

Commentary

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The Medicare Health Outcomes Survey program: Overview, context, and near-term prospects

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Abstract

In 1996, the Centers for Medicare & Medicaid Services (CMS) initiated the development of the Medicare Health Outcomes Survey (HOS). It is the first national survey to measure the quality of life and functional health status of Medicare beneficiaries enrolled in managed care. The program seeks to gather valid and reliable health status data in Medicare managed care for use in quality improvement activities, public reporting, plan accountability and improving health outcomes based on competition. The context that led to the development of the HOS was formed by the convergence of the following factors: 1) a recognized need to monitor the performance of managed care plans, 2) technical expertise and advancement in the areas of quality measurement and health outcomes assessment, 3) the existence of a tested functional health status assessment tool (SF-36®) I, which was valid for an elderly population, 4) CMS leadership, and 5) political interest in quality improvement.

Since 1998, there have been six baseline surveys and four follow up surveys. CMS, working with its partners, performs the following tasks as part of the HOS program: 1) Supports the technical/scientific development of the HOS measure, 2) Certifies survey vendors, 3) Collects Health Plan Employer Data and Information Set (HEDIS®) HOS data, 4) Cleans, scores, and disseminates annual rounds of HOS data, public use files and reports to CMS, Quality Improvement Organizations (QIOs), Medicare+Choice Organizations (M+COs), and other stakeholders, 5) Trains M+COs and QIOs in the use of functional status measures and best practices for improving care, 6) Provides technical assistance to CMS, QIOs, M+COs and other data users, and 7) Conducts analyses using HOS data to support CMS and HHS priorities.

CMS has recently sponsored an evaluation of the HOS program, which will provide the information necessary to enhance the future administration of the program. Information collected to date reveals that the HOS program is a valuable tool that provides a rich set of data that is useful for quality monitoring and improvement efforts. To enhance the future of the HOS program, many stakeholders recommend the implementation of incentives to encourage the use of the data, while others identify the need to monitor the health status of plan disenrollees.

Overall, the HOS program represents an important vehicle for collecting outcomes data from Medicare beneficiaries. The new Medicare Prescription Drug, Improvement, and Modernization Act (2003) mandates the collection and use of data for quality, outcomes measurement, program administration, and facilitating consumer choice. Consequently, it is important that the HOS program effectively meet this mandate.

Editor's note

On 22 July 2004 this article replaced the incorrect version that had originally been published. The differences are minor and of no consequence to the data or conclusions.

Introduction

Medicare managed care plans are an important source of health care services for beneficiaries. At present, 5.3 million beneficiaries receive care in these settings, of whom 4.6 million are enrolled in Medicare+Choice plans (since renamed Medicare Advantage plans, effective January 1, 2006). The number enrolled in Medicare Advantage plans is projected to increase to 13.6 million by 2010, given the recent passage of the Medicare Prescription Drug, Improvement and Modernization Act [1]. Thus, an estimated 30 percent of Medicare beneficiaries will receive care in managed care settings by 2010. The quality of care provided in managed care settings is a critical and growing issue.

A managed care organization's ability to provide quality health care is particularly important to the Medicare program. Medicare provides services to 34.6 million elderly and six million younger beneficiaries with disabilities [1]. A substantial share of beneficiaries are poor, with 40 percent having incomes of 200 percent of the federal poverty level or lower. Chronic conditions are prevalent, with 57 percent of non-institutionalized beneficiaries self reporting arthritis, 55 percent reporting hypertension and 37 percent reporting heart disease [2]. More than one-third need assistance with at least one activity of daily living [3], while 28 percent self reports their health status as fair or poor [2]. Thus, Medicare enrollees are often those vulnerable to problems with quality in managed care settings [4-7].

CMS's current vision involves enhancing "quality and efficiency in an evolving health care system" [8]. Some of CMS's specific goals include securing and enhancing health and satisfaction, creating a system of high quality care, and providing guidance for the overall health care market to improve beneficiaries' health [8]. CMS has made considerable progress in becoming a value-based purchaser of health care by pursuing high quality care for beneficiaries at a reasonable cost. Value-based purchasing includes several strategies directed at improving the quality of care, encouraging the efficient use of resources, and improving information to beneficiaries to assist them in making choices. Performance measurement is a critical component for all these purchasing strategies.

