

Attachment 3:

Adjusted Medicaid Spending Models

Introduction

The primary analysis presented in the report presents the effect of CHC on total Medicaid Home and Community-Based Services (HCBS) spending for the subset of the CHC population that uses HCBS. That analysis does not adjust for individual risk factors on the assumption that the composition of the population (e.g., health status or risk) did not change meaningfully over the time period from 2016 to 2019. It is possible that changes in the health status of the population may have led to changes in spending. For example, if there were a significant influx of HCBS users who were significantly less disabled than previous cohorts, then it might be plausible that average costs might decline. This might invalidate the conclusion that the change in spending can be attributed to CHC. However, it seems highly unlikely that the population changed substantially over a short period.

There are several technical challenges in determining of the composition of the population changed over time. Arguably, the most relevant factors to risk adjust HCBS use and spending are physical and cognitive function. In principle, this information is available from the comprehensive assessment instrument used for eligibility and service planning. Among older adults in the legacy Pennsylvania Department of Aging waiver program (AKA the PDA Waiver), the Level of Care Determination (LCD) was used for many years for both functional eligibility determination, annual redetermination, and in case of a significant change in status. For individuals in the four other legacy programs that served people aged 21-59, the annual redetermination process used a different form. Thus, the available archival information varies somewhat by population subgroup.

Another concern arises with regard to data availability starting in 2018.

In 2018, OLTL implemented the interRAI-HC for HCBS participants and phased out the LCD in each region of Pennsylvania as CHC was being implemented. (For the purpose of eligibility determination, the LCD was replaced with the Functional Eligibility Determination (FED)). While this has the advantage of standardized assessment data collected for all subgroups using the same rules, the transition creates a technical challenge. Specifically, if we consider the CHC program the ‘intervention,’ the ‘treatment’ group was assessed using the interRAI-HC and the ‘comparison’ group was assessed using the LCD. There is currently no way to crosswalk the two assessment instruments that would allow fair ‘apples to apples’ comparisons. The MRC is currently developing a methodology that would permit such an analysis to be conducted, however that work has not been completed. That analysis will also need to address the substantial amount of missing interRAI data.

Given these limitations, the decision was made to present unadjusted analysis of HCBS spending for the primary report. However, the MRC recognizes that changes in the composition of the population may lead to criticism of the findings. Thus, an alternative strategy was pursued that measured risk based on the presence of common chronic conditions using validated claims-based algorithms from the chronic condition warehouse.¹ This approach has other limitations. The first flows from the availability of claims data for all subgroups of the CHC population.

A small fraction of the CHC population is eligible for Medicaid only. For these individuals, referred to as ‘non-duals,’ Medicaid is the sole payor, so all medical, behavioral and long-term services and supports (LTSS) claims are available. However, the majority of the CHC population is dually eligible for both Medicaid and Medicare. For this population, the bulk of medical spending is paid for by Medicare and the bulk of LTSS spending is covered by Medicaid. In order to get a picture of the effect of CHC on total spending, it is necessary to combine claims data from these two sources. Unfortunately, a large fraction of participants are enrolled in a Medicare managed care product (either a special needs plan or Medicare advantage plan), rather than traditional fee for service (FFS). Claims data are not available for individuals enrolled in Medicare managed care products. Therefore, it is necessary to restrict the analysis of duals to only those individuals enrolled in Medicare FFS. In addition, to use the CCW algorithms, the sample must be limited to people who were fully enrolled for an entire calendar year. This implicitly drops any individual with partial year enrollment due to death. Since it is known that the last year of life tends to be very expensive, such a ‘healthy survivor bias’ can lead to attenuated estimates of spending.

Approach

The MRC constructed indicators of the most common chronic conditions, as well as a count of the number of conditions per person. These variables were merged to person-month Medicaid spending for the non-dual and dual (Medicare FFS) sub-groups. The following 14 chronic conditions were selected based on having at least 5% overall prevalence:

- Hypertension,
- Hyperlipidemia,
- Depression,
- Diabetes,
- Ischemic Heart Disease,
- Chronic Kidney Disease,
- Rheumatoid Arthritis,
- Alzheimer’s Disease or Other Dementia,
- Chronic Obstructive Pulmonary Disease,
- Heart Failure,
- Acquired Hypothyroidism,
- Asthma,
- Atrial Fibrillation, and
- Stroke.

¹ See <http://ccwdata.org>.

To test the assumption that the composition of the population changed over time, the count of chronic conditions (0 to 14) was calculated for each year (2016 to 2019) and each implementation region. As can be seen on the following table, the number of chronic conditions is stable within the regions over time. This is evidence that the level of risk did not change over time.

