A Budgetary Impact Analysis of Medicare Coverage for Anti-Obesity Interventions

Wayne Su

Director, Life Sciences Consulting

1150 Connecticut Ave. NW, Suite 401

Washington DC 20036

Mobile: +1 202 384 9837

Email: Wayne.Su@ihsmarkit.com

Key Findings

- IHS Markit used a validated and published individual simulation model to predict the budget impact to Medicare coverage utilization of anti-obesity interventions
- Over the next 10 years, Medicare is expected to save $19 billion after a modest coverage utilization, and $21 billion after a more aggressive coverage utilization, with the majority of the savings coming from reduction in ambulatory care (Part B) and prescription drug (Part D) expenditures
- Even after an aggressive (67.4%) coverage utilization, the evidence shows ≤8% of all Medicare beneficiaries to receive some form of anti-obesity treatment
- The analysis demonstrates on average, lifestyle intervention helps elderly who are eligible lose 7.5% of excessive weight per year, and anti-obesity drug combined with lifestyle intervention can help eligible patients lose about 9.7%. Participants regain 1/3 of initial lost weight within 5 years after discontinuation
- The data show that each treated beneficiary is expected to incur direct costs to Medicare of ~$1,700 from covered anti-obesity treatment. Those costs will be offset by improvement in their overall health condition, leading to lower expenditures in ER, ambulatory care, inpatient stays, and Rx, resulting in net savings between $6,700 - $7,100 over 10 years per person
- Model estimates across the entire Medicare population suggest medical expense would increase about $120 per beneficiary due to higher coverage utilization. The reduction in the cost of treating obesity complications would be more than enough to offset the increased expense, leading to a net savings of between $300 - $330 per beneficiary over 10 years

Background

Obesity is acknowledged as a critical public health concern in the U.S, and has been the subject of numerous studies, with results indicating that elevated risks of developing other chronic conditions, as well as increased health care utilization and spending, are strongly associated with the disease.[1,2,3] The economic burden of the disease is not insignificant-estimates vary, but a recent study suggested that in the U.S, the cost of obesity and obesity-related treatments was approximately $427.8 billion in 2014, an amount that has undoubtedly escalated in the years that followed owing to the increasing numbers of individuals with obesity.[4] In terms of health outcomes, the National Institutes of Health (NIH) has reported that obesity and overweight are now the second leading cause of death nationally, with an estimated 300,000 deaths a year attributed to the epidemic.[5] Given the magnitude of obesity's impact, policies that seek to treat and prevent the condition are of high priority and warrant careful consideration.

[1] Malnick SD, Knobler H. (2006) The medical complications of obesity. QJM. 99(9): 565-579
[2] Pi-Sunyer, Xavier. "The medical risks of obesity." Postgraduate medicine 121.6 (2009): 21-33.
[3] Dee, Anne, et al. "The direct and indirect costs of both overweight and obesity: a systematic review." BMC research notes 7.1 (2014): 242.
[4] Milken Institute, Weighting Down America: The Health and Economic Impact of Obesity, November 2016, http://assets1c.milkeninstitute.org/assets/Publication/ResearchReport/PDF/Weighing-Down-America-WEB.pdf
[5] Obesity: Facts, Figures, Guidelines. https://www.wvdhhr.org/bph/oehp/obesity/mortality.htm

In October 2015, the Congressional Budget Office (CBO) released a blog post on the topic of obesity.[6] The post featured a discussion of the potential budgetary implications of various policies, ranging from broad measures to be applied to the entire population to more specific policies that focus on select subgroups, all meant to address the epidemic. Highlighting the scarcity of studies that focused on the effect of these policies on health outcomes and Medicare spending, CBO illustrated the challenges of trying to fill these research gaps, particularly for understanding the financial impacts of policies that propose to promote weight loss among Medicare beneficiaries with obesity. The two proposals used as an example include:

- Higher utilization of behavioral counseling
- Coverage of obesity drugs

To assist researchers conducting studies on these policy proposals, CBO further outlined the following questions that must be answered to adequately evaluate proposed Medicare coverage policies:

- How many beneficiaries would participate?
- How many providers, and of what types, would offer the treatment?
- What share of participants would complete the full course of treatment?
- What would be the direct costs of treatment?
- How much weight would participants lose, and how long would that weight loss be maintained?
- How would weight loss affect the health care spending of participants and the federal budget?

