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MEASUREMENT OF HEALTH CARE UTILIZATION IN CANADA: AGREEMENT BETWEEN SURVEYS AND ADMINISTRATIVE RECORDS

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ABSTRACT

Self-reported health utilization data and provincial administrative records are widely used by researchers and policy-makers in Canada to examine determinants of health care utilization, access to care, and other research and policy issues. The purpose of this paper is to examine literature that quantifies and explains differences between these two important sources of primary care utilization data in Canada; to describe important gaps in the existing literature; and to identify issues which need to be addressed in order to assist researchers in interpreting, comparing, and improving these measures.

KEYWORDS: Administrative Databases; Data Quality; Health Care Utilization; Self-Reports.

1. INTRODUCTION

1.1 Overview

This literature review examines studies that provide information about the level of agreement between two important sources of primary health care utilization data in Canada: self-reports and provincial administrative databases.

The first section of this paper places this literature review in a broader context of inquiry about self-reports and data quality, and then focuses on issues associated with the measurement of health care utilization. The second section provides an overview of two common measures of health care utilization in Canada, and differences between them. The third section examines studies that may provide insights into the level of disagreement between these data sources. The closing section summarizes the findings, and comments on the implications and next steps.

1.2 Background

Despite the widespread influence of self-reported data on research, government policy, and program planning and evaluation, relatively little attention has been given to how well self-reports represent the phenomena they are intended to measure. Self-reported data is commonly obtained through the use of survey interviews, research study interviews, or self-administered questionnaires.

Self-reports provide information about attitudes, opinions, behaviours, health status, and other variables. For example, research subjects may be asked how they rate their health, or how many times they have watched television in the past week; or they may be asked questions used to assess levels of a psycho-social variable such as "self-esteem."

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Many types of self-reported data are difficult to compare and confirm with other sources. However, it is possible to examine the discrepancy between certain types of self-reported events or behaviours and other measures. Information about such differences is useful when using and interpreting data from either source, and when comparing studies which have employed different types of measures.

It is also important to be able to understand how and why differences between self-reports and other measures occur, and how they can be reduced. For example, self-report errors have been found to vary according to demographic and other characteristics, but substantial disagreement between data sources remains unexplained.

During the past two decades, considerable advances have been made towards identifying types of self-report errors, and expanding knowledge of factors that can exacerbate or reduce such phenomena. The CASM movement (Cognitive Aspects of Survey Measurement) has been largely credited with the on-going application of theoretical frameworks and methods from the field of cognitive science to improve our understanding of self-reporting processes and sources of error.

It is important to be aware that discrepancies between self-reports and other measures may not solely reflect errors in *self-reports*. For example, Ritter *et al* (2001, p. 140), compared self-reported health services utilization of 216 participants in a chronic disease self-management program with computerized utilization records for a Health Management Organization (HMO). The researchers examined 10 cases that showed the largest discrepancy, and found that the computerized records were less accurate than the self-reports in more than half of the cases.

It is within this broader context of differences between self-reports and other measures that this literature focuses on comparisons between measures of health care utilization. The linkage between large databases, such as national health survey databases and provincial health agencies' administrative databases in Canada, provides a fruitful and unique context to compare self-reports with another measure of health care utilization.

1.3 Differing Measures of Health Care Utilization

National health surveys and provincial administrative databases are two of the most commonly used sources of primary care utilization information in Canada. They are used to examine determinants of health care utilization, access to care, and other issues. However, both of the measures are "representations" of "actual" health care utilization. There is a paucity of research that examines the extent to which these measures are comparable or interchangeable.

This objective of this literature review was to identify studies which describe the direction and magnitude of differences between national survey data and provincial administrative records for primary care utilization in Canada; to describe gaps in the existing literature; and to identify issues which need to be addressed in order to assist researchers in interpreting, comparing, and improving these measures.

1.4 Primary Health Care Utilization

Health care utilization is a broad term which encompasses hospital stays, emergency department contacts, general practitioner contacts, specialist physician contacts, and other types of services within and outside the formal health care systems (such as contacts with psychologists, physiotherapists, and so on).

This study focuses on primary care utilization, which is considered to be the "foundation of Canada's health care system" ("Primary health care," 2004).

