Recommended Best and Promising Practices on Technology-Mediated Services for Quitlines

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This report contains recommendations for Quitlines on technology-mediated services that are based on best and promising practices and effective for improving reach, engagement, and outcomes.

Background

Quitlines are expanding cessation services beyond the traditional phone to include digital options such as text, Web, and Apps to stay current, meet their target audience needs on preferred platforms, and ultimately maximize reach and efficacy. Consistent with NAQC's strategic vision for 2025, there is support for positioning Quitlines as the hub of cessation services with scalable, evidence-based, and research-informed treatment options. Quitlines acknowledge that while direct calls remain the most common source of entry, expansion with integrated technologies is necessary to evolve with the times and consider new approaches to expanding reach, engagement, and efficacy.

Goals of the Learning Community

The North American Quitline Consortium (NAQC) began a Learning Community project to assess Quitline practices on technology-mediated services with the ultimate goal of identifying best and promising practice recommendations. NAQC published a Brief in 2020 as a foundational resource as the Learning Community was launched that includes a review of the literature and practice of Quitlines on the utilization of technology-mediated services. Subsequently, NAQC hosted two Learning Community meetings in 2021 focused on research findings and innovative Quitline practices to consider key questions and recommend the next steps. These structured forums were designed to offer learnings from expert panelists, respondents, and researchers who provided presentations, dialogues, breakout sessions, and feedback on best and promising practices on technology-mediated services and their feasibility in real-world settings.

Intended Audience for this Report

This NAQC report is designed for all Consortium members and the community interested in expanding their knowledge of technology-mediated services within Quitline environments. These include:

Funders: State entities who fund Quitline services
Service Providers: The operators of Quitlines who develop and deliver services
Researchers: Those who advance the evidence base and evaluate Quitlines
National Organizations: The federal agencies, foundations, and non-profit organizations that support Quitlines and help advance their practice.

This report presents recommendations to the field on expanding traditional Quitline services towards multimodal service delivery that includes cost-effective technology-mediated options such as text messaging programs, Web-based services, and mobile Apps. It is organized as follows:

- Glossary of terms
- Common examples of modalities (Table 1)
- Definition and criteria for levels of evidence
- Recommendations
- Supporting evidence and rationale for the recommendations (Table 2)
- Moving forward
- Acknowledgments
- References

Glossary of Terms

Modalities: The types of technology-mediated services described in this report include text messaging, Web-based services, and mobile Apps.

> **Text Messaging:** Brief electronic messages sent to mobile phones. They may follow either the Short Message Service (*SMS*) standard, which allows up to 160 characters of text, or the multimedia message service (*MMS*) standard, which allows more than 160 characters of text, as well as images, video, and audio (NAQC, 2016). They are considered 'one-way' when they are sent in one direction and do not have the capacity for a response. They are considered 'interactive' when messages may be sent in both directions. Examples of this may include text messaging between a Quitline participant and counselor, or an automated text messaging program asking questions of a participant and a participant responding via text, or on-demand features where a participant texts a keyword to the automated text messaging program and receives messages based on the keyword. They are 'tailored' when they are personalized based on unique qualities or needs of the participant around timing, frequency, etc.
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> **Web-based Services:** Internet-based communications such as Webpages or Websites with resources (e.g., documents, links, images, videos), and interactive communication tools (e.g., self-help, interactive counseling, and chat, internet forums, chat rooms, online courses, or social media) (NAQC, 2016).
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> **Mobile Apps**: Software applications that can be downloaded to a smartphone or tablet from a distribution platform such as the Apple App Store or Google Play. Once downloaded, they can be used without an internet connection, though some features may be fully functional only while online (NAQC, 2016).

Purposes: The multiple uses for the technology-mediated services identified as outreach, enrollment, engagement, intervention, and evaluation.

> **Outreach:** Proactively promoting Quitline services through phone, text, Web, or Apps for the purpose of improving reach and Quitline enrollment of diverse populations of individuals.
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> **Enrollment:** The use of phone, text, Web, or Apps for the purpose of enrolling or being enrolled into Quitline services.
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> **Engagement:** The action of interacting with participants enrolled in Quitline services through phone, text, Web, or Apps for the purpose of understanding and responding to their unique

needs and interests while promoting active and sustained involvement.