This whitepaper seeks to answer those questions using a validated, peer reviewed, and published microsimulation model. (The second question regarding providers is related to clinical practice, and thus will be omitted from this white paper.) The authors hope that this study will help to further research in this area and assist CBO in its deliberations.

Modelling Approach

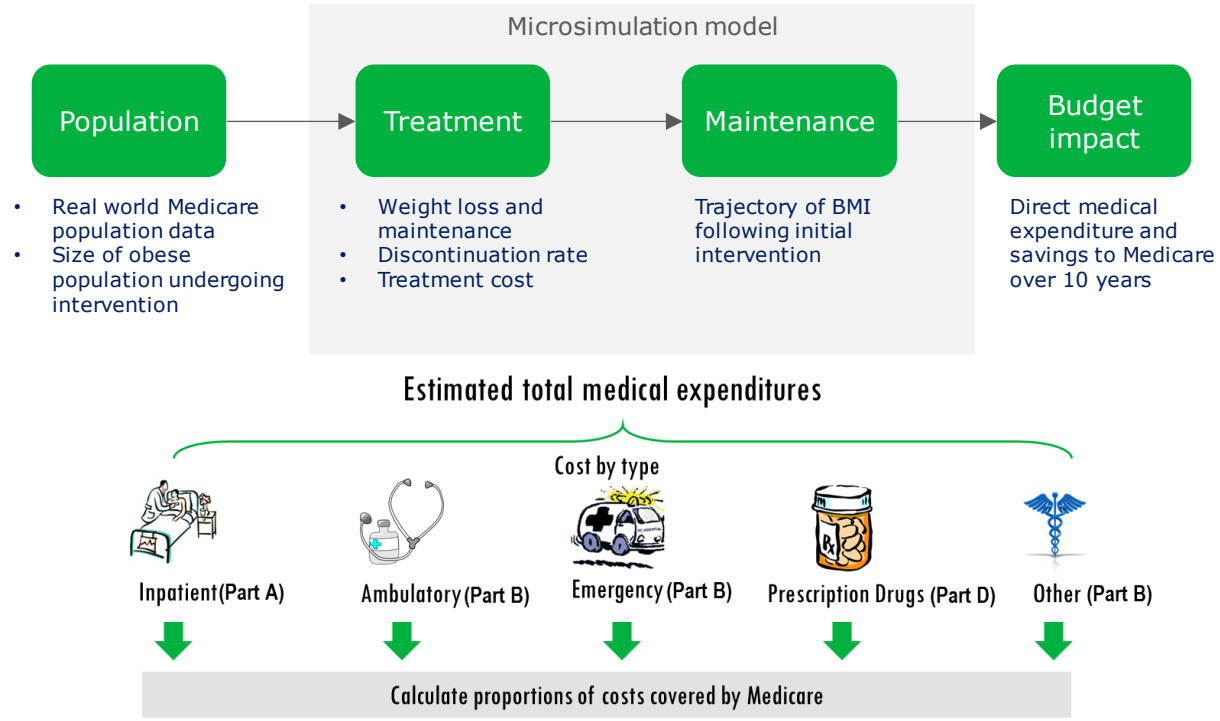
To generate economic evidence to address CBO's concerns, a simulation study, informed and supported by a comprehensive literature review to fill in the data gaps, was conducted to project the budget impact of different coverage scenarios regarding anti-obesity treatments. The study was based on a validated simulation platform designed to simulate the long-term health and economic outcomes of the US population.[7] The model simulates disease onset for each individual using current risk factors and medical history to predict annual onset of more than 30 conditions that cover the following disease areas: cardiovascular, endocrine, gastroenterology, mental and cognitive illness, musculoskeletal, pulmonary and other obesity-related conditions. Disease-specific mortality is also modeled. Direct and indirect economic outcomes were also predicted from payer, employer, and societal perspectives. Prediction equations for disease onset and economic outcomes were derived

