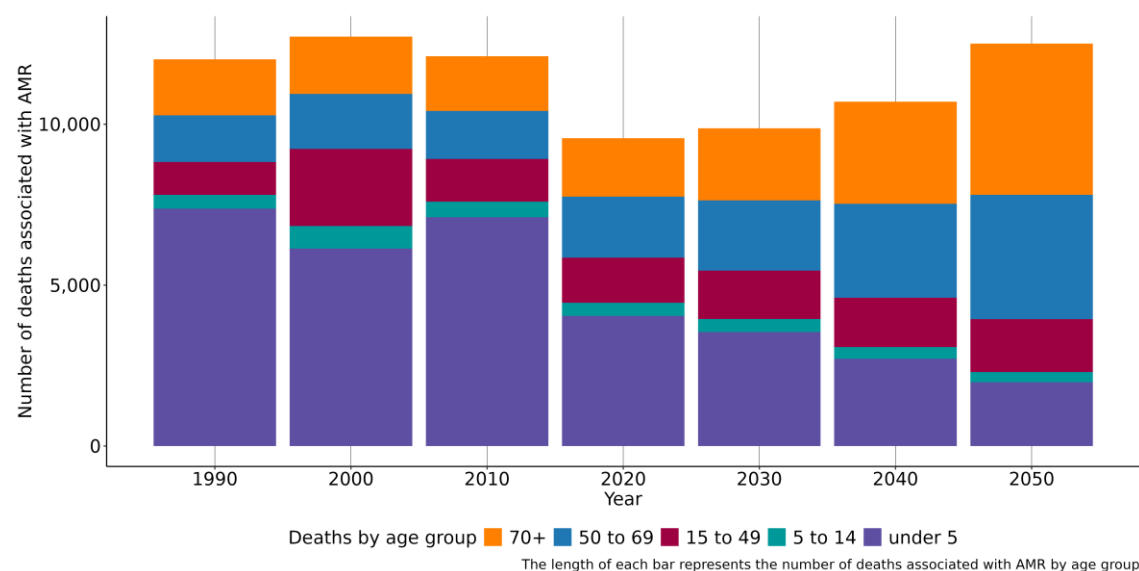
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

Burden Rank	Associated			Attributable		
	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	1,910 UI (1,500-2,330)	↓	Mycobacterium tuberculosis MDR excluding XDR	151 UI (0-453)	↑
	Klebsiella pneumoniae TMP-SMX	1,870 UI (1,470-2,270)	↑	Streptococcus pneumoniae Carbapenems	109 UI (57-162)	↓
	Escherichia coli Aminopenicillin	1,500 UI (925-2,070)	↓	Escherichia coli Carbapenems	109 UI (27-192)	↑
	Escherichia coli TMP-SMX	1,290 UI (859-1,730)	↓	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	104 UI (44-165)	↓
	Streptococcus pneumoniae TMP-SMX	1,190 UI (863-1,520)	↓	Klebsiella pneumoniae TMP-SMX	87 UI (43-131)	↑
	Escherichia coli Beta-Lactam/Lactamase Inhib.	1,090 UI (709-1,470)	↓	Klebsiella pneumoniae 3GC	86 UI (47-125)	↑
	Klebsiella pneumoniae 3GC	1,090 UI (809-1,360)	↑	Acinetobacter baumannii Carbapenems	83 UI (52-114)	↓
	Klebsiella pneumoniae Fluoroquinolones	1,030 UI (688-1,370)	↑	Staphylococcus aureus Methicillin	79 UI (17-141)	↑
	Klebsiella pneumoniae Aminoglycosides	1,030 UI (732-1,320)	↓	Klebsiella pneumoniae Fluoroquinolones	74 UI (43-106)	↑
	Staphylococcus aureus TMP-SMX	686 UI (377-995)	↑	Klebsiella pneumoniae Aminoglycosides	68 UI (44-91)	↓

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% (pink), 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) bloodstream infections (7,950 UI (5,970-9,930)), lower respiratory infection (excl. COVID) (7,070 UI (5,580-8,550)), tuberculosis (6,890 UI (4,820-8,950)), diarrhea (5,080 UI (2,490-7,680)) and meningitis (1,230 UI (775-1,680)).

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



- In Burundi, people aged under 5 saw the largest number of deaths associated with AMR both in 1990 and 2021, which indicates that under 5 continues to be particularly vulnerable to infections which are resistant to antibiotics. In 2021, the number of deaths associated with AMR among the under 5 was 3,880 UI (2,340-5,430), whereas the mortality rate per 100,000 was 1,020 UI (793-1,250).

Data sources for Burundi

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 Burundi by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2021	2,190	Study-year datapoints
Microbial or laboratory data without outcome	1990-2021	2	Isolates
Literature studies	1990-2009	596	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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