Association of Cost Sharing With Use of Home Health Services Among Medicare Advantage Enrollees

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IMPORTANCE Several policy proposals advocate introducing copayments for home health care in the Medicare program. To our knowledge, no prior studies have assessed this cost-containment strategy.

OBJECTIVE To determine the association of home health copayments with use of home health services.

DESIGN, SETTING, AND PARTICIPANTS A difference-in-differences case-control study of 18 Medicare Advantage (MA) plans that introduced copayments for home health care between 2007 and 2011 and 18 concurrent control MA plans. The study included 135,302 enrollees in plans that introduced copayment and 155,892 enrollees in matched control plans.

EXPOSURES Introduction of copayments for home health care between 2007 and 2011.

MAIN OUTCOMES AND MEASURES Proportion of enrollees receiving home health care, annual numbers of home health episodes, and days receiving home health care.

RESULTS Copayments for home health visits ranged from $5 to $20 per visit, which were estimated to be associated with $165 (interquartile range [IQR], $45-$180) to $660 (IQR, $180-$720) in out-of-pocket spending for the average user of home health care. The increased copayment for home health care was not associated with the proportion of enrollees receiving home health care (adjusted difference-in-differences, −0.15 percentage points; 95% CI, −0.38 to 0.09), the number of home health episodes per user (adjusted difference-in-differences, 0.01; 95% CI, −0.01 to 0.03), and home health days per user (adjusted difference-in-differences, −0.19; 95% CI, −3.02 to 2.64). In both intervention and control plans and across all levels of copayments, we observed higher disenrollment rates among enrollees with greater baseline use of home health care.

CONCLUSIONS AND RELEVANCE We found no evidence that imposing copayments reduced the use of home health services among older adults. More intensive use of home health services was associated with increased rates of disenrollment in MA plans. The findings raise questions about the potential effectiveness of this cost-containment strategy.
From 2000 to 2010, Medicare home health care expenditures increased from $8 billion to $19 billion, making home health care one of the fastest growing components of Medicare spending. Under traditional Medicare’s benefit design, home health care is provided at no cost to the patient, which means there is no financial incentive for beneficiaries to restrict their use of these services. To address this concern the Medicare Payment Advisory Commission and the Bowles-Simpson deficit reduction committee have expressed support for the imposition of a copayment for the use of home health care. President Obama’s 2017 budget proposal called for a home health copayment of $100 per episode beginning in 2020 and estimated that this measure would save $1.3 billion over 10 years. Proposed legislation in the US House of Representatives also includes a $100 copayment for each home health episode. Despite this momentum, there is no empirical evidence to guide policymakers about the impact of home health cost sharing in the Medicare program.

Although older adults may be particularly responsive to small changes in outpatient cost sharing, the effects of copayments for home health care may be distinct from those observed for other health services. To receive home health services, the traditional Medicare program requires that patients be homebound. Furthermore, Medicare policy requires physicians to assess and certify patients’ need for home health care during a face-to-face encounter, and home health agencies must submit documentation of this certification for Medicare billing. Patients’ needs for home health care must be re-certified every 60 days. These factors suggest that the use and intensity of home health care may be primarily driven by physician decisions rather than patients’ demand. Therefore, increasing home health out-of-pocket costs may not necessarily reduce utilization, especially for frail homebound patients.

Medicare Advantage (MA) plans provide an opportunity to investigate the consequences of home health copayments. Unlike traditional Medicare, these plans have the flexibility to introduce patient cost sharing for this service, in addition to applying other cost-containment strategies, such as prior authorization, utilization review, and restricting its network to more efficient providers. Using a quasiexperimental design, we sought to determine the association between introducing home health copayments and the use of home health services. In addition, given that beneficiaries who receive home health services may opt to leave their plan to avoid copayments, we also assessed rates of disenrollment among MA enrollees who did and did not receive home health services in the year prior to the copayment increase.