[6] Noelia Duchovny, Eamon Molloy, Lori Housman, and Ellen Werble, Estimating the Effects of Federal Policies Targeting Obesity: Challenges and Research Needs, October 26, 2015, https://www.cbo.gov/publication/50877
[7] Su W, Huang J, Chen F et al. Modeling the clinical and economic implications of obesity using microsimulation. *J Med Econ* 2015;1-27

from published literature and original research with public databases. [8] A comprehensive technical documentation about an earlier version of the model is also available online.[9]

Simulation starts with a representative real-life Medicare population sample synthesized from large national survey databases,[10] with intervention eligible criteria of BMI ≥30, or BMI ≥27 with at least one of a few select comorbidities (e.g. hypertension, dyslipidemia, and type-2 diabetes). Real life population characteristics, cost and effectiveness of anti-obesity interventions, duration of weight loss and maintenance, as well as other input data were read into the modeling framework to produce the budgetary impact on Medicare in the following 10 years. The model broke down Medicare spending into 5 care delivery settings (inpatient, outpatient, Rx, emergency department, and other [11]) after patient out-of-pocket contributions (deductibles, copayments, coinsurance). The spending breakdown by type of service provided further insights into the sources of potential budget savings.

Exhibit 1 Analytical framework to project Medicare budget impact



Source: IHS Markit microsimulation analysis

[8] Dall, TM, et al., Value of Lifestyle Intervention to Prevent Diabetes and Sequelae, American Journal of Preventive Medicine, 2014
[9] https://cdn.ihs.com/www/pdf/IHS-DPMM-Technical-documentation-Mar2016.pdf
[10] Databases used to synthesize population include National Health and Nutrition Examination Survey, (NHANES), American Community Survey (ACS), National Nursing Home Survey (NNHS), and Behavioral Risk Factor Surveillance System (BRFSS)
[11] All other expenses not covered in the previous four categories, such as the cost of durable medical equipment

Addressing CBO's concerns

This white paper addressed CBO's concerns as follows:

CBO question #1:

How many beneficiaries would participate?

Answer:

Among all Medicare beneficiaries, it is estimated about 0.27% are using lifestyle intervention services (covered by Medicare), [6] and 3.6% are on combined anti-obesity drugs (out of pocket or through Non-Medicare sources) and lifestyle intervention.[12] Based on evidence in the literature,[13] we expect the overall usage will increase by 50.0% (modest assumption) to 67.4% (aggressive assumption) if Medicare expands coverage on obesity treatment. As shown in the table below, based on the total enrollment of Medicare program (57.65 million, February 2017), we estimated 3.1~3.5 million beneficiaries would participate in the weight loss intervention due to higher coverage utilization.

Exhibit 2 Population size under different coverage utilization scenarios

	Baseline		Modest (50.0%) coverage utilization scenario		Aggressive (67.4%) coverage utilization scenario	
Estimated participation	%	n (million)	%	n (million)	%	n (million)
Total Medicare enrollment (February 2017)	100%	57.65	100%	57.65	100%	57.65
Beneficiaries participate in lifestyle intervention	0.27%	0.16	0.41%	0.24	0.45%	0.27
Beneficiaries participate in lifestyle + medication intervention	3.6%*	2.08	5.4%	3.11	6.0%	3.46

* Cost base to Medicare is 0 as these are all self-paying patients

Source: IHS Markit microsimulation analysis

[12] Hampp C, Kang Em et al. Pharmacotherapy. 2013 Dec; 33(12): 1299–1307. Use of Prescription Anti-obesity Drugs in the United States. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4740913/
[13] Goldman, DP, et al., Pharmacy benefits and the use of drugs by the chronically ill, JAMA, Vol. 291, No. 19, 2014

