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Forgetting to remember or remembering to forget: A study of the recall period length in health care survey questions

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ABSTRACT

Self-reported data on health care use is a key input in a range of studies. However, the length of recall period in self-reported health care questions varies between surveys, and this variation may affect the results of the studies. This study uses a large survey experiment to examine the role of the length of recall periods for the quality of self-reported hospitalization data by comparing registered with self-reported hospitalizations of respondents exposed to recall periods of one, three, six, or twelve months. Our findings have conflicting implications for survey design, as the preferred length of recall period depends on the objective of the analysis. For an aggregated measure of hospitalization, longer recall periods are preferred. For analysis oriented more to the micro-level, shorter recall periods may be considered since the association between individual characteristics (e.g., education) and recall error increases with the length of the recall period.

1. Introduction

A large and growing number of health economic studies rely on survey-based self-reported data to obtain information on health care use, out-of-pocket expenses, and health behaviors. The design of these surveys will inevitably affect the result, and possibly, the conclusions of research, which, in turn, may influence our beliefs and future policy. One feature that varies greatly between different surveys is the period over which people are asked to recall prior events. A recent review of almost 90 country-level health surveys reports that the recall periods range from 2 weeks to 14 months with a significant proportion of surveys using either 1 or 12 months (Heijink et al., 2011). While information tends to be collected over longer recall periods for hospitalizations than physician visits, there is still a surprising degree of variation between surveys. For example, in the case of hospitalizations, 36% of the surveys use a one month recall period, while 46% use one year.[1]

It has been well established that self-reported behaviors such as health care use are subject to error. Gaskell et al. (2000) suggest four types of recall error:

> "Respondents may forget details on even entire events. Although less common, respondents may recall events that did not occur. These are referred to as errors of omission and commission, respectively ... another type of error ... [is] telescoping. Respondents may recall an event but report that it happened earlier than it actually did (backward telescoping) or report that it happened more recently (forward telescoping)."

It has also been recognized that the longer the recall period, the less accurate the reported estimates (Stull et al., 2009; Bhandari and Wagner, 2006). However, even though the likelihood of recall error

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[1] Debate over the appropriate length of the recall period is not confined to health care use. See Arnold et al. (2013) for an examination of trade-offs when collecting information on childhood illness in developing countries.

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increases with longer recall periods, so does the amount of information provided, so there is a potential trade-off between recall error and information. The presence of this implicit trade-off when designing health surveys may explain the high degree of variation in recall periods used for the same types of health care.

The appropriate length of recall period also depends on the type of health care consumption and the intended use of the information. First, events that are more salient call for a longer recall period, while events that are more frequent call for a shorter period; the probability of remembering spending a night at the hospital is likely to be higher than the probability of remembering a visit to a GP. Second, while an overall average for a given target period may be well approximated (given no seasonality) by scaling up an estimate from a shorter recall period, the same exercise with the objective of estimating individual health care use for an infrequent and unpredictable event will probably yield estimates that are at best weakly related to the actual use (e.g., Deaton, 1997). Third, because individual characteristics such as cognitive ability or socioeconomic variables also potentially affect the process of recalling information (Bhandari and Wagner, 2006; Bound et al., 2001), the consequences of recall error may be more severe if the data is intended for studying the relationship between consumption of care and socioeconomic variables (e.g., studying demand or consumption using regression analysis). Unless recall error is orthogonal to individual characteristics, it is problematic to recover the relative impact of variables, and the bias induced by the recall error may falsely affect our understanding of the relationships of interest (e.g., Wooldridge, 2010).

