Maryland Diabetes Incidence Outcomes-Based Credit Methodology
September 18, 2019

Summary

The State of Maryland will estimate averted cases of diabetes by calculating the difference in diabetes incidence rate (newly diagnosed diabetes cases) between Maryland and a pre-established control group to estimate the impact of the Maryland Total Cost of Care (TCOC) Model. The difference will be multiplied by the Maryland population aged 45+ to estimate the number of averted cases. The averted cases will then be multiplied by a pre-established cost estimate to calculate the outcomes-based credit.

Figure 1. Diabetes Outcomes-Based Credit Calculation

Averted cases = Performance improvement x Maryland population Age 45+.

Step 1. Estimate the Averted cases of Diabetes

Maryland will first compare the diabetes incidence rate in Maryland in the performance year compared to the diabetes incidence rate in a control group.[1] Also known as a *counterfactual*, the control group represents the performance Maryland may have expected without the TCOC model. After extensive analysis, Maryland chose to use a "*synthetic control*", which is made up of an aggregate of other states, rather than comparing to the nation. The goal of the synthetic control approach is to identify a comparison group in the pre-intervention time period (2011-2018) that closely resembles the intervention group (Maryland) in the same time period. The effect of the intervention may be measured as the difference between Maryland's change in incidence during the intervention period and the control group's change in incidence. See "Development" section for more details.

The difference in diabetes incidence rates between Maryland and the synthetic control group will be multiplied by the Maryland adult population age 45+ in order to estimate the number of *averted cases* of diabetes.[2]

Step 2. Apply Cost Estimate

The State developed a methodology to translate averted cases into health system costs for Medicare enrollees. Using Medicare claims data, HSCRC worked with actuaries to generate a *cost estimate*, which is a constant dollar value attributed to one averted case. For more information on the cost estimate, please see "Development" section. The methodology estimated a total cost savings of $14,512 from averting a case of diabetes for five years. Therefore, the number of averted cases of diabetes will be multiplied by $14,512 to calculate the total credit.

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[1] Calculated based on Behavioral Risk Factor Surveillance Survey (BRFSS)

[2] Population based on the most recent five-year American Community Survey

Example

In the following example, we assume that in the first year of the intervention, the synthetic control group experiences an increase of 0.5 cases per 10,000 adults compared to a Maryland incidence rate decreases of -1.5 cases per 10,000 adults.[3] For this simplified example, the estimated incidence difference between Maryland and the synthetic control group is two averted cases per 10,000 adults. The two averted cases per 10,000 are then applied to the Maryland population over age 45 based on the most recent five-year American Community Survey (2,499,824). This results in an estimate of 500 averted cases. A per-case credit of $14,512 yields a one-time outcome-based credit of $7.3 million in 2019.

Methodology Development

Control Group Development

The State used pre-intervention diabetes trends and demographic factors, including race/ethnicity, gender, and income, in the synthetic control matching process to determine a subset of states and weights to comprise the synthetic Maryland. The resulting synthetic control is a better match to Maryland than the national mean, both in terms of Maryland's diabetes incidence trajectory in the pre-intervention period and key demographic characteristics, especially in its racial/ethnic and socioeconomic composition (see graphs).
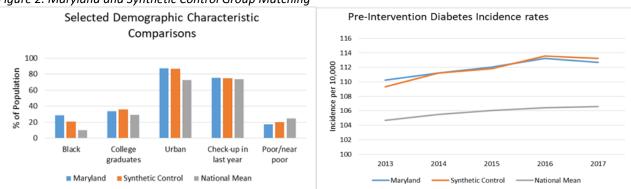
Figure 2. Maryland and Synthetic Control Group Matching[4]

Cost Estimate Development

Analysis estimated that each year of incident diabetes avoided in the Medicare population would save Medicare about $4,100 per year in 2019. Additionally, individuals who transition to diabetes after a delay related to the intervention are estimated to save an additional $775 per year, due to reduced duration of the disease. The combination of the annual numbers, assumed mean onset delay, and additional accounting for inflation and mortality results in a value of $14,512 per averted case over five years.[5]   The cost estimate per averted case represents an aggregate estimate of: a) savings realized during the year in which a Maryland resident may have otherwise been diagnosed with diabetes absent the TCOC Model, and b) savings accrued in the following four years, when the resident may be diagnosed with diabetes but can be treated at a lower cost because they have had the disease for less time.

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[3] Increase of 0.5 cases was selected for the example as it is the mean annual incidence change among all states

[4] Graphs are based on matching using 2011-2017 data; control group will be rerun with 2018 data

[5] Assuming each case of averted incidence remains free of diabetes for about 2 years.