

Measuring Reach of Quitline Programs

Introduction

In North America quitlines, which provide telephone-based tobacco cessation services, have become a mainstay of tobacco control programs. To date, there has been no standard way to assess and report on their reach, making comparisons across quitlines, time or promotional strategies difficult. There are a number of ways to conceptualize reach, but this Issue Paper focuses on *quitline treatment reach*, which is defined as “the proportion of the target population who receive an evidence-based treatment from a quitline.”

- Quitline treatment reach has several advantages over other measures of reach: it is relevant, meaningful, available and reliable.
- In this definition the target population should be tobacco users, and evidence-based treatment refers to counseling and/or pharmacotherapy.
- The size of the target population should be obtained using a population survey that is large, well conducted and representative, such as the Behavioral Risk Factor Surveillance Survey (BRFSS) or the Canadian Tobacco Use Monitoring Survey (CTUMS).
- To the degree possible, quitlines should also report on number of calls, completed intakes, number opting for various quitline services and other measures that provide the context for treatment reach.
- Limiting reach to those who receive an evidence-based quitline treatment will result in the most conservative (lowest rate) measure of reach.

Why Do We Need to Measure Reach?

In North America quitlines, which provide telephone-based tobacco cessation services, have become a mainstay of tobacco control programs. Tobacco users worldwide have access to quitlines throughout the U.S. Canada, Mexico and 30 other countries (McAfee, 2007). Quitlines are easy to access and have been shown to appeal to a broad range of tobacco users (Zhu et al., 1995; Maher et al., 2007). But, to date, there has been no standard way to assess and report on their reach. Reach is a measurement of the potential impact of a program. For example, if a program such as the quitline reaches its target population with an effective intervention, the resulting impact will be a decrease in the rate of tobacco use.

Why Do We Need a Standard Measure of Reach?

In the absence of a standard measure of reach, quitline funders, operators and researchers have developed various definitions to report their findings. The result has been an ambiguity of terms. *Reach* and *utilization* have been used to refer broadly to any type of program use. *Utilization* has been used to refer to call volume (CDC, 2004). It has described the number of callers who complete an initial intake call. For example, Tinkelman and colleagues (2007) used the average number of callers per month to examine the utilization of the Ohio quitline before and after the introduction of free nicotine replacement products. Reporting the number of calls as an indicator of quitline utilization allows for comparison within a particular quitline over time, but will not accommodate comparisons across quitlines since each quitline is operating in a different context of tobacco use prevalence.

NAQC's Quality Improvement Initiative is made possible with funds from The Centers for Disease Control and Prevention, The American Cancer Society and The American Legacy Foundation. NAQC would like to acknowledge its Advisory Council members for their role in reviewing and approving this Issue Paper as well as the invaluable feedback from NAQC members during the review and comment phases of the process.

© North American Quitline Consortium, 2009.

NAQC Issue Paper: *Measuring Reach of Quitline Programs*

More commonly reach has been reported as a proportion or percent rather than simply the number of people who use a program. McCorry, Garnick and Bartlett (2000) reported on “the proportion of a population who use a service,” which they define as *utilization*. It is not always clear what constitutes use of a service. Work by Glasgow and colleagues (2006) represent a decided improvement in clarity of terms. Their RE-AIM framework has precise definitions of the terms Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM). In RE-AIM, reach is conceptualized as participation in *effective* treatment rather than simply the use of the service. For greater detail about the RE-AIM framework, visit the Web site (<http://www.re-aim.org/2003/>).

Most of the measures of reach cited in quitline research have counted as “reached” tobacco users who call the quitline for help, whether they received treatment or not and whether the treatment they received was effective or not. One variant of this is counting as reached all callers who completed at least the portion of the intake that allows for them to be identified as tobacco users (Swartz, Woods & Haskins, 2007; Cummins, Bailey, et al., 2007). In another variant, the number of tobacco users reached was estimated rather than counted (Owen, 2000; Miller, Wakefield & Roberts, 2003). These estimates were based on the number of calls received by a quitline over a given period of time, subtracting the number who would typically be calling on behalf of a friend or family member.

Although it is possible to compare reach over time using any measure as long as the definition remains consistent, this lack of standardization makes it difficult to compare reach across quitlines or promotional strategies. Funders are interested in setting benchmarks to compare the reach of their state/provincial quitline to others, the success of promotional efforts for increasing calls to the quitline and changes in their state/province’s tobacco use prevalence. Organizations that provide quitline services (i.e. vendors) want to ensure their work is being evaluated fairly by using measures that are calculated in a consistent way. Discrepancies in how reach is determined can lead to erroneous conclusions when comparing across quitlines. A standard definition and report of reach will enable funders, vendors and researchers to have a common point of reference to set goals and evaluate programs.

Why Now?

Currently state quitlines are estimated to reach between 1-2% of tobacco users annually (Cummins, et al, 2007). Quitlines are interested in improving their reach, but there is no agreement about how to measure reach nor is it clear what represents a realistic or attainable reach. The North American Quitline Consortium (NAQC) has led a movement to create common language among quitlines to allow dissemination and learning regarding best practices. To this end NAQC established the Minimal Data Set Workgroup in 2003 to recommend a basic set of questions and response codes that quitlines could use to gather information about callers at the time of intake and evaluation (NAQC, 2005). The Minimal Data Set (MDS) intake includes questions about tobacco use and intention to quit, how the caller heard about the program and demographic characteristics such as age, gender, ethnicity and education level ([View the MDS Intake and Follow-Up Questions](#)). The MDS evaluation includes caller satisfaction, current tobacco use and recent quitting behavior, use of quitting aids and whether the caller has used any tobacco in the last seven days or 30 days, information that can be used in the calculation of quit rates. Recommendations for the calculation of quit rates are addressed in a companion NAQC Issue Paper, “Measuring Quit Rates” (NAQC, 2009). Although there are now standard questions to ask at intake and evaluation, there continues to be considerable variability in collection procedures and reporting (NAQC Minimal Data Set Workgroup, 2008). More recently the *NAQC Quality Improvement Initiative* set as a goal the creation of Issue Papers, which will outline recommendations for the standard measurement and reporting of quit rates and the focus of this paper, reach.

What Does it Mean to Reach a Population?

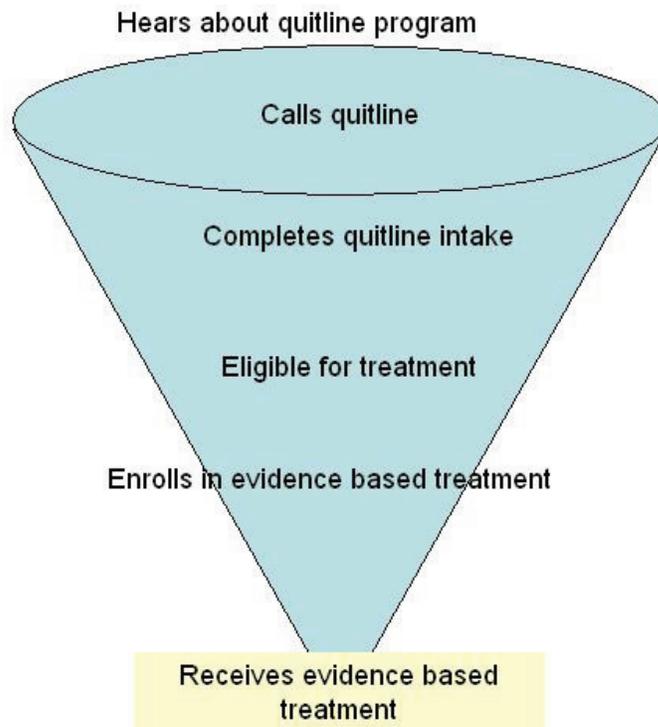
To a certain extent what it means to reach the target population with a quitline service depends on one’s

perspective. If your job is to raise awareness of quitline services, you might consider someone reached if they remember hearing about the program or if they call in as a result of your promotional activity. If you are tasked with providing counseling you might consider only counseled clients as reached. No one measure will be able to serve all reporting needs. Nonetheless, it is possible to clearly define our terms, discuss the trade-offs for various measures and make a recommendation. This paper makes the case for defining reach in terms of possible impact on the prevalence of tobacco use in the population. As a result, it focuses on the proportion of tobacco users who receive evidence-based treatment from the quitline.

