Differences in Healthcare Utilization by Birth Cohort Over the Past 34 Years and Potential Policy Implications

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Abstract:

We examine whether there are cohort effects in healthcare utilization over the last 34 years, we examine healthcare utilization using National Health Interview Survey (NHIS) data obtained from a new data resource called the Integrated Health Interview Series (IHIS). The IHIS is a harmonized set of variables from the NHIS public use microdata files from 1969 to the present, which allows easy access to all years of data. Our preliminary results show signs of a cohort effect in that each successive cohort is utilizing medical doctors more frequently than the last at the same age and that the divergence seems to be growing over time. Our analysis could have implications for how we estimate the impact of population aging on healthcare expenditures in the United States. Current expenditure models assume that age-specific utilization rates from one cohort can be applied to project the utilization and costs of the next.

Extended Abstract:

There have been changes in healthcare utilization and access to healthcare over the past 40 years in the United States including the introduction of managed care providers, Medicare and Medicaid programs. In this paper we examine how healthcare utilization has changed over the last 34 years using one measure over this period that has changed slightly over time. Our measure of interest is the interval since the last doctor's visit. We examine this variable through the creation of birth cohorts and track them through 34 years of survey data. We find that preliminary support for the notion of changing utilization patterns by birth cohorts using these data. If confirmed through additional research the data presented in this abstract could be used to improve economic forecast models of health care spending and Medicare/Medicaid spending taking into account these cohort differences. Our results, however, are preliminary and we are currently adjusting them for important covariates we describe below. Our analyses will be complete by the meeting of the Population Association of America's 2008 conference and our results are subject to change.

DATA and RESEARCH METHODS

Data source and sample

To determine if there are cohort effects in healthcare utilization over the last 34 years we examine healthcare utilization using National Health Interview Survey (NHIS) data, which is an annual cross-sectional survey of the civilian, non-institutionalized U.S. population. The NHIS is sponsored by the U.S. Centers for Disease Control and Prevention. Each year, the NHIS collects detailed information on the health conditions, health status, healthcare utilization and insurance coverage of a nationally representative sample of households in all 50 states and the District of

Columbia. To perform our analysis we obtained data for 1969 to 2003 from a new data resource called the Integrated Health Interview Series (IHIS, see www.ihis.us). The IHIS is a harmonized set of variables from the NHIS public use microdata files from 1969 to the present, which allows easy access to all years of data. It also helps researchers create carefully constructed cross-sectional time series data for trend analyses.

Measures

The utilization variable of interest represents the interval since last doctor visit. It is obtained by asking the respondent to approximate the amount of time since they last talked to a medical provider. Beginning with the 1982 NHIS survey, the question was changed slightly to include "medical doctor or assistants." This implies that professionals such as a nurse practitioner would now be counted which they would not have been earlier. Beginning in 1997, the questions changes slightly to include "medical doctor or other healthcare professionals." Additionally, beginning in 1997 the question universe changed such that this question was only asked of a sample adult and a sample child within each household.

When answering the question the respondent was instructed to choose from several categorical responses ranging from "never" to "more than 5 years ago." For this analysis we *a priori* created a dichotomous variable indicating if the respondent had visited a medical doctor or assistant within the past 12 months; responses that were "unknown" (approximately 1.3% of the total sample) were coded as missing.

Analytic Methods

Using 1969 as the starting point, we constructed 10-year birth cohorts based on the reported age of the respondent. With each successive survey year, the age range for each cohort shifts by one year. For example, cohort #1 in the 1969 survey included respondents age 10-19 (born between 1950-1959). This birth cohort #1 in the 1970 survey would be 11-20 years old, and so forth. We did this analysis for 6 birth cohorts over 34 years worth of survey data. The birth cohorts are: 1950-1959, 1940-1949, 1930-1939, 1920-1929, 1910-1919, and 1900-1909.

For each survey year from 1969-2003, the mean age and proportion of visits within the past year were estimated for each cohort. Age was top-coded at 85 for several of the survey years; therefore mean values were no longer estimated once the upper age range of a cohort reached 85. These estimates were then plotted using Microsoft Powerpoint to visualize trends in utilization over time. The analysis was conducted using StataSE version 9.2 software to adjust for complex survey sample design.

