

## Assessing the Cost-Effectiveness of Quitline Programs

### INTRODUCTION

Today, in 2010, tobacco remains the number one cause of preventable death and disability in the United States [1]. Mortality rates associated with most chronic illnesses are falling and yet, with tobacco use as the main contributing factor, mortality from Chronic Obstructive Pulmonary Disease (COPD) continues to rise [2]. In addition to direct health effects associated with tobacco use, there is growing awareness of the health effects of exposure to secondhand smoke. Numerous facts are available that dramatically substantiate the significant health, economic and societal toll of tobacco. Nonetheless, a lack of precise information on the magnitude of tobacco's total burden to the individual and to society remains. This paper aims to:

- *document the facts related to the cost of tobacco use;*
- *provide an overview of methods currently used for cost-effectiveness analysis of quitlines; and*
- *in general terms, describe approaches and considerations for conducting cost-effectiveness analysis on a specific quitline program.*

This paper is intended to present general information useful for a wide variety of stakeholders and not to serve as a guide for performing cost-effectiveness analyses. Performing cost-effectiveness analyses is an essential element of the quality improvement process for all interventions being considered for tobacco cessation programs. This is especially true as budgetary constraints become more important for determining all aspects of service delivery.

### THE IMPACT OF TOBACCO ON HEALTH

The ultimate burden of tobacco consumption on an individual is death. In the November, 2008, Center for Disease Control's Morbidity and Mortality Weekly Report (MMWR) it was estimated that 443,000 deaths directly associated to cigarette smoking and exposure to tobacco smoke occurred for each year between 2001 and 2004. Of even more concern is that this number is higher than the 438,000 estimated annual deaths from smoking from the previous four year survey [4]. Despite the attention and efforts initiated in this time period, mortality and morbidity associated with tobacco use continue to rise. While it is understood that the current mortality rate reflects a pattern of smoking over many years, it is unclear when tobacco control efforts of the recent past will have a substantial impact on reducing the mortality rate.

Hundreds of thousands of premature deaths occur every year and it is not difficult to imagine there are many more people than reported who suffer from tobacco related diseases. It is estimated that 90% of all lung cancers in men and 80% of all lung cancers in women are directly related to smoking [4, 5]. Lung cancer is one of the most prevalent forms of cancer that result in death in the United States.

COPD is a slowly progressive, destructive disease that results primarily from long-term exposure to smoking tobacco. The damage may take years of exposure to manifest. Approximately 90% of all deaths from COPD can be attributable to smoking [4]. However, COPD is not the only chronic illness directly associated with tobacco exposure. The effects from smoking are insidious. Smokers experience an increased risk of coronary heart disease and stroke (two to four times) [5]. A variety of cancers are more common in smokers including bladder, cervix, pharynx, kidney, uterus,

stomach and the oral cavity [5]. The risk of developing lung cancer is 23% higher in men who smoke than nonsmokers and is 13 times higher in women who smoke [5]. Smoking also has a dramatic negative effect on women who are pregnant and on their babies. For women who smoke, there is a higher risk of infertility, pre-term delivery and stillbirth. Their babies are at a higher risk for being of low birth weight and experiencing Sudden Infant Death Syndrome [5].

Tobacco smoke not only affects those who use tobacco products. It is clear that exposure to secondhand smoke is associated with both acute and chronic illness. Children of smokers experience a higher incidence of ear infections and asthma (6) and it is estimated that 7,500 to 15,000 hospitalizations of children annually are directly related to the effects of being exposed to parents' tobacco smoke [5]. Effects of side-stream smoke (smoke emitted between puffs of a burning cigarette, pipe, or cigar) are better understood every year, and it is clear that those who spend a lot of time around smokers are also at higher risk of developing acute and chronic affects because of it.

## **COST OF SMOKING**

Understanding that significant health effects can be directly attributed to tobacco use and exposure, there have been efforts to assess the economic burden to individuals and society as it relates to these acute and chronic diseases. On one side of the discussion is the “positive economic impact” of tobacco use in the United States. American consumers spend billions of dollars each year on a variety of tobacco products. In 2006, \$83.6 billion was spent on cigarettes and \$3.2 billion on cigars [7]. An additional revenue of \$2.6 billion resulted from sales of smokeless tobacco products [8, 9]. The sale of tobacco products result in federal and state tax revenue as well as employment for those in the tobacco growing, producing and sales industries.

