

# IMPACT OF BEHAVIORAL HEALTH ON HEALTHCARE UTILIZATION

November 2017

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## SUMMARY

The intent of this analysis was to examine the relationship between behavioral health and physical healthcare utilization, with particular attention to the potential impact of treatment on costs.

Using fiscal year 2017, we conducted a non-time-dependent<sup>1</sup> analysis of all Multnomah County Health Share members who had full coverage for the entire year--62,486 individuals. Dual diagnosis clients--those with co-occurring substance use and mental health diagnoses--had the highest average physical healthcare costs, followed by clients with only substance use disorders, followed by mental health, and followed by those with no noted diagnoses in these categories. **For all three behavioral health groups, average physical healthcare costs declined significantly if treatment encounters were also present.**

For dual diagnosis and SUD members, the cost of treatment was less than the reduction in physical healthcare costs, amounting to a net savings. For mental health members, the cost of treatment slightly outweighed the reduction. However, a better analysis would look at these members in the future, to specifically compare costs before and after treatment and move beyond simple correlation. Yet these early results, significant across a large population, are promising for the future.

Demographics may also impact healthcare costs. We found that African-American members were significantly more likely to have higher expenditures, as were older adults and English speakers. These bring up interesting questions of health disparities versus access disparities--**are costs higher for any of these groups because they have greater healthcare needs or because they have better access?** These are very different possibilities, and the answer may be mixed depending on the group in question. At this point, we can only theorize and further investigation is required, but an example would be that women may cost more because of different medical issues that arise (e.g. pregnancy) *or* because they are more likely to go to the doctor for health concerns than men are. English speakers may cost more because they are somehow less healthy *or* because it is harder for those who do not speak English as their native language to navigate the healthcare system.

We also briefly looked at how behavioral health costs may compare to other chronic or high-acuity conditions. A comparison with HIV, diabetes, and heart disease/heart failure showed **substance use as outranking both HIV and diabetes in terms of total average costs per member for the year.** Future comparisons between treated and untreated groups (treated and untreated behavioral health, as we already analyzed here, and managed versus not managed other chronic conditions) could be illuminating as well.

## CRITERIA AND METHODOLOGY

All HSO Multnomah members who retained *uninterrupted* coverage from 7/1/16 to 6/30/17. This resulted in a sample of 62,486.

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<sup>1</sup> Non-time-dependent means that we simply examined the relationship between total physical healthcare and total behavioral healthcare utilization, without looking to see what costs or encounters were occurred first--e.g., did the behavioral health and physical health encounters take place simultaneously, did behavioral healthcare come first, did physical healthcare come first, etc. This is merely an examination of total costs of the year for a variety of subpopulations, with attention to whether those differences are statistically significant and what demographic factors may also impact those costs. A longer panel of data is necessary for longitudinal analysis (e.g., examining physical healthcare costs before and after a treatment episode and comparing). While we have physical and mental health data from earlier years, we are lacking SUD data prior to 7/1/16, and considering its major role in driving healthcare costs, it would be difficult to complete a reliable analysis.

- Omitting those with coverage gaps may exclude very different members (moving out of eligibility due to higher income...lapsing eligibility because of lack of paperwork/meeting deadlines/homeless and unable to reach).

All approved claims from 7/1/16 to 6/30/17 for those members. (Note: data was pulled in late September 2017. Due to timely filing and upload lags, some data from the end of the year is still outstanding, which may impact results. Missing data appears to be more heavily from the behavioral health side, which may mean higher treatment costs by the fiscal year's end. However, even if we were to increase treatment's estimated per-member costs by the approximate size of the gap, with no adjustments whatsoever to physical health costs, untreated dual diagnosis and substance use disorder members would still generate more costs than the combined total of physical and behavioral health for those who received treatment.)

Used all 13 diagnosis fields in physical claims and all 4 fields in behavioral health claims to flag mental health and substance use diagnoses (using the F\* series in ICD-10). Diabetes, HIV, and heart disease/heart failure were identified using a keyword search with Stata 15's ICD-10-CM feature--all diagnosis categories with "diabetes," "hiv", "human immunodeficiency virus," "aids", "heart disease," or "heart failure" in the title.

Used OHP enrollment data for demographics.

"Treatment" was defined as having at least one approved behavioral health encounter claim in the time period at any level of care, with the exception of detox for SUD and hospitalization/inpatient/subacute/crisis stabilization encounters for mental health, which were categorized as acute care and separate from the other two categories.