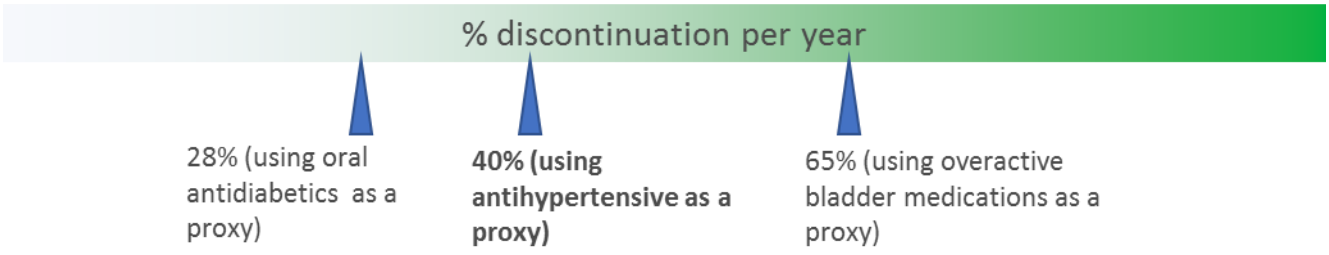
CBO question #2:

What share of participants would complete the full course of treatment?

Answer:

According to current Medicare coverage policy on weight loss counseling, participants of lifestyle intervention receive reimbursement for the first 6 months of treatment and are re-assessed for continuing coverage during month 7~12. The discontinuation rate at 6 months is 11%.[14] Since the majority of generic anti-obesity drugs were only recommended for short term use, users tend to discontinue their treatment within the first year with 24% discontinuation rate at 6 months.[15] On the other hand, newer branded drugs were approved for long term use but there is a dearth of research on real-life patient adherence outside of a controlled setting. Their annual discontinuation rate is estimated to be around 40% (using antihypertensives as an approximation),[16] with a possible range from 28% (lower bound) to 65% (upper bound)[17].

Exhibit 3 Estimated annual discontinuation rate of anti-obesity medications



Source: IHS Markit microsimulation analysis

CBO question #3:

How much weight would participants lose?

Answer:

A review of recent publications on the effectiveness of weight loss interventions estimates the weight loss percentage to between 5%-12%. Studies have shown lifestyle intervention helped elder adults

[14] Villareal DT, Chode S et al. Weight Loss, Exercise, or Both and Physical Function in Obese Older Adults. NEJM. 2011
[15] Astrup A, Carraro R et al. Safety, tolerability and sustained weight loss over 2 years with the once-daily human GLP-1 analog, liraglutide. Int J of Obesity. 2012
[16] Vrijens, B, Antoniou, S, et al., Current situation of medication adherence in hypertension, Frontiers in Pharmacology, 2017
[17] Yeaw, J, Benner, JS, Walt, JG, Sian, S, Smith, B, Comparing adherence and persistence across 6 chronic medication classes, Journal of Managed Care Pharmacy, Vol. 15, No. 9, 2009

lose 7.5% of excess weight,[18] while those who participated in interventions combining anti-obesity drugs and lifestyle modifications reduced weight by approximately 9.7%. [19]

CBO question #4:

How long would weight loss be maintained?

