

## Quitline Programs Tailored for Mental Health: Initial Outcomes and Feasibility



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**Introduction:** The general efficacy of quitlines has been widely demonstrated, but uncertainty exists regarding how quitlines might best intervene for persons with mental health conditions. A total of 1 in 5 people in the U.S. has a diagnosable psychiatric disorder. These individuals smoke at 2–4 times the rate of smoking among those without a mental health condition and face high rates of related death and disability. About half of quitline callers self-report a mental health condition, but until recently, quitline protocols tailored to these smokers did not exist.

**Methods:** This paper provides initial results for tailored mental health programs from the largest quitline providers in the U.S., Optum and National Jewish Health. From 2017 to 2018, cohorts of callers with a mental health condition who enrolled in tailored programs were compared with cohorts with a mental health condition who received standard care. Both mental health programs offered participants additional calls, longer duration of combination nicotine-replacement therapy, and attention to mental health issues. Analyses were conducted in 2018–2019.

**Results:** Findings suggest that callers with a mental health condition benefit from both standard care and tailored mental health services. Tailored programming did well in engaging people with mental health conditions. At the same time, there were no significant differences in abstinence rates when comparing mental health programs with standard care. Mental health cohorts did receive significantly greater service durations, more counseling calls, and longer nicotine-replacement therapy duration.

**Conclusions:** Tailored mental health quitline programs present a promising framework for testing the services that address psychiatric symptoms as well as other frequent population characteristics such as chronic illness. Implications for increasing reach to the often underserved population with a mental health condition are discussed.

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### INTRODUCTION

The 19% of adults in the U.S. who have a mental illness are over-represented among smokers.<sup>1</sup> Although the general smoking prevalence is 14%,<sup>2</sup> smoking prevalence among those who have a mental health condition (MHC) is 2–4 times this rate.<sup>3</sup> The population with MHC faces high rates of morbidity and mortality related to tobacco-related illnesses,<sup>4,5</sup> and those who smoke have more psychiatric symptoms, have increased psychiatric and general hospitalizations, and require higher dosages of psychotropic medications than

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the nonsmoking population with MHC.<sup>6–10</sup> The health-care sector has been slow to promote cessation services for this at-risk population even though 75% of people with an MHC desire to quit, 65% made a quit attempt in the past year, and cessation treatments are well tolerated and effective.<sup>8,11–14</sup> The population with MHC is able to quit smoking at significant rates when provided a treatment that meets the clinical guideline standard, including 3 or more counseling sessions and a full course of cessation pharmacotherapy.<sup>7,15,16</sup>

Quitlines are a widely available, evidence-based, tobacco cessation service. Quitlines generally offer some combination of brief telephonic counseling combined with cessation pharmacotherapy as well as online and texting platforms. The efficacy of quitlines for the general population is widely acknowledged,<sup>16–18</sup> but quitline vendors initially voiced concerns about serving people with MHCs, citing staff's lack of training, potential liability issues, and time burden. Quitlines further questioned whether the MHC population would utilize telephonic services,<sup>19</sup> but by 2009, quitlines were reporting that the prevalence of MHC among callers ranged from 19% to 50%.<sup>8,20–22</sup> An early study found that a quarter of callers reported current major depression alone.<sup>23</sup> An observational study of quitlines across 3 states found that 46% of respondents reported 1 or more MHCs, with the most common conditions being depression, anxiety, and bipolar disorder.<sup>24</sup> Another 6-state pilot program found that 58%–73% of callers reported an MHC history.<sup>25</sup> In response, the North American Quitline Consortium endorsed questions screening for MHCs and how MHCs might impact the ability to quit.<sup>26</sup> At least 90% of state quitlines are now utilizing optional Minimum Data Set (MDS) questions, and among these states, an average of 46% of callers report an MHC (North American Quitline Consortium, unpublished data, 2019).