Intervention: The action or process of intervening with Quitline participants through phone, text, Web, or Apps for the purpose of achieving defined program outcomes.

Evaluation: The use of text, Web, or Apps for the purpose of promoting a survey link and reminding participants about upcoming evaluations of services utilized through a Quitline. This may also involve using text, Web, or Apps for the purpose of administering evaluations directly for rapid feedback in a Quitline setting.

State Quitlines: State Quitlines are a partnership between a funder (which is generally a state health department or other state agency) and an operator (which provides the service) that aims to help tobacco users quit by providing information, counseling, and mediation services.

TCPA Telephone Consumer Protection Act (TCPA): The Telephone Consumer Protection Act of 1991 was passed by the United States Congress in 1991 and signed into law by President George H. W. Bush as Public Law 102-243. The TCPA restricts telephone solicitations and the use of automated telephone equipment. The TCPA limits the use of automatic dialing systems, artificial or prerecorded voice messages, SMS text messages, and fax machines. Compliance with these standards has relevance for Quitlines who are required to obtain consent from participants before sending text messages.

Common Examples of Modalities

Table 1: Common Examples of Modalities of Text, Web, and Apps by Purpose in Quitlines

Purpose	Text	Web	Apps
Outreach	promote priority messages, access to care, provider referrals	mobile-friendly Websites, description of choice options	referrals, marketing, and media campaigns
Enrollment	text enrollment (obtaining prior consent per TCPA[1] standards)	online enrollment options; online ordering of NRT[2]	fast and seamless App log-on features
Intervention	interactive, tailored, immediate and continued texting based on motivation, readiness, dependence, and confidence levels, quit date, etc.	interactive, personalized, and tailored, targeted Web content (e.g., tools, videos, quit plans, journeys, quizzes, self-help, calculators, etc.),	personalized, interactive features, (e.g., chat messaging, virtual counseling, meditations, mood trackers, etc.)
Engagement	programmatic reminders, NRT[2] shipment, texting support between calls promoting compliance to behavioral regimens, building motivation, confidence, and skills	reminders, interactive tools for self-activation, building motivation, skill-building in between coaching sessions, social support through chat rooms, discussion forums	interactive, real-time features with a care team (e.g., coach, counselor, provider, psychiatrist, etc.) craving management tools, local data storage
Evaluation	message reminders with links to promote surveys	embedded links to promote and/or complete surveys	performance feedback, embedded surveys

[1] **TCPA: Telephone Consumer Protection Act**
[2] **NRT Nicotine Replacement Therapy**

Definitions and Criteria for Levels of Evidence

To assess the levels of evidence for the recommendations for each mode of technology and associated purpose (i.e., intervention, outreach, enrollment, engagement, or evaluation), NAQC has adopted criteria for Quitline services presented by Anderson (2016) for best and promising practices, and insufficient evidence to recommend.

A. Best Practices

- Research-validated practices whose efficacy has been demonstrated as effective based on results of established meta-analytic reviews such as Cochrane Reviews
- Field-tested practices that have a compelling rationale from widespread practice and success

B. Promising Practices

- Practices that have one or more limited examples of success in the research literature or Quitline practice

C. Insufficient to Recommend

- Practices that lack strong examples and consistent findings assessing efficacy within the literature and/or Quitline practice

Recommendations for Technology-Mediated Quitline Services

Texting Services

Recommendation 1: All Quitlines should offer at least one or more tailored and/or interactive texting service(s) as a standalone intervention or adjunct to other smoking cessation interventions by June 30, 2022.

Level of evidence: Interactive and/or tailored text messaging interventions in a Quitline setting are a research-validated best practice.

Notes and Suggestions: This recommendation may be implemented using texting services developed by Quitline service providers or external vendors or by leveraging Federal programs with free text-messaging services. Services should be closely based on interventions proven effective and include content scheduled at relapse sensitive intervals around a quit date, frequently sent, extended duration, and be interactive and tailored (NAQC, 2016). A demonstrated impact from texting services is more likely when other cessation support services are minimally utilized (Whittaker, et al., 2019). Additionally, Quitlines should follow the Telephone Consumer Protection Act (1991) compliance regulations around providing consent to receive a text message.

