HOS Highlights

Multiple Cohorts Analysis of the Medicare Health Outcomes Survey, 1998-2002

Susan C. Grace, B.S.N., C.C.R.P., Erin Dowd Shannon, M.P.H., David Drachman, Ph.D., and Beth Hartman Ellis, Ph.D.

INTRODUCTION

National surveys such as the Medicare Health Outcomes Survey (HOS) provide an opportunity to examine changes in the physical and mental health of Medicare beneficiaries over time. The current study is based on results from the HOS. This survey, sponsored by CMS, is the first health outcomes measure for the Medicare population in managed care settings. Beginning in 1998 and continuing annually, a new baseline cohort is created from a randomly selected sample of Medicare Advantage (MA) plans, members from each applicable Medicare contract market area in the United States. Beneficiaries from the baseline sample are surveyed again 2 years later (the followup data collection).

For the survey results on which this study is based, the HOS includes the RAND® 36-Item Health Survey (RAND® SF-36),[1] which yields two distinct higher order measures of health status: the physical component summary (PCS) score and the mental component summary (MCS) score. The HOS also includes demographic information, as well as activities of daily living, negative symptoms, and chronic conditions.

[1] The RAND® 36-Item Survey 1.0 was developed at RAND® as part of the Medical Outcomes Study and is used with permission.

A beneficiary is eligible for remeasurement if a PCS and MCS score can be calculated from the baseline survey. Beneficiaries are excluded from followup if they were involuntarily or voluntarily disenrolled from their plan, or were deceased prior to the 2-year followup survey. The availability of followup data allows researchers to analyze physical and mental health status changes for Medicare managed care beneficiaries.

The survey sampling methodology is dependent on the size of a plan's population. For MA plans with Medicare populations of more than 1,000 members, a simple random sample of 1,000 members is selected for the baseline survey. For MA plans with populations of 1,000 members or less, all eligible members are included in the sample for the baseline survey. Because a beneficiary may have been surveyed multiple times during the administration of the HOS, observation of mean changes in PCS and MCS scores over differing time intervals is possible. This allows us to answer the following questions: Is 2 years the optimum followup period for this survey? If we were able to observe change over 3, 4, or 5 years, would the amount of change be linear over time or would the amount of change accelerate?

METHOD

For this analysis, surveys collected from 1998-2002 were analyzed. A completed survey was defined as having a calculable PCS

and MCS score using 1998 norm-based standard scoring. The analysis was limited to seniors, age 65 or over who completed a survey. For those years where both baseline and followup surveys were administered; a completed survey was included in the analysis if either a baseline or a followup survey was completed in that year. The total number of beneficiaries who met these criteria was 682,311.[2]

To assess changes in PCS and MCS scores at yearly intervals, individual level change scores were calculated by subtracting the scores in a given year from the scores in the succeeding year. We also assessed linearity over the 5 years by analyzing polynomial contrasts using SAS®[3] (SAS Institute, Inc., 2002).

Polynomial contrasts were used to compare linear to potential nonlinear relationships in a repeated measures design. Mean PCS and MCS scores were modeled with all 5 years as the dependent variables.[4] For example, the quadratic contrast tests whether the data may be curvilinear. The cubic contrast tests for two bends in the line, and the quartic contrast tests for three bends in the line. Each higher order equation (quadratic, cubic, and quartic) contains all lower order terms (Cohen et al., 2003).

RESULTS

A total of 22,196 beneficiaries completed a survey in 2 consecutive years. A total of 8,105 beneficiaries completed a survey in 3 consecutive years and the number of beneficiaries who completed a survey in 4 consecutive years was 3,881. By year 5 a total of 668 beneficiaries had completed all five consecutive surveys.

For beneficiaries who completed five surveys in a row, the mean PCS scores are 44.16, 43.26, 42.20, 41.50, and 40.22, and the mean changes for successive years are -0.90, -1.06, -0.70, and -1.28, respectively. MCS scores indicate a similar pattern; however, the decline is smaller than for PCS scores. Mean changes for successive years are -0.48, -0.26, +0.10, and -0.54, respectively. A similar pattern of results was also observed for the beneficiaries completing four consecutive surveys, the beneficiaries completing three consecutive surveys, and the beneficiaries completing two consecutive surveys (Figures 1 and 2).