Funnel of Quitline Services

To appreciate the different perspectives, it is useful to understand how calls flow through the quitline; Figure 1 presents a schematic of a funnel. The narrowing of the funnel reflects that only a portion of the target population continues down through the process to the final step of receiving an evidence-based treatment. The broadest level of the funnel is awareness of quitline services; to participate in quitline services one would need to know about them. Narrowing from there, calls enter the phone system and from there may or may not be answered. Once answered, callers are typically asked a series of “intake” questions, which includes information about whether callers are tobacco users and where they heard about the program. Eligible callers are offered quitline services, some of which are evidence-based, and many, but not all, go on to receive them.

Figure 1 Funnel of Quitline Service



At what point in the process do we consider tobacco users to be reached by the program? Is it when they hear about the service, call, get screened or enrolled in the program, opt to receive services or when they receive the intended service? Does it matter which service they receive or how closely the service provided matches the intended protocol? Which point is “best” depends largely on whether you are interested in the promotion of quitlines, the workload involved in operating quitlines or the ultimate impact of quitlines on tobacco use. Although this Issue Paper recommends the primary definition of reach be the one most directly tied to impact, reporting other measures provides valuable information for a range of quitline stakeholders. Table 1 describes various measures, indicates their pros and cons, and indicates whether they are primarily related to promotion and/or awareness, workload or impact.

Table 1: Measures Related to Reach

<i>Measure</i>		<i>P*</i>	<i>W*</i>	<i>I*</i>	<i>Pros</i>	<i>Cons</i>	<i>Comment</i>
Awareness	Proportion of tobacco users who know about quitline services or report using quitline.	X			Data from population survey, which is representative of the population.	Self-report may be inaccurate. Doesn't indicate willingness to use service.	Useful promotion related measure.
Call volume	Number of calls that come to the service number, whether answered, hang up, or leave a voice mail.	X	X		Easy to obtain—straight from phone system. Indication of interest in service. Independent of service capacity.	No way to determine if repeat callers. May not receive service.	Can be used make the case for additional resources to be allocated to service.
Intake	Completed MDS questions including how they heard about the service.	X	X		All quitlines currently collect intake information.	Many callers do not intend to receive counseling—proxies, materials-only, brief questions.	Can track specific promotional efforts.
Intended service	Enrolled in service—eligible and agreed to participate.		X		Matches the “intent-to-treat” used in calculating quit rates.	Conversion from intended to received can vary across quitlines and time.	Indicates how well the quitline “sells” evidence-based service.
Received evidence based service	Participated in an treatment informed by the evidence-base, e.g., telephone counseling or NRT.		X	X	Relevant Meaningful Available Reliable	Conservative measure, therefore, will be lowest.	Reinforces high standards for quitlines by counting as reached only callers receiving evidence-based treatment.

**P* = Promotional, *W* = Workload, *I* = Impact

How Can Promotion or Awareness of the Quitline be Measured?

Quitline telephone numbers are widely distributed through paid media (TV, radio, newspaper), public service announcements, community partnerships, schools and word of mouth. One measure of the effect of these promotional efforts is to determine what proportion of the target population (such as tobacco users) knows about the quitline program. This can be done through population surveys in which participants are asked to name services available to help smokers quit or are asked if they are aware of or have used their state quitline (Al-Delaimy et al., 2008; CDC, 2004). Self-reported use may or may not reflect actual use, but high awareness of the quitline indicates the promotional messages are reaching the target population.

NAQC Issue Paper: *Measuring Reach of Quitline Programs*

since calls often come in bursts that correspond with these efforts. Not all quitlines have phone systems that track the number of calls, but for those that do, call volume can reflect interest in quitline services independent of the capacity of the quitline to meet the demand. In New York, for example, over 400,000 calls came into the quitline over a three-day period following the introduction of an offer of free nicotine replacement products (Cummings et al., 2006), clearly generating interest in the service while exceeding the quitline resources to provide counseling and products to all callers. Call volume does not shed light on who is calling or why, but it can be used to make the case for increasing service capacity.

A recent survey indicates quitlines have, by and large, implemented NAQC's recommended MDS intake procedure (NAQC, 2008). Another measure of the success of promotional campaigns is the number of callers who complete the intake procedure and indicate they heard about the quitline from a particular source (e.g., TV, radio, healthcare provider).

Recommendations

- **Record and report quitline call volume and number of callers who complete the quitline intake.**
- *Work with those who promote quitlines to demonstrate the response to specific media efforts.*

How Can Workload Be Measured?

Quitline funders are naturally interested in the workload of quitlines because budgets must be justified by the work done. One measure of workload is the number of quitline callers who complete the intake procedure, as mentioned above. Typically, at the end of the intake, quitline callers are offered services for which they are eligible. Because of funding constraints, about one third to one half of U.S. quitlines use eligibility criteria to limit services in some way (Cummins et al., 2007). For example, quitlines may provide counseling only to callers who say they are ready to quit or may limit pharmacotherapy to callers who engage in counseling or who have no insurance. Some quitlines triage callers to their health plans and focus on providing service to callers who do not have access to other cessation services (McAfee, 2007). Determining eligibility, triaging and providing quitline services (e.g., sending cessation materials, providing counseling or nicotine replacement products) account for much of the quitline staff's time.

In addition, not all callers complete the intake procedure. These callers, nonetheless, require time and attention of quitline staff. Callers may be provided with service but be unwilling to complete the intake procedure, or enrolled clients may call to cancel an appointment or to speak to their quitline counselor/coach. These calls are often not counted in measures of reach, yet they are significant in terms of workload.

Recommendations

- *Record and report measures that reflect the workload of the quitline staff including the number of calls answered, completed intakes and types and amount of services provided.*
- *If possible, track the number of calls that do not result in an intake and report on the disposition of these calls.*

How Can Quitline Impact Be Measure?

Although the measures reported above could be said to indicate that a target population has been reached, we are particularly interested in defining reach in terms of the potential impact of the program on tobacco use. The measure most directly related to program impact is what we will call *quitline treatment reach* and is defined as "the proportion of the target population who receive an evidence-based treatment from a quitline."

Formula for Quitline Treatment Reach

The calculation for quitline treatment reach is relatively straightforward and requires the division of a numerator by a denominator. The formula is:

Treatment Reach	=	$\frac{\text{\# in target population who received quitline evidence-based treatment}}{\text{total target population (\#)}}$
------------------------	---	---

Example:

Treatment Reach	=	$\frac{30,496 \text{ tobacco users call the quitline and receive telephone counseling}}{3,823,443 \text{ tobacco users in the state}}$
------------------------	---	--

Treatment Reach = 0.008 or .8%

This formula considers as “reached” only clients who received an evidence-based treatment. These are the clients at the very bottom of the quitline services funnel. The number of clients who receive this level of service is necessarily a subset of the people who initially call the quitline. As a result, this definition is a very conservative measure of reach and rates will be small.

Why Use This Definition of Reach?

This definition has four main strengths: (1) As mentioned, it is the measure most directly relevant to the impact of the quitline on tobacco control efforts; (2) Research supports that changes in reach would create meaningful change in tobacco use prevalence; (3) It is based on readily available data and routinely collected; and (4) There are reliable estimates of the size of the target population.

How is Quitline Treatment Reach Relevant?

