

Medicare Advantage to Traditional Medicare Spillovers: Further Considerations

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December 7, 2016

At the October/November meeting, Greger Vigen and I presented a memo on spillovers from Medicare Advantage (MA) to Traditional Medicare (TM) and whether/how they might be reflected in the Trustees' projections. Subsequent panel discussion at that meeting led to the conclusion that I should draft a recommendation for the panel to consider. This memo provides that draft recommendation.

Many studies have documented a spillover from MA to TM. (These studies are briefly summarized below and in the Appendix.) Though the studies vary in their focus and, somewhat, in their results, by and large they find that when and where MA market penetration is larger, TM utilization — particularly inpatient utilization — is lower or less intense. Because MA market penetration is projected to continue to grow, we might anticipate further, downward influence on TM utilization and spending. But, no such linkage is explicitly include in the Trustees' projection methodology.

Explicit inclusion of the effect could be challenging because the literature has not coalesced around its magnitude. Moreover, the projection methodology does account for spillovers in an implicit manner. Its extrapolation of recent trends in the short term model and implicit treatment of institutional factors in its long term model can be reasonably interpreted to reflect spillovers, among other things. But, it is not clearly articulated in the Trustees Report or supporting documentation how spillovers are accounted for in this way.

I. Recommendation

The Trustees Report and/or supporting methodological documents it references should elaborate on how current projection methodology incorporates MA-to-TM spillovers, as well as other endogenous, market and institutional changes to health insurance and the Medicare program.

II. Justification

Why this particular recommendation? The following subsections explain.

II.A. Prior Panel's Consideration of Spillovers and Older Studies of It

OACT staff have pointed me to a paper on the matter written in 2010 by [Michael Chernew, Katherine Baicker, and Carina Martin](#). It is my understanding that this paper informed the 2010-2011 Technical Panel. Moreover this paper includes older MA-to-TM spillover literature that the current panel has not yet considered. (For convenience, the five recent spillover papers we have examined are summarized in the appendix of this memo, in addition to a sixth from Greger Vigen. The appendix also includes a tabular summary of them drafted by RTI.)

The paper by [Chernew et al.](#) also summarizes many other studies on spillovers from commercial market managed care. The MA (or, more properly, Medicare HMO) based studies it covers are summarized in their Table 1, reproduced below. For full references and details, see Chernew et al.

Table 1 from [Chernew et al.](#)

Table 1. Effect of Medicare HMO Penetration on FFS Medicare Spending: Estimates from the Recent Literature

			Effect of a 10 percentage point increase in Medicare HMO Market Share on:		
Author (year)	Study design	Years	Part A expenditures	Part B expenditures	Total Medicare expenditures
Baker (1997)	Fixed effects model and IV estimation	1986-1990	For fixed effects, 4.5% to 6.6% decrease. For IV estimation, 38.4% decrease to 6.3% increase, depending on initial HMO share.	For fixed effects model, 4.1% to 5.6% decrease. For IV estimation, 32.0% decrease to 22.3% increase, depending on initial HMO share.	-
Baker and Shankarkumar (1998)	Fixed effects model	1990-1994	7.7% to 9.4% increase, depending on initial HMO share.	0.7% to 2.4% decrease, depending on initial HMO share.	-
Chernew, DeCicca and Town (2008)	IV model	1994-2001	-	-	9% reduction in total annual per beneficiary spending.

Chernew et al. concluded that there is ample evidence supporting spillovers in general, but insufficient evidence on their precise magnitude, particularly in the long run. I do not think the additional, recent studies we have reviewed (and in the Appendix) substantially alter this conclusion. That's one reason not to recommend altering projection models to explicitly incorporate such spillovers.

However, there is another reason: To large extent the short- and long-run effect of spillovers is arguably already included in the projection models, albeit implicitly. The next two subsections explain how.

II.B. Short Term Methodology and Spillovers

The short term projection methodology amounts to 10-year projections of spending (by Medicare Part) based on recent trends. As such, to the extent spillovers have short-term impacts, they are reflected in recent Medicare spending trends and, therefore, in the projection of them. It does not seem sensible to me to separately estimate spillovers, thereby inviting the thorny problem of avoiding double counting them.