In 1996, the Centers for Medicare & Medicaid Services initiated the Medicare HOS program. The Medicare HOS is a survey that measures a health plan's ability to maintain or improve the physical and mental health of its Medicare

beneficiaries over time. It is the first national survey to measure the health related quality of life and functional health status of Medicare beneficiaries enrolled in managed care [9]. The HOS consists of the SF-36[®], questions concerning Activities of Daily Living (ADLs)³, chronic health conditions, demographics, and survey administration. The use of the HOS to collect health outcomes data mirrors a national trend in quality improvement activities to utilize outcome-based measures of quality. The goal of the HOS has been to gather valid and reliable health status data in Medicare managed care for use in quality improvement activities, public reporting, plan accountability and improving health outcomes based on competition [10]. The HOS has the potential of becoming a model of government leadership in our nation's quest to improve the quality of health care for all Americans.

CMS has sponsored a program evaluation of the HOS, a CAHPS[®]-HOS Integration study, and analytical studies of the HOS data. The results of these studies will provide CMS the information it needs to improve the future administration of HOS. The current evaluation of HOS, which will conclude in Fall 2004, includes three components: 1) a description of the context of HOS development, 2) an examination of the HOS instrument and operational protocols, and 3) an assessment of the policy issues concerning the utility of HOS data. The contextual analysis presented here is one component of the total evaluation.

This paper explores the historical context that led to the development and implementation of the HOS program; it also describes the HOS and examines its administration, its role and function within CMS, and the direction that the program may take in the future. The information for this paper was obtained through a review of the published health services literature, national reports, unpublished CMS documents and reports, and interviews with key CMS staff members (current and former), HOS partners, and Technical Expert Panel (TEP) members.

Background

Quality concerns, during the late 1980s and early 1990s, led to heightened interest in establishing effective mechanisms for measuring and, ultimately, ensuring quality in health care. Following Donabedian's widely recognized paradigm (1988), a variety of methods for defining and measuring health care quality have evolved [11]. From the use of process and structural measures of care, to the use of more quality of life and functional health outcomes-based measures, evaluators have sought to develop and implement the most effective methods for assessing health care quality and performance.

During the time of HOS development, there was an increased interest in measuring outcomes of health care. The use of outcome measures in quality improvement efforts stems, in part, from a desire to focus on the impact of care on patients [12]. Berwick (2002) asserts that the experience of patients should be the ultimate source of defining quality. Berwick views the purpose of the U.S. health care system as enhancing the functioning and health status of citizens by decreasing the burden resulting from disease, injury and disability [13]. Rogers (2003) notes that one of the motivations to pursue functional status assessment from the beginning was to try to inject awareness of outcomes into the medical system. There was an interest in moving the focus from "treating diseases" to "treating patients." [14]"

Traditional health outcome measures have included physiologic measures as well as mortality. More recently, a variety of tools to measure additional dimensions of health and well being of importance to individuals have been developed [15][16]. As described by Bierman and colleagues, "health status measures assess the net effect of one or all health problems and treatments on multiple domains of health" [15]. Those health status measures that are generic should consider function across a number of domains as well as be applicable to various health states [15].

CMS activities

CMS like other large purchasers wanted to establish a manner in which to measure the quality that managed care organizations were providing their beneficiaries. According to the 1998 President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry Report, a key element of improving health care quality is the Nation's ability to measure the quality of care and provide easily understood, comparable information on the performance of the industry [17].

