



## Offsetting Effects of Prescription Drug Use on Medicare's Spending for Medical Services

### Summary

Prescription drugs affect people's health and their need for medical services.<sup>1</sup> Therefore, policy changes that influence Medicare beneficiaries' use of prescription drugs, such as those altering the cost-sharing structure of the Part D prescription drug benefit, probably affect federal spending on their medical services.<sup>2</sup> After reviewing recent research, the Congressional Budget Office (CBO) estimates that a 1 percent increase in the number of prescriptions filled by beneficiaries would cause Medicare's spending on medical services to fall by roughly one-fifth of 1 percent. That estimate, which applies only to policies that directly affect the quantity of prescriptions filled, represents a change in the agency's estimating methodology, which until now has not incorporated such an effect.

Previously, when estimating the budgetary effects of legislation regarding prescription drugs, CBO found insufficient evidence of an "offsetting" effect of prescription drug use on spending for medical services. But recently, more analysis has been published that demonstrates a link between changes in prescription drug use and changes in the use of and spending for medical services. This report provides background information about that relationship; reviews the literature on the size of the offset for the Medicare population; and describes how CBO synthesized the recent research. The report also provides an

example of how CBO's change in methodology will affect the agency's cost estimates for proposals that would change prescription drug use by Medicare beneficiaries.

### Background

In the first two years of Medicare's Part D program—which was created in 2003 with the passage of the Medicare Prescription Drug, Improvement, and Modernization Act and implemented in 2006—the number of prescriptions filled by Medicare beneficiaries increased by more than 10 percent, according to one estimate.<sup>3</sup> More recently, the Part D benefit was expanded by the Affordable Care Act—which, between 2011 and 2020, is gradually closing the gap in coverage in which beneficiaries were responsible for all of the costs for their prescription drugs.<sup>4</sup> That change is expected to further boost the use of prescription drugs. The design of Medicare's prescription drug benefit continues to be debated, as evidenced by recent proposals to change the cost-sharing rules for low-income beneficiaries and to repeal the gradual closure of the coverage gap.

A substantial body of evidence indicates that people respond to changes in cost sharing by changing their consumption of prescription drugs. From beneficiaries' perspective, the price of a prescription drug is the portion of the prescription's cost that they bear. The use of

1. For the purposes of this publication, "medical services" refers to medical and surgical services other than self-administered prescription drugs.

2. For a full description of the prescription drug benefit provided by Medicare's Part D program, see Congressional Budget Office, *Spending Patterns for Prescription Drugs Under Medicare Part D* (December 2011).

3. Becky A. Briesacher and others, "Medicare Part D and Changes in Prescription Drug Use and Cost Burden," *Medical Care*, vol. 49, no. 9 (2011), pp. 834–841.

4. That coverage gap (sometimes referred to as the doughnut hole) existed between Medicare's initial coverage limit and its out-of-pocket threshold. See Congressional Budget Office, *Spending Patterns for Prescription Drugs Under Medicare Part D*.

prescription drugs—or number of prescriptions filled—increases in response to price reductions and falls in response to price increases. That response is widespread, found within both the elderly population and the non-elderly population, and among both enrollees in public health care plans and people with private health insurance. Numerous studies have demonstrated the effect of price changes on the use of prescription drugs overall, and several others have found that lower prices for drugs used to treat chronic conditions improve the likelihood that patients take their medication as prescribed.<sup>5</sup>

Changes in the use of prescription drugs have the potential to affect the use of medical services. For example, overuse or inappropriate use of prescription drugs may raise the risk of adverse reactions, triggering a need for medical treatment. But most often, pharmaceuticals have the effect of improving or maintaining an individual's health. Taking an antibiotic may prevent a more severe infection, and adhering to a drug regimen for a chronic condition such as diabetes or high blood pressure may prevent complications. In either of those circumstances, taking the medication may also avert hospital admissions and thus reduce the use of medical services.

Previously, CBO did not include any offsetting effect on medical services in its estimates involving changes to prescription drug policies. Most notably, the agency's estimate for the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (which established Medicare's Part D prescription drug benefit) did not include an offset. At the time, there was little evidence of a relationship between prescription drug use and spending for medical services.<sup>6</sup> Likewise, CBO did not include an offset in its estimates of the cost of the Affordable Care Act (which includes the provisions closing the Part D coverage gap). However, a body of research has since developed that demonstrates a connection between prescription drug use and the use of medical services.