In 2002 a subcommittee of the U.S. Interagency Committee on Smoking and Health (ICSH), at the request of the secretary of the U.S. Department of Health and Human Resources, constructed a plan to promote cessation in the U.S. (Fiore, et al., 2004) with an ambitious goal of reducing tobacco use by 10% in the first year. One recommendation in this National Action Plan was to create a National Tobacco Quitline (1-800-QUIT-NOW) to serve callers throughout the U.S. either directly or by transferring them to their respective state quitline. The plan estimated that using this strategy could help one million smokers. The committee felt it would be possible to reach 16% of smokers by extending quitline services to include both counseling and medication and by providing robust promotional efforts; however, they decided on a more conservative estimate of reach of 10% for their calculation. The recommendations did not directly define *reach*. However, given the calculation of impact in the plan, it is likely it referred to treatment reach. The estimate of helping one million smokers was calculated by assuming quitlines would reach 5 million smokers in the year (10% of the 50 million smokers in the U.S.) with a long-term quit rate of 20% among those smokers reached. Impact is calculated as Reach x Effect Size (Glasgow, 2006); here impact of one million smokers quitting = 50 million smokers x 10% reach x 20% quitting long-term (i.e., effect size). This calculated impact would hold true only if the reach of 10% referred to quitline treatment reach, since long-term quit rates of 20% would be rare among quitline callers who failed to receive any evidence-based service. Therefore, the definition of quitline treatment reach is relevant to the National Action Plan’s goals for quitline service.

Recommendation

- **Define the quitline and timeframe of interest. For example, you might be interested in assessing the reach of a state quitline over fiscal year 2006- 2007.**

How is Treatment Reach Related to Meaningful Change?

All state quitlines provide telephone counseling, which is the core service of cessation quitlines (Cummins et al., 2007). Telephone counseling has been tested repeatedly and shown to be efficacious. The rigorous Cochrane Review analysis of 48 studies concluded telephone counseling increases success rates by 40% (Stead, Perera,

Lancaster & 2006). Thus telephone counseling is considered an “evidence-based treatment,” one which is supported by research evidence. The research indicates there is a dose dependent relationship with greater intensity counseling (additional proactive sessions) being more effective than lower intensity counseling. Nonetheless, a single counseling session (often provided reactively when clients initiate the call) also increases the likelihood of success compared to materials only.

Beyond telephone counseling, recently several quitlines have provided quitting aids to eligible callers (McAfee, 2007; Cummings, 2006). These nicotine replacement products (e.g., patches, gum, lozenges, inhaler) and several non-nicotine aids such as bupropion (Zyban) and varenicline (Chantix) are considered evidence-based because there is sufficient evidence of their effectiveness (Stead, Perera et al., 2008; Hughes et al., 2007; Lancaster et al., 2008; Fiore et al., 2008).

In addition, most quitlines provide a number of other services such as self-help materials, brief information and/or web-based programs (Cummins et al., 2007). These services ensure all callers receive a basic level of support (CDC, 2004), but there is insufficient evidence to date that would support the effectiveness of providing self-help materials or static Web-based fact sheets for tobacco users trying to quit (Stead et al, 2007).

Table 2 provides a list of treatments that many quitlines provide. It indicates which have enough research support to be considered an evidence-based treatment. To date there is evidence to support telephone counseling (single or multiple sessions, reactive or

proactive) and/or pharmacotherapy as evidence-based. Interactive Web-based programs look promising (Severson, 2008; Stretcher, 2008) although there has not been enough research done to establish the effectiveness of this approach (Fiore et al., 2008). Quitlines sometimes refer clients to another program. Although a referral may be warranted, it would not be considered an evidence-based intervention without confirmation that the client received additional services that meet the standards of evidence-based. To the degree new treatments compile sufficient proof of their efficacy, the list of evidence-based treatments will grow.

Table 2: Evidence Base for Treatment Offered Through Quitlines

<i>Quitline Treatments</i>	<i>Evidence base</i>	<i>Citation</i>
Telephone counseling	Yes	Stead, Perera, Lancaster, 2006; Fiore et al., 2008
Nicotine replacement therapy	Yes	Stead, Perera et al., 2008; Fiore et al., 2008
Zyban / Bupropion	Yes	Hughes et al., 2007; Fiore et al., 2008
Chantix / Varenicline	Yes	Lancaster et al., 2008; Fiore et al., 2008
Web based interactive program	Promising	Severson, 2008; Stretcher, 2008
Referral to another program	Equivocal	No direct evidence
Self-help materials	No	Stead et al., 2007

NAQC Issue Paper: *Measuring Reach of Quitline Programs*

One assumption made in reporting treatment reach is that receiving an evidence-based treatment is likely to make a meaningful difference in the quitting success of a population of quitline users. A second assumption is that receipt of a service that is not supported by research evidence would, on average, be unlikely to impact the population of quitline users.

There are several caveats to note. First, the lack of research support does not mean an individual user would not benefit from these services, indeed they might. Second, even treatments with evidence of their effectiveness may not be provided optimally. For example, although multiple proactive counseling sessions is considered an evidence-based service, counseling varies considerably within and across quitlines in terms of session number, length, content and timing. Third, the discussion of evidence-based treatment reflects an interest in the direct impact of a quitline. A comprehensive tobacco control model postulates quitlines also have an indirect or synergistic effect with other components of the model (CDC, 2004). This effect is more difficult to measure, but important nonetheless. Simply by existing, quitlines may increase the likelihood that healthcare providers (and others) will advise their patients who use tobacco to quit because they know help is available. Even if the patient never calls the quitline or calls but receives a service not designated as evidence-based, those interventions by doctors would lead to higher levels of quitting in the population since physicians' advice to quit has been shown to be effective (Stead, Bergson & Lancaster, 2008).

Recommendations

- **Identify the evidence-based services provided by the quitline. Research supports telephone counseling (proactive and reactive, single or multiple) and pharmacotherapy as evidence-based, but ongoing research will likely expand the list.**
- *Although quality control is not directly related to treatment reach, consider instituting quality control measures that would ensure treatments are provided with high fidelity to the intended protocol.*

How Does Data Availability Affect Treatment Reach?

The primary task for a quitline is to provide service to callers. It is important to be mindful of the potential burden caused by the collection of large amounts of data. Most callers are willing to answer questions that appear related to their request for service—contact information, tobacco use history, medical conditions, readiness to quit and intention to use quitting aids all seem relevant and meet with little resistance. Callers will also respond to demographic questions such as gender, ethnicity and education level as these are seen as routine for public health programs (Peterson, 2000). However, long intakes can alienate clients and cause stress to quitline staff, especially during times of high call volume. As a result, it is important that a standard measure of reach be based on data quitlines already collect or can collect with relative ease.

As part of the NAQC recommended MDS, quitlines are encouraged to record the service provided to each client screened (Campbell et al., 2007). In 2007, the NAQC MDS Workgroup conducted an assessment of the MDS implementation process, which provided information about whether quitlines recorded the recommended elements and whether they deviated from the recommended coding categories (*It is important to note that the survey assessed the implementation of the MDS, not the quitlines*). The survey had high participation rates from the quitlines in the U.S. and Canada (92% of the 62 state and provincial quitlines) (NAQC MDS Workgroup, 2008). Almost all quitlines (56 of the 57 who participated in the survey) indicated they are able to identify what service they provide to a given caller, although not necessarily using the MDS recommended categories, which are: basic information, literature and/or self-help materials, reactive counseling (one counseling session), proactive counseling (more than one counseling session), medications, referral or other. There may need to be further standardization of service categories, but quitlines appear to have easy access to the information needed for the numerator in the calculation of treatment reach.

Recommendation

- **Verify the quitline records the type of service each client receives in a way that differentiates evidence-based treatment from other services.**

How Can We Reliably Estimate the Size of the Target Population?

The denominator in the calculation of treatment reach is the number of people in the target population. The best measure of the target population is a complete count of all cases. There are rare situations when the population is known; for example, a healthcare system might have a record of the smoking status of each participant. More commonly, however, there is no direct count of the target population, so the denominator will be based on an estimate using state/provincial or national survey data. The accuracy of measure of reach will depend on the accuracy, reliability and appropriateness of the population estimate. Therefore, it is important to choose a stable estimate that is representative of the target population.