Several studies have found 7-day abstinence rates for people with MHCs to be equivalent to general callers at the end of treatment and follow-up.<sup>20–22,24</sup> For callers to California Smokers' Helpline (N=844), those with depression attempted to quit smoking at the same rate as callers without depression ( $p=0.34$ ), and approximately 1 in 5 remained abstinent after 2 months.<sup>23</sup> Abstinence rates at 7-month follow-up for an observational study of quitline callers from Maryland, Nebraska, and North Carolina (N=3,132) were significantly lower for callers with an MHC than for callers without an MHC (22.0% vs 31.0%,  $p<0.001$ ).<sup>24</sup> Yet, another observational 6-state study (Idaho, Kentucky, Michigan, Montana, Ohio, and Pennsylvania; N=4,960) also found that abstinence rates for callers with an MHC were substantial but lower than abstinence rates for callers without an

MHC at 3-month (31% vs 43%,  $p<0.001$ ) and 6-month follow-up (29% vs 40%,  $p<0.001$ ). Quit rates were lowest for the subset of callers reporting that their MHC would hinder a quit attempt at 3-month (23% vs 34%,  $p<0.001$ ) and 6-month follow-up (24% vs 32%,  $p<0.001$ ).<sup>25</sup>

Questions remain regarding how quitlines might most effectively serve the population with MHC. All quitlines report that staff receive training to treat tobacco dependence in the population with MHC,<sup>27</sup> but the degree of training is variable.<sup>28</sup> There is expert consensus that smokers with MHCs often require more intense services, with longer duration of treatment, more frequent counseling, and higher doses and combinations of cessation medications.<sup>3,16,24</sup> Individuals with MHCs may also be more likely to quit when cognitive behavioral therapy, mood management skills, and motivational enhancement treatments are provided.<sup>29–31</sup>

This manuscript describes initial data for 2 large quitline vendors, Optum and National Jewish Health (NJH), which have initiated programming for the population with MHC. Optum is the quitline provider for 23 states and the District of Columbia; NJH is the quitline provider for 18 states. Feasibility, including available initial outcomes and participant characteristics, is described for these quitlines' 2 unique protocols.

## METHODS

Both NJH and Optum programs were internal quality improvement projects and IRB exempt.

### National Jewish Health Protocol

The NJH standard care (SC) protocol offered up to 5 scheduled coaching calls and nicotine-replacement therapy (NRT). All SC participants were eligible for at least 2 weeks of combination NRT or 4 weeks of monotherapy ordered during the first coaching call. Coaches had a minimum of a bachelor's-level education in human service–related fields. In response to the expert consensus that smokers with MHCs often require more intense services,<sup>3,16</sup> the SC protocol was adapted to incorporate discussion of MHCs into calls and provide 2 additional coaching sessions and a minimum of 8 weeks of combination NRT. The first 3 calls focused on self-monitoring mood, behavioral strategies to track and manage mood, and tobacco reduction to assist participants with stabilizing mood symptoms before quit attempts. Mood management was then reviewed on subsequent calls. The addition of mood management was based on promising evidence demonstrating approximately 40% increased cessation rates when mood management augments SC for individuals with depression.<sup>32,33</sup> All coaches received in-service protocol training at 1–2 months before program launch, including training from mental health clinicians on the impact of tobacco use on mental health and the rationale for incorporating mood management into cessation coaching.

The protocol was implemented with quitline callers in 8 states in 2017. Eligibility for the protocol included smokers self-reporting either depression or anxiety, with no MHC comorbidities

(including comorbid depression and anxiety) or medical conditions that required medical authorization to use NRT; who were not receiving active treatment for their MHC; and who were assessed as moderately to severely nicotine dependent on the Heaviness of Smoking Index.<sup>34</sup> Eligibility was restricted because limited evidence was available to guide adapting outpatient MHC interventions to telephone coaching. NJH sought to test the feasibility of the intervention while minimizing the number of confounding variables, including any potential impact of concurrent mental health treatment.