The linear contrast for the PCS scores over 5 years was significant ($F = 122.29$, $p < 0.0001$); however, the quadratic, cubic, and quartic contrasts were not significant. The linear contrast for the MCS scores was also significant ($F = 9.50$, $p < 0.002$); however, the quadratic, cubic, and quartic contrasts were not significant. Significance tests were also conducted for 4 years (PCS linear contrast, $F = 421.72$, $p < 0.0001$; quadratic and cubic contrasts not significant and MCS linear contrast, $F = 44.43$, $p < 0.0001$; quadratic and cubic contrasts not significant) as well as 3 years (PCS linear contrast, $F = 480.03$, $p < 0.0001$; quadratic contrast not significant, and MCS linear contrast, $F = 54.57$, $p < 0.0001$; quadratic contrast not significant). These results confirm that both PCS and MCS scores decline at a constant rate from year to year.
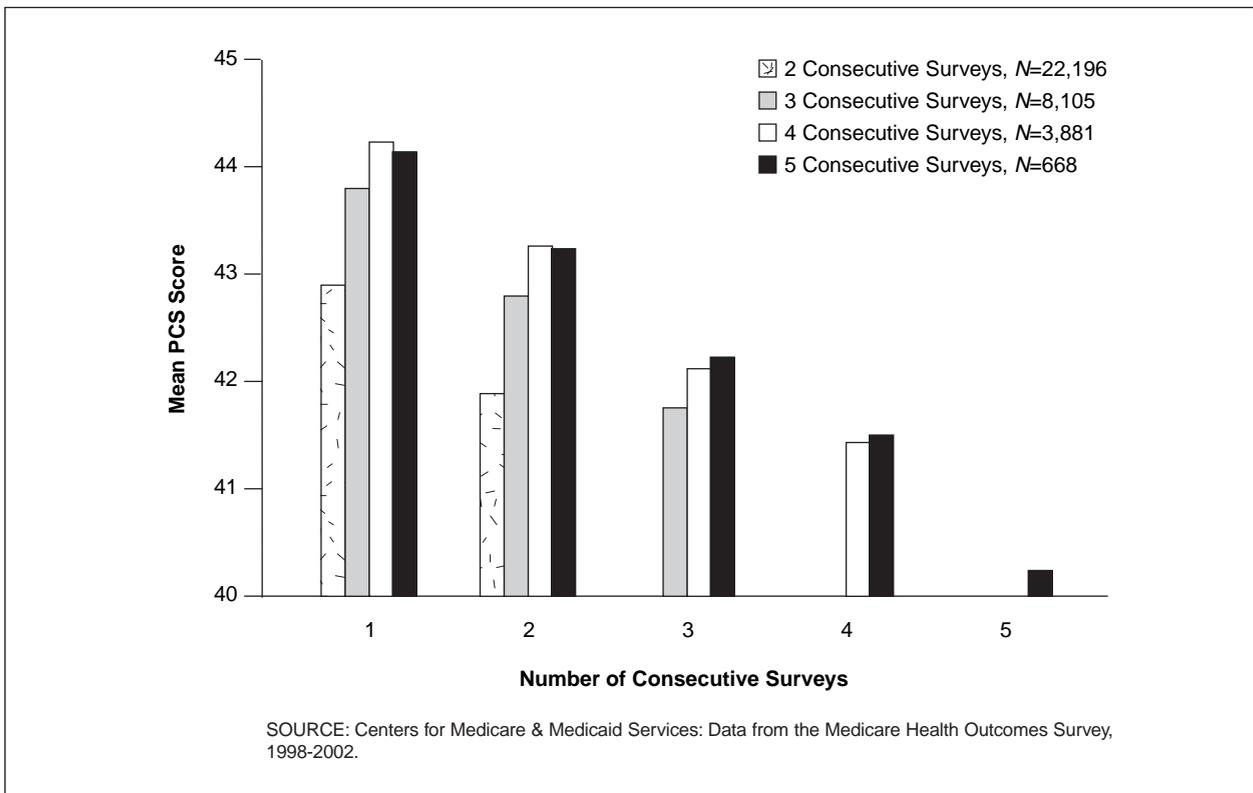
CONCLUSIONS

A limitation of this study is attrition. It is possible that the health of beneficiaries who are too ill to respond to the survey may be declining at a more rapid rate than the respondents in the current analysis. Another limitation of this study is that beneficiaries from small plans were more likely to be sampled on repeated occasions, and therefore more likely to be included in

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[2] Additional information on the HOS methodology is available at www.cms.hhs.gov/surveys/hos.

[3] SAS® is a registered trademark of the SAS Institute, Inc., Cary, NC.

[4] PROC GLM in SAS® was used to examine contrasts.

