

How do individuals with behavioral health conditions contribute to physical and total healthcare spending?

Commissioned on behalf of The Path Forward for Mental Health and Substance Use by the Mental Health Treatment and Research Institute LLC, a tax-exempt subsidiary of The Bowman Family Foundation

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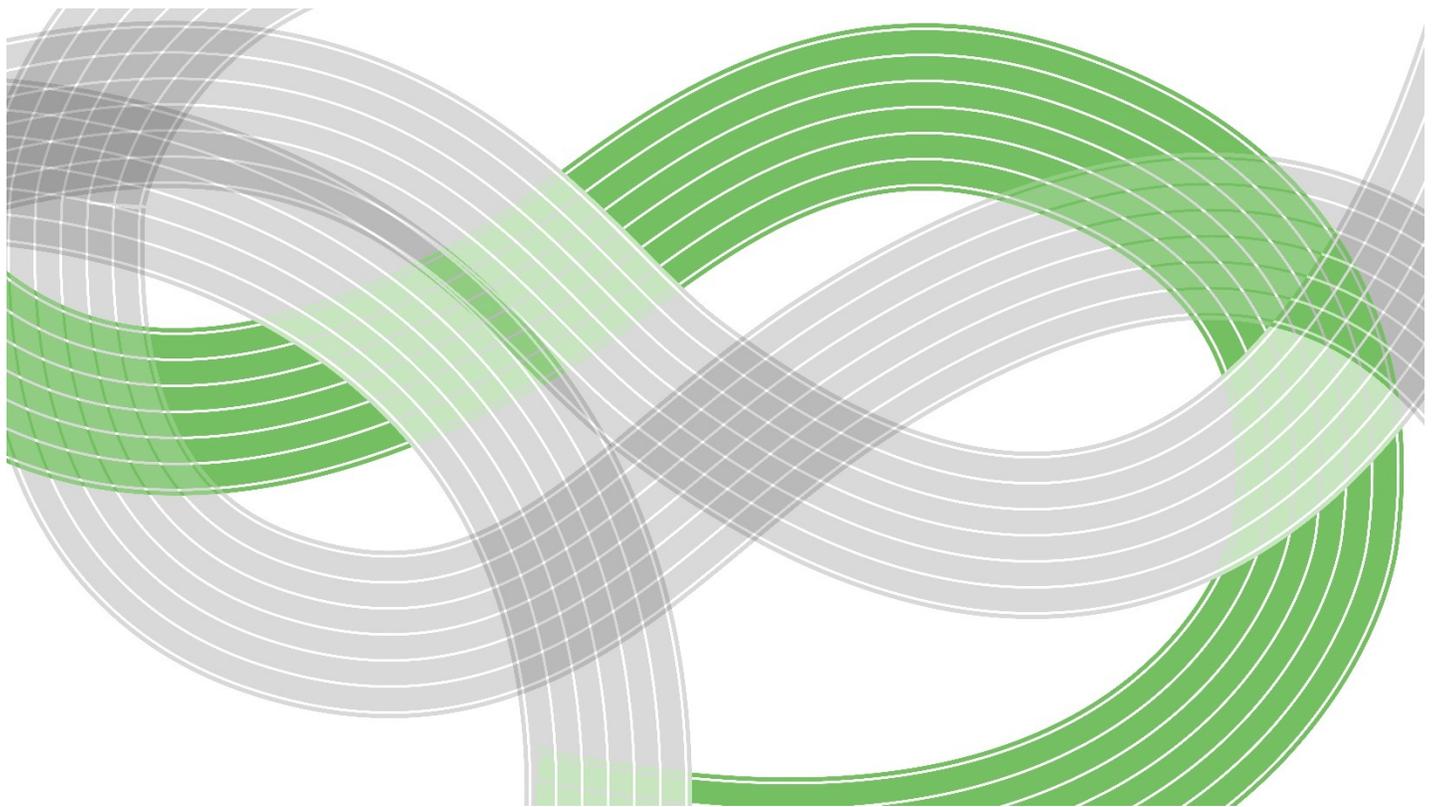




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Executive Summary

Milliman was commissioned on behalf of The Path Forward for Mental Health and Substance Use¹ by the Mental Health Treatment and Research Institute LLC to examine in detail the characteristics of total healthcare costs for all patients, and separately for high-cost patients, with a focus on the role played by behavioral health conditions—mental health conditions and substance use disorders—and treatment. Our analysis of 2017 healthcare claims data for 21 million commercially insured lives focused on the prevalence of behavioral health conditions and the levels of spending associated with both medical/surgical (physical) treatment and behavioral health treatment (i.e., total healthcare costs) for these individuals. The Path Forward is a private sector initiative to drive market-based improvements in access and care for all Americans with behavioral healthcare needs. In order to achieve this goal, those who pay healthcare expenses (e.g., employers, unions, private health insurers, Medicaid, Medicare) and providers may benefit from understanding the key elements of total healthcare costs.

In this study, we focused on individuals with diagnoses for behavioral health conditions and/or receipt of behavioral-specific treatment, including services or prescriptions for behavioral drugs (hereinafter referred to as the “BH Group”). See the Methodology section of this report for further details.

KEY FINDINGS

1. Within our study population of 21 million insured lives, the most expensive 10% of individuals accounted for 70% of total healthcare costs. In this report, these 2.1 million individuals are referred to as the “High-cost Group.”
 - The annual total healthcare costs for individuals in the High-cost Group averaged \$41,631—which is 21 times higher than the \$1,965 for individuals in the remaining 90% of the population, or the “Non-high-cost Group.”
2. Of the 2.1 million individuals in the High-cost Group, 57% (1.2 million individuals) were in the BH Group (referred to as the “High-cost Behavioral Subgroup”).
 - The High-cost Behavioral Subgroup constituted 5.7% of the total population of 21 million insured lives, yet accounted for 44% of total healthcare costs.
 - Annual total healthcare costs for individuals in the High-cost Behavioral Subgroup averaged \$45,782.
 - Half of these individuals (50%) had less than \$95 per year of total spending for behavioral health treatment (i.e., inpatient and outpatient hospital or facility services, and/or professional services coded as behavioral health services, and prescription behavioral health drugs).
3. Of the total population of 21 million insured lives, 27% (5.7 million) were in the BH Group.
 - The BH Group accounted for 56.5% of total healthcare costs for the entire study population.
 - Average annual costs for the BH Group for medical/surgical (physical) treatment were 2.8 to 6.2 times higher (depending on the BH condition) than such costs for individuals with no behavioral health condition.
 - Half of these 5.7 million individuals (50%) had less than \$68 of annual costs in 2017 for behavioral health treatment; the next 25% ranged from \$68 to \$502 of annual spending.
 - Of total healthcare costs for the entire study population, 4.4% were for behavioral health treatment.

CONCLUSIONS AND IMPLICATIONS FOR EMPLOYERS, OTHER PAYERS, AND PROVIDERS

Our analysis found that a small minority of high-cost individuals drive a significant majority of total healthcare costs. The majority of those high-cost individuals were in the BH Group. In most cases, costs for behavioral health-specific treatment represented a small fraction of total healthcare costs for these individuals, and many had no or minimal spending on behavioral health-specific services.

Appropriate consideration and management of behavioral health conditions that are so prevalent among the population are important in a comprehensive strategy to manage total healthcare costs and contribute to positive outcomes for patients. The evidence base is growing for the favorable impact of effective behavioral health interventions on health outcomes and total costs for patients and payers. In particular, effective approaches for the integration of behavioral and physical healthcare, including “Collaborative Care” (a particular model of integration with specific reimbursement codes), have been well studied and found to have significant potential for total cost savings. See the Implications section of this report for further details.

¹ For more information, see https://higherlogicdownload.s3.amazonaws.com/NAHPC/3d988744-80e1-414b-8881-aa2c98621788/UploadedImages/BH_PF_Action_Plan_Executive_Summary_FINAL_1219.pdf.

Introduction

It is widely understood that for any given population a large portion of total healthcare costs (medical/surgical and behavioral health costs) is typically driven by a small subset of the population. This has been referred to as healthcare’s version of the “80/20 rule.”² Within any given population, the least costly users of the healthcare system may not use any services at all, and thus incur \$0 of annual costs, but the most costly patients can accrue several million dollars of healthcare costs in a year.³ Most people experience healthcare costs that are less than the average; insurance fundamentally relies on this principle by charging a premium that spreads the expected costs of the high-cost patients across a pool of individuals.