Many process and clinical care performance measures existed in the 1990s; however, noticeably lacking were appropriate measures of health outcomes. The Office of the Inspector General (1997), as well as Bailit (1997a, b) released reports encouraging CMS to adopt an outcomes-based performance assessment model that emphasizes the use of outcome-oriented performance data [18-20]. It was felt that an emphasis on the use of outcomes-oriented performance data would be consistent with the goals of value-based purchasing [21]. Stevic commented, "In the health care industry, everyone was frustrated with measurement. We had been doing measurement for a long time....we were doing a lot of process measures and no one was satisfied that we had the right information....[22]" According to Jencks, "CMS needed to develop an appropriate health outcome measure because one did

not already exist and there was not likely to be one developed by someone other than CMS in the near term" [23].

In 1996, CMS decided to partner with NCQA to develop a functional health status assessment tool to be used as a health plan performance measure for Medicare beneficiaries. The Medicare HOS was created to provide health outcomes data as a performance measure of Medicare managed care plans. To justify the emphasis on Medicare enrollees in managed care, NCQA representatives indicated that "the focus has been on managed care because the accountability movement started with managed care. Managed care was promoting itself as an accountable entity that would lead to better care outcomes and the government wanted to show that managed care was valuable.... Also, people thought managed care would grow in Medicare" [9].

According to Kang, functional health status was selected as CMS's outcome measure of choice because it was of greatest interest to Medicare beneficiaries [24]. Paul stated that "the decision to use functional health status was the right one [25]. It reflects the agency's strategic objective of being patient-centered" [25]. Additionally, there was evidence that complex issues such as chronic illness, co-morbidity, and functional impairment are particular problems among the elderly and present distinct challenges to this population. It was believed that a functional status measure was an important outcome of care, due to the complexities involved in the health of older adults, and because of the growing concern about how managed care would affect these conditions and this population's subsequent functional status [15].

Haffer maintains that, "During the Clinton administration, the agency thought of itself as a beneficiary-centered, value-based purchaser of services, and tried to do things to measure the value we [CMS] were getting for the services we [CMS] were purchasing on behalf of the beneficiaries. These performance measures filled a need because we [CMS] could now look at what we [CMS] were spending and compare plans based on standardized, scientifically sound performance measures. [28]" Bierman et al. (2001) said that quality of care is a complex concept and measures such as the HOS examine an important dimension of quality of care for Medicare beneficiaries [15].

Although the planning and development of the HOS began in 1996, it was the 1997 Balanced Budget Act that gave the HOS a clear mandate. Among its requirements was the establishment of quality requirements for health plans enrolling Medicare and Medicaid beneficiaries. According to the legislation, performance measurement reporting requirements for Medicare managed care are authorized to promote quality improvement. Section

1851 (d) (4)(D)(iii) of Title XVIII of the Social Security Act (the Act) authorizes CMS to review the quality of care provided to people with Medicare. Section 1876 (I) of the Act sets several criteria for managed care contracts. These statutorily mandated provisions have been implemented in the regulations at CFR 417.470, *et seq.*, which reference 42 CFR 417.126(a), which states that each contracted managed care plan must have an effective procedure to develop, compile, evaluate, and report to CMS, to its enrollees, and to the general public, developments in the health status of its enrollees to the extent practical.

CMS established a technical expert panel (TEP) to guide the development, implementation and operations of the HOS [8]. The TEP recommended that the HOS become a component of Medicare HEDIS[®] and that the SF-36[®] be used as the foundation of the measure. The SF-36[®], a physical and mental health status measure, was used in the Medical Outcomes Study (MOS) [7] and has a history of use in estimating relative disease burden for numerous conditions [27]. The SF-36[®] has been used in both specific populations such as the elderly and disabled, as well as in the general population [10]. The tool has been used to determine the effectiveness of various treatments such as hip and knee replacement and heart valve surgery [28][29], as well as the burden of various illnesses such as cancer, diabetes, and HIV/AIDS on populations [27]. Commenting on the reason the SF-36[®] was chosen for the HOS, Ware [30] noted that the SF-36[®] was the most widely used health status measure at the time [of HOS development]...and was found to be reliable and valid for use with the elderly and other demographic groups. The SF-36[®] had good psychometric properties and had been peer-reviewed. Additionally, both a user's manual and normative SF-36[®] data were available.