Methods

Data Sources
We merged the 2007 to 2011 Medicare Healthcare Effectiveness Data and Information Set (HEDIS) with the Outcome and Assessment Information Set (OASIS), which provides data on the use of home health services. All Medicare-certified home health care providers are required to submit OASIS assessments for all patients (irrespective of insurance) at the start of care, at 60 days, and at discharge. We also acquired information on MA plans’ benefits for Medicare-covered services, including the required copayment for each home health visit and summary data on the average expected monthly out-of-pocket costs (including premiums and cost sharing) in each MA plan. Finally, to estimate potential out-of-pocket spending associated with a given home health copayment level, we merged OASIS data with Medicare home health claims for traditional Medicare beneficiaries. Brown University’s Human Research Protections Office and the CMS Privacy Board approved the study protocol.

Selection of Case and Control MA Plans
The proportion of plans with home health copayments decreased from 21.8% to 12.6% from 2007 to 2011. Because we aimed to examine how plan members responded to new home health copayments, we identified 18 MA plans that introduced copayments for home health visits in any year between 2007 and 2011, hereafter referred to as “case plans.” We matched these 18 case plans to 18 concurrent control MA plans that maintained no cost sharing for home health visits over the same time period in which case plans introduced copayments. For each case plan, we selected control plans in the same region and with similar expected average monthly out-of-pocket payments for medical services throughout the study period. Then we created a propensity score based on plan size and enrollees’ demographic characteristics (age, sex, race, ZIP code-level income) and used one-to-one matching for case and control plans on the basis of nearest match in propensity scores.

Study Population
Our main study cohort included beneficiaries who were enrolled in a study MA plan in the year prior to the introduction of home health copayments. Any beneficiaries who joined the plan after the introduction of copayments were excluded. We also excluded Medicare beneficiaries younger than 65 years of age and those dually-eligible for full Medicaid coverage because Medicaid covers Medicare’s cost sharing. The study included 135,302 enrollees in MA plans that introduced copayments for home health care between 2007 and 2011 and 155,892 enrollees from concurrent control MA plans. Among this population, 10,417 enrollees in case plans and 11,629 in control plans used home health care in the year before the copayment was introduced.

Key Points

Question Do copayments reduce the use of home health care among older adults?

Findings In this case-control study of 36 Medicare Advantage plans, increased copayments for home health care were not associated with changes in the proportion of enrollees receiving home health care, the number of home health episodes per user, or home health days per user.

Meaning We found no evidence that imposing copayments meaningfully reduces the use of home health care, but such cost sharing may add substantially to the burden of out-of-pocket spending among frail older adults.
Variables
The main outcome variables for each MA member were: (1) the number of annual home health episodes, (2) the annual duration of home health care (in days), and (3) use of any home health care services. The first 2 outcome variables were restricted to those who used home health care. We only considered utilization that occurred while the member was enrolled in his or her plan. For members that disenrolled in the year when the copayment was introduced, our utilization measure only counted these members’ home health utilization prior to the copayment increase. We measured the share of beneficiaries who disenrolled as an additional outcome.

The number of home health episodes was determined based on admission assessments in OASIS. Days covered by home health care were defined as the duration between the admission date and discharge date for each episode. For persons with concurrent episodes from distinct providers, we summed home health episodes and days.

For our primary utilization analyses, the independent variables were indicator variables for whether the plan was a case plan, whether the episode took place after the copayment introduction, and an interaction of these 2 variables. Covariates included age, sex, race/ethnicity (black, white, Hispanic, Asian, or other), and ZIP code–level income derived from national Census data.

Utilization Analyses
We used a difference-in-differences approach by subtracting the change in utilization in control plans from the concurrent change in plans that increased cost sharing. To test the parallel-trends assumption, we evaluated home health utilization in the 2 years prior to the copayment introduction. This analysis was conducted for 11 case plans that had no copayments for 2 years prior to home health copayment increase and submitted valid HEDIS data in each of these 2 years, and each of these plans’ matched control plan. These analyses suggested parallel trends for the proportion of enrollees receiving home health care or the annual number of home health episodes per user. For home health days per user, we observed a modest decline in utilization in case plans relative to controls prior to the copayment (adjusted difference-in-differences, −0.01 to 0.03), and home health days per user (adjusted difference-in-differences, 0.01; 95% CI, −0.38 to 0.09), the number of home health episodes (none, 1-59 days, and >59 days) prior to copayment increase. We fitted a linear probability model with generalized estimating equations to account for clustered data by plan. We used a 1-part generalized linear model, an identity link, and specified a negative binominal distribution for home health episodes. We also determined the average user of home health care in case plans. By multiplying the estimated number of visits by the copayment for each visit, we derived the potential out-of-pocket costs associated with a particular level of home health copayment.

