

P2855 A new approach for quantifying the antimicrobial resistance burden: introducing an open-source application for automated linking and processing of routinely collected databases

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Background: Quantification of health burdens attributable to antimicrobial resistance (AMR) in hospitals poses a number of challenges. The challenges include the fact that microbiology data and hospital admission data are often stored in different databases, both databases require substantial cleaning before surveillance reports can be generated, and data analysis can be time-consuming and complicated. Both isolate-based and sample-based surveillance reports can be generated from microbiology databases alone, but are difficult to stratify by infection origin, especially when hospital admission data are stored in a separate database. Case-based surveillance report and mortality rates attributable to AMR per infection origin are important for understanding the burden of AMR. However, the case-based surveillance report requires complicated data processing and appropriate analytical procedures.

Materials/methods: We developed an offline, open-access and easy-to-use application that allows a hospital to independently perform data analysis and generate isolate-based, sample-based, and case-based surveillance reports from routinely collected electronic databases. The application was built in R, which is a free software environment. The application was placed within a user-friendly interface that only requires the user to double-click on the application icon to perform the data processing and analysis.

Results: Data analysis and report generation are automated by the application. The raw data files required are hospital admission and microbiology databases. The application cleans the raw microbiology database and produces isolate-based and sample-based surveillance reports. The application then merges the microbiology and hospital admission databases, analyzes these merged data, and produces a case-based surveillance report. The final step is a statistical analysis to estimate all-cause mortality of patients with AMR infection and mortality attributable to AMR, which are automatically added into the case-based surveillance report. The application was tested using a retrospective dataset from a provincial hospital in Thailand. A hypothetical dataset was also generated as a demonstration tool for users.

Conclusions: This newly developed and open-access application represents an important tool to generate AMR surveillance reports and parameters required for quantifying AMR burden. This tool is likely to be of particular use in resource-limited settings.