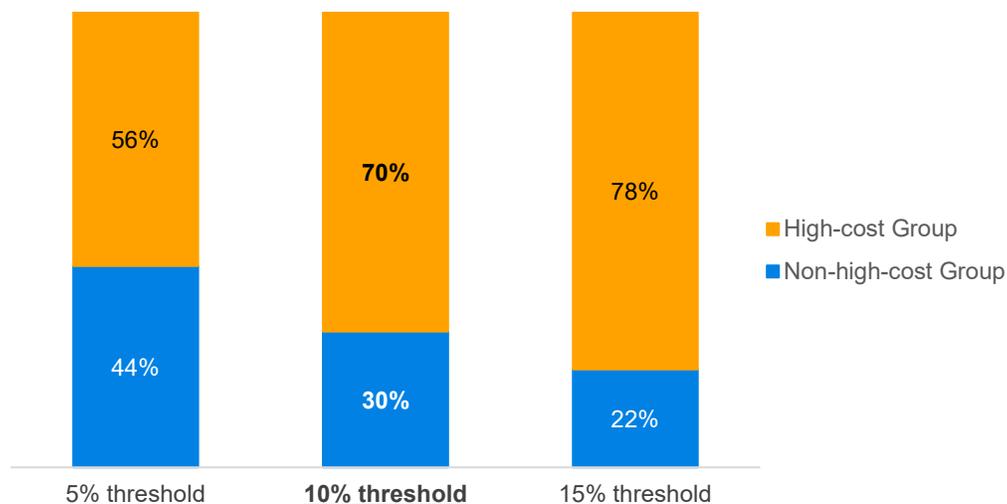
In this research, we used 2017 data from a large sample of the commercially insured population⁴ (predominantly those with employer-sponsored insurance) to understand the characteristics of the small number of individuals who often drive a majority of total healthcare costs. Specifically, we examined the prevalence of behavioral healthcare conditions—mental health (MH) conditions and substance use disorders (SUD)—and the proportion of total healthcare costs accounted for by individuals with these conditions.

The study population is comprised of just over 21 million commercially insured individuals across the United States, aged 2 to 64, with a full year of eligibility for both medical and prescription drug coverage in 2017. The final age/sex distribution was similar to a general commercial population and to the age/sex distribution of the U.S. census.⁵

High-cost Group

In the study population, we examined the proportion of total healthcare costs accounted for by the most costly 5%, 10%, and 15% of individuals in the population. As illustrated by Figure 1, the most costly 5% of patients accounted for 56% of total healthcare costs,⁶ the most costly 10% of patients accounted for 70% of total healthcare costs, and the most costly 15% of patients accounted for 78% of total healthcare costs.

FIGURE 1: PERCENTAGE OF TOTAL HEALTHCARE COSTS ACCOUNTED FOR BY HIGH-COST PATIENTS, 2017



² See, for example, <https://www2.deloitte.com/us/en/pages/life-sciences-and-health-care/articles/is-80-20-rule-of-health-care-still-true-population-value-based.html>.

³ Throughout this report, all cost figures refer to allowed costs, which reflect the fee levels negotiated between providers and payers, inclusive of costs paid by both the insurer and the patient.

⁴ See the Methodology section of this report for details on data used in the analysis and sample selection.

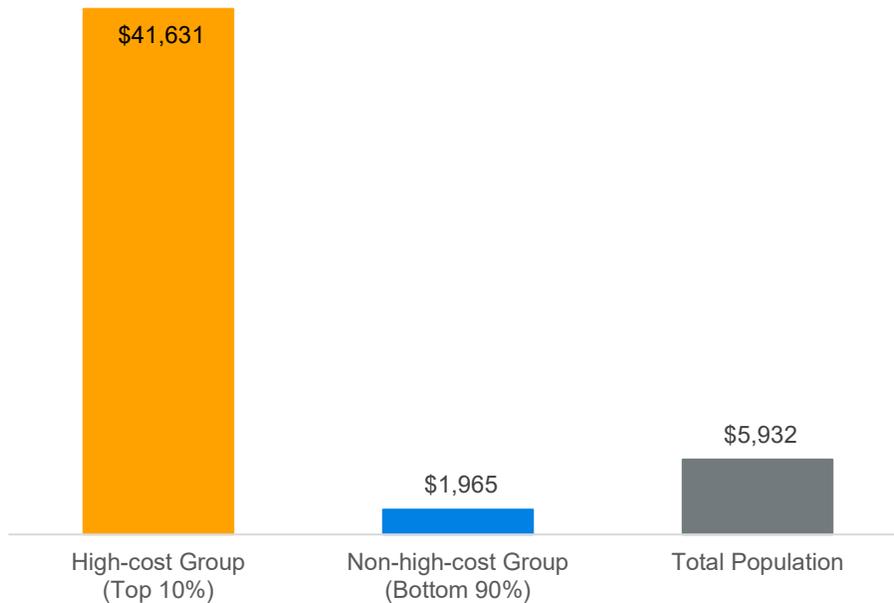
⁵ See the Methodology section for further description.

⁶ In this report, total healthcare costs refers to allowed costs, which includes both the insurer’s share of the cost, as well as any applicable member cost sharing. These costs have been area-adjusted using Milliman’s Health Cost Guidelines™ Area Factors to standardize for regional differences in price levels.

For the remainder of this report, we define the “High-cost Group” as the most costly 10% of individuals, and the “Non-high-cost Group” as the remaining 90% of individuals.⁷

Average annual healthcare spending per patient was \$5,932 across the entire study population, and the average for the High-cost Group was over 21 times higher than for the Non-high-cost Group. Figure 2 illustrates the substantial differences in these costs.

FIGURE 2: AVERAGE ANNUAL TOTAL HEALTHCARE SPENDING PER PATIENT BY COST COHORT, 2017



BH Group: Prevalence and costs

Within the study sample, we identified individuals in the BH Group based on information available within healthcare claims data, including diagnoses for behavioral health conditions, claims for certain prescription drugs commonly used to treat behavioral health conditions, use of behavioral healthcare-specific services, and diagnoses indicating attempted suicide or self-harm.⁸

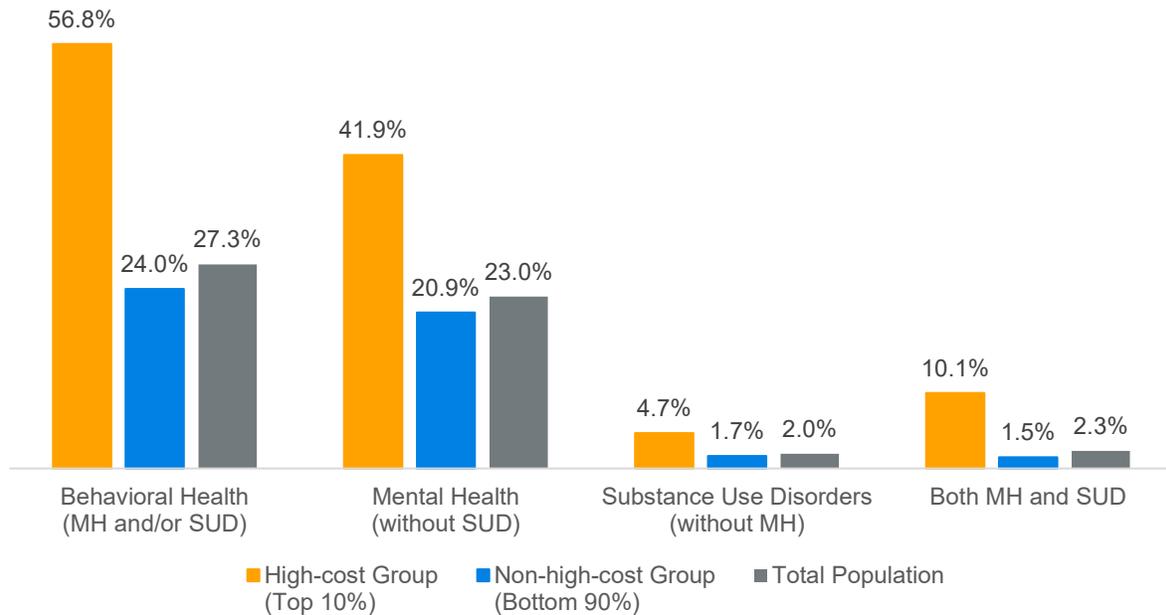
PREVALENCE RATES

As shown in Figure 3, we found that 27.3% of the study population was in the BH Group, 25.3% had a mental health diagnosis and/or received mental health services or medications (collectively referred to as the “MH Group”), and 4.3% had a substance use disorder diagnosis and/or received substance use services or medications (collectively referred to as the “SUD Group”).