Although the most widely used generic health status measure at the time of developing the HOS instrument, debate existed about its use with elderly individuals [31-33]. As discussed by McHorney (1996), there are "...practical and psychometric issues that can differentially affect the performance of generic health status tools in cross-sectional and longitudinal studies of elderly persons, including mode-of-administration effects, floor and ceiling effects, and score stability versus internal consistency" [16]. Two additional issues are relevant for longitudinal studies – selective mortality and proxy reports [16]. Beirman and colleagues (2001) raise similar concerns related to administration and survey response [15]. For example, while the SF-36[®] takes approximately ten minutes to complete, it likely takes longer for participants with less than a high school education [16], older participants [6] and participants with cognitive impairment [34]. However, the previously mentioned issues are not specific to the SF-36[®], and does not seem to rise to the level unacceptability

for use with a geriatric population [11][31][33]. These issues will be important to address in the broader HOS evaluation, discussed below.

The HOS program

CMS, responsible for leadership, oversight, coordination, and successful implementation of the national Medicare HOS Program (formerly the Health of Seniors Survey), formed partnerships with organizations that had skills and experience in the areas of health outcomes and performance measurement. The team of HOS partners and technical experts are described in Tables 1 and 2.

The instrument

The HOS is based on a longitudinal cohort research design, in which a baseline and 2-year follow-up surveys are administered to a sample of beneficiaries in each plan. The survey is primarily a mailed questionnaire that is sent to selected participants, with a series of reminder postcards and telephone interviews among non-respondents and incomplete survey respondents in efforts to increase the survey response rate⁴. The HOS survey instrument consists of three primary components: 1) the SF-36[®], 2) case-mix and risk-adjustment questions, and 3) demographic and other questions required by the 1997 Balanced Budget Act [9]. The SF-36[®], as previously noted, is a multipurpose short-form general health survey, which provides eight scale scores of physical and mental health attributes, as well as two summary measures of physical and mental health status, the Physical Component Summary (PCS) and Mental Component Summary (MCS), both of which are weighted combinations of all eight scale scores [35] (Table 3).

The responses to the SF-36[®] are scored as eight Likert scales, summarized using standard weights, and then normed using 1998 US general population data to produce the PCS and MCS scales (see both the SF-36[®] Health Survey Manual and Interpretation Guide and SF-36[®] Physical and Mental Health Summary Scales: A Manual for Users of Version 1 for details) [40][35]. Each beneficiary who remains in the health plan in which he or she was originally sampled is measured twice, at baseline and again at follow-up; thus, the beneficiary serves as his/her own control. All respondents who die during the two-year follow-up period also are included in the follow-up analysis. Because there are many differences among individual survey respondents based on age and initial health status, for example, the mortality results and PCS and MCS two-year change scores are risk-adjusted⁵. Thus, plan-to-plan comparisons of health outcomes are adjusted for differences in case-mix, using available data on characteristics such as chronic conditions, age, ethnicity, gender, and education, among others. Logistic regression models which incorporate techniques for missing data estimation

Table 1: HOS partners and their roles and responsibilities

HOS Partners	Role responsibilities
Health Assessment Lab (HAL) & QualityMetric (QM)	Under subcontract with NCQA, HAL and QM provided the following services. HAL and QM staff and consultants have collaborated in developing the HOS survey form, designing the HOS case-mix adjustment methodology, studying the psychometric properties of the HOS survey, and translating the HOS form into Spanish and Chinese.
Health Services Advisory Group (HSAG)	Under contract with CMS, HSAG performs HOS data cleaning and analysis, developing and disseminating data files and reports, educating data users and stakeholders on HOS findings and applications, and conducting applied research with HOS data to support CMS priorities.
Boston University/Health Outcomes Technologies Program (HOT)	Under subcontract with NCQA, Boston University compares health outcomes between Medicare managed care using HOS data and the Veteran's Health Administration using data from Veteran's versions of the SF-36® (Veterans SF-36) and SF-12® (Veterans SF-12) health surveys. The analyses includes psychometric comparisons of the SF-36® between the HOS and VA and comparisons of disease burden of patients seen in Medicare managed care and veterans seen in the VA system of care. The SF-12® is a registered trademark of the Medical Outcomes Trust.
National Committee for Quality Assurance (NCQA)	Under contract with CMS, NCQA implements the HEDIS® Medicare HOS, which includes managing the data collection and transmittal of the HOS, supporting the development and standardization of the HOS measure, annually certifying and evaluating HOS vendors, and conducting ongoing quality assurance of the survey process.
Research Triangle Institute (RTI) International	Under subcontract with NCQA, RTI International is involved in the sample selection for each round of the Medicare HOS, development, fielding and analysis of the HOS for use in special plans that target frail beneficiaries, the development of frailty adjusters for payment using HOS data, and the calibration of Medicare costs associated with HOS measures. RTI also piloted the HOS in the fee-for-service samples for comparisons to managed care.

