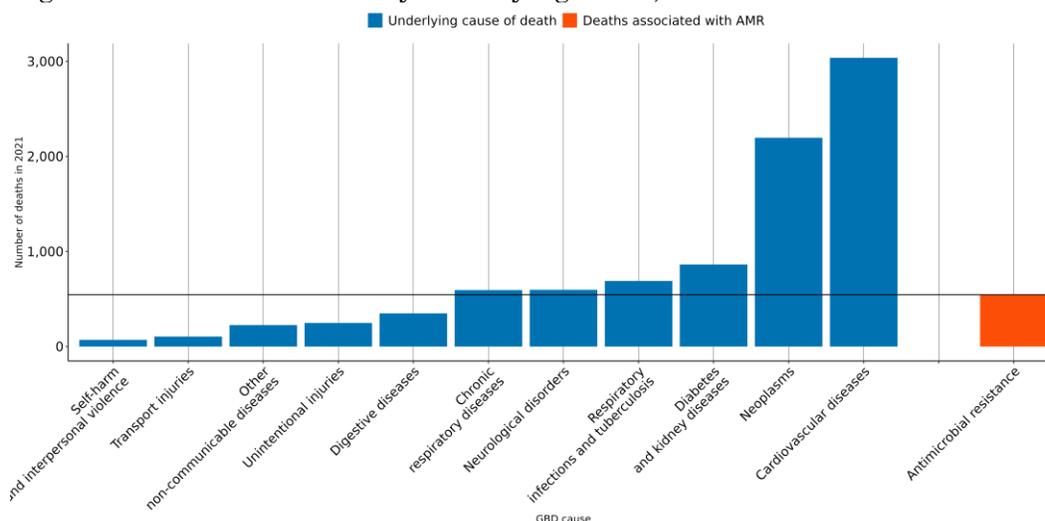


The burden of antimicrobial resistance (AMR) in Cyprus

Executive summary

- Antimicrobial Resistance (AMR) is a major global health threat, over **100 lives** have been lost each year since 1990 in Cyprus due to AMR.
- In 2021, there were an estimated **130 UI (110-151)** deaths attributable to AMR and **545 UI (456-633)** 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, *Pseudomonas aeruginosa* resistant to carbapenems and *Acinetobacter baumannii* resistant to carbapenems.

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



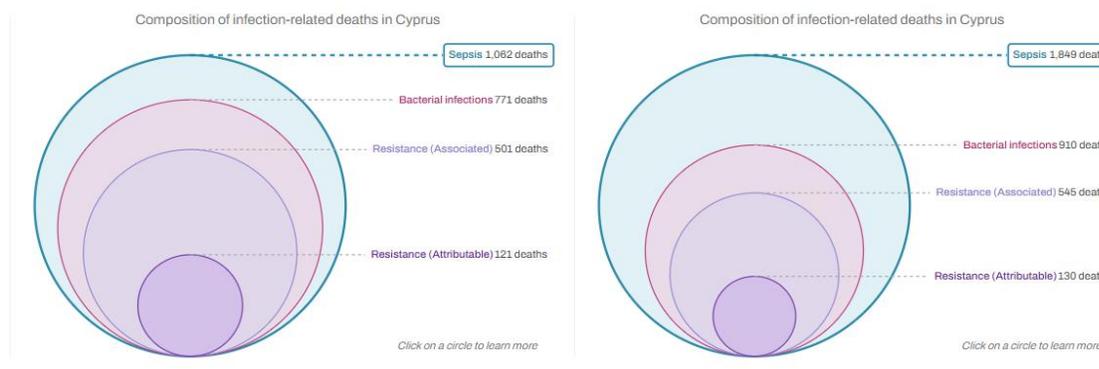
- In 2021, the number of deaths associated with AMR (orange bar in *figure 2*) were high compared to the most relevant underlying causes of death (depicted in blue) in the country. AMR associated deaths occur within multiple Global Burden of Disease (GBD) causes of death and AMR is not an underlying 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 Cyprus, a 10% reduction means to decrease the number of deaths associated with AMR to **524**, but currently the trend for this country could reach up to **760 UI [580-930]** AMR-associated deaths in 2030.

