Introduction
CHAPTER 1

Introduction

Purpose

CDC developed this publication to help state and territorial health departments plan and evaluate state tobacco control programs. This publication is a companion to Best Practices for Comprehensive Tobacco Control Programs, Introduction to Program Evaluation for Comprehensive Tobacco Control Programs, and Surveillance and Evaluation Data Sources for Comprehensive Tobacco Control Programs.1–3

Audience

The primary audiences for this publication are (1) planners, managers, and evaluators of state programs to prevent or control tobacco use and (2) CDC’s national partners in the fight against tobacco use.

The National Tobacco Control Program

As part of its mission to reduce the incidence of tobacco-related disease and preventable death, CDC created the National Tobacco Control Program (NTCP) to encourage coordinated, nationwide activities. The goal of the NTCP is to reduce tobacco-related disease, disability, and death. This overarching goal is subdivided into four goal areas:

► Preventing initiation of tobacco use among young people.
► Eliminating nonsmokers’ exposure to secondhand smoke.
► Promoting quitting among adults and young people.
► Identifying and eliminating tobacco-related disparities.

For more information on the NTCP, see Appendix A.

Logic Models

As explained in Introduction to Program Evaluation for Comprehensive Tobacco Control Programs, logic models depict the presumed causal pathways that connect program inputs, activities, and outputs with short-term, intermediate, and long-term outcomes.2 An example of a basic logic model is provided in Figure 1.

To help tobacco control programs with planning and evaluation, we updated logic models previously published in the Introduction to Program Evaluation for Comprehensive Tobacco Control Programs.
We numbered the outputs (direct results of program activities) and outcomes in each logic model to allow for easy reference in discussing the links between logic model components.

The logic models for the NTCP’s goal areas can be used in several ways:

- To see the links between program activities; outputs; and short-term, intermediate, and long-term outcomes.
- To identify relevant short-term, intermediate, and long-term outcomes.
- To assist in selecting indicators to measure outcomes.

**Outcome Components**

The outcome components in the logic models are categorized as short-term, intermediate, or long-term to indicate a presumed causal sequence.

For each outcome component, we provide an outcome overview in which we summarize the scientific evidence in support of the assumption that implementing the program activities shown in the NTCP logic model for a particular goal area will lead to the short-term or intermediate outcomes shown in the same NTCP logic model. In turn, achieving the short-term and intermediate outcomes will affect the long-term outcomes in the logic model. For example, if a program is working with the example logic model shown in Figure 1 and the program selects outcome component 7 as its intermediate outcome, program activities designed to achieve changes in short-term outcomes 4, 5, and 6 (linked vertically on the logic model) should lead to changes in outcome 7 (linked horizontally with outcomes 4, 5, and 6 on the logic model). Indeed, not only will changes to outcomes 4, 5, and 6 affect outcome 7, but they will also affect intermediate outcome 8 as well as long-term outcomes 9 and 10 and distal outcomes 11 and 12. Distal outcomes are the last two outcomes in each logic model. They are the longest-term outcomes and are the same for the first three NTCP goal areas.

**Indicators**

Outcome indicators are specific, observable, and measurable characteristics or changes that represent achievement of an outcome. For example, if your program is trying to increase restrictions on young people’s access to tobacco and you measured the proportion of jurisdictions with policies that control the location, number, and density of retail outlets that sell cigarettes, the result would indicate the extent of your progress toward creating restricted access policies in all jurisdictions.

Most indicators we discuss in this publication are useful for measuring progress toward reducing cigarette use. However, we encourage programs to broaden their surveillance and evaluation activities to include measuring all forms of tobacco use, including spit tobacco (smokeless), bidis, small cigars, and loose tobacco (roll your own).

In this publication, indicators are organized by outcome component in the logic models for goal areas 1, 2, and 3 of the NTCP. We list indicators for only the first...
three NTCP goal areas because the logic models for these goal areas focus on evaluating and measuring the effects of a state tobacco prevention and control program. The focus of the logic model for goal area 4 (page 271) is on developing and increasing organizational capacity to plan and implement activities to identify and eliminate tobacco-related disparities. Currently, few well-established, evidence-based indicators are available for measuring a program’s success in increasing organizational capacity in this area. See Chapter 5 for more details.