Recommendation 2: All Quitlines should offer at least one or more tailored and/or interactive texting service(s) for the purpose of improving outreach, enrollment, and/or engagement by June 30, 2023.

Level of evidence: Interactive and/or tailored text messaging programs for the purpose of outreach, enrollment, or engagement in a Quitline setting are a promising practice.

Notes *and Suggestions:* Although presently there is not aggregated Quitline data on texting for outreach, enrollment, and engagement, we learned they are being applied in Quitline settings. Texting is used to reinforce priority messaging, support from healthcare professionals, and access to health plan cessation benefits. It also provides an opportunity to expand reach to teens, young adults, and

other populations who prefer to text than call. Some Quitlines offer direct text enrollment for youth and young adults and are exploring creative ways to obtain consent. Reminders keep the participant connected to the program, on track, informed with NRT shipment notifications, and adhering to behavioral regimens between calls. Texting may also promote self-activation, where participants are actively involved in their quit.

Web-Based Services

Recommendation 1: All Quitlines should offer at least one or more interactive and/or tailored Web-based service(s) as a standalone intervention or adjunct to other smoking cessation interventions by June 30, 2022.

Level of evidence: A Web-based intervention that is interactive and tailored is a research-validated best practice.

Notes and Suggestions: This recommendation can be implemented using Web-based services developed by Quitline service providers or external vendors.

Recommendation 2: All Quitlines should offer at least one or more interactive and tailored Web-based service(s) for the purposes of improving outreach, enrollment, and/or engagement by June 30, 2023.

Level of evidence: Interactive and tailored Web-based programs for the purpose of outreach, enrollment, or engagement is a promising practice.

Notes and Suggestions: Although presently there is not aggregated Quitline data on Web services for outreach, enrollment, and engagement, we learned they are being applied in the field. Regarding outreach, service providers are reaching more diverse audiences who appreciate having a variety of choices that meet their unique learning needs (e.g., interactive education through rich media like video, audio, quizzes, libraries, trackers, etc.). By offering online enrollment options participants get to choose their communication preferences. This has the potential to reach younger tobacco users who prefer not to call. Providing real-time chat features, online community forums, and interactive education offers timely responses to build motivation, confidence, and engagement.

Recommendations Currently Not Possible

Currently, there is insufficient evidence in the literature and Quitline practice for providing recommendations on the following:

- Offering text messaging or Web-based programs in the Quitline setting for the purpose of promoting or reminding about upcoming evaluations or administering evaluations directly
- Utilizing Apps for any purpose in the Quitline setting

Although literature exists on these topics it is not yet sufficient to qualify as a best or promising practice. While recommendations are not provided due to a lack of strong evidence, NAQC does not discourage Quitlines from exploring the use of these modalities. NAQC will monitor the literature and update the recommendations on technology-mediated services for Quitlines as new evidence becomes available.

Supporting Evidence and Rationale for the Recommendations

Table 2 provides detailed research to support NAQC's technology-mediated services recommendations. Current adoption by Quitlines of the type of service is also included when available. Whereas the use of technology by Quitlines is emerging, much of the research on technology-mediated services are drawn from health delivery settings external to Quitlines in which no other cessation services or only minimal support is offered.

Table 2 is designed to be a quick, 'at a glance' summary that guides the reader through the rationale for recommendations. You will find that it starts with everything on texting, Web, and Apps services and includes summaries of research and practice findings found to be most applicable to using those technologies in Quitline settings.

The categories not only consist of the modality and percentage of adoption among Quitlines but also demonstrate the various purposes these technologies are being used for in addition to interventions, such as outreach, enrollment, engagement, and evaluation. While they do not have the highest levels of evidence associated with them as you see with interventions, we chose to include them even though they are not part of a randomized clinical trial. These modalities have purposes beyond a cessation intervention and are being recognized as a means of increasing reach, enrollment, engagement, and the promotion of evaluations in Quitline settings.