Protocol effectiveness was evaluated using an SC comparison group of callers with MHCs ( $n=1,125$ ) from a 6-month period (January–June 2017) before the MHC protocol launched. The same inclusion criteria were used for the SC group as were utilized for the MHC pilot group. Participants with MHC ( $n=594$ ) enrolled in quitline coaching over an 8-month period (November 2017–June 2018). The evaluation analysis was stratified by callers with depression or anxiety. Callers were not aware that a new MHC protocol had been implemented, and all callers who met the requirements were automatically enrolled. Coaches received ongoing supervision and bimonthly quality assessment using validated tools for Motivational Interviewing. The clinical director assessed protocol fidelity over the first month and then transitioned to random fidelity checks for the program duration. Outcomes included self-reported 30-day tobacco use, abstinence at 6 months, completed coaching calls, receipt of NRT, and satisfaction. An external evaluator conducted 6-month follow-ups.

### Optum Protocol

Optum launched its MHC program in 2017 as a quality improvement pilot for 1 state quitline; the program was implemented in 7 states in 2018. Optum's coaching staff must have a bachelor's degree on hire and go through a certified training course that includes classroom and supervised work before providing independent coaching. Coaches must complete an additional training to support those callers who enroll in the MHC program. This training was developed and led by Optum's clinical team. Coaches' calls are reviewed monthly for quality and fidelity to treatment protocols.

Using the optional MDS questions, callers self-reporting bipolar disorder or schizophrenia were automatically asked to enroll in the MHC program, whereas those with other MHCs were asked the additional MDS question: *Do you believe that your mental health condition will interfere with your ability to quit and/or stay quit?* Callers who answered *yes* or *I don't know* were also offered tailored programming. Optum SC participants received up to 4–5 coaching calls and, based on state-specific eligibility criteria, received 2–8 weeks of NRT. MHC program enrollees received an SC augmented by interventions from staff with enhanced MHC training. Coaches received training to flex their communication style to match/complement that of MHC callers. Those enrolled in the MHC program received up to 7 calls. Stress level was added as a mandatory assessment question for every call to ensure this topic was addressed. As possible, a letter was sent to participants' community providers to inform them about the program, tips for supporting their patients' quit attempts, and quitline contact information.

Combination NRT has been shown to be more effective than monotherapy<sup>35</sup> and was therefore chosen for use in the Optum

program. In addition, longer duration of use has been shown to be more effective than shorter duration.<sup>36</sup> The Optum MHC state programs offered up to 12 weeks of combination NRT to those without medical contraindications. On the basis of state funding, 3 states offered a 12-week NRT benefit, 3 offered 8 weeks, and 1 offered 2 weeks. Participants had the option to receive NRT patches only rather than combination NRT. The first 4-week NRT shipment was sent after the first call; the second and third shipments were sent after potential exclusions were reassessed. Analyses presented here focus on the 2 states that launched the Optum program before 2019 with up to 12 weeks of NRT ( $n=1,906$  with an opt-in rate of 84%).

## RESULTS

### National Jewish Health Outcomes

For the NJH program, demographic and tobacco-use characteristics did not differ significantly between SC participants and participants with MHC in either the depression or anxiety subgroups. Nearly all the depression subgroup (94%) had used tobacco for >10 years, and 50% reported having a chronic disease commonly associated with smoking. Most participants (80%) smoked >10 cigarettes per day, and 94% smoked within 30 minutes of waking. Similarly, participants who reported anxiety did not differ between protocols. Most participants (89%) with anxiety had used tobacco >10 years, and 38% had a chronic disease caused by smoking. A total of 80% smoked >10 cigarettes per day, and 94% smoked within 30 minutes of waking (Table 1).

For participants with depression, 68% enrolled in the standard motivational text message support program. For participants with anxiety, 72% enrolled in the text message support program. Significantly more participants in the group with anxiety MHC also enrolled in e-mail support than those in the SC group (59% vs 49%). Self-reported 30-day tobacco cessation rates did not significantly differ between the MHC and SC protocols for either the depression or anxiety groups. More participants in SC received NRT, but participants in the MHC pilot used NRT longer. This reflects the MHC protocol design that both initiated NRT during the second coaching call and provided at least 8 weeks of combination NRT. Overall, participants with MHC completed more coaching calls and completed calls in fewer weeks—a marker of participant engagement. For MHC, 85% of participants with depression and 89% with anxiety reported satisfaction with the protocol. Satisfaction data were not available for SC (Table 2).