Although significant, the revenue generated from the sale of tobacco products is overshadowed by the costs associated with the health burden they create. In 2008, it was reported that smoking was responsible for \$193 billion in annual health-related economic losses in the U.S. (\$96 billion in direct medical costs and \$97 billion in lost productivity) [4]. For cigarette smoking alone, the total economic cost related to health care was estimated to be \$10.47 per pack of cigarettes sold in the U.S. in 2006 [9, 10]. Unfortunately, there is limited information related to the health and associated economic effects of secondhand smoke in children. One report estimates that 19% of all respiratory healthcare costs in children are related to tobacco exposure. Children less than two years of age with a mother who smokes have an increase of \$175 per year in total healthcare costs [6]. Cigarette smoking results in 5.1 million years of potential life lost per year [4, 9]. As indicated later in the paper, there are several ways to assess the financial impact from such an unnecessary loss.

## **EFFORTS TO REDUCE TOBACCO USE**

Over the past two decades, significant efforts have been taken, and positive results achieved, toward the goal to reduce and eliminate tobacco consumption in the U.S. Efforts have been at both ends of the smoking continuum, including preventing children from starting to use tobacco products to helping people reduce and stop their tobacco use. Some of the more common programs include:

- *state and federal price and tax increases;*
- *smokefree laws;*
- *community-based, face-to-face cessation counseling programs;*
- *school-based education programs;*

- *employer-sponsored smoking cessation programs;*
- *state-funded and private quitline programs; and*
- *subsidized or free cessation medication programs.*

These efforts have gradually reduced cigarette use across the country. In 2008, it was reported that 20.6% of U.S. adults over 18 were smokers (46 million people), with smoking being more common among men (23.1%) than women (18.3%) [2, 4]. However, the rate of decline in the number of smokers has recently slowed [1]. While it is impossible to determine the factors most to blame for the slowing rate of decline, a reduction of available funds for cessation programs, the ease of getting those who were ready to quit with early cessation efforts and leaving those who are more addicted to nicotine remaining, and the increased stress of economic hard times are likely contributing to it.

## **QUITLINES AS A RESOURCE IN THE FIGHT AGAINST TOBACCO USE**

The first toll-free tobacco cessation service was developed as an extension of a toll-free cancer hotline in the early 1980s. In the following years, free telephonic programs were developed to help smokers quit in Australia (Quit Victoria) and England (UK Quit). These programs became the model for the development of other programs in Europe and the U.S. [11]. Although providing a service to smokers, these programs were not initially subject to scientific evaluation. The first publications evaluating the efficacy of telephonic smoking cessation programs studied programs operating in California and Seattle, Washington [12, 13].

With the publication of numerous scientific papers, publicly-supported quitline programs were developed across Europe, Australia and in most U.S. states. As the proliferation of telephonic-based smoking cessation programs continued, organizations of funders and providers of these programs were established in Europe (European Network of Quitlines) and in North America (North American Quitline Consortium) to help promote quality improvement and information exchange [11]. With the development of new quitline programs and services, many scientific studies were performed and published evaluating and comparing the effectiveness of each service provided. The formation of a significant body of knowledge regarding telephone-based tobacco cessation services emerged. There were studies on specific populations (14, 15), studies that evaluated different types of services provided within quitlines (16, 17), those that evaluated outcomes with the use of various pharmacotherapies (18, 19), and those that looked at the effectiveness of telephonic administration of cessation therapy as a way to help people stop smoking [20, 21]. A major result of these efforts to evaluate the effectiveness of quitlines was the published declaration in the U.S. Department of Health and Human Services Clinical Practice Guideline, *Treating Tobacco Use and Dependence, 2008 Update*, that quitlines are effective, citing a meta-analysis based on nine studies [22]. This assertion was followed by the general recommendation that telephonically-administered counseling combined with pharmacotherapy are effective together in the battle against tobacco consumption [22].