2. MEASUREMENT OF HEALTH CARE UTILIZATION

2.1 Measurement of Health Care Utilization – Self-Reports and Records

2.1.1 Health care utilization: Self-reports

Self-reported health care utilization data are commonly collected through self-completed questionnaires or interviews. The most widely and readily available sources of self-reported primary health care utilization data in Canada are national Canadian health surveys, such as the National Population Health Survey or Canadian Community Health Survey.

National Canadian health surveys include questions about demographic characteristics, health information, and health care utilization. Health care utilization measures include the number of nights spent in hospital, nursing home or convalescent home; the kinds of health professionals contacted by the respondent about the respondent's general physical, emotional, or mental health (or more specific conditions); the number of contacts with each of several categories of health professionals; satisfaction with care; the venue of most recent contact with a health professional; and so on. The timeframe of interest is generally the 12-month period preceding the interview. Additional information, related to alternative or complementary care, unmet needs, specific services like screening tests and mental health care, or other health care variables, is also collected in some surveys.

2.1.2 Health care utilization: Records

Non-self-reported sources of information about primary care health care utilization may include medical chart reviews, interviews with physicians, or routinely collected information in health care databases. In some provinces in Canada, researchers may access provincial administrative databases that include records of health services rendered to provincial populations under Canada's system of universal publicly funded health care.

An example of a provincial administrative database is the British Columbia Linked Health Database (BCLHD), which includes individual-level linkable information about publicly-insured health services for which health professionals have billed and been paid; hospital separations; certain mental health services; continuing care; publicly-insured pharmaceutical purchases; as well as linkable data files from the British Columbia Workers' Compensation Board, the British Columbia Cancer Agency, and Vital Statistics ("Frequently asked questions," 2004).

2.1.3 Two different measures of primary health care utilization

National Canadian health surveys and provincial administrative databases are different representations of actual utilization. Surveys are based on respondents' recall and reporting of contact, by phone or in person, with a general practitioner or family physician. In the case of administrative data, the number of primary care "visits" is derived from records of payments for insured services.

In national Canadian health surveys, participants are commonly asked if they will provide permission for a linkage between their survey responses and their provincial health information. They are also asked to provide their provincial health insurance number. (Probabilistic linkages can be used to link those respondents who provided permission for a linkage, but who did not provide their personal health number). Such linkages permit an examination of the extent to which the two data sources differ, and the factors that are associated with such differences.

3. LITERATURE REVIEW

3.1 Comparisons of utilization in national surveys and provincial administrative databases

A literature review was conducted to identify studies that have compared estimates of primary health care utilization in national Canadian health surveys with provincial administrative records. Three published studies and one working paper in Canada were reviewed.

In addition, other studies which have compared self-reported health care utilization and records, and which could potentially be generalized to the context of this literature review were sought. Studies from Canada and other jurisdictions such as the United States, Europe, and Australia were identified, however they did not meet all of the following criteria for inclusion in this literature review:

- The study population must be representative of the general Canadian population sampled in national health surveys:

The study populations in most studies were not similar to the general Canadian population because the research subjects and their records were drawn from randomized controlled trials or other studies, Health Management Organizations, and so on.

- The wording of health care utilization questions must be very similar to the wording of national Canadian health survey questions about primary care utilization:

Studies were excluded if questions about health care utilization did not specifically address primary care utilization, or they were distinctly different from the questions used in national Canadian health surveys.

- The recall period must be the same as the 12-month recall period used in national Canadian surveys:

Some studies use recall periods as short as 2-weeks, or several months. Studies were excluded if they did not use a 12-month recall period.

- The comparison data must originate from a provincial administrative database

The following Canadian studies compared self-reports to provincial administrative records:

3.1.1 Mustard *et al* (2000) – Health care utilization in the general population

Mustard *et al* (2000) examined agreement between self-reported health care utilization in the 1994 National Population Health Survey (NPHS) and administrative databases in British Columbia, Saskatchewan, Manitoba, and Ontario. Their sample included 8,529 individuals (or their proxies), aged 12 or over, who responded to the NPHS and who were successfully linked to provincial administrative databases in four provinces.

The overall proportion of individuals who reported *any* contact with a general practitioner was very similar to the overall proportion of individuals with any contact with a general practitioner according to the administrative data (80.4 percent versus 80.2 percent). The authors reported moderate agreement using the Kappa statistic.