SUD and MH are frequently used as abbreviations to represent "substance use disorder" and "mental health."

For mental health alternative payment models where slots are funded, the fee-for-service-equivalent was used to calculate cost. For case rate clients, encounters were prorated (e.g., a \$3,000 case rate where there were 10 encounters would mean \$300 per encounter).

## DATA OVERVIEW

3,619 people had a SUD diagnosis recorded in a physical healthcare claim. After including an examination of behavioral health claims, that number increased to 4,834--nearly 8% of the total sample, and 12% of all those who had incurred at least some healthcare expenses during the year .

- Of those, 36% had accessed treatment at some point during that year (at least one encounter).
- 39% had a recorded alcohol diagnosis, and 37% had a recorded opioid diagnosis, making them the two most prominent diagnoses.<sup>2</sup>

13,167 had a mental health diagnosis recorded in a physical healthcare claim. After including behavioral health claims, that increased to 16,895--about 27% of the sample.

- Of those, 44% had accessed treatment at some point during that year (at least one encounter).

3,355 members had both mental health and substance use disorder diagnoses recorded during the year, whether in physical healthcare claims, behavioral healthcare claims, or both.

Of the top 50 "spenders" in physical healthcare (ranging from \$133K to \$870K):

- 50% had a diagnosed SUD, but only 2 people had gone to treatment during that time.

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<sup>2</sup> Note that anywhere a single substance is mentioned--e.g., alcohol--it may be a sole disorder, or coexisting with other substance use disorders.

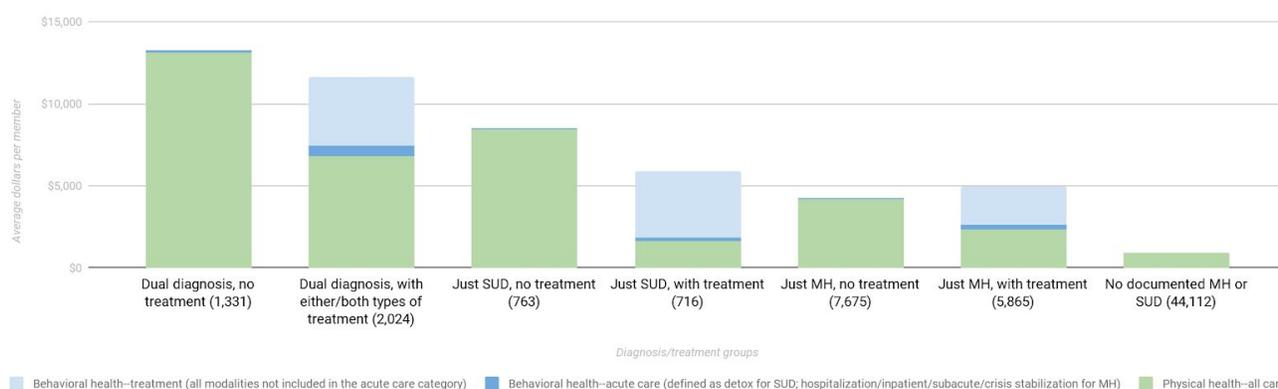
- 64% had a diagnosed mental health disorder, but only 6 people had accessed any mental healthcare during that time.
- Nearly \$13.6 million was paid out from the physical plans during this year for these 50 members; only \$23,680 was paid out from the behavioral health benefit for those few individuals who did access care.
  - As discussed earlier, this analysis is looking at simple correlation currently. Information like this reminds us of the distinction between two potential causal relationships: to what extent behavioral health drives up physical healthcare costs *or* to what extent those with severe health conditions experience behavioral health issues as a result of suffering with a particular disease?

21,959 members (35%) had zero costs in either physical health or behavioral health.<sup>3</sup>

Average per-member costs across a variety of member “categories” were calculated, as follows:

Average per-member costs, by diagnosis and treatment groups (count of members)

July 2016 to June 2017



For every category, the presence of some kind of treatment decreased physical healthcare costs, and even when adding in the cost of treatment and other behavioral health interventions, all categories decreased except for mental health. The differences between the groups were statistically significant.

It is worth noting that *all* mental health diagnoses, at all degrees of severity, were included. This ranges from mild depression to severe schizophrenia.