Table 1. Average Number of Chronic Conditions

	SW	SE	NW/NE/LC	All Regions
2016	3.10	3.41	3.30	3.31
2017	3.10	3.41	3.34	3.33
2018	3.14	3.42	3.32	3.34
2019	3.12	3.41	3.36	3.35
All Years	3.11	3.41	3.33	3.33

Note: SW = Southwest, SE = Southeast, NW/NE/LC = Northwest, Northeast and Lehigh Capital. Count of 14 chronic conditions: hypertension, hyperlipidemia, depression, diabetes, ischemic heart disease, chronic kidney disease, rheumatoid arthritis, Alzheimer’s Disease or other dementia, chronic obstructive pulmonary disease, heart failure, acquired hypothyroidism, asthma, atrial fibrillation, and stroke. Limited to Medicaid only (non-dual) and individuals dually enrolled in Medicaid and Medicare in traditional Medicare fee-for-service (FFS).

Although there does not appear to be evidence that the overall composition of the population changed over time, it is possible that the impact of CHC varied based on the health status of the participants. This could occur if the CHC Managed Care Organizations were more accurate in targeting health and LTSS to participants than the legacy system. Thus, it is still important to consider risk-adjusted estimates of spending. The following section compares adjusted and unadjusted estimates of the effect of CHC on Medicaid spending. The following table summarizes the measures for the various sub-populations.

Table 2. Spending Measures for Each Sub-Population

Spending Measure	Sub-Population
Total Medicaid Spending	Full year enrollees
	Non-dual (Medicaid Only)
	Dual (Medicare FFS Only)
Non-LTSS Spending	Full year enrollees
	Non-dual (Medicaid Only)
	Dual (Medicare FFS Only)

HCBS Spending	Full year enrollees Non-dual (Medicaid Only) Dual (Medicare FFS Only) HCBS Users Only Stratified by age (21-59/60 and older)
Nursing Home Spending	Full year enrollees Non-dual (Medicaid Only) Dual (Medicare FFS Only) Nursing Home Residents Only Stratified by age (21-59/60 and older)

The analysis of spending used a difference-in-difference (DID) model adjusted for the chronic conditions listed above. The DID model estimates the change in per person per month spending for participants in the CHC program relative to participants who were not in the program for the same time period. There are multiple comparisons possible. First, since the program was implemented in the SW in 2018, it is possible to compare the change in spending from 2017 to 2018 in the SW to the change in the SE and the change in the NW/NE/LC regions. These estimates are in the first two columns of Table 3.

In 2019, CHC was operating in both the SW and the SE. Thus, it is possible to compare the trend in the SE and the SW from 2018 to 2019 to the trend in the NW/NE/LC region over the same time periods. These estimates appear in the third and fifth columns of Table 3. Finally, the fourth column on Table 3 shows the average, or pooled, effect for the SW over both 2018 and 2019. The pooled effect is important to consider because health care spending varies over time, and the impact of the program may also vary in effectiveness. Note that the sample sizes are very large, therefore statistical significance is not considered a guide to interpretation.

It is important to note that conclusions about the effect of CHC on spending are based on the relative change in spending, not the level of spending. There are differences in the level of spending between the three regions (SW, SE, NW/NE/LC), thus the relative differences between SW and SE is different than the relative difference between the SE and the NW/NE/LC region. However, our conclusions are based on the magnitude of the relative differences. Although admittedly somewhat arbitrary, differences of greater than \$100 per person per month are more likely to be meaningful.

Findings

The results shown on Table 3 suggest that the CHC program was associated with lower total Medicaid spending from 2017 to 2018 in the SW relative to the SE, however spending in the SW and the SE outpaced spending in the NW/NE/LC region. The unadjusted and adjusted estimates are very

close for all five comparisons, suggesting that the inclusion of risk adjustment does not affect the conclusion.

Table 3. Effect of CHC on Total Medicaid Spending, Dollars (2018, 2019)

	SW vs. SE	SW vs. NW/NE/LC			SE vs. NW/NE/LC
	2018	2018	2019	Pooled	2019
Unadjusted	-263	252	436	343	330
Adjusted	-287	251	457	353	376

Note: SW = Southwest, SE = Southeast, NW/NE/LC = Northwest, Northeast and Lehigh Capital. Per person per month spending. Limited to Medicaid only (non-dual) and people dually enrolled in Medicaid and Medicare in traditional Medicare FFS. Estimates adjusted for diagnosis of hypertension, hyperlipidemia, depression, diabetes, ischemic heart disease, chronic kidney disease, rheumatoid arthritis, Alzheimer’s Disease or other dementia, chronic obstructive pulmonary disease, heart failure, acquired hypothyroidism, asthma, atrial fibrillation, and stroke. All comparisons are statistically significant.

The results shown on Table 4 suggest that the CHC program was not associated with a meaningful change in non-LTSS Medicaid spending from 2017 to 2018 in any region. The unadjusted and adjusted estimates are very close for all five comparisons, suggesting that the inclusion of risk adjustment does not affect the conclusion.