II.C. Long Term Methodology and Spillovers

The long-term projection out to 75 years is based on the factors model, which is described in [a June 22, 2016 OACT memo](#). Though components of it are estimated separately, the conceptual model takes the form:

$$h = a + \varepsilon_y y + \varepsilon_i i + (1 + \varepsilon_p) p + d$$

where

- h = annual, constant dollar health spending
- a = residual (technology?)
- y = annual GDP per capita
- i = average, effective coinsurance rate
- p = medical price relative to GDP deflator
- d = index of demographic contribution to health spending

and the various ε are elasticities. (See pages 31-33 of the memo, though I'm slightly departing from the notation used there for simplicity.)

Though technology change has been found to be one of the largest, if not the largest, factor influencing long-term health care spending growth, there is no explicit term for it in the model. There is good reason for this: we don't know how to measure it, particularly in a consistent manner over time and across all modalities and settings of care. Similarly, we don't know how to measure the management of it (e.g., managed care techniques) in a consistent manner over time. As such, both technology and its management enter the model implicitly, as follows.

As explained in the memo, the effect of technology on health spending is related to economic factors captured by y , therefore ε_y is properly interpreted as a combined "income-technology elasticity" that also includes the variation in technology growth that would otherwise appear in the residual that can be explained by per capita GDP.

To make a long story short, for this reason the effect of technology shows up both in a and ε_y . But, more important for our purposes, the effect of institutional factors to control the large impact of technology on health care spending (including managed care techniques, but also alternative payment models, and other innovations) are also reflected in a and ε_y . The memo very nearly states this as:

*Both the direction and uptake of medical technology are responsive to **ability and willingness to pay** for new forms of treatment. In other words, the effects of medical technology on health care spending growth are conditional, not only on the state of medical knowledge, but **also on public and private budget constraints**. (Emphasis added.)*

In other words, the effect of technology on health spending is mediated by public and private institutional attempts to control it, apart from controls through cost sharing (already captured in *i*). As such, to the extent care management in MA (or the commercial market) spillover to TM, that effect can be reflected in the assumed trend of ε_y and a in the long-term projection. Because we have no consistent way of measuring technology or its management, this is the only sensible way to incorporate them.

Both of those factors are projected to trend downward over time, reflecting historical trends, as described in the memo. For example, Figures A.1 and A.2 show the income-technology elasticity and residual estimates over time.

