

January 2012

# MEDICARE

## Use of Preventive Services Could Be Better Aligned with Clinical Recommendations



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## Why GAO Did This Study

Preventive care services have the potential to improve health outcomes and lower health care expenditures. This report examines (1) whether preventive service use by Medicare fee-for-service (FFS) beneficiaries aligns with recommendations from the U.S. Preventive Services Task Force and the Advisory Committee on Immunization Practices (ACIP), (2) use of the Welcome to Medicare (WTM) exam and its association with use of preventive services, (3) preventive service use in Medicare Advantage (MA) relative to FFS, and (4) service use among MA health maintenance organizations (HMO) and efforts by high-performing HMOs to encourage preventive care. To do this, GAO selected eight preventive services that had Task Force or ACIP guidelines for the general Medicare population. GAO analyzed the most recently available data from Medicare claims, a beneficiary survey, and MA plan ratings. GAO also interviewed representatives of selected HMOs.

## What GAO Recommends

Congress should consider requiring beneficiaries to share the cost of a service if the Task Force recommends against use of that particular service for those beneficiaries. The Administrator of CMS should provide coverage for Task Force recommended services, as she determines is appropriate considering cost-effectiveness and other criteria. CMS agreed that preventive service use could be improved, but stated that GAO likely undercounted use of some preventive services. The agency also pointed out that it has recently added coverage for several new preventive services.

View [GAO-12-81](#). For more information, contact James C. Cosgrove at (202) 512-7114 or [cosgrovej@gao.gov](mailto:cosgrovej@gao.gov).

## MEDICARE

### Use of Preventive Services Could Be Better Aligned with Clinical Recommendations

## What GAO Found

Use of some preventive services—cardiovascular disease screening and cervical cancer screening—by FFS beneficiaries generally aligned with clinical recommendations, but use of other cancer screenings for certain age groups, osteoporosis screening, and immunizations did not. In particular, among women aged 65 to 74, for whom breast cancer screening is recommended biannually by the Task Force, only two out of three received a mammogram in 2008 or 2009. Among beneficiaries aged 65 to 75, about one out of four received any of the Task Force recommended regimens for colorectal cancer screening from 2005 through 2009. Among men aged 75 or older, about two out of five received a Prostate-Specific Antigen test for prostate cancer—a test that required no cost sharing—from 2006 through 2009 even though the Task Force recommended against this service for that age group. Use of osteoporosis screening—for which Medicare coverage is limited—and influenza and pneumococcal immunizations was generally lower than recommended by the Task Force or ACIP. The Department of Health and Human Services has the authority to modify coverage of Medicare preventive services—such as osteoporosis screening—consistent with Task Force recommendations.

Fewer than 7 percent of FFS beneficiaries who became eligible for the WTM exam in 2008 received it. For FFS beneficiaries who became eligible in 2006 and received the exam, use rates for all of the selected preventive services GAO reviewed were higher than for beneficiaries who did not have the exam. Specifically, use of selected preventive services from 2006 through 2009 was greater by about 3 to 20 percentage points for women and about 4 to 17 percentage points for men.

Compared to beneficiaries in FFS, those in MA HMOs reported greater use of immunizations and cholesterol tests but not cancer screenings, holding demographic and geographic factors constant. There was no discernable difference in use rates between FFS beneficiaries and those in MA non-HMO plans. Overall, Medicare beneficiaries who did not receive certain preventive services commonly reported that they had limited information on prevention; had concerns about discomfort, side effects, or efficacy; or their doctor did not recommend the services.

HMO performance data from the Centers for Medicare & Medicaid Services' (CMS) Medicare Health Plan Compare ratings show that use varied substantially for the preventive services we examined. Representatives from higher-performing HMOs reported using tools such as clinical guidelines, performance monitoring and feedback, and financial incentives to encourage physicians to provide preventive services. HMO representatives also said they developed newsletters, phone messages, and websites to highlight the availability of preventive services and enhanced benefits to encourage enrollees' use of preventive care.

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## Abbreviations

AAA	Abdominal Aortic Aneurysm
ACIP	Advisory Committee on Immunization Practices
AHIP	America's Health Insurance Plans
AHRQ	Agency for Healthcare Research and Quality
AWV	Annual Wellness Visit
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare & Medicaid Services
EKG	electrocardiogram
ESRD	end-stage renal disease
FFS	fee-for-service
HCPCS	Healthcare Common Procedure Coding System
HEDIS	Healthcare Effectiveness Data and Information Set
HHS	Department of Health and Human Services
HIV	human immunodeficiency virus
HMO	health maintenance organization
HPSA	Health Professional Shortage Area
HRSA	Health Resources and Services Administration
ICD	International Classification of Diseases
IPPE	Initial Preventive Physical Examination
MA	Medicare Advantage
MCBS	Medicare Current Beneficiary Survey
MIPPA	Medicare Improvements for Patients and Providers Act of 2008
NCQA	National Committee on Quality Assurance
PFFS	Private Fee-for-Service
PPACA	Patient Protection and Affordable Care Act
PPO	Preferred Provider Organization
PSA	Prostate-Specific Antigen
Task Force	U.S. Preventive Services Task Force
VIS	Vaccine Information Statement
WTM exam	Welcome to Medicare exam

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Washington, DC 20548

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January 18, 2012

The Honorable Max Baucus  
Chairman  
Committee on Finance  
United States Senate

The Honorable Tom Harkin  
Chairman  
Committee on Health, Education, Labor and Pensions  
United States Senate

The Honorable Sheldon Whitehouse  
United States Senate

Over the past several years, preventive health care services have received increased attention for their potential to improve health outcomes and lower health care expenditures. Researchers have found that certain preventive services are effective in early diagnosis or reduced prevalence of diseases that contribute to the growth in Medicare spending. As of the end of 2011, Medicare covered 30 preventive services, including 3 types of immunizations, various screenings for a number of diseases, and several other types of preventive services under Part B.<sup>1</sup> To encourage beneficiary use, the Patient Protection and Affordable Care Act (PPACA) removed beneficiary cost-sharing requirements for many Medicare-covered preventive services.<sup>2</sup> Additionally, PPACA created an annual wellness visit benefit—which allows Medicare beneficiaries a yearly examination without cost sharing—in part to improve the identification of needed preventive services. Prior to this new benefit, the only coverage for a physical was the Welcome to Medicare exam, a one-time benefit for new beneficiaries.

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<sup>1</sup>Medicare Part B covers physician, outpatient hospital, home health care, and certain other services.

<sup>2</sup>Cost sharing can include coinsurance—a percentage of the cost—or a copayment—a fixed amount toward the cost. Although PPACA eliminated the deductible and coinsurance for certain preventive services, beneficiaries may still be required to pay coinsurance for the office visit during which the service takes place. Pub. L. No. 111-148, § 4103-04, 10406, 124 Stat. 119, 553, 975 (2010).

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These changes are important for the vast majority of the roughly 36 million beneficiaries covered by fee-for-service (FFS) or “traditional” Medicare, and the nearly 12 million beneficiaries enrolled in Medicare Advantage (MA) plans as of 2010.<sup>3,4</sup> Because MA organizations—which typically offer plans with a number of different benefit packages—bear a certain amount of financial risk and are assessed for quality, they may have an incentive to encourage preventive care use to better control expenditures and improve performance.<sup>5</sup> Given their organizational characteristics, health maintenance organizations (HMO) in particular may be able to employ strategies with both providers and beneficiaries to promote greater use of preventive services than is feasible in Medicare FFS.

Despite Medicare’s expanded coverage and the removal of financial barriers for certain preventive services, research suggests that use of some preventive services may not be optimal. Some researchers have raised concerns that the use of some preventives services is low—overall or for particular patient populations.<sup>6</sup> Other researchers have noted the overuse and misuse of certain preventive services.<sup>7</sup> To enhance appropriate provision of preventive services by primary care clinicians and health systems, the Department of Health and Human Services’

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<sup>3</sup>MA organizations, which sponsor MA plans, are private health insurers that contract with the Centers for Medicare & Medicaid Services (CMS) to provide health care to Medicare beneficiaries. MA organizations must provide all Medicare-covered services (except hospice care) and may sponsor multiple plans with different benefits, cost-sharing requirements, and premiums.

<sup>4</sup>Some FFS beneficiaries may be insulated from the reduction in cost sharing if they have supplemental insurance coverage, which pays expenses not covered by Medicare.

<sup>5</sup>A study of MA benefits found that most plans covered certain preventive services with no cost sharing. In 2009, the share of MA beneficiaries enrolled in plans that did not require cost sharing for eight preventive services ranged from 84 and 100 percent, depending on the service. See M. Gold and M.C. Hudson, *Medicare Advantage Benefit Design: What Does It Provide, What Doesn’t It Provide, and Should Standards Apply?* (prepared by Mathematica Policy Research, Inc. for AARP Public Policy Institute, March 2009).

<sup>6</sup>M.V. Maciosek et al., “Priorities Among Effective Clinical Preventive Services,” *American Journal of Preventive Medicine*, 31, no. 1 (2006): 52-61.

<sup>7</sup>D. Steinwachs et al., “National Institutes of Health State-of-the-Science Conference Statement: Enhancing Use and Quality of Colorectal Cancer Screening,” *Annals of Internal Medicine*, vol. 152, no. 10 (2010):663-667. C. Sima et al., “Cancer Screening Among Patients With Advanced Cancer,” *Journal of the American Medical Association*, vol. 304, no. 14 (2010): 1584-1591.

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(HHS) Agency for Healthcare Research and Quality (AHRQ) provides the U.S. Preventive Services Task Force—a group composed of independent, private-sector experts in prevention and evidence-based medicine—with research support. The Task Force reviews evidence from randomized control trials and other studies documenting the effectiveness of clinical preventive services. It then issues recommendations for providers and may include guidance on the sex and age groups most likely to benefit from the service, as well as the interval of the service. The Task Force does not make recommendations with regard to vaccines; rather, it defers to the Centers for Disease Control and Prevention’s (CDC) Advisory Committee on Immunization Practices (ACIP).<sup>8</sup> The Centers for Medicare & Medicaid Services (CMS)—the agency within HHS that administers the Medicare program—relies on recommendations by the Task Force when considering coverage of a new preventive service. However, research has shown that Medicare coverage does not always correspond with the specifications of Task Force recommendations.<sup>9</sup>

You asked us about a range of issues concerning use of preventive services, particularly in the Medicare program. This report examines (1) the extent to which use of preventive services by FFS beneficiaries aligns with Task Force or ACIP recommendations, (2) the extent to which FFS beneficiaries use the Welcome to Medicare exam and whether use of that service is associated with higher use of preventive care services, (3) how preventive service use in MA compares to use in FFS, and (4) the extent to which use varies among MA HMOs and which practices the better performing HMOs find effective in promoting use of preventive services.

To determine the extent to which preventive service use by FFS beneficiaries aligns with guidelines, we selected eight Medicare-covered preventive services that had related Task Force or ACIP usage recommendations for the general Medicare population. In making our selection, we excluded certain services for which the recommendations

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<sup>8</sup>ACIP is a committee of 15 experts selected by the Secretary of HHS that provides recommendations for vaccination administration, including a schedule of recommended vaccines for adults and children.

<sup>9</sup>L.I. Lesser et al., “Comparison Between US Preventive Services Task Force Recommendations and Medicare Coverage,” *Annals of Family Medicine*, 9, no. 1 (2011): 44-49.

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were primarily aimed at high-risk populations or populations with specific diagnoses. We analyzed a 5 percent sample of FFS claims from 2005 through 2009 to determine use rates based on service-specific age groups and intervals outlined in Task Force or ACIP recommendations.<sup>10</sup> We excluded claims for beneficiaries who were under the age of 65 or were not continuously enrolled in Medicare Part B. We also excluded beneficiaries who resided in institutions, were qualified for Medicare due to end-stage renal disease (ESRD), and were enrolled at any time in MA during the period of study. We recognize that guidelines may not apply to all beneficiaries due to individual circumstances, and that 100 percent use of recommended services is unrealistic. We considered Medicare FFS use to be in alignment with the Task Force and ACIP if at least three in four beneficiaries overall received a recommended service. We also considered use to be in alignment if no more than one in four beneficiaries overall received a service that the Task Force recommended against having.

To assess the use of the Welcome to Medicare exam, we analyzed a 5 percent sample of 2008 and 2009 FFS claims for this service by eligible beneficiaries. To examine the association, if any, between the Welcome to Medicare exam and use of preventive services, we compared 100 percent of claims for a selection of recommended preventive services from 2006 through 2009 for beneficiaries who became eligible for a Welcome to Medicare exam in 2006 and received it with those for beneficiaries who did not have that exam.

To compare preventive service use in MA to use in FFS Medicare, we analyzed beneficiary survey results because claims data for services provided to MA beneficiaries are not available from CMS. Using 2008 and 2009 Medicare Current Beneficiary Survey (MCBS) data and plan enrollment data supplied by CMS, we examined the effect enrollment in MA HMO and MA non-HMO organizations had on reported use compared with FFS beneficiaries' reported use. We analyzed these data using a logistic regression model that included the effects of contract type, age, dual-eligibility, education, race, income, marital status, health status, and

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<sup>10</sup>The Medicare 5 percent files contain claims and demographic information for 5 percent of the Medicare FFS population. Files are constructed such that results from this analysis are generalizable to the entire FFS Medicare population.

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geographic location.<sup>11</sup> This analysis allowed us to isolate the effect of beneficiaries' enrollment choice, holding other beneficiary characteristics constant.

To examine differences in utilization of preventive services across HMOs, we reviewed information on relative utilization for five services posted on CMS's Medicare Health Plan Compare website for 2011.<sup>12</sup> To learn about approaches for improving delivery of preventive services, we interviewed officials from six HMOs that ranked among the top performing for provision of selected preventive services and had enrollment of 37,000 or greater in January 2011.

We ensured the reliability of the Medicare claims data, MCBS data, and Plan Compare data used in this report by performing appropriate electronic data checks and by interviewing agency officials who were knowledgeable about the data. Analyzing claims data on preventive service use risks undercounting because some preventive services are available outside of Medicare (such as at community events), and would not be reflected in the claims data. Analyzing survey or self-reported data on preventive service use risks overcounting due to reasons such as interviewee recollection errors or inclination to give a socially desirable response. However, we found the data were sufficiently reliable for the purpose of our analyses. Appendix I contains a more complete description of our methodology.

We conducted this performance audit from September 2010 through January 2012, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We

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<sup>11</sup>The MCBS is a survey of a nationally representative sample of the Medicare population, including both aged and disabled beneficiaries. The survey data are released annually and the results are contained in two data files, Access to Care and Cost and Use. The Access to Care file contained responses related to preventive care.