(Source: [8])

Table 2: Technical expert panel interviewees their roles and responsibilities

TEP Interviewees	Role & Responsibilities
Steven Clauser, Ph.D.	Clauser is currently a Senior Scientist at the National Cancer Institute. He is interested in using HOS data to study the impact of cancer on health outcomes. From 1997–2001, Clauser was Director, of the Quality Measurement and Health Assessment Group (QM HAG), the organizational unit within which HOS was located. Current Director of the Medicare Health Outcomes Survey Program since 1997.
Samuel C. "Chris" Haffer, Ph.D.	
Stephen Jencks, MD, MPH	Current Director, of the Quality Improvement Group at CMS since 1998.
Jeffrey Kang, MD, MPH	Kang was Director, of the Office of Clinical Standards & Quality at CMS from 1998–2000. Kang was the principal champion within CMS leadership for developing a health outcomes measure for Medicare. He also served on NCQA's Committee for Performance Measurement, which played a key role in the development of the HOS instrument.
Lewis Kazis, ScD	Kazis is Director of the Veterans SF-36 Project for the Veterans Administration and Chief of Health Outcomes for the Center for Health Quality at the Veterans Administrative Medical Center in Bedford, Massachusetts. He has provided technical expertise in the development and refinement of the HOS instrument, as well as conducted comparative analyses using Veterans SF-36 and HOS data.
William Rogers, Ph.D.	Rogers is Senior Statistician at The Health Institute and has worked for nearly three decades to apply statistical methods to studies of health and health care delivery. He served as senior statistician for both the RAND Health Insurance Experiment and the Medical Outcomes Study. He collaborated in the development of the HOS survey, case mix adjustment methodology, and studies of the psychometric properties of the HOS.
Marcia Stevic, RN, Ph.D.	Stevic is a nationally recognized expert in health outcomes measurement and improvement, who was involved in the initial discussions at CMS/HCFA on designing an outcomes measure. She served as Director of Health Outcomes at the Health Services Advisory Group from 1995–1999 and previously worked in the Administrator's office at CMS (HCFA).
John E. Ware, Jr., Ph.D.	Ware is the Founder, President, CEO, and CSO of QualityMetric, Inc., and Executive Director of HAL. He served as Principal Investigator for the Medical Outcomes Study, which developed the SF-36® Survey. Ware collaborated in the development of the HOS instrument, case mix adjustment methodology, and studies of the psychometric properties of the HOS.
Barbara Paul, MD	Paul was Director of the Quality Measurement and Health Assessment Group at CMS from 2001–2003.
Catherine Gordon, RN, MBA	Gordon was Director of the Division of Health Promotion and Disease Prevention in QMHAG from 1997–2003. She conducted the initial research on state-of-the-art instruments available for measuring functional health status to inform the development of the HOS instrument.

