

Management of Urinary Incontinence in Medicare Managed Care Beneficiaries

Results From the 2004 Medicare Health Outcomes Survey

Russell E. Mardon, PhD; Shaheen Halim, PhD; L. Gregory Pawlson, MD; Samuel C. Haffer, PhD

Background: Despite the high prevalence of urinary incontinence (UI) among older persons and the existence of effective treatments, UI remains underreported by patients and underdiagnosed by clinicians. We measured the occurrence of UI problems in Medicare managed care beneficiaries, frequency of physician-patient communication regarding UI, and frequency of UI treatment.

Methods: We used cross-sectional data from the 2004 Medicare Health Outcomes Survey, which measured self-reported UI (accidental leakage of urine) and UI problems in the past 6 months, 36-Item Short-Form Health Survey health measures, discussions of UI with a health care provider, and receipt of UI treatment.

Results: The overall incidence of UI within the past 6 months was 37.3%, consistent with previous estimates. Problems with UI were strongly associated with poorer self-reported health. Mean 36-Item Short-Form Health

Survey physical and mental health scores were lower by more than 5 points (on a 100-point scale, $P < .001$) for respondents with major UI problems when controlling for age, sex, race, Hispanic ethnicity, and major comorbidities. These differences were among the largest of any condition measured. Only 55.5% of those with self-reported UI problems reported discussing these problems during their recent visit to a physician or other health care provider. The rate of patient-reported UI treatment was 56.5% and was lower ($P < .001$) for older individuals (eg, 46.3% for those aged 90-94 years) or those with poor self-reported health status (50.5%).

Conclusions: Among older persons, UI is common, underdiagnosed, and associated with substantial functional impairment. There appears to be considerable opportunity to mitigate the effects of UI on health and quality of life among community-dwelling older persons.

Arch Intern Med. 2006;166:1128-1133

Author Affiliations: National Committee for Quality Assurance, Washington, DC (Drs Mardon, Halim, and Pawlson), and Centers for Medicare and Medicaid Services, Baltimore, Md (Dr Haffer). Dr Mardon is now with Westat, Rockville, Md.

PUBLISHED ESTIMATES OF THE prevalence of urinary incontinence (UI) for community-dwelling older persons range from 15% to 50%, depending on the definition, sampling methods, response rate, and interview method.¹ Estimates from the National Health and Nutrition Examinations Survey indicate that more than one third of women and about half as many men older than 65 years reported bladder control problems in the past 12 months.² Of these, more than half reported problems at least a few times per week. Estimates of the total economic costs of UI range from \$12 billion to \$16 billion annually in the United States, comparable to the total cost of osteoporosis or arthritis.^{3,4} Studies have shown links between UI and depression,⁵ reported declines in quality of life,⁶ and limitations on the ability to socialize.⁷

Effective treatments for UI include behavioral therapies (bladder training, pel-

vic muscle-strengthening techniques such as Kegel exercises, biofeedback, vaginal weight training, and pelvic floor electrical stimulation), pharmacologic therapies (anticholinergic agents such as oxybutynin chloride and tricyclic antidepressants), and surgery.⁸⁻¹⁰ Despite its frequency and disease burden and the existence of effective treatments, a recent scientific review¹¹ showed that UI appears to be significantly underreported by patients and underdiagnosed by clinicians, resulting in considerable unmet need for continence treatment. Furthermore, the single greatest influence on the use of services for continence problems was being asked about UI problems by a health care professional.¹²

The purpose of our research was to examine the incidence of UI problems in the Medicare managed care population, the frequency of physician-patient communication regarding UI, and the frequency of UI treatment.