Today, there are publicly-funded quitlines throughout North America that offer a range of services, including everything from single counseling calls to multiple, proactive calls; no free pharmacotherapy to full courses of medication extending over months; stand-alone web-based programs to integrated telephone and web-assisted tobacco interventions; and use of the latest technology via text-messaging [23, 24]. The variety of services provided, as well as the variation in populations served, depends for the most part on the availability of funding by states or provinces. While there are data to support certain interventions, funding is simply not available to provide the full spectrum of effective services to every tobacco user in every state or province. Naturally, this situation leads funders to offer the most cost-effective services.

## **COST-EFFECTIVENESS OF QUITLINES**

Cost-effectiveness analyses are an essential part of any quality improvement process for new interventions that might be considered for tobacco cessation programs. It is no longer acceptable to simply state that an intervention is effective. Facing budgetary restrictions, it is also critical to demonstrate that new interventions are cost-effective and present greater efficiencies than existing ones. Given the huge healthcare burden associated with smoking, it may seem intuitive that tobacco cessation programs are cost-effective. However, the first basic question for any funding agency is whether or not they are cost-effective at all. There have been many published papers that have either directly or indirectly evaluated this important question.

In some studies, the question of cost-effectiveness was tied to the use of pharmacologic products in addition to basic quitline services [25]. In a study by Javitz et al. (25), different doses of sustained released bupropion were evaluated as part of a comparison of written smoking cessation materials mailed to participants and a series of proactive telephone calls related to smoking cessation. In this study, either dose of medication was effective when used in addition to proactive calls, but not as effective when used with mailed materials only. Other studies conducted early in the development of quitlines evaluated programs and concluded from a scientific basis that quitline services were cost-effective in tobacco control [13, 26].

Tomson et al. (26), evaluated the cost-effectiveness of the Swedish quitline primarily in terms of cost per year of life saved. The study analyzed data over the course of 22 months and compared results from that period to published data of other smoking cessation methods. Results indicated that the quitline was a “cost-effective public health intervention compared to other smoking cessation interventions.” In April 1996, the Agency for Health Care Policy and Research recommended 15 smoking cessation interventions [9 as cited in 28]. The following year, Cromwell et al. (28), evaluated the cost-effectiveness of these interventions and published their conclusions that the more intensive the intervention, the more cost-effective the result. Quitlines, particularly those offering more intensive counseling and pharmacotherapy, were highly cost-effective in this analysis.

Several recent large studies have been performed using different analytic methods to address the critical question of cost-effectiveness of quitlines. In each of these studies the broader issue of whether or not it is reasonable to allocate public funds to tobacco cessation is the key question addressed. In December 2008, Kahende et al. (29), published an extensive review of 42 papers that address the economics of tobacco control programs. In their analyses, the authors clearly indicated that quitlines are cost-effective and cost-effectiveness increases when nicotine replacement therapy (NRT) is added to counseling. From each study, it is clear that smoking cessation efforts are, indeed, cost-effective. How much to allocate and to what specific interventions are addressed, but need to be individualized for different populations and funding situations [27-29]. A recent review by Lichtenstein, Zhu and Tedeschi presented the accumulation of data to support the effectiveness of quitline programs over the past 20 years [24].

On the basis of these published, scientifically-conducted studies and subsequent published papers, it is clear that the question of cost-effectiveness across the broad category of quitlines as an intervention has been answered positively. Perhaps the best source for reviewing the strongest evidence related to effectiveness is found in the 2008 update to *Treating Tobacco Use and Dependence*, a Public Health Service-sponsored Clinical Practice Guideline, which recommends the use of quitlines along with pharmacotherapy, as one of the best interventions for addressing tobacco dependence [22]. While papers referenced in the Guideline do not specifically address cost-effectiveness, they are the scientific basis for the conclusion for the effectiveness of quitlines in tobacco control. Subsequently, these recommendations from the federal government have been the basis for much activity in developing and implementing quitlines in both public and private settings.

