160. A Simulation Study to Assess Indicators of Antimicrobial Use as Predictors of Resistance
Elise Fortin, PhD(c)1,2; Caroline Quach, MD MSc FRCPC3,4; Patricia Fontela, MD PhD5; David I. Buckeridge, MD PhD2; Robert W Platt, PhD2; 1Institut National De Santé Publique Du Québec, Quebec, QC, Canada; 2Epidemiology, Biostatistics, and Occupational Health, McGill University, Montreal, QC, Canada; 3Quebec Institute of Public Health, Montreal, QC, Canada; 4McGill University, Montreal, QC, Canada; 5Pediatric Intensive Care, The Montreal Children’s Hospital, Montreal, QC, Canada

Session: 39. Antibiotic Stewardship
Thursday, October 9, 2014: 12:30 PM

Background. Indicators of antimicrobial (AM) use have been described previously, but the optimal indicator for predicting AM resistance in hospital settings, especially when including pediatric populations, is unknown. This simulation study aimed to assess if a significant difference could be found between these indicators’ accuracy as predictors of AM resistance, even with entire networks of intensive care units (ICUs).

Methods. Ten different resistance / AM use combinations (combinations) were studied. Simulations were run to find out if Québec’s network of ICUs or the National Healthcare Safety Network (NHSN) ICUs could have allowed the detection of predetermined differences between the most accurate and 1) the second most accurate indicator, and 2) the least accurate indicator, in more than 80% of simulations. For each indicator, simulated absolute errors were generated, for each ICU and each 4-week period, over 4 years of surveillance (absolute error = |observed prevalence or incidence – predicted prevalence or incidence|. Absolute errors in prediction were generated following a binomial distribution, using mean absolute errors (MAEs) observed in data from 9 ICUs as the average proportion; simulated MAEs were then compared using t-tests. This was repeated 1,000 times for each scenario.

Results. Main results are presented in the table.

| Measure of resistance predicted | Most accurate indicator of AM use was compared to | Number of combinations for which a significant difference was observed in >80% of simulations (N=10) |
|--------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------|
| Prevalence                     | 2nd most accurate indicator                      | Québec network 0 2                                                             |
|                                | Least accurate indicator                         | NHSN 5 10                                                                        |
| Incidence                      | 2nd most accurate indicator                      | Québec network 1 5                                                             |
|                                | Least accurate indicator                         | NHSN 7 10                                                                        |

Conclusion. The two most accurate indicators of AM use would often offer similar predictions of resistance, even in large networks. The least accurate indicators could frequently be distinguished, but not always, especially in the Québec network, which is smaller.

Disclosures. All authors: No reported disclosures.