Disenrollment Analyses
We compared the difference in disenrollment rate between enrollees in case and control plans in the year with the increase of copayments for home health care. We separately estimated the differences in disenrollment rates between case and control plans in 3 levels of home health utilization (none, 1-59 days, and >59 days) prior to copayment increase. We fitted a linear probability model with generalized estimating equations and plan fixed effects.

We stratified disenrollment rates in plans by the level of copayment (ie, <$15, $15-$19, ≥$20). The differences in disenrollment rate between case and control plans were compared within and between different home health copayment levels and levels of baseline utilization.

Estimation of Out-of-Pocket Spending on Home Health Care Associated With Copayment Levels
The data from OASIS include information on admission and discharge dates for home health episodes, but do not include the number of visits associated with a particular episode. We therefore merged 2007 to 2011 OASIS data with Medicare home health claims for traditional Medicare beneficiaries, which report the number of visits per home health episode. Using these merged data, we compared the number of days of home health care for traditional Medicare and MA enrollees; and assessed the correlation between the number of visits and the duration of home health episodes. We also determined the average number of visits and interquartile range (IQR) for the average user of home health care in case plans. By multiplying the estimated number of visits by the copayment for each visit, we derived the potential out-of-pocket costs associated with a particular level of home health copayment.

Results
Characteristics of Enrollees in Case and Control Plans
Prior to the introduction of the copayment, compared with enrollees in control plans, enrollees in case plans were more likely to be racial/ethnic minorities, younger, living in areas with slightly lower income, and have partial Medicaid benefits (Table 1). The magnitudes of these differences were modest.

Changes in Home Health Utilization in Case and Control Plans
The number of home health days per enrollee during the 12 months before and after the copayment increase is shown in Figure 1. The graph demonstrates parallel trends in utilization in the case and control plans before the introduction of copayments and no visual evidence of a change in utilization in case plans after the introduction of cost sharing. In adjusted analyses, the increased copayment for home health care was not associated with the proportion of enrollees receiving home health care (adjusted difference-in-differences, −0.15; 95% CI, −0.38 to 0.09), the number of home health episodes per user (adjusted difference-in-differences, 0.01; 95% CI, −0.01 to 0.03), and home health days per user (adjusted difference-in-differences, −0.19; 95% CI, −3.02 to 2.64) (Table 2).

In the plans that introduced home health copayments of $20...
or more, the difference-in-differences estimate for the mean number of annual home health episodes was −0.06 (95% CI, −0.11 to −0.02), but the adjusted differences-in-differences for the annual number of health days and the proportion receiving home health care were not significant. We observed no significant reductions in home health utilization for case plans that introduced copayments of $19 or less (Table 2).

In stratified analyses, home health copayments were not associated with significant changes in home health utilization for any population subgroups with the exception of enrollees in the lowest quartile of ZIP code–level income. In this subgroup, the difference-in-differences estimates for the mean number of annual home health episodes and for the annual number of health days were 0.05 (95% CI, 0.004-0.10) and 7.19 (95% CI, 0.26-14.20), respectively, but the estimate for the proportion receiving home health care was not significant (eTable 2 in the Supplement).