(Source: [8])

Table 3: SF-36® scale measures

Scale Measures	Questions
Physical Component Summary (PCS)	Summary measure which included: PF, RP, BP, VT, SF, RE, MH, and GH.
Physical Functioning (PF)	Ten questions ask respondents to indicate the extent to which their health limits them in performing physical activities.
Role-Physical (RP)	Four questions assess whether respondents' physical health limits them in the kind of work or usual activities they perform.
Bodily Pain (BP)	Two questions determine frequency of pain and extent to which pain interferes with normal activities.
General Health (GH)	Five questions ask respondents to rate their current health status overall, their susceptibility to illness, and their expectations for health in the future.
Mental Component Summary (MCS)	Summary measure which included: VT, MH, RE, PF, RP, BP, GH, and SF.
Vitality (VT)	Four questions ask respondents to rate their well being by indicating how frequently they experience energy and fatigue.
Mental Health (MH)	Five questions ask respondents how frequently they experience feelings representing the 4 major mental health dimensions.
Role-Emotional (RE)	Three questions assess whether emotional problems have caused respondents to accomplish less in their work or other usual activities in terms of time and performance.
Social Functioning (SF)	Two questions ask respondents to indicate limitations in social functioning due to health.

(Source: [40])

are used for risk-adjustment; the change in two-year health status is determined as: better than expected, same as expected⁶, or worse than expected [10]. The *a priori* primary outcomes were "alive and PCS same or better than expected" and "MCS same or better than expected".

Program administration

The HOS survey is administered to a random sample of 1,000 Medicare beneficiaries from each M+CO at baseline⁷ [10]. Beneficiaries are deemed eligible if they were continuously enrolled for at least 6 months in the same plan and do not have End Stage Renal Disease (ESRD). The survey is administered at baseline, and again two years later; a new cohort is sampled each year [41].

Plans contract with an NCQA-certified vendor to conduct the survey once the sample has been selected and approved by CMS through its contractor, Research Triangle Institute (RTI) International, a subcontractor to NCQA.. Vendors receive HOS survey administration training annually from NCQA. Vendors then administer the surveys in accordance with the applicable NCQA HEDIS® protocol. Once the survey data have been collected, they are submitted to NCQA for consistency review. The data are then submitted to Health Services Advisory Group (HSAG) for cleaning, aggregation, and analysis. Following data cleaning, aggregation, and analysis, HSAG develops and disseminates data files and reports to CMS, Quality Improvement Organizations (QIOs) and the health plans⁸ [10].

From 1998-2003, six baseline surveys and four follow-up surveys have been conducted, with the seventh HOS round being fielded in 2004. CMS, working with its partners, performs the following tasks as part of the HOS program: 1) Supports the technical/scientific development of the HOS measure, 2) Certifies survey vendors, 3) Collects Health Plan Employer Data and Information Set(HEDIS®)⁹ HOS data, 4) Cleans, scores, and disseminates annual rounds of HOS data, public use files and reports to CMS, Quality Improvement Organizations (QIOs), Medicare+Choice Organizations (M+COs), and other stakeholders, 5) Trains M+COs and QIOs in the use of functional status measures and best practices for improving care, 6) Provides technical assistance to CMS, QIOs, M+COs and other data users, and 7) Conducts analyses using HOS data to support CMS and HHS priorities [10].

Current utilization of HOS

As stated previously, the goal of the HOS is to collect valid and reliable health status data in Medicare managed care for the purposes of quality improvement activities, public reporting, and competition based plan accountability and health outcomes improvement [10]. The overall HOS performance measurement results, by cohort are presented in Table 4.

The data suggest some general performance improvement over time, as the number of plans reporting better than expected scores increased, particularly for physical health. The number of plans with mental health scores worse

Table 4: Medicare HOS performance measurement results

COHORT	YEARS	TOTAL NUMBER OF REPORTING UNITS	MENTAL HEALTH BETTER THAN EXPECTED	MENTAL HEALTH WORSE THAN EXPECTED	PHYSICAL HEALTH BETTER THAN EXPECTED	PHYSICAL HEALTH WORSE THAN EXPECTED
Cohort I	1998–2000	188 plans	13 plans	15 plans	None	None
Cohort II	1999–2001	160 plans	8 plans	5 plans	9 plans	5 plans
Cohort III	2000–2002	146 plans	15 plans	4 plans	20 plans	1 plan

(Source: [8])

than expected also declined. However, the effect of plan attrition over time on plan performance of remaining plans is unclear. Additionally, the majority of plans show no change in performance over the two year period, suggesting that the SF-36® may not sufficiently discriminate differences in plan performance.