<sup>12</sup>We analyzed Plan Compare data on colorectal cancer screening, influenza vaccination, mammography, osteoporosis screening, and pneumococcal vaccination. The Plan Compare database contained use rate information for cholesterol testing but it was based on a subset of beneficiaries with certain diseases. The database did not include information on cervical cancer screening or PSA tests.

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believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

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### Medicare Coverage of Preventive Services

When the Medicare program was established in 1965, it covered health care services for the diagnosis or treatment of illness or injury, but did not cover preventive services. Since 1980, Congress has expanded coverage of preventive services for the Medicare population several times. For instance, the Balanced Budget Act of 1997 added coverage of prostate and colorectal cancer screening, among other things. Later, the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 mandated coverage of a one-time Initial Preventive Physical Examination (IPPE)—also known as the Welcome to Medicare (WTM) exam—for new Part B enrollees. The WTM exam includes a review of medical history, blood pressure, vision, height, as well as weight, and planning for patients’ preventive service needs. The WTM exam was initially available to beneficiaries within the first 6 months of enrollment beginning in 2005, but the Medicare Improvements for Patients and Providers Act of 2008 (MIPPA) extended the period of eligibility to within the first 12 months of enrollment beginning in 2009. MIPPA also gave HHS authority to add coverage of new preventive services through its National Coverage Determination process when HHS determines services are reasonable and necessary for the prevention or early detection of an illness, recommended by the Task Force, and appropriate for beneficiaries. Medicare coverage and cost sharing for selected preventive services in 2009—the year relevant to several of the findings in this report—is shown in table 1.

**Table 1: Medicare Part B Coverage and Cost Sharing for Selected Preventive Services, 2009**

Selected preventive service	Medicare coverage	Beneficiary cost sharing <sup>a</sup>
<b>Vaccinations</b>		
Influenza vaccination	Covered once every influenza season in the fall or winter, for all beneficiaries	None <sup>b</sup>
Pneumococcal vaccination	Covered as needed, likely once in a lifetime for all beneficiaries	None <sup>b</sup>
<b>Screening services</b>		
Breast cancer—mammography	Covered annually for beneficiaries 40 or older <sup>c</sup>	20 percent of approved amount
Cardiovascular disease—cholesterol test	Covered every 5 years for all beneficiaries	None for the lab work, but may have required 20 percent of the approved amount for the physician office visit
Cervical cancer—pap test	Covered biannually for all female beneficiaries, annually for female beneficiaries at high risk	None for the lab work, but 20 percent of the approved amount for the administration
Colorectal cancer—colonoscopy, fecal occult blood test, or flexible sigmoidoscopy <sup>d</sup>	Fecal occult blood test and flexible sigmoidoscopy covered for beneficiaries aged 50 or older, and colonoscopy covered without minimum age; colonoscopy covered every 10 years or 4 years after a previous flexible sigmoidoscopy; fecal occult blood test covered annually; flexible sigmoidoscopy covered every 4 years, or 10 years after a previous colonoscopy <sup>e</sup>	20 percent of the approved amount for colonoscopy and flexible sigmoidoscopy; none for the fecal occult blood test lab work, but 20 percent of the approved amount for an office visit associated with it
Osteoporosis—bone mass measurement	Covered biannually, or more often if medically necessary, for people with certain medical conditions or that meet certain criteria	20 percent of the approved amount for the test, and the deductible applied to this service
Prostate cancer—Prostate-Specific Antigen (PSA) test <sup>f</sup>	PSA test covered annually for men 50 or older	None for the lab work, but 20 percent of the approved amount for the physician office visit; the deductible applied for the physician office visit
<b>Other</b>		
Initial Preventive Physical Examination (IPPE) or Welcome to Medicare (WTM) exam	Beginning in 2009, Medicare covered a WTM exam for all new beneficiaries within 12 months of enrollment	20 percent of the approved amount for the service

Source: GAO analysis of CMS information.

<sup>a</sup>Cost sharing may have been different for several components of a preventive service, such as the administration of the service, any lab testing that may be involved with the service, and the physician office visit associated with the service. In addition, some services when provided in a hospital setting may have required cost sharing of a different amount.

<sup>b</sup>If the provider did not accept assignment for providing the vaccination, the beneficiary may have had to pay for 100 percent of the vaccination up front and submit a claim to Medicare for reimbursement, and the provider may have charged more than the Medicare-approved payment.

<sup>c</sup>Medicare also covered one baseline mammogram for women 35-39.

<sup>d</sup>Medicare also covered a barium enema as a form of colorectal cancer screening, but because the Task Force does not recommend it, it was not included in our analysis.

<sup>e</sup>Screening intervals for some of these tests were shortened for beneficiaries at high risk.

<sup>f</sup>Medicare also covered an annual digital rectal exam as a form of prostate cancer screening, but because the Task Force does not endorse it, it was not included in our analysis.

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PPACA created further incentives for Medicare beneficiaries to obtain preventive care. In addition to covering wellness visits annually, beginning January 1, 2011, PPACA eliminated cost sharing for the WTM exam and for covered preventive services that are appropriate for a beneficiary and recommended by the Task Force for any indication or population. Prior to the implementation of PPACA, influenza and pneumococcal immunizations and clinical lab testing for preventive services were available with no cost sharing, but many other preventive services had some cost-sharing requirements. Further, PPACA gave HHS the authority to modify or eliminate coverage of certain preventive services.<sup>13</sup> (For specifics on Medicare preventive services coverage and cost sharing for 2011, see app II.)

In developing regulations implementing these provisions, CMS acknowledged that although the Task Force may find a service to produce net benefits for only certain patients, the services would be available to all beneficiaries without cost sharing.<sup>14</sup> In instances where the Task Force recommends against the use of a service by a certain population, CMS expects providers to limit delivery to those beneficiaries for whom it is clinically appropriate on a case-by-case basis. CMS also noted that if, at a later date, concern is raised about the appropriateness of a service for a specific population, it may use its authority to adjust Medicare coverage for that service.

In addition, PPACA required HHS to implement a national public-private partnership for prevention and health promotion outreach and education. In June 2011, CMS announced the “Share the News. Share the Health.” campaign to educate Medicare providers, beneficiaries, and caregivers about new and expanded prevention-related benefits. The goal of the campaign is to encourage use of those preventive services that are now available to beneficiaries without cost sharing.

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<sup>13</sup>HHS can (1) modify the coverage of most of the preventive services enumerated in the statutory provision on the WTM exam to the extent that the modification is consistent with Task Force recommendations, (2) modify which services are included in the WTM exam, and (3) eliminate payment for those services that the Task Force determines have no net benefit or that the harms outweigh the benefits. § 4105, 124 Stat. at 558 (adding 42 U.S.C. § 1395m(n)).

<sup>14</sup>Medicare Program; Payment Policies Under the Physician Fee Schedule and Other Revisions to Part B for CY 2011. 75 *Fed. Reg.* 73,170, 73,415 (Nov. 29, 2010).

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## Public Reporting on the Use of Preventive Services in MA

As of July 2011, roughly one in four Medicare beneficiaries were enrolled in approximately 3,700 MA plans sponsored by 667 parent MA organizations. Nearly two-thirds of MA enrollees were covered by HMOs. HMOs tend to limit utilization outside the organization's network of providers to a greater degree than other MA organization types. They are also more likely to coordinate care across providers and provider types. Other MA organization types, such as Preferred Provider Organizations or Private Fee-for-Service organizations, are more similar to Medicare FFS in that enrollees face fewer limitations on their choice of providers.

Each year CMS posts information on its website about MA organizations' performance in delivering preventive services and other performance measures.<sup>15</sup> The information is available in CMS' Medicare Health Plan Compare database, which compiles information comparing MA organizations' performance from survey and administrative data. CMS assigns ratings—ranging from one to five stars—for each measure, which are based on an MA organization's performance compared to other organizations.<sup>16</sup> The star ratings are designed to indicate meaningful differences between MA organizations and thus the cut points vary by service. For example, a mammography use rate of below 59 percent would yield one star, while a use rate of 82 percent or above would yield five stars. Conversely, for colorectal cancer screening, one star plans had use rates of less than 36 percent while five star plans had use rates equal to or above 70 percent. Better-scoring MA organizations may attract new enrollees and, beginning in 2012, may qualify for Medicare bonus payments.

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<sup>15</sup>Some measures, such as breast cancer screening, are based on data for broad populations that may be limited only by age range or sex. Other measures, such as cholesterol screening for patients with diabetes, are based on groups of individuals who have displayed some risk of illness.

<sup>16</sup>Plan Compare data are compiled at the organization level and thus the star ratings are the same across each organization's plans. Not all organizations in the database have information for every measure; some organizations are not required to report data for certain measures, others may be too new or too small, or there may not be enough data to calculate the measure.

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## Development of Task Force and ACIP Recommendations

When developing its recommendations for specific preventive services, the Task Force takes into account the medical evidence on benefits across a broad population; that is, whether the benefits across a broad population outweigh the harms. A commonly cited potential benefit is preventing the development of a condition through early diagnosis. For example, medication therapy as a result of cholesterol testing to detect lipid disorders may substantially decrease the incidence of coronary heart disease. Likewise, treatment as a result of the early detection of cancer may increase one's odds of survival from cancer. The Task Force also takes into consideration any potential harms related to specific preventive services. These include pain or complications associated with the screening procedures themselves or with the procedures used as a follow-up to screening. For example, risks associated with colonoscopies include perforations and other complications that can arise from the invasive procedure. Similarly, treatment of conditions identified through screening can cause harms that may be viewed as worse than the underlying condition.

The Task Force reviews clinical research and issues a recommendation statement and evidence report giving each service a grade, as follows:

- An "A" grade means that the Task Force recommends the service because there is high certainty that the net benefit is substantial.
- A "B" grade means that the Task Force recommends the service because there is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.
- A "C" grade means that the Task Force recommends against routinely providing the service because, although there may be considerations that support providing the service in an individual patient, there is at least moderate certainty that the net benefit is small.<sup>17</sup>

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<sup>17</sup>Prior to May 2007, a "C" grade meant that the Task Force made no recommendation for or against the provision of the service because it found at least fair evidence that the service could improve health outcomes but concluded that the balance of benefits and harms was too close to justify a general recommendation.

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- A “D” grade means that the Task Force recommends against the service because there is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.
  - An “I Statement” means that the Task Force concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service.

AHRQ officials have noted that the Task Force’s recommendations are designed as guidance for clinicians, not coverage policies for health insurers. They maintain that patients should have access to preventive services and that decisions to obtain a particular service should rest with patients, based on their values and preferences. For example, although colorectal cancer screening for people age 86 or older in the general population received a D grade, the service may be appropriate for certain older beneficiaries given their health status. At the same time, AHRQ officials noted that the Task Force position on “D” rated services is that physicians should discourage most patients from obtaining such services.

Similarly, ACIP takes into account benefits and risks of vaccines in developing its recommendations, and CDC publishes information on the benefits and risks of vaccines through its Vaccine Information Statements (VIS). ACIP experts review clinical research to obtain information related to disease morbidity and mortality, safety, efficacy, effectiveness, and cost-effectiveness of specific vaccines. Potential benefits may be short-term protection from the disease, in the case of the influenza vaccine, or long term, in the case of the pneumococcal vaccine, as well as preventing the spread of infection. The VISs for influenza and pneumococcal immunizations generally report minimal risks with these vaccines.

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## FFS Use of Tests for Cardiovascular Disease and Cervical Cancer Generally Aligned with Recommendations, but Use of Other Preventive Services Did Not

While FFS beneficiaries' use of cardiovascular and cervical cancer tests generally aligned with clinical recommendations, use of immunizations and osteoporosis screenings was low compared to recommendations, and tests for breast, colorectal, and prostate cancer were generally not aligned with recommendations for certain age groups. Alignment with recommendations was generally lower for beneficiaries living in rural and provider shortage areas.

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### Use of Cardiovascular and Cervical Cancer Tests Generally Aligned with Recommendations

#### Cholesterol testing to detect lipid disorders

We found that more than four out of five male FFS beneficiaries received a cholesterol test in the 5-year period 2005 through 2009, indicating that utilization generally aligned with Task Force recommendations. Because lipid disorders are a risk factor for cardiovascular disease and other heart-related conditions, the Task Force strongly recommends cholesterol screening (grade A) for men aged 35 or older to detect lipid disorders.<sup>18,19</sup> Although the Task Force states that the optimal screening interval is uncertain, it notes that a reasonable interval for cholesterol screening to detect a lipid disorder would be once every 5 years. Cholesterol testing may also be conducted for the purpose of monitoring cholesterol after a diagnosis of abnormal levels, and thus may be done more frequently than for screening to identify cardiovascular disease risk. From 2005 through 2009, approximately 84 percent of male beneficiaries aged 65 or older

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<sup>18</sup>Among available lipid screening tools, the Task Force endorses total cholesterol and high density lipoprotein-cholesterol testing samples as the preferred tests.

<sup>19</sup>In 2008, the Task Force updated its recommendation statement to strongly recommend screening women aged 45 or older for lipid disorders only if they are at increased risk for heart disease. Because claims data are not sufficiently detailed to ascertain which female beneficiaries were at increased risk, we could not reliably analyze use of cholesterol screening in high-risk women.

received at least one cholesterol test, with the majority receiving two or more such tests.<sup>20</sup> Overall use of cholesterol testing was somewhat lower for male beneficiaries 85 or older, but remained relatively high. (See table 2.)

**Table 2: Use of Cholesterol Tests by Male Medicare FFS Beneficiaries during the 5-year Period 2005 through 2009**

Numbers in percent			
Male beneficiaries <sup>a</sup>	No services	One service	Two or more services
<b>All</b>	<b>16.2</b>	<b>8.3</b>	<b>75.5</b>
65 to 74	16.4	7.9	75.8
75 to 84	15.2	8.6	76.2
85 or older	21.7	12.3	66.0

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2005.

Pap testing to detect cervical cancer

In general, female FFS beneficiaries' use of cervical cytology, or Pap tests, was relatively low, which generally aligns with Task Force recommendations. For women 65 or older, the Task Force recommended against routine screening (grade D) if they have had a recent normal Pap test and are not otherwise at high risk for cervical cancer.<sup>21,22</sup> After reviewing evidence, the Task Force concluded that screening women older than 65 is associated with an increased risk for potential harm, including false-positive results and invasive procedures. However, for women under age 65 who have been sexually active and have a cervix, the Task Force strongly recommended the use of Pap tests to detect

<sup>20</sup>It was beyond of the scope of this report to determine the reason for which the cholesterol testing was administered. Additionally, claims data may undercount the actual use of cholesterol testing, as some beneficiaries may receive cholesterol testing outside of FFS Medicare, such as at a health fair.

