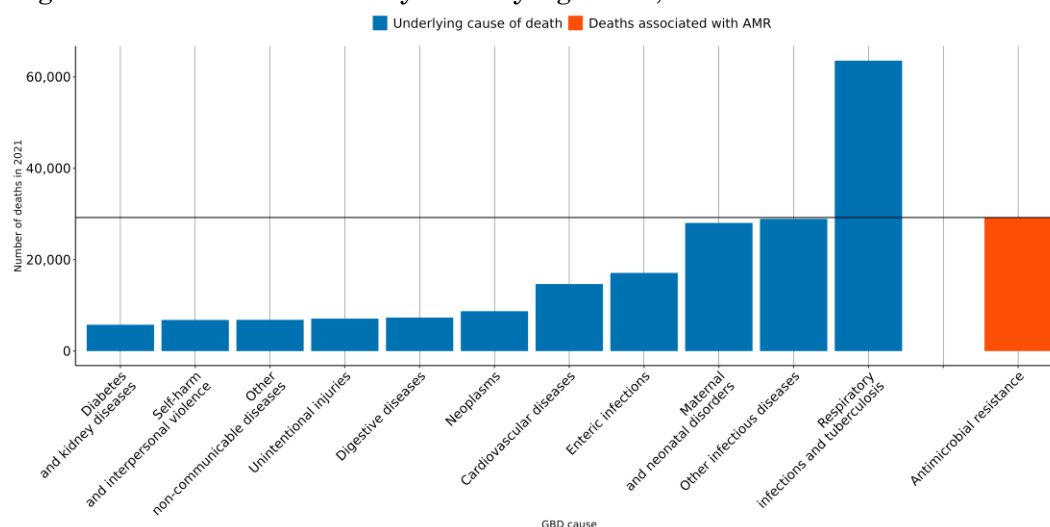


The burden of antimicrobial resistance (AMR) in Somalia

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **6,000 lives** have been lost each year since 1990 in Somalia due to AMR.
- In 2021, there were an estimated **7,130 UI (4,500-9,750)** deaths attributable to AMR and **29,200 UI (21,200-37,200)** 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



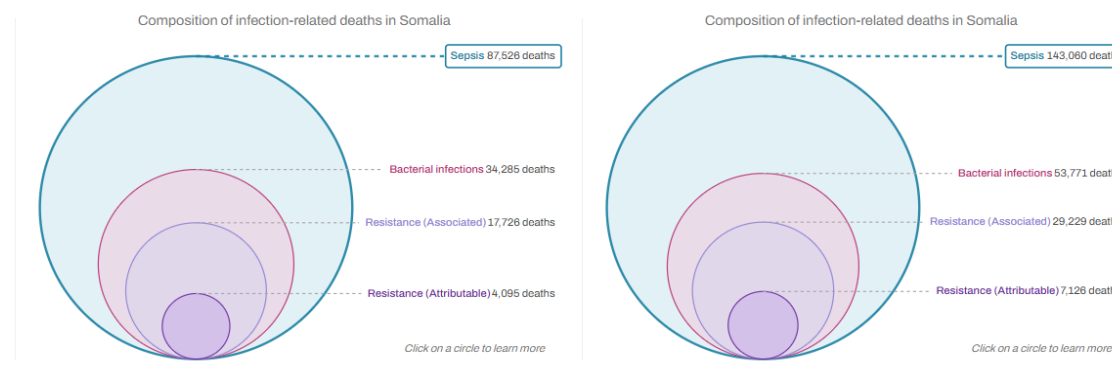
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Somalia, a 10% reduction means to decrease the number of deaths associated with AMR to **27,500**, but currently the trend for this country could reach up to **33,600 UI [21,800-50,500]** AMR-associated deaths in 2030.

AMR in Somalia

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 Somalia between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#)
- In **Somalia** in 2021, there were an estimated **7,130 UI (4,500-9,750)** deaths attributable to AMR and **29,200 UI (21,200-37,200)** 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, **Somalia was among the highest 10 countries in** 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)