Because of the HOS, QIOs and health plans have data that they may use to identify opportunities to improve the quality of care provided to their Medicare populations. In addition, they are regularly provided information and education on intervention strategies that may lead to measurable improvements in health care quality.

HOS data are also used as part of CMS's Health Plan Management System (HPMS), a system of process and outcomes health plan performance measures. These measures are composite scores derived from HEDIS®, Consumer Assessment of Health Plans Study (CAHPS®),¹⁰ HOS and disenrollment data, and are used by CMS to rank plans [36]. To develop a plan composite score, the percentile ranks for each reported HEDIS®, HOS, CAHPS® and disenrollment indicator are averaged. Those plans deviating substantially from the mean are considered either high or low overall performers based on the national comparison group. By comparing their composite scores against those of others on individual indicators, health care organizations are able to better assess how they compare with a national sample of their peers. The formation of this scale may represent an interim step in the development of a score card that could be used by CMS, managed care plans, and others to assess health plan performance.

HOS data may facilitate identification of beneficiaries at risk of declining physical and mental functioning. For example, Bierman and Clancy (2001) identified chronic conditions that lead to poor physical functioning and mental functioning among elderly women in Medicare managed care plans using HOS data [37]. These condi-

tions include, for example, arthritis, coronary artery disease, diabetes, and reported feelings of depression or sadness [37]. Using HOS data, they examined the extent to which women of lower socioeconomic status and/or racial/ethnic minorities were disproportionately affected by these conditions. They suggest that HOS data can assist in addressing these disparities.

Further, the HOS has provided CMS the ability to use health outcomes data for payment adjustments. CMS is now using the ADL data from the HOS to calculate a frailty adjustor to set payment for Social Health Maintenance Organizations. A variant of the HOS, the Program of All-inclusive Care for the Elderly (PACE) Health Survey, is being used to calculate a frailty adjustor for PACE plans and for demonstrations that target frail Medicare beneficiaries [38].

HOS data have also been used in research. To date, eleven research reports have been made available on the Medicare HOS website, covering topics such as how performance measurement results are calculated, and the health status of younger individuals with disabilities enrolled in M+C plans. These reports are available at <http://www.cms.hhs.gov/surveys/hos/hosresearch.asp>. The HOS website also includes a list of publications appearing in scientific journals.

Researchers have used HOS data to examine the functional status of chronically ill Medicare managed care enrollees to assess the need for disease management programs. A study also reviewed the disease management demonstration projects sponsored by CMS, and discussed how such interventions may help enhance the functional status of chronically ill Medicare beneficiaries over time. Through exploring the change in SF-36® scores over time, it has been found that the presence of chronic disease has a negative impact on both physical and mental health of enrollees over a two year period [26]. Preventing the onset of disease is the best manner in which to maintain opti-

mal health. However, once a disease has surfaced, there must be interventions in place to manage the disease. Results from the HOS data indicate that opportunities exist to enhance health outcomes in this population [15]. Efforts by CMS, such as the incorporation of guidelines into HOS documents encouraging the use of evidence-based interventions to prevent and manage chronic illness, convey CMS's goal of helping plans use HOS data to improve the health and functional status of enrollees [39].

The HOS has also been used as a vehicle to explore emerging and/or geriatric quality care related health issues and concerns. The HOS instruments have included questions concerning health services utilization, retirement community living, smoking frequency and cessation, healthy days, management of urinary incontinence, among others [10]. The healthy days questions from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS) were added to allow a link between HOS and BRFSS results, facilitating comparison across federal initiatives. The management of urinary incontinence questions were added in 2003 as a new HEDIS® measure [10].