Table 2: Quitline Technology-mediated Services: Modality, Purpose, Findings, and Adoption

Modality	Purpose	Text Research and Practice Findings	Adoption (2020 Annual Survey)
Text		Overall, research findings show strong evidence that interactive and/or tailored text-message-based interventions improve smoking cessation rates when delivered on their own or as an adjunct to other treatments. Text messaging may also be effective for outreach, enrollment, and engagement purposes. Based on practice in a Quitline environment, texting as an interactive and/or tailored intervention is effective as a stand-alone service or as an adjunct to telephone service. In practice settings, Quitlines have used texting for the purposes of outreach, enrollment, intervention, engagement, and promoting evaluations. Participants who are already seeking assistance through the phone may be willing to extend their care to also include texting, especially if services remain personalized and interactive. Also, participants not willing to make a call may be willing to text instead.	
Text	Intervention	The 2019 Cochrane Review (Whittaker et al., 2019) found moderate certainty evidence that interactive and/or tailored text messaging interventions are more effective than minimal smoking cessation support. Interactive and/or tailored text messaging added to other smoking cessation interventions also appeared more effective than the other smoking cessation interventions alone.	84.6% of Quitlines offer interactive text-messaging

Text	Intervention	Also, in this Cochrane Review (Whittaker et al., 2019), Bock et al. (2013) examined the efficacy of a tailored texting smoking cessation intervention program based on an individual's stage of readiness and learned that text-based interventions can be successfully implemented with a diverse group of adult smokers at unique stages of readiness. A study by Naughton et al., (2014), included in the 2017 Cochrane Review (Taylor et al., 2017) assessed the short-term effectiveness of tailored Web and text-based facilitation of smoking cessation in primary care. While observing no evidence of a short-term benefit, longer-term abstinence at 6 months was statistically higher among participants receiving tailored print and short message service (SMS) text message self-help delivered as an adjunct to cessation support in primary care. Findings showed this support was acceptable to most participants and was feasible to deliver within the context of a primary care consultation. These learnings could have implications for Quitlines who also pair texting services with cessation support or utilize texting referrals to enhance reach. Cobos-Campos et al, (2017) conducted a randomized trial researching the effectiveness of text messaging as an adjuvant to health advice in smoking cessation programs in primary care. They concluded the combined program was effective for smoking cessation and it was included in the 2019 Cochrane Review (Whittaker et al., 2019). Similarly, Vidrine et al. (2019) learned that text messaging needs to be tailored and paired with phone counseling for increased effectiveness. They observed higher cessation rates among participants assigned to tailored, interactive text messages and proactive counseling compared to a lower intensity intervention of nicotine patches and a passive referral to a Quitline. The Surgeon General's findings reveal evidence is sufficient to infer that short message services (SMS) for cessation are independently effective in increasing smoking cessation, particularly if they are interactive or tailored to individual text responses. The Community Preventive Services Task Force (CPSTF) recommends mobile phone text messaging interventions for tobacco smoking cessation to increase the number of adults who successfully quit (Guide to Community Preventive Services (2020)). Evidence shows a meaningful increase in the number of adults who successfully quit smoking, six or more months following intervention (Whittaker et al., 2019) This finding applies to a range of intervention characteristics that include text messaging either being implemented alone or with other interventions including counseling, Web-based materials or email messages, nicotine replacement therapy, printed materials, or a mobile phone App. Scott-Sheldon et al., (2016) provided a meta-analysis demonstrating support for the efficacy of text messaging interventions. Most text-messaging interventions were targeted to the sample and tailored to the recipient (i.e.,	84.6% of Quitlines offer interactive text-messaging