The total number of self-reported general practitioner contacts was between 7 and 8 percent lower than the total number of contacts in the administrative database. A larger difference was observed for the number of specialist contacts. In contrast, disagreement in the opposite direction was observed for the number of days of hospital care.

The authors reported that individuals with certain types of characteristics, such as older age, or who reported better health status according to various indicators were, on average, more likely to report fewer contacts relative to administrative records. The opposite was observed in some cases; for example, among individuals who reported poorer health status according to various indicators.

In summary, the aggregate-level findings suggest that either measure of the overall proportion of individuals who have had *any* contact with a general practitioner will yield a similar estimate for the general population. However, estimates of the *number* of contacts are less similar, and the total number of contacts according to self-reports is somewhat lower than the number of contacts according to administrative data. Moreover, the likelihood of self-reporting more or fewer contacts relative to administrative records varies according to certain respondent characteristics. Such findings have implications for health research, planning, and policy.

These findings also demonstrate that the direction and magnitude of agreement between self-reports and administrative records for other types of health care utilization may not be generalizable to primary care utilization.

3.1.2 Raina *et al* (2002) –Health care utilization in the elderly

Raina *et al* (2002) examined agreement between self-reported health care utilization and administrative records in community-dwelling adults in Ontario, aged 65 and older. In order to facilitate comparisons with national surveys, the researchers used an abbreviated version of the health care utilization module of the 1994 National Population Health Survey (NPHS), with a 12-month recall period. Self-reported contacts with general practitioners were compared with billing records from health professionals in the Ontario Health Insurance Plan (OHIP). A sample of 1,500 subjects were randomly selected using the Ontario Ministry of Health's Registered Persons Data Base, and 1,054 consented to telephone interviews of approximately 30 minutes.

3.1.2.1 Agreement for *any* contact

The researchers found observed agreement (yes/yes and no/no) for *any* contact with a general practitioner to be 79.3 percent. They reported poor to fair agreement using Cohen's Kappa statistic.

In 16.4 percent of cases, the administrative data indicated no general practitioner visits, while the respondents had reported visits. In a much smaller number of cases (4.3 percent), the respondents reported no visits while the administrative data indicated that they had had at least one visit. (By contrast, disagreement between self-reports and administrative records for any contact with a medical *specialist* were in the opposite direction. This was not attributed to respondent confusion about types of physicians).

3.1.2.2 Agreement for the *number* of contacts

The researchers found substantially lower agreement for observed agreement for the *number* of visits (13.6 percent) than for *any* contacts. They reported fair agreement, using the intraclass correlation coefficient (ICC).

The differences were larger and in the opposite direction of the differences observed for *any* contact. More than half of respondents (59.4 percent) reported a smaller number of contacts with general practitioners than the number of contacts observed in administrative records, whereas the number of self-reported visits were significantly higher than the number of contacts observed in administrative records for 26.9 percent of respondents.

The magnitude of differences were large, particularly when respondent reported fewer visits than were observed in administrative records. Among respondents who reported at least one visit with a general practitioner, in 41.1 percent of cases administrative records exceeded the number of self-reported contacts by three or more contacts. In 12.9 percent of cases, self-reports exceeded administrative records by three or more contacts.

3.1.2.3 Factors associated with disagreement

The odds of agreement between self-reports and administrative records for *any* contact with a general practitioner was significantly lower for respondents who reported annual incomes below \$25,000 than for those who reported incomes greater than \$25,000. Differences between the *number* of self-reported visits and administrative records were associated with variables such as self-reported health status indicators.

3.1.2.4 Summary

Once again, agreement between self-reports and administrative data was better for *any* contact than for the *number* of contacts, and that there is evidence of differences in agreement in individuals with different demographic and health characteristics.

It may be difficult to generalize the specific results of this study to the *general* Canadian population. There is evidence to suggest that individuals over age 65 could have different patterns of disagreement than those in other age groups (Mustard, 2000; Cleary, 1984). In addition, Raina *et al* did not use exactly the same survey methods and format used in national surveys.

However, this study of individual-level rather than aggregate-level differences between self-reports and administrative data provides more detailed insight into differences between the measures than the does study by Mustard *et al*. Such information would be valuable at the general population level.