Unlike the numerator, for which it is possible to recommend a particular term (i.e., the number of tobacco users who receive an evidence-based treatment), it may not be possible to identify a source of data for the denominator that would be best to use under all circumstances. There are four issues to consider in selecting a survey:

- (1) Was the survey conducted using procedures and questions that make it relevant to the intended target population? Calculating quitline reach to Spanish-speaking tobacco users should use an estimate of the population size from a survey that was conducted in Spanish. Likewise, if the target population is tobacco users, the data would need to come from a survey that assessed both smoking and other tobacco use.
- (2) Was the survey conducted in the geographic area of interest? Often the area of interest is the state or province, but sometimes there is interest in comparing states or provinces to one another. Since each survey uses different sampling schemes, questions and coding, it is best to compare the reach across states using the same survey.
- (3) Is the survey timely? If the number of tobacco users were stable over time, surveys from different years would give the same estimate of the size of the population (within sampling error). However, tobacco use prevalence is slowly decreasing. Older surveys will overestimate the current tobacco use prevalence and using that estimate in the calculation of reach will underestimate reach.
- (4) What assurance is there that the population estimates reflect the real population size? Surveys with sound sampling schemes, large sample sizes and high participation rates ensure greater accuracy.

Recommendations

- **To estimate the size of the target population, select a population survey that is relevant, covers the geographic area and time of interest.**
- *Opt for a survey that is likely to provide an accurate estimate because of the sound sampling scheme, large sample size and high participation rate.*

What is the Target Population?

The target population is the group the quitline is attempting to impact with services. Quitlines may provide service to anyone who calls or may restrict service by age (e.g., adults, teens), by willingness to quit or by insurance status. Most quitline participants are smokers but some use other tobacco such as smokeless tobacco, cigars or pipes. In areas (states or provinces) where the use of tobacco products other than cigarettes is small, the difference between the estimated number of tobacco users in the state and the number of smokers will be small and will not unduly affect calculations of reach. However, in some states the rate of tobacco use other

than cigarettes is substantial. Therefore, it is important that the target population be defined and the same definition be used in the numerator and denominator. For the purposes of the definition of treatment reach, the target population will be assumed to be adult tobacco users unless otherwise designated.

Recommendations

- **Most quitlines provide services to all tobacco users rather than only to smokers. Therefore, the target population should be all tobacco users.**
- **Treatment reach can be calculated for any age group, but the target population should be adults unless otherwise specified.**
- *If there is no survey estimate of all tobacco users, select a survey that estimates the number of smokers in the population and restricts the numerator to smokers who received evidence-based treatment.*

There are a number of surveys that can provide reasonable estimates of tobacco use prevalence. The following discussion of particular surveys is meant to be illustrative rather than exhaustive. Table 3 compares three surveys on issues such as the frequency of the survey, size, content and respondents. Generally, population estimates are more stable if they come from larger samples and telephone surveys are more representative when random digit dial sampling is used and they achieve high participation rates. In Canada, the CTUMS is conducted for Health Canada and tracks smoking prevalence by province. In the U.S., the BRFSS and the Tobacco Use Supplement of the Current Population Survey (CPS-TUS) are surveys that report smoking prevalence by state. If the intention is to compare reach within one state over time, then a statewide survey such as the Adult Tobacco Survey (not shown) would be a reasonable choice. For a good review on tobacco surveys in the U.S. (see Delnevo and Bauer, 2008).

Table 3: Comparison of Surveys

	<i>Canadian Tobacco Use Monitoring Survey (CTUMS)</i>	<i>Behavioral Risk Factor Surveillance System (BRFSS)</i>	<i>Current Population Survey—Tobacco Use Supplement (CPS-TUS)</i>
Geographic area	All of Canada by province except the Yukon, Northwest Territories and Nunavut	Conducted by state	National, state, and some sub-state level
Method	100% telephone Cross-sectional	100% telephone Cross-sectional	75% telephone 25% in person Cross-sectional and some longitudinal
Languages	English and French?	English and Spanish	English and Spanish, Chinese, Khmer, Korean, Vietnamese
Respondents' age	15 and up	18 and up	15 and up

Table cont. next page..

NAQC Issue Paper: *Measuring Reach of Quitline Programs*

Survey population	Noninstitutionalized, land-lines only	Noninstitutionalized, land-lines only	Civilian, noninstitutionalized
Tobacco data	Cigarette, cigar, and smokeless tobacco use	Cigarette use Some states—other tobacco use	Full tobacco use and cessation data
Sample size	About 20,000/year	350,000/year	About 240,000/year
Participation rate	Average of 40%	Median = 51%	60-70%
Sampling method	Random digit-dialed	Random digit-dialed	Area probability
Weighted	For probability of selection of household and person	For probability of selection, adults in home, telephones in home, nonresponse, noncoverage due to no phone	
Frequency	Twice yearly	Yearly	Every 3 years
Started	1999	1984	1992
Most recent data set	Cycle 2 2007 (7/07-12/07)	2007	2003
Conducted by	Statistics Canada	State health departments	US Census Bureau
Sponsored by	Health Canada	US Centers for Disease Control and Prevention (CDC)	National Cancer Institute (NCI) and US Centers for Disease Control and Prevention (CDC)
Link	http://www.statcan.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=4440&lang=en&db=imdb&dbg=f&adm=8&dis=2	ftp://ftp.cdc.gov/pub/Data/Brfss/userguide.pdf	http://riskfactor.cancer.gov/studies/tus-cps/

The BRFSS includes questions about smoking in the survey “core”asked by all states. There is an optional module that includes questions about other tobacco use, however, most states do not include this module. The 2009 version of the BRFSS will include a measure of other tobacco use in the core rather than in the optional module. Until then, the BRFSS will only provide an estimate of the number of smokers for the majority of states. For most states, use of this survey will require the numerator in the calculation of treatment reach be limited to smokers. The most recent BRFSS data available are those from 2007 and the estimated number of smokers are listed in Table 4 by state. The CPS-TUS provides estimates not only of smokers but of all tobacco

NAQC Issue Paper: *Measuring Reach of Quitline Programs*

users. However, the survey is conducted only every three years and there is some delay in when the data are available for public use. The 2006 data will be available for use in December 2008. Table 5 provides the latest numbers available for target population estimates of smokers and all tobacco users from the 2003 surveys.

Table 4: Behavioral Risk Factor Surveillance System - 2007

	survey	state	prevalence	estimated #
State	sample size	population estimate	% smokers	of smokers
Alabama	7250	3497303	22.5	786383
Alaska	2552	479293	22.2	106583
Arizona	4733	4537483	19.8	898294
Arkansas	5733	2130433	22.4	477589
California	5691	27220000	14.3	3901408
Colorado	11908	3552807	18.7	663151
Connecticut	7523	2685976	15.4	414051
Delaware	3991	660179	18.4	125046
District of Columbia	3957	459423	17.2	78981
Florida	39549	14140000	19.3	2728341
Georgia	7703	6905384	19.4	1336592
Hawaii	6603	985324	17.0	167335
Idaho	5315	10867292	19.1	207786
Illinois	5236	9600020	20.1	1933212
Indiana	5991	4720990	24.1	1138955
Iowa	5428	2305847	19.8	457319
Kansas	8495	2086135	17.9	372498
Kentucky	6908	3229173	28.2	909518
Louisiana	6684	3233829	22.6	732320
Maine	6830	1054321	20.2	212574
Maryland	8829	4248290	17.0	724446
Massachusetts	21507	4928996	16.4	808017
Michigan	7505	7627510	21.1	1612476
Minnesota	4774	3945187	16.5	649403
Mississippi	7818	2195175	23.9	525689
Missouri	5263	4480987	24.5	1097928
Montana	5995	737869	19.5	143745
Nebraska	10944	1335778	19.9	266308
Nevada	4125	1883517	21.4	404054
New Hampshire	5990	1024345	19.3	198143
New Jersey	7236	6597427	17.1	1129605
New Mexico	6606	1464055	20.8	304251
New York	6525	14750000	18.9	2787650
North Carolina	14777	6699625	22.9	1533521
North Dakota	4751	501188	20.9	104855
Ohio	11229	8722123	23.1	2011728
Oklahoma	7463	2711382	25.8	699120
Oregon	4951	2840943	16.9	480375
Pennsylvania	13231	9632966	20.9	2018315
Rhode Island	4499	837536	17.0	142308
South Carolina	10395	3286768	21.9	719588
South Dakota	6871	592572	19.8	117394
Tennessee	5032	4640789	24.2	1125440
Texas	17248	16970000	19.3	3281169
Utah	5079	1773115	11.7	207597

Table cont. next page...