Text	Intervention	quit date). They often provided personalized feedback on smoking behaviors, encouraged participants to set quit goals or make plans to reduce smoking, addressed self-efficacy goals, and provided self-management skills training. Participants were often encouraged to use social support and recommended pharmacological interventions to aid in their smoking cessation. These meta-analytic reviews could offer guidance for Quitline text-messaging interventions to explore for whom and under what circumstances text-messaging interventions are optimized based on the duration of effects. Research also exists around using text messaging as a post-intervention supplement. Armanasco et al's (2017) meta-analysis studied the impact of text messaging being used to maintain behavior change after the intervention ends. This provides preliminary evidence that small, sustained intervention effects are possible, which has implications for Quitlines providing services around relapse prevention. Boal et al., (2016) examined the role of text messaging in combination with comprehensive Quitline services including multi-call phone counseling, access to an interactive website, and nicotine replacement therapy. Similar rates of 7-day abstinence were reported regardless of whether participants received combined multi-call Quitline services plus text messaging or multi-call Quitline services in isolation. These results are helpful to understand the impact of combining Quitline and text messaging services on smoking outcomes. Spears et al. (2019) recognized the importance of including populations of concern when designing interventions and created a text message intervention for low SES African American smokers. They learned through focus groups that text messages should be personalized, interactive, provide strategies for coping with cravings and recovering from smoking lapses, involve relatively short to the point messages, and include pictures. These learnings reinforce the value in Quitlines tailoring text messages to the needs of unique groups. Mays et al., (2021) provided an example of an effective tailored mobile text messaging intervention for Waterpipe Tobacco Cessation in young adults that resulted in higher 6-month cessation rates. These learnings are beneficial for Quitlines to incorporate into their existing efforts to personalize messages uniquely to groups more challenging to reach, like young adults. As part of the 2019 Cochrane Review (Whittaker et. al., 2019), Abroms et. al., (2017) recognized the need for innovation in both the enrollment of pregnant smokers in smoking cessation treatment programs and the types of treatment offered. They capitalized on pregnant women already enrolled in a health text messaging program and investigated whether an interactive and intensive text message program called Quit4baby can promote smoking cessation for pregnant women. Recruitment text messages were sent to Text4baby subscribers. Results provide limited support of the efficacy of the	84.6% of Quitlines offer interactive text-messaging

Text	Intervention	Quit4baby text messaging program in the short term and late in pregnancy, but not in the postpartum period. Graham et al., (2021) also completed a randomized controlled trial and found that Web services alone were just as effective for abstinence rates as a combined Internet and text message intervention for smoking cessation among adult current smokers in the U.S. There also was evidence of higher levels of intervention engagement and satisfaction at 3 months among the combined group.	84.6% of Quitlines offer interactive text-messaging
Text	Outreach	The 2017 Cochrane Review (Taylor et al., 2017) also included Marcano Belisario et al., (2017) who studied Interventions for recruiting smokers into cessation programs, as part of outreach. Their tailored text messaging attempts to recruit were more effective than generic reminders. Also, adding a text message reminder or real quotes from participants to a personal phone call improved the recruitment of participants. Findings suggest elements to improve recruitment of smokers into cessation programs include personally tailored interventions, recruitment methods proactive in nature, and more intensive recruitment strategies. Abroms et al., (2021) studied automated text messaging as an outreach tool to increase the reach of smoking cessation treatment. One of the text interventions was aimed at connecting smokers to Quitline phone counseling via text message and the other was aimed at connecting smokers to a smoking cessation text messaging program They investigated the effects of outreach on rates of opting in and successful treatment delivery. Outreach text messages were found to have moderately high uptake, with most participants opting into their tobacco treatment program and younger and female participants more likely to opt-in. The majority found it helpful for quitting smoking and would recommend the program to a friend. Receipt of the treatment program also differed significantly, with 67.5% receiving the texting program and 27.5% receiving the phone counseling. In conclusion, outreach text messages were found to have a moderately high reach among Medicaid smokers. Amato et al., (2020) studied the integration of digital behavior change interventions within an EHR system. This implementation study is still completing their analyses and speaks to Quitlines possibly being able to leverage EHRs to identify at-risk patients and increase the reach of digital interventions through proactive electronic outreach. It also provides a novel approach that may increase the number of individuals who engage with evidence-based treatment. Krebs et al., (2020) examined the feasibility and effectiveness of Text2Connect that uses text messages to offer proactive connection to the New York State Smokers Quitline and had notable response rates. Results indicate that simple self-efficacy-focused messaging is most effective at	No Annual Survey data is available

