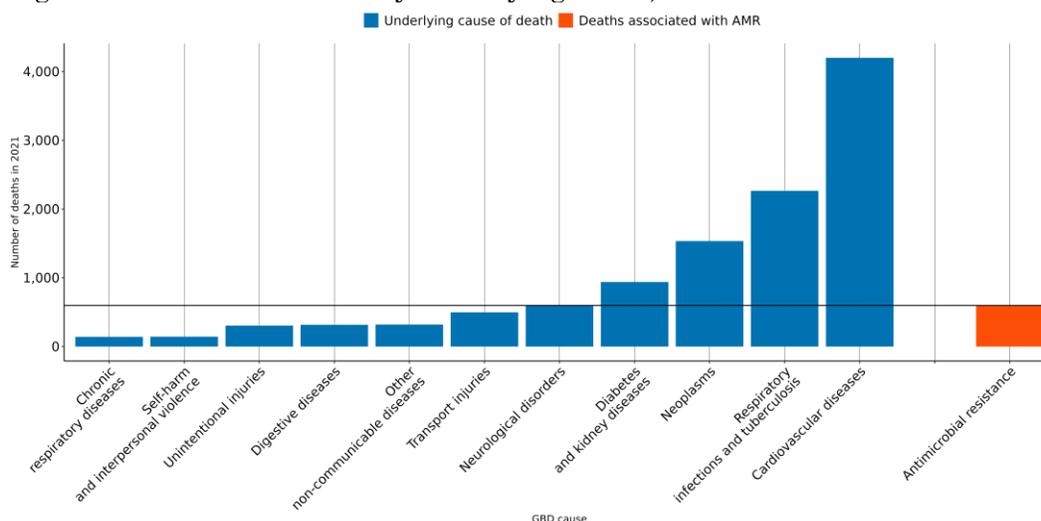


The burden of antimicrobial resistance (AMR) in Kuwait

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **100 lives** have been lost each year since 1990 in Kuwait due to AMR.
- In 2021, there were an estimated **145 UI (115-174)** deaths attributable to AMR and **598 UI (486-709)** deaths associated with AMR in this location.
- The largest number of deaths associated with AMR in 2021 occurred among those aged **70+** in the country.
- Among the most deadly pathogen-drug combinations in 2021 were *Staphylococcus aureus* resistant to methicillin, *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



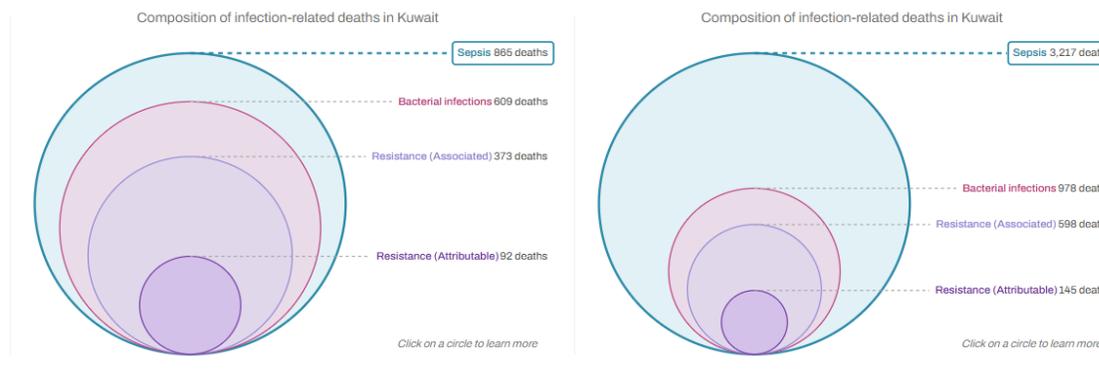
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Kuwait, a 10% reduction means to decrease the number of deaths associated with AMR to **545**, but currently the trend for this country could reach up to **956 UI [717-1,220]** AMR-associated deaths in 2030.

AMR in Kuwait

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 Kuwait between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#)
- In **Kuwait** in 2021, there were an estimated **145 UI (115-174)** deaths attributable to AMR and **598 UI (486-709)** 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, **Kuwait has the 26th lowest** 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
Burden rank	Staphylococcus aureus 235 UI (195-276) ↑	Staphylococcus aureus 142 UI (110-174) ↑	Staphylococcus aureus 41 UI (31-51) ↑
	Escherichia coli 137 UI (114-160) ↑	Escherichia coli 116 UI (96-135) ↑	Escherichia coli 23 UI (18-28) ↑
	Pseudomonas aeruginosa 100 UI (82-117) ↑	Streptococcus pneumoniae 70 UI (56-85) ↓	Acinetobacter baumannii 20 UI (17-24) ↓
	Streptococcus pneumoniae 98 UI (82-115) ↓	Klebsiella pneumoniae 60 UI (48-71) ↑	Pseudomonas aeruginosa 16 UI (12-20) ↑
	Klebsiella pneumoniae 86 UI (71-101) ↑	Pseudomonas aeruginosa 59 UI (47-71) ↑	Klebsiella pneumoniae 15 UI (12-18) ↑
	Acinetobacter baumannii 53 UI (44-63) ↓	Acinetobacter baumannii 50 UI (41-59) ↓	Streptococcus pneumoniae 13 UI (10-17) ↓
	Mycobacterium tuberculosis 47 UI (38-56) ↑	Enterococcus faecium 20 UI (17-24) ↑	Enterococcus faecium 4 UI (2-5) ↑
	Group A Streptococcus 34 UI (28-40) ↑	Proteus spp. 17 UI (13-20) ↑	Enterobacter spp. 3 UI (2-3) ↑
	Enterococcus faecalis 25 UI (20-29) ↑	Group B Streptococcus 11 UI (9-13) ↑	Proteus spp. 2 UI (1-3) ↑
	Enterococcus faecium 24 UI (20-29) ↑	Enterobacter spp. 10 UI (8-13) ↑	Enterococcus faecalis 2 UI (1-2) ↑