<sup>21</sup>The Task Force also recommends against screening with Pap test in women who have had a total hysterectomy for benign disease.

<sup>22</sup>Prior to May 2007, a D grade indicated that the Task Force recommended against routinely providing the service to asymptomatic patients.

cervical cancer, and stated that annual screening achieves outcomes no better than screening every 3 years.<sup>23,24</sup>

Although claims data do not identify women who are at high risk for cervical cancer, use appears to align with recommendations. Approximately 23 percent of female beneficiaries aged 65 or older received a screening Pap test from 2007 through 2009. Use was lower for older beneficiaries; approximately 17 percent of women 75 to 84 and 6 percent of women 85 or older received one or more Pap tests. (See table 3.)

**Table 3: Use of Screening Pap Tests by Female Medicare FFS Beneficiaries during the 3-year Period 2007 through 2009**

Numbers in percent			
Female beneficiaries <sup>a</sup>	No services	One service	Two or more services
<b>All</b>	<b>77.0</b>	<b>17.8</b>	<b>5.2</b>
65 to 74	69.1	23.7	7.3
75 to 84	83.1	13.4	3.5
85 or older	93.9	5.1	1.0

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2007.

<sup>23</sup>Because beneficiaries may have continued receiving Pap tests at the interval recommended for younger women, we used a 3-year period to assess use in the Medicare population.

<sup>24</sup>In October 2011, the Task Force submitted a draft update to its 2003 recommendation, proposing to issue an 'A' grade for Pap smear every 3 years in women ages 21 to 65, and proposing to issue a "D" grade for Pap smear in women younger than age 21. The draft recommendation still issues a "D" grade for Pap smear in women older than age 65 who have had adequate prior screening and are not otherwise at high risk for cervical cancer.

## Use of Immunizations and Osteoporosis Screenings Was Lower than Recommended

### Vaccination to prevent influenza virus

Medicare claims data indicated that use of the influenza vaccination was low relative to the ACIP recommendation that it be received every year. Despite the absence of cost sharing, only about half of all beneficiaries 65 or older had a Medicare claim for the influenza vaccination during the 2008-09 influenza season.<sup>25</sup> A higher proportion of women than men had a claim for the influenza vaccine, and older beneficiaries were more likely to have such claims than younger beneficiaries. (See table 4.)

**Table 4: Use of the Influenza Vaccination by Medicare FFS Beneficiaries for the July 2008 through June 2009 Flu Season**

Numbers in percent		
Beneficiaries <sup>a</sup>	No vaccinations	One or more vaccinations <sup>b</sup>
<b>All</b>	<b>50.9</b>	<b>49.1</b>
Female	49.2	50.9
Male	53.4	46.6
65 to 74	55.7	44.3
75 to 84	45.8	54.2
85 or older	45.3	54.7

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of July 1, 2008.

<sup>b</sup>Less than one half of 1 percent received two or more influenza vaccinations for the July 2008 through June 2009 flu season.

Medicare claims data, however, may undercount the actual use of the influenza vaccine because some beneficiaries receive this service from nontraditional sources of care, such as a workplace or health fair. Survey data—which can capture use of clinical services outside of Medicare—suggest that a substantially higher proportion of beneficiaries received

<sup>25</sup>Some beneficiaries, such as those who are very ill, may not be appropriate candidates for the influenza vaccination.

Vaccination to prevent pneumonia

influenza vaccinations. In a 2009 CDC survey, more than 31 percent of older adults reported they had not received an influenza vaccination in the past year.<sup>26</sup>

Although ACIP recommends that beneficiaries 65 or older receive the pneumococcal vaccination, few newly enrolled FFS beneficiaries received one within 5 years of Medicare enrollment even though it was available without cost sharing.<sup>27,28</sup> During the 5 years from 2005 through 2009, about 27 percent of beneficiaries aged 65 as of January 1, 2005, received a pneumococcal vaccination. Use did not vary substantially between women and men. (See table 5.)

**Table 5: Use of the Pneumococcal Vaccination during the 5-year Period 2005 through 2009 by Medicare FFS Beneficiaries Aged 65 as of January 1, 2005**

Numbers in percent		
Beneficiaries	No vaccination	One or more vaccinations <sup>a</sup>
All	72.7	27.3
Female	71.7	28.4
Male	73.9	26.1

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (2) beneficiaries residing in institutions, (3) ESRD beneficiaries, and (4) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Less than 2 percent of beneficiaries aged 65 at the beginning of the 5-year period 2005 through 2009 received two or more pneumococcal vaccinations.

<sup>26</sup>Centers for Disease Control and Prevention, Administration on Aging, Agency for Healthcare Research and Quality, and Centers for Medicare & Medicaid Services, *Enhancing Use of Clinical Preventive Services Among Older Adults* (Washington, D.C.: AARP), 2011.

<sup>27</sup>We analyzed use of the pneumococcal vaccination for beneficiaries who were aged 65 as of January 1, 2005, to determine whether they received it between 2005 and 2009—a period generally covering their first 5 years of enrollment in Medicare FFS.

<sup>28</sup>Pneumococcal vaccination is recommended for all adults aged 65 or older who were vaccinated over 5 years prior and were less than 65 years of age at the time of the prior vaccination. Pneumococcal vaccination is also recommended for adults aged 65 or older who lack documentation of vaccination.

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Bone mass measurement to detect osteoporosis

Similar to measurement issues regarding influenza vaccination and cholesterol testing, these claims data may undercount the actual use of the pneumococcal vaccine because beneficiaries may receive this service from sources outside of Medicare. According to the 2009 CDC survey, more than 33 percent of older adults reported never having received a pneumococcal vaccination.<sup>29</sup>

Relative to Task Force recommendations, female FFS beneficiaries' use of bone mass measurement was low. The Task Force recommends that women aged 65 or older be screened for osteoporosis with a bone mass measurement (grade B). Regarding the appropriate screening interval, the Task Force suggests that a minimum of 2 years between screenings may be necessary to discern notable differences in bone density, but that longer intervals may be necessary to improve the prediction of fracture risk. From 2005 through 2009, approximately 53 percent of female beneficiaries who were aged 65 or older at the beginning of 2005 received at least one bone mass measurement screening. Older beneficiaries had lower use of this service; about 50 percent of beneficiaries aged 75 to 84 received at least one bone mass measurement, and about 30 percent of beneficiaries aged 85 or older received a bone mass measurement. (See table 6.)

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<sup>29</sup>Centers for Disease Control and Prevention, Administration on Aging, Agency for Healthcare Research and Quality, and Centers for Medicare & Medicaid Services, *Enhancing Use of Clinical Preventive Services Among Older Adults*. (Washington, D.C.: AARP), 2011.

**Table 6: Use of Bone Mass Measurements by Female Medicare FFS Beneficiaries during the 5-year Period 2005 through 2009**

Numbers in percent			
Female beneficiaries <sup>a</sup>	No services	One service	Two or more services
<b>All</b>	<b>47.4</b>	<b>29.3</b>	<b>23.3</b>
65 to 74	42.2	31.2	26.6
75 to 84	50.3	28.5	21.2
85 or older	70.5	19.7	9.8

Source: GAO analysis of CMS Medicare claims data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2005.

One factor that may have contributed to the relatively low use of bone mass measurement is that Medicare coverage is limited. Although the Task Force recommends the screening for all female beneficiaries aged 65 or older, Medicare covers this service only for people who have certain medical conditions or meet certain criteria.<sup>30</sup> To the degree that coverage for preventive care is a significant determinant of service use, not having coverage could explain why some beneficiaries have not received the service. In 2010, PPACA gave HHS the authority to modify coverage of Medicare preventive services—including bone mass measurement—when the change is consistent with Task Force recommendations.

<sup>30</sup>Beneficiaries need to meet one of the following criteria to be eligible for bone mass measurement coverage: be estrogen deficient and at clinical risk for osteoporosis; have vertebral abnormalities; be receiving glucocorticoid therapy for more than 3 months; have primary hyperparathyroidism; or be in the process of monitoring to assess response to FDA-approved osteoporosis drug therapy.

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## Use of Breast, Colorectal, and Prostate Cancer Tests Generally Did Not Align with Recommendations for Certain Age Groups

### Screening mammography to detect breast cancer

Use of mammography is low relative to recommendations for younger Medicare FFS beneficiaries, indicating that use generally does not align with recommendations for that age group. The Task Force recommends that women aged 50 to 74 receive a screening mammogram every 2 years (grade B). Because some high-risk women may receive a diagnostic mammogram in lieu of a screening mammogram, we included both types of claims in our analysis for younger beneficiaries.<sup>31</sup> We found that, among women aged 65 to 74, roughly two out of three beneficiaries received either a screening or diagnostic mammogram in 2008 or 2009.<sup>32</sup>

For women 75 or older, the Task Force reported that evidence is insufficient to assess the additional benefits and harms of screening mammography (with a grade of I). About 41 percent of women in that age group received at least one screening mammogram in 2008 or 2009, and 22 percent of women 85 or older received at least one screening mammogram. (See table 7.)

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<sup>31</sup>Diagnostic mammograms are administered when evidence already exists that a beneficiary may have or be at risk to develop breast cancer—that is, when a beneficiary is symptomatic. However, some asymptomatic, high-risk women may be given a diagnostic mammogram instead of a screening mammogram.

<sup>32</sup>We included screening and diagnostic mammograms in the analysis for the younger population because diagnostic mammograms are sometimes given for the purpose of screening in high-risk women, and because beneficiaries who received diagnostic testing would not necessarily be expected to receive additional screening.

**Table 7: Use of Mammography by Female Medicare FFS Beneficiary Age during the 2-year Period 2008 through 2009**

Numbers in percent

Female beneficiaries <sup>a</sup>	Type of mammogram	No mammogram	One or more mammograms
65 to 74	Screening or diagnostic	35.5	64.5
75 or older	Screening only	59.5	40.5
75 to 84	Screening only	52.9	47.1
85 or older	Screening only	77.9	22.1

Source: GAO analysis of CMS Medicare claims data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2008.

Testing to detect colorectal cancer

We found that use of colorectal cancer testing regimens was low relative to the recommendations for younger FFS beneficiaries. For beneficiaries aged 50 to 75, the Task Force recommends using one of three different regimens to screen for colorectal cancer (grade A): fecal occult blood testing once per year, a sigmoidoscopy every 5 years along with fecal occult blood testing every 3 years, or a colonoscopy every 10 years.<sup>33</sup> For beneficiaries aged 65 to 75, we computed use rates using codes for screening and diagnostic services because it is likely that at least some services claimed as diagnostic were for screening purposes.<sup>34</sup> Beneficiaries who satisfied one of the colorectal cancer screening regimens from 2005 through 2009 were deemed to have met the recommendation, and those who satisfied none of the regimens were considered to not have met the recommendation.<sup>35</sup> From 2005 through

<sup>33</sup>Screening colonoscopies and sigmoidoscopies are examples of multiple types of colorectal cancer testing. Diagnostic colonoscopies and sigmoidoscopies are administered when symptomatic evidence already exists that a beneficiary may have colorectal cancer or had it in the past.

<sup>34</sup>Also, because beneficiaries who received diagnostic testing would not necessarily be expected to receive additional screening, we included both screening and diagnostic services for the recommended population of beneficiaries aged 65 to 75.

<sup>35</sup>Screening colonoscopy is recommended every 10 years. We reviewed data for 2005 through 2009, which allowed us to maintain a robust sample. Not including colonoscopy services from 2000 through 2004 may have resulted in undercounting the share of beneficiaries who met the recommended regimens.

2009, about one quarter of Medicare FFS beneficiaries aged 65 to 75 followed any of the recommended regimens. (See table 8.)

**Table 8: Use of Colorectal Cancer Screening and Diagnostic Services by Medicare FFS Beneficiaries Aged 65 to 75, 2005 through 2009**

Numbers in percent		
Beneficiaries <sup>a</sup>	Followed a regimen	Did not follow a regimen
<b>All aged 65 to 75</b>	<b>25.5</b>	<b>74.5</b>
Female	27.0	73.0
Male	23.5	76.5

Source: GAO analysis of CMS Medicare claims data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2005.

Among older Medicare FFS beneficiaries, use of colorectal cancer testing regimens generally aligned with recommendations. The Task Force recommends against routine screening in adults aged 76 to 85 (grade C), and recommends against any screening for adults aged 86 or older (grade D).<sup>36</sup> Using only claims for services coded as screenings, we found that about 6 percent of beneficiaries aged 76 to 85 received a colorectal cancer screening regimen. Among beneficiaries aged 86 or older, 2 percent met any of the regimens. Because routine screening of older beneficiaries is discouraged by the Task Force, these low rates indicate general alignment with recommended use. (See table 9.)

<sup>36</sup>According to AHRQ officials, the Task Force believes there are circumstances where individuals may benefit from a "D" grade service, but "D" services are not recommended for the general population.

**Table 9: Use of Colorectal Cancer Screening Services by Medicare FFS Beneficiaries Aged 76 or Older, 2005 through 2009**

Numbers in percent		
Beneficiaries <sup>a</sup>	Followed a regimen	Did not follow a regimen
Female	5.4	94.6
Male	6.4	93.6
76 to 85	6.3	93.7
86 or older	2.0	98.0

Source: GAO analysis of CMS Medicare claims data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2005.

Prostate-Specific Antigen (PSA) testing to detect prostate cancer

We found that rates of PSA screening differed substantially from the Task Force recommendation for older FFS beneficiaries. In 2008, the Task Force recommended against screening for prostate cancer (grade D) for men aged 75 or older.<sup>37</sup> The Task Force noted that treatment for prostate cancer as a result of screening can cause moderate to substantial harms, and some men who are treated would not have developed symptoms related to the cancer during their lifetime. Among beneficiaries aged 75 or older, more than 40 percent received a PSA test, with 35 percent of those at least 85 years old having the screening at least once. Approximately one in five beneficiaries aged 75 or older received two or more PSA tests in our 4-year study period. By statute, beneficiaries were not required to share the cost of the PSA test.<sup>38</sup>

For men younger than 75, the Task Force reported that current evidence was insufficient to assess the balance of benefits and harms of PSA testing for prostate cancer (with a grade of I). It further stated that PSA screening as infrequently as once every 4 years could yield as much benefit as annual screening. Among male beneficiaries aged 65 to 74, about half received at least one PSA test in our 4-year study period. (See table 10.)

<sup>37</sup>In October 2011, the Task Force submitted a draft update to its 2008 recommendation, proposing to issue a "D" grade for PSA testing in men of all ages.