NAQC Issue Paper: *Measuring Reach of Quitline Programs*

Vermont	6936	492867	17.6	86714
Virginia	6203	5852131	18.5	1082125
Washington	25881	4876979	16.8	819070
West Virginia	4445	1440410	26.9	387028
Wisconsin	7435	4275395	19.6	837417
Wyoming	6160	397808	22.1	87995

Table 5: Current Population Survey - Tobacco Use Supplement 2003

State	Survey sample size	State population est	Prevalence % smokers	Estimated # of smokers	Prevalence % tobacco users	Estimated # tobacco users
Alabama	3635	3271655	19.3	630848	24.1	788924
Alaska	3416	434756	25.0	108551	28.2	123608
Arizona	3312	3864074	17.4	673088	20.1	778611
Arkansas	3040	1982841	26.7	529270	31.0	615783
California	16887	25410000	13.2	3365078	15.0	3823443
Colorado	4976	3301041	18.7	616932	21.6	717052
Connecticut	4363	2530963	15.8	400818	18.0	457164
Delaware	3266	587209	19.1	112189	20.6	121299
District of Columbia	2574	446984	16.4	73203	19.3	86413
Florida	10371	12430000	17.5	2170656	19.5	2434032
Georgia	3397	6182935	18.1	1119782	21.3	1316230
Hawaii	3229	872305	16.2	141321	16.6	149035
Idaho	3323	957150	21.4	204670	24.6	235601
Illinois	8446	9251165	19.2	1771734	21.8	2026184
Indiana	4914	4473728	23.7	1060994	25.9	1163454
Iowa	4370	2186852	19.4	424656	22.4	490808
Kansas	4355	1961477	21.5	422233	25.8	508201
Kentucky	3482	3031316	27.4	829991	31.2	947888
Louisiana	2759	3212754	22.7	729395	25.1	809847
Maine	4409	991257	21.8	216267	24.3	241928
Maryland	3927	3978841	16.2	643315	18.3	732091
Massachusetts	5073	4911041	16.3	799983	18.4	905039
Michigan	6829	7394410	22.8	1683053	25.2	1876791
Minnesota	4509	3738473	19.5	728989	24.0	901434
Mississippi	2499	2020658	20.6	416794	25.7	520209
Missouri	3788	4187204	24.6	1030608	27.4	1151045
Montana	3034	680124	22.0	149853	27.4	186635
Nebraska	4178	1273191	21.8	277248	25.8	329356
Nevada	4993	1540976	17.8	273790	20.2	312127
New Hampshire	4427	957436	18.5	177395	20.6	198075
New Jersey	6088	6409341	15.3	979742	17.2	1107110
New Mexico	2764	1332346	19.3	257022	22.1	295316
New York	12186	14520000	17.8	2588518	19.9	2906002
North Carolina	5165	6104816	22.2	1353504	25.3	1555053
North Dakota	3858	474220	21.1	100236	24.5	116442
Ohio	7865	8406731	22.0	1846198	25.3	2140137

Table cont. next page...

Oklahoma	3389	2535265	22.5	571496	26.0	660088
Oregon	4033	2609287	19.4	506480	22.5	588108
Pennsylvania	9205	9296025	19.2	1787924	22.6	2107406
Rhode Island	4532	812222	19.6	158939	21.2	173011
South Carolina	3168	3018569	23.3	704578	26.2	792020
South Dakota	4116	552176	20.7	114499	23.9	132400
Tennessee	3017	4337133	22.8	987892	26.6	1155444
Texas	10265	15470000	18.5	2859583	21.2	3300856
Utah	3437	1583323	11.6	184015	13.3	211496
Vermont	3908	470111	21.7	101933	24.8	117259
Virginia	3908	5270308	17.3	910365	19.5	1032809
Washington	4501	4471235	20.6	922722	23.8	1065247
West Virginia	3842	1379080	24.1	331804	29.4	406377
Wisconsin	5117	4028111	20.9	840776	23.6	955596
Wyoming	3475	367208	20.9	76649	27.1	99618

Recommendations

- To estimate the number of Canadian provincial tobacco users, consider using the CTUMS.
- To estimate a U.S. state’s tobacco users, consider using the BRFSS once the survey includes questions about all tobacco use in 2009.

How Do We Calculate Quitline Treatment Reach?

As stated earlier, the formula for treatment reach is:

Treatment Reach	=	$\frac{\text{\# in target population who received quitline evidence-based treatment}}{\text{total target population (\#)}}$
------------------------	---	---

Although the division of a numerator by a denominator is simple, there are a few questions that must be answered to determine the correct numbers to use in the formula. These questions lead to the seven steps for calculating treatment reach.

Step 1: Identify the quitline program and time frame of interest. *What program is being measured for reach and over what time frame?* Treatment reach can be used to measure a single quitline, to compare across state or provincial quitlines or to measure the total reach in a given state or country. Typically reach is based on a given year, although it would be possible to determine the reach over multiple years. It is important to consider which program is being measured and the timeframe because it can influence which survey to use for the estimate of the target population.

Step 2: Identify the target population. *What is the target population that the quitline is tasked to reach?* Most quitlines provide service to all tobacco users who call (Cummins et al, 2007). However, quitlines may primarily be tasked to provide service to a subgroup of tobacco users. As a result the quitline might want to determine the reach to that particular group. For example, the quitline might only advertise service to smokers, teens, the uninsured or pregnant smokers. Whichever group is considered the target must be consistent for the numerator and the denominator.

Step 3: Identify which quitline services are evidence-based. *What services does the quitline provide and how does the quitline identify the receipt of a quitline service?* Quitlines provide a number of services, but only those that are evidence-based are counted in the calculation of treatment reach (see Table 2). Most quitlines

record whether the client receives service, but it is important to differentiate the type of service so that only the receipt of evidence-based treatment is counted.

Step 4: Obtain the numerator. *What is the numerator?* Once it is clear what program and time frame are being assessed, who the target population is and what services count, it is possible to determine the number of the target population that received the evidence-based service.

Step 5: Identify the proper survey to use for the denominator. *What survey is available to obtain the best estimate of the size of the target population?* The best survey to use is the one that provides the most stable estimate of the target population during the appropriate timeframe. If the target population is a highly specific group such as pregnant smokers or American Indian smokers, it may be useful to consider alternative surveys. To assess the treatment reach for a state quitline, select a representative population survey such as the CTUMS, BRFSS or CPS-TUS.

Step 6: Obtain the denominator. *What is the denominator?* Select the proper estimate from the chosen survey. Most of these surveys are available for public use meaning they can be obtained for analysis. For the 2007 BRFSS or the 2003 CPS-TUS, see Table 4 or Table 5. For other surveys, check the survey’s Web site for reports of smoking or tobacco use prevalence by state or province.

Step 7: Divide the numerator from Step 4 by the denominator from Step 6. *What is the quitline treatment reach?* Table 6 summarizes the steps for calculating treatment reach and provides an example from the Oklahoma Quitline from Fiscal Year 2006-2007.

Table 6: Calculation of Quitline Treatment Reach

	Task		Example from Oklahoma
Step 1	Identify program and time frame	State or provincial quitline? A given fiscal or calendar year?	Interested in calculating the treatment reach of the Oklahoma state quitline during fiscal year 2006-2007.
Step 2	Identify target population	Smokers or all tobacco users? Adults 18+ or 15+?	Adult (18+) smokers
Step 3	Identify which quitline services offered are evidence-based	See table 2	Telephone counseling and quitting aids to eligible callers.
Step 4	Obtain the numerator—	Analyze quitline data to determine the number of the target population who received evidence-based treatment during the proper time frame	For Oklahoma: quitline data on: Adults smokers who Received counseling and / or quit aids During the time 7/06 to 6/07 Numerator = 15,793

Table cont. next page...