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

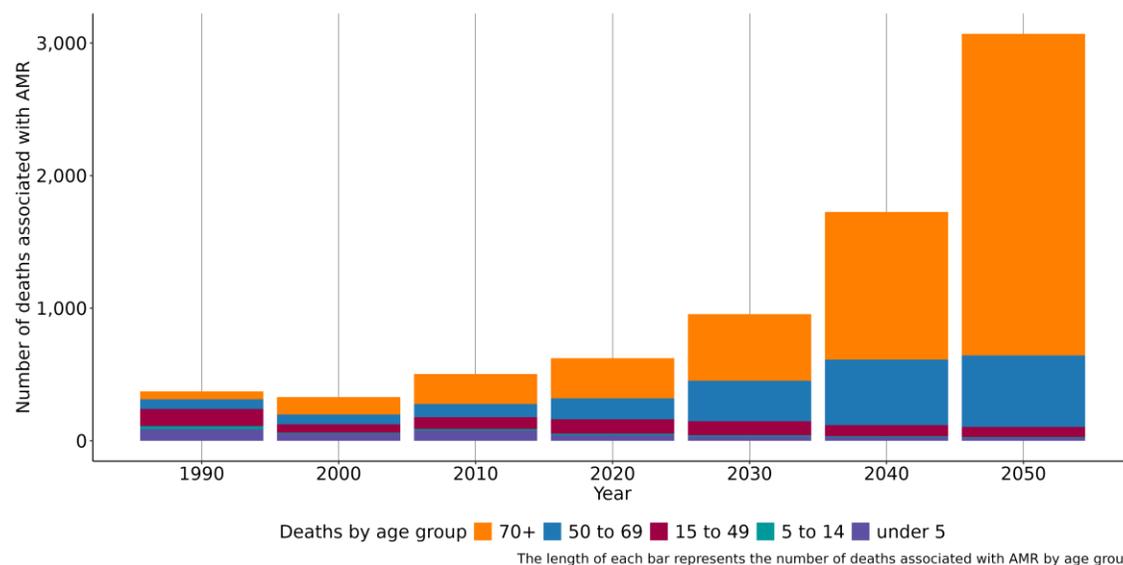
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

	Associated	Attributable
Burden Rank	Staphylococcus aureus Methicillin 124 UI (88-160) ↑	Staphylococcus aureus Methicillin 31 UI (23-40) ↑
	Escherichia coli Aminopenicillin 105 UI (83-126) ↑	Acinetobacter baumannii Carbapenems 12 UI (9-14) ↑
	Escherichia coli Fluoroquinolones 80 UI (62-99) ↑	Streptococcus pneumoniae Carbapenems 8 UI (6-11) ↓
	Staphylococcus aureus Macrolides 78 UI (62-95) ↑	Pseudomonas aeruginosa Carbapenems 8 UI (5-10) ↑
	Staphylococcus aureus Fluoroquinolones 76 UI (59-92) ↑	Escherichia coli 3GC 6 UI (3-8) ↑
	Escherichia coli TMP-SMX 71 UI (55-86) ↑	Escherichia coli Fluoroquinolones 6 UI (3-8) ↑
	Escherichia coli Beta-Lactam/Lactamase Inhib. 57 UI (45-70) ↑	Acinetobacter baumannii Fluoroquinolones 5 UI (4-7) ↑
	Escherichia coli 3GC 55 UI (40-70) ↑	Staphylococcus aureus Fluoroquinolones 5 UI (2-8) ↑
	Streptococcus pneumoniae Macrolides 53 UI (43-63) ↑	Klebsiella pneumoniae Fluoroquinolones 4 UI (3-6) ↑
	Acinetobacter baumannii Carbapenems 48 UI (40-57) ↓	Klebsiella pneumoniae Carbapenems 4 UI (3-5) ↑

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

- 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) (704 UI (578-830)), bloodstream infections (463 UI (386-540)), peritoneal and intra-abdominal infections (126 UI (103-150)), urinary tract infections and pyelonephritis (75 UI (60-90)) and tuberculosis (47 UI (38-56)).

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



- In Kuwait, people aged 15 to 49 experienced the largest number of deaths associated with AMR in 1990 but this changed by 2021 as the largest number of deaths occurred among the 70+. This indicates that prevention of infections among the 15 to 49 has contributed to the reduction in the number of AMR associated deaths. In 2021, the number of deaths associated with AMR among the 70+ was 283 UI (225-341), whereas the mortality rate per 100,000 was 286 UI (228-345).

Data sources for Kuwait

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 Kuwait by source type

Source type	Years	Sample size	Sample size units
Microbial or laboratory data without outcome	2010-2021	386,986	Isolates
Microbial or laboratory data with outcome	2010-2021	1,895	Isolates
Literature studies	1990-2021	19,882	Cases/isolates/susceptibility tests
Single drug resistance profile data	2010-2021	43,674	Antibiotic susceptibility test

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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