Table 1. Self-reported UI Incidence and Treatment Rates by Demographic Subgroup, 2004 HOS*

Demographic Characteristic (No. of Patients)	Report of UI Within Past 6 mo, %	Small UI Problem, %	Big UI Problem, %	Talked to Physician About UI Problem, %	Received UI Treatment, %
Total (145 765)	37.3	58.8	17.3	55.5	56.5
Sex					
Female (86 708)	43.6†	58.0	19.2†	53.0†	58.0‡
Male§ (58 470)	27.9	57.5	13.9	61.8	53.6
Age, y					
65-69§ (27 742)	31.9	57.4	13.6	51.0	60.0
70-74 (42 303)	34.0‡	58.9	14.7	55.1‡	58.9
75-79 (35 572)	37.9†	57.1	18.2†	56.9†	58.1
80-84 (24 326)	41.1†	59.0	19.0†	56.4‡	54.7‡
85-89 (11 438)	45.6†	57.5	22.6†	56.8‡	50.5†
90-94 (3658)	49.3†	52.1	27.0†	59.3‡	46.3†
≥95 (726)	54.3†	47.0	37.5†	55.8	46.0
Health compared with peers					
Excellent§ (17 573)	25.6	52.7	7.4	53.2	61.6
Very good (41 894)	31.9†	57.4‡	9.9‡	53.3	60.2
Good (49 795)	38.1†	60.3†	15.0†	53.1	58.2
Fair (28 947)	47.0†	59.7†	25.5†	58.3‡	52.7‡
Poor (6800)	56.1†	48.1	42.1†	65.2†	50.5†
Race/ethnicity					
Hispanic (8343)	30.6†	59.8	24.7†	58.9	51.3
Non-Hispanic§ (133 860)	37.9	57.7	17.0	55.4	56.9
American Indian (739)	38.7	52.9	30.4‡	58.7	59.1
Asian (3047)	31.6†	54.3	14.5	53.6	56.4
African American (10 775)	30.3†	57.7	20.1	55.1	50.6‡
White§ (125 154)	38.3	58.0	17.1	55.3	57.0
Other (3863)	31.2†	58.4	23.1‡	61.3	51.8

Abbreviations: HOS, Medicare Health Outcomes Survey; UI, urinary incontinence.

*Data regarding a small or big UI problem pertain only to those who reported recent UI. Those who talked to a physician about their UI problem had also reported a small or big UI problem. Those who received UI treatment had also talked to a physician about their UI problem. Total numbers vary owing to missing data.

† $P < .001$ compared with the reference category.

‡ $P < .01$ compared with the reference category.

§Indicates reference category.

METHODS

To address these objectives, the National Committee for Quality Assurance, with the support of the Centers for Medicare and Medicaid Services, developed and validated through cognitive testing a set of survey-based performance measures regarding the management of UI in older adults. Four UI questions were included in the 2004 administration of the Medicare Health Outcomes Survey (HOS) (available from the authors on request). The UI questions allowed respondents to be classified into the following 4 mutually exclusive categories: those not experiencing UI in the past 6 months and those describing their recent (within the past 6 months) UI experience as “not a problem,” “a small problem,” or “a big problem.” Respondents who reported a big or small UI problem were asked whether they had talked with a physician or other health care provider about the problem. Those who answered in the affirmative were asked whether they had received any UI treatments. These 2 questions were used to compute the percentages of respondents who had talked to a physician and who had received UI treatment (**Table 1**).

The Centers for Medicare and Medicaid Services requires the annual administration of the HOS to a random sample of 1000 persons drawn from the membership of each Medicare Advantage health care plan.^{13,14} Respondents to the baseline survey undergo another survey 2 years later. This analysis drew from a data set of 101 485 baseline surveys completed in 2004,

representing a baseline response rate of 67%, and 58 658 follow-up surveys completed in 2004, representing a follow-up response rate of 82%. The validity and reliability of the HOS are high, and there is no meaningful nonresponse bias, as has been reported elsewhere.¹⁵⁻¹⁷ For this analysis, responses from institutionalized individuals and those younger than 65 years were excluded. The survey data were cleaned for skip pattern violations to eliminate inappropriate responses, eg, responses about UI treatment from individuals who indicated no current UI problem. The questionnaire included the 36-Item Short-Form Health Survey (SF-36), which yields an 8-scale profile of scores and physical and mental health summary measures¹⁸ as displayed in **Table 2**. The SF-36 scale scores we report are normed so that the US population mean is 50 and the standard deviation is 10; higher scores reflect better health and functioning. The SF-36 scores were calculated using the half-scale imputation method to estimate missing data for key items.¹⁹ The data were weighted to take into account the stratification of the sample by health plan and remove any bias due to plan size. The HOS also included items on chronic disease presence and member demographics.