While numerous studies have compared reported and actual use for a range of health care variables, almost all previous studies have examined only one period over which the respondent is asked to recall their prior use (for an overview see Bhandari and Wagner, 2006). It is hard to draw general conclusions about the nature of recall error as there are many differences between such studies, including the type of health care use examined, the nature of the survey (e.g., face-to-face interview vs. mail questionnaire), and the characteristics of the respondents. One way to control for these confounders is by allocating respondents to versions of the same question that differ only in the time period over which they are asked to recall past use. Das et al. (2012) performed such an experiment in India finding significant variation in reported doctor visits between those collected using a one-month recall period and those collected using four weekly reports, as well as differences in reporting behavior between rich and poor. However, this experiment could only document differences in patterns of reporting, not differences in patterns of *reporting error*, i.e., the degree to which self-reported use differs from recorded information on actual use.

The primary aim of this study is to use a large survey experiment to examine the role of the length of recall period in recall error about hospitalization. By comparing self-reported data gathered from a public health survey with registered data (treating the latter as the gold standard), we explore the nature of recall error and examine its implications for two aspects of survey design. First, we extend the framework suggested by Clarke et al. (2008) to determine an optimal length for a recall period for an aggregated measure of hospitalization, i.e., estimating the mean number of nights of stay. Second, we report how individual characteristics affect the quality of self-reported data and examine the degree of association between years of schooling (a proxy for cognitive ability) and recall errors over different recall periods. We know of no comparable published experiment to quantify recall error for a type of health care use. Therefore, this study contributes to the literature by exploiting variation in the length of the recall period for a large sample.

2. Description of a household survey experiment

This household survey experiment uses data from two different sources—Swedish registry data and a public health survey from the most southern Swedish county council (i.e., Region Skåne)—to examine how the length of the recall period affects the accuracy of self-reported hospitalization. Respondents in the public health survey were asked

> "How many nights were you hospitalized during the last year/X months?"

Respondents were assigned to one of four groups, each with a different recall period, based on the quarter of their birth. For respondents born in the months January to March (Group 1), April to June (Group 2), July to September (Group 3), and October to December (Group 4), the lengths of the recall period were one month ($w = 30$), three months ($w = 91$), six months ($w = 183$), and twelve months ($w = 365$), respectively. The wording of the question, specifically asking for hospital nights rather than days, was chosen to assure that the respondents' perception of the event corresponded to the registered event. In addition to this question, respondents were asked to state whether they had been admitted to the hospital during the last three months (admission).

2.1. Experimental population

The population in the public health survey, Folkhälsoenkät Skåne 2008 (Rosvall et al., 2009), consists of all individuals from the ages of 18 to 80 living in Region Skåne, one of the 21 county councils of Sweden. A total of 28 198 out of 52 142 respondents answered the survey. This study is based on the subset of 7500 respondents who answered the questionnaire on the web because the exact date of their survey completion was known.[2] The survey data, which also include information on self-assessed health, living conditions, and background information such as age and country of birth, are linked to registry data on income, education, and hospitalization. The link to registry data allows us to compare self-reported hospitalization with registered number of nights spent at a hospital. The National Board of Health and Welfare (2009) has stressed that the quality of registry data is high for the date of admission to and discharge from the hospital. The registry data include hospitalizations at public hospitals within Region Skåne as well as in other county councils, but they do not include nights spent at private hospitals. As the registry data do not include private care, we may overestimate the number of individuals who falsely reported hospital nights. The bias we observe may therefore be due to consumption of private care. However, this is unlikely to have a significant impact on the results since the share of private in-patient care in Region Skåne is less than one percent (in terms of hospital admission). Out of the 7500 observations, 365 have missing values on either reported or registered hospitalizations and an additional 136 have missing values on either years of schooling or income. Therefore, the analysis uses the remaining 6999 observations.

The definitions of the variables are explained in Table 1a. As the length of the recall period the respondent is exposed to is determined by the quarter of birth and not by randomization, it is important to compare the descriptive statistics for the four groups. Table 1b shows that the four groups are equal in terms of sex, non-Nordic origin, and health care consumption (i.e., the proportion being admitted during the last three month, admission, and the

[2] For the remainder of the sample only the dates of receipt of the mailed returned survey form were known, so the exact recall period could not be obtained.