GBD 2023: LRIs Remain Leading Infectious Cause of Death Globally

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Lower respiratory infections (LRIs) continue to be the primary infectious cause of death globally. The Global Burden of Disease (GBD) Study 2023 provides updated estimates on LRI incidence, mortality, and disability-adjusted life-years (DALYs), identifying 26 pathogens across 204 countries and territories.1,2,3

KEY TAKEAWAYS

- The Pivot: The GBD 2023 analysis updates and expands upon previous GBD estimates, incorporating new data and revised modelling techniques.1
- The Data: LRIs remain the world's leading infectious cause of death.1,2,3
- The Action: Clinicians should be aware of the persistent global burden of LRIs, particularly in the context of the 2025 Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD) target for pneumonia mortality in children younger than 5 years.1

The Global Burden of Disease Study 2023, a systematic analysis, has reaffirmed lower respiratory infections (LRIs) as the leading infectious cause of death globally.1,2,3 This comprehensive analysis provides updated global, regional, and national estimates for LRI incidence, mortality, and disability-adjusted life-years (DALYs).1 The study period spanned from 1990 to 2023, covering 204 countries and territories.1

What the study did

The GBD 2023 analysis built upon previous GBD studies, specifically GBD 2021, by incorporating new data and revised modelling techniques.1 The collaborators aimed to provide an expanded understanding of the LRI burden, attributing cases to 26 pathogens, including 11 newly modelled pathogens.1 Beyond quantifying the burden, the study also sought to assess progress towards the 2025 Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD) target for pneumonia mortality in children younger than 5 years.1

The GBD 2023 Causes of Death Collaborators also conducted a systematic analysis of the global burden of 292 causes of death across 204 countries and territories and 660 subnational locations from 1990 to 2023.2 Concurrently, the GBD 2023 Demographics Collaborators provided global age-sex-specific all-cause mortality and life expectancy estimates for the same 204 countries and territories and 660 subnational locations, covering 1950 to 2023.3 These broader analyses contextualise the persistent impact of LRIs within the overall global health landscape.2,3

Lower respiratory infections encompass a range of acute infections affecting the airways and lungs, including bronchitis, bronchiolitis, and pneumonia. These infections are primarily caused by viruses and bacteria, leading to inflammation and impaired respiratory function. Common viral pathogens include respiratory syncytial virus (RSV), influenza viruses,

and rhinoviruses, while bacterial causes frequently involve Streptococcus pneumoniae, Haemophilus influenzae, and Staphylococcus aureus. The clinical presentation of LRIs can vary from mild symptoms to severe respiratory distress, requiring hospitalisation and intensive care. Vulnerable populations, such as young children, the elderly, and individuals with underlying health conditions like chronic obstructive pulmonary disease (COPD) or immunocompromise, are at higher risk for severe outcomes. Understanding the specific pathogens driving LRI burden is crucial for developing targeted prevention strategies, including vaccination programs, and for guiding appropriate antimicrobial treatment, thereby mitigating the development of antimicrobial resistance.

Methodology Expansion

The GBD 2023 LRI analysis employed a sophisticated modelling framework to estimate incidence, prevalence, mortality, and DALYs. This framework integrated diverse data sources, including vital registration systems, verbal autopsy studies, disease registries, hospital discharge data, and population-based surveys. The incorporation of 11 newly modelled pathogens expanded the granularity of aetiological attribution, allowing for a more precise understanding of the specific microbial drivers of LRI burden. These new pathogens likely include emerging or previously under-recognised viral and bacterial agents that contribute significantly to LRI morbidity and mortality. The modelling techniques accounted for various factors such as age, sex, geographical location, and temporal trends, enabling the generation of robust and comparable estimates across different regions and over time. The assessment of progress towards the GAPPD target for pneumonia mortality in children younger than 5 years involved comparing observed mortality rates against the established targets, providing an important benchmark for global health efforts aimed at reducing childhood mortality from preventable infectious diseases.

Key Findings

The primary finding across these GBD 2023 analyses is that lower respiratory infections continue to be the world's leading infectious cause of death.1,2,3 The detailed attribution to 26 specific pathogens provides a granular understanding of the aetiological landscape of LRIs globally.1 The updated estimates for incidence, mortality, and DALYs offer a current picture of the disease burden, which is essential for public health planning and resource allocation.1 The inclusion of 11 newly modelled pathogens represents an expansion in the understanding of LRI epidemiology.1

While the abstracts provided do not detail specific progress towards the GAPPD target, the stated aim of the LRI analysis was to assess this progress, indicating its importance in the broader context of global health initiatives.1 The comprehensive nature of the GBD 2023 studies, encompassing all-cause mortality and life expectancy, underscores the significant and sustained impact of LRIs on global health outcomes.2,3 The persistent burden of LRIs highlights the ongoing need for effective public health interventions, including improved sanitation, access to healthcare, vaccination programs, and antimicrobial stewardship. The detailed pathogen attribution can inform the development of new vaccines and diagnostic tools, as well as guide empirical treatment guidelines in different epidemiological settings. Furthermore, the study's ability to track trends over several decades provides valuable insights into the effectiveness of past interventions and identifies areas where further efforts are most needed.

CLINICAL IMPLICATIONS

The persistent ranking of lower respiratory infections as the leading infectious cause of death globally, as confirmed by the GBD 2023, should serve as a stark reminder to clinicians. Despite advances in diagnostics and therapeutics, the fundamental challenge of managing and preventing LRIs remains. The detailed pathogen attribution, including 11 newly modelled pathogens, highlights the evolving epidemiological landscape and the need for continuous surveillance and adaptation in clinical practice. This is not merely an academic exercise; it directly impacts treatment guidelines and vaccine development priorities.

For public health bodies and pharmaceutical companies, the GBD 2023 data provides a clear mandate. The continued focus on the 2025 GAPPD target for pneumonia mortality in children younger than 5 years indicates that current strategies, while important, may require re-evaluation or intensified implementation. Investment in novel antimicrobial agents, improved diagnostic tools, and expanded vaccination programmes, particularly in regions with high LRI burdens, is not optional but essential. The economic burden of LRIs, reflected in DALYs, underscores the societal cost of inaction.

Patients, particularly vulnerable populations such as young children, bear the brunt of this persistent global health issue. The data reinforces the importance of primary prevention strategies, including vaccination and improved hygiene, as well as timely access to effective medical care. Clinicians must continue to advocate for these measures and ensure that evidence-based LRI management protocols are rigorously followed, especially in settings where resources may be constrained. The GBD 2023 is a call to action, not merely a statistical update.

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