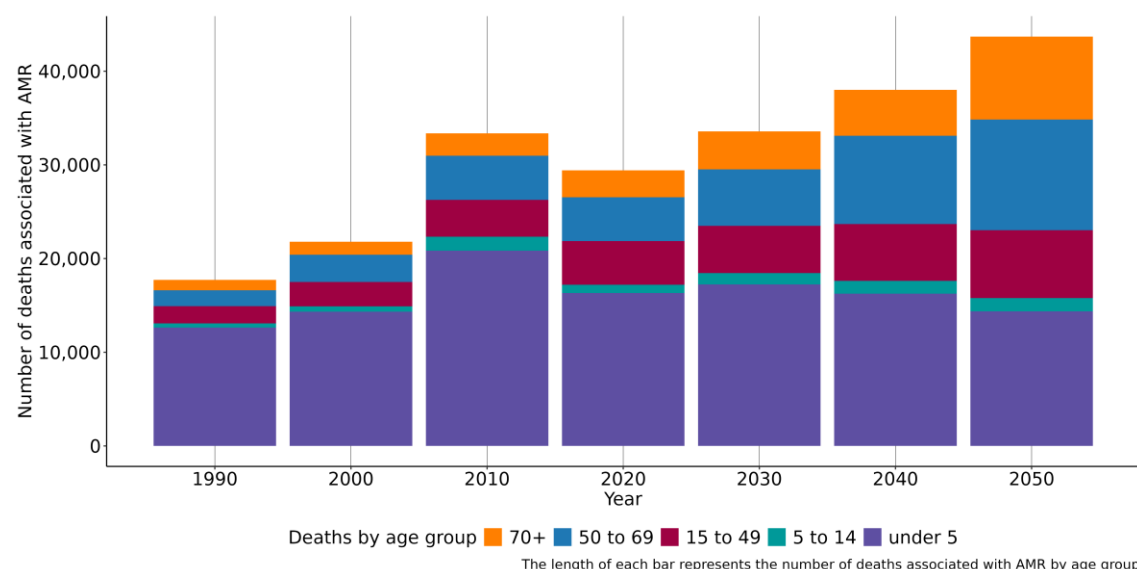
Burden rank	Overall susceptible and resistant		Associated		Attributable	
	Mycobacterium tuberculosis 19,500 UI (8,840-30,100)	↑	Streptococcus pneumoniae 7,160 UI (4,860-9,450)	↑	Streptococcus pneumoniae 1,440 UI (812-2,070)	↑
	Streptococcus pneumoniae 8,820 UI (6,410-11,200)	↑	Klebsiella pneumoniae 4,330 UI (3,350-5,310)	↑	Acinetobacter baumannii 1,140 UI (924-1,350)	↑
	Klebsiella pneumoniae 5,020 UI (3,920-6,110)	↑	Escherichia coli 3,580 UI (2,390-4,760)	↑	Klebsiella pneumoniae 1,060 UI (790-1,320)	↑
	Escherichia coli 3,990 UI (2,670-5,310)	↑	Acinetobacter baumannii 2,980 UI (2,330-3,640)	↑	Mycobacterium tuberculosis 910 UI (0-2,970)	↑
	Acinetobacter baumannii 3,060 UI (2,390-3,730)	↑	Mycobacterium tuberculosis 2,800 UI (715-6,750)	↑	Escherichia coli 755 UI (443-1,070)	↑
	Pseudomonas aeruginosa 2,830 UI (2,230-3,420)	↑	Pseudomonas aeruginosa 2,020 UI (1,500-2,540)	↑	Pseudomonas aeruginosa 521 UI (360-681)	↑
	Staphylococcus aureus 2,120 UI (1,670-2,570)	↑	Staphylococcus aureus 1,900 UI (1,450-2,360)	↑	Staphylococcus aureus 473 UI (341-606)	↑
	Shigella spp. 1,750 UI (713-2,790)	↓	Serratia spp. 852 UI (648-1,060)	↑	Serratia spp. 246 UI (186-306)	↑
	Group B Streptococcus 1,360 UI (986-1,740)	↑	Shigella spp. 765 UI (204-1,330)	↑	Enterobacter spp. 160 UI (114-206)	↑
	Haemophilus influenzae 1,010 UI (726-1,280)	↑	Group B Streptococcus 573 UI (382-764)	↑	Haemophilus influenzae 102 UI (41-162)	↓
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 TMP-SMX	6,530 UI (4,310-8,740)	↑	Mycobacterium tuberculosis MDR excluding XDR	891 UI (0-2,930)	↑
	Klebsiella pneumoniae 3GC	4,010 UI (3,110-4,910)	↑	Streptococcus pneumoniae Carbapenems	749 UI (388-1,110)	↑
	Klebsiella pneumoniae TMP-SMX	3,690 UI (2,790-4,590)	↑	Klebsiella pneumoniae 3GC	395 UI (240-551)	↑
	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	3,690 UI (2,710-4,670)	↑	Acinetobacter baumannii Carbapenems	377 UI (236-518)	↑
	Klebsiella pneumoniae Fluoroquinolones	2,930 UI (2,100-3,770)	↑	Acinetobacter baumannii Fluoroquinolones	333 UI (261-406)	↑
	Acinetobacter baumannii Beta-Lactam/Lactamase Inhib.	2,890 UI (2,250-3,520)	↑	Streptococcus pneumoniae Fluoroquinolones	264 UI (84-444)	↑
	Streptococcus pneumoniae Carbapenems	2,880 UI (1,530-4,240)	↑	Staphylococcus aureus Methicillin	259 UI (163-355)	↑
	Acinetobacter baumannii 3GC	2,850 UI (2,210-3,480)	↑	Escherichia coli 3GC	233 UI (67-399)	↑
	Mycobacterium tuberculosis MDR excluding XDR	2,760 UI (705-6,660)	↑	Klebsiella pneumoniae Fluoroquinolones	219 UI (137-301)	↑
	Escherichia coli Beta-Lactam/Lactamase Inhib.	2,730 UI (1,810-3,650)	↑	Streptococcus pneumoniae TMP-SMX	199 UI (0-442)	↑
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) tuberculosis (19,500 UI (8,840-30,100)), bloodstream infections (18,700 UI (14,300-23,100)), lower respiratory infection (excl. COVID) (17,900 UI (13,200-22,600)), diarrhea (17,800 UI (11,300-24,300)) and meningitis (4,820 UI (2,870-6,780)).

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



- In Somalia, 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 16,000 UI (11,300-20,700), whereas the mortality rate per 100,000 was 1,510 UI (1,130-1,890).

Data sources for Somalia

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 Somalia by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2021	837	Study-year datapoints
Literature studies	2010-2021	18,267	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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- **LinkedIn:** <https://www.linkedin.com/company/institute-for-health-metrics-and-evaluation>