### Optum Outcomes

Optum participants with MHC were more likely to report anxiety, substance abuse disorder, and multiple MHCs; less likely to be Caucasian; and more likely to

**Table 1.** Descriptive Characteristics of NJH Pilot MHC Protocol Study Participants

Characteristics	Group with depression		Group with anxiety	
	SC, n (%)	MHC, n (%)	SC, n (%)	MHC, n (%)
Total	547 (68)	254 (32)	578 (63)	340 (37)
Demographics				
Age, years, mean (SD)	52 (13)	53 (14)	46 (15)	46 (14)
Gender, % female	344 (63)	164 (65)	407 (70)	229 (67)
Hispanic	37 (7)	19 (7)	44 (8)	31 (9)
Race				
White	361 (69)	172 (72)	445 (82)	254 (81)
African American/Black	104 (20)	43 (18)	56 (10)	38 (12)
All others	60 (11)	23 (10)	40 (8)	23 (7)
LGBT	27 (5)	11 (5)	33 (6)	16 (5)
Education, high school, or less	323 (60)	134 (59)	325 (57)	180 (60)
Insurance				
Uninsured	71 (13)	31 (12)	112 (19)	53 (16)
Medicare	122 (22)	56 (22)	67 (12)	42 (12)
Medicaid	106 (19)	66 (26)	151 (26)	88 (26)
Commercial/Private	179 (33)	72 (28)	173 (30)	110 (32)
Refused/Did not answer	69 (13)	29 (11)	75 (13)	47 (14)
Tobacco-use characteristics				
Tobacco use for >10 years	516 (94)	235 (93)	515 (89)	299 (88)
Have chronic disease from tobacco	272 (50)	131 (52)	219 (38)	130 (38)
Live with tobacco user	205 (37)	91 (40)	225 (44)	118 (39)
Smoke >10 cigarettes per day	439 (80)	198 (78)	467 (81)	264 (78)
Smoke at <30 minutes of waking	516 (94)	239 (94)	538 (93)	322 (95)
Heaviness of smoking index, mean (SD)	3.7 (1.2)	3.7 (1.2)	3.6 (1.1)	3.5 (1.1)

Note: Differences between protocols are not statistically significant ( $p>0.05$ ). Participants enrolled in quitline services from Colorado, Massachusetts, Michigan, Nevada, Ohio, Pennsylvania, Vermont, and Wyoming.

LGBT, lesbian, gay, bisexual, transgender; MHC, mental health condition; NJH, National Jewish Health; SC, standard care.

**Table 2.** NJH MHC Pilot Program Engagement and Outcomes

Variable	Group with depression		Group with anxiety	
	SC, n (%)	MHC, n (%)	SC, n (%)	MHC, n (%)
Enrolled in texting program	368 (67)	173 (68)	416 (72)	249 (73)
Enrolled in e-mail program	250 (46)	125 (49)	284 (49)	<b>199 (59)</b>
Received NRT <sup>a</sup>	500 (91)	<b>122 (48)</b>	525 (91)	<b>155 (46)</b>
Weeks of NRT received, mean (SD)	4.5 (2)	<b>6.5 (2.9)</b>	4.5 (2)	<b>6.1 (2.6)</b>
Coaching calls completed, mean (SD)	1.8 (1.2)	<b>2.2 (1.5)</b>	1.7 (1.1)	<b>2.1 (1.5)</b>
Completed $\geq 3$ calls and received NRT	110 (20)	<b>74 (29)</b>	107 (19)	<b>88 (26)</b>
Total enrolled time, week, mean (SD)	27 (42)	<b>16 (22)</b>	22 (40)	<b>13 (20)</b>
Satisfied with program		71 (85)		88 (89)
Responded to evaluation survey	100 (18)	<b>90 (35)</b>	101 (17)	<b>100 (29)</b>
Intent to treat: 30-day PPA from all tobacco at 6 months	26 (5)	<b>22 (9)</b>	31 (5)	22 (6)
Responder: 30-day PPA from all tobacco at 6 months	26 (26)	22 (24)	31 (31)	22 (22)

Note: Boldface indicates statistical significance ( $p<0.05$ ).

