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Social Science & Medicine 60 (2005) 2623–2627

SOCIAL SCIENCE & MEDICINE

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Do panel surveys make people sick? US arthritis trends in the Health and Retirement Study

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Available online 12 January 2005

Abstract

Researchers have long viewed large, longitudinal studies as essential for understanding chronic illness and generally superior to cross-sectional studies. In this study, we show that (1) age-specific arthritis prevalence in the longitudinal Health and Retirement Study (HRS) from the United States has risen sharply since its inception in 1992, and (2) this rise is almost surely spurious. In periods for which the data sets are comparable, we find no such increase in the cross-sectional National Health Interview Survey (NHIS), the primary source for prevalence data of chronic conditions in the US. More important, the upward trend in the HRS is not internally consistent: even though prevalence in the HRS rises sharply between 1992 and 1996 for 55–56 year-olds, the prevalence for that age group plummets to its 1992 level among the new cohort added in 1998 and then rises rapidly again between 1998 and 2002. We discuss possible reasons for these discrepancies and demonstrate that they are not due to sample attrition in the HRS.

Keywords: Arthritis prevalence; Survey methods; USA

Introduction

In recent decades, governments around the world have spent considerable sums of money on long-term panel surveys (usually annual or biannual observations on the same survey respondents). These costs are usually rationalized by important research questions that cannot be adequately addressed with cross-sectional data. Panel surveys, therefore, provide social scientists with a new arsenal of data for studying the role of health across the life course. In the United States, probably the most important health-related data collection in the past decade has been the Health and Retirement Study (HRS), which is a National Institute on Aging study designed to track a cohort of individuals from working ages into retirement, collecting economic, demographic and biomedical information every two years.

In theory, panel surveys should (after adjusting for issues such as sample attrition) yield the same estimates of disease prevalence as found in cross-sectional data. Whether or not a 55-year-old has arthritis on a given date, for instance, should not depend on whether his/her data is obtained from a longitudinal or cross-sectional study. However, researchers rarely analyze such comparisons. In this brief, we bring to light a novel (and, we argue, spurious) feature of the HRS, namely sharp increases in age-specific prevalence of arthritis. Although other diseases often draw more attention in the public eye, arthritis is possibly the most economic-

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doi:10.1016/j.socscimed.2004.10.027

ally important chronic disease for people approaching retirement. Arthritis is both highly prevalent (Centers for Disease Control, 2001a, b; Manton, Corder, & Stallard, 1993) and costly (Centers for Disease Control, 1999; Lubeck, 1995; Pugner, Scott, Holmes, & Hieke, 2000; Rice, 1992; Yelin, Callahan, & National Arthritis Data Work Group, 1995). And as the population ages, arthritis (particularly osteoarthritis) is likely to grow in importance as a public health concern. Understanding policy-relevant questions such as the effect of arthritis-induced disability on the retirement decision necessitate a data source that can be trusted to yield reliable information over time.

Methods

Data

The original HRS cohort consists of a random sample of the non-institutionalized US population aged 51–61 in 1992 (The Health and Retirement Study, 2003; Rand Center for the Study of Aging. Rand Population Program, 2002). The HRS has been repeated every two years subsequent to 1992, and preliminary data from the sixth wave (2002) is now available. In 1998, additional cohorts added to the HRS made it representative of the entire US population aged 51 and over. The NHIS consists of annual cross-sections of the US non-institutionalized population and samples about 100,000 adults aged 18 and over each year (National Center for Health Statistics, 1994).

The outcome variable under study in each sample is self-reported arthritis, with no distinction made between osteoarthritis and rheumatoid arthritis. The HRS question is "Has a doctor ever told you that you have arthritis?", which remains constant over the survey waves (The Health and Retirement Study, 2003). Arthritis is one of eight general chronic conditions queried in the HRS (the others are heart disease, respiratory disease, diabetes, hypertension, stroke, cancer and psychological disorders).

The NHIS underwent a major design change in 1997. Prior to 1997, a primary respondent answered questions for all adults in the household. The question was, "Tell me if anyone in the family has had any of these conditions [arthritis being one]…" (National Center for Health Statistics, 1994). Starting in 1997, proxy reporting was dropped and each adult in the household was asked, "During the past 12 months, have you had pain, aching, stiffness or swelling in or around a joint?" (National Center for Health Statistics, 2002). Thus, the NHIS went from an emphasis on physician diagnosis of disease to a symptom-based approach to indicate arthritis.

Analyses

Characteristics of each data source limit the kinds of direct comparisons we can make. The redesign of the NHIS in 1997, especially the change in the question wording noted above, makes it impossible to follow trends over the entire period covered by the HRS, and the narrow age range of the original HRS cohort limits the number of age-specific comparisons we can make over time. Given these limitations, we conduct the following four analyses:

(1) Arthritis prevalence at ages 59–61 is calculated from 1992–2000 in the HRS. In order to show that the strong upward trend is not due to sample attrition bias, we re-compute the trend including those cases lost to follow-up, assuming that they retain their previous disease state. Since these lost cases are not allowed to acquire the disease, the estimates form a lower bound on the trend.
(2) A direct comparison is made of arthritis prevalence proportions in the HRS and NHIS for those aged 55–59 in 1992, 1994 and 1996. During this period, the questions were nearly identical between the surveys, and they remained constant over time.
(3) The trend in within-cohort prevalence for those aged 51–61 in 1992 is compared across data sets, though the 1992–1996, 1998–2000 periods must be examined separately in the NHIS due to the 1997 redesign of the NHIS. The within-cohort prevalence will naturally rise over time as the cohort ages. The NHIS estimates are weighed to follow the same change in the age distribution as found in the HRS.
(4) The additional cohorts added to the HRS in 1998 are used to examine whether the upward trend in arthritis prevalence among those aged 55–56 during the 1992–1996 continues in the new cohort sample in 1998 or whether it follows another pattern. The age group 55–56 is chosen because it is the only one present in the data that can be found in each wave of the data from 1992 to 2002.

In all analyses mentioned above, the age distribution in the NHIS is standardized to match the HRS distribution in the HRS sample in each survey year. However, because both surveys are large, random samples of the US population, age standardization has minimal effect on the prevalence estimates. Standardizing by the age distribution of the HRS has the added advantage of automatically adjusting for age-related sample attrition across the survey waves.

Finally, in all analyses, sampling weights that account for complex sampling designs in both the HRS and the NHIS are applied throughout.