

# The Cost-Effectiveness of a Hybrid Telehealth Approach to Treating Individuals with Severe Mental Illness (SMI) with Co-Occurring Substance Use Disorder (SUD)

Jason C. Goldwater, MA, MPA & Yael M. Harris, PhD, MHA

Laurel Health Advisors, LLC

www.laurelhealthadvisors.net



If a person has both a serious mental illness (SMI) and at least one substance use disorder (SUD), they meet the criteria for co-occurring disorders. Co-occurring disorders (CODs) are experienced by an estimated 8.9 million adults in the United States. COD with SMIs encompasses depression, anxiety, post-traumatic stress disorder, bipolar disorder, and schizophrenia. Substance use disorders include alcohol, opioids, other illicit substances, and nicotine. COD is found in about half of the people with SUDs or SMI. The reasons for developing co-occurring disorders may be genetic makeup, additional risk factors for SUD for those with SMI, stress, environmental influences, trauma, or adverse childhood experiences. Further complicating this diagnosis is that SUDs and mental disorders are associated with changes in brain areas that may lead to the development of a comorbid illness.

## MODEL DEVELOPMENT

This analysis examined the cost-effectiveness of a usual care program treating COD. A Markov model with patients 18 and over was used to simulate the progression of SMI, COD, and cumulative deaths for 82 years, analyzed monthly. The study followed the cohort, using mutually exclusive and exhaustive health states throughout their lifetime. Two approaches to care were studied: in-person care only versus telehealth plus in-person care. The in-person care strategy was characterized by weekly meetings with a mental health counselor, monthly visits with a psychiatrist, laboratory visits every six to eight weeks (depending on the condition), medication, and in-person group therapy once a week. The hybrid approach was characterized by video visits with a counselor once a week instead of in person, a video meeting with a psychiatrist once a month with in-person meetings three times a year, mediated group sessions once a week through videoconferencing, laboratory tests, and medications.

Individuals in the model start with either mild or no SMI, which means that the SMI is controlled with medication adherence, meeting regularly with a counselor and psychiatrist, and consistently reporting symptoms to adjust treatment potentially. Additionally, the individual has, at most, a controlled SMI. The risk of feeling moderate to severe SMI represents a person who has inconsistent medication use, does not regularly see their psychiatrist or therapist, and does not attend group sessions. The probability of death in all health states was caused by complications attributed to SUD or severe mental health conditions, and mortality was caused by factors different from those under study.

## MODEL INPUTS, OUTPUTS & FINDINGS

Within the decision analytic model, all individuals in the mild or no SMI state are diagnosed with SMI or can die from an SMI-related condition. Individuals with moderate to severe SMI experience a low quality of life but receive treatment for SUD and SMI but are inconsistent with their adherence to treatment and medication. They can improve and return to mild or no SMI. If the treatment fails, the individual's health status remains unchanged, and the likelihood of death increases. Mortality attributable to other (non-COD causes) is possible across all health states.

The comparison of individuals within the model was split into two groups: one with a low risk of COD and those who experience a high risk of COD. The probability of improvement using hybrid telehealth, or in-person care only assumed that an initial low level of SMI maximizes health. Background mortality was developed using the 2021 US Life Tables from the CDC. A discount rate of 3% was applied.

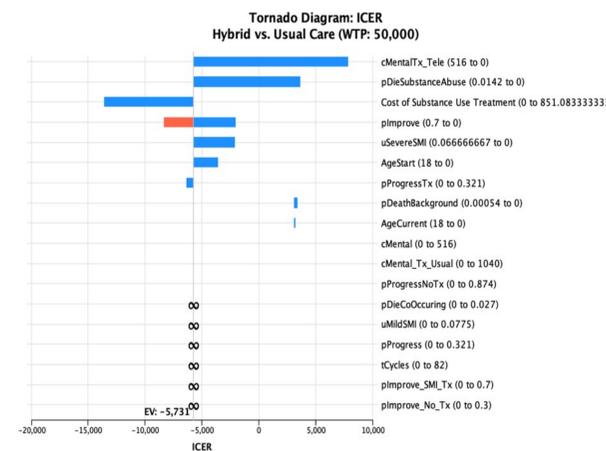
The model was designed to compute the cost and effectiveness derived from a patient with a severe mental illness diagnosis and an additional co-occurring substance use disorder diagnosis. The WTP threshold was set at \$50,000, and the analysis examined the incremental cost, incremental effectiveness, and incremental cost-effectiveness ratio. The net monetary benefits (NMB) for each intervention were also examined.