Text	Outreach	supporting response rates. This research relates to the value of using texting in Quitline environments as a form of promotional outreach.	No Annual Survey data is available
Text	Enrollment	Christofferson et al., (2021) investigated a smoking cessation mobile health program called SmokefreeVET in a real-world veterans' health care setting and helped enroll a different segment of their smoking population, which was female and younger than they typically enroll. Nearly half of them combined the use of the text program with smoking cessation medication and the majority went on to complete a full six weeks of the program. These interventions have implications for Quitlines who also serve similar priority populations and are trying to reach and enroll younger populations, including female veterans who demonstrated a preference for texting versus telephone services.	No Annual Survey data is available
Text	Engagement	Graham (2016) optimized text messaging through the aspects of personalization, integration, dynamic tailoring, and message intensity to improve adherence to web-based smoking cessation treatment. This highlights key components that can be helpful to consider when trying to strengthen engagement with Web-based services using texting. Regarding targeting youth for engagement in text messaging, Graham et al., (2020) determined that young people can be easily engaged inaccessible, anonymous, digital, platforms like text messaging, promoted through social media to quit E-cigarettes.	No Annual Survey data is available
Text	Evaluation	While the research was not identified in Quitline settings around texting used to administer evaluations directly, service providers report using text messaging as reminders for participants to complete 7-month surveys (Practice Brief, 2020).	No Annual Survey data is available

Modality	Purpose	Web Research and Practice Findings	Adoption (2020 Annual Survey)
Web		Overall, research findings show strong evidence that Web services are effective in providing interactive and tailored interventions. Some research evidence exists that Web-services are effective for providing enrollment, engagement, and outreach. Based on practice in a Quitline environment, Web services as an interactive or tailored intervention are effective as a stand-alone service or as an adjunct to telephone services. In practice settings, Quitlines have used Web-based services with good results, for the purpose of outreach, enrollment, intervention, engagement, and as	

Web		reminders to encourage participants to complete evaluations or obtain real-time feedback. Participants who are already seeking assistance through the phone may be willing to extend their care to also include Web services, especially if services remain interactive and tailored. Also, participants not willing to make a call may be willing to access the Web instead.	
Web	Intervention	The evidence from trials with adults from the 2017 Cochrane Review (Taylor et al., 2017) suggests that interactive and tailored Internet-based interventions with or without additional behavioral support are moderately more effective than usual care or self-help at six months or longer. Still, there was no evidence that these interventions were better than other active smoking treatments. Treatment effectiveness in younger people is unknown. Siemer et al., (2020) researched the user experience of a blended face-to-face and Web-based smoking cessation intervention. They learned that face-to-face sessions compensated for the weakness of the Web sessions but not vice versa. Therefore, knowing that Web sessions were supported by the strengths of a face-to-face session could be useful to entice participants entering solely through the Web, to consider enhancing their experience through face-to-face services. The Surgeon General's Report indicates the evidence is sufficient to infer that Web or Internet-based interventions increase smoking cessation and can be more effective when they contain behavior change techniques and interactive components (US Department of Health, 2020). The Community Preventive Services Task Force (CPSTF) recommends Web-based interventions to increase tobacco use cessation as evidence shows interventions increase cessation among adults interested in quitting when measured six or more months following the intervention. (Guide to Community Preventive Services, 2020). Interventions must have at least one type of interactive feature to help clients monitor progress and provide feedback, tailored guidance that matches users with services and advice, and coaching, counseling, or social support from peers or trained professionals. Content may also be developed or adapted to specific populations and incorporate text messaging, phone calls, or medications. An example of their cited research includes Graham et al. (2016) who compared internet-based interventions to other broad reach cessation approaches and concluded they were more effective and had effects equivalent to those of telephone and phone counseling. Bricker et al., (2018) investigated a full-scale randomized trial comparing Web-delivered interventions for smoking cessation and improving quit rates. He found WebQuit.org and Smokefree.gov had	Quitlines offer Web-based self-help (94.2%), chat rooms (80.8%), interactive counseling (94.2%)