<sup>a</sup>NRT was ordered during the first coaching call in the SC and second coaching call in the MHC protocol. Participants with MHC who completed only 1 coaching call were not eligible for NRT. Additional NRT was offered to participants with MHC.

MHC, mental health condition; NJH, National Jewish Health; NRT, nicotine-replacement therapy; PPA, point prevalence abstinence; SC, standard care.

have a high school degree or greater than that of participants in SC. The subgroup of callers who reported having schizophrenia or bipolar disorder smoked more cigarettes per day, although the difference did not appear meaningfully significant (20.8 vs 19.3 cigarettes per day). Among the callers who reported MHCs other than schizophrenia or bipolar, participants were less likely to be commercially insured (versus Medicaid-insured) and less likely to be heterosexual (Table 3).

Optum participants with MHC completed significantly more coaching calls on average, were more likely to receive NRT through the quitline, and were more likely to interact with the text messaging program than SC participants. Among those who reported schizophrenia or bipolar disorder, participants were also more likely to complete at least 1 coaching call but less likely to visit the program website (Table 4).

Cessation outcomes data are not yet available for Optum's MHC program from all the participating states. As previously reported, early cessation outcomes for the initial MHC pilot in Texas (N=311) demonstrated higher quit rates for pilot participants than for those with MHCs in SC, but findings were not significant owing to the small sample size and low-response rates.<sup>37</sup>

## DISCUSSION

Multiple studies have found that high numbers of people with an MHC enroll in and benefit by standard quitline interventions, but their levels of engagement and quit outcomes have been lower than those of persons without an MHC.<sup>25,38</sup> These are some of the first outcomes reported for quitline programming tailored to those with an MHC. Although full cessation results are not yet available, initial outcomes support the feasibility of MHC programs and suggest considerations for maximizing caller engagement.

Both NJH and Optum protocols offered more intense treatment than the standard quitline service, but the protocols differed substantially. The NJH protocol only included the callers with depression or anxiety not reporting other medical or MHC comorbidities, who were not actively being treated for an MHC, and who were heavy daily smokers. These individuals were enrolled automatically. Optum included callers with a range of MHCs, including schizophrenia and bipolar disorder; callers with comorbidities; those receiving MHC treatment; and light smokers. Callers meeting inclusion criteria were asked to opt into the program. Optum offered up to 7 coaching calls and 12 weeks of combination NRT, whereas the NJH study offered additional calls and up to 8 weeks of NRT.

Regardless of protocol differences, both MHC programs found that participants completed more coaching calls and received longer durations of NRT. Participants also engaged in text and e-mail messaging. As a result, these MHC protocols increased access to tobacco treatment for a population that tends to have lower service reach and engagement. Although initial outcomes for both programs found trends indicating that MHC protocols outperform that of SC, the sample sizes lacked sufficient statistical power to reach significance.

The high interest in quitting among smokers presents an opportunity to encourage more smokers to utilize proven services.<sup>39</sup> Currently, far too few smokers, only 1% each year, use quitline interventions (North American Quitline Consortium, unpublished data, 2018). Increasing engagement among those disparately affected by tobacco use is as important as increasing comparative abstinence rates. In this respect, the MHC programs demonstrated encouraging levels of engagement. It further may be advantageous to focus protocol enhancements on callers with an MHC who also have chronic medical conditions and are younger; female; White, non-Hispanic; Medicaid-insured; less educated; more nicotine dependent; or included in other health disparity groups (e.g., lesbian, gay, bisexual, transgender, and questioning; criminal justice populations).<sup>24,25,38,40–42</sup> Tailored programming that addresses multiple health disparity characteristics may lead to heightened treatment engagement and effectiveness.