Figure A.1. —Income-technology Elasticity Estimates, 1980-2002

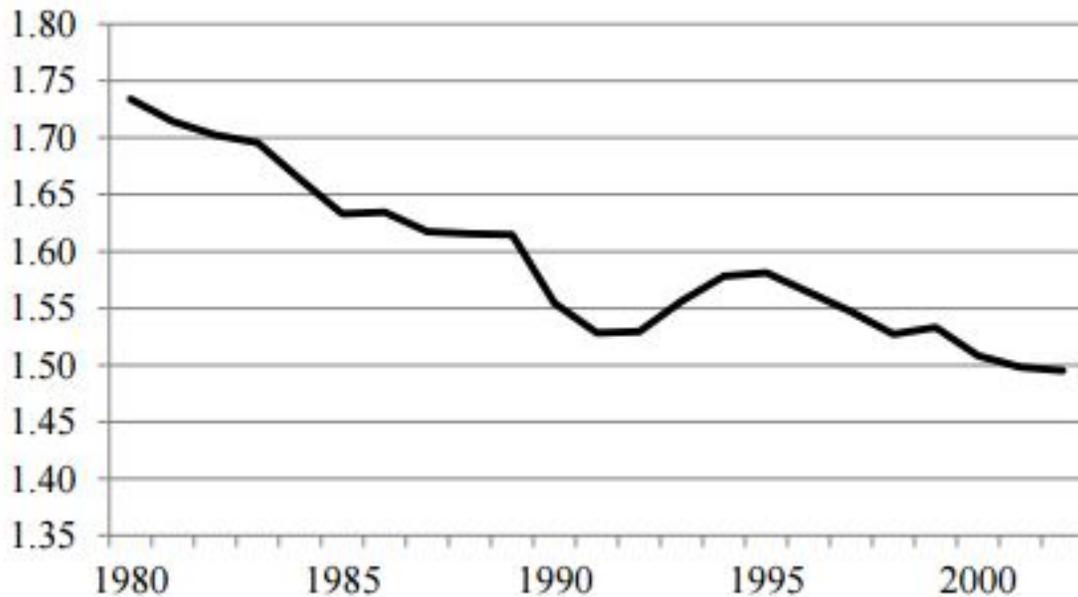
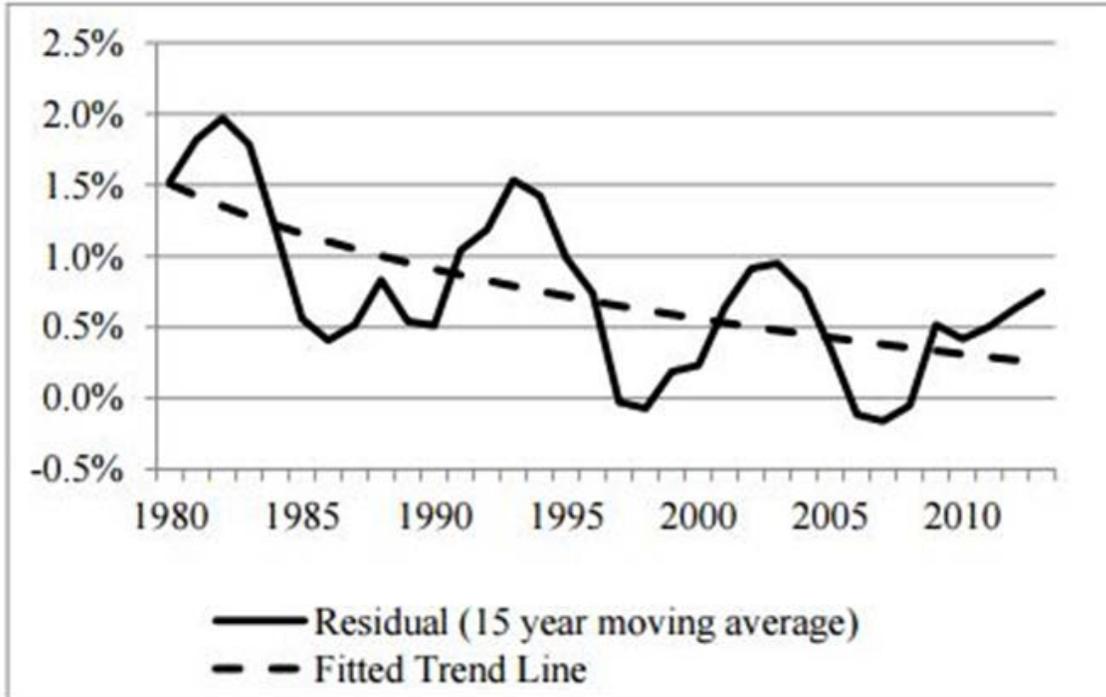


Figure A.2. —FCG Model Residual with Fitted Trend Line, 1980-2012



Reflecting these, in the current long-term projection model, the income-technology elasticity estimate is trended from 1.27 to 1.09 over 2040-2090 and the residual is trended to zero by 2040 and held at that level through 2090.

One can certainly quibble with the assumed trends of these factors, but it'd be very difficult to do so with explicit reference to MA-to-TM spillovers. They implicitly aggregate far more than that.

III. Conclusion

Were one to attempt to explicitly model and project MA-to-TM spillovers, it is not evident exactly what level of effect to build in. Though the literature is abundantly clear there are spillovers, it is less so on the quantitative impact, particularly in the long run.

Moreover, in different ways, both the short- and long-term model capture MA-to-TM spillovers. Further, the long-term on model implicitly captures any institutional mediation of health spending through downward trends in factors that govern the influence of technology.