<sup>38</sup>Beneficiaries may have been required to pay coinsurance for the physician visit.

**Table 10: Use of PSA Tests by Male Medicare FFS Beneficiaries during the 4-year Period 2006 through 2009**

Numbers in percent

Male beneficiaries <sup>a</sup>	No services	One service	Two or more services
<b>All</b>	<b>50.9</b>	<b>23.6</b>	<b>25.6</b>
65 to 74	48.0	23.5	28.5
75 or older	55.3	23.8	20.9
75 to 84	53.7	24.1	22.1
85 or older	65.0	21.5	13.6

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2006.

For more detail on Medicare beneficiaries' use of the eight selected preventive services, see appendix III.

**Lack of Alignment with Recommendations Was Particularly Evident for Beneficiaries Who Live in Rural or Provider Shortage Areas**

For all of the recommended preventive services in our study where use did not align with recommendations, FFS beneficiaries living in rural areas or areas with provider shortages had consistently lower use rates than their counterparts in urban areas. Rural beneficiaries had slightly lower use rates than urban beneficiaries, ranging from about 1 percentage point lower for use of colorectal cancer screening to about 6 percentage points lower for bone mass measurement. (See table 11.)

**Table 11: Use of Selected Preventive Service among Urban and Rural Medicare FFS Beneficiaries**

Numbers in percent

	Urban	Rural	Percentage point difference
Use of influenza vaccination during 2008 to 2009 flu season	50.2	45.6	-4.6
Use of pneumococcal vaccination within first 5 years of enrollment beginning in 2005 <sup>a</sup>	28.4	24.2	-4.2
Use of bone mass measurement by women, 2005 through 2009	54.0	47.7	-6.3
Up-to-date colorectal cancer screening by beneficiaries 65 to 75, 2005 through 2009 <sup>b</sup>	25.7	24.8	-0.9
Use of mammography by women 65-74 from 2008 through 2009 <sup>c</sup>	65.3	62.0	-3.3

Source: GAO analysis of CMS Medicare claims data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>These data include only beneficiaries who were aged 65 as of January 1, 2005.

<sup>b</sup>Denotes the beneficiary's age as of January 1, 2005.

<sup>c</sup>Denotes the beneficiary's age as of January 1, 2008.

Similarly, FFS beneficiaries living in Health Professional Shortage Areas (HPSA) had lower use rates than beneficiaries who did not live in HPSAs.<sup>39</sup> For example, influenza immunization rates were about 11 percentage points lower for HPSA beneficiaries than for non-HPSA beneficiaries, and bone mass measurement use rates for women living in a HPSA were about 8 percentage points lower than their counterparts. (See table 12.)

<sup>39</sup>HPSAs are urban/rural areas, population groups, or medical facilities that have a shortage of primary medical care, dental, or mental health providers. CMS makes bonus payments to physicians who provide medical care in geographic areas designated as Primary Care HPSAs. Approximately 66 million Americans live in a Primary Care HPSA.

**Table 12: Use of Selected Preventive Service among Medicare FFS Beneficiaries Who Live in a HPSA and Those Who Do Not**

Numbers in percent

	Not HPSA	HPSA	Percentage point difference
Use of influenza vaccination during 2008 to 2009 flu season	49.9	39.4	-10.5
Use of pneumococcal vaccination within first 5 years of enrollment beginning in 2005 <sup>a</sup>	27.8	22.5	-5.3
Use of bone mass measurement by women, 2005 through 2009	53.2	44.8	-8.4
Up-to-date colorectal cancer screening by beneficiaries 65 to 75, 2005 through 2009 <sup>b</sup>	25.7	23.3	-2.4
Use of mammography by women 65 to 74, 2008 through 2009 <sup>c</sup>	65.0	58.4	-6.6

Source: GAO analysis of CMS Medicare claims data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Medicare Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>These data include only beneficiaries who were aged 65 as of January 1, 2005.

<sup>b</sup>Denotes the beneficiary's age as of January 1, 2005.

<sup>c</sup>Denotes the beneficiary's age as of January 1, 2008.

**Few FFS Beneficiaries Had a Welcome to Medicare Exam; Its Use Was Associated with Greater Utilization of Preventive Services**

A small number of FFS beneficiaries received a Welcome to Medicare (WTM) exam. Among beneficiaries who became eligible for the WTM in 2006 and subsequently received it, use of preventive services was higher.

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## Less than 7 Percent of FFS Beneficiaries Had the Welcome to Medicare Exam

Very few FFS beneficiaries who reached age 65 during 2008, and were thus eligible for a WTM exam sometime in 2008 or 2009, received a WTM exam in either year.<sup>40</sup> Overall, 6.6 percent of beneficiaries received the WTM exam after becoming eligible for it in 2008. Specifically,

- about the same proportion of women and men had a WTM exam,
- urban beneficiaries had similar use rates as rural beneficiaries, and
- a somewhat smaller share of beneficiaries who lived in a HPSA used the exam (4.2 percent) compared to beneficiaries who did not live in a HPSA (6.8 percent).

For more detail on Medicare beneficiaries' use of the WTM exam, see appendix IV.

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## Among FFS Beneficiaries Who Received the Welcome to Medicare Exam, Use of Preventive Services Was Higher

Use of selected preventive services was higher for FFS beneficiaries who had a WTM exam after becoming eligible for it in 2006 compared to those who did not receive the exam.<sup>41</sup>

Female beneficiaries who received the WTM exam had higher Medicare use rates than female beneficiaries who did not receive the exam for each of five services we reviewed. For example, use of bone mass measurement over the period 2006 through 2009 was about 20 percentage points higher for female beneficiaries who received the WTM exam than for those who did not receive the WTM exam.<sup>42</sup> Similarly, the rate at which female beneficiaries had at least three influenza vaccinations over the period was about 15 percentage points higher

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<sup>40</sup>In 2008, beneficiaries were eligible for a WTM exam for up to 6 months after enrollment, and beginning January 1, 2009, new beneficiaries became eligible for a WTM exam within 12 months of enrollment.

<sup>41</sup>It is possible that users of the WTM exam were generally more inclined to be users of other preventive services as well. Determining the cause of the higher use of preventive services was beyond the scope of our objective.

<sup>42</sup>In this analysis, we examined a cohort of beneficiaries who turned 65 in 2006—1 year after the WTM benefit became available—and was thus eligible for a WTM exam sometime in 2006 or 2007. We then examined preventive service use from 2006 through 2009 in beneficiaries who received the WTM exam compared with beneficiaries who did not receive the WTM exam.

among those who received the WTM exam compared to those who did not receive the exam.<sup>43</sup> (See table 13.)

**Table 13: 2006 through 2009 Use of Selected Preventive Services by Female Medicare FFS Beneficiaries Who Became Eligible for a Welcome to Medicare (WTM) Exam in 2006**

Numbers in percent

	Female beneficiaries who had a WTM exam	Female beneficiaries who did not have a WTM exam	Percentage point difference
Influenza vaccinations <sup>a</sup>	47.4	32.3	15.1
Pneumococcal vaccination	17.3	14.6	2.7
Colorectal cancer screening	44.7	34.3	10.4
Bone mass measurement	65.3	45.1	20.2
Mammogram	38.3	30.4	7.9

Source: GAO analysis of CMS Medicare claims data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries residing in institutions, (3) ESRD beneficiaries, and (4) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Influenza vaccinations are recommended annually. Because beneficiaries reached age 65 at some point during 2006, and thus may have been in Medicare for less than 4 years, this rate reflects beneficiaries who had claims for three or more influenza vaccinations.

Similarly, male beneficiaries who received the WTM exam had higher Medicare use rates of vaccinations and selected screenings than male beneficiaries who did not receive the exam. For example, the rate at which male beneficiaries had at least three influenza vaccinations was about 17 percentage points higher among those who received the WTM exam compared with those who did not receive the exam. Male beneficiaries who received the WTM exam had a colorectal cancer screening rate about 13 percentage points higher than male beneficiaries who did not receive the exam. (See table 14.)

<sup>43</sup>Because influenza vaccination is recommended annually, one would expect a beneficiary that was new to Medicare sometime in 2006 to have received at least three influenza vaccinations from 2006 through 2009.

**Table 14: 2006 through 2009 Use of Selected Preventive Services by Male Medicare FFS Beneficiaries Who Became Eligible for a Welcome to Medicare (WTM) Exam in 2006**

Numbers in percent

	<b>Male beneficiaries who had a WTM exam</b>	<b>Male beneficiaries who did not have a WTM exam</b>	<b>Percentage point difference</b>
Influenza vaccinations <sup>a</sup>	42.0	25.2	16.8
Pneumococcal vaccination	16.7	12.3	4.4
Colorectal cancer screening	40.7	27.5	13.2
Cardiovascular disease screening	86.7	74.4	12.3

Source: GAO analysis of CMS Medicare data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries residing in institutions, (3) ESRD beneficiaries, and (4) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Influenza vaccinations are recommended annually. Because beneficiaries reached age 65 at some point during 2006, and thus may have been in Medicare for less than 4 years, this rate reflects beneficiaries who had claims for three or more influenza vaccinations.

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## Beneficiaries in MA HMOs Reported Higher Use of Immunizations and Cholesterol Tests than Those in FFS

Relative to beneficiaries in FFS, those enrolled in HMOs—the most popular type of MA plan—reported higher use rates for some preventive services.<sup>44</sup> Specifically, survey data indicate that beneficiaries enrolled in MA HMOs in 2009 had slightly greater use of immunizations and cholesterol tests compared to beneficiaries in FFS, holding constant demographic and geographic factors.<sup>45</sup> For HMO beneficiaries,<sup>46</sup>

- reported use of cholesterol screening in the preceding 12 months was 3.6 percentage points higher,
- reported use of the influenza vaccine during the most recent flu season was 4.0 percentage points higher, and
- reported use of the pneumococcal vaccination at least once in the beneficiary's lifetime was 3.0 percentage points higher.

However, the data did not indicate a difference between reported use of various cancer screening tests.<sup>47</sup> For breast, cervical, colorectal, and prostate cancer screenings, we did not find a statistically significant difference in reported utilization between MA HMO and FFS beneficiaries, when holding other factors constant. This was equally true among younger beneficiaries and older beneficiaries for breast, colorectal, and

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<sup>44</sup>This is consistent with previous research on preventive service use in Medicare managed care. A study of survey data for 2001 found that, holding other factors constant, beneficiaries in Medicare+Choice—now known as MA—plans were slightly more likely to be high users of certain preventive services relative to those in Medicare FFS. See Ozminowski et al., “Predictors of Preventive Service Use Among Medicare Beneficiaries,” *Health Care Financing Review*, Spring 2006, Volume 27, Number 3: 5-23.

<sup>45</sup>To account for other factors that may influence preventive service use, we used logistic regression to hold constant the impact of beneficiaries' age, sex, dual-eligibility status, education level, marital status, income, race, Hispanic heritage, health status, and residence by state and metropolitan area.

<sup>46</sup>For enrollment status, we were able to classify 96 percent of survey respondents as enrolled in Medicare FFS, an MA HMO, or another type of MA organization (such as preferred provider organizations or private FFS organizations).

<sup>47</sup>The MCBS varies some questions from year to year. Although not asked in 2009, our analysis of the responses regarding osteoporosis tests in 2008 showed no statistically significant difference in reported use rates by type of enrollment.

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prostate cancer screenings—services that have different Task Force recommendations for the different age groups.<sup>48</sup>

We were not able to discern a distinction in use rates between enrollees in FFS and enrollees in other types of MA organizations. Holding other factors constant, there was no statistically significant difference in reported use rates by FFS and MA non-HMO enrollees for any of the services we examined. This result may stem from the fact that non-HMO plans are structurally more similar to FFS than HMOs.

When asked why they did not have a particular preventive service, beneficiaries commonly indicated that they had limited information on prevention and relied on providers to initiate preventive care, regardless of whether the beneficiaries were enrolled in FFS, MA HMOs, or MA non-HMO organizations. Among the more common reasons beneficiaries gave for not having a preventive service were that they did not know it was needed; they had concerns about discomfort, side effects, or efficacy; or their provider did not recommend it to them. Table 15 shows the proportion of beneficiaries, regardless of their enrollment choice, who cited these reasons for not having one of three services where the use rates in our analysis of Medicare claims were generally lower than desired based on clinical guidelines—influenza vaccination, pneumococcal vaccination, and mammography for younger beneficiaries. For example, about half of beneficiaries who reported never having received a pneumococcal vaccination said that they did not know it was needed, and more than half of beneficiaries who reported not receiving an influenza vaccination in the previous winter said they were concerned about discomfort, side effects, or efficacy. Furthermore, a substantial share of surveyed beneficiaries for whom certain preventive services are recommended indicated that they were unaware that those services were Medicare-covered benefits.<sup>49</sup>

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<sup>48</sup>For breast and prostate cancer screening, younger respondents were ages 65 to 74 and older respondents were age 75 and older. For colorectal cancer screening, the age groups were 65 to 75 and 76 and older, respectively.

<sup>49</sup>For instance, among beneficiaries age 65 to 75, about one in four reported that they did not know or thought Medicare did not cover colorectal cancer screening.

**Table 15: Common Reasons Medicare Beneficiaries Reported for Not Using Certain Preventive Services, 2009**

Numbers in percent

	Reason reported for not having service		
	Did not know it was needed <sup>a</sup>	Concerned about discomfort, side effects, or efficacy <sup>b</sup>	Doctor did not recommend it <sup>c</sup>
Pneumococcal vaccination ever	50.2	20.9	21.2
Influenza vaccination in the previous winter	16.3	51.9	9.7
Mammogram in the previous year (women 65 to 74 years old)	20.5	14.1	10.1

Source: GAO analysis of MCBS data.

Note: Survey respondents may have given multiple answers.

<sup>a</sup>Data include responses for “wasn’t needed,” “didn’t know it was needed,” “no need,” or “nothing wrong.”

<sup>b</sup>Data include responses for “don’t like (shots/needles, mammograms);” “could have side effects;” “don’t think it prevents (flu, pneumonia, cancer);” or “could cause (flu, pneumonia, cancer).”

<sup>c</sup>Data include responses for “doctor did not recommend,” or “doctor recommended against getting shot/allergic to shot/medical reasons.”

**Preventive Care Use Varied Widely among MA HMOs; Higher-Performing HMOs Provided Information and Offered Incentives to Promote Preventive Care**

Among MA HMOs, use of preventive services varied widely and tended to be higher among HMOs with greater enrollment. Higher-performing HMOs told us they generally share guidelines, monitor work performance, and offer financial incentives to encourage the provision of preventive care by providers. These HMOs also reported using outreach and benefit incentives to encourage enrollees to obtain preventive care services.