5. For a review of the literature, see Dana P. Goldman, Geoffrey F. Joyce, and Yuhui Zheng, "Prescription Drug Cost Sharing: Associations with Medication and Medical Utilizations and Spending and Health," *Journal of the American Medical Association*, vol. 298, no. 1 (2007), pp. 61–69.

6. See Congressional Budget Office, *Issues in Designing a Prescription Drug Benefit for Medicare* (October 2002).

## CBO's Review of Recent Research

CBO recently reviewed dozens of newer studies to determine whether and how to include an offsetting effect on medical services in estimates for proposals to change prescription drug policies. CBO considered studies to be particularly relevant if the population examined was similar to the general Medicare population, the policy changes analyzed were similar to recent or recently discussed ones, and effects on medical spending were estimated.

In addition to studies examining broad populations, a large body of literature also exists on the effects of changes in cost sharing within classes of drugs that treat particular health problems or for people with specific conditions. That literature generally finds a larger offsetting effect of changes in prescription drug policies than do studies based on the broader population—probably because people with certain diseases are more sensitive to changes in prescription drug use than is the general population. However, CBO did not incorporate the results of such studies of cost sharing in its analysis because robust findings for each therapeutic class or chronic condition do not exist, so generalizing to a broader population is difficult. In addition, most proposed policies to date would apply to broad populations of Medicare beneficiaries.

As a result, CBO's analysis relied on a selected set of studies that fell into three categories:

- Estimates of the impact of pharmaceutical policies on a broad population outside of Medicare,
- Estimates of the impact of pharmaceutical policies on Medicare beneficiaries before Medicare Part D was implemented, and
- Comparisons of medical expenditures by Medicare beneficiaries before the Medicare Part D benefit was implemented with medical expenditures after the benefit was implemented.

Despite their similarities, the studies used different methodologies and examined different populations (as described in this section), so CBO needed to synthesize the results to put them on a comparable basis (as described in the following section).

CBO found one study in the first category. It analyzed the effect of differences in cost sharing for prescription drugs on their use and the use of medical services by people in employment-based insurance plans.<sup>7</sup> That population was younger and healthier than the Medicare population but included a larger-than-average share of nearly elderly people and people with chronic conditions (relative to the broader population covered by employment-based insurance). The authors found that a substantial fraction of the reduction in spending on prescription drugs stemming from increases in employees' cost sharing was offset by increases in spending on medical services. The offset stemmed primarily from changes in the use of outpatient medical services rather than changes in hospitalizations, unlike the results of several of the other studies CBO examined.

CBO identified four studies in the second category; all used varying prescription drug coverage among Medicare beneficiaries before the implementation of Part D to study the effect of prescription drug use on the use of medical services. Two of the studies used the Medicare Current Beneficiary Survey to analyze the effect of varying levels of supplemental coverage.<sup>8,9</sup> A third study focused on beneficiaries enrolled in a Medicare HMO (health maintenance organization); some beneficiaries had a cap on their prescription drug benefits of \$1,000, and others did not.<sup>10</sup> All of these studies found that lower spending on prescription drugs among those with less generous coverage was partially offset by higher costs for their medical services.

The fourth study in this category was particularly relevant because it examined a large group of Medicare beneficiaries, considered changes in cost sharing similar to those included in the original Part D legislation and

proposed amendments to it, and rigorously compared beneficiaries before and after changes in their cost sharing to an unaffected control group.<sup>11</sup> The study analyzed the effect of an increase in cost sharing for prescription drugs among groups of Medicare beneficiaries with supplemental coverage from the California Public Employees Retirement System. One of the groups also experienced an increase in cost sharing for office visits, but the methodology controlled for that difference and other related issues. Like the other three studies in this category, this one found that decreased use of prescription drugs (before Part D existed) was associated with increased use of medical services.