Web	Intervention	similar 30-day point prevalence abstinence rates at 12 months that were higher than those of prior published Website-delivered interventions and telephone counselor-delivered interventions. These Web-delivered interventions were evaluated for their clinical approach and included long-term follow-up.	Quitlines offer Web-based self-help (94.2%), chat rooms (80.8%), interactive counseling (94.2%)
Web	Outreach	The National Cancer Institute's (NCI's) experience with the Smokefree.gov initiative suggests that offering different, complementary technology options to meet the needs and preferences of smokers has the potential to meaningfully expand the reach of cessation treatment. In addition to digital resources directed at the general population, the Smokefree.gov initiative includes population-specific resources targeted at adolescents, women, military veterans, Spanish speakers, older adults, and other populations. Meeting smokers on their preferred platforms and providing multiple, asynchronous opportunities for content engagement may enable Quitlines to reach and engage millions of additional smokers each year and accelerate the rates of smoking cessation. (Prutzman et al., 2021) Keller et al., (2020) researched changing promotional Quitline services by offering service choices, ensuring tobacco users could register for all services either online or by telephone, and utilizing nonjudgmental media campaigns. These innovations increased treatment to reach and the estimated number of participants who quit smoking.	No Annual Survey data is available
Web	Enrollment	Most Quitlines are offering Web enrollment options currently. Data from NAQC's Annual Survey of Quitlines shows 44 States reported having Web-based enrollment (2020). Conversion from entry from a Web enrollment page to registration (26%), was very similar to the conversion rate through telephone contact (25%) (2019). This supports the rationale for Quitlines to continue to provide online options around enrollment. Keller, et al., (2021) researched differences between online and telephone enrollments in Quitline participant characteristics and found online Quitline enrollment engages younger tobacco users and may be particularly appropriate for non-telephone Quitline services. This supports Quitlines' interest to add an online enrollment to their Web-based services. Additionally, Quitlines should be aware of the need to continue to monitor who is accessing online services. Webb Hooper, et al., (2019)	92% of Quitlines offer Web enrollment. Of these, the percentage registering by Web ranged from 1% to 80%.

Web	Enrollment	determined that digital inequalities exist in Web-based tobacco cessation services. Compared with Whites, African Americans, Hispanics, American Indian/Alaskan Natives, and others were less likely to enter the Quitline via the Web and enroll in a Web-only program. Balmford et al. (2013) included in the 2019 Cochrane Review (Whittaker et al., 2019) and investigated the uptake of automated tailored interventions for smoking cessation comparing a Web-based system, text messaging program, both as an integrated package and the choice of either or both, with the highest overall intervention uptake occurring in the choice condition. They learned that a Web-based intervention is most attractive if the offer to use is made by Web, whereas a phone-based intervention is more likely to be used if the offer is made by phone. Providing automated interventions on multiple platforms allows for maximal choice and the greatest overall use of some form of help.	92% of Quitlines offer Web enrollment. Of these, the percentage registering by Web ranged from 1% to 80%.
Web	Engagement	Perski, et al., (2021) presents a case study of WebQuit, a smoking cessation website grounded in Acceptance and Commitment Therapy which is based on psychological flexibility and embracing thoughts and feelings in a nonjudgmental way. Their research identified content-based engagement patterns and their associations with user characteristics and cessation outcomes. WebQuit users were categorized into disengagers, tryers, and committers to capture how unique categories of users engage with Web interventions over time. Committers saw increases in a key mechanism of action and greater odds of quit success. This case study demonstrates how analyzing usage data can help to understand how users engage with a given eHealth intervention over time. Future WebQuit users may benefit from being directed to the values, acceptance-based self-monitoring, and feedback components via reminders throughout the program.	79% of Quitlines offer Web-based services
Web	Evaluation	While the research was not identified in Quitline settings around Web-based services used to directly administer evaluations, service providers report using the Web to promote evaluations and to obtain real-time feedback (Practice Brief, 2020).	No Annual Survey data is available

Modality	Purpose	Apps Research and Practice Findings	Adoption (2020 Annual Survey)
Apps		Overall, when compared to minimal non-App smoking cessation support or less intensive Apps support, research findings are limited. Cochrane Reviews (Whittaker et al., 2019) do not provide favorable	