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## Preventive Service Use Ranged Widely among HMOs and Was Higher in HMOs with Greater Enrollment

MA HMO performance data from CMS's Medicare Health Plan Compare database show that use—based on star ratings—varied substantially for the five preventive services we examined: colorectal cancer screening, the influenza vaccine, mammography, osteoporosis testing, and the pneumococcal vaccine.<sup>50</sup> In developing the star ratings for each service, CMS selected cut points from data on reported utilization rates.<sup>51</sup> The cut points produced a range in the average use rates for each star category. For each of the five preventive services, the difference in average use rates between one-star and five-star MA HMOs was 30 percentage points or more in 2009. For example, the average mammography use rate for HMOs with five stars was 86 percent, while the average mammography use rate for HMOs with one star was 53 percent.

Although the average number of stars assigned to MA HMOs was similar across the selected services—ranging from a low of 2.7 for mammography to a high of 3.1 for colorectal cancer and osteoporosis testing—the distribution of HMO star ratings varied significantly by service. Notably,

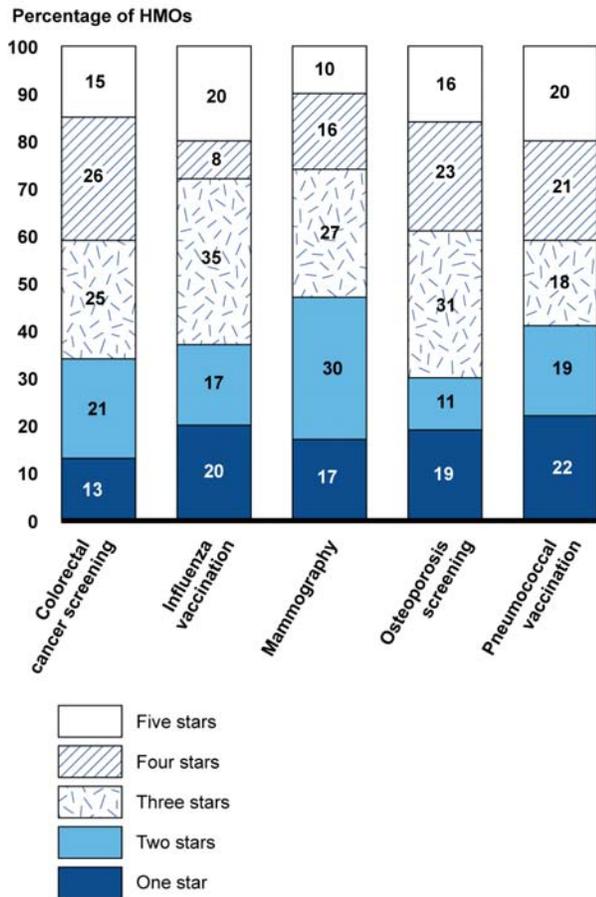
- For colorectal cancer screening, 34 percent of HMOs received either one or two stars while 41 percent of HMOs had four or five stars.
- For the influenza vaccinations, the same proportion of HMOs—20 percent—garnered one star as they did five stars.
- For mammography, nearly half of the HMOs had fewer than three stars and 10 percent achieved five stars.
- For pneumococcal vaccinations, HMOs were more evenly distributed, with roughly 20 percent of HMOs in each of the five star categories. (See fig 1.)

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<sup>50</sup>Using enrollment data from January 2010, we were able to match 353 HMOs in the Plan Compare database with just under 7 million MA beneficiaries. Roughly one quarter of the HMOs did not have star ratings for at least one of the five preventive services we examined because they were too new, too small, unable to report, or not required to report data. However, those that did not have star ratings accounted for less than 2 percent of enrollees for any of the five services.

<sup>51</sup>The use rates for colorectal cancer screening and mammography were based on administrative data while the use rates for osteoporosis testing and the vaccines were based on survey data.

**Figure 1: Distribution of HMOs by Service and 2011 Medicare Compare Star Rating**



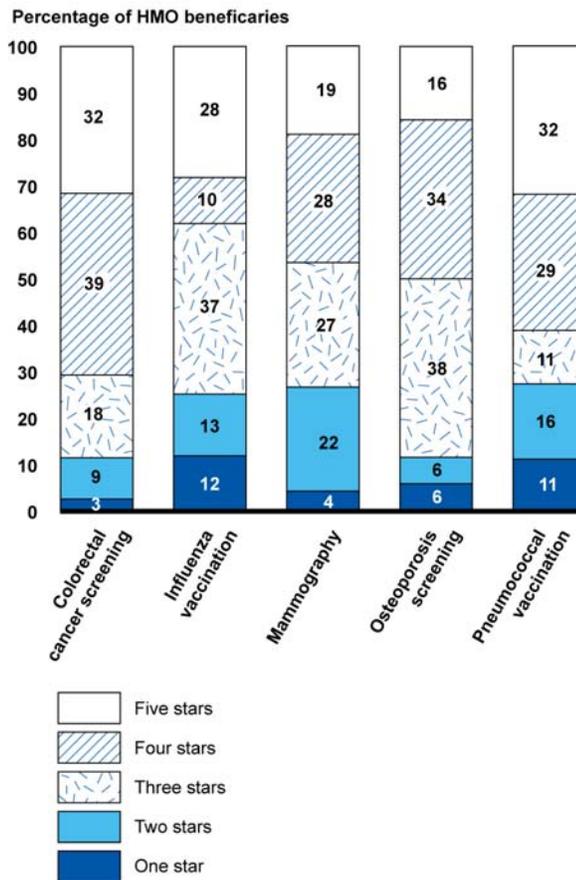
Source: GAO analysis of 2011 Medicare Plan Compare data.

Note: Although MA organizations may sponsor a number of different plan benefit packages, star data are aggregated across plans to the organization level. Data are derived from a combination of administrative sources for 2009 and surveys for 2009 and 2010.

We also found that, for the preventive services we examined, larger HMOs generally had higher star ratings than smaller HMOs. When weighted by enrollment, the average HMO star rating ranged from 3.3 to 3.9 across our study services. For colorectal cancer screening and pneumococcal vaccination, more than 6 in 10 HMO beneficiaries were enrolled in organizations with four- or five-star ratings. Roughly half of HMO beneficiaries were enrolled in organizations that had the top two ratings for mammography and osteoporosis screening. For influenza vaccinations, almost 4 in 10 HMO beneficiaries were enrolled in an

organization with four or five stars and more than a third were enrolled in organizations with three stars. (See fig 2.)

**Figure 2: Distribution of HMO Beneficiaries by Service and 2011 Medicare Compare Star Rating**



Source: GAO analysis of 2011 Medicare Plan Compare and other data.

Note: Percentages may not add to 100 due to rounding. Although MA organizations may sponsor a number of different plan benefit packages, star data are aggregated across plans to the organization level. Data are derived from a combination of administrative sources for 2009 and surveys for 2009 and 2010. Organization ratings were weighted by January 2010 enrollment data from CMS.

A number of possible reasons could explain why HMOs with higher enrollment tend to have higher star ratings. A Medicare Payment Advisory Commission analysis of some of the measures used to determine star

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ratings found that older, more established HMOs had higher use rates—which increase the chance of a higher star rating for the organization—than newer HMOs.<sup>52</sup> These organizations may benefit from a more extensive infrastructure and a more loyal enrollee base that may allow them to increase total enrollment over time. Also, CMS has been publishing plan ratings since 2006, and the ratings themselves may have helped drive beneficiary migration to better-rated organizations.

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### Higher-Performing HMOs Disseminated Guidelines, Monitored Performance, and Offered Financial Incentives to Encourage Physicians' Provision of Preventive Services

Representatives from higher-performing MA HMOs said they employed a number of tools at the organization level—such as clinical guidelines, performance monitoring and feedback, and financial incentives—to encourage physicians to provide preventive services.

To develop guidelines about preventive service use for their physicians, representatives from the HMOs said they relied on Task Force recommendations and, in some cases, recommendations of other entities as well. Some HMOs considered the Task Force recommendations a key source of information, while others said they also consulted a range of other sources, such as the American Cancer Society and specialty societies. Two HMOs told us they collaborated with other guideline sponsors in the states where they operate to develop sets of common clinical guidelines.

While recognizing the important role of clinical recommendations, HMOs used public reporting of performance data to set targets for high rates of preventive service use. They specifically cited the National Committee on Quality Assurance's (NCQA) Healthcare Effectiveness Data and Information Set (HEDIS)<sup>53</sup> measures and CMS's Medicare Health Plan Compare measures. For example, HMOs used data on preventive service use specified in HEDIS—which includes use rates for services such as influenza immunization, breast cancer screening, and colorectal cancer screening—to establish utilization goals. Several HMOs said they set their

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<sup>52</sup>Medicare Payment Advisory Commission, *Report to the Congress: Medicare Payment Policy* (Washington, D.C.: March 2011).

<sup>53</sup>HEDIS consists of 75 measures that include preventive services and contains data from Medicare Advantage plans collected on behalf of CMS. Not all HEDIS measures align with Task Force recommendations; for example, HEDIS measures mammography use by women through age 69 while the Task Force recommends mammography for women up to age 75.

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annual utilization targets to the 90th percentile of the use rates reported in the NCQA Quality Compass—an online database that features up to 3 years of performance data from HEDIS and the Consumer Assessment of Healthcare Providers and Systems (CAHPS).<sup>54</sup> They explained that public reporting in Plan Compare is a way to compare their performance to the performance of their competitors and will be increasingly important in the future when Medicare bonus payments will be based on these data.<sup>55</sup>

Monitoring providers' provision of care and giving feedback were important motivators to increase utilization. HMOs routinely monitor physicians' delivery of preventive services by conducting retrospective reviews.<sup>56</sup> Typically, they collect and evaluate data on use rates monthly or quarterly to determine whether individual practitioners are meeting performance targets or if additional efforts are needed. For example, one organization said it maintained an electronic registry of patient screenings and tests that was updated monthly; another reported it was about to implement a system that would compute utilization for the previous 12 months on a quarterly basis. Several HMOs based their monitoring at the individual physician level, while one focused on physician group practices. The HMOs we contacted also commonly used provider feedback to encourage the provision of preventive services. The representatives stated that provider feedback was a significant motivator of physician behavior, particularly when their performance was compared to others in the network. Several HMOs stated that they either sent out reports on utilization to providers or made them available to providers

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<sup>54</sup>CAHPS is an annual CMS patient satisfaction survey of Medicare beneficiaries.

<sup>55</sup>PPACA, as amended by the Health Care and Education Reconciliation Act of 2010, stipulated that organizations with a cumulative average of four stars out of a possible five would be eligible for bonus payments. However, in November 2010, CMS announced it would test an alternative approach that would provide bonuses to organizations with three stars or higher.

<sup>56</sup>Although representatives of some HMOs reported that they monitored preventive service use to identify potential overuse of services, in general, HMO representatives did not indicate that curbing inappropriate use of preventive services through referrals or prior approval was a high priority.

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who wanted to see them. Representatives of one HMO said they followed up their reports by meeting with individual physicians.<sup>57</sup>

Representatives of some of the HMOs also reported using clinical reminders to support the delivery of preventive services. By integrating clinical reminders into their electronic medical records, the HMOs could prompt physicians at the point of service. Other HMOs said they notified physicians about needed screenings and vaccines for their patients. However, representatives of some HMOs commented that they discontinued this practice because it appeared to be ineffective.

Another key strategy employed by HMOs is to reward the delivery of preventive services through provider financial incentives. Most of the organizations used some form of performance-based compensation that included using preventive service measures. The staff of one of the six HMOs said future contracts will associate bonuses with HEDIS-based goals. Providers will be rewarded with incentive payments, but the amounts that will be paid were described as “small.”

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### HMOs Used Outreach and Benefit Incentives to Encourage Enrollees’ Use of Preventive Care

A representative of one MA HMO said emphasis on enrollees is more effective than emphasis on providers as it becomes a teachable moment for the enrollees. Ultimately, beneficiary action is an essential component of preventive care delivery, and several HMOs suggested that some beneficiaries are resistant to receiving preventive care. Representatives of one HMO noted that certain beneficiaries are skeptical of preventive services, such as vaccines, which can make delivery of preventive care difficult. This HMO suggested certain beneficiaries who are very ill may not benefit from all types of preventive care given their underlying medical condition. HMO representatives gave us examples of enrollee populations that have anxiety or ambivalence about preventive care.

Representatives of the HMOs described various initiatives directed at enrollees. Most commonly, they distributed enrollee education materials that outline preventive service recommendations. They developed

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<sup>57</sup>CMS is implementing a physician feedback reporting program. CMS plans to use information from the feedback program to adjust payments to physicians starting in 2015. See GAO, *Medicare Physician Feedback Program: CMS Faces Challenges with Methodology and Distribution of Physician Reports*, [GAO-11-720](#) (Washington, D.C.: Aug. 12, 2011).

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newsletters, phone messages, and websites to highlight the availability of preventive services. They also conducted health fairs and used their disease and care management programs to attempt to improve immunization and screening rates.

Several HMOs employed software programs that identified gaps in care to identify the enrollees who need specific preventive services. For example, one HMO reported that when an enrollee contacts its staff, the HMO's data system provides the staff member with information concerning the enrollee's preventive care status. Also, regardless of whether enrollees initiate contact, this HMO's staff contact enrollees to alert them about the need for a preventive service. Several HMOs' efforts also targeted specific populations. For example, some HMOs conducted outreach among high-risk enrollees to raise awareness and encourage screening and vaccinations.

The HMOs also offered incentives to enrollees directed at increasing the number that get vaccinations or screenings each year. To reduce financial barriers, some HMOs did not impose cost-sharing requirements for certain preventive services, such as screenings for cervical or colorectal cancer, even before PPACA required elimination of cost sharing for these services in FFS. In addition, all of the HMOs we interviewed had broader coverage of preventive services, such as covering an annual physical exam, before Medicare FFS implemented such coverage. One HMO reported that it also covered vaccinations by non-network providers to increase enrollees' access and that this action had boosted utilization rates. Another HMO offered enrollees incentives, such as tote bags, when they visit a provider to obtain a mammogram.

These higher-performing HMOs also noted that their organizational structure contributed to their ability to encourage preventive care. One HMO said its new enrollees may have had long-standing relationships with network providers because they used these providers as members of the organization's commercial HMO before they became eligible for Medicare. Additionally, unlike FFS Medicare, there is a primary care focus in HMOs. As an example of a benefit of that focus, one HMO representative said primary care providers have a more holistic view of a patient's health status. Furthermore, HMOs suggested that if Medicare FFS could employ care coordination—a process in which an individual or group helps to arrange a patient's primary and specialty health care services—it may be able to utilize measures HMOs now use to promote preventive care use.