3.1.3 Rhodes *et al* (2002) – Mental health care utilization

Whereas Raina *et al* developed a questionnaire which was based on the health care utilization questions in the 1994 NPHS, Rhodes *et al* (2002) directly compared responses to mental health care utilization questions in the 1994 NPHS with mental health billing records in the OHIP database and data on inpatient stays from the Canadian Institute for Health Information (CIHI). However, this study did not distinguish between general practitioner contacts and contacts with other types of professionals, and it focused specifically on mental health care utilization. Therefore, it was not deemed to be generalizable to the research question of interest in this literature review.

3.1.4 Ungar *et al* (1998) – Respiratory-related health care utilization

Ungar *et al* compared visits to general practitioners with OHIP data for 83 participants in the Pharmacy Medication Monitoring Program Bronchial Inhalers pilot project, established at McMaster University. The longitudinal study asked participants for various health information, including the number of respiratory-related family physician visits during the 6-month period prior to their first interview, and during two subsequent intervals which were 2 and 3 months apart. The potential for selection bias, the focus on respiratory-related visits, and the length of the recall period limit the generalizability of the study for the purposes of this literature review.

3.1.5 Summary of the literature

Only one study was identified which examined agreement between self-reported primary health care utilization in a national population health survey and utilization recorded in provincial administrative databases. Three other studies that compared self-reports to administrative data were identified but had limitations in terms of their generalizability to the general Canadian population.

The studies by Mustard *et al* (2000) and Raina *et al* (2002) suggest that agreement between self-reports and administrative data was better for *any* contact than for the *number* of contacts. However, more work is needed to examine in what types of cases individuals' self-reports may exceed their recorded contacts in administrative records and vice versa.

The results suggest that the direction and magnitude of differences between data sources may vary between sub-populations. In addition, the direction and magnitude of differences between data sources may vary according to the kind of utilization being measured.

3.2 Gaps in the literature

There are limited number of studies which directly quantify the direction and magnitude of differences between national Canadian survey estimates of primary health care utilization and provincial administrative data.

This literature review reveals a need for studies which directly quantify the direction and magnitude of differences between measures of primary care utilization in provincial administrative databases and national health surveys in the general Canadian population, at an individual level, and not only at an aggregate level. It is important to further explore the factors associated with such differences. Large-scale studies have typically presented correlations between measurement error and readily available descriptive variables such as age, gender, health status, and so on. Few such studies have addressed the limitations of using self-reported measures (for example, self-reported chronic illnesses, self-reported income and so on) as independent variables in such analyses. Yet, in order to understand difference between the data sources, independent variables that are grounded, for example, in models from cognitive psychology, are also needed, and interactions need to be explored.

Studies that describe the direction and magnitude of differences between measures, and examine factors associated with discrepancies are good preliminary steps, but these need to be followed up with more in-depth exploration of the mechanisms underlying self-report errors. Issues associated with the completeness and accuracy of visits derived from administrative databases also need to be explored.

It is important that such research be conducted on general practitioner contacts, as distinct from other types of health care utilization, since there is evidence that the direction and magnitude of differences between self-reports and other measures may vary between different types of health care utilization.

Finally, the use of consistent measures of agreement in such studies, or the reporting of more detailed data would facilitate comparisons between different studies of discrepancies between self-reports and administrative data. In addition, researchers need to describe the limitations of various measures of agreement, and address other such methodological issues when reporting their results.

4. CONCLUSION

The objective of this literature review was to examine the extent to which two commonly used measures of primary care health service utilization data in Canada are comparable and interchangeable. Three published studies and one unpublished study were reviewed, but only one study directly compared estimates from national survey questions with provincial administrative data.

These preliminary findings revealed some general tendencies which may be useful for researchers, health planners and policymakers to consider when using and interpreting data arising from self-reports or administrative sources, and when comparing results of studies which have been based on different measures. However, a review of the existing research reveals a need for more detailed exploration of the direction and magnitude of individual-level differences between measures. In addition, more study is needed to describe personal and other characteristics associated with disagreement.

In order to better understand and reduce measurement error, it is important for such research to incorporate concepts from cognitive theory which describe factors that may influence recall and reporting accuracy. Such information will be helpful to those who design and interpret surveys. In addition, it is important to recognize that self-reports are not the only source of errors. Gaps, data quality issues, and evolving policies on what is or is not included in administrative databases also need to be understood on a province-by-province basis.

Fortunately, linkages between large national health surveys and provincial administrative databases in Canada provide rich sources of variables and very large samples with which to explore issues and interactions associated with discrepancies between data sources that have not previously been studied.

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