Quitting can also be paired with additional behavioral interventions, such as treatment for depression, that people with MHCs may readily accept. One of the MHC protocols directly addressed mood management, which may have led to high treatment engagement among participants reporting depression. By attending to callers' frequent desire to address negative moods, sleep, nutrition, stress management, and substance use, quitlines might further engage individuals with MHCs.<sup>9,43</sup> Self-efficacy and confidence in these areas may help callers more successfully quit smoking. For instance, in community-based settings, cotreatment of tobacco use and other substance use disorders has been shown to be effective.<sup>44,45</sup> Quitlines might similarly engage callers with MHC with cotreatment protocols addressing tobacco concurrently with alcohol and other drugs.

As states consider tailoring to the population with MHC, there are a number of considerations. The costs of extended counseling and pharmacotherapy must be balanced by potential gains. Although there is mounting evidence that greater access to extended NRT, combination pharmacotherapy, and offering varenicline and bupropion all lead to greater abstinence rates,<sup>46,47</sup> MHC

**Table 3.** Baseline Characteristics of Optum Participants with MHC and Optum SC Participants by Condition Type, Collected at Enrollment

Baseline characteristic	Reported other MHC(s)			
	SC,% (n/N)	MHC,% (n/N)	SC,% (n/N)	MHC,% (n/N)
MHC <sup>a</sup>				
Bipolar disorder	85.0 (623/733)	86.7 (1,036/1,195)	0.0 (0/1,694)	0.0 (0/711)
Schizophrenia	31.4 (230/733)	30.5 (365/1,195)	0.0 (0/1,694)	0.0 (0/711)
Depression	67.8 (497/733)	70.5 (843/1,195)	<b>69.5*</b> (1,177/1,694)	<b>74.5*</b> (530/711)
Anxiety disorder	58.1 (426/733)	58.1 (694/1,195)	<b>55.7**</b> (944/1,694)	<b>65.4**</b> (465/711)
Post-traumatic stress disorder	33.8 (248/733)	37.2 (444/1,195)	18.9 (321/1,694)	22.4 (159/711)
Substance abuse disorder	<b>12.1**</b> (89/733)	<b>25.3**</b> (302/1,195)	<b>10.7**</b> (181/1,694)	<b>17.3**</b> (123/711)
Attention deficit hyperactivity disorder	18.4 (135/733)	20.5 (245/1,195)	13.6 (231/1,694)	12.0 (85/711)
≥2 conditions (any)	<b>85.5*</b> (627/733)	<b>89.2*</b> (1,066/1,195)	<b>48.8**</b> (827/1,694)	<b>62.6**</b> (445/711)
Bipolar/schizophrenia + other condition (s)	<b>83.8*</b> (614/733)	<b>87.3*</b> (1,043/1,195)	0.0 (0/1,694)	0.0 (0/711)
Female gender	71.8 (526/733)	68.8 (822/1,195)	69.5 (1,178/1,694)	72.9 (518/711)
Age, years, mean ± SD (N)	47.7 ± 12.5 (733)	48.7 ± 12.4 (1,195)	49.3 ± 13.4 (1,694)	50.0 ± 13.5 (711)
Caucasian race (versus other races)	<b>69.4**</b> (490/706)	<b>60.2**</b> (693/1,151)	<b>75.9**</b> (1,260/1,660)	<b>66.3**</b> (450/679)
Education, HS degree or greater (versus GED or <HS)	<b>66.5*</b> (461/693)	<b>72.0*</b> (837/1,163)	<b>68.8**</b> (1,127/1,637)	<b>75.8**</b> (522/689)
Health insurance status				
Commercial/Private insurance	9.1 (65/715)	6.5 (71/1,091)	<b>18.0*</b> (296/1,642)	<b>12.7*</b> (77/607)
Medicaid	34.4 (246/715)	32.8 (358/1,091)	<b>25.3*</b> (415/1,642)	<b>29.2*</b> (177/607)
Medicare	27.8 (199/715)	29.7 (324/1,091)	<b>22.2*</b> (365/1,642)	<b>23.2*</b> (141/607)
Uninsured	28.7 (205/715)	31.0 (338/1,091)	<b>34.5*</b> (566/1,642)	<b>34.9*</b> (212/607)
Sexual orientation, <sup>b</sup> heterosexual (versus other orientations)	94.5 (121/128)	93.4 (156/167)	<b>94.3**</b> (217/230)	<b>81.3**</b> (87/107)
Tobacco history at enrollment				
Smoke daily <sup>b</sup>	91.5 (509/556)	91.8 (816/889)	93.2 (1,292/1,387)	93.3 (516/553)
Smoke within 5 minutes of waking	60.6 (343/566)	60.0 (655/1,091)	51.3 (715/1,395)	47.7 (317/665)
Mean cigarettes per day ± SD (N)	<b>19.3 ± 13.0*</b> (579)	<b>20.8 ± 13.9*</b> (1,013)	18.9 ± 11.2 (1,410)	19.0 ± 11.0 (641)
Multiple tobacco types	6.9 (50/727)	6.0 (72/1,191)	6.1 (103/1,684)	6.0 (43/711)
Other tobacco users at home	50.3 (284/565)	46.3 (463/1,001)	49.0 (637/1,299)	46.0 (270/587)