⁷ We examined most of the outcomes studied for this report using the 5%, 10%, and 15% thresholds, and found that while the specific numerical results differed for each threshold, the general conclusions were broadly consistent across each version, and did not appear to be sensitive to the specific threshold used.

⁸ Each of these criteria is further defined in the Methodology section.

FIGURE 3: PREVALENCE RATES BY COST GROUP, 2017



The prevalence of these conditions was much higher in the High-cost Group than in the population as a whole: 56.8% of individuals in the High-cost Group were in the BH Group (referred to as the “High-cost Behavioral Subgroup” throughout this report), 52.0% were in the MH Group, and 14.8% were in the SUD Group. .

COMPARISON OF PREVALENCE ESTIMATES AND METHODS TO OTHER SOURCES

These prevalence rates differ from those reported in some other sources, and the differences are largely driven by differences in the criteria used to identify individuals for inclusion in our BH Group. For example, results from the 2018 National Survey on Drug Use and Health (NSDUH) suggest that 23.2% of adults aged 18 or older had either a mental illness or a substance use disorder.⁹ These figures are based on the application of Diagnostic and Statistical Manual of Mental Disorders, 4th or 5th Edition (DSM-IV or DSM-V) criteria to survey responses for around 68,000 respondents, and exclude developmental disorders, tobacco use disorder or nicotine dependence, and individuals younger than 18.

Another recent study that used a claims-based analysis reported that 23% of individuals had a mental health condition or substance use disorder.¹⁰ This analysis included individuals with one or more medical claims with a primary or secondary diagnosis for any behavioral health condition, and included Medicare and Medicaid data in addition to commercial data. This study did not include prescriptions for behavioral health drugs in their identification criteria.

Earlier studies based on the U.S. National Comorbidity Survey and National Comorbidity Survey Replication found prevalence rates for mental health or substance use disorders of 26.2% to 29.5% over a 12-month period.^{11,12} These

⁹ Substance Abuse and Mental Health Services Administration (August 2019). Key Substance Use and Mental Health Indicators in the United States: Results From the 2018 National Survey on Drug Use and Health. Retrieved August 11, 2020, from <https://www.samhsa.gov/data/sites/default/files/cbhsq-reports/NSDUHNationalFindingsReport2018/NSDUHNationalFindingsReport2018.pdf>.

¹⁰ Coe, E.H. & Enomoto, K. (April 2, 2020). Returning to resilience: The impact of COVID-19 on mental health and substance use. McKinsey & Company. Retrieved August 11, 2020, from <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/returning-to-resilience-the-impact-of-covid-19-on-behavioral-health>.

¹¹ Kessler, R.C., Chiu, W.T., Demler, O., Merikangas, K.R., Walters, E.E. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005 Jun; 62(6):617-27. Retrieved August 11, 2020, from <https://pubmed.ncbi.nlm.nih.gov/15939839/>.

¹² Kessler, R.C., McGonagle, K.A., Zhao, S., et al. Lifetime and 12-Month Prevalence of DSM-III-R Psychiatric Disorders in the United States. Results from the National Comorbidity Survey. *Arch Gen Psychiatry*. 1994; 51(1):8-19. Retrieved August 11, 2020, from <https://jamanetwork.com/journals/jamapsychiatry/article-abstract/496456>.

surveys were among the first of their kind to provide nationally representative surveillance of psychiatric conditions in the United States, and applied earlier versions of DSM criteria to structured survey responses.¹³ Disorders identified under earlier editions of the DSM criteria may represent different ranges of severity or clinical significance than are represented under the latest criteria (DSM-V). Significant sociodemographic and other changes have also occurred in the United States since the time that these surveys were administered in the early 1990s and 2000s.

For this study, we have used a broad definition in order to capture the full array of individuals who may have identifiable behavioral healthcare needs, and to avoid excluding individuals who may not meet stricter identification criteria due to potential underdiagnosis or undertreatment of behavioral health conditions. We are relying on diagnosis codes in healthcare claims data and are not able to apply DSM criteria to detailed survey responses, and as a result may be capturing a wider range of condition severity or clinical significance than would meet DSM criteria. We used diagnoses in any position on a claim, and also included individuals who used behavioral services (except for services for screening or evaluation purposes only that produced no behavioral health diagnoses) or who were prescribed certain drugs commonly used to treat behavioral health conditions.

We included 1.5 million individuals in the BH Group who were prescribed behavioral drugs but did not have behavioral health diagnoses present on claims data or meet other inclusion criteria as described in the Sample Selection section of this report. This represents 26% of individuals in the BH Group. The list of prescription drugs used for this study is intended to mirror the drugs used in a Substance Abuse and Mental Health Services Administration (SAMHSA) report on behavioral health spending published in February 2019.¹⁴ This includes a number of behavioral health drugs that can also be used to treat physical conditions, and some individuals who used behavioral drugs may have had those drugs prescribed to treat physical conditions instead. There are other drugs not included in the SAMHSA drug list that can also be used to treat behavioral conditions.¹⁵

Because prescription drug claims do not contain diagnosis codes in our research data, we are not able to ascertain from claims data the precise reason that a clinician prescribed a particular drug. We do have visibility into the diagnosis codes that appear on the medical claims records (if any) for a contemporary time period. Some of those who used behavioral drugs may have initiated the prescription prior to our study time period, and continued refilling the prescription without additional healthcare visits that might have reestablished an explanatory diagnosis within the study time period. Other researchers have found that psychotropic prescriptions are often initiated without any explanatory diagnoses at all, particularly when prescribed by non-psychiatrists.¹⁶

As a supplemental analysis, we identified the common physical indications (on-label or off-label) for each behavioral drug prescribed to at least 2,000 individuals within our study population (representing over 99% of all individuals prescribed behavioral drugs included in the analysis). We found that less than one-third of individuals prescribed behavioral drugs with no behavioral health diagnoses had diagnoses within 60 days of the prescription for the types of physical conditions that might provide an alternate explanation for their use. If all of these individuals were removed from the behavioral group, the BH Group would include 25.0% of the study population rather than 27.3%, and would include 50.5% of the High-cost Group rather than 56.8%. This approach may under-identify physical explanations for prescriptions for behavioral drugs to the extent that behavioral drugs were prescribed for physical indications that were outside the scope of our analysis, and may overidentify physical explanations to the extent that such physical conditions were comorbid with or a symptom of behavioral health conditions. Either approach may under-identify individuals with behavioral health needs who were prescribed other drugs (such as some anticonvulsants, central nervous system agents, stimulants, or smoking cessation aids) that can be used for

¹³ National Institute of Mental Health. Questions and Answers about the National Comorbidity Survey Replication (NCSR) Study. Retrieved August 11, 2020, from <https://www.nimh.nih.gov/health/topics/ncsr-study/questions-and-answers-about-the-national-comorbidity-survey-replication-ncsr-study.shtml>.

¹⁴ SAMHSA (February 2019). Behavioral Health Spending & Use Accounts 2006-2015. Retrieved August 11, 2020, from <https://store.samhsa.gov/product/Behavioral-Health-Spending-and-Use-Accounts-2006-2015/SMA19-5095>.

¹⁵ The drug list used in the SAMHSA report excludes most anticonvulsants, central nervous system (CNS) agents, and nonamphetamine stimulants, some of which can also be used to treat behavioral health conditions. This list also excludes smoking cessation aids such as nicotine replacement therapy or varenicline, but does include bupropion, which also has other (i.e., nonsmoking) behavioral health applications.

