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Small area variation in the utilization of common medical tests and consultations in Ontario, Canada

Webber, Colleen¹, Dewit, Yvonne², and Hall, Steve¹

¹Queen's University

²Institute for Clinical Evaluative Sciences

Objectives

Evidence of regional variation in the utilization of medical tests and procedures has raised concern surrounding the potential overuse of unnecessary care. Such overuse is detrimental as it may lead to overdiagnosis, and the resulting overtreatment of indolent disease, inefficient use of resources, and rising health-care costs. The purpose of this study was to explore small area variation in rates of commonly used laboratory, imaging, and cardiac tests and specialist consultations, and to identify factors associated with rate variations.

Approach

This is a population-based cross-sectional study in Ontario, Canada using linked, administrative databases from the Institute for Clinical Evaluative Sciences (ICES). The study population was all adults aged 40 to 75 as of January 1, 2008. We measured the age- and sex-standardized rates of 36 laboratory, imaging and cardiac tests and specialist consultations across 97 health regions in 2008 using physician and laboratory billing data. The list of tests and consultations was chosen through discussion with primary care physicians to identify procedures that are commonly used and potentially overused in primary care settings. We compared the small area rates to the Ontario rate. We calculated small area variation statistics, including the extremal quotient (EQ), coefficient of variation (CV) and systematic component of variance (SCV), for each test and consult. We used multivariable regression models to identify factors associated with health area utilization rates.

Results

At minimum, a 10-fold difference was observed in the rates of each test and consult across the 97 health regions in Ontario,

with the extremal quotients ranging from 13.6 to 54.9. When ranked in highest to lowest variation using the SCV, the tests and procedures with the greatest small area variation were limb computed tomography (EQ=49.6, CV=23.3, SCV=38.9), ferritin blood tests (EQ=42.7, CV=33.4, SCV=36.8) and vitamin B12 blood tests (EQ=40.9, CV=35.9, SCV=36.0). The test with the smallest variation was knee imaging (EQ=13.6, CV=2.1, SCV=1.7).

Conclusion

We observed substantial variation across Ontario in the utilization of 36 medical tests and consultations. These findings may indicate problems with access to care in areas with low utilization, or overuse of potentially inappropriate or unnecessary medical care in areas with high utilization. Ongoing analyses are exploring determinants of area-level utilization to better understand the observed rate variations.

*Corresponding Author:

Email Address: colleen.webber@queensu.ca (C. Webber)