### Rates of Disenrollment in Case and Control Plans

During the year that the copayment was introduced, we observed higher disenrollment rates from case plans (17.9%) relative to disenrollment from control plans (13.3%; P < .001). In both case and control plans, the rate of disenrollment increased with greater baseline utilization of home health care. The disenrollment rates were consistently higher in the case plans compared with the control plans across 3 utilization groups (Figure 2). In adjusted analyses, we observed a 5.3 percentage point (95% CI, 4.1-6.5) greater rate of disenrollment in case plans relative to control plans among enrollees who used 1 to 59 days of home health care in the year. We also observed a 6.4 percentage point (95% CI, 4.7-8.1) greater rate of disenrollment in case plans relative to control plans among enrollees using 60 or more days of home health care in the year before the copayment was introduced.

Across every level of copayment and for both case and control plans, we consistently observed an association between greater baseline use of home health services and higher rates of disenrollment (Table 3).

### Discussion

We examined the association of introducing home health co-payments in a large, nationally representative sample of MA enrollees. The plans in this study introduced copayments of $5 to $20 per home health visit, which we estimate would translate to $165 to $660 in annual out-of-pocket costs for an average user of home health care with an IQR of $45 to $180. A $20 home health visit copayment would translate to $660 in annual out-of-pocket spending for an average user of home health care, with an IQR of $180 to $720.

#### Estimation of Out-of-Pocket Spending Associated With Copayment Levels

We found a correlation of 0.8 between the number of days spent in home health care according to OASIS and the number of home health visits as determined by traditional Medicare claims. Among enrollees in traditional Medicare, the average user of home health care received 37 annual visits (IQR, 10-40). Among enrollees in case plans, we estimated the average user received 33 annual visits (IQR, 9-36). Case plans introduced copayments ranging from $5 to $20. A $5 home health visit copayment would translate to approximately $165 in annual out-of-pocket costs for an average user of home health care with an IQR of $45 to $180. A $20 home health visit copayment would translate to $660 in annual out-of-pocket spending for an average user of home health care, with an IQR of $180 to $720.
services where the expected value is less than the out-of-pocket expense.\textsuperscript{1,11} For example, the RAND Health Insurance Experiment found that increased cost sharing reduced aggregate health care spending and use.\textsuperscript{12} In contrast, our findings suggest that the introduction of home health copayments was not associated with fewer days covered by home health care or lower rates of home health episodes. It may be difficult for elderly patients, particularly those with functional impairments and frailty, to reduce their use of home health care in response to out-of-pocket costs. Home health care may also substitute for visits to a medical facility (where there will likely be a copayment) for therapy, treatment, or minor procedures. Another potential explanation for our results is that the duration and intensity of home health care may be strongly influenced by providers’ decisions and treatment protocols such that patients may not be able to terminate care early or be presented with other alternatives. Thus, our finding that patients did not reduce their use of home health care in the face of substantial increases in out-of-pocket costs is concerning, given prior evidence that out-of-pocket medical spending may crowd out spending on other nonmedical necessities such as food, housing, transportation, and personal care expenses, with adverse consequences for seniors’ health and welfare.\textsuperscript{13,14}

Across every level of copayment and for both case and control plans, we consistently observed an association between greater baseline use of home health services and higher rates of disenrollment. Our findings extend previous work demonstrating\textsuperscript{15} that the persons with intensive care needs,

### Table 2. Changes in the Use of Home Health Services After Introduction of Home Health Copayments in Case and Control Plans