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## Conclusions

Adherence to Task Force and ACIP recommendations is uneven among Medicare FFS beneficiaries, with use of a number of services falling short or exceeding age-specific clinical recommendations. Likewise, MA HMO performance data revealed wide variation in service use across organizations. This information indicates the considerable challenge in achieving closer alignment of patterns of use with evidence-based recommendations for preventive care. Even when beneficiaries were not required to share the cost of a service—as with immunizations—many were not receiving the recommended preventive services. Therefore, efforts may be needed that go beyond eliminating out-of-pocket costs for a core set of preventive services, as PPACA has done.

Use of preventive services could be improved to better align with Task Force and ACIP recommendations by providing more information to both beneficiaries and providers. For some services, beneficiaries may not be aware of the preventive services that they need or their physicians may not have discussed certain preventive services, resulting in lower than recommended use. For other services, use rates were substantial even though the Task Force recommended against their provision for certain subpopulations. Beneficiaries and providers may not be aware that some preventive services are recommended for specific age groups and not recommended for others.

Furthermore, better alignment of preventive service use with Task Force and ACIP recommendations is unlikely without appropriate Medicare coverage. Low use of some recommended services which have a recommendation grade of “A” or “B”—such as bone mass measurement for osteoporosis screening—may result, in part, from limitations on which beneficiaries are covered or how frequently the service is covered. Conversely, the absence of cost sharing for services with a recommendation grade of “D”—such as the PSA test—may send an inappropriate signal to Medicare beneficiaries. Thus, Medicare coverage and cost-sharing policies do not always encourage the use of high-valued preventive services—those recommended by the Task Force—and discourage use of low-value services—those for which clinical evidence suggests that the risks generally outweigh the benefits.

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## Matter for Congressional Consideration

To further align Medicare beneficiary use of preventive services with Task Force recommendations, Congress should consider requiring beneficiaries who receive services with a grade of “D” to share the cost, notwithstanding that cost sharing may not be required for other beneficiaries receiving the same services.

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## Recommendation for Executive Action

The Administrator of CMS should take steps to better align Medicare beneficiary use of preventive services with Task Force recommendations, including providing coverage of services with an “A” or “B” grade for the recommended population and at the recommended frequency, as she determines is appropriate considering cost-effectiveness and other criteria.

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## Agency and Industry Comments and Our Evaluation

We received written comments on a draft of this report from HHS and oral comments on a portion of the draft from representatives of America’s Health Insurance Plans (AHIP).<sup>58</sup> HHS’s general comments are included as appendix V. The agency also provided technical comments, which we incorporated as appropriate.

HHS agreed that there is room for improvement in preventive service use by Medicare beneficiaries, but noted that FFS preventive service use rates are likely higher than we reported due to inherent difficulties in relying on claims data and the time frame of the analysis. Specifically, the agency stated that our claims-based analysis of vaccinations likely underestimated actual 2009 use rates because not all vaccine providers bill Medicare directly; it cited higher 2009 use rates derived from telephone survey responses. In the report, we acknowledge that FFS claims may not account for all utilization if beneficiaries obtain services from sources that do not bill Medicare. We further report that CDC survey data showed higher use rates for both influenza and pneumococcal vaccinations. At the same time, we note that self-reported data collected by surveys may overcount use of preventive services for various reasons.

In addition, HHS commented that our use rates for colorectal cancer screening would have been more accurate if we had examined a 10-year period—the recommended time frame for a screening colonoscopy for those not at high risk; again, it cited higher use rates for a related colorectal cancer screening measure derived from survey data. For two of the three recommended regimens for detecting colorectal cancer, our review of 5 years of Medicare claims data corresponds to the recommended frequencies—fecal occult blood testing every year or a sigmoidoscopy every 5 years along with fecal occult blood testing every

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<sup>58</sup>AHIP is a national trade association representing health insurance companies, including those participating in the Medicare Advantage program.

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3 years. For the third regimen—a colonoscopy every 10 years—we note in the report that our decision to use a 5-year time frame for this service may have resulted in an undercount of the share of beneficiaries who met the recommendation. Because our methodology required continuous enrollment in Medicare FFS during the period of examination, we chose the shorter time frame in order to obtain a robust sample of beneficiaries, as well as to allow for the inclusion of younger beneficiaries in our analysis.

HHS also commented that, because the report examined service use as of 2009, it does not capture the influence of PPACA changes to beneficiary cost sharing, which it expects will increase use of certain preventive services over time. When we began our review, Medicare claims for 2009 were the most current data available. We describe the January 2011 changes in beneficiary cost sharing in the report, but measuring their effect on utilization—which may not be evident for some time—was not possible. Nevertheless, our analysis demonstrates that for certain services—such as immunizations—the absence of cost sharing has not been sufficient to align FFS beneficiary use with Task Force recommendations.

In response to our recommendation, HHS pointed out that it has recently used its authority to expand Part B benefits to cover several new preventive services. This additional coverage, however, does not address the misalignment that remains between Medicare coverage for certain services and the corresponding Task Force recommendations. As we noted in the report, for example, bone mass measurement for osteoporosis screening has a recommendation grade of “B” from the Task Force for all women over the age of 65. Yet, Medicare coverage for this service is limited to those who meet specific clinical criteria. As a result, not all women over the age of 65 are eligible for this benefit. We have altered the language of our recommendation to clarify that, in addition to covering new services recommended by the Task Force, CMS should ensure that all beneficiaries for whom a current recommendation applies have coverage for that service at the recommended frequency, as appropriate.

In their oral comments, AHIP representatives said the report demonstrated that, through the use of innovative tools such as performance feedback and incentives, MA plans are leaders in promoting greater use of preventive services. They also noted that, as it is currently structured, Medicare FFS cannot apply the kinds of management tools used by HMOs.

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As we agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution of it until 30 days from its date. We are sending copies of this report to the Secretary of Health and Human Services. The report will also be available at no charge on our website at <http://www.gao.gov>.

If you or your staffs have any questions about this report, please contact me at (202) 512-7114 or [cosgrovej@gao.gov](mailto:cosgrovej@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix VI.

A handwritten signature in black ink, appearing to read 'James C. Cosgrove', written in a cursive style.

James C. Cosgrove  
Director, Health Care

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# Appendix I: Scope and Methodology

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This appendix describes our methodology for addressing the four objectives: (1) the extent to which use of preventive services by fee-for-service (FFS) beneficiaries aligns with U.S. Preventive Services Task Force or the Advisory Council on Immunization Practices (ACIP) recommendations, (2) the extent to which FFS beneficiaries use the Welcome to Medicare (WTM) exam and whether use of that service is associated with higher use of preventive care services, (3) how preventive service use in Medicare Advantage (MA) compares to use in FFS, and (4) the extent to which use varies among MA health maintenance organizations (HMO) and which practices the better performing HMOs find effective in promoting use of preventive services. To address the objectives, we analyzed the most recently available data from Medicare claims, a beneficiary survey, and MA plan ratings. The appendix also describes our efforts to ensure the reliability of the data.

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## Preventive Service Use Alignment with Task Force Recommendations

To determine the extent to which preventive service use aligns with guidelines, we selected certain Medicare-covered preventive services that had related Task Force or ACIP guidelines for the general Medicare population. We identified all Medicare-covered preventive services, but included only those that had an “A,” “B,” “C,” or “D” grade from the Task Force or an ACIP recommendation for some groups of beneficiaries.<sup>1</sup> We excluded preventive services for which the recommendations were primarily aimed at high-risk populations and populations with specific diagnoses because identifying the appropriate target population cannot be done reliably. Finally, we excluded preventive services that are only recommended by providers through the use of the WTM exam or billed through the WTM exam. We recognize that guidelines may not apply to all beneficiaries due to individual circumstances, and that 100 percent use of recommended services is unrealistic. We considered Medicare FFS use to be in alignment with the Task Force and ACIP if at least three in four beneficiaries overall received a recommended service. We also considered use to be in alignment if no more than one in four beneficiaries overall received a service that the Task Force recommended against having.

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<sup>1</sup>In some instances, services we reviewed had a grade of “I” for certain age groups, but all selected services at least had one “A,” “B,” “C,” or “D” grade recommendation.

To determine FFS beneficiaries' use rates for the selected preventive services, we analyzed claims data from 2005 through 2009 from a 5 percent sample of beneficiaries. Measurement intervals varied by service based on service-specific age and frequency parameters outlined in Task Force or ACIP guidelines. CMS provided a list of relevant Healthcare Common Procedure Coding System (HCPCS) codes and International Classification of Diseases (ICD) diagnosis and procedure codes for the services for which claims could be submitted. Using claims from Physician, Inpatient, Outpatient, and Skilled Nursing Facility 5 Percent Standard Analytic Files and enrollment data from CMS's Denominator file for the same 5 percent sample, we created an estimate of the use rates of the selected preventive services for service-specific time frames, based on Task Force and ACIP recommendations.

- Influenza Vaccine: Because it is recommended once a year, we examined claims from the 2008 to 2009 flu season.
- Pneumococcal Vaccine: Because it is recommended once for those 65 or older, we examined beneficiaries who were 65 years old as of January 1, 2005, and examined claims from 2005 through 2009.
- Mammography: Because it is recommended once every 2 years, we examined claims in 2008 and 2009.
  - Mammography is recommended for women 50 through 74. To account for all potential screenings, we included both screening and diagnostic HCPCS codes when analyzing use rates for women 65 through 74. When analyzing use for women aged 75 or older, we only included screening codes.
- Cervical Cancer Screening: Because the recommended interval was every 3 years, we examined claims from 2007 through 2009.
- Cholesterol Screening: Because the Task Force suggests that a reasonable interval may be every 5 years, we examined claims from 2005 to 2009. Because it is recommended for all men aged 35 or older (but only high-risk women), we only examined claims for male beneficiaries.
- Colorectal Cancer Screening: Because the Task Force recommends most services annually or every 5 years, we examined colorectal cancer screening claims from 2005 through 2009.

- Colorectal cancer screening is recommended for beneficiaries aged 50 through 75. To account for all potential screenings, we included both screening and diagnostic HCPCS codes when analyzing use rates for beneficiaries 65 through 75. When analyzing use for beneficiaries aged 76 or older, we only included screening codes.
- Osteoporosis Screening: Because the Task Force notes that a screening interval of a minimum of 2 years may be necessary to discern notable differences in bone density, but that longer intervals may also be necessary, we calculated bone mass measurement claims from 2005 through 2009.
- Prostate Cancer Screening: For men younger than 75, the Task Force concluded that evidence was insufficient to assess the balance of benefits and harms of PSA testing. Because it found that PSA screening as infrequently as once every 4 years could yield as much benefit as annual screening, we measured use of the PSA test over a 4-year period 2006 through 2009.

The Medicare 5 percent files contain claims and demographic information for 5 percent of the Medicare FFS population. Files are constructed such that results from this analysis are generalizable to the entire FFS Medicare population.

We excluded the following beneficiaries from the denominator: beneficiaries under the age of 65, beneficiaries with MA enrollment, beneficiaries who had End Stage Renal Disease (ESRD), beneficiaries who were institutionalized, and beneficiaries who were only partially enrolled in Medicare part A or B during the interval of study. To analyze urban/rural beneficiary status, we used the CMS Core Based Statistical Area state and county code crosswalk to match with the state and county code information in the Denominator file. To analyze Health Professional Shortage Area (HPSA) beneficiary status, we used the Health Resources and Services Administration (HRSA) Primary Care HPSA zip code crosswalk to match with the zip code information in the Denominator file. We determined that the urban/rural status of beneficiaries in the 5 percent denominator file is proportionate to the 100 percent denominator file, and thus geographic weights were not necessary for our analysis.

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**Welcome to Medicare Exam Use**

To assess FFS beneficiaries' use of the Welcome to Medicare exam, we analyzed a 5 percent sample of 2008 and 2009 claims for eligible beneficiaries—that is, beneficiaries who became eligible for the Welcome to Medicare exam sometime in 2008. We excluded the following beneficiaries from the denominator: beneficiaries with MA enrollment, beneficiaries who had ESRD, beneficiaries who were institutionalized, and beneficiaries who were not simultaneously enrolled in both Medicare part A and B for at least 6 months in 2009.

To determine the association, if any, between the Welcome to Medicare exam and use of preventive services, we compared claims for a selection of recommended preventive services from 2006 through 2009 for beneficiaries who became eligible for a Welcome to Medicare exam in 2006 and received it with those for beneficiaries who did not have that exam. We constructed a data set that consisted of 100 percent of the beneficiaries who reached age 65 in 2006. We also excluded the following beneficiaries from the data set: beneficiaries with MA enrollment, beneficiaries who had ESRD, beneficiaries who were institutionalized, and beneficiaries who were only partially enrolled in Medicare part A or B anytime from 2007 through 2009. Looking separately at female and male beneficiaries, we counted claims for recommended preventive services between 2006 and 2009 using CMS-provided HCPCS and ICD codes from 100 percent of the Medicare claims. For female beneficiaries, we calculated the rate of having received at least three influenza vaccines, at least one pneumococcal vaccination, one bone mass measurement, one colorectal cancer screening, and one mammography. For male beneficiaries we calculated the rate of having received at least three influenza vaccines, at least one pneumococcal vaccination, one colorectal cancer screening, and one cholesterol test. For mammography and colorectal cancer screenings, we included both diagnostic and screening codes.

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**Medicare Advantage and Fee-for-Service Use**

To compare preventive service use in MA to use in FFS, we analyzed beneficiary survey results, as claims data for services provided to MA beneficiaries are not available from CMS. Using 2009 Medicare Current Beneficiary Survey (MCBS) data and plan enrollment data supplied by CMS, we examined the effect that enrollment in MA HMO plans and non-

HMO plans had on use compared with FFS.<sup>2</sup> The MCBS interview data contained responses from a sample of 14,695 MA and FFS beneficiaries as well as weights that can be used for making estimates for the population enrolled in Medicare during the year.

The 2009 MCBS contained survey questions for seven of our selected preventive services: cholesterol testing, mammography, pap testing, PSA testing, colorectal cancer testing, influenza vaccination, and pneumococcal vaccination. We constructed a measure for colorectal cancer screening using several survey variables. The survey question for pneumococcal vaccination asked if the respondents had ever had the service while the questions for the other services either asked about the most recent year—the question for influenza vaccination asked about the recent flu season—or asked about certain time intervals that allowed us to group answers in a way to measure utilization within the last year. The 2008 MCBS contained a question on osteoporosis testing and we conducted the same analysis using the survey and enrollment data from 2008.