In 2010, Chernew et al. reached the conclusion that there was insufficient evidence to support explicit incorporation of a particular size of spillover into a projection model. Nevertheless, they felt the spillover effects estimated in the literature were qualitatively informative:

[G]iven substantial evidence of managed care's broad influence on care via system-wide infrastructure and practice pattern changes, we conclude that scenarios in which public and private spending trends are persistently and widely divergent seem unlikely. Second, we believe it is reasonable to use the spillover literature to justify the reduced rate of excess spending growth. Our general sense is that an even further reduction in the assumed rate of excess spending growth might be justifiable if one assumed that: (1) commercial plans would be able to successfully slow spending (evidence of which is weak, but economics suggests that private spending is likely to slow as the share of GDP devoted to health care rises); and (2) public payers would not react by providing a financial cushion to providers to maintain access for public plan enrollees.

They also point to the value of developing a model that explicitly includes spillovers even if one cannot pin down their size.

Given the large uncertainty surrounding spillovers (particularly long-run spillover) in the future, it is important for forecasters to evaluate the impact different assumptions will have on policy. Assuming strong spillovers will tend to generate forecasts of slower Medicare spending growth and dampen the alarm sent to policy-makers about the need for policy action. Making that spillover assumption explicit may help illustrate that, while spending for Medicare is slowing, it is doing so only because private sector spending is assumed to be slowing. The public policy consequences and distributional implications of spending growth slowed by spillovers, rather than through other mechanisms, are quite different.

It is beyond the scope of this memo to attempt to evaluate the return-on-effort for development of such a model. Though it might be of some value for policy evaluation, it's not evident to me it's institutionally valuable for OACT or the Trustees. Therefore, at a minimum, I recommend that the Trustees more fully articulate how spillovers and other intuitional factors enter the current projection models, as articulated above.

Appendix: Recent MA to TM Spillover Literature

1. "[Managed care and medical expenditures of Medicare beneficiaries](#)," by Michael Chernew, Philip DeCicca, and Robert Town (Journal of Health Economics, 2008)

The authors use an instrumental variables (IV) approach and 1994–2001 Medicare Current Beneficiary Survey data to estimate that each percentage point increase in Medicare HMO market penetration leads to a one percent decrease in annual, per capita TM spending. The spending reduction is for both inpatient and outpatient care and is concentrated among TM beneficiaries with at least one chronic condition.

Their instrument for Medicare HMO market penetration is the county-level government payment rate to plans. Higher payment rates attract plans into markets and permit more generous benefits, which increases market penetration. During the study period, those county-level plan payments were divorced from TM spending (the outcome variable), making them valid (exogenous) instruments for the analysis.

2. "[The spillover effects of Medicare managed care: Medicare Advantage and hospital utilization](#)," by Katherine Baicker, Michael Chernew, and Jacob Robbins (Journal of Health Economics, 2013).

Using a similar IV approach as Chernew, DeCicca, and Town, the authors examined the relationship between greater MA enrollment and hospital utilization in the following year. Their analysis focused on five states represented in 1999–2009 Healthcare Cost and Utilization (HCUP) State Inpatient Databases (SID) — Florida, New York, California, Arizona, and Massachusetts — which account for almost half of all MA enrollees.

They found higher MA penetration associated with reduced TM and commercial market hospital costs and utilization. A 10 percentage point increase in MA penetration is associated with a about a 4.5% decrease in overall and TM-specific hospital costs and a commensurate shortening of length of stay. In addition, preventable hospitalization rates are lower when MA market penetration grows. Their (non-IV) OLS specification is conservative, obtaining a smaller spillover.

The size of the estimated spillover to TM would offset more than 10% of increased payments to Medicare Advantage plans. But, the manner in which Medicare pays for hospital care (prospectively based on diagnosis related groups (DRGs)) means that it could only recoup spillover savings for services bundled into DRG payments over time, as payment rates are adjusted.

