# The burden of antimicrobial resistance (AMR) in Burkina Faso

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **5,000 lives** have been lost each year since 1990 in Burkina Faso due to AMR.

- In 2021, there were an estimated **4,930 UI (3,440-6,410)** deaths attributable to AMR and **22,400 UI (16,300-28,500)** 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 *Escherichia coli* resistant to carbapenems, *Klebsiella pneumoniae* resistant to beta lactam / beta-lactamase inhibitors and *Streptococcus pneumoniae* resistant to fluoroquinolones.

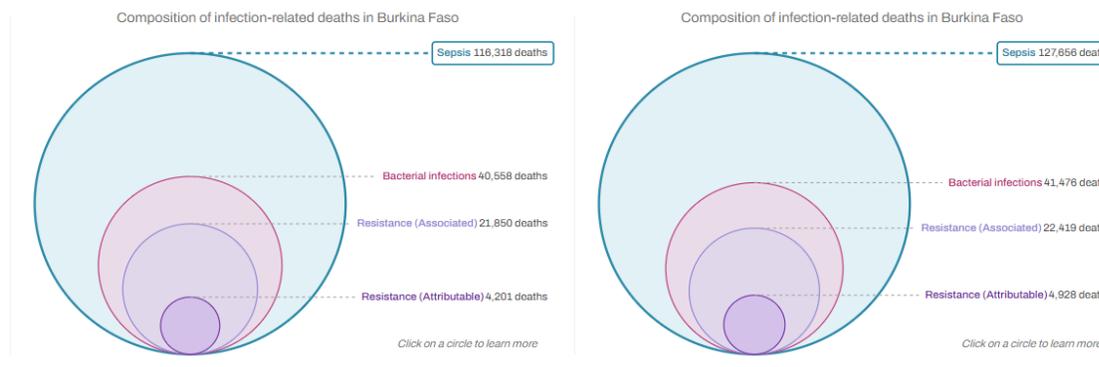Figure 1 Number of deaths by underlying cause, and those associated with AMR in 2021
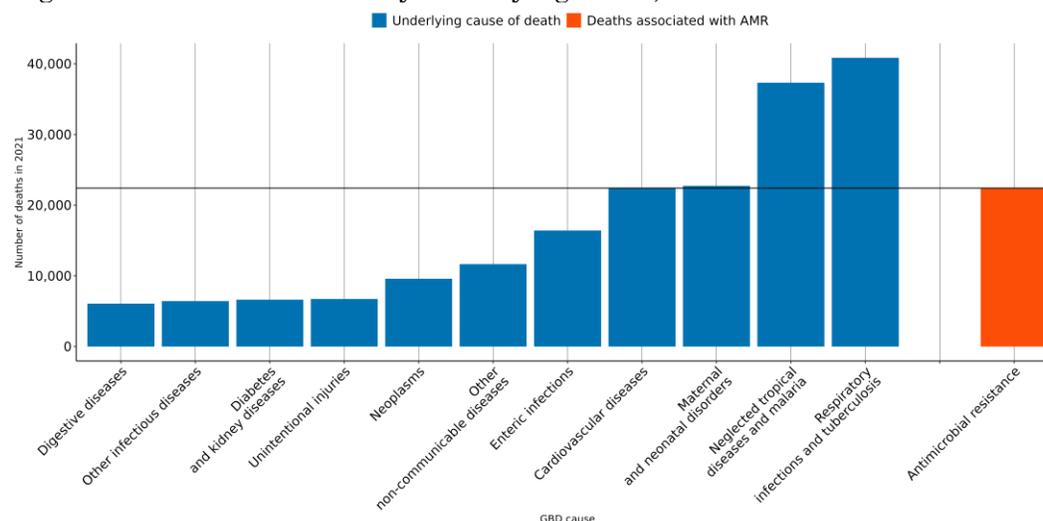
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Burkina Faso, a 10% reduction means to decrease the number of deaths associated with AMR to **22,000**, but currently the trend for this country could reach up to **26,200 UI [18,200-37,400]** AMR-associated deaths in 2030.