CBO identified three studies in the third category, which took advantage of the implementation of the Medicare Part D benefit to examine the effect that changes in cost sharing for prescription drugs had on spending for medical services. One of these studies compared changes in hospitalizations among people over age 65 to changes in hospitalizations among people who were between 60 and 64 years old.<sup>12</sup> That approach—comparing changes in hospitalizations among a group of individuals affected by Part D to changes among a group of individuals not affected by Part D—enabled the authors to control for ongoing trends in hospitalizations. The other two studies compared changes in spending for medical services among beneficiaries who had limited or no prescription drug coverage before Part D and beneficiaries who had generous prescription drug coverage before Part D.<sup>13,14</sup> That approach similarly enabled the authors to control for trends in spending for medical services.

One of these studies found that people with the most generous coverage before Part D existed used medical

7. Martin Gaynor, Jian Li, and William B. Vogt, "Substitution, Spending Offsets, and Prescription Drug Benefit Design," *Forum for Health Economics and Policy*, vol. 10, no. 2 (2007), pp. 1–31.

8. Baoping Shang and Dana P. Goldman, *Prescription Drug Coverage and Elderly Medicare Spending*, Working Paper No. w13358 (Cambridge, Mass.: National Bureau of Economic Research, September 2007).

9. Bruce C. Stuart, Jalpa A. Doshi, and Joseph V. Terza, "Assessing the Impact of Drug Use on Hospital Costs," *Health Services Research*, vol. 44, no. 1 (2009), pp. 128–144.

10. John Hsu and others, "Unintended Consequences of Caps on Medicare Drug Benefits," *New England Journal of Medicine*, vol. 354, no. 22 (2006), pp. 2349–2359.

11. Amitabh Chandra, Jonathan Gruber, and Robin McKnight, "Patient Cost Sharing and Hospitalization Offsets in the Elderly," *American Economic Review*, vol. 100, no. 1 (2010), pp. 193–213.

12. Christopher C. Afendulis and others, "The Impact of Medicare Part D on Hospitalization Rates," *Health Services Research*, vol. 46, no. 4 (2011), pp. 1022–1038.

13. J. Michael McWilliams, Alan M. Zaslavsky, and Haiden A. Huskamp, "Implementation of Medicare Part D and Nondrug Medical Spending for Elderly Adults with Limited Prior Drug Coverage," *Journal of the American Medical Association*, vol. 306, no. 4 (2011), pp. 402–409.

14. Yuting Zhang and others, "The Effect of Medicare Part D on Drug and Medical Spending," *New England Journal of Medicine*, vol. 361, no. 1 (2009), pp. 52–61.

services more after its implementation.<sup>15</sup> Overall, however, the results from these studies suggest that people who received more generous prescription drug coverage through the implementation of Part D had fewer hospitalizations and used fewer medical services as a result.

## CBO's Methodology for Synthesizing the Evidence

CBO's estimates are designed to represent the middle of the distribution of possible outcomes. To estimate that midpoint, several steps were necessary to create a consistent measure of the offsetting effect of prescription drug use on medical spending across the studies that CBO reviewed. For instance, CBO needed to adjust the reported findings to apply them to the Medicare population and the prices that Medicare pays for medical services. For the studies that reported changes in hospitalizations, CBO adjusted the findings to reflect the changes as a share of overall medical spending. For the studies that analyzed people who were somewhat sicker or somewhat healthier than people enrolled in Medicare, CBO adjusted the results on the basis of the health of the study population relative to the health of the Medicare population. Finally, the agency scaled all changes in medical spending to make them consistent with a 1 percent change in prescription drug use, measured in terms of the number of prescriptions filled. Choosing that measure, rather than spending on prescription drugs, allowed CBO to isolate changes in the use of prescription drugs from shifts between different types of drugs with different prices (a shift from a brand-name drug to its generic equivalent, for instance) that do not affect overall use.

In response to a 1 percent increase in the number of prescriptions filled, the change in spending for medical services (measured consistently across the studies) ranged from a decrease of two-thirds of a percent to an increase of one-third of a percent. With the highest and lowest estimates excluded, the results from the remaining six studies ranged from a decrease in medical spending of one-tenth of a percent to a decrease of four-tenths of a percent.