Step 6	Obtain the denominator	See table 4 or 5	Denominator = 699,120
Step 7	Divide the numerator from Step 4 by the denominator from Step 5		$\frac{15,793}{699,120} = 2.26\%$

What is a Reasonable Goal for Quitline Treatment Reach?

Recently, the Centers for Disease Control and Prevention suggested that quitlines could serve 6% of adult tobacco users if they also provided nicotine replacement therapy (NRT) to callers (CDC, 2007B). They developed recommendations about funding that assumed 8% of adult tobacco users would call a quitline each year and approximately 75% of callers would seek counseling services, especially if NRT was provided only to those enrolled in counseling. These recommendations translate to a 6% treatment reach.

Several NAQC surveys have estimated the utilization/reach of quitlines to be 1- 2% (Cummins, Bailey, et al, 2007 & McAfee, 2007) although these estimates were based on the number of tobacco users who called for help with quitting rather than on those who received treatment. Because quitline treatment reach is likely to yield even lower numbers, it is clear there is considerable room for improvement in reach (McAfee, 2007).

There are a number of ways to increase reach. One way is to increase promotion of the quitline so tobacco users know of the service. Miller, Wakefield and Roberts (2003) reported that a very hard hitting advertisement campaign (“every cigarette is doing you damage”) resulted in 3.6% of adult Australian smokers calling the quitline (referred to as the *uptake* of the service). Call volume was related to the intensity and specificity of the promotion of the quitline. Owen (2000) also found that a strong promotional campaign increased call volume to 4.2% of the adult smokers in the U.K.

Another way to increase reach is to increase the demand for service with policies that motivate more tobacco users to want to quit. Swartz, Woods and Haskins (2007) found an increase in call volume of the Maine Tobacco Helpline from 1.9% in 2002 to 6% in 2006, a rise which corresponded with a \$1 increase in the cigarette tax. It is also possible to increase reach by the provision of free NRT even if that service is not advertised to the general public (Swartz, Woods & Haskins, 2007; Cummings, 2006; An, Schillo et al., 2006).

Most importantly, reach is likely to increase if greater financial resources are allocated to cessation (CDC, 2007B). Cummins et al., 2007 found reach to be strongly correlated with quitline funding ($r=.7$). The National Action Plan includes an ambitious 10% reach, but it should be noted it suggested this could be attained only with high levels of funding to increase quitline hours and capacity, provide free pharmacotherapy and promote the services with sufficient media support.

Recommendations

- *Given the focus of this Issue Paper is to clarify the terms used to discuss quitline reach, the question of reasonable goals is beyond its scope. However, it is clear that efforts should be made to increase quitline treatment reach.*
- *Treatment reach can be increased by driving more calls to the quitline through promotional efforts, by supplying sufficient resources to provide treatment and/or by ensuring more callers are funneled through to evidence-based treatment.*

How Should Changes in Quitline Treatment Reach be Interpreted?

Changes in quitline treatment reach should be interpreted cautiously, especially when dealing with subgroups with small sample sizes. The accuracy of reach calculations depends on the population estimate used in the

denominator of the equation. If these numbers are very accurate, then changes in the reach measure from one year to another or across quitlines are likely to reflect real differences (i.e., statistically significant differences) rather than chance. The accuracy of an estimate is sometimes expressed as a confidence interval (CI), which is used to determine the upper and lower limits of the estimate. A 95% CI means that 95 times out of 100 the true population size would fall between your upper and lower limits. Table 7 illustrates the effect of variability on the measure of reach.

In both examples the quitline provided counseling to 100 tobacco users and the survey data indicated a population estimate of 10,000 tobacco users. In both cases the treatment reach is 1%. However, in Example 1 the estimate was based on a large sample (10,000 respondents) and the CI is narrow (+ 0.2%). In Example 2 the estimate is based on a much smaller sample (500 respondents) resulting in a larger CI (+ 0.8%). The result is a more stable measure of reach from the estimate using the larger sample size. The differences in these numbers might seem relatively inconsequential, however, greater instability in the measure provides less confidence in comparing reach across quitlines or over years.

Table 7: Calculation of Reach

	<i>Example 1</i>	<i>Example 2</i>
Sample size	10,000	500
Population estimate	100/10,000=1.00%	100/10,000=1.00%
95% CI	+0.2	+0.8
Lower limit	0.8%	0.2%
Upper limit	1.2%	1.8%
	Low variability High accuracy	High variability Low accuracy

Typically confidence intervals are not included in the reports of tobacco use prevalence. Many of these datasets are public use and can be obtained for analysis. Therefore, quitlines interested in determining significance of changes in reach should consider working with a statistician. This is especially true if there is interest in comparing subgroups within a state (e.g., a county, racial/ethnic groups, etc.). The sample sizes for these subgroups are likely to be smaller, so the population estimate will be less stable. Surveys that have large sample sizes, such as those that provide population estimates for an entire state, are not likely to have large confidence intervals. For a more comprehensive discussion of measurement error, visit the Web site of the American Association of Public Opinion Research - <http://www.aapor.org/marginofsamplingerror>.

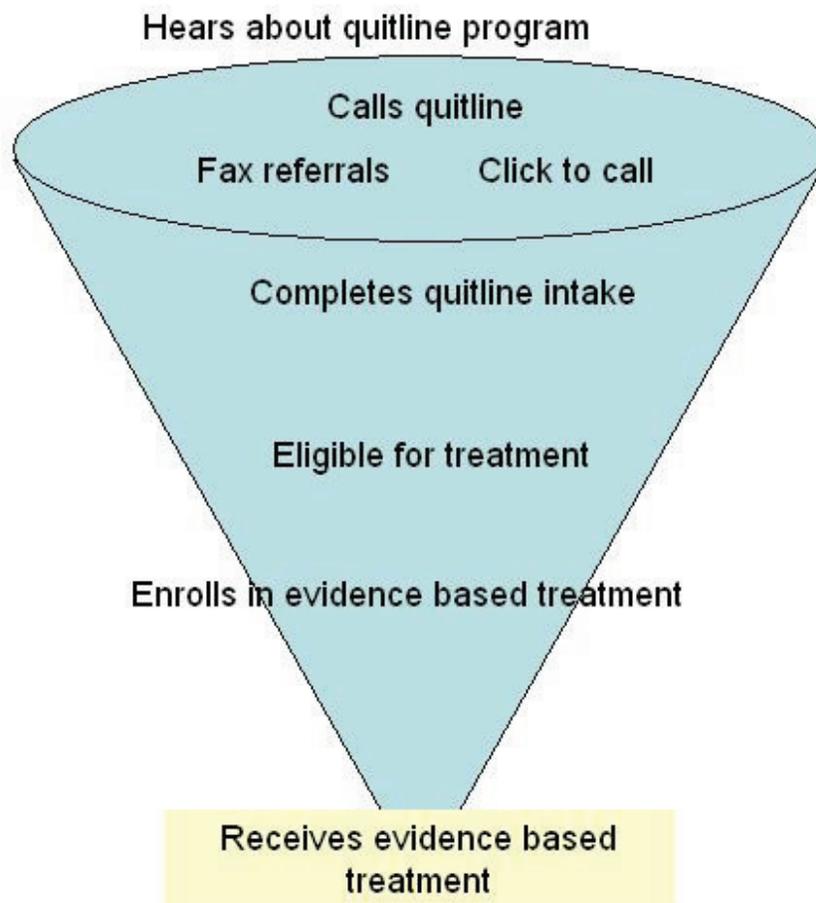
Standards and Issues

Data collection standards must be realistic given the quitline setting and must be easy to report. Several issues specific to the quitline setting should be taken into account. For example, people access quitline services through methods other than the telephone. How do online access, fax referrals and text messages fit into the measurement of reach?

How Do Web and Fax Referrals Affect Measures of Reach?