AMR in Burkina Faso

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 Burkina Faso between 1990 and 2019.

Composition of infection-related deaths in Burkina Faso

Sepsis 116,318 deaths

Bacterial infections 40,558 deaths

Resistance (Associated) 21,850 deaths

Resistance (Attributable) 4,201 deaths

Click on a circle to learn more

Composition of infection-related deaths in Burkina Faso

Sepsis 127,656 deaths

Bacterial infections 41,476 deaths

Resistance (Associated) 22,419 deaths

Resistance (Attributable) 4,928 deaths

Click on a circle to learn more

- To look at these and more visualization interactively visit Measuring Infectious Causes and Resistance Outcomes for Burden Estimation (MICROBE)

- In **Burkina Faso** in 2021, there were an estimated **4,930 UI (3,440-6,410)** deaths attributable to AMR and **22,400 UI (16,300-28,500)** 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, **Burkina Faso has the 19th 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)

Overall susceptible and resistant		Associated		Attributable	
Mycobacterium tuberculosis 5,680 UI (4,170-7,190)	↑	Klebsiella pneumoniae 4,460 UI (3,460-5,460)	↑	Klebsiella pneumoniae 1,040 UI (759-1,320)	↑
Streptococcus pneumoniae 4,960 UI (3,770-6,160)	↓	Escherichia coli 4,190 UI (3,070-5,320)	↓	Escherichia coli 902 UI (599-1,210)	↑
Klebsiella pneumoniae 4,960 UI (3,920-6,010)	↑	Streptococcus pneumoniae 3,850 UI (2,590-5,110)	↓	Streptococcus pneumoniae 691 UI (407-975)	↓
Escherichia coli 4,540 UI (3,350-5,730)	↓	Pseudomonas aeruginosa 1,980 UI (1,400-2,560)	↑	Acinetobacter baumannii 644 UI (487-801)	↑
Non-typhoidal Salmonella 3,690 UI (1,800-5,570)	↑	Acinetobacter baumannii 1,800 UI (1,310-2,290)	↑	Pseudomonas aeruginosa 469 UI (308-629)	↑
Pseudomonas aeruginosa 3,070 UI (2,420-3,710)	↑	Staphylococcus aureus 1,320 UI (729-1,910)	↑	Staphylococcus aureus 229 UI (110-348)	↑
Staphylococcus aureus 2,840 UI (2,250-3,440)	↑	Serratia spp. 668 UI (462-873)	↑	Enterobacter spp. 182 UI (143-221)	↑
Acinetobacter baumannii 2,200 UI (1,700-2,710)	↑	Group B Streptococcus 655 UI (426-884)	↑	Serratia spp. 177 UI (119-234)	↑
Group B Streptococcus 1,700 UI (1,260-2,130)	↑	Enterobacter spp. 574 UI (452-697)	↑	Mycobacterium tuberculosis 110 UI (0-369)	↑
Salmonella Typhi 1,510 UI (436-2,580)	↓	Non-typhoidal Salmonella 504 UI (226-783)	↑	Group B Streptococcus 85 UI (41-129)	↑

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)

Associated			Attributable		
Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	4,170 UI (3,170-5,180)	↑	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	218 UI (95-340)	↓
Klebsiella pneumoniae TMP-SMX	4,010 UI (3,070-4,950)	↑	Streptococcus pneumoniae Fluoroquinolones	200 UI (73-327)	↓
Escherichia coli Aminopenicillin	3,600 UI (2,050-5,150)	↓	Escherichia coli Carbapenems	190 UI (42-337)	↑
Escherichia coli TMP-SMX	3,400 UI (2,520-4,290)	↓	Klebsiella pneumoniae Fluoroquinolones	185 UI (108-262)	↑
Escherichia coli Beta-Lactam/Lactamase Inhib.	3,170 UI (2,310-4,020)	↓	Klebsiella pneumoniae TMP-SMX	180 UI (89-271)	↑
Streptococcus pneumoniae TMP-SMX	3,110 UI (1,930-4,290)	↓	Klebsiella pneumoniae 3GC	176 UI (92-260)	↑
Klebsiella pneumoniae Fluoroquinolones	2,570 UI (1,730-3,400)	↑	Escherichia coli TMP-SMX	166 UI (112-219)	↓
Klebsiella pneumoniae 3GC	2,450 UI (1,790-3,100)	↑	Klebsiella pneumoniae Aminoglycosides	159 UI (102-216)	↑
Klebsiella pneumoniae Aminoglycosides	2,440 UI (1,720-3,160)	↑	Streptococcus pneumoniae 3GC	152 UI (93-211)	↑
Escherichia coli Aminoglycosides	1,960 UI (1,000-2,910)	↓	Pseudomonas aeruginosa Anti-pseudomonal	138 UI (90-185)	↓

