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Variations in antibiotic use for respiratory tract infections

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Objective

Antibiotic resistance is a significant public health issue, driven in large part by selection pressure induced by antibiotic use. Despite knowledge that a reduction in inappropriate antibiotic use is important, significant and sustained behaviour change has remained difficult to achieve. Previous studies have suggested that prescribing decisions vary with patient comorbidities and age, as well as the physician's age, claim volume, specialty, and continuity of care with the particular patient. Regional level variation has also been reported. The goal of this study is to explore variations in antibiotic prescribing for respiratory tract infections (RTIs) at the levels of patients, physicians, and regions.

Approach

We used data on fee-for-service physician visits from the universal Medical Services Plan (MSP) for all residents of British Columbia, Canada from 2002 to 2012. We identified a cohort of patient visits for RTI (ICD-9 codes 460-466, 480, or 487). We derived measures of healthcare use and comorbidities at the patient level, and measures of physician claim volume and frequency of respiratory tract infection management, at the level of the physician. We used data on antibiotics filled by individuals, the number of all medications filled by individuals each year, and counts of prescriptions written by physicians (and filled) by month, from the provincial drug insurance database. We linked antibiotic prescriptions to physician visits by patient and prescriber as antibiotics dispensed within 5 days after the RTI visit. We calculated measures of regional population distributions. We used data on meteorological temperature readings assigned to each region, for each day, and calculated 28-day moving averages. We linked data on patient demographics, physician demographics, and hospitalizations to our dataset. Our analysis will use hierarchical generalized linear mixed models (GLMMs) with logit link to account for the clustering effects of patients among physicians and regions, to model the odds of an anti-

biotic prescription being dispensed. Measures of variation will be discussed.

Results

Between April 1, 2005 and March 31, 2012, there were over 10.5 million visits by nearly 3 million individuals, served by over 8000 physicians in 88 regions. Antibiotics were prescribed in 37% of all visits.

Conclusion

These are preliminary results, with full analytic results available in the coming months. These results will have implications for better understanding the extent of variations in antibiotic prescribing, and some of the drivers of these variations, as well as the potential to inform ongoing efforts to improve the appropriateness of antibiotic use.

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