The eight studies encompass a wide variety of policy changes, both in terms of the type of change and the magnitude. CBO considered whether a larger policy

change, such as the implementation of the Medicare Part D program, might have a larger proportional impact on the use of prescription drugs and, therefore, on spending for medical services, than a smaller policy change, such as an adjustment to cost sharing. However, the relationship between changes in prescription drug use and medical spending appeared relatively consistent for policy changes of different magnitudes; the same was true for policy changes in different directions, that is, ones increasing benefits as well as ones reducing them.<sup>16</sup>

CBO pooled the adjusted results to calculate an average offset, giving greater weight to studies examining populations more closely resembling the Medicare population and changes in prescription drug policies more like ones currently discussed. With those adjustments, CBO concludes that a 1 percent increase in prescription drug use would cause spending for medical services to fall by roughly one-fifth of 1 percent; likewise, a 1 percent decrease in prescription drug use would cause medical spending to increase by roughly one-fifth of 1 percent. Because the studies found that changes in spending for medical services occurred fairly close in time to the changes in prescription drug use, CBO assumes that the change in spending on medical services would begin in the same year as the change in prescription drug use.

## Approach to Future Cost Estimates

In estimating the budgetary impact of future legislation or proposals that would directly affect prescription drug use in the Medicare program, CBO will include an offsetting effect on medical spending. The agency will first estimate a proposal's direct effect on prescription drug costs; then, the agency will estimate the effect on the number of prescriptions filled and any resulting offsetting effect on spending for medical services.

For example, a policy that increased prescription drug copayments for certain Medicare beneficiaries might save \$4 billion in federal drug costs in a given year but reduce the number of prescriptions filled that year by 1 percent. That reduction in use would result in a one-fifth of

15. Zhang and others, "The Effect of Medicare Part D."

16. In the studies CBO examined, the range of effects on prescription drug use suggests that the offset the agency has calculated will apply for most policy changes that might be proposed. However, proposals that would produce more extreme changes in the number of prescriptions filled might cause CBO to revise its estimate of the offset.

1 percent increase in the affected population's total spending for medical services. If that total spending would otherwise be \$250 billion in that year, then those costs would increase by \$0.5 billion. The net effect of the policy, combining the savings on drug costs and the costs of increased use of medical services, would be a savings for the federal government of \$3.5 billion in that year.

If the policy in question targeted a particular population and the prescription drug use by and medical spending for that population could be identified, the offset would be calculated for that specific population. For example, if a policy targeted people receiving the low-income subsidy (LIS) in Medicare Part D, the change in prescription drug use would be estimated as a percentage of total prescription drug use by the LIS population. Likewise, the offset would be applied to Medicare's spending on medical services for that population.<sup>17</sup>

CBO will apply the offset only for policies that would change the quantity of prescriptions filled. It will not apply the offset to policies that would not affect the demand for and, therefore, the consumption of prescription drugs. For example, policies that change manufacturers' rebates to the federal government are unlikely to have a notable effect on the number of prescriptions that Medicare beneficiaries fill.

Finally, the offset described in this report applies only to the Medicare program. Further research would be needed to determine if such an offset was appropriate for changes affecting programs serving different populations—such as Medicaid beneficiaries or veterans—and what the magnitude of that offset might be.

As an illustration, CBO has applied its revised methodology to its estimate of the budgetary impact of closing the Part D coverage gap. Over the next eight years, Medicare beneficiaries' cost sharing will continue to be reduced gradually as that gap closes. That process involves two components. First, manufacturers of brand-name drugs are now responsible for 50 percent of the costs of pre-

scriptions that are dispensed when spending is within the coverage gap, effectively lowering the price for brand-name prescriptions relative to that under prior law.

Second, the generosity of the basic Part D benefit is gradually increasing so that, by the time the coverage gap is closed in 2020, Part D plans will be required to pay for 25 percent of the costs of brand-name prescriptions and 75 percent of the costs of prescriptions for generic drugs dispensed within the coverage gap. Those changes in the prescription drug benefit will affect only beneficiaries who do not receive the low-income subsidy, so CBO's estimates of prescription drug use and spending and the resulting offset to other Medicare spending apply to that population only.