Our analysis accounted for the effects of contract type, age, dual-eligibility, education, sex, race, Hispanic heritage, income, marital status, health status, and geographic location. We omitted beneficiaries in institutional settings or those under 65 as well as those who did not give a response on any of the included questions on beneficiary characteristics. These filters yielded a dataset of 11,216 respondents representing 34 million beneficiaries.

Although the MCBS contained an array of useful variables on beneficiary characteristics, the variable for MA enrollment was not particularly useful for our purposes as 95 to 96 percent of MA enrollees were classified as “risk HMO enrollees” for every month in 2009 while data from monthly CMS enrollment data showed a much different distribution. For example, the CMS enrollment file for February 2009 showed that 63 percent of MA enrollees were enrolled in HMO plans, 22 percent were enrolled in Private Fee-for-Service (PFFS) plans and another 12 percent were enrolled in Preferred Provider Organization (PPO) plans, with the remainder

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<sup>2</sup>The MCBS is a survey of a nationally representative sample of the Medicare population, including both aged and disabled beneficiaries. The survey data are released annually and the results are contained in two data files, Access to Care and Cost and Use. The Access to Care file contained responses related to preventive care.

scattered among some other plan categories. At our request, CMS supplied us with a crosswalk that allowed us to map respondents to MA organization contract number. As each organization contract number had a unique plan type, we were able to associate each contract number with its plan type using mapping available in CMS MA enrollment data. Based on this mapping, the resulting distribution approximated the CMS-reported distribution of enrollees by plan type. Of this group, we were able to assign all but 4 percent of enrollees to one of three enrollment categories—FFS, MA HMO, and MA non-HMO (both PFFS and PPO enrollees). Beneficiaries were assigned to a category if they were enrolled no more than 1 month in a different plan type. Those who were enrolled at least 2 months in multiple categories were not assigned.

We used logistic regression to estimate the marginal effect of beneficiaries' enrollment choice on the use of a selected preventive service, holding other beneficiary characteristics constant. We reported the differences if the results were statistically significant at the 95 percent confidence level.

To determine reasons beneficiaries report for not receiving preventive services, we examined MCBS follow-up questions for respondents who indicated they had not received a particular preventive service. For example, a respondent may indicate they did not know the test was needed or their doctor did not recommend it. We compared the distribution of reasons given by nonrecipients of those services by question and by enrollment category.

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## Comparison of MA HMO Use of Preventive Services

Because our analysis of MCBS data indicated that only MA HMOs displayed a statistically significant difference in use rates from FFS, we limited our examination of any differences in utilization of preventive services to MA HMOs. Using information on star ratings for 2011 posted on CMS's Medicare Health Plan Compare website, we examined ratings for five of the eight selected preventive services: Colorectal cancer screening, influenza vaccination, mammography, osteoporosis testing, and pneumococcal vaccination.<sup>3</sup> The ratings are based on relative use rates across plans and, although they are displayed by plan, they are

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<sup>3</sup>The Plan Compare database contained use rate information for cholesterol testing but it was based on a subset of beneficiaries with certain diseases. The database did not include information on cervical cancer screening or PSA tests.

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actually determined at the contract organization level. In order to analyze the distribution of HMO beneficiaries as well as the distribution of HMO organizations, we associated each organization with enrollment data from January 2010 because it represented a midpoint in the range of dates of the source data.<sup>4</sup> We identified HMO organizations using the plan type variable in the enrollment file. Of the 575 MA organizations in the 2011 Plan Compare, 353 were HMOs with enrollment in January 2010. Of the 353, between 262 and 288 had star rankings for the selected services, the remainder were either not required to report data, were too new or too small, or had insufficient data to calculate a particular measure.

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**Practices Considered Effective by MA Organizations**

To learn about approaches for improving delivery of preventive services, we interviewed officials from six HMOs that ranked among the top performing for provision of selected preventive services and had enrollment of 37,000 or greater in January 2011. The HMOs we selected had five stars on four of our selected services and at least four stars on the remaining service.

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**Data Reliability and Audit Standards**

We ensured the reliability of the Medicare claims data, MCBS data, and Plan Compare data used in this report by performing appropriate electronic data checks and by interviewing agency officials who were knowledgeable about the data. We found the data were sufficiently reliable for the purpose of our analyses.

We conducted this performance audit from September 2010 through January 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>4</sup>The star ratings are based on use rates from administrative data from 2009 and survey data from 2009 and 2010.

# Appendix II: Medicare Part B Coverage and Cost Sharing for Preventive Services as of September 2011

Service	Year first covered	Groups covered	Frequency of service	Beneficiary cost sharing <sup>a</sup>
<b>Vaccinations</b>				
Pneumococcal vaccination	1981	All beneficiaries	As needed (likely once per lifetime)	None <sup>b</sup>
Hepatitis B vaccination	1984	Beneficiaries at intermediate or high risk of contracting hepatitis B	Scheduled dosages are required	None <sup>b</sup>
Influenza vaccination	1993	All beneficiaries	Once every flu season	None <sup>b</sup>
<b>Screening services</b>				
Cervical cancer—pap test	1990	All female beneficiaries	Every 2 years <sup>c</sup>	None <sup>b</sup>
Breast cancer—mammography	1991	Female beneficiaries 40 or older <sup>d</sup>	Every year	None <sup>b</sup>
Vaginal cancer—pelvic exam	1998	All female beneficiaries	Every 2 years <sup>c</sup>	None <sup>b</sup>
Colorectal cancer—fecal occult blood test	1998	Beneficiaries 50 or older	Every year	None for screening; generally 20 percent of approved amount for visit
Colorectal cancer—barium enema	1998	Beneficiaries 50 or older when used instead of a flexible sigmoidoscopy or colonoscopy	Every 4 years <sup>e</sup>	20 percent of approved amount
Colorectal cancer—flexible sigmoidoscopy	1998	Beneficiaries 50 or older	Every 4 years or 10 years after a colonoscopy <sup>e</sup>	None <sup>b</sup>
Colorectal cancer—colonoscopy	1998	All beneficiaries	Every 10 years or 4 years after a flexible sigmoidoscopy <sup>e</sup>	None <sup>b</sup>
Osteoporosis—bone mass measurement	1998	Estrogen-deficient female beneficiaries at clinical risk for osteoporosis as well as other qualified individuals <sup>f</sup>	Every 2 years <sup>g</sup>	None <sup>b</sup>
Prostate cancer—Prostate-Specific Antigen test	2000	Male beneficiaries 50 or older	Every year	20 percent of approved amount for visit and deductible for visit may apply <sup>h</sup>
Prostate cancer—digital rectal examination	2000	Male beneficiaries 50 or older	Every year	20 percent of approved amount and deductible applies for visit <sup>h</sup>
Glaucoma	2002	Beneficiaries determined to be at high risk for glaucoma <sup>i</sup>	Every year	20 percent of approved amount after annual deductible <sup>h</sup>
Cardiovascular disease—screening electrocardiogram (EKG)	2004	For beneficiaries whose physician ordered as part of a Welcome to Medicare exam	One-time	20 percent of approved amount after annual deductible <sup>h</sup>

**Appendix II: Medicare Part B Coverage and  
Cost Sharing for Preventive Services as of  
September 2011**

<b>Service</b>	<b>Year first covered</b>	<b>Groups covered</b>	<b>Frequency of service</b>	<b>Beneficiary cost sharing<sup>a</sup></b>
Diabetes	2005	Beneficiaries with risk factors such as hypertension, history of dyslipidemia, obesity, a history of high blood sugar	Up to twice a year	None for screening; generally 20 percent of approved amount for visit
Cardiovascular disease—cholesterol test	2005	Beneficiaries with no signs or symptoms of cardiovascular disease	Every 5 years	None for screening; generally 20 percent of approved amount for visit
Abdominal Aortic Aneurysm (AAA)—ultrasound	2007	Beneficiaries medically determined to be at risk for AAA and given a referral during the Welcome to Medicare exam	One-time	None <sup>b</sup>
Human immunodeficiency virus (HIV)	2009	All beneficiaries who ask for the test, pregnant women, and beneficiaries at increased risk for infection	Every year for beneficiaries at increased risk, or up to three times per pregnancy	None for screening; generally 20 percent of approved amount for visit
<b>Other</b>				
Diabetes outpatient self-management training	1998	Diabetic beneficiaries with written order from provider	Up to 10 hours of training first year, up to 2 hours follow-up training subsequent years	20 percent of approved amount after annual deductible <sup>h</sup>
Medical nutrition therapy	2002	Beneficiaries with diabetes, kidney disease, or who have had a kidney transplant within the past 3 years, and that are referred by a physician	Up to 3 hours of training first year, 2 hours training subsequent years	None <sup>b</sup>
Initial Preventive Physical Examination (IPPE) or Welcome to Medicare (WTM) exam	2005	All beneficiaries within 1 year of enrollment	One-time	None <sup>b</sup>
Smoking and tobacco use cessation	2005	All beneficiaries who use tobacco	Up to eight visits every year	None for beneficiaries who have not been diagnosed with related illness <sup>j</sup>
Annual Wellness Visit (AWV)	2011	All beneficiaries enrolled in Part B for at least 1 year who have not had an IPPE or AWV within the past year	Every year	None <sup>b</sup>

Sources: CMS, GAO.

Note: In October 2011, CMS announced new coverage of alcohol misuse counseling and depression screening; CMS also announced in November 2011 new coverage of screening for Sexually Transmitted Infections, high-intensity behavioral counseling to prevent Sexually Transmitted Infections, and intensive behavioral therapy to reduce the risk of cardiovascular disease as well as obesity.

<sup>a</sup>Cost sharing may be different for several components of a preventive service, such as the administration of the service, any lab testing that may be involved with the service, and the physician office visit associated with the service. Some services when provided in a hospital setting may require a separate copayment for the hospital visit.

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**Appendix II: Medicare Part B Coverage and  
Cost Sharing for Preventive Services as of  
September 2011**

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<sup>b</sup>If the provider does not accept assignment for providing the service, the beneficiary may have to pay for 100 percent of the service up front and submit a claim to Medicare for reimbursement, and the provider may charge more than the Medicare-approved payment.

<sup>c</sup>Medicare covers annual pap and pelvic exams for women who are at high risk for cervical or vaginal cancers and for women who are of childbearing age who have had an abnormal Pap test result within the past 3 years.

<sup>d</sup>Medicare also covers one baseline mammogram for women 35-39.

<sup>e</sup>Medicare-covered screening intervals for these tests are shortened for beneficiaries at high risk.

<sup>f</sup>The statute defines "qualified individuals" to include also those who have vertebral abnormalities or primary hyperparathyroidism, or who are receiving long-term glucocorticoid steroid or osteoporosis drug therapy. See 42 U.S.C. § 1395x(rr)(2).

<sup>g</sup>CMS permits coverage of a bone mass measurement more frequently if the service is medically necessary. 42 C.F.R. § 410.31(c) .

<sup>h</sup>Each year, beneficiaries are responsible for 100 percent of the payment amount until those payments equal a specified deductible amount, \$162 in 2011.

<sup>i</sup>High-risk populations include those with diabetes, a family history of glaucoma, African Americans aged 50 or older, and Hispanics aged 65 or older. 42 C.F.R. § 410.23(a)(2).

<sup>j</sup>Beneficiaries who have been diagnosed with an illness caused or complicated by tobacco use must still pay 20 percent of the approved amount after the annual deductible.

# Appendix III: Tables with Full Analysis of Preventive Service Use in Medicare FFS

This appendix provides complete details of our analyses of the following Medicare preventive services: cholesterol tests, pap tests, influenza vaccinations, pneumococcal vaccinations, bone mass measurements, mammograms, colorectal cancer screenings, and PSA tests.

**Table 16: Use of Cholesterol Tests by Male Medicare FFS Beneficiaries during the 5-year Period 2005 through 2009**

Numbers in percent			
Male beneficiaries <sup>a,b</sup>	No services	One service	Two or more services
<b>All</b>	<b>16.2</b>	<b>8.3</b>	<b>75.5</b>
65 to 74	16.4	7.9	75.8
75 to 84	15.2	8.6	76.2
85 or older	21.7	12.3	66.0
Not dual	16.0	8.2	75.9
Dual	19.9	10.0	70.1
White	15.6	8.2	76.3
Black	24.3	9.8	65.9
Hispanic	22.7	10.2	67.2
Asian	12.7	7.6	79.7
Other/Unknown	23.7	8.1	68.2
Urban	15.1	7.8	77.1
Rural	19.6	9.9	70.5
South	15.7	8.0	76.3
West	19.0	9.2	71.8
Midwest	16.7	9.2	74.1
Northeast	13.9	6.8	79.3
Other/Unknown	18.9	7.2	73.9
Not HPSA	15.8	8.2	76.0
HPSA	21.2	9.8	69.0

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2005.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 17: Use of Screening Pap Tests by Female Medicare FFS Beneficiaries during the 3-year Period 2007 through 2009**

Numbers in percent			
Female beneficiaries <sup>a,b</sup>	No services	One service	Two or more services
<b>All</b>	<b>77.0</b>	<b>17.8</b>	<b>5.2</b>
65 to 74	69.1	23.7	7.3
75 to 84	83.1	13.4	3.5
85 or older	93.9	5.1	1.0
Not dual	75.7	18.7	5.6
Dual	86.3	11.5	2.1
White	76.3	18.3	5.4
Black	81.6	14.7	3.7
Hispanic	86.2	11.7	2.1
Asian	84.7	12.8	2.6
Other/Unknown	81.1	15.4	3.6
Urban	76.5	18.0	5.4
Rural	78.7	17.1	4.3
South	75.6	18.9	5.5
West	79.8	16.2	4.1
Midwest	78.6	16.9	4.5
Northeast	75.4	18.3	6.3
Other/Unknown	89.7	9.2	1.1
Not HPSA	76.8	18.0	5.3
HPSA	80.1	16.0	3.9

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2007.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 18: Use of Influenza Vaccination by Medicare FFS Beneficiaries for the July 2008 through June 2009 Flu Season**

