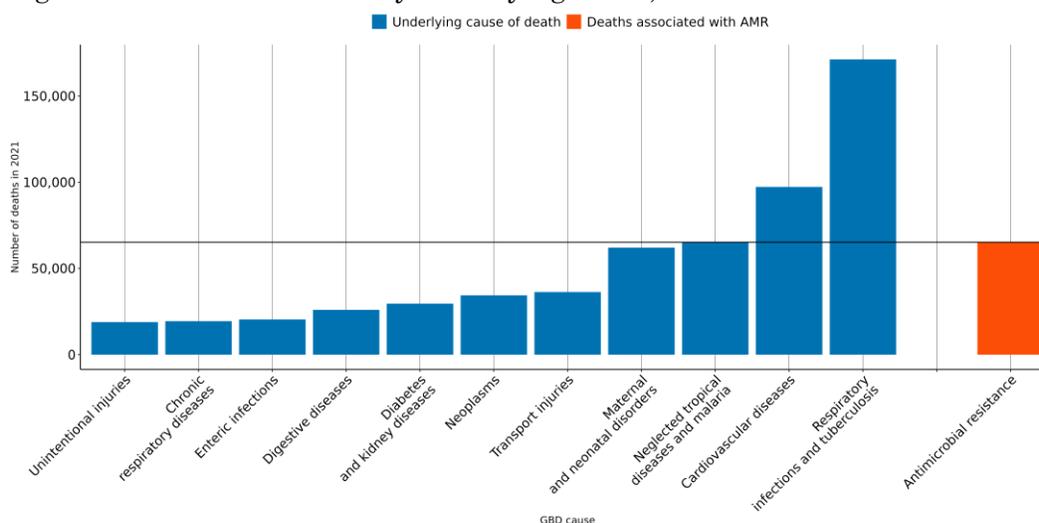


The burden of antimicrobial resistance (AMR) in the Democratic Republic of the Congo

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **20,000 lives** have been lost each year since 1990 in the Democratic Republic of the Congo due to AMR.
- In 2021, there were an estimated **15,700 UI (11,200-20,200)** deaths attributable to AMR and **65,200 UI (50,100-80,300)** 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), *Klebsiella pneumoniae* resistant to third-generation cephalosporins and *Streptococcus pneumoniae* resistant to carbapenems.

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



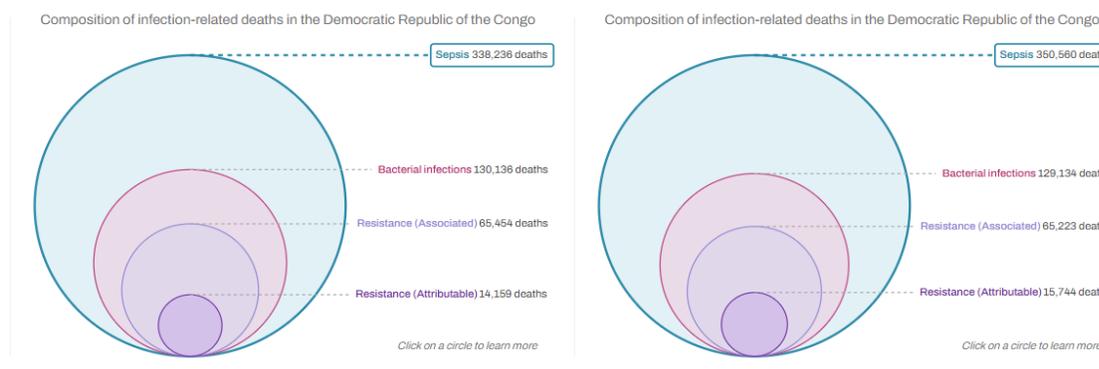
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 DRC, a 10% reduction means to decrease the number of deaths associated with AMR to **63,300**, but currently the trend for this country could reach up to **74,200 UI [47,200-109,000]** AMR-associated deaths in 2030.