¹⁶ Rhee, T.G., Rosenheck, R.A. Initiation of new psychotropic prescriptions without a psychiatric diagnosis among US adults: Rates, correlates, and national trends from 2006 to 2015. *Health Serv Res*. 2019 Feb; 53(1): 139-148. Retrieved August 11, 2020, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6338322/>.

behavioral health conditions, unless they also had a behavioral health diagnosis in the medical claims data. Many of the physical indications that behavioral drugs are used to treat are also common symptoms or comorbidities for those with behavioral health conditions (including chronic pain,¹⁷ insomnia or sleep disorders,¹⁸ migraines or headaches,¹⁹ and others). For this reason, we have included all individuals who were prescribed any of the listed behavioral drugs in the BH Group throughout this report.

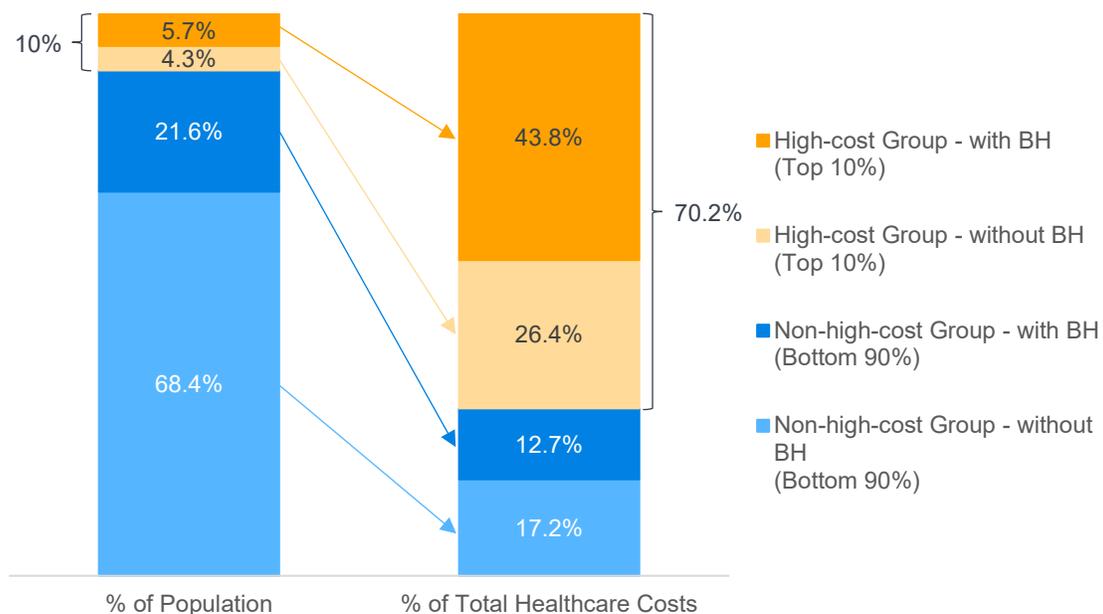
Some individuals may have had behavioral conditions but received no treatment (or received treatment on a self-pay basis only) and were therefore not assigned a behavioral diagnosis code on any claim. These individuals were not counted in our analysis as having a behavioral condition. According to the 2018 National Survey on Drug Use and Health (NSDUH), 17% of those aged 12 or older who needed treatment for a substance use disorder in the prior year actually received it, and 43% of adults with any mental illness received mental health services in the prior year.²⁰ The remainder who did not receive substance use disorder treatment or mental health services may not have had their behavioral health conditions recognized in another clinical setting that would have led to a diagnosis code on a medical claim.

See the Methodology section for a list of the behavioral drugs used in this report, as well as other considerations that are relevant to the comparison of these prevalence estimates to those reported elsewhere.

TOTAL HEALTHCARE COSTS FOR INDIVIDUALS IN THE BH GROUP

Figure 4 illustrates how different segments of the population contribute to total healthcare costs. Individuals in the High-cost Behavioral Subgroup represent 5.7% of the study population; however, this same set of individuals contributes 43.8% of total healthcare costs.

FIGURE 4: DISTRIBUTION OF THE POPULATION AND TOTAL HEALTHCARE COSTS AMONG COST AND BEHAVIORAL HEALTH GROUPS, 2017



¹⁷ Sheng, J, Liu, S, Wang, Y, Cui, R, Zhang, X. The Link Between Depression and Chronic Pain: Neural Mechanisms in the Brain. *Neural Plast.* 2017; 2017:9724371. Retrieved August 11, 2020, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5494581/>.

¹⁸ Finan, P.H., Smith, M.T. The comorbidity of insomnia, chronic pain, and depression: Dopamine as a putative mechanism. *Sleep Medicine Reviews*, Volume 17, Issue 3, June 2013, Pages 173-183. Retrieved August 11, 2020, from <https://www.sciencedirect.com/science/article/abs/pii/S1087079212000299>.

¹⁹ Ratcliffe, G.E., Enns, M.W., Jacoby, F., Belik, S.L., Sareen, J. The relationship between migraine and mental disorders in a population-based sample. *General Hospital Psychiatry*, Volume 31, Issue 1, January-February 2009, pp. 14-19. Retrieved August 11, 2020, from <https://www.sciencedirect.com/science/article/abs/pii/S0163834308001679>.

²⁰ Substance Abuse and Mental Health Services Administration (August 2019), op. cit.

Across the entire study population, 56.5% of total healthcare costs can be attributed to the 27.3% of individuals in the BH Group.²¹ The 68.4% of the population that was not high-cost and not in the BH Group accounted for 17.2% of total healthcare costs. Figures 5 through 7 illustrate how individuals in different behavioral health categories (or not in the BH Group) contribute to both the population and to total healthcare costs.

FIGURE 5: DISTRIBUTION OF THE POPULATION AND TOTAL HEALTHCARE COSTS BETWEEN THOSE IN THE BH GROUP AND NOT IN THE BH GROUP, 2017

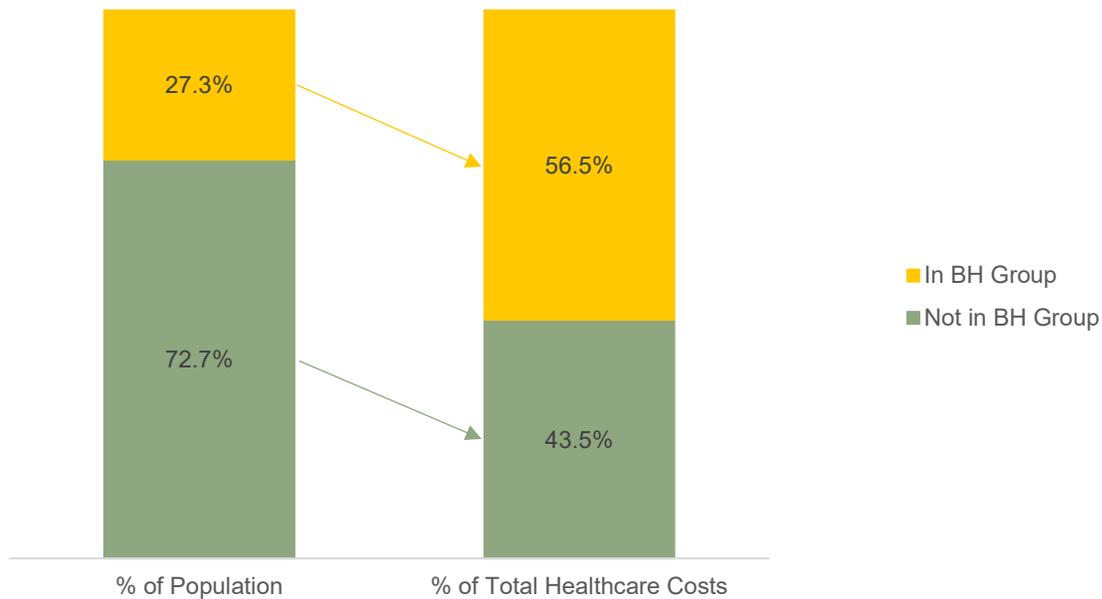
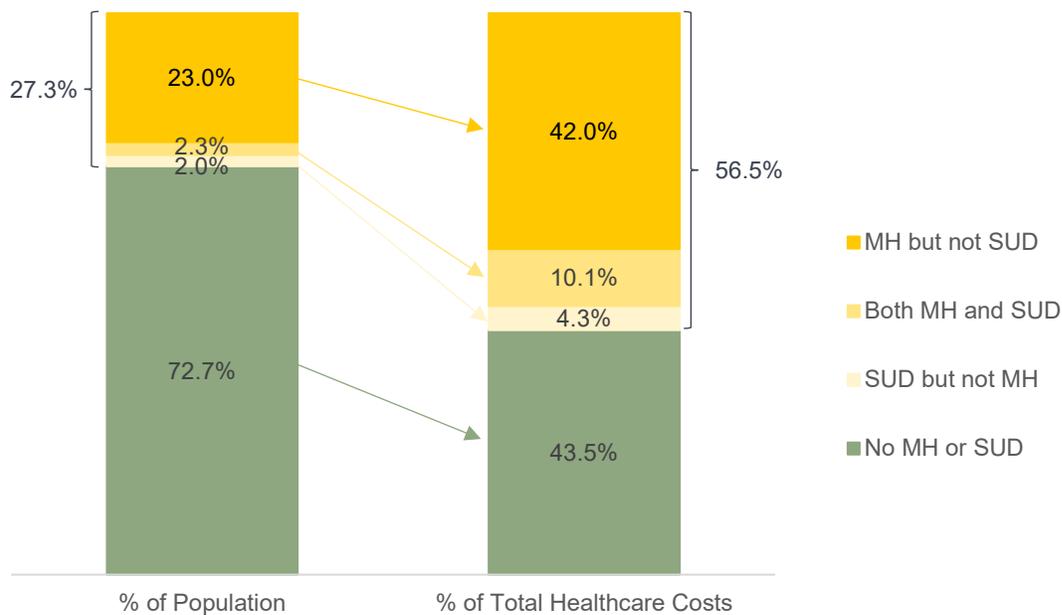


