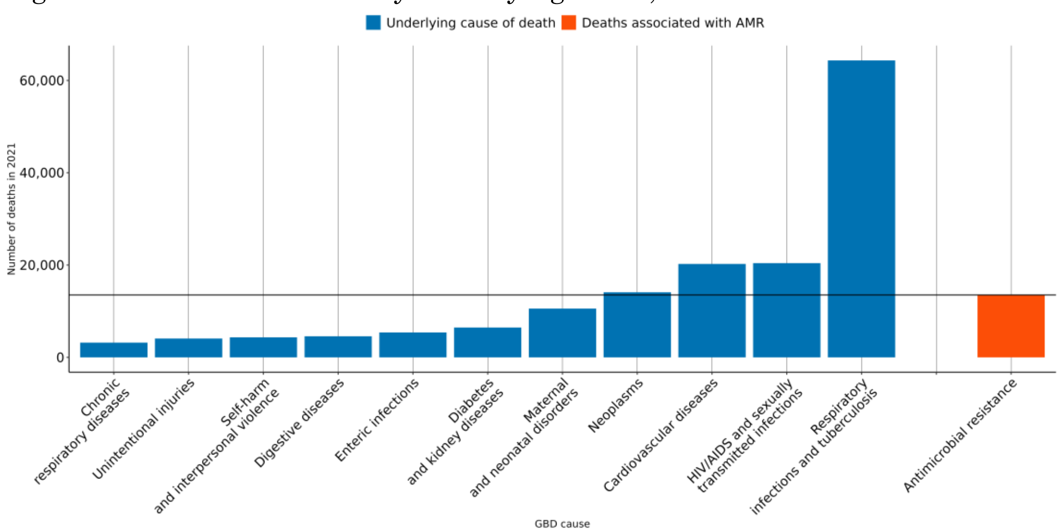
The burden of antimicrobial resistance (AMR) in Zimbabwe

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **3,000 lives** have been lost each year since 1990 in Zimbabwe due to AMR.
- In 2021, there were an estimated **3,220 UI (2,100-4,340)** deaths attributable to AMR and **13,500 UI (9,890-17,200)** 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), *Acinetobacter baumannii* resistant to carbapenems and *Streptococcus pneumoniae* resistant to carbapenems.

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



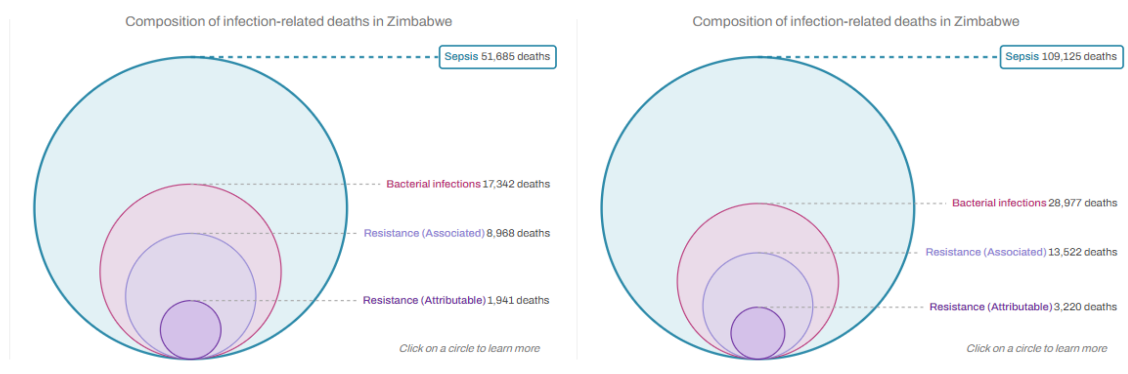
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Zimbabwe, a 10% reduction means to decrease the number of deaths associated with AMR to **13,400**, but currently the trend for this country could reach up to **13,700 UI [9,630-19,400]** AMR-associated deaths in 2030.

AMR in Zimbabwe

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 Zimbabwe between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation (MICROBE)]
- In **Zimbabwe** in 2021, there were an estimated **3,220 UI (2,100-4,340)** deaths attributable to AMR and **13,500 UI (9,890-17,200)** 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, **Zimbabwe 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
1	Mycobacterium tuberculosis 11,200 UI (7,640-14,900) ↑	Klebsiella pneumoniae 2,680 UI (2,130-3,230) ↑	Klebsiella pneumoniae 606 UI (462-749) ↑
2	Streptococcus pneumoniae 3,100 UI (2,450-3,750) ↓	Streptococcus pneumoniae 2,590 UI (1,970-3,220) ↓	Streptococcus pneumoniae 489 UI (319-660) ↓
3	Klebsiella pneumoniae 3,080 UI (2,470-3,690) ↑	Escherichia coli 1,610 UI (1,260-1,970) ↑	Mycobacterium tuberculosis 398 UI (0-1,180) ↑
4	Pseudomonas aeruginosa 2,060 UI (1,660-2,460) ↑	Staphylococcus aureus 1,290 UI (812-1,760) ↑	Acinetobacter baumannii 376 UI (306-445) ↑
5	Staphylococcus aureus 1,950 UI (1,560-2,340) ↑	Pseudomonas aeruginosa 1,090 UI (779-1,400) ↑	Escherichia coli 368 UI (257-479) ↑
6	Escherichia coli 1,830 UI (1,470-2,190) ↑	Mycobacterium tuberculosis 1,020 UI (216-2,650) ↑	Pseudomonas aeruginosa 270 UI (177-364) ↑
7	Acinetobacter baumannii 1,040 UI (832-1,240) ↑	Acinetobacter baumannii 934 UI (743-1,130) ↑	Staphylococcus aureus 259 UI (136-381) ↑
8	Group B Streptococcus 799 UI (611-987) ↑	Serratia spp. 372 UI (289-456) ↑	Serratia spp. 109 UI (84-133) ↑
9	Serratia spp. 528 UI (415-640) ↑	Group B Streptococcus 341 UI (232-451) ↑	Enterobacter spp. 90 UI (68-111) ↑
10	Haemophilus influenzae 509 UI (398-621) ↑	Enterobacter spp. 294 UI (234-355) ↑	Haemophilus influenzae 67 UI (19-115) ↑