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) (19,800 UI (15,500-24,000)), bloodstream infections (17,700 UI (13,300-22,100)), diarrhea (11,700 UI (7,700-15,600)), tuberculosis (5,680 UI (4,170-7,190)) and typhoid fever, paratyphoid fever, and invasive non-typhoidal salmonella (4,810 UI (2,670-6,940)).

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

Deaths by age group ■ 70+ ■ 50 to 69 ■ 15 to 49 ■ 5 to 14 ■ under 5
The length of each bar represents the number of deaths associated with AMR by age group
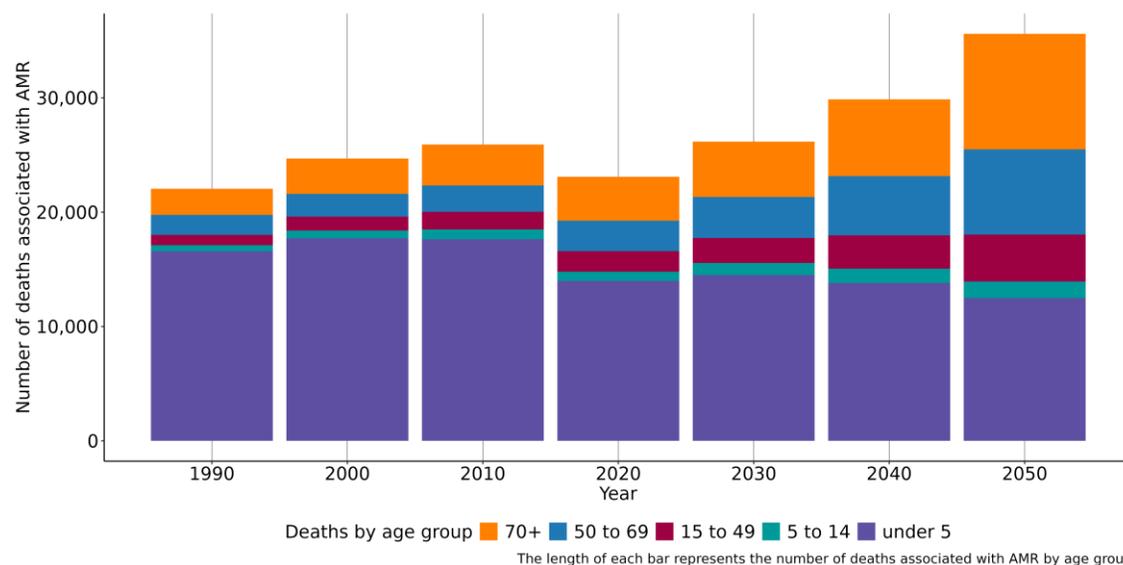
- In Burkina Faso, people aged under 5 saw the largest number of deaths associated with AMR both in 1990 and 2021, which indicates that under 5 continues to be particularly vulnerable to infections which are resistant to antibiotics. In 2021, the number of deaths associated with AMR among the under 5 was 13,400 UI (9,280-17,500), whereas the mortality rate per 100,000 was 884 UI (672-1,100).

Data sources for Burkina Faso

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 Burkina Faso by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2021	3,722	Study-year datapoints
Microbial or laboratory data without outcome	1990-2021	500	Isolates
Literature studies	1990-2021	30,307	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:

- 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