Table 4. Effect of CHC on Medicaid Non-LTSS Spending, Dollars (2018, 2019)

	SW vs. SE	SW vs. NW/NE/LC			SE vs. NW/NE/LC
	2018	2018	2019	Pooled	2019
Unadjusted	-22	63	123	93	64
Adjusted	-17	62	119	90	64

Note: SW = Southwest, SE = Southeast, NW/NE/LC = Northwest, Northeast and Lehigh Capital. Per person per month spending. Limited to Medicaid only (non-dual) and people dually enrolled in Medicaid and Medicare in traditional Medicare FFS. Estimates adjusted for diagnosis of hypertension, hyperlipidemia, depression, diabetes, ischemic heart disease, chronic kidney disease, rheumatoid arthritis, Alzheimer’s Disease or other dementia, chronic obstructive pulmonary disease, heart failure, acquired hypothyroidism, asthma, atrial fibrillation, and stroke. All comparisons are statistically significant.

The results shown on Table 5 suggest that the CHC program was associated with lower Medicaid HCBS spending from 2017 to 2018 in the SW relative to the SE and the NW/NE/LC regions in both age groups. In addition, spending in the SE declined slightly from 2018 to 2019 relative to the NW/NE/LC region. The unadjusted and adjusted estimates are very close for all five comparisons,

suggesting that the inclusion of risk adjustment does not affect the conclusion. Note that the magnitude of these differences is smaller than what is reported in the main report. The main report presents estimates of HCBS spending that include all dual eligible and partial year enrollees, which includes individuals who die during each year.

Table 5. Effect of CHC on Medicaid HCBS Spending, Dollars (2018, 2019)

	SW vs. SE	SW vs. NW/NE/LC			SE vs. NW/NE/LC
	2018	2018	2019	Pooled	2019
Age 21-59					
Unadjusted	-511	-345	-611	-464	-121
Adjusted	-529	-318	-578	-434	-152
Age 60+					
Unadjusted	-533	-420	-615	-509	-175
Adjusted	-513	-378	-574	-467	-158

Note: SW = Southwest, SE = Southeast, NW/NE/LC = Northwest, Northeast and Lehigh Capital. Per person per month spending. Limited to Medicaid only (non-dual) and people dually enrolled in Medicaid and Medicare in traditional Medicare FFS. Estimates adjusted for diagnosis of hypertension, hyperlipidemia, depression, diabetes, ischemic heart disease, chronic kidney disease, rheumatoid arthritis, Alzheimer’s Disease or other dementia, chronic obstructive pulmonary disease, heart failure, acquired hypothyroidism, asthma, atrial fibrillation, and stroke. All comparisons are statistically significant.

The results shown on Table 6 suggest that the CHC program was not associated with a meaningful nursing home Medicaid spending. Note that this analysis examines the per person per month spending on nursing home care conditional on living in a nursing home. This does not take into account changes in the number or percentage of CHC participants living in nursing homes, just the cost for people who are in those settings. The unadjusted and adjusted estimates are very close for all five comparisons, suggesting that the inclusion of risk adjustment does not affect the conclusion.

Table 6. Effect of CHC on Medicaid Nursing Home Spending, Dollars (2018, 2019)

	SW vs. SE	SW vs. NW/NE/LC			SE vs. NW/NE/LC
	2018	2018	2019	Pooled	2019
Age 21-59					
Unadjusted	-34	-74	-74	-74	-119
Adjusted	-68	-44	-47	-45	-96

Age 60+					
Unadjusted	77	12	84	47	-75
Adjusted	70	16	91	52	-74

Note: SW = Southwest, SE = Southeast, NW/NE/LC = Northwest, Northeast and Lehigh Capital. Per person per month spending. Limited to Medicaid only (non-dual) and people dually enrolled in Medicaid and Medicare in traditional Medicare FFS. Estimates adjusted for diagnosis of hypertension, hyperlipidemia, depression, diabetes, ischemic heart disease, chronic kidney disease, rheumatoid arthritis, Alzheimer’s Disease or other dementia, chronic obstructive pulmonary disease, heart failure, acquired hypothyroidism, asthma, atrial fibrillation, and stroke. All comparisons are statistically significant, except as noted.

Conclusion

The implementation of CHC was associated with a slight reduction of overall Medicaid spending on a per person per month bases when comparing the SW to the SE. However, overall spending increased in the SW and SE relative to the NW/NE/LC region in both implementation years.

By contrast, there was marked decrease in HCBS spending among HCBS users in both the SW and SE in both implementation years. This was evident in both age groups (21-59 and 60 and older). This is notable, as other evidence shows that the size of the HCBS sub-group grew, while the number of nursing home residents declined.

The finding that the effect size does not change appreciably when adjusting for health status deserves some attention. First, it suggests that the apparent program impact was not due to changes in the composition of the population. This rules out the possible explanation that spending was lower under CHC because the population was healthier than the legacy program or in comparison regions. However, it is not immediately clear from these data that spending on HCBS is better targeted than under the legacy program. Analysis of HCBS utilization that incorporates direct measures of need (e.g., physical function) is currently underway by the MRC, but is beyond the scope of this report.