The multiple regression models used to generate the results in **Table 3** had the mental component summary (MCS) or physical component summary (PCS) score as the dependent variable and independent 0 or 1 indicator variables for each of the chronic conditions listed. The reliability of these self-reported conditions on the HOS is good relative to the medi-

INCIDENCE AND TREATMENT OF UI BY DEMOGRAPHIC CHARACTERISTIC

Table 2. Mean SF-36 Scale and Summary Scores by UI Status, 2004 HOS*

SF-36 Component	Respondents With Self-reported UI			
	No UI† (n = 91 358)	Not a Problem (n = 12 387)	Small Problem (n = 31 974)	Big Problem (n = 9424)
Physical functioning scale	42.5	42.1	37.1‡	29.8‡
Role-physical scale	45.4	44.3‡	40.0‡	34.7‡
Bodily pain scale	48.0	47.0‡	43.1‡	38.2‡
General health scale	47.7	47.9	44.0‡	38.3‡
Vitality scale	51.3	50.0‡	46.3‡	40.6‡
Social functioning scale	49.3	49.6	45.0‡	37.3‡
Role-emotional scale	48.7	48.7	44.8‡†	39.8‡
Mental health scale	52.1	52.2	48.8‡	43.8‡
PCS	44.0	43.1‡	38.6‡	32.6‡
MCS	53.1	53.3	50.0‡	44.9‡

Abbreviations: HOS, Medicare Health Outcomes Survey; MCS, mental component summary; PCS, physical component summary; SF-36, 36-Item Short-Form Health Survey; UI, urinary incontinence.

*Total numbers vary owing to missing data.

†Indicates reference category.

‡ $P < .001$ compared with the reference category.

cal record.²⁰ The UI problems were incorporated into the models in the following 2 ways: once as a 0 or 1 variable indicating a small or big UI problem, and once as a 0 or 1 variable indicating a big UI problem only. Each model was run separately with these 2 UI variables. In all of the models, age, sex, race, and Hispanic status were included as independent variables.

This research was reviewed by Chesapeake Research Review, Inc, Columbia, Md, and granted an exemption because it was an analysis of existing de-identified data.

RESULTS

DATA COMPLETENESS AND MODEL FIT

The analytic data set included 145 765 questionnaires for noninstitutionalized respondents, 65 years or older, who answered the UI incidence question. Most of the unused completed surveys were for respondents younger than 65 years. Approximately 1500 respondents to the UI incidence question failed to respond to 1 or more of the appropriate follow-up questions and were excluded from analyses relying on those questions. No variable used in the analysis had more than 5% missing values, and most had less than 2%. A maximum of 16% of the records was excluded from any regression model owing to missing values. The regression models underlying the results had R^2 values of 0.10 for the MCS models and 0.35 for the PCS models. Although much of the variation in MCS and PCS is unexplained by the factors in the model, the parameter estimates of interest were internally consistent across SF-36 subscales and stable over time based on analysis of field-test data from the prior year.

The overall incidence of self-reported UI in the past 6 months in the Medicare managed care population older than 65 years was 37.3% (Table 1). Women were more likely to report UI than were men (43.6% vs 27.9%; $P < .001$), and the frequency increased with age to the point that approximately half of those older than 90 years reported UI in the past 6 months. Incidence of UI was inversely associated with self-reported health compared with peers, ie, 25.6% for those in excellent health vs 56.1% for those in poor health ($P < .001$). There was moderate variability in UI frequency by race and ethnicity, with Hispanic (30.6%), African American (30.3%), and Asian (31.6%) respondents being less likely to report UI than non-Hispanic (37.9%) or white (38.3%) respondents ($P < .001$). Among those who reported UI, 58.8% characterized it as a small problem and 17.3% described it as a big problem (Table 1). The percentage with small UI problems was relatively consistent across demographic and health subgroups. However, the percentage with big UI problems increased with age (27.0% for those aged 90-94 years vs 13.6% for those aged 65-69 years), female sex (19.2% for women vs 13.9% for men), and poorer health status (42.1% for those with poor health status vs 7.4% for those with excellent health status) ($P < .001$). Hispanic (24.7%) and American Indian (30.4%) respondents were more likely to report big UI problems than were non-Hispanic (17.0%) or white (17.1%) respondents ($P < .001$ and $P < .01$, respectively).