Answer:

Based on the results from the Diabetes Prevention Program Outcomes Study (DPPOS), on average senior participants regain 1/3 of the weight lost in the 5 years following the completion of the initial program.[20]

CBO question #5:

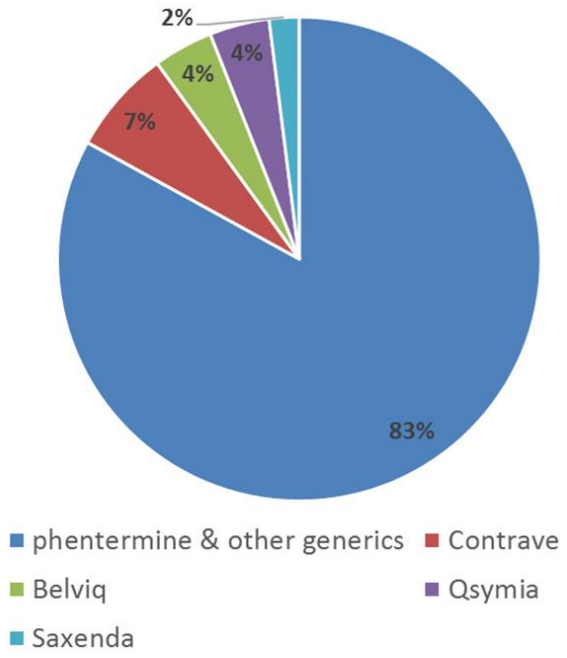
What would be the direct costs of treatment?

Answer:

Lifestyle intervention (Intensive Behavioral Therapy) is currently covered by Medicare Part B with a reimbursement rate of $25.19 per session.[21] The total treatment cost is $226 for the first 6 months (9 sessions), and $151 for the second half year (6 sessions) if the participant meets the 3kg weight loss requirement. The generic anti-obesity drugs hold an 83% share of the weight loss drug market and on average cost each user $7 per month (using generic phentermine as an approximation), while newer branded drugs are used by the remaining 17% of the market and cost around $331 per month.[22]

[18] Felix HC, West DS et al. Effectiveness of Weight Loss Interventions for Obese Older Adults. American Journal of Health Promotion. 2012
[19] Yeh JS. Obesity and Management of Weight Loss . NEJM. 2016
[20] Diabetes Prevention Program Research Group, et al., 10-year follow-up of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study, Lancet, 2009, 14(374): 1677-86
[21] Hoerger, Course et al. Am J Prev Med 2015;48(4):419–425. Medicare's intensive behavioral therapy for obesity: an exploratory cost-effectiveness analysis.
[22] IHS PharmaOnline International price database, accessed April 5, 2017

Exhibit 4 Market share of anti-obesity medications



Source: IHS Markit microsimulation analysis

We estimated the increased cost of intervention from the Medicare perspective under 2 higher utilization scenarios. Compared to the current Medicare spending level, the 10-year cost of treatment per treated beneficiary will be $1,657 higher under modest coverage utilization, and $1,737 higher under aggressive coverage utilization. (2% inflation[23])

CBO question #6:

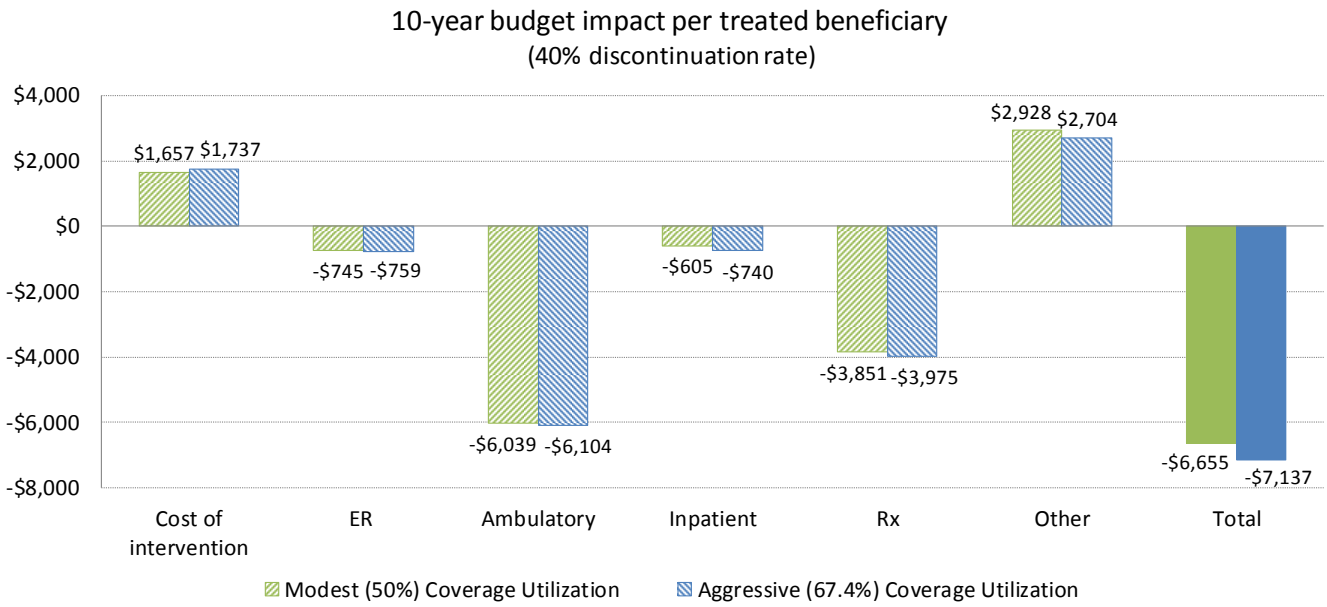
How would weight loss affect the health care spending of participants and the federal budget?

Answer:

10-year individual simulation analysis projected that due to weight loss interventions, each treated beneficiary will incur $6,655 and $7,137 less in medical costs over 10 years under the modest and aggressive coverage utilization scenarios, respectively. And the majority of the savings will come from reduced spending on other prescription drugs and ambulatory care services (Exhibit 5). This is expected because the comorbidities of obesity, such as cardiovascular diseases and diabetes, are primarily managed through outpatient visits and prescription medicines. Expanding Medicare coverage on anti-obesity treatments will lead to fewer occurrences of obesity comorbidities, which in turn will reduce the population demand for these two types of services.

[23] Congressional budget office, The budget and economic outlook: 2017 to 2027, January 24, 2017

Exhibit 5 10-year budget impact on Medicare per treated beneficiary under modest and aggressive coverage utilization *