## CONSIDERATIONS FOR CONDUCTING COST-EFFECTIVENESS ANALYSIS OF A QUITLINE

Even within the broad category of quitlines as an intervention, there are numerous choices regarding specific policies, procedures, and treatment options to offer tobacco users, such as frequency of calls and type and amount of pharmacotherapy. With limited available resources, decisions need to be made about the most effective *and* cost-effective approaches to tobacco cessation. Funding agencies must make difficult decisions about which programs and services to offer. There are many published papers and guidelines that have evaluated the cost-effectiveness of different interventions included in various quitline programs. In the 1996 paper by Zhu et al. (12), authors investigated whether a single counseling session was as good as multiple sessions in successfully attaining smoking cessation. The authors demonstrated that there was a dose-response relationship in providing counseling sessions in 12-month cessation rates. There have also been several studies evaluating different forms of pharmacotherapy and all have demonstrated a positive effect toward providing tobacco cessation when used in addition to counseling. In the study by Cornuz et al. (41), the authors evaluated different pharmacotherapies across several countries and found that pharmacotherapy was a cost-effective intervention in terms of cost per life-year saved.

Despite a large number of published papers, a single methodology to evaluate cost-effectiveness of different programs has not yet been established. This is partly due to various stakeholders in the process having diverse needs and perspectives. Healthcare policy makers may take a longer and broader view of the impact of smoking and methods for reducing the use of tobacco. Their interests may be across large populations and disease states and projecting costs and savings over a long period of time is useful [27, 30, 31]. However, other stakeholders may have a need for short-term evaluation of the cost-effectiveness of specific interventions, such as the use of different types of pharmacotherapy to produce a quit rate in six months [32, 33].

There have been many investigators who have used randomized, controlled study design to answer a variety of cost-related questions, ranging from benefits design to pharmacotherapy. These are typically more defined studies with smaller populations and controlled situations, using a variety of outcome measurements to evaluate cost-effectiveness. Some analyzed total program costs [32]. These analyses can be used to compare a before and after effect or to compare two specific types of interventions. As annual budget concerns become more of an issue, this type of analysis becomes more useful. Other studies have used cost per quit as a measure of cost-effectiveness [19]. In some instances, analyses are specific to a particular setting or company. In these cases, the measurements used may not apply broadly, such as measuring savings resulting from insurance savings or from decreased absenteeism [33].

Although evidence for the cost-effectiveness of NRT is fairly clear (Table 2), the challenge for funding agencies to provide program-specific evidence continues to be present. The studies above provide a basic framework for taking on this challenge to provide objective data in support of a program when existing studies are not sufficient. The following may be useful for agencies to conduct basic research on the cost-effectiveness of certain interventions:

### **Step One**

Decide on two or three potential interventions to test (e.g., counseling with or without pharmacotherapy or additional dosing levels of pharmacotherapy).

### **Step Two**

For callers who may be eligible for the interventions being tested, randomly assign them to the two or three interventions being tested.

### Step Three

Provide basic counseling services to all three groups in the same manner.

### Step Four

Assess quit rates for each of the intervention groups at a defined period of time (6 or 12 months) in the same manner as previously assessed, and by an outside agency, if possible.

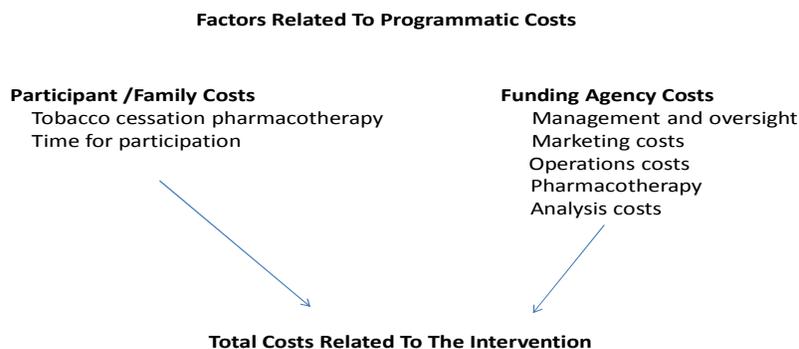
### Step Five

Assess the costs of the three interventions and divide by the number of quitters. This allows the agency to evaluate differences between the interventions for both quit rates and cost per quit. This is a rather simple process that will provide an objective answer in a fairly short period of time. (See *formula* below.)

## IDENTIFYING COSTS AND BENEFITS

While the need to perform single or ongoing cost-effectiveness evaluations exists for most programs, it is not an easily defined process. There are many considerations that must be taken into account. The basic premise in these types of analyses is that a comparison of the costs and effectiveness data for a minimum of two or more interventions will be made, even if one of these is conducting no intervention at all.