3. "[Medicare Payments and System-Level Health-Care Use: The Spillover Effects of Medicare Managed Care](#)," by Katherine Baicker and Jacob Robbins (American Journal of Health Economics, 2015).

The authors extended prior work, focusing on 1999-2011. Their models include one year lags of MA market penetration and, as in earlier work, market penetration is instrumented with MA payment rates.

They found that a 10 percentage point increase in MA market penetration associated with decreases of 7.3% in hospital days and 9.1% in nonsurgical hospital days and increases of 5.5% in outpatient visits and 8.9% in outpatient surgical visits. For beneficiaries with chronic conditions the results are a bit larger. And, with a model that includes MA market penetration squared, they estimated that the spillover to hospital days is maximized when penetration is at 18%. OLS results are conservative, showing a smaller spillover effect.

In total, the authors calculate a \$252 per TM beneficiary per year in spillover savings for every 10 percentage points in higher MA market penetration, though as noted above, the savings would have to be recouped in DRG payment updates over time.

4. "[Medicare Managed Care Spillovers and Treatment Intensity](#)," by Kevin Callison (Health Economics, 2016).

Like prior studies, Callison uses 2003-2009 SID data and MA payment rates as an instrument for market penetration to examine the relationship between MA market penetration and TM-financed treatment intensity for patients hospitalized with AMI. He finds that a 1 percentage point increase in MA market penetration is associated with a 0.94% reduction in TM hospital costs for AMI patients, a 2.2% reduction in the number of inpatient procedures, a 2.4% reduction in the probability of receiving an angioplasty, a 2.4% reduction in the probability of ventilator utilization, and a 1.8% increase in the probability of mortality. (This mortality finding is at odds with prior work relating MA penetration to mortality and hospitalization by [Afendulis, Chernew, and Kessler](#).) As in prior studies, OLS (non-IV) estimates are conservative in their estimation of a spillover effect.

5. "[Recent Growth In Medicare Advantage Enrollment Associated With Decreased Fee-For-Service Spending In Certain Counties](#)," by Garret Johnson, Jose Figueroa, and Ashish Jha (Health Affairs, 2016)

The authors bring the spillover literature up to date with an analysis of the association of changes in county-level MA market penetration with changes in

county-level TM spending between 2007 and 2014. Changes are measured over two year periods and MA market penetration is lagged by a full period (i.e., 2007-2009 MA penetration change predicts 2009-2011 TM spending change, etc.). Unfortunately (for analytic purposes), the ACA tied MA payments directly to TM spending, so the authors could not use the IV approach exploited in prior studies. However, an OLS approach, which the authors used, has underestimated the spillover in prior work, as discussed above.

A spillover was observed only for counties in the highest quartile of baseline MA market penetration (>17.2). In those counties, a 10% increase in penetration was associated with a \$154 annual decrease in TM spending per beneficiary. The results suggest a threshold effect, by which spillovers only occur (or are detectable with OLS methods) when MA market penetration is sufficiently large. The estimated spillover accounts for 11% of the recent slowdown in TM spending and more than offset the payment to MA plans above TM costs.

6. [“Turning Value-Based Health Care into a Real Business Model,”](#) by Laura S. Kaiser and Thomas H. Lee, MD

This article from Intermountain Healthcare summarizes the business perspective on value-based care. It outlines why some of the early-adopter hospitals have moved in this direction. It references the “all-in” approach that creates spillover within the hospital setting (although the word spillover is not used). The article offers four examples of actions move toward better care and affordability (their term for smarter spending).

As part of the “all-in” approach, Intermountain runs an MA program, but the MA program is not explicitly mentioned in the article.

