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MERU HEALTH COST SAVINGS WHITE PAPER

Meru Health Works with Stanford and Harvard to Provide Significant Clinical Results and Cost Savings

Significant Improvements in Depressive and Anxiety Symptoms Result in Estimated Cost Savings of Over \$6000 per Year for Each Enrolled Participant



Executive Summary

The Problem

Major depression affects over 7% (17.7 million) of American adults each year with enormous health, social, and economic consequences¹ estimated at \$210.5 billion annually. Those suffering from depression and anxiety typically have high healthcare costs and reduced productivity at work. The increased depression and anxiety associated with the CoVid-19 pandemic has further escalated the need for quick deployment of accessible, engaging, and effective mental health care.

The Solution

Meru Health is an online mental health provider with a holistic treatment for depression and anxiety accessed entirely remotely through a smartphone. Evidence-based care is provided by licensed clinical therapists during a structured, 12-week program that routinely assesses patient outcomes, engagement, and satisfaction.

The Analysis and Results

Meru Health program participants experience reductions in both depression and anxiety symptoms at the end of treatment. We hypothesized that these symptom improvements result in cost savings via reduced health care utilization and improved worker productivity.

Our analysis uses real-world Meru Health program data combined with data from a published Blue Cross Blue Shield Association (BCBS) study. The BCBS analysis showed that

depressed people had, on average, \$6,390 more healthcare costs annually than nondepressed people. We use this figure combined with our real-world Meru data to estimate the potential healthcare cost savings associated with program enrollment. We also calculated the improvement in worker productivity using data from Meru Health participants who completed the Worker Productivity and Activity Impairment (WPAI) scale combined with the average annual worker's salary in the U.S. For this analysis, we study these two types of cost savings for Meru Health participants who had PHQ-9 scores indicative of major depression (PHQ-9 of 10 or higher) at the start of the program. On average, we estimate that Meru enrollees experience a reduction in depressive symptoms by the end of treatment associated with a cost savings of:

\$3,020 in reduced healthcare costs
+ \$4,150 in worker productivity improvements

for a total savings = \$7,170

The Bottom Line

Accounting for the average cost of the Meru Health program, **enrollment in the Meru Health program results in symptom improvements associated with a cost savings of \$6,090 per enrolled depressed participant per year.**

In addition to significant costs savings, our findings demonstrate that the Meru Health program provides an accessible, engaging, and effective form of continual mental health care for those suffering from depression and anxiety that is a preferable option to some over the appointment-based care provided by traditional EAP programs, teletherapy, and face-to-face therapy.

¹ Substance Abuse and Mental Health Services Administration. (2019). Results from the 2018 National Survey on Drug Use and Health: Detailed tables. Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from <https://www.samhsa.gov/data/>

Major depression affects over 7% (17.7 million) of American adults each year with enormous health, social, and economic consequences.² The second leading cause of disability worldwide, major depression costs the U.S. an estimated \$210.5 billion per year.³ Those costs are due to greater direct medical care of depression but also indirect costs. For example, people with untreated or undertreated depression are more likely to have comorbid conditions, decreased worker productivity, and increased risk of suicide. For every \$1 spent on direct medical care costs of depression, an estimated \$1.90 is spent on indirect costs.

Now is a particularly important time to provide comprehensive, effective, and accessible depression care based on the most up-to-date research evidence. The stress and isolation caused by the CoVid-19 pandemic has led to a rise in mental health problems globally. People are reporting historical levels of both depression and anxiety symptoms, especially women, minorities, and people with preexisting health conditions. Effective mental health solutions are urgently needed to meet the needs of those suffering and, because the U.S. has a shortage of mental health professionals⁴, the chosen interventions need to be creative as well as effective, engaging, and accessible to those in need.