Figure 1

Mean Physical Component Summary (PCS) Scores of Beneficiaries (Age 65 or Over) Who Completed 2, 3, 4, or 5 Consecutive Surveys: 1998-2002

SOURCE: Centers for Medicare & Medicaid Services: Data from the Medicare Health Outcomes Survey, 1998-2002.

these analyses than beneficiaries from large plans. However, for the beneficiaries who responded to consecutive surveys, this longitudinal analysis reveals that PCS and MCS scores decline at a constant rate over periods as long as 5 years. If these declines had either accelerated or decelerated over the 3rd, 4th, and 5th year, then it could be argued that collecting data over these longer intervals would provide important new information about rates of decline in health status that would not be apparent over a 2-year interval. However, this study demonstrates that health declines remain constant over these longer intervals for this elderly population. Therefore, the current HOS administrative procedure of following up on respondents after a 2-year interval appears to be sufficient for accurately documenting rates of health decline. Intervals longer than 2 years would likely result in more beneficiaries lost through attrition and therefore smaller sample sizes.
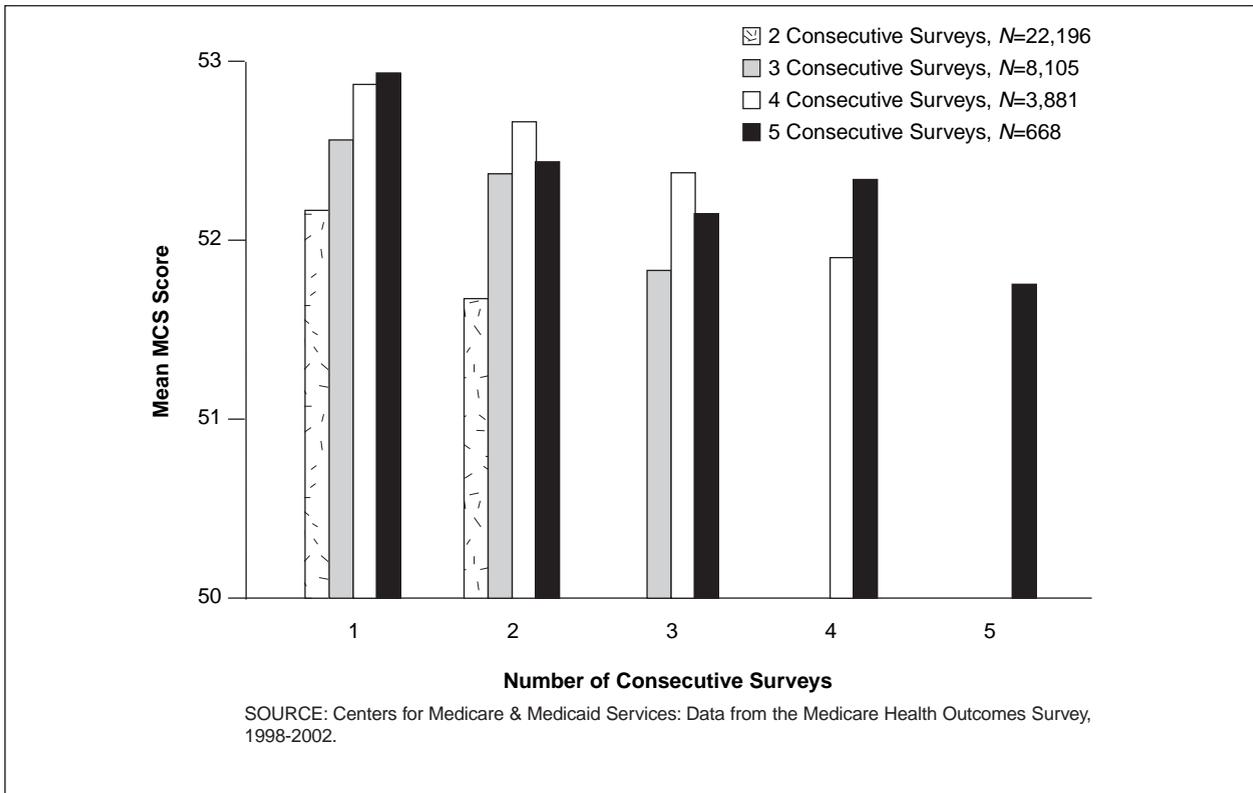
ACKNOWLEDGMENTS

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SAS Institute Inc.: *SAS®/STAT User's Guide Version 8.2.* SAS Institute Inc. Cary, NC. 2002.

Figure 2

Mean Mental Component Summary (MCS) Scores of Beneficiaries (Age 65 or Over) Who Completed 2, 3, 4, or 5 Consecutive Surveys: 1998-2002

SOURCE: Centers for Medicare & Medicaid Services: Data from the Medicare Health Outcomes Survey, 1998-2002.