AMR in Cyprus

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 Cyprus between 1990 and 2019.



- To look at these and more visualization interactively visit [Measuring Infectious Causes and Resistance Outcomes for Burden Estimation \(MICROBE\)](#)
- In **Cyprus** in 2021, there were an estimated **130 UI (110-151)** deaths attributable to AMR and **545 UI (456-633)** 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, **Cyprus has the 44th 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 252 UI (218-285) ↑ | Staphylococcus aureus 170 UI (145-195) ↑ | Staphylococcus aureus 44 UI (37-52) ↑ |
| | Escherichia coli 142 UI (122-163) ↑ | Escherichia coli 112 UI (95-128) ↑ | Escherichia coli 21 UI (17-25) ↑ |
| | Pseudomonas aeruginosa 92 UI (80-104) ↑ | Klebsiella pneumoniae 46 UI (39-54) ↑ | Acinetobacter baumannii 14 UI (12-16) ↓ |
| | Streptococcus pneumoniae 84 UI (73-95) ↓ | Pseudomonas aeruginosa 38 UI (29-46) ↓ | Klebsiella pneumoniae 14 UI (11-16) ↑ |
| | Klebsiella pneumoniae 68 UI (59-78) ↓ | Streptococcus pneumoniae 37 UI (24-49) ↓ | Pseudomonas aeruginosa 10 UI (7-13) ↓ |
| | Group A Streptococcus 40 UI (34-46) ↑ | Acinetobacter baumannii 34 UI (29-38) ↓ | Streptococcus pneumoniae 7 UI (4-10) ↓ |
| | Acinetobacter baumannii 36 UI (32-41) ↓ | Enterococcus faecium 25 UI (21-29) ↑ | Enterococcus faecium 6 UI (5-8) ↑ |
| | Enterococcus faecium 31 UI (27-36) ↑ | Proteus spp. 21 UI (16-27) ↑ | Enterobacter spp. 4 UI (2-6) ↓ |
| | Enterococcus faecalis 31 UI (26-35) ↑ | Enterobacter spp. 17 UI (14-20) ↓ | Proteus spp. 3 UI (2-4) ↑ |
| | Proteus spp. 29 UI (24-33) ↑ | Enterococcus faecalis 16 UI (14-19) ↓ | Enterococcus faecalis 3 UI (2-4) ↓ |

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

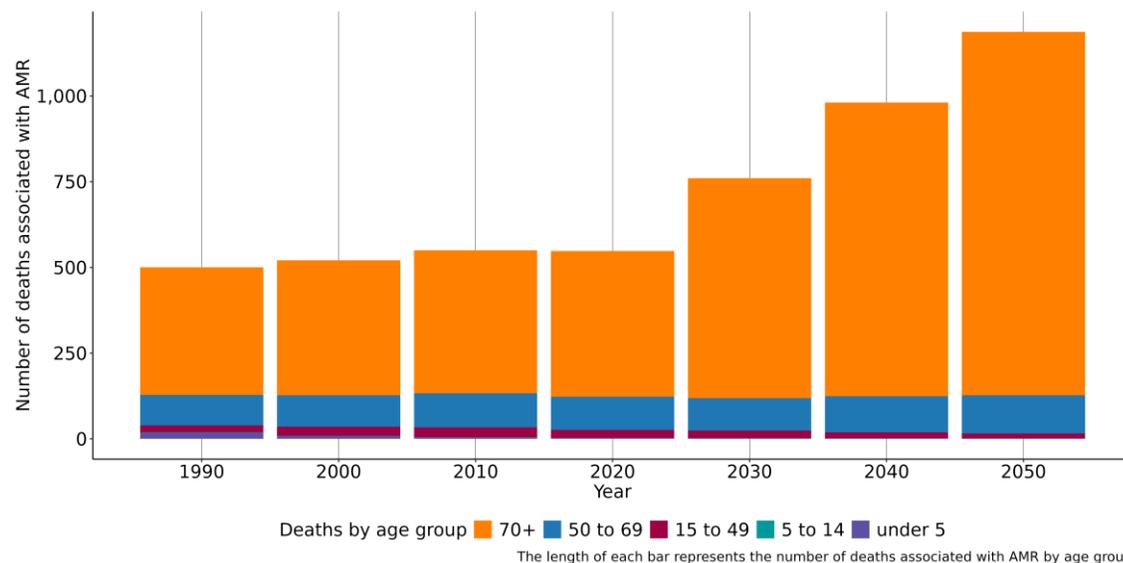
Table 2. Combinations which cause most deaths in 2021 (Number of deaths in parenthesis)