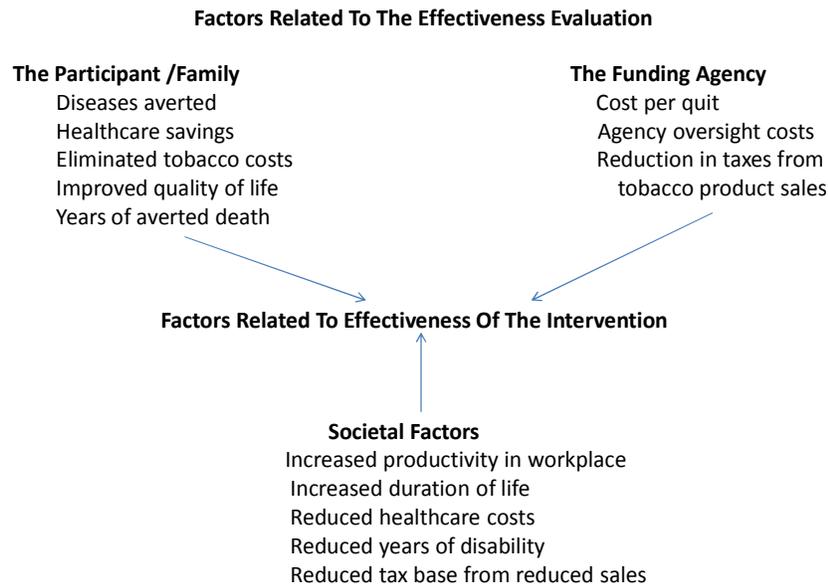
To begin, it is essential to clearly define the interventions and all associated costs and benefits. This may be difficult for some interventions as costs and benefits may not be obvious. The scope of the costs and the effectiveness measures included in any process will vary according to the interests of the stakeholders requesting the analysis and the audience for the final report. On the costs-side of the analysis there are several perspectives that might be considered [Figure 1]. There may be costs related to the tobacco user or their family members with respect to their participation in the program. There are also costs that can be attributed to the agency funding the tobacco cessation program. These can include obvious costs, such as marketing, operations, assessments and pharmacotherapy. But other costs, such as oversight and agency management duties, may not be as clear.



**Figure 1**

Costs for specific tobacco cessation program interventions can be evaluated for participants, the funding agency, and, in some cases, for the public at-large. For participants, costs associated with the intervention may be tangible and easily obtained and quantified, such as direct costs for a tobacco cessation product. Other costs may not be as tangible or as easily quantified, such as activities performed by different tobacco users during the course of the intervention. These could include changes in the home or work environment, cleaning to get rid of tobacco odors within a home or purchasing new foods to substitute for holding a cigarette. Societal costs associated with cessation interventions are also not as easily tracked and measured, such as taxes used to support tobacco cessation activities.

Measuring efficacy for tobacco cessation interventions is an area with many different potential variables and options from which stakeholders can choose. These, too, can be grouped into three basic categories: the participant (and the participant’s family) in the program; the funding agency; and the society in which the smoker resides [Figure 2]. Each has its own perspectives and potential parameters that can be used to evaluate effectiveness of the interventions. Yet, there can be significant overlap between outcomes among the groups. Ultimately, if tobacco cessation averts possible death for a participant, this is probably the most significant possible outcome of all. However, there are many outcomes related to the participants and their families than can be measured and quantified to assess efficacy. Data that might be collected directly include quit rates, direct healthcare costs for the participants and those around them, and quality of life for both the participants and their families. While quantifiable, quality of life changes are not as easy to put into economic terms. What is the economic value of feeling better or breathing better? Missed days of work and insurance premiums are also measurements that can be directly quantified or, at least, inferred.