AMR in the Democratic Republic of the Congo

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 Democratic Republic of the Congo 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 Democratic Republic of the Congo in 2021, there were an estimated **15,700 UI (11,200-20,200)** deaths attributable to AMR and **65,200 UI (50,100-80,300)** 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 Democratic Republic of the Congo has the 12th 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	
	Number of deaths (UI)	Annualized rate of change (1990-2021)	Number of deaths (UI)	Annualized rate of change (1990-2021)	Number of deaths (UI)	Annualized rate of change (1990-2021)
1	Mycobacterium tuberculosis 48,200 UI (28,600-67,700)	↑	Streptococcus pneumoniae 15,500 UI (12,200-18,800)	↓	Streptococcus pneumoniae 3,580 UI (2,530-4,630)	↓
2	Streptococcus pneumoniae 16,300 UI (12,900-19,700)	↓	Klebsiella pneumoniae 12,200 UI (9,680-14,700)	↑	Klebsiella pneumoniae 2,930 UI (2,210-3,650)	↑
3	Klebsiella pneumoniae 13,000 UI (10,300-15,600)	↑	Staphylococcus aureus 6,680 UI (4,840-8,520)	↑	Acinetobacter baumannii 1,840 UI (1,400-2,290)	↑
4	Pseudomonas aeruginosa 8,640 UI (6,930-10,300)	↑	Escherichia coli 6,360 UI (4,830-7,900)	↓	Staphylococcus aureus 1,620 UI (1,070-2,170)	↑
5	Staphylococcus aureus 8,310 UI (6,640-9,990)	↑	Pseudomonas aeruginosa 5,370 UI (3,890-6,860)	↑	Escherichia coli 1,480 UI (966-2,000)	↑
6	Escherichia coli 6,880 UI (5,400-8,350)	↓	Acinetobacter baumannii 5,050 UI (3,820-6,280)	↑	Pseudomonas aeruginosa 1,330 UI (874-1,790)	↑
7	Acinetobacter baumannii 6,340 UI (5,010-7,670)	↑	Mycobacterium tuberculosis 2,480 UI (493-7,000)	↑	Mycobacterium tuberculosis 720 UI (0-2,480)	↑
8	Non-typhoidal Salmonella 3,860 UI (1,810-5,920)	↓	Group B Streptococcus 2,070 UI (1,290-2,850)	↑	Serratia spp. 494 UI (351-637)	↑
9	Group B Streptococcus 3,210 UI (2,310-4,120)	↑	Serratia spp. 1,750 UI (1,280-2,230)	↑	Group B Streptococcus 372 UI (188-555)	↓
10	Haemophilus influenzae 2,220 UI (1,700-2,740)	↓	Enterobacter spp. 1,310 UI (983-1,640)	↑	Enterobacter spp. 303 UI (227-380)	↑

Annualized rate of change (1990-2021): <-3% (dark blue), -3% to -1.5% (medium blue), -1.5% to 0% (light blue), 0% to 1.5% (pink), 1.5% to 3% (red), 3% to 5% (dark red), >5.0% (black)

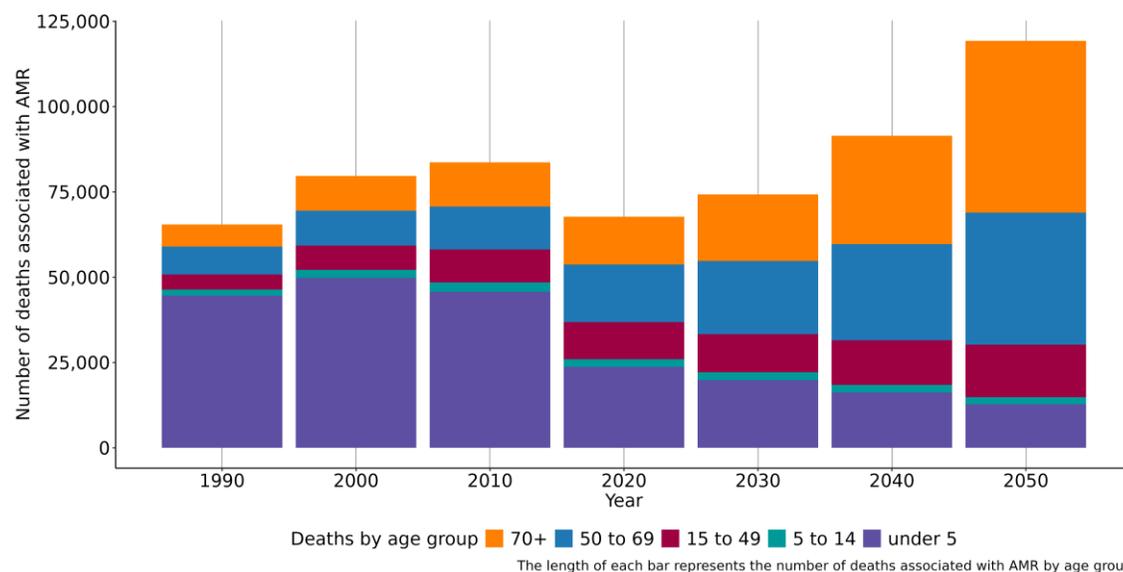
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