As a test, we isolated the F20\* range of diagnoses: schizophrenia, schizoaffective, and other psychotic disorders for non-dual diagnosis clients. However, the trend remained and actually increased; while physical healthcare costs declined, the cost of behavioral health services represented more dollars spent overall. This testing could be repeated with a number of diagnoses, but it is possible that the combined cost of care is simply more.

One other worthy consideration is that this is only an observation of a 12-month period of co-occurrent treatment and physical healthcare costs. It is possible that there may be long-term effects that make mental health investment also cost-effective in total, but we need to longer-term data to test that hypothesis. The opposite is also possible, for both SUD and mental health services; that the effect may wear off over time. The next step would be analyzing this same cohort of people next year, to see how healthcare costs fare *after* treatment interventions.

<sup>3</sup> While this affects the assumed normal distribution of the data under many standard statistical models, it is commonly accepted in public health that these models are still valid on large datasets, such as this one.

## MULTIVARIATE ANALYSIS

We also examined the impacts of behavioral health diagnoses and treatment on physical healthcare costs while controlling for sex, race, age, and primary language, seeking whether these differences are statistically significant.

Methodological notes: OLS (ordinary least squares) regression; used robust standard errors to counteract heteroskedasticity driven by high zero prevalence; tested for multicollinearity using variance inflation factors; tested for omitted variable bias using the Ramsey RESET test; weighted effect coding was used for dummy variables, allowing interpretation to be relative to the group mean rather than to the omitted group. Included active members with zero costs for the year.

Results notes: the model as a whole was significant at the 99% level (prob > F = 0.0000); individual results were only highlighted below if they were significant at the 90% level or better. Results were very similar if we included acute (behavioral) care costs with physical care costs as the outcome variable.

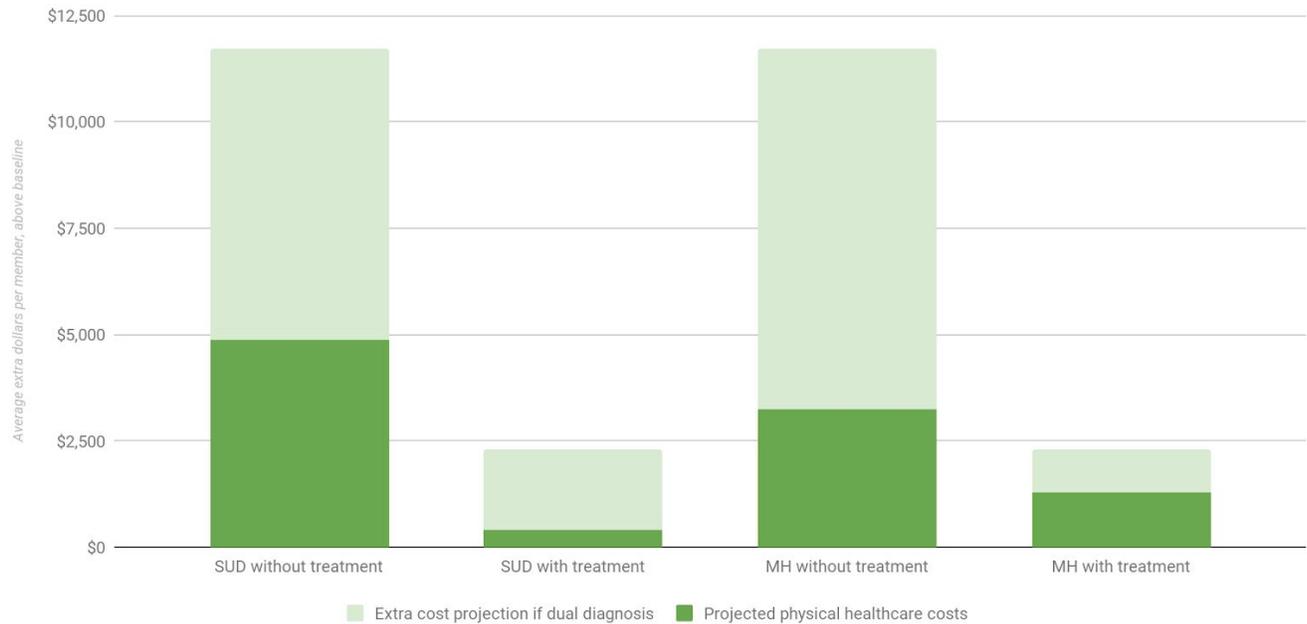
<i>Variable</i>	<i>Projected impact on costs (rounded to nearest dollar):</i>
Diagnosis and treatment (relative to individuals without SUD or MH diagnoses) SUD without treatment SUD with treatment MH without treatment MH with treatment Dual diagnosis without treatment Dual diagnosis with treatment	Increased by \$4,889 Increased by \$413 Increased by \$3,250 Increased by \$1,281 Increased by \$11,717 Increased by \$2,312
Sex Female	(insignificant result)
Language English	Increased by \$292
Race African-American Asian Caucasian Hispanic Native American Pacific Islander Other (omitted)	Increased by \$662 (insignificant result) Decreased by \$125 (insignificant result) (insignificant result) (insignificant result) -----
Age Under 12 (omitted) 12 to 17 18 to 29 30 to 39 40 to 49 50 to 59 60 and over	----- Decreased by \$362 (insignificant result) Decreased by \$235 (insignificant result) Increased by \$1,192 (insignificant result)