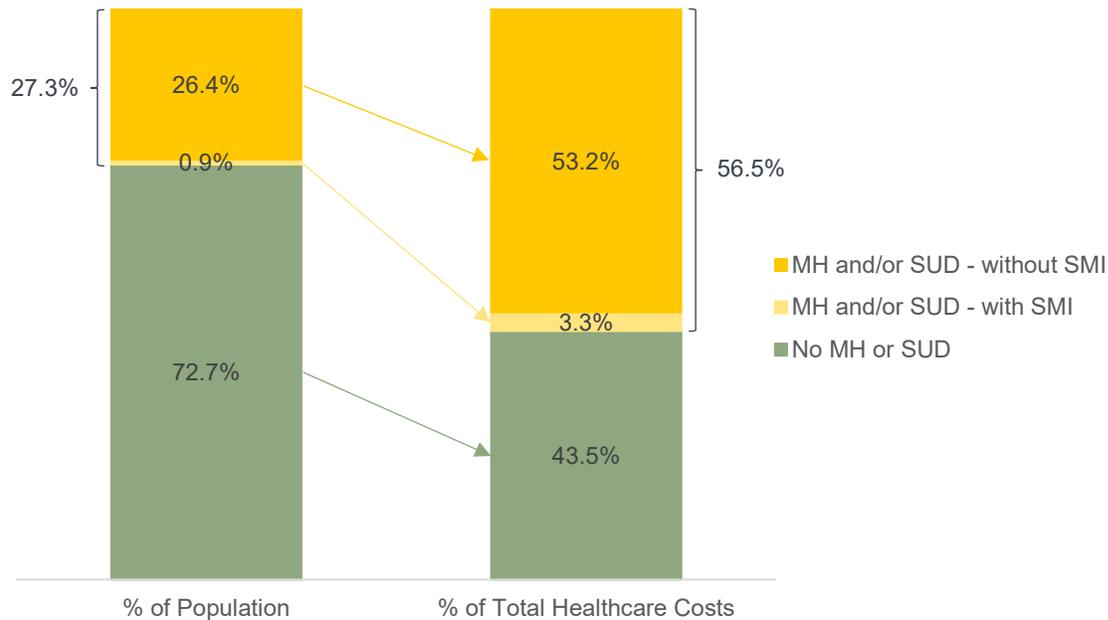
FIGURE 6: DISTRIBUTION OF THE POPULATION AND TOTAL HEALTHCARE COSTS AMONG BEHAVIORAL HEALTH GROUPS (MENTAL HEALTH CONDITIONS AND SUBSTANCE USE DISORDERS), 2017



²¹ In the supplemental analysis (as described in the Comparison of Prevalence Estimates and Methods to Other Sources section above), the BH Group would account for 50.3% of total healthcare costs and the High-cost Behavioral Subgroup would account for 38.7% of total healthcare costs.

We also examined the prevalence and costs of serious mental illness (SMI), and found that the average costs for individuals with SMI were substantial, but that the prevalence of SMI was relatively low. As shown in Figure 7, individuals with SMI (as defined in this study) are a relatively small proportion of both the population and of total healthcare costs.²²

FIGURE 7: DISTRIBUTION OF THE POPULATION AND TOTAL HEALTHCARE COSTS AMONG BEHAVIORAL HEALTH GROUPS (SERIOUS MENTAL ILLNESS AND OTHER MENTAL HEALTH CONDITIONS OR SUBSTANCE USE DISORDERS), 2017



BEHAVIORAL HEALTH COSTS AS A PORTION OF OVERALL COSTS

Average annual healthcare costs for individuals in the BH Group were higher than for those not in the BH Group, both in the study population as a whole, and within both the High-cost and Non-high-cost Groups.²³ Figure 8 shows average annual healthcare costs per individual for the High-cost and Non-high-cost Groups.

FIGURE 8: AVERAGE ANNUAL HEALTHCARE COSTS (SERVICES AND PRESCRIPTION DRUGS) PER INDIVIDUAL, BY SUBGROUP, 2017

COST SUBGROUPS	AVERAGE TOTAL COSTS	AVERAGE BEHAVIORAL HEALTH TREATMENT COSTS	AVERAGE MEDICAL/SURGICAL TREATMENT COSTS	% OF COSTS FOR BEHAVIORAL-SPECIFIC TREATMENT
High-cost Group, with BH (top 10%)	\$45,782	\$2,620	\$43,162	5.7%
High-cost Group, without BH (top 10%)	\$36,183	\$0	\$36,183	0.0%
Non-high-cost Group, with BH (bottom 90%)	\$3,475	\$531	\$2,944	15.3%
Non-high-cost Group, without BH (bottom 90%)	\$1,488	\$0	\$1,488	0.0%
Total Population	\$5,932	\$263	\$5,669	4.4%

²² See the Methodology section for the definition of serious mental illness used for this analysis.

²³ These cost comparisons have not been adjusted for age, sex, or health risk differences among the different population segments. Those factors may explain some of the observed cost differences. The intent of these comparisons is to demonstrate differences in healthcare use and costs between different population segments, not to attribute those differences to any individual factor.

On average, individuals in the BH Group experience higher total healthcare costs than those who are not in the BH Group; however, the costs for behavioral health-specific treatment represent a small share of their overall costs. For example, high-cost patients in the BH Group had total healthcare costs that were on average \$9,599 more over the course of a year than high-cost patients not in the BH Group, but only \$2,620 of their costs (or about 5.7%) were for behavioral health-specific treatment.

Among non-high-cost patients, those in the BH Group had total healthcare costs that were 2.3 times higher than patients not in the BH Group (\$3,475 versus \$1,488, respectively).

Figure 9 provides comparable metrics, split by whether the individuals were in the BH, MH, or SUD Groups, and by whether the identified mental health conditions met the criteria for serious mental illness (SMI).

FIGURE 9: AVERAGE ANNUAL HEALTHCARE TREATMENT COSTS (SERVICES AND PRESCRIPTION DRUGS) PER INDIVIDUAL BY BEHAVIORAL HEALTH CATEGORY, 2017 TOTAL POPULATION

BH CATEGORY*	INDIVIDUALS		AVERAGE ANNUAL HEALTHCARE COSTS			% OF COSTS FOR BEHAVIORAL HEALTH	COSTS RELATIVE TO NO BH	
	NUMBER	%	TOTAL	BEHAVIORAL HEALTH	MEDICAL/ SURGICAL		TOTAL	MEDICAL/ SURGICAL
No BH	15,275,323	73%	\$3,552	\$0	\$3,552	0.0%	1.0x (ref.)	1.0x (ref.)
Any BH (MH and/or SUD)	5,733,998	27%	\$12,272	\$965	\$11,307	7.9%	3.5x	3.2x
Any MH	5,317,964	25%	\$12,221	\$1,017	\$11,204	8.3%	3.4x	3.2x
MH, not SMI	5,135,034	24%	\$11,856	\$789	\$11,067	6.7%	3.3x	3.1x
MH, SMI	182,930	1%	\$22,460	\$7,422	\$15,038	33.0%	6.3x	4.2x
MH, without SUD	4,825,499	23%	\$10,855	\$772	\$10,083	7.1%	3.1x	2.8x
Any SUD	908,499	4%	\$19,796	\$1,989	\$17,807	10.0%	5.6x	5.0x
SUD, without MH	416,034	2%	\$12,923	\$303	\$12,619	2.3%	3.6x	3.6x
Both MH and SUD	492,465	2%	\$25,602	\$3,413	\$22,189	13.3%	7.2x	6.2x
Total Population	21,009,321	100%	\$5,932	\$263	\$5,669	4.4%	1.7x	1.6x

* Note that the "MH, not SMI" and "MH, SMI" categories include some individuals who also have substance use disorders.