| | Associated | Attributable |
|-------------|--|--|
| Burden Rank | Staphylococcus aureus Methicillin 131 UI (103-159) ↑ | Staphylococcus aureus Methicillin 32 UI (24-40) ↑ |
| | Staphylococcus aureus Macrolides 131 UI (102-160) ↑ | Acinetobacter baumannii Carbapenems 8 UI (7-10) ↑ |
| | Escherichia coli Aminopenicillin 101 UI (81-121) ↑ | Pseudomonas aeruginosa Carbapenems 6 UI (4-8) ↓ |
| | Staphylococcus aureus Fluoroquinolones 81 UI (63-99) ↑ | Escherichia coli Fluoroquinolones 6 UI (3-8) ↑ |
| | Escherichia coli Fluoroquinolones 74 UI (57-92) ↑ | Staphylococcus aureus Macrolides 5 UI (4-7) ↑ |
| | Escherichia coli TMP-SMX 47 UI (29-65) ↑ | Staphylococcus aureus Fluoroquinolones 5 UI (2-8) ↑ |
| | Escherichia coli Beta-Lactam/Lactamase Inhib. 45 UI (35-56) ↑ | Klebsiella pneumoniae Carbapenems 5 UI (3-6) ↑ |
| | Klebsiella pneumoniae 3GC 42 UI (35-48) ↑ | Escherichia coli Aminopenicillin 4 UI (3-6) ↑ |
| | Klebsiella pneumoniae Fluoroquinolones 39 UI (31-46) ↑ | Enterococcus faecium Vancomycin 4 UI (3-5) ↑ |
| | Escherichia coli 3GC 36 UI (27-45) ↑ | Acinetobacter baumannii Fluoroquinolones 4 UI (3-5) ↓ |

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

- Independently of antimicrobial resistance, the infectious syndromes accounting for the most deaths in 2021 were as follows (estimated thousands of deaths in parenthesis) bloodstream infections (419 UI (363-475)), lower respiratory infection (excl. COVID) (352 UI (300-404)), urinary tract infections and pyelonephritis (166 UI (133-199)), peritoneal and intra-abdominal infections (154 UI (128-179)) and infections of the skin and subcutaneous systems (76 UI (63-89)).

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



- In Cyprus, people aged 70+ saw the largest number of deaths associated with AMR both in 1990 and 2021, which indicates that 70+ continues to be particularly vulnerable to infections which are resistant to antibiotics. In 2021, the number of deaths associated with AMR among the 70+ was 425 UI (352-497), whereas the mortality rate per 100,000 was 314 UI (260-367).

Data sources for Cyprus

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 Cyprus by source type

| Source type | Years | Sample size | Sample size units |
|--|-----------|-------------|--------------------------------|
| Microbial or laboratory data without outcome | 1990-2021 | 58,552 | Isolates |
| Microbial or laboratory data with outcome | 1990-2021 | 1,834 | Isolates |
| Single drug resistance profile data | 1990-2021 | 3,042 | 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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