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Case Plans That Introduced Copayments</th>
<th>Matched Control Plans</th>
<th>Unadjusted Between-Group Difference</th>
<th>Adjusted Between-Group Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year Before Copayment Increase</td>
<td>Year With Copayment Increase</td>
<td>Change</td>
<td>Year Before Case Plans Increased Copayment</td>
</tr>
<tr>
<td>All Plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of enrollees with home health care, %</td>
<td>7.46</td>
<td>7.76</td>
<td>0.30</td>
<td>7.23</td>
</tr>
<tr>
<td>Home health episodes per user</td>
<td>1.35</td>
<td>1.32</td>
<td>−0.03</td>
<td>1.38</td>
</tr>
<tr>
<td>Home health days per user</td>
<td>75.98</td>
<td>74.94</td>
<td>−1.04</td>
<td>90.85</td>
</tr>
<tr>
<td>Plans With Copayments of $14 or Less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of enrollees with home health care, %</td>
<td>8.05</td>
<td>8.65</td>
<td>0.59</td>
<td>7.62</td>
</tr>
<tr>
<td>Home health episodes per user</td>
<td>1.36</td>
<td>1.33</td>
<td>−0.03</td>
<td>1.45</td>
</tr>
<tr>
<td>Home health days per user</td>
<td>78.58</td>
<td>80.73</td>
<td>2.15</td>
<td>99.67</td>
</tr>
<tr>
<td>Plans With Copayments of $15-$19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of enrollees with home health care, %</td>
<td>7.43</td>
<td>7.28</td>
<td>−0.15</td>
<td>4.91</td>
</tr>
<tr>
<td>Home health episodes per user</td>
<td>1.34</td>
<td>1.32</td>
<td>−0.02</td>
<td>1.28</td>
</tr>
<tr>
<td>Home health days per user</td>
<td>78.78</td>
<td>69.56</td>
<td>−9.22</td>
<td>65.64</td>
</tr>
<tr>
<td>Plans With Copayments of $20 or More</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of enrollees with home health care, %</td>
<td>6.72</td>
<td>7.11</td>
<td>0.39</td>
<td>8.48</td>
</tr>
<tr>
<td>Home health episodes per user</td>
<td>1.36</td>
<td>1.32</td>
<td>−0.05</td>
<td>1.32</td>
</tr>
<tr>
<td>Home health days per user</td>
<td>68.67</td>
<td>71.55</td>
<td>2.88</td>
<td>87.72</td>
</tr>
</tbody>
</table>

### Table 3. Disenrollment Rate Differences Between Case and Control Plans by Level of Copayment Increase and Baseline Level of Home Health Utilization

<table>
<thead>
<tr>
<th>Home Health Care Copay, $</th>
<th>Group</th>
<th>No. of Patients in Year Before Copayment Increase</th>
<th>Disenrollment Rate in Year With Copayment Increase, %</th>
<th>P Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>1-59 Days</td>
<td>60 or More Days</td>
<td>None</td>
</tr>
<tr>
<td>≤14</td>
<td>Case</td>
<td>47 955</td>
<td>2327</td>
<td>1489</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>78 992</td>
<td>3471</td>
<td>2474</td>
</tr>
<tr>
<td>15-19</td>
<td>Case</td>
<td>40 510</td>
<td>1780</td>
<td>1112</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>32 826</td>
<td>1095</td>
<td>398</td>
</tr>
<tr>
<td>≥20</td>
<td>Case</td>
<td>37 667</td>
<td>1654</td>
<td>808</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>33 817</td>
<td>1708</td>
<td>1111</td>
</tr>
</tbody>
</table>

* We used a test for linear trend in increasing disenrollment across these three utilization categories to obtain the P values.
including those with prior hospitalizations and long-term and short nursing home stays, are more likely to exit MA plans, compared with those who do not use these services. Further study of the reasons for disenrollment is urgently needed, because the benefits of managed care may be attenuated if patients exit their plans once they have complex medical needs.

Unlike traditional Medicare, MA plans can exercise a number of strategies to reduce health services utilization, such as providing feedback and incentives to providers to reduce utilization, restricting the network of contracted providers, and implementing prior authorization procedures. It is possible that the plans that introduced copayments may have been particularly motivated to reduce home health spending via these techniques. However, despite these available strategies, home health utilization did not decline in these plans relative to concurrent trends in control plans.

Limitations
Our study has limitations. First, we cannot fully exclude the possibility that unmeasured differences between case and control plans influenced our results. Second, our study findings may not be generalizable to beneficiaries in traditional Medicare. Although there are differences between these 2 populations, we found that the duration of home health care was similar among traditional Medicare and MA enrollees in case plans. Third, we do not have claims data from MA plans to directly measure the number of home health visits per MA member. However, among traditional Medicare enrollees, the duration of home health care exhibited a high degree of correlation with the number of home health visits. Furthermore, our estimates of home health utilization in MA plans align with findings from the Kaiser Family Foundation.