RESULTS

We present two summaries of our initial results. Both of these present cross-tabulation data only. Table 1 contains the utilization results for the six birth cohorts at four specific age categories. At 48 years of age, the utilization ranges from 70.9% to 83.6% having seen a medical provider in the past year. The first two age cohorts (1920-1929 and 1930-1939) are not significantly different from each other, but both are different from the successive cohorts. The 1940-1949 cohort utilized at 76.4% and the 1950-1959 cohort utilized at 83.6%. A similar

pattern emerges with the other age ranges as well. At 58 years of age the 1910-1919 cohort utilized at 73.0% and the 1940-1949 cohort utilized at a significantly higher rate of 88.9%. At 68 years of age the 1900-1909 cohort utilized at a rate of 75.4% and the 1930-1939 cohort utilized at a significantly higher rate of 93.5%. The final data point shows that the 1900-1909 cohort utilized at a rate of 84.2% when they were 78 years old and the 1920-1929 cohort utilized at a significantly higher rate of 95.2%. We present the full findings for our preliminary analysis in Figure 1. Figure 1 shows the average age of the cohort by the percent of the cohort who utilized a medical provider in the past year.

-- Insert Table 1 and Figure 1 About Here --

DISCUSSION

Both Table 1 and Figure 1 show signs of a cohort effect in that each successive cohort is utilizing medical doctors more frequently than the last at the same age and that the divergence seems to be growing over time. These results will be further investigated through analysis that adjusts them for changes in the NHIS survey instrument and changes in self-reported health status over time. Our preliminary results show that the 1950-1959 birth cohort is utilizing at higher rates than did the 1930-1939 age cohorts at similar ages. This analysis could have major implications for how we estimate the impact of population aging on healthcare expenditures in the United States. At the moment healthcare simulation models assume that age-specific utilization rates from one cohort can be applied to projecting the utilization and costs of the next.

The Center's for Medicare and Medicaid Services and Congressional Budget Office routinely project spending for important healthcare programs like Medicare. These projections often fall short of actual spending on the program and we believe one reason could be the existence of cohort differences in utilization, which are not currently taken into account in either these projections (Reinhardt 2003; Topoleski 2004; O'Harra, Sabelhaus and Simpson 2004).
The issue of disentangling cohort effects from age effects is an important demographic concern (Hobcraft, Menken and Preston 1982). Most of the forecasting models rely on a model that assumes there are no cohort differences in healthcare utilization patterns. They use "age-specific utilization" and the number of people projected to be that age in the future to determine the impact of the aging US population on healthcare spending. We do not know whether there are normative differences or differences in access to care that cause tomorrow's 70 year olds to utilize more healthcare than today's 70 year olds, but it is an important variable to examine to see how its changed over time and whether simulation models of healthcare spending and Medicare spending in particular should make adjustments for cohort effects.

An adjustment of forecasting models may be helpful for two reasons. First, there appear to be cohort and age effects and that each successive cohort is utilizing more healthcare (with respect to our one measure) than the one before. Second, if there is more utilization than projected the demand for healthcare also increases while holding the supply side of the equation constant. This usually has the effect of increasing prices paid for healthcare services (Reinhardt 2003). So not only are cohort effects driving up utilization beyond projections, but the indirect effect on prices through increased demand would also increase the aggregate healthcare costs for the population.

As to why the increased utilization occurs we are unable to say whether it's due to healthcare benefit design, increased managed care penetration, cohort norms about consulting doctors, or general improvements in access to healthcare. But it is likely that all play a role in the results presented in Table 1 and Figure 1. Our analysis is not complete at this point. We need to control for changes in the question wording over time (discussed above) and we need to model the impact of cohort in a logistic regression framework controlling for self-reported health status, race, sex and other important socio-demographic characteristics that have changed over time to understand what features are determining the change. Between now and the conference in April we will complete our background work and expand on the simple analysis presented here. We do think, however, that this analysis demonstrates the possibilities for demographic health research that can be accomplished by working with as much of the NHIS data as is publicly available to construct careful cross-sectional time series trend data.

References

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Table 1. Proportion of Doctor Visits within the Past 12 Months, by Birth Cohort

	Average Age of Birth Cohort			
	48 Years	58 Years	68 Years	78 Years
Birth Cohort 1900-1909	---	---	75.4%	84.2%
Birth Cohort 1910-1919	---	73.0%	80.3%	89.6%
Birth Cohort 1920-1929	70.9%	74.4%	86.1%	95.2%
Birth Cohort 1930-1939	71.2%	79.6%	93.5%	---
Birth Cohort 1940-1949	76.4%	88.9%	---	---
Birth Cohort 1950-1959	83.6%	---	---	---

Figure 1: Average Age of Birth Cohort in the Survey Year by the Proportion of the Cohort Reporting a Doctor Visit in the Past Year in the U.S.: 1969-2003