Table 1 also shows the percentage of those with self-reported big or small UI problems in the past 6 months who saw a physician or health care provider during this period and who reported talking with the provider about the problem. The result was 55.5%, with men more likely to have talked about their UI problem than women (61.8% vs 53.0%; $P < .001$). There were no significant differences in UI discussion rates by race or Hispanic ethnicity. Finally, Table 1 shows the percentage of respondents who discussed their recent UI problem with a physician or health care provider in the past 6 months and who also received treatment for the problem. The overall percentage was 56.5%, with women reporting higher rates of treatment than men (58.0% vs 53.6%; $P < .01$). The treatment rate was inversely associated with age (46.3% for those aged 90-94 years vs 60.0% for those aged 65-69 years) and health compared with peers (50.5% for those with poor health status vs 61.6% for those with excellent health status). African American respondents had the lowest treatment rate of any racial or ethnic group at 50.6% ($P < .01$ compared with white respondents).

UI AND SELF-REPORTED HEALTH

Urinary incontinence problems were strongly associated with lower levels of self-reported physical and mental health. Table 2 indicates that mean SF-36 scale and summary scores for individuals with no recent UI were similar to those for individuals with recent (within the past 6 months) UI experiences who did not perceive UI to be a problem, although several of these differences are

Table 3. Change in PCS and MCS Scores Associated With Major Chronic Conditions, 2004 HOS

Independent Variable	Dependent Variable*			
	PCS, Big UI Problem	PCS, Small or Big UI Problem	MCS, Big UI Problem	MCS, Small or Big UI Problem
Urinary incontinence as small or big problem		-3.1†		-2.8†
Urinary incontinence as big problem	-5.1†		-5.0†	
Hypertension	-1.4†	-1.4	-0.0	-0.0
Angina or coronary artery disease	-1.6†	-1.5†	-0.7†	-0.7†
Congestive heart failure	-4.0†	-4.0†	-2.1†	-2.2†
Myocardial infarction history	-0.8†	-0.8†	-0.3	-0.4
Other heart condition (eg, valve condition)	-1.6†	-1.5†	-0.5†	-0.5†
Stroke history	-3.6†	-3.7†	-2.7†	-2.8†
Emphysema, asthma, chronic obstructive pulmonary disease	-4.9†	-4.8†	-2.0†	-2.0†
Crohn disease, ulcerative colitis, inflammatory bowel disease	-1.7†	-1.7†	-3.4†	-3.5†
Arthritis of hip or knee	-5.7†	-5.5†	-0.4‡	-0.3
Arthritis of hand or wrist	-2.3†	-2.2†	-1.5†	-1.5†
Sciatica	-3.4†	-3.3†	-1.9†	-1.8†
Diabetes	-2.9†	-2.8†	-1.1†	-1.0†
Any cancer except skin cancer	-1.5†	-1.4†	-0.6†	-0.5‡

Abbreviations: HOS, Medicare Health Outcomes Survey; MCS, mental component summary of the 36-Item Short-Form Health Survey (SF-36); PCS, physical component summary of the SF-36; UI, urinary incontinence.

*Each column shows the results of a different multiple regression model. All models controlled for age, sex, race, and Hispanic ethnicity, as well as the presence of multiple chronic conditions. Urinary incontinence problems are incorporated as a 0 or 1 variable.

† $P < .001$ compared with respondents without the condition.

‡ $P < .01$ compared with respondents without the condition.

statistically significant owing to the large number of observations. All of the mean scale scores were lower by 4 to 5 points for those reporting small UI problems relative to those with no UI or no UI problems. For example, the mean PCS score for those with no UI was 44.0 compared with 38.6 for those with small UI problems ($P < .001$). Scores were lower by an additional 5 to 8 points for respondents who reported big UI problems (eg, the mean PCS score was 32.6 for this group [$P < .001$]). The scales exhibiting the largest UI association were physical functioning and social functioning.