This shows behavioral health to potentially be a significant driver of physical healthcare costs. However, while even those in treatment cost more than the average healthcare consumer, in relation to those who did *not* receive

treatment, there is significant potential cost-savings. The starkest difference is for dual diagnosis clients, whose projected average costs were over \$9,400 lower if they had received treatment during this time. Taking into account that treatment costs, combined with acute care, averaged at approximately \$4,150 per client, this is still a large decline in overall costs. Shifting the financial investment to behavioral health may therefore provide larger cost savings to Health Share overall.

The following graph shows the extra costs associated with each condition, above and beyond the average member with no behavioral health diagnoses:

Projected additional physical healthcare costs, compared to average member, with control variables (July 2016 to June 2017)



It is also notable that being African-American increased projected average health expenditures, while being Caucasian decreased them. At the same time, speaking English as one’s primary language was also a significant increaser of costs. The difficult question with these types of trends is assessing need versus access--does someone who utilizes more or less healthcare *need* it more or less than others, or have the ability to *access* it more or less than others? These point to two very different types of disparity. It’s also important to note that, while we have demographic information for everyone enrolled in Health Share, we can only know things like substance use or mental health by actual claims data, which means they accessed care somewhere, in some capacity, at least once. There is a large “silent” part of the population on whom we lack such information.

### HOW DOES BEHAVIORAL HEALTH COMPARE TO OTHER CHRONIC OR HIGH-ACUITY CONDITIONS?

For a simple comparison, we selected three conditions--diabetes, human immunodeficiency virus (HIV), and heart disease/heart failure--and isolated members who had diagnoses in one or more of these categories at some point in the year. The total average cost per member was as follows:

<i>Condition</i>	<i>Number of members identified with condition</i>	<i>Average paid per member</i>	<i>Total physical healthcare paid</i>
Mental health--all diagnoses	16,895	\$4,584	\$7,726,1481
HIV	348	\$5,955	\$2,072,195
Diabetes	4,860	\$6,949	\$33,773,918
Substance use--all diagnoses	4,834	\$8,011	\$38,561,154
<i>Opioid use disorder</i>	<i>1,804</i>	<i>\$8,905</i>	<i>\$16,064,428</i>
<i>Alcohol use disorder</i>	<i>1,892</i>	<i>\$8,753</i>	<i>\$16,560,622</i>
Heart disease/heart failure	2,528	\$12,230	\$30,917472

There is also overlap in the above; for example, those with substance use disorders *and* HIV averaged \$12,686--\$14,281 if one then included mental health as well. Those with both diabetes and heart disease averaged \$15,003 per member. Comorbidities like these can substantially increase healthcare costs, and it is helpful to examine where chronic or high-acuity illnesses intersect with behavioral health.

It is also important to reiterate once again that the only method we have of identifying a member as possessing certain health conditions is via claims data, which infers that they have had at least one encounter that identified this diagnosis. There may be individuals struggling with behavioral health (or physical health) who have not accessed any medical care, or who have but have yet to be diagnosed.

## **FUTURE ANALYSES**

1. More stratification on type of care (e.g., outpatient versus residential) and treatment dosage (those with one encounter versus those with many, etc.).
2. More examination of potential equity issues, including access versus health disparities.
3. Longitudinal analysis of the relationship between physical healthcare costs and behavioral health diagnoses/treatment--the pre- and post-approach with control groups, examination of long-term impacts (if any) on expenditures, lagged effects, and so forth.