Conclusions
The introduction of home health copayments among MA plans was not associated with lower use of home health services. More intensive use of home health services was associated with increased rates of disenrollment in MA plans. Our study suggests that imposing copayments does not meaningfully reduce the use of home health services, but may add substantially to the burden of out-of-pocket spending among frail older adults.
Cost Sharing and Home Health Care

David C. Grabowski, PhD

Home health care has been one of the fastest-growing parts of the Medicare program, with spending doubling on these services between 2001 and 2014. In 2014, roughly 3.4 million Medicare beneficiaries received home health care at a total cost to Medicare of $17.7 billion.

In an attempt to limit spending on home health care, some Medicare Advantage plans have introduced cost sharing. When patients have to pay some part of the cost of their care through a deductible or copayment, standard theory suggests that they will cut back on services. Although traditional fee-for-service Medicare beneficiaries face no cost sharing for home health care, various proposals have been made to introduce cost sharing for home health care into traditional Medicare.

In this issue of JAMA Internal Medicine, Li et al3 provide novel evidence on home health cost sharing in Medicare Advantage plans. Although Medicare Advantage plans differ from traditional Medicare in important ways, the authors’ results provide a window into how Medicare beneficiaries responded to the introduction of home health cost sharing. The authors identified 18 plans that introduced copayments between 2007 and 2011 and matched them to 18 control plans that maintained no cost sharing for home health visits. The introduction of a home health copayment was not significantly associated with the number of enrollees receiving home health care, the number of home health episodes, or the number of home health days per user. The authors3 did find that high users of home health care were more likely to leave Medicare Advantage, and this effect was consistently stronger among those beneficiaries in plans with cost sharing.

These results suggest home health cost sharing is not an effective cost containment strategy. Given a large health policy literature showing that cost sharing decreases use, these results are somewhat surprising. However, there are reasons to be cautious with these results, especially in applying them to traditional Medicare.

First, home health care services vary in their effectiveness, with some episodes of services offering considerable value. Although cost sharing can potentially limit wasteful or inefficient home health care, it is a blunt instrument that can discourage high-value as well as low-value services. This may explain why during the 4 years that the 18 Medicare Advantage plans studied by Li et al3 introduced cost sharing, the overall proportion of Medicare Advantage plans with home health copayments actually decreased from 21.8% to 12.6%.

The idea that home health care episodes vary in their effectiveness is well-understood by policy analysts. Home health is one of the few services that does not have a copayment or deductible in traditional Medicare. The Medicare Payment Advisory Commission recently recommended applying per-episode cost sharing in fee-for-service Medicare specifically to those home health episodes that were not preceded by a hospitalization or post–acute care stay. The rationale is that these particular home health episodes are of lower value and more discretionary relative to post–acute care home health episodes that might substitute for high-cost institutional services. Home health use has increased substantially since 2002, with a 60% increase in the number of episodes and most of the growth has been in episodes not preceded by a hospitalization. From a benefit design perspective, the key issue is being able to selectively apply cost sharing to those relatively ineffective services.

A second reason to be cautious with these results is that cost sharing is just one potential arrow in the broad Medicare Advantage quiver to manage home health care use. As Li et al3 note, Medicare Advantage plans can use a range of utilization management strategies that are not allowed in fee-for-service Medicare, such as prior authorization and preferred networks. Thus, it is unclear whether the control plans that did not introduce cost sharing introduced other mechanisms to limit home health care spending. Li et al3 were unfortunately not able to account for the use of these other strategies in their analyses. Thus, the lack of a significant relationship between cost sharing and home health care use may have 2 very different explanations. Either cost sharing by Medicare Advantage plans does not reduce home health use or plans that do not use cost-sharing to limit home care costs may use other strategies. To resolve this issue, future research will need to more completely account for plan attributes in studying this issue.

Third, the plans that introduced home health cost sharing are not random. These plans may have introduced cost sharing in anticipation of an increase in home health spending. Li et al3 were able to show relatively equal trends in use across the plans that did and did not institute cost sharing in