The Meru Health Solution

Meru Health is an online mental health provider of a holistic treatment for depression and anxiety. Accessed entirely remotely through a smartphone and guided by a licensed clinical therapist, the structured, 12-week program combines several different evidence-based treatment modalities such as cognitive behavioral therapy, behavioral activation therapy, and mindfulness

meditation. The program also includes heart rate variability biofeedback (HRVB) and other promising new care components based on sleep hygiene and nutritional psychiatry. During the 12-week program, participants can access video-lessons and complete prescribed practices and exercises designed to help them reduce their symptoms at times most convenient for them. Participants complete routine outcomes assessments including depression and anxiety symptoms, engagement, and satisfaction. These evaluations inform both the Meru Health licensed clinical therapist as well as any referring healthcare providers as needed. The Meru therapist supports participant progress and gives feedback via in-app chat and, when needed, phone or televideo calls. The tools and learnings of the program can be used indefinitely to enhance a participant's learning long after the program concludes.

The Meru Health program provides an excellent alternative to existing care models. Because each therapist can support about 100 patients at a time, the program addresses the scalability challenge faced by traditional teletherapy and face-to-face options caused by the shortage of mental health providers in the U.S. As opposed to the traditional appointment-based care, the Meru Health program provides continual, proactive care for each participant that can be accessed anywhere at any time. Meru can augment, or stand alone as a preferred solution over traditional employer offerings such as Employee Assistance Programs (EAPs), as shown in Figure 1. The Meru Health team has published several research papers demonstrating how well the program has worked, and how engaged and satisfied its participants are with the care received.

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- 2 Substance Abuse and Mental Health Services Administration. (2019). Results from the 2018 National Survey on Drug Use and Health: Detailed tables. Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from <https://www.samhsa.gov/data/>
 - 3 Greenberg, P. E., Fournier, A. A., Sisitsky, T., Pike, C. T., & Kessler, R. C. (2015). The economic burden of adults with major depressive disorder in the United States (2005 and 2010). *The Journal of clinical psychiatry*, 76(2), 155-162.
 - 4 National Council for Behavioral Health. (2017). The psychiatric shortage: Causes and solutions. National Council Medical Director Institute. Retrieved from: <https://www.thenationalcouncil.org/wp-content/uploads/2017/03/Psychiatric-Shortage-National-Council-.pdf>

FIGURE 1. Comparison of Meru Health Versus a Typical EAP Provider

COMPARISON	 Meru Health	Typical EAP provider
Measurable clinical results	Yes - Develop long term coping skills	Usually incident-specific
Program length	12 weeks	Average 2.5 sessions per incident****
Average engagement time	20 hours	2.5 hours*
Average completion rate	89%	36.7%**
Average utilization rate	3-8%	2-4%***

* <http://chestnutglobalpartners.org/Portals/cgp/Publications/Trends-Report-April2017.pdf>

** <https://digitalcommons.du.edu/cgi/viewcontent.cgi?article=2456&context=etd>

*** <https://www.perspectivesltd.com/2014/09/11/eap-utilization-data-trends-2/>

**** Citation: Mahieu, K., & Taranowski, C. J. (2013). External Employee Assistance Program Vendors: A Study of RFI Data from 2009-2010. Accessed here: <https://archive.hshsl.umaryland.edu/bitstream/handle/10713/5111/EASNA-Research-Notes-Vol-3-No-3.pdf?sequence=1&isAllowed=y>