Medicare Prescription Drug, Improvement, and Modernization Act of 2003

Public Law 108-173, The Medicare Prescription Drug, Improvement, and Modernization Act of 2003, provides HOS a clear mandate and focus. Specifically, Section 722 specifies requirements for CMS and Medicare Advantage (MA) organizations that must be undertaken to pursue quality health care for Medicare beneficiaries. Section 722 requires that each MA organization comply with the following:

1. Have an ongoing quality improvement program for the purpose of improving the care provided to enrollees in each MA plan offered by such organizations.
2. Have a chronic care improvement program, which consist of having a method of monitoring and identifying enrollees with multiple or sufficiently severe chronic conditions that meet established criteria.
3. Provide for collection, analysis, and reporting of measures of health outcomes and other indices of quality [42].

It also requires CMS to establish appropriate regulatory requirements for the following:

1. The collection, analysis, and reporting of data that permits the measurement of health outcomes and other indices of quality for MA organizations; and,

2. Dictates that no new quality, outcomes, and beneficiary satisfaction data to facilitate consumer choice and program administration shall be collected that were not collected by CMS as of November 1, 2003. However, CMS may only change the types of data that are required to be submitted by MA(s) after submitting to Congress a report on the reasons for such changes that was prepared in consultation with MA organizations and private accrediting bodies [42].

The HOS is now the only approved patient-based health outcomes measure for MA quality improvement and performance monitoring. In addition, HOS provides MA organizations data that they can use as a means of identifying and monitoring enrollees with chronic conditions as part of their chronic care quality improvement programs. Using HOS data in this manner however, may be limited to some extent by the underlying sampling strategy, which was designed as a simple random sample with each MA organization as the unit of analysis. Given the restriction imposed by the new legislation concerning the development of new measures, HOS will likely be CMS's primary health outcomes measure of MA plans for the foreseeable future.

Conclusion

Articles and studies published to date suggest that CMS's leadership and innovation with respect to the development of the HOS represented an important initial step toward the development of one major component of an information infrastructure needed to monitor and improve the quality of health care. Now fully developed, HOS's data and administration are under study. Interviews with HOS partners and stakeholders have revealed that the majority feel that the HOS provides a rich and unique set of valid, reliable, and actionable data. However, interviewees have offered some additional recommendations to improve the HOS, which include: 1) tracking the health status of plan disenrollees, and 2) creating greater incentives for plans and QIOs to use the HOS data.

CMS values programs and measurement tools that facilitate improvements in health care for its beneficiaries. The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 mandate the measurement of health outcomes and restrict the development of new measures. Consequently, HOS is CMS's primary vehicle to collect outcomes data, particularly patient-based functional health status measures. The evaluation of the efficacy of the HOS program will provide CMS with essential information to improve the HOS and to determine the best way for HOS to effectively meet this new legislative mandate.

Endnote

1. SF-36® is registered trademark of the Medical Outcomes Trust.
2. HEDIS® is registered trademark of the National Committee for Quality Assurance.
3. ADL assessments focus on an individual's ability to perform various basic functions, such as bathing, dressing, eating, and walking.
4. The HEDIS® Volume 6 Specifications for the Medicare HOS should be consulted for detailed discussions of the HOS instrument, sampling and survey administration protocols [10].
5. The HEDIS® Volume 6 Specifications for the Medicare HOS should be consulted for a detailed discussion of the HOS case-mix and risk-adjustment protocol [10].
6. Expected outcomes were calculated using a series of eight different death, three PCS and three MCS case-mix models. For complete details refer to the Performance Measurement Report, Cohort III (2000-2002) <http://www.cms.hhs.gov/surveys/hos/hosresearch.asp>.
7. In plans with fewer than 1,000 beneficiaries all beneficiaries are included in the sample. For a more detailed discussion of the HOS sampling protocol, refer to the HEDIS® Volume 6 Specifications for the Medicare HOS [10].
8. Baseline beneficiary level data files are only made available to health plans after each 2-year cohort is completed <http://www.cms.hhs.gov/surveys/hos/hosreports.asp>.
9. HEDIS® is registered trademark of the National Committee for Quality Assurance.
10. CAHPS® is a registered trademark of the Agency for Healthcare Research and Quality.

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