

Indicator 3.d.2

Indicator Name, Target and Goal

Indicator 3.d.2 Percentage of bloodstream infections due to selected antimicrobial-resistant organisms

Target 3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

Goal 3 Ensure healthy lives and promote well-being for all at all ages

Definition and Rationale

○ Definition

Percentage of bloodstream infection due to methicillin-resistant *Staphylococcus aureus* (MRSA) and *Escherichia coli* resistant to 3rd-generation cephalosporin (e.g., ESBL- *E. coli*) among patients seeking care and whose blood sample is taken and tested.

○ Concepts

- Presumptive methicillin-resistant *S. aureus* (MRSA) isolates as defined by oxacillin or ceftazidime minimum inhibitory concentration (MIC) and ceftazidime disc diffusion tests according to internationally recognized clinical breakpoints (e.g., CLSI) or bacteria confirmed to be MRSA in selected media.
- *E. coli* resistant to third generation cephalosporins: *E. coli* isolates that are resistant as defined by current internationally recognized clinical breakpoints for third generation cephalosporins (e.g., CLSI), specifically ceftazidime or cefotaxime or ceftazidime.

○ Rationale and Interpretation:

- (i) *E. coli* and *S. aureus* are among the most common human fast-growing bacteria causing acute human infections;
- (ii) *E. coli* is highly prevalent in both humans, animals and environment, being an ideal indicator for monitoring Antimicrobial resistance (AMR) across the sectors in line with the One Health approach. It recognizes that the health of humans, animals and ecosystems are interconnected and therefore requires a

coordinated, collaborative, multidisciplinary and cross-sectoral approach to address potential or existing risks that originate at the animal-human-ecosystems interface;

(iii) both MRSA and *E. coli* resistant to 3rd-generation cephalosporin are largely disseminated and found in high frequency in human infections observed in hospital settings all over the world and increasingly very frequent in the community. Infections with these types of AMR lead to increase in use of the last resort drugs (e.g., vancomycin for MRSA infections, and carbapenems for *E. coli* resistant to 3rd-generation cephalosporin) against which new types of AMR are emerging.

Effective control of these two types of AMR will ultimately help preserve the capacity to treat infections with available antimicrobials while new prevention and treatment solutions can be developed. WHO has well defined global infection prevention and control standards and strategies.

Data Sources and Collection Method

Data Sources: Japan Nosocomial Infections Surveillance (JANIS)

A national surveillance program organized by the Ministry of Health, Labour and Welfare (MHLW) of Japan designed to provide basic information on the incidence and prevalence of nosocomial infections and antimicrobial-resistant bacteria in Japanese medical settings.

Data Collection Method: The number of isolation of major bacteria detected from various samples through bacterial testing, as well as their antimicrobial susceptibility, will be continuously collected from all hospitalized patients at participating healthcare institutions.

Method of Computation and Other Methodological Considerations

○ Computation Method

- methicillin-resistant *Staphylococcus aureus*. (MRSA)
$$=(A / B) \times 100$$
- *E. coli* resistant to third generation cephalosporins.

$$=(C / D) \times 100$$

- (A) : Number of blood samples in which MRSA were detected.
(B) : Number of blood samples in which *S. aureus* were detected.
(C) : Number of blood samples in which *E. coli* resistant to 3rd-generation cephalosporins were detected.
(D) : Number of blood samples in which *E. coli* were detected.

○ Comments and limitations

- CLSI M100-S22 is used to determine the breakpoint.
- MRSA cannot be calculated due to the ongoing renovation of the tabulation tool.
- Due to ongoing modification of the aggregation tool, the number of blood samples in which *E. coli* resistant to 3rd-generation cephalosporins were detected, as well as the number of blood samples in which *E. coli* were detected, were counted only the samples in which antimicrobial susceptibility test results for ceftazidime were reported.
- Even when detected in the same patient, they were counted as duplicates.
- The data registered before the modification of the aggregation tool will be updated after the modification is finished.

Data Disaggregation

References

- Global metadata published by the United Nations Statistics Department.
<https://unstats.un.org/sdgs/metadata/files/Metadata-03-0D-02.pdf>
- Japan Nosocomial Infections Surveillance (JANIS)
<https://janis.mhlw.go.jp/english/about/index.html>

Custodian Ministries of Data

Ministry of Health, Labour and Welfare.

Custodian Ministries of Related Policies

Ministry of Health, Labour and Welfare.

International Organizations

World Health Organization (WHO)