Urinary incontinence in older persons is often associated with other chronic conditions. In the HOS data, respondents with 1 or more self-reported conditions such as hypertension, angina, congestive heart failure, history of acute myocardial infarction, stroke, pulmonary diseases, gastrointestinal tract problems, arthritis, sciatica, diabetes, or cancer were nearly twice as likely to report UI in the past 6 months relative to respondents reporting none of these conditions (39.0% compared with 21.8%; $P < .001$). To separate the health impact of UI from the influence of comorbid conditions, we performed a multiple regression analysis controlling for age, sex, race, Hispanic ethnicity, and the presence of major comorbidities. Table 3 displays the regression coefficients, which can be interpreted as the estimated change in PCS or MCS score associated with each condition, independent of the other conditions. Urinary incontinence was incorporated into the models in the following 2 ways: as a small or big problem, or as a big problem only. The results from each model are reported separately.

The first column of data in Table 3 shows the results for the model analyzing the relationship between a big UI problem and PCS. The coefficient for the big UI variable

was -5.1 ($P < .001$), indicating a mean reduction of 5.1 points on the PCS score for individuals with big UI problems when controlling for age, sex, race, Hispanic ethnicity, and all of the other conditions in the model. This was among the largest association of any condition in the model, larger than congestive heart failure, stroke history, and major respiratory and gastrointestinal tract illnesses, and was exceeded only by arthritis of the hip or knee. The results were similar when the big or small UI problem variable was used, although the estimated coefficient for the UI variable was smaller (-3.1; $P < .001$) (Table 3). For the MCS models, the estimated coefficients of the UI variables were similar, but the coefficients of most of the other conditions were smaller (ie, the coefficients were less negative), making the relative association of UI with the MCS scores even higher.

COMMENT

The Medicare HOS provides useful estimates of UI incidence and its relationship to health, treatment, and associated factors among community-dwelling residents 65 years or older. Our 37% overall estimate of UI within the past 6 months is slightly higher than 1999-2000 National Health and Nutrition Examination Survey data but within the range of previous estimates.² Although one fourth of those with recent UI reported that it was not a problem, 58.8% characterized it as a small problem and 17.3% described it as a big problem. Urinary incontinence problems were associated with significant differences in health as measured by the SF-36. These differences were statistically significant, larger with more severe UI problems, and evident across every SF-36 domain.

The multiple regression results presented in Table 3 confirm the significant association of UI with physical and mental health, independent of demographic factors or major comorbidities. The UI association was among the largest of any of the conditions measured, comparable to congestive heart failure, a history of stroke, major respiratory conditions (eg, emphysema, asthma, or chronic obstructive pulmonary disease), or major gastrointestinal tract conditions (eg, Crohn disease, ulcerative colitis, or inflammatory bowel disease). Such large associations represent significant and meaningful limitations in a wide range of physical and social activities, along with a serious impact on emotional well-being.

Recent research on health-related quality of life provides additional insight into the meaning of PCS and MCS changes of this magnitude. Arday et al²¹ documented that Medicare managed care beneficiaries who had recently quit smoking (ie, within the past 12 months) (n=1951) reported a mean PCS score 5.1 points and a mean MCS score 3.7 points lower than those who had never smoked (n=63 039). Baker et al²² found that the mean PCS score reported by Medicare managed care beneficiaries receiving treatment for cancer ranged from 3.9 to 10.2 points lower than those reporting no cancer history, depending on the type of cancer. Similarly, active cancer treatment reduced the mean MCS score by 1.7 to 5.6 points. Cooper and Kohlmann²³ found that Medicare managed care beneficiaries reporting any lower back pain in the past 4 weeks had a mean PCS score 13.7 points lower than those reporting no recent back pain. The mean difference in MCS scores associated with lower back pain was 5.9. In addition, beneficiaries who had been diagnosed as having arthritis of the hip or knee had a mean PCS score 9.3 points lower and a mean MCS score 1.8 points lower than those without the diagnosis. A change in mean MCS as large as that found in those for whom UI is a big problem is of the same magnitude as reported in those with clinical depression.²⁴

The association between UI incidence and UI problems was consistent across subgroups defined by age, sex, and health compared with peers. In each case, the subgroup with the highest UI incidence was also more likely to report that UI was a big problem. This is consistent with previous literature¹¹ indicating that women, older persons, and those in poorer health are more likely to have a physiological basis for UI.

