

Global Antimicrobial Resistance and Use Surveillance System

GLASS method for estimating attributable mortality of antimicrobial resistant bloodstream infections



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Foreword

Antimicrobial resistance (AMR) is a growing public health concern, with a strong impact not only on human health but also on the economy and human development. Heads of States unanimously recognized this threat in September 2016 at the United Nations General Assembly, where they issued a declaration in support of implementation of the Global Action Plan on AMR that was adopted by WHO's Member States at the Sixtyeighth World Health Assembly in 2015. AMR is considered a threat to achieving several Sustainable Development Goals, and the percentage of bloodstream infections due to two types of AMR has been defined as an indicator of progress in tackling this global threat.

Harmonized data collection is necessary to guide the world towards an optimal public health response and informed decision-making. In 2015, WHO launched the Global Antimicrobial Resistance and Use Surveillance System (GLASS) – the first global system for collecting official national data on AMR in bacterial pathogens that cause common infections in humans. GLASS monitors the spread and frequencies of AMR in all regions of the world. But in addition to this monitoring, GLASS is also aiming to gather accurate estimates of the impact of AMR on human health to better inform strategies and investment to tackle this global threat.

Most estimates of the impact of AMR on human health are based on fragmented, very limited data, many of which are derived from epidemiological studies in high-income countries, often conducted by different methods, which makes consolidation for regional or global estimates impossible. The **GLASS method for estimating attributable mortality of antimicrobial resistant bloodstream infections** is appropriate for generating robust estimates of the impact of AMR on human health. Like the SDG AMR indicator, the method addresses bloodstream infection with AMR organisms, which are considered to be among the most serious life-threatening infectious diseases.

Application of the **GLASS method** is expected to generate particularly robust estimates of the impact of AMR on global health through a systematic, harmonized approach in all countries.

WHO is grateful for the support of international, regional and national partners that contributed to the development of this harmonized, sound approach to broadening the evidence base for better-informed strategies to curb the impact of AMR on human health.

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Abbreviations and Acronyms

AMR	Antimicrobial resistance
BSI	Bloodstream infection
CDC	Center for Disease Prevention and Control
CLSI	Clinical and Laboratory Standards Institute
DALYs	disability-adjusted life-years
ECDC	European Centre for Disease Prevention and Control
ESBL	Extended-spectrum beta-lactamase
EUCAST	European Committee on Antimicrobial Susceptibility Testing
GLASS	Global Antimicrobial Resistance and Use Surveillance System
HCF	Health-care facility
HR	Hazard ratio
HR ICU	Hazard ratio Intensive care unit
HR ICU IHME	Hazard ratio Intensive care unit Institute for Health Metrics and Evaluation
HR ICU IHME LIC	Hazard ratioIntensive care unitInstitute for Health Metrics and EvaluationLow income country
HR ICU IHME LIC LOS	Hazard ratioIntensive care unitInstitute for Health Metrics and EvaluationLow income countryLength of stay
HR ICU IHME LIC LOS MDR	Hazard ratioIntensive care unitInstitute for Health Metrics and EvaluationLow income countryLength of staymulti-drug resistance
HR ICU IHME LIC LOS MDR MRSA	Hazard ratioIntensive care unitInstitute for Health Metrics and EvaluationLow income countryLength of staymulti-drug resistanceMethicillin-resistant Staphylococcus aureus
HR ICU IHME LIC LOS MDR MRSA MSSA	Hazard ratioIntensive care unitInstitute for Health Metrics and EvaluationLow income countryLength of staymulti-drug resistanceMethicillin-resistant Staphylococcus aureusMethicillin-susceptible Staphylococcus aureus
HR ICU IHME LIC LOS MDR MRSA MSSA NHSN	Hazard ratioIntensive care unitInstitute for Health Metrics and EvaluationLow income countryLength of staymulti-drug resistanceMethicillin-resistant Staphylococcus aureusMethicillin-susceptible Staphylococcus aureusNational Healthcare Safety Network

Rationale

1.1 Background

Antimicrobial resistance is a growing public health concern, which jeopardizes achievement of a number of sustainable development goals. However, the exact burden of disease associated with AMR is very difficult to establish, and in many settings no reliable estimates are available. Nevertheless, such findings are essential to inform policy makers about the potential health effects of interventions aimed at reducing AMR, to establish the amount of resources required to tackle this health concern, and to determine the most appropriate intervention strategies.



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