Individuals in the MH Group (not including SMI) have 3.4 times higher annual total healthcare costs and 3.2 times higher medical/surgical costs compared to individuals not in the BH Group. Those individuals with SMI have 6.3 times higher annual total healthcare costs and 4.2 times higher medical/surgical costs. Those individuals in the SUD Group have 5.6 times higher annual total healthcare costs and 5.0 times higher medical/surgical costs. Total annual healthcare costs for individuals in the BH Group are on average \$12,272, with \$965 (7.9%) spent on behavioral health-specific treatment. Individuals in both the MH and SUD groups have the highest average annual costs among the groups studied (\$25,602), followed by individuals with SMI (\$22,460). However, average annual behavioral health-specific costs were highest among those with SMI, at \$7,422 (or 33.0% of total costs for this subgroup).

While the average annual healthcare costs for individuals with SMI were substantial, the prevalence of identified SMI was low. As shown in Figure 7 above, these individuals represent a small proportion of total healthcare costs across the entire population.

As shown in Figures 4 through 9 above, individuals in the BH Group account for 56.5% of total healthcare expenditures within our overall study population, while behavioral health-specific costs represented 4.4% of total costs across the total population. Figure 10 displays how these costs break down between treatment in facility and professional settings versus prescription drugs, and between mental health-specific services versus substance use disorder-specific services.

FIGURE 10: DISTRIBUTION OF COSTS BETWEEN BEHAVIORAL HEALTH AND MEDICAL/SURGICAL CARE, 2017 TOTAL POPULATION

HEALTHCARE TREATMENT CATEGORY	MH ONLY	SUD ONLY	TOTAL BH*	MED/SURG	TOTAL (BH + M/S)*
Inpatient and outpatient services in facility and professional settings only	2.03%	0.63%	2.66%	75.80%	78.47%
Prescription drugs only	1.66%	0.12%	1.78%	19.76%	21.53%
Total healthcare costs*	3.69%	0.75%	4.44%	95.56%	100.00%

* Totals may not match the sum of the parts due to rounding.

Behavioral health-specific costs represent 4.44% of total healthcare costs. Prescription drugs represent 40% of total behavioral health-specific costs.

COSTS OF BEHAVIORAL HEALTH-SPECIFIC TREATMENT

As shown in Figures 8, 9, and 10, behavioral health-specific costs represent 4.4% of total annual healthcare costs across the study population as a whole. Among the High-cost Behavioral Subgroup, 5.7% of total healthcare costs are accounted for by spending on behavioral health-specific treatment. For the Non-high-cost Behavioral Subgroup, the comparable figure is 15.3%.

Among all individuals in the BH Group, 8.3% of costs for those with mental health conditions and 10.0% of costs for those with substance use disorders are for behavioral health-specific treatment. This is consistent with prior research showing that costs for individuals with chronic conditions are much higher for those who also have comorbid behavioral health conditions than for those who do not, but the increase in costs is primarily attributed to additional medical/surgical costs.²⁴

While behavioral health conditions are relatively common, and the total healthcare costs associated with individuals that have them are often higher than for those who do not, many individuals with behavioral health conditions receive no behavioral health-specific treatment. According to the 2018 National Survey on Drug Use and Health (NSDUH), 17% of those aged 12 or older who needed treatment²⁵ for a substance use disorder in the prior year actually received it, and 43% of adults with any mental illness received mental health services in the prior year.²⁶ Within our study population, we also found that a significant proportion of individuals with identified behavioral health conditions did not receive any behavioral health-specific services, or only a nominal amount.

Costs for behavioral health-specific services for members of the High-cost Behavioral Subgroup exhibit a wide range of variation. The average annual behavioral health cost for members of this subgroup was \$2,620, but the median was \$95, suggesting that, even within this High-cost Behavioral Subgroup, a significant proportion of total behavioral health-specific costs are driven by a small minority of individuals. This means that, among this subgroup, over 50% of these individuals had total costs of less than \$8 per month for behavioral health treatment. For the total population, over 50% of individuals in the BH Group had total costs of less than \$6 per month for behavioral health treatment.

²⁴ Melek, S.P. et al. (January 2018). Potential Economic Impact of Integrated Medical-Behavioral Healthcare: Updated Projections for 2017. Milliman Research Report. Retrieved August 11, 2020, from <https://milliman-cdn.azureedge.net/-/media/milliman/importedfiles/uploadedfiles/insight/2018/potential-economic-impact-integrated-healthcare.ashx>.

²⁵ NSDUH considers individuals to have needed treatment if they had a substance use disorder or received substance use disorder treatment at a specialty facility in the past year.

²⁶ Substance Abuse and Mental Health Services Administration (August 2019), op. cit.

Conclusions

Our analysis found that a small minority of high-cost individuals drive a significant majority of total healthcare costs. The majority of those high-cost individuals have identifiable behavioral health conditions or prescriptions for behavioral drugs. In most cases, costs for behavioral health-specific treatment represent a small fraction of total healthcare costs for these individuals, and many had no or minimal spending on behavioral health-specific services.

Although the methodology of this study does not allow us to attribute causality between behavioral health conditions and very high medical/surgical spending, appropriate consideration and management of behavioral health conditions that are so prevalent among the population are important parts of a comprehensive strategy to manage total healthcare costs and contribute to positive outcomes for patients.

IMPLICATIONS

A fundamental principle of effective healthcare is early detection and, in most circumstances, prompt treatment of identified health risks. One prominent study found that there is approximately an 11-year median lag between onset of behavioral health symptoms and initial behavioral health treatment.²⁷ Prompt and effective access to affordable behavioral health-specific care is critical to improving behavioral health outcomes, yet we reported in another recent study that individuals are significantly more likely to access behavioral health-specific care on an out-of-network basis than physical healthcare.²⁸

The evidence base is growing for the favorable impact of effective behavioral interventions on health outcomes and total costs for patients and payers. We have previously reported on the potential cost savings for Medicare, Medicaid, and commercial insurers from effective integration of medical and behavioral healthcare (IMBH).²⁹ Based on our review of the results of effective IMBH programs, we calculated that between 9% and 17% of the excess costs incurred by individuals with comorbid physical and behavioral health conditions might be saved through effective integration of medical and behavioral care, totaling \$37.6 billion to \$67.8 billion across the United States as of 2017.³⁰

As one example, “Collaborative Care” (a particular model with specific reimbursement codes), which integrates behavioral health care into primary care settings, has shown efficacy in improving clinical outcomes and reducing total healthcare costs.³¹ This approach has been studied in more than 70 randomized controlled trials, which have “shown collaborative care for common mental health disorders such as depression to be more effective and cost-effective than usual care.”³² One major study found that Collaborative Care “yielded net savings in every category of health care costs examined, including pharmacy, inpatient and outpatient medical, and mental health specialty.”³³

²⁷ Wang, P.S. et al. (April 2004). Delays in initial treatment contact after first onset of a mental disorder. *Health Services Research*; 39(2): 393-416. Retrieved August 11, 2020, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1361014/>.

²⁸ Melek, S., Davenport, S., & Gray, T.J. (November 10, 2019) Addiction and Mental Health vs. Physical Health: Widening Disparities in Network Use and Provider Reimbursement. Milliman Research Report, Retrieved August 11, 2020, from <https://milliman-cdn.azureedge.net/-/media/milliman/importedfiles/ektron/addictionandmentalhealthvsphysicalhealthwideningdisparitiesinnetworkuseandproviderreimbursement.ashx>.