Figure 1 showed how calls funnel through the quitline process. However, quitlines often have a Web presence and some are using a “click-to-call” system where Web users enter their telephone number requesting a call from the quitline (e.g., Free & Clear at http://findarticles.com/p/articles/mi_pwwi/is_200705/ai_n19196791). Many quitlines, such as Minnesota’s, have robust fax referral programs where healthcare providers fax the contact information of a tobacco user requesting quitline staff contact the tobacco user and offer services. Some quitlines are experimenting with text messages. Figure 2 shows how clients who come through these proactive efforts could be included in the reach of the quitline if they received evidence-based treatment. These clients would need to be differentiated from others if there was a desire to examine the relative success of various promotional strategies, such as the success of “click-to-call” advertising compared to television promotion of the quitline.

Figure 2 Funnel of Quitline Service including alternate referrals



Recommendation

- **Include fax referral and “click to call” in the measure of treatment reach if the clients go on to receive one of the evidence-based treatments.**

How are Repeat Calls Dealt With?

A second quitline issue is how to deal with repeat callers. Each client should be counted only once over the period covered by the reach calculation. Typically, reach is reported as an annual rate—the percent of the target population that received evidence-based treatment from the quitline in a given year. An illustration might be

useful. A client who receives a comprehensive prequit counseling call at the beginning of 2008 and then calls back later in the year for a new quit attempt and receives four more counseling calls and an eight-week supply of nicotine patches would be counted once in the numerator for the 2008 reach. A client who calls late in 2008 and starts counseling would be counted once in the 2008 reach, even if some of the follow up counseling calls continued into 2009. However, a client who calls and receives service in 2008 and then calls back in 2009 for a new quit attempt would be counted once for the 2008 reach and once for the 2009 reach.

Recommendation

- **Count each client only once in the measure of treatment reach regardless of the number of services they receive in the time period.**

How Should Quitlines Ensure They are Reaching Priority Populations?

A third issue is the way quitlines work to minimize health disparities in tobacco use through increasing access for groups identified as priority populations in tobacco control. These racial/ethnic and social groups have high rates of tobacco-related morbidity and mortality and are traditionally understudied and underserved. These populations include racial and ethnic minorities, youth and young adults, women and girls, low socio-economic status (SES), rural populations, the Lesbian, Gay, Bisexual and Transgendered (LGBT) community and tobacco users with co-addictions or mental disorders. Quitlines, which are free and easy to access, have broad appeal across ethnic and social dimensions. Quitlines are interested in being able to report on their success in reaching priority populations. One method employed is to assess the proportion of quitline participants from a particular subgroup relative to their proportion in the general population of smokers/tobacco users. Table 8 gives an example of how a quitline might assess utilization by ethnic minorities. These data are from the California Smokers’ Helpline (Zhu et al., 1995).

Table 8: Ethnic Representiveness of Smokers Who Called the California Smokers’ Helpline

	<i>Smokers in California 1992-1993</i>	<i>Called the Helpline 8/92-8/96</i>
	<i>(N = 4,078,306) %</i>	<i>(N = 39,888) %</i>
White	67.4	62.4
Hispanic	18.5	18.2
African-American	7.0	11.5
Asian	5.0	2.5
Others	2.0	5.5

The table shows that 7% of the smokers in California are African American, yet they make up 11.5% of quitline callers. Therefore, the quitline is well utilized by African Americans. This method of examining subgroup differences can be useful, but it must be recognized that an increase in the percent represented by one group must involve a decrease in the percent represented by another (since the total will always be 100%). The true goal is to increase the reach into each community without pitting one ethnic group against another.

An alternative would be to measure the reach for each ethnic group. However, these measures are unlikely to be reliable because the estimates of the target population size are likely based on relatively small samples. These small samples would result in large confidence intervals making it impossible to rule out chance as the reason for any differences in reach between the subgroups and across time.

Recommendations

- **To report on reach to priority populations, assess proportion of quitline participants from a particular subgroup relative to their proportion in the general populations of smokers/tobacco users.**
- *Because estimates of subgroups are likely to be based on small sample sizes, it would be important to work with a statistician if you want to compare reach across these populations.*

How Should Reach be Calculated in States with More than One Quitline?

Calculating reach becomes more complex when states have both state and private quitlines. Some states provide free services primarily to uninsured or underinsured tobacco users. Callers who have tobacco cessation benefits as part of their insurance plans are transferred or referred to their health plan for services. Many, especially if they are transferred immediately, will obtain evidence-based treatments through those health plans. Therefore, the true reach of the quitline to the tobacco users in the state would most accurately be the combination of those callers who were provided evidence-based treatment through the state quitline plus those who received evidence-based treatment through their health plan as a result of the state quitline efforts to connect them to these programs. To report this treatment reach for the state would require the collaboration of the state quitline and health plans. The health plans would need to record the origin of the call and be willing to share aggregate information on the numbers who received telephone counseling, pharmacotherapy, group cessation treatment or other treatment research has shown to be effective.

Recommendation

- *To assess treatment reach for several quitlines in a state collaborate with the various service providers to determine the number of the target population who receive evidence-based treatment through any of the services.*

Looking Forward

The goal of this Issue Paper is to develop a standard measure of quitline reach to allow for clearer communication across diverse quitline stakeholders. This effort at standardization extends the work started with the establishment of the NAQC MDS. It is part of *NAQC's Quality Improvement Initiative*, which also includes a separate Issue Paper devoted to the establishment of a standard measure of quit rates. Although no one measure will meet all reporting needs, this Issue Paper focuses on *quitline treatment reach*, defined as “the proportion of the target population who receive an evidence-based treatment from a quitline.” Although this measure is conservative and will result in a smaller number than other measures, it was chosen because it is most directly related to the impact of the quitline.

From the establishment of common definitions of reach and quit rates, we can look forward to further improvements in quality assurance for quitlines. One area for improvement concerns the reporting of the implementation of treatment, which can vary within and across quitlines. Treatment reach assumes those who receive an evidence-based treatment will, on average, benefit. A next step would be to establish a standard set of measures reflecting the fidelity of the treatment to the intended protocol. Quantitative and qualitative measures could include number, length and timing of counseling calls, ratings of clinical content (e.g., planning, setting a quit date) and ratings of therapeutic environment (e.g., rapport). These measures might prove particularly useful in establishing “best practices” for quitlines.

ACKNOWLEDGEMENTS

Authors:

NAQC would like to acknowledge the author of this issue paper, Sharon Cummins, PhD. Dr. Cummins was responsible for conceptualizing and drafting the original paper and incorporating feedback of NAQC staff, NAQC Advisory Council members, and NAQC general membership.

Contributors:

For managing the feedback and revision process, support of the author and editing NAQC would like to acknowledge Tamatha Thomas-Haase, MPA. For final editing, layout and design of the paper, NAQC would like to acknowledge Brenda Bryan, MAdmin. Linda Bailey, JD, MHS contributed important feedback that shaped the scope and content of the paper.

NAQC would also like to acknowledge its Advisory Council members for their role in reviewing and approving this Issue Paper, most notably the four members who served as primary reviewers: Michael Cummings, PhD, MPH, Colleen Stephens, MSW, Barbara Schillo, PhD, and Ann Malarcher, PhD, MSPH. The feedback from NAQC members during the review and comment phases of the process was also invaluable. All member feedback ensured the paper's relevancy to the field.

Funders:

NAQC's Quality Improvement Initiative is made possible with funds from The Centers for Disease Control and Prevention, The American Cancer Society and The American Legacy Foundation. The contents of this publication are under the editorial control of NAQC and do not necessarily represent the official views of the funding organizations.

Recommended Citation:

NAQC. (2009). *Measuring Reach of Quitline Programs. Quality Improvement Initiative* (S. Cummins, PhD). Phoenix, AZ.