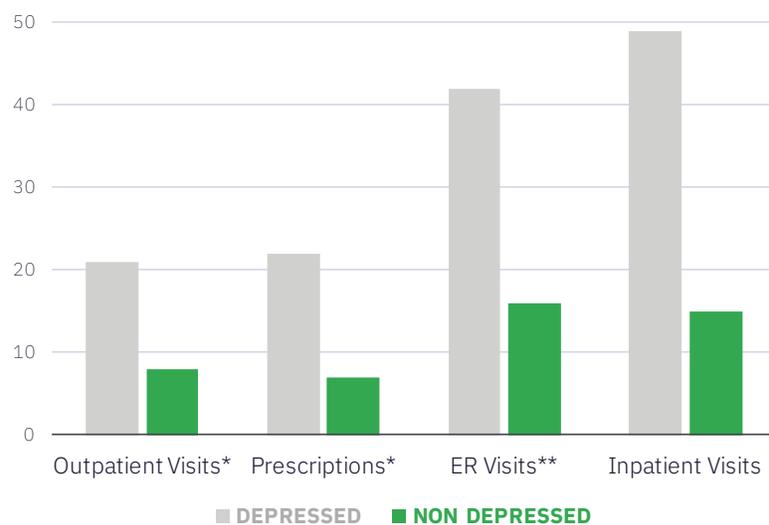


Healthcare Costs and Potential Savings

The healthcare costs associated with depression are staggering. People suffering from depression get sick more often and, when they do, tend to get sicker and for longer than those without depression. They are likely to have increased risk of comorbid medical conditions like diabetes, cancer, and heart disease that, conversely, can be worsened by depression as well. In one study, 85% of those diagnosed with major depression had at least one additional serious chronic health condition and nearly 30% had four or more of these conditions.⁵ As a result, people with more depressive symptoms become higher utilizers of healthcare services than those with lower levels of symptoms, which ends up costing insurers, employers, and patients. *For example, people with higher depressive symptom scores tend to have more emergency room visits and hospitalizations than those with lower depression scores.*

The Blue Cross Blue Shield Association (BCBS) recently compared the healthcare costs between those with and without a diagnosis of major depressive disorder (MDD) and found very striking differences in the number of outpatient visits, inpatient visits, emergency room visits, and prescription drugs taken between depressed and nondepressed people⁶ (see Figure 2). **When the authors of this BSBC study added up all of the costs associated with these visits and prescriptions, they found that the average total cost of care for depressed patients was \$10,673 per year as compared with \$4,283 per year for nondepressed patients. That is, depressed people had, on average, \$6,390 more healthcare costs than nondepressed people each year.**

FIGURE 2. Healthcare Utilization Comparisons for Depressed Versus Nondepressed Individuals



Source: BlueShield, B. (2018). Major Depression: The Impact on Overall Health. Retrieved from: <https://www.bcbs.com/the-health-of-america/reports/major-depression-the-impact-overall-health>

* Per Member Per Year

** Per 100 Members Per Year

We can use the BCBS study findings and real-world data from 453 Meru Health participants to estimate the potential healthcare utilization cost savings associated with program enrollment. The focus only on participants who started the program with a PHQ-9 depressive symptom score indicative of having a major depressive disorder (score of 10+) allowed us to apply the BCBS study findings to our data. From this analysis, we estimated **cost savings associated with decreased healthcare utilization of \$3020 per enrolled participant in the 12 months following treatment completion.**⁷

5 Sutor, B., Rummans, T.A., Jowsey, S.G., Krahn, L.E., Martin, M.J., O'Connor, M.K., Philbrick, K.L. and Richardson, J.W., 1998, April. Major depression in Medically III Patients. In Mayo Clinic Proceedings (Vol. 73, No. 4, pp. 329-337). Elsevier. And <https://www.cdc.gov/workplacehealthpromotion/tools-resources/pdfs/issue-brief-no-2-mental-health-and-chronic-disease.pdf>

6 BlueShield, B. (2018). Major Depression: The Impact on Overall Health. Retrieved from: <https://www.bcbs.com/the-health-of-america/reports/major-depression-the-impact-overall-health>

7 Among 453 participants who started the Meru Health program with a PHQ-9 symptom score that indicated major depressive disorder (MDD) like those in the BCBS study (score of 10 or higher), about half (214 or 47.24%) no longer had symptoms indicative of MDD (PHQ-9<10) at the end of the program. Using the BCBS study findings, this means that per 1000 participants with MDD, 472.4 will get better, each saving \$6390 in the 12 months following treatment. $472.4 \times \$6390 = \$3,018,636$ in cost savings per enrolled participant per year.