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%

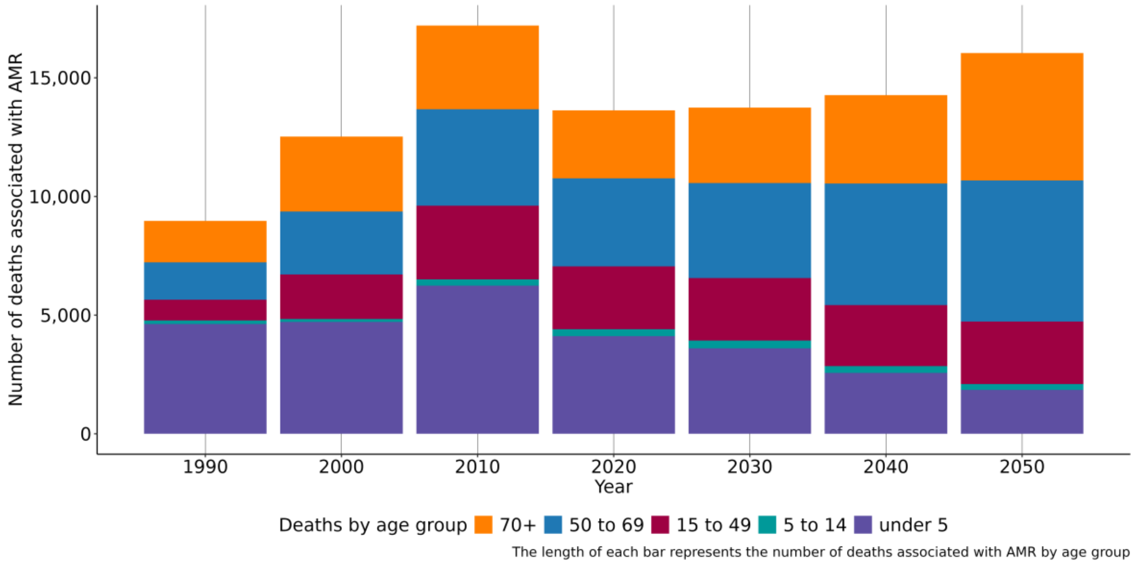
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

Burden Rank	Associated		Attributable	
1	Klebsiella pneumoniae TMP-SMX	2,620 UI (2,080-3,160) ↑	Mycobacterium tuberculosis MDR excluding XDR	390 UI (0-1,160) ↑
2	Streptococcus pneumoniae Macrolides	2,030 UI (1,490-2,570) ↑	Streptococcus pneumoniae Carbapenems	243 UI (127-360) ↓
3	Streptococcus pneumoniae TMP-SMX	2,010 UI (1,350-2,670) ↓	Acinetobacter baumannii Carbapenems	218 UI (167-270) ↑
4	Klebsiella pneumoniae 3GC	1,880 UI (1,460-2,300) ↑	Klebsiella pneumoniae 3GC	182 UI (106-258) ↑
5	Klebsiella pneumoniae Beta-Lactam/Lactamase Inhib.	1,820 UI (1,240-2,390) ↑	Klebsiella pneumoniae TMP-SMX	158 UI (80-237) ↑
6	Escherichia coli Aminopenicillin	1,290 UI (602-1,980) ↑	Staphylococcus aureus Methicillin	107 UI (22-192) ↑
7	Escherichia coli TMP-SMX	1,280 UI (979-1,580) ↑	Acinetobacter baumannii Fluoroquinolones	97 UI (76-118) ↑
8	Klebsiella pneumoniae Aminoglycosides	1,100 UI (766-1,440) ↑	Pseudomonas aeruginosa Carbapenems	96 UI (50-142) ↑
9	Escherichia coli Beta-Lactam/Lactamase Inhib.	1,030 UI (794-1,260) ↑	Klebsiella pneumoniae Carbapenems	96 UI (69-123) ↑
10	Mycobacterium tuberculosis MDR excluding XDR	1,010 UI (213-2,620) ↑	Klebsiella pneumoniae Aminoglycosides	84 UI (54-114) ↑

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) (13,900 UI (11,000-16,800)), tuberculosis (11,200 UI (7,640-14,900)), bloodstream infections (9,600 UI (7,500-11,700)), diarrhea (5,310 UI (2,940-7,670)) and meningitis (1,460 UI (1,030-1,880)).

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



- In Zimbabwe, 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 4,180 UI (3,040-5,320), whereas the mortality rate per 100,000 was 1,010 UI (815-1,210).

Data sources for Zimbabwe

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 Zimbabwe by source type

Source type	Years	Sample size	Sample size units
Antibiotic use	1990-2021	1,560	Study-year datapoints
Microbial or laboratory data without outcome	1990-2021	178	Isolates
Microbial or laboratory data with outcome	2010-2021	389	Isolates
Literature studies	1990-2021	1,846	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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