Recent Medicare Advantage Spillover Literature

Paper	Data	Method	Model Specification	Estimates
1. Chernew et al., JHE, 2008	Annual Cost and Use files of MCBS from years 1994-2001	IV, use county-level payment rates from CMS to HMOs as instruments to identify the effect of county-level Medicare HMO penetration	Dependent variable is log of FFS beneficiary annual spending. In addition to county and year fixed effects, all models control for age, age squared, race, income, household size, marital status, general health status, sixteen disease indicators, smoking status and body mass index	a 10% point increase in Medicare HMO enrollment is associated with a reduction in expected FFS expenditure of between 7% and 8%
2. Baicker et al., JHE, 2013	Healthcare Cost and Utilization Project's state inpatient database for NY, MA, AZ, FL, and CA for 1999–2009 and from the Medicare enrollment files for 1998–2009	IV, use lagged county- or hospital-level payment rates from CMS to HMOs as instruments to identify the effect of county-level Medicare HMO penetration	examine the effect of MA enrollment on beneficiary spending, utilization, and quality both at the county- and hospital-levels	a 10% point increase in MA penetration yields a 4.7% decline in hospitalization costs for the full sample in the IV specification and a 4.5% decline for the TM FFS sample; a 10% point increase in MA penetration has no significant effect on length of stay in the OLS specification, but the IV regressions suggest a shortening of approximately 0.2 days (a 4% decrease relative to the average length of stay of about 5 days)
3. Baicker & Robbins, AJHE, 2015	20% sample of Medicare FFS enrollees during 1999-2011	IV, use lagged county-level payment rates from CMS to HMOs as instruments to identify the effect of county-level Medicare HMO penetration	examine the effect of MA enrollment on beneficiary inpatient utilization, outpatient utilization, and quality at the county-level	a 10% point increase in MA market penetration is associated with decreases of 7.3% in hospital days and 9.1% in nonsurgical hospital days and increases of 5.5% in outpatient visits and 8.9% in outpatient surgical visits. For beneficiaries with chronic conditions, the results are a bit larger.

(continued)

Recent Medicare Advantage Spillover Literature (continued)

Paper	Data	Method	Model Specification	Estimates
4. Callison, HE, 2015	Healthcare Cost and Utilization Project's state inpatient database for NY, MA, AZ, FL, and CA during 2003–2009 for all Medicare beneficiaries between 65-85 hospitalized with AMI	IV, use county-level payment rates from CMS to HMOs as instruments to identify the effect of county-level Medicare HMO penetration	examine the effect of MA enrollment on AMI beneficiary hospital costs and inpatient utilization	a 10% point increase in MA market penetration is associated with a 9.4% reduction in TM hospital costs for AMI patients, a 12% increase in average length of stay, a 22% reduction in the number of inpatient procedures, a 24% reduction in the probability of receiving an angioplasty, a 24% reduction in the probability of ventilator utilization, and a 18% increase in the probability of inpatient mortality for FFS Medicare patients suffering an AMI
5. Johnson et al., HA, 2016	Geographic Variation Public Use File on US county's MA penetration and average spending per beneficiary in FFS Medicare from 2007-2014, combined with AHRF, BLS, market data, and Medicare Master Beneficiary Summary File	used analysis of variance and chi-square tests to compare county-level population demographic characteristics and health care market based on their change in Medicare Advantage penetration; also used OLS with Medicare Advantage penetration as the independent variable and FFS Medicare costs as the dependent variable, and included a random intercept for each county in the model to allow for within-county correlation over time	using a lagged approach with eight years of data for each of the 3,014 counties, they look at the association of changes in county-level MA market penetration with changes in county-level TM spending between 2007 and 2014. Changes are measured over two year periods and MA market penetration is lagged by a full period (i.e., 2007-2009 MA penetration change predicts 2009-2011 TM spending change, etc.)	Overall, a 10% point increase in MA penetration was associated with a small and nonsignificant \$32.74 decrease in annual FFS Medicare cost growth. A spillover was observed only for counties in the highest quartile of baseline MA market penetration (>17.2%). In those counties, a 10% point increase in penetration was associated with a \$154 (an 18% decrease relative to the 2007 average FFS per capita Medicare costs of \$8,301) annual decrease in TM spending per beneficiary. The results suggest a threshold effect, by which spillovers only occur (or are detectable with OLS methods) when MA market penetration is sufficiently large. The estimated spillover accounts for 11% of the recent slowdown in TM spending and more than offset the payment to MA plans above TM costs.