Numbers in percent

<b>Beneficiaries<sup>a,b</sup></b>	<b>No vaccinations</b>	<b>One vaccination</b>	<b>Two or more vaccinations</b>
<b>All</b>	<b>50.9</b>	<b>48.8</b>	<b>0.3</b>
Female	49.2	50.6	0.3
Male	53.4	46.4	0.2
65 to 74	55.7	44.1	0.2
75 to 84	45.8	53.9	0.3
85 or older	45.3	54.4	0.3
Not dual	49.4	50.3	0.3
Dual	63.2	36.5	0.3
White	48.9	50.9	0.3
Black	70.2	29.6	0.1
Hispanic	73.1	26.7	0.2
Asian	52.4	47.2	0.4
Other/Unknown	59.1	40.6	0.3
Urban	49.8	49.9	0.3
Rural	54.4	45.4	0.2
South	51.5	48.3	0.3
West	55.2	44.6	0.2
Midwest	48.0	51.7	0.3
Northeast	48.9	50.7	0.4
Other/Unknown	93.1	6.9	0.0
Not HPSA	50.1	49.6	0.3
HPSA	60.6	39.2	0.2

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of July 1, 2008.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 19: Use of the Pneumococcal Vaccination during the 5-year Period 2005 through 2009 by Medicare FFS Beneficiaries Aged 65 as of January 1, 2005**

Numbers in percent

<b>Beneficiaries<sup>a</sup></b>	<b>No vaccinations</b>	<b>One vaccination</b>	<b>Two or more vaccinations</b>
<b>All</b>	<b>72.7</b>	<b>25.8</b>	<b>1.5</b>
Female	71.7	26.9	1.5
Male	73.9	24.5	1.6
Not dual	72.1	26.5	1.5
Dual	78.4	19.8	1.8
White	71.6	26.8	1.6
Black	82.4	16.5	1.1
Hispanic	84.7	13.9	1.3
Asian	75.7	22.8	1.6
Other/Unknown	76.3	22.7	1.1
Urban	71.6	26.7	1.7
Rural	75.8	23.1	1.1
South	73.2	25.2	1.6
West	74.4	24.3	1.3
Midwest	71.2	27.2	1.6
Northeast	71.4	27.1	1.6
Other/Unknown	97.1	2.9	0.0
Not HPSA	72.2	26.2	1.6
HPSA	77.6	21.2	1.3

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (2) beneficiaries residing in institutions, (3) ESRD beneficiaries, and (4) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 20: Use of Bone Mass Measurements by Female Medicare FFS Beneficiaries during the 5-year Period 2005 through 2009**

Numbers in percent			
Female beneficiaries <sup>a,b</sup>	No services	One service	Two or more services
<b>All</b>	<b>47.4</b>	<b>29.3</b>	<b>23.3</b>
65 to 74	42.2	31.2	26.6
75 to 84	50.3	28.5	21.2
85 or older	70.5	19.7	9.8
Not dual	45.7	29.8	24.6
Dual	59.8	25.8	14.4
White	46.0	29.8	24.2
Black	62.7	24.5	12.8
Hispanic	54.5	27.6	18.0
Asian	50.7	27.9	21.5
Other/Unknown	53.3	26.2	20.5
Urban	46.0	29.5	24.5
Rural	52.3	28.6	19.2
South	45.8	29.6	24.6
West	47.2	29.3	23.5
Midwest	49.9	29.6	20.5
Northeast	47.8	28.1	24.0
Other/Unknown	45.3	30.2	24.6
Not HPSA	46.8	29.5	23.7
HPSA	55.2	27.1	17.8

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2005.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 21: Use of Screening and Diagnostic Mammography by Female Medicare FFS Beneficiaries Aged 65 to 74 during the 2-year Period 2008 through 2009**

Numbers in percent		
Female beneficiaries <sup>a,b</sup>	No mammogram	One or more mammograms
<b>All aged 65 to 74</b>	<b>35.5</b>	<b>64.5</b>
Not dual	33.2	66.8
Dual	51.3	48.7
White	34.3	65.8
Black	40.9	59.1
Hispanic	51.6	48.4
Asian	51.7	48.3
Other/Unknown	45.6	54.4
Urban	34.7	65.3
Rural	38.0	62.0
South	35.8	64.3
West	37.8	62.2
Midwest	34.7	65.3
Northeast	33.7	66.3
Other/Unknown	44.5	55.5
Not HPSA	35.0	65.0
HPSA	41.6	58.4

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2008.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 22: Use of Screening Mammography by Female Medicare FFS Beneficiaries Aged 75 or Older during the 2-year Period 2008 through 2009**

Numbers in percent		
Female beneficiaries <sup>a,b</sup>	No mammogram	One or more mammograms
<b>All aged 75 or older</b>	<b>59.5</b>	<b>40.5</b>
75 to 84	52.9	47.1
85 or older	77.9	22.1
Not dual	57.3	42.7
Dual	73.8	26.2
White	58.4	41.6
Black	64.7	35.4
Hispanic	71.5	28.5
Asian	74.3	25.7
Other/Unknown	68.6	31.4
Urban	59.2	40.8
Rural	60.4	39.6
South	59.1	40.9
West	60.0	40.0
Midwest	58.6	41.4
Northeast	60.3	39.7
Other/Unknown	88.2	11.8
Not HPSA	59.1	40.9
HPSA	64.2	35.8

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2008.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 23: Use of Colorectal Cancer Screening and Diagnostic Services by Medicare FFS Beneficiaries Aged 65 to 75, 2005 through 2009**

Numbers in percent		
Beneficiaries <sup>a,b</sup>	Followed a regimen	Did not follow a regimen
<b>All beneficiaries 65 to 75</b>	<b>25.5</b>	<b>74.5</b>
Female	27.0	73.0
Male	23.5	76.5
Not dual	26.1	73.9
Dual	19.8	80.2
White	25.8	74.2
Black	24.8	75.2
Hispanic	19.2	80.8
Asian	19.3	80.7
Other/Unknown	21.8	78.2
Urban	25.7	74.3
Rural	24.8	75.2
South	26.1	73.9
West	23.2	76.8
Midwest	25.3	74.7
Northeast	26.6	73.4
Other/Unknown	24.3	75.7
Not HPSA	25.7	74.3
HPSA	23.3	76.7

Source: GAO analysis of CMS Medicare claims data.

Note: These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2005.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 24: Use of Colorectal Cancer Screening Services by Medicare FFS Beneficiaries Aged 76 or Older, 2005 through 2009**

Numbers in percent		
Beneficiaries <sup>a,b</sup>	Followed a regimen	Did not follow a regimen
<b>All beneficiaries 76 or older</b>	<b>5.8</b>	<b>94.3</b>
Female	5.4	94.6
Male	6.4	93.6
76 to 85	6.3	93.7
86 or older	2.0	98.0
Not dual	6.0	94.0
Dual	3.6	96.4
White	5.9	94.1
Black	5.3	94.7
Hispanic	3.5	96.5
Asian	4.3	95.7
Other/Unknown	3.9	96.1
Urban	5.7	94.3
Rural	5.8	94.2
South	5.8	94.2
West	5.4	94.6
Midwest	6.6	93.4
Northeast	4.9	95.1
Other/Unknown	0.6	99.4
Not HPSA	5.8	94.2
HPSA	5.3	94.7

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2005.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

**Table 25: Use of PSA Tests by Male Medicare FFS Beneficiaries during the 4-year Period 2006 through 2009**

Numbers in percent			
Male beneficiaries <sup>a,b</sup>	No services	One service	Two or more services
<b>All</b>	<b>50.9</b>	<b>23.6</b>	<b>25.6</b>
65 to 74	48.0	23.5	28.5
75 or older	55.3	23.8	20.9
75 to 84	53.7	24.1	22.1
85 or older	65.0	21.5	13.6
Not dual	50.1	23.6	26.3
Dual	60.6	23.1	16.3
White	49.5	23.9	26.6
Black	59.9	21.7	18.5
Hispanic	67.4	21.2	11.4
Asian	67.1	19.9	13.0
Other/Unknown	64.1	19.2	16.7
Urban	52.5	23.3	24.3
Rural	46.0	24.5	29.4
South	48.0	24.0	28.0
West	60.5	22.3	17.2
Midwest	44.1	24.8	31.1
Northeast	56.1	22.7	21.3
Other/Unknown	92.3	5.7	2.1
Not HPSA	51.1	23.6	25.4
HPSA	48.6	23.9	27.5

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries under age 65, (2) beneficiaries who were not continuously enrolled in Parts A and B during the period of study, (3) beneficiaries residing in institutions, (4) ESRD beneficiaries, and (5) beneficiaries who were enrolled at any time in Medicare Advantage during the period of study.

<sup>a</sup>Denotes the beneficiary's age as of January 1, 2006.

<sup>b</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

# Appendix IV: Use of the Welcome to Medicare Exam by Medicare FFS Beneficiaries Who Reached Age 65 in 2008

Numbers in percent		
Beneficiaries <sup>a</sup>	Received WTM exam	Did not receive WTM exam
<b>All</b>	<b>6.6</b>	<b>93.4</b>
Female	7.0	93.0
Male	6.1	93.9
Not dual	7.3	92.7
Dual	1.1	99.0
White	7.3	92.7
Black	1.7	98.3
Hispanic	0.7	99.3
Asian	3.4	96.6
Other/Unknown	3.7	96.3
Urban	6.7	93.3
Rural	6.3	93.7
South	6.1	93.9
West	6.4	93.6
Midwest	8.0	92.0
Northeast	6.4	93.7
Other/Unknown	0.0	100.0
Not HPSA	6.8	93.2
HPSA	4.2	95.8

Source: GAO analysis of CMS Medicare claims data.

Note: Percentages may not add to 100 due to rounding. These data exclude (1) beneficiaries who were not continuously enrolled in Parts A and B during 2008 and half of 2009, (2) beneficiaries residing in institutions, (3) ESRD beneficiaries, and (4) beneficiaries who were enrolled at any time in Medicare Advantage during 2008.

<sup>a</sup>Enrollment data have limitations in accurately identifying beneficiary race and ethnicity, resulting in an underreporting of Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives.

# Appendix V: Comments from the Department of Health and Human Services



DEPARTMENT OF HEALTH & HUMAN SERVICES

OFFICE OF THE SECRETARY

Assistant Secretary for Legislation  
Washington, DC 20201

James Cosgrove, Director  
Health Care  
U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

DEC 16 2011

Dear Mr. Cosgrove:

Attached are comments on the U.S. Government Accountability Office's (GAO) draft report entitled, "MEDICARE: Use of Preventive Services Could Be Better Aligned with Clinical Recommendations" (GAO-12-81).

The Department appreciates the opportunity to review this report prior to publication.

Sincerely,

A handwritten signature in black ink that reads "Jim R. Esquea".

Jim R. Esquea  
Assistant Secretary for Legislation

Attachment

**GENERAL COMMENTS OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS) ON THE GOVERNMENT ACCOUNTABILITY OFFICE'S (GAO) DRAFT REPORT ENTITLED, "MEDICARE: USE OF PREVENTIVE SERVICES COULD BE BETTER ALIGNED WITH CLINICAL RECOMMENDATIONS" (GAO-12-81)**

The Department appreciates the opportunity to review and comment on this draft report.

While the Centers for Medicare & Medicaid Services (CMS) agrees that there is room for improvement in the use of recommended preventive services in the Medicare population, we believe the actual rates of preventive service use are likely to be better than reported due to inherent difficulties in using claims data to estimate health behaviors and the timeframe of the data analyses used in the report. Specifically, CMS has the following comments:

1. The influenza and pneumococcal vaccination rates listed in the report likely underestimate the actual immunization rates since many vaccinations provided to Medicare beneficiaries may not be billed directly to Medicare. For 2009, the Centers for Disease Control and Prevention (CDC) reported in a recent *Morbidity and Mortality Weekly Report* (MMWR) that "the estimated overall prevalence of influenza vaccination during the preceding 12 months among adults aged  $\geq 65$  years" was 69.8 percent (median among States) based on data from the Behavioral Risk Factor Surveillance System. Similarly, they also reported that "the estimated overall prevalence of pneumococcal vaccination among adults aged  $\geq 65$  years" was 68.1 percent (median among States).
2. The reported colorectal cancer screening rate also appears to underestimate actual screening. Since screening colonoscopy is recommended every 10 years for persons not at high risk for colorectal cancer, a 10 year analytical timeframe rather than the 5 year interval used in the report would have provided a more accurate estimate. In addition, the CDC noted in a 2011 MMWR that 72.8 percent of respondents aged  $\geq 65$  years reported "receiving a fecal occult blood test within 1 year or a lower endoscopy within 10 years" using 2008 data from the Behavioral Risk Factor Surveillance System.
3. Since the elimination of beneficiary cost-sharing for preventive services recommended with a grade of A or B by the USPSTF was established by the Affordable Care Act of 2010 and became effective on January 1, 2011, utilization of the affected benefits would not be evident in analyses of claims data through 2009. We believe that appropriate utilization of these preventive services will increase in subsequent years when the full effect of this provision is evident.

**GAO Recommendation**

*The Administrator of CMS should take steps to better align Medicare beneficiary use of preventive services with Task Force recommendations, including providing coverage for services with "A" or "B" grade recommendation, as she determines is appropriate considering cost-effectiveness and other criteria.*

**CMS Response**

CMS has used the authority granted in section 1861(ddd) of the Social Security Act to add coverage under Medicare Part B for several additional preventive services through the national coverage determination process, and continues to review the USPSTF's recommendations on other preventive services for their applicability to Medicare beneficiaries. Information regarding these new covered services is available on the Medicare coverage website:

**GENERAL COMMENTS OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS) ON THE GOVERNMENT ACCOUNTABILITY OFFICE'S (GAO) DRAFT REPORT ENTITLED, "MEDICARE: USE OF PREVENTIVE SERVICES COULD BE BETTER ALIGNED WITH CLINICAL RECOMMENDATIONS" (GAO-12-81)**

<https://www.cms.gov/medicare-coverage-database/indexes/nca-open-and-closed-index.aspx?bc=AgAAAAAAAAAA&#Closed>.

New preventive services for which coverage has been added to date under section 1861(ddd) include:

- Counseling to Prevent Tobacco Use
- Screening for the Human Immunodeficiency Virus (HIV) Infection
- Screening for Depression in Adults
- Screening for Sexually Transmitted Infections (STIs) and High-Intensity Behavioral Counseling (HIBC) to prevent STIs
- Screening and Behavioral Counseling Interventions in Primary Care to Reduce Alcohol Misuse
- Intensive Behavioral Therapy for Cardiovascular Disease
- Intensive Behavioral Therapy for Obesity

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# Appendix VI: GAO Contact and Staff Acknowledgments

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## GAO Contact

James C. Cosgrove, (202) 512-7114 or [cosgrovej@gao.gov](mailto:cosgrovej@gao.gov)

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## Acknowledgments

In addition to the contact named above, individuals making key contributions to this report include Rosamond Katz, Assistant Director; Todd D. Anderson; and Kate Nast. Zhi Boon and Elizabeth T. Morrison also provided valuable assistance.

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