Burden Rank	Associated		Attributable	
	Number of deaths (UI)	Annualized rate of change (1990-2021)	Number of deaths (UI)	Annualized rate of change (1990-2021)
1	Streptococcus pneumoniae TMP-SMX 13,700 UI (10,500-17,000)	↓	Streptococcus pneumoniae Carbapenems 1,410 UI (794-2,020)	↓
2	Streptococcus pneumoniae Macrolides 12,700 UI (9,730-15,600)	↓	Klebsiella pneumoniae 3GC 988 UI (558-1,420)	↑
3	Klebsiella pneumoniae TMP-SMX 11,900 UI (9,420-14,300)	↑	Mycobacterium tuberculosis MDR excluding XDR 708 UI (0-2,450)	↑
4	Klebsiella pneumoniae 3GC 11,400 UI (9,080-13,800)	↑	Streptococcus pneumoniae Beta-Lactam/Lactamase Inhib. 689 UI (406-972)	↓
5	Streptococcus pneumoniae Beta-Lactam/Lactamase Inhib. 11,200 UI (7,920-14,400)	↓	Staphylococcus aureus Methicillin 661 UI (334-988)	↑
6	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib. 10,100 UI (7,700-12,600)	↑	Acinetobacter baumannii Carbapenems 638 UI (353-924)	↑
7	Klebsiella pneumoniae Aminoglycosides 9,610 UI (7,470-11,700)	↑	Klebsiella pneumoniae Aminoglycosides 619 UI (410-828)	↑
8	Streptococcus pneumoniae Penicillin 8,330 UI (5,180-11,500)	↓	Streptococcus pneumoniae Fluoroquinolones 569 UI (257-882)	↓
9	Klebsiella pneumoniae Fluoroquinolones 8,160 UI (6,000-10,300)	↓	Klebsiella pneumoniae Fluoroquinolones 563 UI (350-777)	↓
10	Streptococcus pneumoniae Fluoroquinolones 6,710 UI (3,570-9,860)	↑	Klebsiella pneumoniae TMP-SMX 485 UI (238-732)	↑

Annualized rate of change (1990-2021): <-3% (dark blue), -3% to -1.5% (medium blue), -1.5% to 0% (light blue), 0% to 1.5% (pink), 1.5% to 3% (red), 3% to 5% (dark red), >5.0% (black)

- 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) (53,500 UI (41,300-65,700)), tuberculosis (48,200 UI (28,600-67,700)), bloodstream infections (45,000 UI (32,300-57,600)), diarrhea (16,600 UI (7,860-25,300)) and meningitis (7,450 UI (4,940-9,970)).

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



- In the Democratic Republic of the Congo, 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 21,300 UI (13,300-29,200), whereas the mortality rate per 100,000 was 1,100 UI (835-1,360).

Data sources for the Democratic Republic of the Congo

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 Democratic Republic of the Congo by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2021	2,143	Study-year datapoints
Microbial or laboratory data without outcome	2010-2021	100	Isolates
Literature studies	1990-2021	4,996	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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