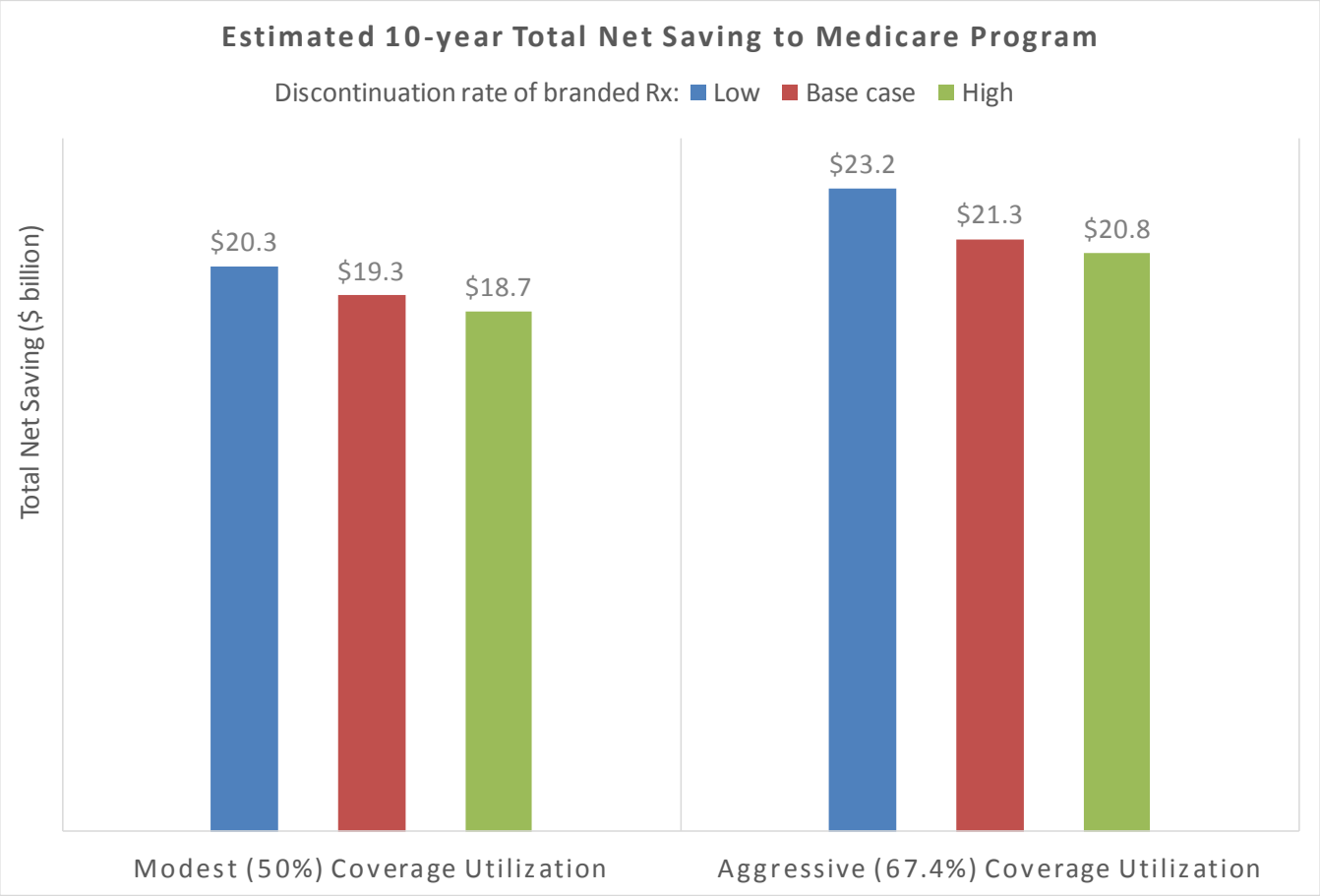
* This chart shows the change in Medicare spending under various categories as compared to the no utilization scenario

Source: IHS Markit microsimulation analysis

Because a substantial proportion of the population won't receive any intervention, the average budget savings per beneficiary over the entire Medical population is approximately $300 - $330 per year. This is expected to fluctuate 10% higher or lower depending on the discontinuation rate of branded anti-obesity medications. Thus, plausible variation in the continuation rate of branded medications is unlikely to significantly influence the budget impact of the coverage utilization on Medicare.

In total, Medicare is expected to save $19 or $21 billion over 10 years with modest or aggressive coverage utilization, respectively. The savings can reach $23 billion if the discontinuation rate of branded drugs is lower. (Exhibit 6)

Exhibit 6 Total Savings of Medicare Program over 10 Years



Source: IHS Markit microsimulation analysis

Conclusion

We estimated 3.3~3.7 million Medicare beneficiaries would take some form of weight loss intervention due to higher coverage utilization, losing 7.5% and 9.7% of weight for those who take lifestyle intervention and medications, respectively. Patients are likely to regain 1/3 of the initial weight loss within 5 years after discontinuing any form of anti-obesity intervention. 40% of those who take branded medications will discontinue treatment within the first year.

Our simulation suggests there are likely to be sizable long-term Medicare budget savings due to higher utilization of anti-obesity interventions (lifestyle interventions and/or anti-obesity medications). Under modest and aggressive coverage utilization, Medicare is expected to pay $1,660 - $1,740 more over 10 years to cover anti-obesity interventions. The higher utilization will generate budget savings between $8,300 - $8,870, resulting in a net savings of approximately $6,660 - $7,140 for each treated beneficiary. In total, Medicare is expected to save $19 - $21 billion over 10 years due to the higher utilization.

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