**Figure 2**

The effectiveness of specific interventions is of high interest to funding agencies. These agencies want the most cost-effective program and services that result in the best rate of smoking cessation in the target population. Measuring the effectiveness of different interventions may have different meaning for different types of services and desired outcomes. For instance, the effectiveness of marketing efforts may be assessed by measuring how many people in a specific target population called the quitline to register for services as a result of the marketing effort. However, the funding agency may want to assess marketing costs as one factor within the entire quit process and is therefore more interested in cost per quit for each participant. In this case, it is essential to capture all relevant costs in the cessation

process, including marketing, and measure against the number of people who quit tobacco use as a result of the services provided.

In some cases, funding agents may wish to evaluate return on investment for a specific intervention [25]. These types of evaluation require cost and benefit data that can be more difficult to obtain or must be collected or inferred, such as productivity and absenteeism directly related to tobacco use, and direct healthcare costs. Return on investment analysis is not typically performed by publicly-funded programs, as healthcare savings resulting from smoking cessation interventions can be spread across stakeholder groups, such as state Medicaid and Medicare systems and private insurers. Thus, return on investment is not only accruing to the public agency directly responsible for paying for the intervention.

A typical analysis for a public funding agency might look like the following example:

$$\text{COST PER QUIT} = \frac{\text{Total costs to provide the intervention}}{\text{Number of people who quit tobacco use for a defined period of time}}$$

In many cases, the funding agency also has a broader societal perspective and wishes to evaluate beyond cost per quit. A cost-effectiveness analysis from this broad lens usually has both presumed and calculated outcomes. The basis for these analyses can be created from existing smoking cessation data and by taking known information from the present and predicting anticipated effects in the future. Some of the more common ways of projecting outcomes into the future are to evaluate cost per life-year saved (LYS) [26, 34], assessing quality-adjusted life years (QALYs) [29, 34, 35], looking at disability-adjusted life years (DALY) [29], and predicting the number of deaths averted as a result of smoking cessation [31]. These projections use the most current and relevant life span data, known costs associated with normal aging, and projected costs for those who smoke and a factor for inflation in costs over time is added [35, 36]. When evaluating papers using these calculations, it is apparent that each method is a little different from the other in how it approaches long-term calculations. Most investigators have used a discounted rate over time to account for changes in costs into the future and the rates of death due to tobacco related illnesses. These discounted rates have been the source of some controversy and certain economists have suggested a more standardized approach to their use [37].

## **CHOOSING THE RIGHT COST-EFFECTIVE ANALYSIS FOR SPECIFIC NEEDS**

With all of the methods available for evaluating cost-effectiveness of tobacco cessation interventions, how does one decide the best process to use and outcomes to measure in order to meet specific needs? There are many factors to consider before making these decisions with the most important factor likely being the resources available to conduct the analysis [Table 3]. With limited resources, both financial and analytical, a more limited approach may be necessary. Quit rates and cost per quit are relatively easy to obtain. In most cases, quit rates are part of the routine assessments performed by quitline vendors. Using cost per quit as an effectiveness measure requires an evaluator to gather all of the cost elements related to the quitting process, which can sometimes be difficult. However, both of these analyses can provide information rather quickly about a finite process in a finite timeframe and can be the basis for most intervention comparisons. For a more global evaluation of the long-term effects of a tobacco intervention, more resources are needed to gather appropriate and relevant data and to perform a variety of analyses that can look into future effectiveness parameters, such as healthcare savings, improved work performance, quality of life measures and time of averted death. There are modeling software packages that can help in these processes, but analytical support (usually a trained statistician familiar with tobacco control studies and analyses) is required to perform them [38, 39].

When considering the best methodology for a cost-effectiveness analysis, the audience for the results should be considered. Will the final report be used by a group that funds the quitline program, such as a state legislature, that would like to focus on more immediate results and cost savings? Or would the funding agency rather look at long-term population changes and savings? Considering long-term investments in tobacco cessation programs might warrant a longer view of the impact of such programs. A discussion among those who require the final reports, prior to initiating a cost-effectiveness study, will often provide insight as to the best methodology to follow.