²⁹ Melek, S.P. et al. (January 2018), op. cit.

³⁰ Ibid.

³¹ Unutzer, J, Harbin H, Schoenbaum, M, & Druss, B. (May 2013). The Collaborative Care Model: An Approach for Integrating Physical and Mental Health Care in Medicaid Health Homes. Center for Health Care Strategies Brief. Retrieved August 11, 2020, from https://www.chcs.org/media/HH_IRC_Collaborative_Care_Model__052113_2.pdf.

³² Ibid.

³³ Ibid.

Methodology

DATA SOURCES

We relied primarily on two large, national, research databases for this analysis:

- 2017 IBM® Watson MarketScan® Commercial Claims and Encounters Database
- 2017 Milliman Consolidated Health Cost Guidelines™ Database

The MarketScan Research Databases reflect the healthcare experience of employees and dependents covered by the health benefit programs of large employers, health plans, and government organizations. The MarketScan Commercial Claims and Encounters Database includes data from active employees, early retirees, COBRA continues, and dependents insured by employer-sponsored plans.

The Milliman Consolidated Health Cost Guidelines Databases contain healthcare experience primarily for large group commercial members, using data contributed from a number of payers with which Milliman has data purchase or trade agreements. Milliman collects this data from various health plans for use in product development, research, and client projects.

The national results discussed in this white paper reflect the geographic and demographic mixes of commercially insured lives available in the research databases used for this analysis. We have normalized the data for regional differences in price levels using Milliman's Health Cost Guidelines Area Factors, but have not otherwise adjusted the data to reflect a standard geographic distribution for the United States.

SAMPLE SELECTION

Our sample was limited to individuals within the two aforementioned databases, aged 2 to 64, with a full year of eligibility for both medical and prescription drug coverage. Appendix A shows the age/sex distribution for the sample.

Identification of individuals in the BH Group

Individuals were included in the BH Group if they met one or more of the four criteria listed below:

1. **Diagnosed patients:** Patients with at least one diagnosis code for a behavioral health condition, in any position on any claim over the course of the calendar year. Under ICD-10, we considered any codes in the F series as behavioral.
2. **Patients who used behavioral drugs:** Patients who have filled prescriptions for certain of the drugs which have indications approved by the U.S. Food and Drug Administration (FDA) for behavioral health conditions. Consistent with a 2019 report on behavioral health spending from the Substance Abuse and Mental Health Services Administration (SAMHSA), we included the following behavioral drugs:³⁴
 - Psychotherapeutic drug classes including benzodiazepines, anxiolytics, sedatives, and hypnotics; antipsychotics, antimanics, antidepressants, analeptics (medications for attention deficit hyperactivity disorder [ADHD], including amphetamine-type stimulants and atomoxetine), and two anticonvulsants (lamotrigine and divalproex sodium) .
 - Medications for substance use disorders, including naltrexone, buprenorphine, naloxone, acamprosate, and disulfiram.³⁵
3. **Patients with costs for behavioral health services:** As defined in the Identification of Behavioral Health Costs section below.
4. **Patients with attempted suicide or self-harm:** Patients with situations that are suggestive of potentially untreated or undiagnosed behavioral health conditions, including:
 - Individuals who experienced injuries where the intent was coded as "intentional self-harm."

³⁴ SAMHSA (February 2019), op. cit.

³⁵ Note that, in addition to the drugs listed, methadone is also commonly used to treat opioid use disorder, but is typically administered through an opioid treatment program or clinic, and is captured in this analysis as an outpatient behavioral health service, rather than through prescription drugs.

- Individuals who experienced poisoning by drugs, medications, or biological substances where the intent was coded as “intentional self-harm.”
- Individuals who experienced toxic effects of chiefly nonmedicinal substances where the intent was coded as “intentional self-harm.”
- Individuals who experienced asphyxiation where the intent was coded as “intentional self-harm.”

Under ICD-10, we used any codes in the X71-X83 range, or any codes in the T36-T65 or T71 series with a sixth character of 2 (except for T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, T49.9, T51.9, T52.9, T53.9, T54.9, T56.9, T57.9, T58.0, T58.1, T58.9, T59.9, T60.9, T61.0, T61.1, T61.9, T62.9, T63.9, T64.0, T64.8, and T65.9, which are included if the fifth character is 2), as well as T14.91.³⁶

Appendix B shows the number of individuals identified based on each of these criteria.

Substance use disorders: Individuals were identified as having a substance use disorder if they had any diagnosis codes in the F10-F19 series of ICD-10, filled any prescriptions for medication for substance use disorders, used any substance use disorder-specific healthcare services, or experienced poisoning or toxic effects of substances where the intent was coded as “intentional self-harm.” Appendix C shows the overlap between individuals identified with mental health conditions and substance use disorder.

Serious mental illness: Individuals were identified as having a serious mental illness (SMI) if they had any ICD-10 diagnosis codes corresponding to schizophrenia or related disorders (F20-F29), severe manic episodes (F30.13, F30.2), severe bipolar disorder (F31.13, F31.2, F31.4, F31.5, F31.63, F31.64), or severe major depression (F32.2, F32.3, F33.2, F33.3). The latter three criteria include all of the ICD-10 diagnosis codes that included the designation “severe” for these conditions. Diagnosis codes do not always specify the level of severity or functional impairment experienced by the individual, and as such not all individuals with serious mental illness can be identified in a claims-based analysis. Other individuals may have also had severe forms of these conditions, but the level of detail available in claims data is not sufficient to identify the severity level in all cases. Individuals identified as having behavioral conditions based only on use of behavioral health services, psychotropic drugs, or instances of self-harm or suicide attempts (and not on the basis of behavioral health diagnoses) were not considered for identification as having SMI. The definition of SMI used in this study is one approach to identifying individuals with SMI, and other approaches may produce differing results.

Nicotine dependence: We included individuals with diagnoses of nicotine dependence in our behavioral group. Guidance from the American Psychiatric Association (APA) recommends that clinicians use substance dependence codes for individuals with moderate or severe substance use disorders.³⁷ This includes the use of nicotine dependence codes for individuals with tobacco use disorder. Tobacco use disorder is considered a substance use disorder within the DSM-V. However, SAMHSA reports on but does not include tobacco use in its measures of substance use disorders from the NSDUH, and did not include smoking cessation aids in its 2019 report on behavioral health spending (though it did include medical claims with nicotine dependence diagnoses).

Additional commentary on identification criteria

In some studies, more stringent identification criteria may be used, such as excluding claims for laboratory services, requiring diagnoses to appear on multiple healthcare encounters, only including prescription drugs as secondary confirmation for behavioral health conditions, or only including individuals with substance dependence codes when accompanied by other evidence of a use disorder. Not all clinicians follow the APA’s recommendations regarding the use of substance dependence codes, and some individuals may experience substance dependence without other complicating factors necessary to establish a substance use disorder diagnosis under DSM-V.

³⁶ Hedegaard, H., Schoenbaum, M., Claassen, C., et al. (February 2018). Issues in Developing a Surveillance Case Definition for Nonfatal Suicide Attempt and Intentional Self-harm Using International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) Coded Data. *National Health Statistics Reports*, Number 108. Retrieved August 11, 2020, from <https://www.ncbi.nlm.nih.gov/pubmed/29616901>.

³⁷ American Psychiatric Association. DSM-5 Diagnoses and New ICD-10-CM Codes. Retrieved August 11, 2020 from <https://www.psychiatry.org/File%20Library/Psychiatrists/Practice/DSM/ICD10-Changes-Listed-by-ICD10-October-2017.pdf> (PDF download).

Identification of behavioral health costs

We identified costs related to behavioral health using the criteria below:

1. **Core behavioral health services:** The allowed costs of services on any claims (related to any behavioral health or medical/surgical provider) that are specific to behavioral health or that are provided by behavioral health professionals, including inpatient hospital admissions with a diagnosis-related group (DRG) related to behavioral health, admissions to residential facilities for mental health or substance use disorders, partial hospitalization, or intensive outpatient programs, as well as professional visits and services that are specific to behavioral health, excluding screenings and evaluations that did not produce any behavioral health diagnoses.
2. **Behavioral health drugs:** The allowed costs of prescription drugs as described in the Identification of Individuals in the BH Group section above (“Patients who used behavioral drugs”).