Note: Boldface indicates statistical significance, and asterisks designate multiple *p*-value limits (\**p*<0.05 \*\**p*<0.001). Responses of *refused*, *don't know*, and *not collected* are excluded from characteristics analyses. Analysis is limited to the 2 state quitlines offering the full 12-week NRT benefit to participants with MHC. Subgroups with MHC include participants enrolled from program launch dates (State 1: October 16, 2017; State 2: November 1, 2017) through June 30, 2019. SC subgroups include participants enrolled during the 6 months before MHC launch. N stands for group denominator, whereas *n* stands for number of respondents.

<sup>a</sup>Multiple conditions reported; results might not add up to 100%.

<sup>b</sup>Data were not available for 1 of the 2 state quitlines included.

HS, high school; MHC, mental health condition; NRT, nicotine-replacement therapy; SC, standard care.

**Table 4.** Program Engagement Among Optum Participants with MHC and Optum SC Participants by Condition Type, Captured Over the First 5 Months of Enrollment

Program engagement metric	Reported other MHC(s)			
	SC(available NRT benefit varied),% (n/N)	MHC(12-week NRT benefit available),% (n/N)	SC(available NRT benefit varied),% (n/N)	MHC(12-week NRT benefit available),% (n/N)
Call completion				
Completed at least 1 coaching call	<b>88.8*</b> (651/733)	<b>93.1*</b> (818/879)	84.0 (1,423/1,694)	86.9 (398/458)
Mean call completion $\pm$ SD (N) <sup>a</sup>	<b>2.01 <math>\pm</math> 1.68**</b> (651)	<b>3.42 <math>\pm</math> 2.55**</b> (818)	<b>1.71 <math>\pm</math> 1.20**</b> (1,423)	<b>2.88 <math>\pm</math> 2.18**</b> (398)
NRT shipments				
Shipped NRT through quitline	<b>55.0**</b> (403/733)	<b>86.6**</b> (761/879)	<b>56.7**</b> (960/1,694)	<b>77.3**</b> (354/458)
1 shipment	55.0 (403/733)	44.8 (394/879)	56.5 (957/1,694)	44.8 (205/458)
2 shipments	0.0 (0/733)	21.8 (192/879)	0.2 (3/1,694)	19.7 (90/458)
3 shipments	0.0 (0/733)	19.9 (175/879)	0.0 (0/1,694)	12.9 (59/458)
Text messaging				
Sent 1 + Text2Quit key words	<b>17.9**</b> (131/733)	<b>34.6**</b> (304/879)	<b>22.4**</b> (379/1,694)	<b>44.5**</b> (204/458)
Mean Text2Quit key words $\pm$ SD (N) <sup>a</sup>	11.35 $\pm$ 11.28 (131)	14.67 $\pm$ 22.67 (304)	12.05 $\pm$ 17.59 (379)	11.86 $\pm$ 17.02 (204)
Online engagement				
Logged into Web Coach/Portal	<b>32.1*</b> (235/733)	<b>27.1*</b> (238/879)	33.9 (575/1,694)	30.6 (140/458)
Mean Web Coach /Portal login days $\pm$ SD (N) <sup>a</sup>	4.37 $\pm$ 6.65 (235)	3.80 $\pm$ 4.31 (238)	4.90 $\pm$ 7.10 (575)	5.09 $\pm$ 7.06 (140)

