Estimating the prevalence of depression from EMRs

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Depression is one of the most prevalent chronic conditions in Canada. It costs an estimated $14 billion each year in health care expenditures and productivity losses,[1] and it causes substantial suffering, greater vulnerability to physical illness,[2,3] and increased risk of suicide.[4] Addressing the societal burden of depression requires public health surveillance (PHS) data, which can be used to formulate policies and improve mental health services.

More than 90% of patients diagnosed with depression receive care exclusively from FPs.[5] Primary care practices' electronic medical records (EMRs) are thus rich sources of PHS data. Through the work facilitated by the Canadian Primary Care Sentinel Surveillance Network (CPCSSN), national EMR data on chronic conditions are now available.

CPCSSN has constructed a working definition of *depression* to estimate lifetime prevalence. A patient with any of the following is considered to have had depression: billing for depression using International Classification of Diseases (ICD-9) code 296 or 311; depression recorded in the problem list; or a recorded antidepressant prescription. An antidepressant prescription accompanied by a diagnosis of anxiety (ICD-9 code 300) is not counted[6] if there is no other evidence of depression. To estimate yearly lifetime prevalence for a practice, the total count of patients who met the criteria is divided by the number of patients who visited the practice at least once within the 12-month period. An adjustment factor is applied to the denominator to account for patients with no recorded visits within the 12 months.

This definition can be easily applied to EMR data. CPCSSN estimated the lifetime prevalence of depression among Canadians 12 and older to be 13.2% as of September 2012. This estimate is comparable to the 12.1% lifetime prevalence estimate from a 2001 community-based epidemiologic survey of Canadians 12 and older.[7] The small increase between these estimates is not surprising, given that the rate of depression has been stable in Canada.[8]

There are some limitations to CPCSSN's definition. First, other conditions might be misclassified as depression, as ICD-9 code 296 encompasses subcategories for both depression (296.2, 296.3, 296.9) and bipolar disorders. However, because bipolar disorders are rare (2%) in the general population,[9] use of the 3-digit code will minimally inflate estimates for depression. Second, a definition that monitors *lifetime* prevalence might be less informative for planning health services for those *currently* affected by depression. Estimating patients receiving ongoing depression-related care within a 12-month period would address this limitation. Third, prevalence estimates are influenced by the number of years for which data are available. Evidence of ever having had depression is more likely to be found in patients with 10 years of data than in patients with 2 years of data. Likewise, practices that recently adopted EMRs and did not migrate their paper records will have relatively lower estimates because there are fewer years of data. With CPCSSN's definition, and given current variability in how long practices have been using EMRs, it could be challenging to compare prevalence across practices, sites, or provinces. Fourth, diagnosis of depression in primary care is not standardized. Few clinicians use standardized assessment tools, and those who do use various instruments. Thresholds for diagnosis also differ among clinicians. Finally, use of billing and other physician data to identify depression could underestimate prevalence. Generally EMRs record only medical issues for which patients receive treatment and physicians claim payment. Patients with chronic but stable depression who do not discuss symptoms with their doctors will likely not be diagnosed as depressed, and therefore will not be represented in the prevalence estimate. Conversely, a fee-for-service structure that requires a diagnosis such as depression to justify lengthier counseling visits could potentially result in overestimation of prevalence.

While considerable progress has been made, CPCSSN continues to improve data cleaning, coding, automation, knowledge translation, and the accuracy of prevalence estimates. Early analysis suggests the sensitivity and specificity of the current depression case algorithms are acceptable. These and other CPCSSN initiatives will increase the usefulness of its data platform and of PHS activities to manage and plan health services now and in the future.

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