References

- Al-Delaimy, W.K., Li, L., Messer, K., Sigman, R., Pierce, J.P., Winglee, M., & White, M.M. (September 2008). *California Tobacco Survey (CTS): 2005*. Retrieved from hdl: 1902.1/11547 UNF: 3 :Znn2aeuUgJZIHMDi4db/dQ== California Department of Health Services.
- An, LC, Schillo, BA, Kavanaugh, AM, Lachter, RB, Luxenberg, MG, Wendling, A, & Joseph, AM. (2006). Increased reach and effectiveness of a statewide tobacco quitline after the addition of access to free nicotine replacement therapy. *Tobacco Control*; 15:286- 293.
- Campbell HS, Ossip-Klein D, Bailey L, & Saul J. (2007). North American Quitline Consortium. Minimal dataset for quitlines: a best practice. *Tobacco Control*;16 Suppl 1:i16-20.
- Canadian Tobacco Use Monitoring Survey: Cycle 1. (February – June 2007). *Microdata User Guide*. Retrieved from <http://www.google.com/search?sourceid=navclient&ie=UTF8&rlz=1 T4ADBF en US253US254&q=ctums>.
- Centers for Disease Control and Prevention (CDC). (2007). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved from <http://www.cdc.gov/brfss/>.
- Centers for Disease Control and Prevention (CDC). (September 2004). *Telephone quitlines: a resource for development, implementation, and evaluation*. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; Final Edition.
- Centers for Disease Control and Prevention (CDC). (October 2007). *Best Practices for Comprehensive Tobacco Control Programs*. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- Cummings KM, Fix B, Celestino P, et al. (2006). Reach, efficacy, and cost-effectiveness of free nicotine mediation giveaway programs. *J Public Health Management Practice*; 12:37–43.
- Cummins, SE, Bailey, L, Campbell, S, Koon-Kirby, C, & Zhu, S-H. (2007). Tobacco cessation quitlines in North America: a descriptive study. *Tobacco Control*; 16(Suppl I): i9- i15.
- Delnevo, CD, Bauer, UE. (September 2008). Monitoring the Tobacco Use Epidemic III. *Preventive Medicine*, doi:10.1016/j.ypmed.
- Fiore MC, Jaén CR, Baker TB, et al. (May 2008). *Treating Tobacco Use and Dependence: 2008 Update*. Clinical Practice Guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service.
- Fiore, MC, et al. (2004). Preventing 3 million premature deaths and helping 5 million smokers quit: a national action plan for tobacco cessation. *American Journal of Public Health*: 94(2):205-210.
- Glasgow, RE, Klesges, LM, Dzewaltowski, DA, Estabrooks, PA, & Vogt, TM. (2006). Evaluating the impact of health promotion programs: using the RE-AIM framework to form summary measures for decision making involving complex issues. *Health Education Research*; 21: 688-694.

References cont...

- Hollis JF, McAfee TA, Fellows JL, Zbikowski SM, Stark M, & Riedlinger K. (2007). The effectiveness and cost effectiveness of telephone counselling and the nicotine patch in a state tobacco quitline. *Tobacco Control*;16 Suppl 1:i53-9.
- Hughes JR, Stead LF, & Lancaster T. (2007). Antidepressants for smoking cessation. *Cochrane Database of Systematic Reviews*, Issue 1. Art. No.: CD00003 1. DOI: 10.1002/1465 1858.CD00003 1.pub3.
- Lancaster T, Stead LF, & Cahill K. (2008). An update on therapeutics for tobacco dependence. *Expert Opinion on Pharmacotherapy*; 9(1): 15-22. DOI:10.1517/14656566.9.1.15
- Maher, J.E., Rohde, K., Dent, C.W., Stark, M.J., Pizacani, B., Boysun, M.J., Dilley, J.A., & Yepassis-Zembrou, P.L. (2007). Is a statewide tobacco quitline an appropriate service for specific populations? *Tob Control*, 16(SI), i65-i70.
- McAfee, TA. (2007). Quitlines: a tool for research and dissemination of evidence-based cessation practices. *American Journal of Preventive Medicine*; 33(S6): s357-s367.
- Miller, CL, Wakefield, M, & Roberts, L. (2003). Uptake and effectiveness of the Australian Telephone Quitline service in the context of a mass media campaign. *Tobacco Control*; 12 (Suppl II): ii53-ii58.
- North American Quitline Consortium. (2009). *Measuring Quit Rates*. L. An, MD, M. Luxenberg, PhD, A Betzner, MA, J. Rainey, T. Capesius, MPH, E. Subialka, T. Thomas-Haase, MPA, J. Saul, PhD, Editors. Phoenix, AZ: North American Quitline Consortium.
- North American Quitline Consortium (2005). Minimal Data Set for Evaluating Quitlines. Phoenix, AZ: North American Quitline Consortium.
- North American Quitline Consortium. (2008) Minimal Data Set Workgroup, Editors. *Realizing Opportunities: Implementation Assessment of the Minimal Data Set in North America*. Phoenix, AZ: North American Quitline Consortium.
- Owen, L. (2000). Impact of a telephone helpline for smokers who called during a mass media campaign. *Tobacco Control*; 9: 148-154.
- Peterson AL & Halstead TS. (1998). Group cognitive behavior therapy for depression in a community setting: a clinical replication series. *Behav Ther* ;29 :3-18.
- Peterson, RA. (2000). *Constructing Effective Questionnaires*, SAGE.
- Severson HH, Gordon JS, Danaher BG, & Akers L. (2008). Nicotine ChewFree.com: evaluation of a Web-based cessation program for smokeless tobacco users. *Tob Res*.;10(2):381-91.
- Stead LF, Bergson G, & Lancaster T. (2008). Physician advice for smoking cessation. *Cochrane Database of Systematic Reviews* 16;(2):CD000165.
- Stead LF, Perera R, Bullen C, Mant D, & Lancaster T. (2008). Nicotine replacement therapy for smoking cessation. *Cochrane Database of Systematic Reviews*, Issue 1. Art. No.: CD000146. DOI: 10.1002/14651858.CD000146.pub3.

References cont...

Stead, LF, Perera, R, & Lancaster, T. (2006). Telephone counseling for smoking cessation. *Cochrane Database Systematic Reviews*; 3-CD002850.

Stead LF, Perera R, & Lancaster T. (2007). A systematic review of interventions for smokers who contact quitlines. *Tobacco Control*;16 Suppl 1:i3-8.

Stevens VJ, Glasgow RE, Hollis JF, & Mount K. (2000). Implementation and effectiveness of a brief smoking-cessation intervention for hospital patients. *Med Care*;38:451-9.

Strecher VJ, McClure JB, Alexander GL, Chakraborty B, Nair VN, Konkel JM, Greene SM, Collins LM, Carlier CC, Wiese CJ, Little RJ, Pomerleau CS, & Pomerleau OF. (2008). Web-based smoking-cessation programs: results of a randomized trial. *Am J Prev Med*.;34(5):373-8 1.

Swartz Woods, S, & Haskins, AE. (2007). Increasing reach of quitline services in a US state with comprehensive tobacco treatment. *Tobacco Control*; 16(Suppl I): i33-36.

Tinkelman D, Wilson SM, Willett J, & Sweeney CT. (2007). Offering free NRT through a tobacco quitline: impact on utilisation and quit rates. *Tobacco Control*; 16 (Suppl.1):i42-6.

US Department of Commerce, Census Bureau (2006). National Cancer Institute and Centers for Disease Control and Prevention Co-sponsored Tobacco Use Special Cessation Supplement to the Current Population Survey (2003). Retrieved from <http://riskfactor.cancer.gov/studies/tus-cps/>.

Zhu S-H, Rosbrook B, Anderson C, Gilpin E, Sadler G, Pierce JP. (1995). The demographics of help-seeking for smoking cessation in California and the role of the California Smokers' Helpline. *Tobacco Control*; 4(Suppl.1): S5-S15.

Zhu S-H, Stretch V, Balabanis M, et al. (1996). Telephone counseling for smoking cessation: effects of single-session and multiple-session interventions. *Journal of Consulting and Clinical Psychology*; 64(1): 202-211.

Important Note About the Recommendations Contained in this Issue Paper:

Recommendations that are necessary in order to implement the standard are found in **bold-print** and recommendations that are viewed as important but not critical to implementation are italicized.

Learn more about NAQC: www.naquitline.org
3030 N. Central Avenue, Suite 602, Phoenix, AZ 85012-2713
Ph: 602.279.2719. Fax: 602.279.2740. Email: naqc@naquitline.org.

© North American Quitline Consortium, 2008.