There are clearly gaps in practitioner-patient communication about UI because only 56% of those with self-reported UI problems indicated that these issues were discussed during their recent visit to a physician or health care provider. This is in agreement with other studies that have found that many older adults with UI consider it to be a normal part of aging, do not view it as a medical problem, believe that they are able to cope with it, and thus do not raise the subject during health care visits.²⁵ Furthermore, our data indicate that health care professionals often do not ask about UI problems, even in high-risk patients. This is unfortunate because effective treatments exist¹⁰ and questioning from a health care practitioner is strongly associated with the use of UI treatments.¹² Moreover, it appears that patients who are older and in poorer health actually receive less aggressive intervention (Table 1). Although

the survey did not ask about perceived effectiveness of treatment, these findings suggest that there are considerable opportunities to improve the detection and treatment of UI and thereby enhance health and quality of life for older persons.

These findings are limited by the fact that the data are cross-sectional and self-reported for the Medicare managed care population only. However, the number of survey respondents is large, and the survey instrument has been validated. Furthermore, the similarity of our results to those of previous studies in this area suggests that the experiences of the managed care population are most likely similar to the experiences of the Medicare population as a whole, particularly for those older than 65 years who are nondisabled beneficiaries, the focus of this study. Another limitation is the lack of information on the use of medications that could contribute to UI, eg, diuretics. It would be interesting to know whether individuals using such medications were more likely to receive UI counseling or treatment. The common use of such medications in the treatment of chronic conditions underscores the importance of performance measurement in this area.

CONCLUSIONS

This study is, to our knowledge, among the largest to examine the incidence, health impact, and treatment of UI. It documents the lower quality of life associated with UI and the need for increased health care provider-patient dialogue and treatment. The Centers for Medicare and Medicaid Services has focused attention on the need for improvement in this area by adding the UI survey items to the HOS. This provides a mechanism for annual data feedback to Medicare Quality Improvement Organizations and to health care plans and providers. The National Committee for Quality Assurance has documented increases in the use of evidence-based care in a wide variety of clinical areas after the introduction of standardized performance measurement and feedback.²⁶ Improvements in UI treatment will likely benefit seniors in Medicare fee-for-service plans too, despite the lack of direct UI performance measurement, resulting in substantial increases in health-related quality of life.

Accepted for Publication: January 10, 2006.

Correspondence: Russell E. Mardon, PhD, Westat, 1650 Research Blvd, Rockville, MD 20850 (russmardon@westat.com).

Author Contributions: Dr Mardon had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Financial Disclosure: None.

Funding/Support: This study was supported by contract HHSM-500-2004-000151 from the Centers for Medicare and Medicaid Services (CMS).

Disclaimer: The views expressed are those of the authors and do not necessarily reflect the views or policies of CMS or NCQA.

Acknowledgment: We thank the Urinary Incontinence Technical Subgroup of the National Committee for Quality Assurance (NCQA) Geriatric Measurement Advi-

sory Panel and Medicare Health Outcomes Survey (HOS) Technical Expert Panel for their contributions, and the staff at the CMS, the NCQA, and HOS partner organizations for their work in developing and implementing the urinary incontinence measurement questions.

