Overview
Much of the research to date on the effects of medication adherence has focused on health outcomes and medical costs. Analyses of the studies examining the relationship between improved adherence and lower spending have suffered from methodological shortcomings, making findings somewhat controversial. HCFO-funded researcher, Bruce Stuart, Ph.D., University of Maryland at Baltimore, and colleagues designed a medication adherence study with an eye toward addressing prior methodological limitations. Their analyses explored the role of health behaviors in combination with medication adherence to control costs. In their analysis, the researchers concluded that higher medication adherence among diabetic Medicare beneficiaries resulted in lower medical spending.\(^1\)

Background
Diabetes, especially in the elderly, has been linked with a host of comorbidities, including, but not limited to, cardiovascular and kidney disease. However, several clinical trials in the last 10 years have shown positive outcomes in elderly diabetic patients who are prescribed statins and renin-angiotensin-aldosterone system inhibitors (RAAS-Is), which include angiotensin-converting enzyme (ACE) inhibitors, including a delay in onset of certain comorbidities. Consequently, some clinicians support prescribing RAAS-Is or statins to most, if not all, elderly diabetic patients. This increase in prescribing has led researchers to hypothesize that proper adherence to these medications may actually lower health care costs for the patients. However, the majority of studies that have linked improved adherence with decreased Medicare spending have relied on imperfect methods and failed to substantiate real cost-offsets.\(^2\) For example, some studies have used samples that are not generalizable to the entire Medicare population. Other studies have only looked at a single year of data and are unable to evaluate the longer term benefits of certain drugs, like statins. Additional studies have exhibited survivor bias and reverse causality or “healthy adherer bias.” “Survivor bias” may be
Finding 3

• Diabetes mellitus was associated with higher Medicare spending, but use of RAAS-I users, taking a higher antidiabetic agent was associated with lower Medicare spending, while aspirin use yielded higher costs. For statin users, taking a lower antidiabetic agent was associated with higher Medicare spending.

• In addressing limitations in prior studies on diabetes management class as a mechanism to control their diabetes.

• In both the bivariate and multivariate regression analyses, use of RAAS-Is and statins were associated with lower Medicare spending. However, the results were more statistically significant in the multivariate regression analysis, and the estimated savings was more profound for statin adherence (a 10 percentage point increase in MPR resulted in an additional savings of $547 for statin users when compared to RAAS-I users).

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• The median three-year adherence rate was 0.88 for RAAS-I users and 0.77 for statin users. When considering other health behaviors related to diabetes, 41 percent of the total study sample reported taking antidiabetic drugs, and 11 to 12 percent used insulin. More than half of the sample reported a “good understanding of their disease,” checked their blood sugar levels regularly, checked their feet for sores, and attempted to control their diabetes through dietary changes. Participants were less likely to report using exercise, daily aspirin, or a
The study included observations for persons who died or were lost to follow-up, allowing for greater generalizability.

Multiple controls addressed potential confounding due to potential survivor and healthy adherer bias.

Results from the study suggest that slightly more than half of beneficiaries taking RAAS-Is and slightly fewer than half of statin users were adherent over three years. The researchers noted that nonadherence may be due to intermittent gaps in compliance or discontinuation of medication. While data limitations did not allow for an analysis of gaps, they were able to track discontinuance rates over time; 15 percent of beneficiaries in the first year and an additional 15 percent by the end of year three ceased medication therapy.

In sum, the researchers found that beneficiaries with better adherence rates had lower spending on Medicare Parts A and B services. For those on statins, a 10 percentage point increase in the medication adherence value was associated with $832 lower Medicare costs, while the same increase in medication adherence for those on RAAS-Is resulted in $285 lower costs. The researchers noted that the potential for savings to the Medicare program is largely concentrated among beneficiaries who are relatively poor adherers to their medication regimen.

The researchers acknowledge that they cannot fully explain the discrepancies between their findings and studies that have gone before, but believe that their analyses address shortcomings in prior studies. They further acknowledge the limitations in their own study, including

- A lack of service dates and days’ supply, which may have resulted in a slight overestimation of RAAS-Is MPR and understatement of the effects.
- Small sample sizes, limiting their ability to conduct detailed savings analysis.
- A three-year window, which may be insufficient to fully confirm findings associated with a chronic, progressive disease, like diabetes.
- An inability to track beneficiaries who fail to fill prescriptions.
- The lack of Medicare Advantage claims.
- A focus on costs associated with the drugs themselves.

Policy Discussion
According to Stuart’s results, improving adherence to RAAS-Is and statins in Medicare beneficiaries with diabetes would result in a reduction in Medicare spending. Furthermore, the sensitivity test results showed that the greatest benefit and savings could be gained by focusing on improving adherence in the “worst adherers.” This information would be helpful to policymakers as they consider the future of Medicare and continue to look for ways to bend the cost curve in health care.

However, perhaps the more important contribution of this study is providing this information to policymakers backed by sound methodology.

“In prior published studies of cost savings from improved medication compliance have generally produced much higher savings estimates than our study, which has led policymakers to be quite skeptical about their validity,” says Stuart. “We wanted to make certain that we avoided any potential bias that would overestimate cost offsets; if anything, our results likely underestimate the potential savings available from improving the medication taking behaviors of Medicare beneficiaries.”

Conclusion
Improved adherence to RAAS-Is and statins in Medicare beneficiaries with diabetes is associated with a reduction in overall Medicare spending. Future studies are still needed to analyze whether this cost savings is greater than the potential cost of improving adherence in these populations. However, these results provide promising information to policymakers as they continue to consider how to bend the cost curve of health care in the United States.

For More Information
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Endnotes