Strategy	Cost	Incr. Cost	QALY	Incr. QALY	ICER	NMB
Hybrid	\$36,084	N/A	2.65	N/A	N/A	\$96,420
Usual Care	\$37,209	\$1,122	2.45	-0.20	-\$5,622	\$85,321

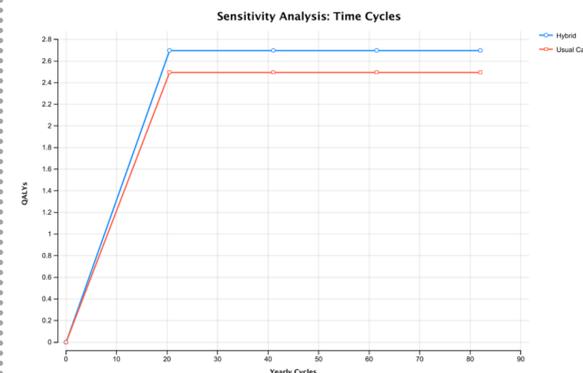
The differences in QALY between the two strategies (2.65 vs. 2.45) are minimal, but the ICER demonstrates the significance of cost to gather a similar type of effectiveness. The ICER for the Usual Care option is negative, indicating that the impact of a Hybrid approach on each QALY differs from that of Usual Care. Additionally, the overall NMB for Hybrid is slightly higher than that of the Usual Care approach.

## SENSITIVITY ANALYSIS

A one-way sensitivity analysis was performed on all model inputs. Three inputs impacted the ICER when running a Monte Carlo simulation of 10,000 patients: the cost of using telehealth to provide treatment for co-occurring disorders, the probability of death from substance use disorder, and the cost of substance use treatment. The difference in cost of a Hybrid approach and the probability of death for SUD decreased the ICER.

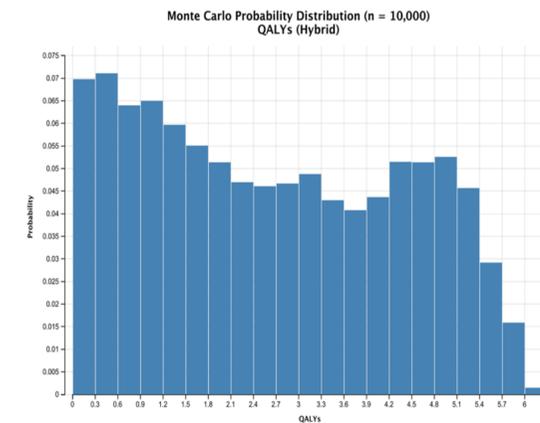


In addition, given the extended Markov cycle of 82 years, the analysis shows that the use of a Hybrid approach over time extends the QALYs of individuals, which supports the discussion that the more that telehealth is used, the more effective it becomes.



## DISCUSSION

These models show slight cost-effectiveness of the Hybrid approach and that its use is sustainable to increase QALYs. However, the difference between Hybrid and In-Person is minimal, which indicates that both approaches are effective and efficient in providing care for those with SMI and co-occurring SUD.



Telehealth combined with in-person care could be a cost-effective solution addressing some of the unique challenges faced by those with co-occurring severe mental illness and substance use disorders. It has shown promise as a vehicle to deliver healthcare to the general public with SUD, SMI, and co-occurring disorders. There are many reasons that individuals with SMI and SUD experience barriers to quality care, including access to appropriate services and providers, stigma, and competing priorities, such as employment and childcare. Telehealth can be used successfully with these patient populations to increase access to care. It can offer effective care for SMI and SUD, including screening and assessment; treatments, including pharmacotherapy, medication management, and behavioral therapies; case management; recovery supports, and crisis services.

## CONCLUSIONS

This study found a stable trend in the cost-effectiveness of using telehealth modalities in combination with in-person care (hybrid) for the treatment of co-occurring SMI and SUD among individuals within the United States. Findings from this study point to ongoing deficiencies in the current service capacity for mental health and SUD treatment, highlight the need for improved access to care using telehealth, and call for policy support to establish permanent payment parity between telehealth and in-person care and ensure access to care and treatment without requiring an initial in-person visit.

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