As a supplemental analysis, we also identified primary care visits with a principal diagnosis of behavioral health. In this report, service costs of these visits have not been included as behavioral health costs, unless they were coded as professional visits or services specific to behavioral health. If these costs had been included as behavioral health-specific costs, the proportion of total costs that are associated with behavioral health treatment for the total population would have risen by 0.2%, from 4.4% to 4.6%.

Any costs not identified as relating to behavioral health were classified as medical/surgical costs throughout this report.

Caveats and limitations

We have not audited the data sets used for this analysis, but have extensive experience using them, and have found them to be reasonable. Any errors or omissions in the data sets could affect the results in this report. Some of the data contributors may use third-party vendors to provide behavioral healthcare services, which could lead to the exclusion of some behavioral healthcare claims from these data sets. We are not able to identify coverage levels or use of third-party vendors for behavioral healthcare in the data sets used for this analysis. However, in our experience, the vast majority of contributors report reasonable claims volumes for behavioral health services.

This study is based on a sample of commercially insured individuals in the United States (predominantly those with employer-sponsored insurance, and not including those with public insurance provided through a commercial entity, such as Medicare Advantage or Medicaid managed care), and results may not be generalizable to those with other types of insurance coverage (or with no insurance coverage at all). We focused on individuals with 12 months of continuous insurance eligibility, which may have excluded some individuals with complex medical/surgical or behavioral healthcare needs who might have been less likely to maintain continuous employment (and thus insurance eligibility). Appendix A provides a comparison of the age and sex distribution present in our study sample to U.S. Census Bureau data for the privately insured population.

All costs presented in this report are provided without adjustment for differences in age, sex, health risk, or other factors. These and other factors may contribute to cost differences described throughout this report. The intent of the analysis is to describe the differences in healthcare use and costs between different population segments, not to attribute those differences to any individual factor or cause.

We identified behavioral health conditions based on information observable in administrative claims data. Not all individuals with behavioral healthcare needs are identifiable by this approach. Further, any healthcare expenses that were not submitted to an insurer for reimbursement were not included in this study. Services that were denied for payment by insurers may not be fully represented within our data. Because of this limitation, the true number of individuals with behavioral health needs or who used behavioral health services may be understated.

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Appendix A: Attrition Table and Age/Sex Distribution of Sample

FIGURE 11: DEVELOPMENT OF STUDY SAMPLE

SAMPLE SELECTION STEP	SAMPLE SIZE		PERCENTAGE OF TOTAL LIVES RETAINED	PERCENTAGE OF THOSE EXCLUDED
	INCLUDED	EXCLUDED		
Starting point commercial data	45,903,262		100%	
Step 1: require 12 months of medical eligibility	31,775,414	14,127,848	69.2%	56.8%
Step 2: require 12 months of Rx eligibility	21,931,907	9,843,507	47.8%	39.5%
Step 3: restrict to ages 2 to 64	21,009,321	922,586	45.8%	3.7%
Final sample	21,009,321	54,487,370	45.8%	

FIGURE 12: DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION, COMPARED TO PRIVATELY INSURED U.S. POPULATION, 2017

AGE GROUP	OVERALL		FEMALE		MALE	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
STUDY POPULATION						
2 to 10 years	2,275,989	10.8%	1,111,434	5.3%	1,164,555	5.5%
11 to 18 years	2,506,914	11.9%	1,228,885	5.8%	1,278,029	6.1%
19 to 24 years	2,020,855	9.6%	995,021	4.7%	1,025,834	4.9%
25 to 34 years	2,907,764	13.8%	1,497,501	7.1%	1,410,263	6.7%
35 to 44 years	3,381,867	16.1%	1,755,447	8.4%	1,626,420	7.7%
45 to 54 years	3,890,655	18.5%	2,023,460	9.6%	1,867,195	8.9%
55 to 64 years	4,025,277	19.2%	2,097,952	10.0%	1,927,325	9.2%
Total (ages 2 to 64)	21,009,321	100.0%	10,709,700	51.0%	10,299,621	49.0%
PRIVATELY INSURED U.S. POPULATION*						
2 to 10 years	22,553,197	12.1%	11,000,724	5.9%	11,552,473	6.2%
11 to 18 years	22,488,048	12.1%	10,950,881	5.9%	11,537,167	6.2%
19 to 24 years	17,684,845	9.5%	8,641,955	4.6%	9,042,890	4.8%
25 to 34 years	31,364,549	16.8%	15,585,769	8.4%	15,778,780	8.5%
35 to 44 years	29,912,315	16.0%	15,105,744	8.1%	14,806,571	7.9%
45 to 54 years	31,792,470	17.0%	16,221,498	8.7%	15,570,972	8.3%
55 to 64 years	30,708,381	16.5%	15,948,703	8.6%	14,759,678	7.9%
Total (ages 2 to 64)	186,503,805	100.0%	93,455,274	50.1%	93,048,531	49.9%

* Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018. Note that the Current Population Survey inquires about prior year insurance status, so the 2018 survey results represent insurance status for the year 2017.

Appendix B: Identification of Patients in the BH Group

FIGURE 13: COUNT OF INDIVIDUALS IN STUDY SAMPLE BASED ON BEHAVIORAL HEALTH CRITERIA IDENTIFIED, 2017

BEHAVIORAL HEALTH CRITERIA	NUMBER	% OF TOTAL
All patients in the BH Group	5,733,998	100.0%
PATIENTS IDENTIFIED BASED ON ...		
Behavioral diagnoses	4,191,654	73.1%
Attempted suicide or self-harm	15,761	0.3%
Use of behavioral drugs	4,271,824	74.5%
Use of behavioral services	1,346,382	23.5%
SINGLE CRITERION ONLY		
Behavioral diagnoses only	932,752	16.3%
Attempted suicide or self-harm only	520	0.0%
Use of behavioral drugs only	1,495,272	26.1%
Use of behavioral services only	17,506	0.3%
TWO CRITERIA		
BH diagnoses and attempted suicide or self-harm	758	0.0%
BH diagnoses and use of BH drugs	1,944,155	33.9%
BH diagnoses and use of BH services	496,066	8.7%
Attempted suicide or self-harm and use of BH drugs	99	0.0%
Attempted suicide or self-harm and use of BH services	13	0.0%
Use of BH drugs and use of BH services	16,060	0.3%
THREE CRITERIA		
BH diagnoses, attempted suicide or self-harm, and use of BH drugs	1,186	0.0%
BH diagnoses, attempted suicide or self-harm, and use of BH services	1,685	0.0%
BH diagnoses, use of BH drugs, and use of BH services	803,552	14.0%
Attempted suicide or self-harm, use of BH drugs, and use of BH services	0	0.0%
ALL FOUR CRITERIA		
BH diagnoses, attempted suicide or self-harm, use of BH drugs, and use of BH services	11,500	0.2%

Appendix C: Overlap of Patients in the Mental Health and Substance Use Disorder Groups

FIGURE 14: COUNT OF INDIVIDUALS IN STUDY SAMPLE BASED ON BEHAVIORAL HEALTH GROUPS IDENTIFIED, 2017

BEHAVIORAL HEALTH GROUPS	RELATIONSHIP BETWEEN CONDITIONS	HIGH-COST PATIENTS		NON-HIGH-COST PATIENTS		TOTAL	
		NUMBER	% OF COST GROUP	NUMBER	% OF COST GROUP	NUMBER	% OF TOTAL
No BH	(A)	908,631	43.2%	14,366,692	76.0%	15,275,323	72.7%
MH but no SUD	(B)	880,982	41.9%	3,944,517	20.9%	4,825,499	23.0%
SUD but no MH	(C)	99,380	4.7%	316,654	1.7%	416,034	2.0%
Both MH and SUD	(D)	211,939	10.1%	280,526	1.5%	492,465	2.3%
Any MH	(E) = (B) + (D)	1,092,921	52.0%	4,225,043	22.3%	5,317,964	25.3%
Any SUDs	(F) = (C) + (D)	311,319	14.8%	597,180	3.2%	908,499	4.3%
Any BH	(G) = (B) + (C) + (D)	1,192,301	56.8%	4,541,697	24.0%	5,733,998	27.3%
Total population	(H) = (A) + (G)	2,100,932	100.0%	18,908,389	100.0%	21,009,321	100.0%



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