Note: Boldface indicates statistical significance, and asterisks designate multiple *p*-value limits (\**p*<0.05

\*\**p*<0.001). Analysis is limited to the 2 state quitlines offering the full 12-week NRT benefit to participants with MHC. Subgroups with MHC include participants enrolled from program launch dates (State 1: October 16, 2017; State 2: November 1, 2017) through January 31, 2019. SC subgroups include participants enrolled during the 6 months before MHC launch. Engagement data are limited to program interactions completed within the first 5 months of a participant's enrollment. Data show enrollment timeframe cut off on January 31, 2019, to allow participants adequate time to engage with the program. N stands for group denominator, whereas *n* stands for number of respondents.

<sup>a</sup>Mean  $\pm$  SD call completion, Text2Quit key words, and Web Coach/Portal login days reported among those who completed a call, sent a key word, or logged into Web Coach/Portal.

MHC, mental health condition; NRT, nicotine-replacement therapy; SC, standard care.

protocols take time and resources to develop, and staff require additional training. Moreover, multiple iterations of MHC protocols may be necessary to demonstrate sustained outcomes. Low reach also continues to be an issue. National initiatives such as the National Behavioral Health Network for Tobacco and Cancer Control are increasing the visibility of the population with MHC and cessation resources,<sup>48</sup> but there is still a need for state and local champions to extend this agenda. In addition, some callers with MHCs and other health disparities may not trust quitline services.<sup>49</sup> This suggests a need to utilize community partnerships to grow the credibility of quitlines and demystify telephonic services.

### Limitations

The 2 MHC programs had several limitations. First, low-response rates to follow-up surveys and small

sample sizes limited statistical power for quit rate analyses. Future studies would allow for appropriate comparisons by achieving a minimum sample size of 400 completed outcomes surveys to achieve 95% confidence and 4.5% precision in outcomes estimates.<sup>50</sup> Second, eligibility criteria for inclusion in the study and analyses could not be applied consistently to both the MHC protocols and SC comparison groups. In addition, the strict eligibility criteria applied at times (e.g., callers reporting only depression or anxiety, which are commonly comorbid in real-world settings; callers not receiving any MHC treatment; callers reporting smoking  $\geq$ 10 cigarettes per day) limit the generalizability of results. The variations in the protocols additionally limited direct comparisons between the studies. Optimally, future studies would also have biologically verified quit outcomes.

## CONCLUSIONS

Effective treatment strategies for the population with MHC are critical to achieving equity in quit outcomes compared with the population without MHCs. Up to half of those diagnosed with schizophrenia, bipolar disorder, or major depressive disorder will die from tobacco-related illnesses.<sup>51</sup> This is a social justice issue because the majority of people with an MHC who smoke wish to quit but often do not have access to or are not encouraged to utilize cessation services. Outcomes for tailored MHC quitline programming are encouraging, but more study is needed regarding how to maximize effectiveness. Given that about half of the quitline callers report 1 or more MHCs, quitlines present an opportunity to assist smokers who might not otherwise seek community-based cessation services.

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