By CBO's estimate, the changes in the Part D benefit will increase total annual consumption of prescription drugs by Medicare enrollees not receiving the low-income subsidy by about 5 percent by 2018. Therefore, by 2018, that change in consumption is now expected to result in a reduction of approximately 1 percent in Medicare's spending on medical services for that population. (Although the provisions largely affect beneficiaries who reach the coverage gap, the figures are presented as a proportion of prescription drug use and medical spending for the entire Medicare population not receiving the low-income subsidy.)

CBO estimates that the two provisions will boost federal spending for Medicare Part D by \$86 billion over the 2013–2022 period relative to what would have been spent under prior law. Applying the offset, CBO estimates that those provisions will reduce federal spending for medical services under Medicare by \$35 billion (out of \$5.6 trillion)—resulting in a net increase in federal spending of \$51 billion from 2013 to 2022.<sup>18</sup> Because the coverage gap is partially closed through manufacturers' discounts rather than federal subsidies, the offset generates larger savings in medical spending as a share of the increase in costs for prescription drugs than it would for proposals in which the change in prescription drug use came entirely from a change in federal subsidies.

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17. Although a substantial share of the LIS population is dually eligible for Medicare and Medicaid, the offset would be applied only to Medicare's spending because there is little evidence of a relationship between prescription drug use and spending on long-term care, which constitutes the majority of Medicaid's spending on dually eligible beneficiaries.

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18. The 10-year reduction in spending for medical services (\$35 billion) is less than 1 percent of the 10-year total spending figure (\$5.6 trillion) in part because the former figure applies to Medicare recipients enrolled in Part D who do not receive the low-income subsidy and the latter figure applies to the broader Medicare population.

In sum, using the revised methodology, CBO estimates that the net cost of implementing the provisions closing the coverage gap will be \$51 billion, rather than the \$86 billion estimated prior to the revision. The estimated savings from narrowing or repealing those provisions would be similarly reduced because of the offset.<sup>19</sup>

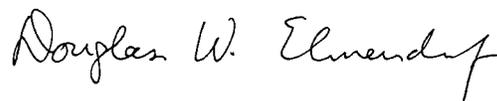
CBO will continue to assess the evidence on how changes in the use of prescription drugs affect spending for medical services and will incorporate new research findings as warranted. The agency will also monitor additional channels through which changes in prescription drug use may affect federal spending. For example, increases in the number of prescriptions filled could reduce mortality in addition to reducing hospitalizations and other medical spending (and decreases in prescription drug use could raise mortality). A decrease in mortality would increase federal spending in later years through additional Social Security payments and Medicare spending. However, at present, there is insufficient evidence of a robust relationship between the number of prescriptions filled and mortality for CBO to incorporate such an effect into its estimates.

Finally, changes in the use of certain health care products or services apart from prescription drugs might also produce countervailing changes in spending on other types of health care. More generous benefits that increase the use of such products and services might result in savings

19. The specifics of legislation to repeal those provisions might yield a different estimate; for example, repayments of discounts provided by manufacturers since the law went into effect would probably reduce net savings.

elsewhere, and less generous benefits might generate costs elsewhere. CBO will continue to review evidence of such effects and incorporate that evidence into its estimates as appropriate.

This Congressional Budget Office (CBO) report provides background information on the agency's estimates of the effects of prescription drug use on Medicare's spending on medical services. In keeping with CBO's mandate to provide objective, impartial analysis, the report makes no policy recommendations. Tamara Hayford and Melinda Buntin of CBO's Health, Retirement, and Long-Term Analysis Division wrote the report under the general supervision of Linda Bilheimer. Rebecca Yip and Jamease Miles of CBO's Budget Analysis Division completed the revised estimates of Medicare spending under the general supervision of Tom Bradley and Holly Harvey. Anna Cook, Alexia Diorio, Michael Levine, Andrea Noda, and Ellen Werble also contributed significantly to the report. Elizabeth Bass of CBO provided useful comments, as did Amitabh Chandra of Harvard University and Mark Miller of the Medicare Payment Advisory Commission. (The assistance of external reviewers implies no responsibility for the final product, which rests solely with CBO.) John Skeen edited the report. This report is available at the agency's Web site ([www.cbo.gov](http://www.cbo.gov)).



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