REFERENCES

1. Thom D. Variation in estimates of urinary incontinence prevalence in the community: effects of differences in definition, population characteristics, and study type. *J Am Geriatr Soc.* 1998;46:473-480.
2. Nygaard I, Thom DH, Calhoun EA. Urinary incontinence in women. In: Litwin MS, Saigal CS, eds. *Urologic Diseases in America*. Washington, DC: US Dept of Health and Human Services, Public Health Service, National Institutes of Diabetes and Digestive and Kidney Diseases; 2004. NIH publication 04-5512:71-103.
3. Hu TW, Wagner TH, Bentkover JD, et al. Estimated economic costs of overactive bladder in the United States. *Urology.* 2003;61:1123-1128.
4. Wilson L, Brown JS, Shin GP, Lue KO, Subak LL. Annual direct cost of urinary incontinence. *Obstet Gynecol.* 2001;98:398-406.
5. Zorn BH, Montgomery H, Pieper K, Gray M, Steers WD. Urinary incontinence and depression. *J Urol.* 1999;162:82-84.
6. Abrams P, Kelleher CJ, Kerr LA, Rogers RG. Overactive bladder significantly affects quality of life. *Am J Manag Care.* 2000;6(suppl):S580-S590.
7. Fultz NH, Herzog AR. Self-reported social and emotional impact of urinary incontinence. *J Am Geriatr Soc.* 2001;49:892-899.
8. Urinary incontinence in adults. National Institutes of Health consensus statement, 1988. http://consensus.nih.gov/cons/071/071_statement.htm. Accessed February 3, 2005.
9. Hendrix SL, Cochrane BB, Nygaard IE, et al. Effects of estrogen with and without progestin on urinary incontinence. *JAMA.* 2005;293:935-948.
10. Holroyd-Leduc JM, Straus SE. Management of urinary incontinence in women: clinical applications. *JAMA.* 2004;291:996-999.
11. Holroyd-Leduc JM, Straus SE. Management of urinary incontinence in women: scientific review. *JAMA.* 2004;291:986-995.
12. Peters TJ, Horrocks S, Stoddart H, Somerset M. Factors associated with variations in older people's use of community-based continence services. *Health Soc Care Community.* 2004;12:53-62.
13. National Committee for Quality Assurance. *HEDIS 2003: Specifications for the Medicare Health Outcomes Survey*. Vol 6. Washington, DC: National Committee for Quality Assurance; 2003.
14. Cooper JK, Kohlmann T, Michael J, Haffer SC, Stevic M. Health outcomes: new quality measure for Medicare. *Int J Qual Health Care.* 2001;13:9-16.
15. Gandek B, Sinclair SJ, Kosinski M, Ware JE. Psychometric evaluation of the SF-36 Health Survey in Medicare managed care. *Health Care Financ Rev.* 2004;25:5-26.
16. McCall N, Bonito A, Trofimovitch L. Estimation and analysis of non-response bias in Medicare surveys. 2004. http://www.hosonline.org/surveys/hos/download/non-response%20bias%20report_8-11-04.pdf. Accessed November 1, 2005.
17. McCall N, Khatutsky G, Smith K, Pope GC. Estimation of non-response bias in the Medicare FFS HOS. *Health Care Financ Rev.* 2004;25:27-42.
18. Ware JE, Gandek B, Sinclair SJ, Kosinski M. *Understanding Health Outcomes: An SF-36 Primer for the Medicare Health Outcomes Survey*. Waltham, Mass: Health Assessment Lab and QualityMetric Inc; 2004.
19. Rogers WH, Gandek B, Sinclair SJ. Calculating Medicare Health Outcomes Survey performance measurement results, 2004. http://www.cms.hhs.gov/surveys/hos/download/HOS_Calculating_PM_Results.pdf. Accessed February 3, 2005.
20. Miller DR, Rogers WH, Spiro A, Kazis LE. Evaluation of disease status based on patient self-report in the Medicare Health Outcomes Survey. December 19, 2003. CMS technical report. http://www.hosonline.org/surveys/hos/download/HOS_Evaluation_Self-Report_Disease_Status.pdf. Accessed March 15, 2006.
21. Arday DR, Milton MH, Husten CG, et al. Smoking and functional status among Medicare managed care enrollees. *Am J Prev Med.* 2003;24:234-241.
22. Baker F, Haffer SC, Denniston M. Health-related quality of life of cancer and non-cancer patients in Medicare managed care. *Cancer.* 2003;97:674-681.
23. Cooper JK, Kohlmann T. Factors associated with health status of older Americans. *Age Ageing.* 2001;30:495-501.
24. QualityMetric, Inc. The SF-36 Health Survey: a summary of responsiveness to clinical interventions. 2000. <http://www.cms.hhs.gov/surveys/hos/hospublications.asp#methodology>. Accessed February 3, 2005.
25. Dugan E, Robers CP, Cohen SJ, et al. Why older community-dwelling adults do not discuss urinary incontinence with their primary care physicians. *J Am Geriatr Soc.* 2001;49:462-465.
26. National Committee for Quality Assurance. *The State of Health Care Quality 2004: Industry Trends and Analysis*. Washington, DC: National Committee for Quality Assurance; 2005.