Apps		evidence that Apps may be effective for intervention purposes. More recent research is demonstrating some support for comparing Apps to standard clinical practice or Apps following Acceptance and Commitment Therapy treatment frameworks. One article investigates privacy standards around Apps (Huckvale et al., 2019). More research is needed to understand how Apps are utilized for outreach, enrollment, intervention, engagement, and evaluation. In the Quitline environment Apps services are not being consistently utilized, but among the few service providers that do, they are beginning to investigate how Apps can be most effective in these real-world settings. According to the 2019 Cochrane Review (Whittaker et al., 2019), the benefits of Apps include interventions with ease of use and access at any time, cost-effective delivery, scalability to large populations, the ability to tailor messages to key user characteristics, and link the user with social support and other tobacco control programs.	
Apps	Intervention	The 2019 Cochrane Review (Whittaker et al., 2019). shows the evidence is inadequate to determine whether Apps are useful for quitting smoking when compared to no cessation intervention or minimal interventions. Five studies tested the effectiveness of smoking cessation smartphone Apps alone and varied considerably in intervention content and components. There was no evidence of a favorable effect of smartphone Apps with minimal-non-Apps smoking cessation support (e.g., a printed self-help guide and encouragement to access available smoking cessation services). There was also no clear evidence of an increase in quit rates because of smartphone smoking cessation Apps when compared to smoking cessation support of lower intensity (i.e., less intensive Apps) support that included Apps that provided only basic information. There is insufficient evidence with which to evaluate the effect of mobile Apps interventions, but there are many ongoing studies, so evidence on these interventions will continue to evolve. The Surgeon General's Smoking Cessation Report 2020 indicates the evidence is inadequate to infer that smartphone Apps for smoking cessation are independently effective in increasing smoking cessation (US Department of Health, 2020) Palleja-Millan, et al., (2020) also recognized the limited number of scientifically validated Apps and evaluated the efficacy of a gamified mobile App to increase the success rate of smoking cessation interventions in adults. They discovered through an intervention trial that regular use of an App for smoking cessation is effective in comparison with standard clinical practice, such as general health advice. Their mobile App usage included interventions such as social compromise and strategies to cope with abstinence syndrome and moments of craving. They reinforced the importance of users having a	1.9% of Quitlines offer Mobile Apps

Apps	Intervention	minimum level of digital skills on which to use the Apps and that they are motivated to use them. They also encouraged researchers to consider how to personalize the intervention and available features to maximize engagement. Patterns of participation and follow-up over time demonstrated encouraging rates of tobacco cessation. Bricker et al, (2020) completed a research trial that provides evidence that, compared with a National Cancer Institute Smoking Cessation App based on the US Clinical Practice Guidelines, an Acceptance and Commitment Therapy-based smartphone App was more efficacious for quitting cigarette smoking and thus can be an impactful treatment option. The main comparison of these applications was teaching acceptance versus avoidance of smoking triggers. It involved teaching skills that allow urges to pass versus avoidance of urges. This study advances the evidence-based smartphone Apps for smoking cessation. Rathbone et al, (2017) combined the use of mobile Apps and SMS messaging as physical and mental health interventions in a systematic review and discovered Apps proved to be more effective than text messaging when used as an intervention for stress, anxiety, and depression. Results also showed Apps to have a more significant effect on medication adherence, while psycho-educational information was understood more when read in SMS form. This has relevance in Quitline environments when integrating services to consider pairing text messages for motivation and support while using an App to promote medication adherence.	1.9% of Quitlines offer Mobile Apps

Moving Forward

Launching the first Learning Community project to assess Quitline practices on technology-mediated services has been a success in advancing our understanding of the evidence, current use, and future potential. The Learning Community proved to be a collaborative, professional effort engaging Quitline service providers, State health departments, researchers, subject-matter experts, and community stakeholders in shared dialogue which allowed the necessary learning to develop recommendations that aim to advance Quitline practice. Meetings were convened to explore research findings and current practices which guided the development of recommendations on best and promising practices.

These recommendations were originally proposed in a draft report and communicated in multiple avenues inviting verbal and written feedback from the Quitline community. An overwhelming majority agreed with the recommendations and found them to be reasonable within the proposed timelines. Feedback around strengthening the recommendations was incorporated into this final report. NAQC will gain an understanding of how Quitlines are using these modalities across multiple purposes by incorporating new questions into NAQC's longstanding Annual Survey of Quitlines.

The Quitline community is committed to exploring, developing, and implementing these technology-mediated services and has helped identify potential operational challenges that include technology

hardware, software, and associated costs. Additionally, staff training and maintenance of skills will be important as technology evolves.

Many Quitlines have already implemented text and Web interventions. For those who have not, we hope they will work towards the upcoming deadlines of June 2022. The adoption date for the recommendations for using text and Web for other purposes of outreach, enrollment, and engagement are not until June 2023. NAQC remains available to answer questions and provide assistance with implementation. We look forward to working with the community on adopting these recommendations while continuing to refine our work on best and promising practices as Quitlines continue to evolve.

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