Productivity Loss and Potential Savings

In addition to increased healthcare utilization, depression typically reduces worker productivity. This costs the U.S. an estimated \$84 billion per year.⁸ These productivity issues include absenteeism--having unplanned absences from work—and presenteeism—being at work but not able to fully meet job requirements because of an illness or injury like depression. As a result of absenteeism and presenteeism, people with depression cost their employers millions of dollars in lost productivity per year. In the worst cases, depression can lead to disability that prevents people from working at all.

Participants enrolled in Meru Health treatment are asked to complete a questionnaire called the Worker Productivity and Activity Impairment (WPAI) scale before and after the program. This scale allows Meru to estimate the amount of absenteeism, presenteeism, and total lost productivity due to depression for each person enrolled in the program. Meru Health can use this information to estimate an employer-specific Return On Investment (ROI) amount for their total population treated by Meru Health.

Among the 453 Meru Health participants who started the program with a depressive symptom score described above (PHQ-9 of 10 or higher), we found a mean increase of 9.48% in worker productivity. We can use the US average salary of \$49,764 per year to estimate the productivity cost savings for the average Meru Health enrollee.

Taken together, we find an average cost savings associated with improved worker productivity of \$4,150 in the 12 months following the end of treatment for the average Meru Health enrollee.

Total Cost Savings of the Meru Health Program

Combining the medical and worker productivity cost savings together and subtracting the Meru Health average program cost yields an overall cost savings of **\$6,090 per participant per year.**⁹ Table 1 below displays estimates of various total cost savings associated with the implementation of the Meru Health program, depending on the size of the organization. These estimates assume that 7% of each population would have major depression (the U.S. average) and that half of all patients with major depression would enroll in the Meru Health program if offered.

TABLE 1. Estimated Annual Cost Savings Associated with Meru Health Program Enrollment by Size of Organization

Size of organization	Estimated number with major depression (3.5% of population*)	Cost savings per participant per year	Total cost savings per year
1,000	35	\$6,090	\$213,150
10,000	350	\$6,090	\$2.13 million
100,000	3,500	\$6,090	\$21.3 million

8 Evans-Lacko, S., & Knapp, M. (2016). Global patterns of workplace productivity for people with depression: absenteeism and presenteeism costs across eight diverse countries. *Social psychiatry and psychiatric epidemiology*, 51(11), 1525-1537.

9 Taking the medical costs savings and worker productivity cost savings together: $\$3,018.64 + \$4,151.41 =$ a total cost savings of \$7,170.15 per worker enrolled in the Meru Health Program in the 12 months following the end of treatment. After accounting for the program cost of \$1,080, this yields a cost savings of \$6,090.15 per participant per year.

Conclusion

Depression is associated with high healthcare costs and reduced productivity at work. The CoVid-19 global pandemic is causing rising rates of depression and anxiety that urgently require effective, engaging, and accessible mental health solutions to address some of the inherent issues with traditional types of care like face-to-face therapy and Employee Assistance Programs. Meru Health is an online mental health provider that delivers holistic evidence-based care via a structured, 12-week program accessed entirely remotely through a smartphone and supported by licensed clinical therapists. The treatment is designed to help patients with depression and anxiety have measurable symptom improvements. Several analyses presented here have demonstrated that participation in the Meru Health treatment program results in significant reductions in symptoms of depression and anxiety that should lead to significant cost savings.

The results of this analysis show that Meru Health participants who have PHQ-9 scores indicative of major depression (PHQ-9 of 10 or higher) at the start of treatment experience sizable cost savings due to a reduction in healthcare utilization and improved worker productivity. It is estimated that Meru Health participants reduce their healthcare costs by \$3,020 and improve their productivity by \$4,150 — for a total savings of \$7,170 per year. Taken together with the average program cost, enrollment in Meru Health is estimated to provide a net cost savings of \$6,090 per enrolled depressed participant per year.

In addition to significant costs savings, our findings demonstrate that the Meru Health program provides an accessible, engaging, and effective form of continual mental health care for those suffering from depression and anxiety that is a preferable option to some over the appointment-based care provided by traditional EAP programs, teletherapy, and face-to-face therapy