In some cases, the analysis is being performed for a scientific, investigational purpose to further the knowledge related to tobacco cessation interventions. In this case, where a submission to a scientific publication is likely, consideration of all of the potential variables that might influence the results is even more important. Were the methods to reach the targeted smoking populations the same regardless of the intervention? Were incentives used to obtain results? In providing incentives for participation in the intervention or in the measurement process, it is important to consider whether or not they influence the overall results that are being reported. In analyzing results, consideration should be given to whether or not different regions of the country have an influence on the results of the intervention. If this is the case, is there a control for regional differences in place in the enrollment process? For instance, can you compare results in Utah to results in Kentucky? The populations in these states may view tobacco use differently and the tobacco use rates may then be very different because of those views. Do areas where smokefree laws exist have the same influence on populations as those without these laws? In some areas, there is a high excise tax placed on tobacco. This tax, alone, influences how people think about tobacco cessation [36].

In almost all of the methods used for assessing cost-effectiveness, it is essential to choose a representative comparison group. For the data to be meaningful, the comparison group has to have the same or very similar demographics and attributes as the population receiving the intervention. In many cases, those in the comparison group are individuals who have chosen or been randomized to a lesser intervention. A typical comparison is between results obtained from a self-help intervention group or a limited intervention group and the “active” intervention group that receives the full intervention in a population with similar geographic and demographic variables [40, 41]. If those in the comparison group had a choice about whether or not to utilize the lesser intervention, there may be a selection bias as these individuals may have a different set of values and motivations regarding tobacco cessation. If the analysis is for scientific purposes, randomization into the intervention and comparison groups helps solve this issue. Differences in motivation and socioeconomic group can be important factors when calculations are considered for future effects on life span, quality of life measurements, and healthcare costs.

A significant potential problem in performing these analyses is the inevitable consequence of having cost-effectiveness data analysis compared to the published or public results of similar programs. Often, those not familiar with the complexities of quitline interventions will think that a comparison between quitline programs is a simple process. What is not considered are the many different types of tobacco cessation services delivered by quitlines across the country. The number of calls provided by various programs can have a significant effect on outcomes [12]. Some quitlines provide free pharmacotherapy of one form or another in varying durations. The demographics of the various programs differ tremendously. Some programs offer services to all callers and others only to specific, underserved populations. Thus, comparisons must be sure to evaluate similar products and have full knowledge of possible variables or there is a danger of reaching erroneous conclusions. Unfortunately, those making these comparisons often do not have the information about these programs needed to make informed evaluations and decisions. The consequences of these decisions can dramatically affect programmatic and funding decisions. This point alone emphasizes the need for well-performed cost-effectiveness analyses that have valid methodologies and present all relevant data.

## SUMMARY AND RECOMMENDATIONS

In 1964, the Surgeon General of the United States published the first report on the health effects of smoking. Since that time, numerous updates from the Office of the Surgeon General have been published [42]. There is no longer any question regarding the enormous healthcare burden caused by tobacco use in this country, irrespective of the protestations of the tobacco industry to the contrary. As a result of this significant and growing burden, programs for the reduction of tobacco use have been developed and implemented worldwide, including the formation of telephonic-based programs that offer a variety of tobacco cessation services. As the variety of interventions for tobacco cessation grows and financial resources shrink, the need to be able to accurately assess and compare interventions from a cost-effectiveness perspective also grows. It has been clearly demonstrated that quitline programs are cost-effective. However, it is also clear that there are many different ways that quitlines operate, providing a fairly significant variety of programs and services. Whether to develop new services or evaluate the cost-effectiveness of providing a certain level of pharmacotherapy in addition to counseling, the need for these types of analyses will be an ongoing part of quitline operations. It is critical, with multiple methodologies to perform cost-effectiveness evaluation, to choose the most appropriate methodology. Making a decision on the best method for conducting the evaluation will depend on several factors which include, but are not limited to:

- *the availability of resources;*
- *the questions that must be answered from a short-term or long-term perspective;*
- *the need to establish a comparison group; and*
- *the availability of data for analysis.*

It is essential to define the purpose of the evaluation and the expectations of the audience that will make use of it. From this initial analysis of the process, the methodology will become clear and the final product will be of more value. Cost-effectiveness analyses are an essential part of the quality improvement process for all new interventions that might be considered for tobacco cessation programs. It is no longer acceptable to simply state that an intervention is effective. Facing budgetary restrictions, it is also critical to demonstrate that new interventions are cost-effective and present greater efficiencies than existing ones. It is through these ongoing analyses that new and effective programs will be developed, implemented and reviewed.

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