Indicators to measure distal outcomes in each goal area (i.e., reduced tobacco-related morbidity, mortality, and disparities) are not included in this book for two reasons. First, the research base establishing linkage between behavioral outcomes (e.g., reductions in tobacco consumption and tobacco use prevalence) and the distal outcomes is well established. Therefore, tobacco control programs need to demonstrate only an effect on behavioral outcomes and they can assume that these will lead to favorable health effects. Second, we determined that the greatest expressed needs of the states for evaluation assistance would be addressed by identifying short-term and intermediate outcome indicators.

This does not mean that programs should not monitor their effect on the distal outcomes in the NTCP logic models. Although some tobacco-related diseases (e.g., lung cancer) are slow to be affected by tobacco prevention and control programs, many positive health effects are realized relatively quickly (e.g., reductions in the risk of cardiovascular disease and low birthweight in babies). Some long-standing programs (e.g., California Tobacco Control Program) have been able to show an effect on long-term outcomes, but most states have not had comprehensive programs in place long enough to show such effects.

We also do not intend to imply that measuring outcomes is sufficient for evaluating a tobacco control program. It is not. Equally important is process evaluation, which focuses on measuring program implementation. (See Introduction to Program Evaluation for Comprehensive Tobacco Control Programs for information on process evaluation.) CDC has begun researching indicators for use in process evaluation. See Chapter 5 for a brief discussion of this topic.

Program managers and evaluators who want to evaluate their progress toward NTCP goal area 4 (identifying and eliminating tobacco-related disparities) can do so by using the indicators for the other three goal areas and analyzing the data gathered by race, ethnicity, or tobacco-related disparity. For example, by measuring the level of confirmed awareness of media messages on the dangers of secondhand smoke (indicator 2.3.1) across various racial populations, evaluators can learn whether the messages’ reach varied among racial groups.

**Indicator Selection and Rating**

CDC proposed a set of outcome indicators and engaged a panel of 16 experts in tobacco control practice, evaluation, and research to assess each indicator on the basis of the following criteria: strength of evaluation evidence, utility, face validity to policy makers, conformity with accepted practice, uniqueness, overall quality, and how essential the indicator is for evaluating state tobacco control programs.
The experts also indicated the level of resources needed to collect and analyze data on the indicator. In addition to rating the indicators that CDC proposed, the experts suggested other indicators and sources of data for those indicators.

CDC reviewed the experts’ responses, comments, and suggestions and compiled the results into an individual rating across criteria for each indicator. A few indicators, however, have no ratings because they were added at the suggestion of the experts after the rating process was complete. These indicators have the symbol NR after their numbers.

In addition, the experts’ ratings showed that the criterion “essential for evaluation” was highly correlated with “overall quality” and is therefore omitted from the indicator rating tables described below. Likewise, the “uniqueness” criterion was used only to narrow the indicator lists (see Appendix B).

For a list of expert panel members, see Appendix C.

Because some reviewers said they were not familiar with all the research on all goal areas, we do not report their ratings on the “strength of evaluation evidence” criterion. Instead, under contract with CDC, the Battelle Centers for Public Health Research and Evaluation rated the strength of scientific evidence that supports using each indicator to measure a downstream outcome of a tobacco control program. This information can be found in the indicator rating tables (described below) for each outcome in the related logic model.

For detailed information on how CDC selected indicators, how the expert panelists and Battelle Centers for Public Health Research and Evaluation went about their tasks, and how the ratings were calculated, see Appendix B. Also in Appendix B is a full explanation of how CDC compiled the indicator ratings.

### Figure 2: Example of Rating Table

**Outcome 7**

**Increase in Anti-tobacco Policies and Programs in Schools**

<table>
<thead>
<tr>
<th>Number</th>
<th>Indicator</th>
<th>Overall quality</th>
<th>Resources</th>
<th>Utility</th>
<th>Effectiveness</th>
<th>Face validity</th>
<th>Acceptability</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7.4</td>
<td>Proportion of schools or school districts that provide program-specific training for teachers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Indicator Rating Tables**

For each outcome component of the logic models, we provide an indicator rating table. In each table is a list of all the indicators associated with the outcome component and the ratings for each indicator by criterion. Using this table makes it easy to compare all the indicators for one outcome. The number and name of each relevant indicator is provided in each table, as are graphic displays of the criteria scores for each indicator.

An example of an indicator rating and an explanation of how to read it is provided in Figure 2.
The following are definitions of the criteria on which the ratings are based:

- **Overall quality.** The general worth of the indicator as it relates to evaluating state tobacco control programs.

- **Resources needed.** Dollar signs show the amount of resources (funds, time, and effort) needed to collect and analyze data on the indicator using the most commonly available data source: the more dollar signs (maximum four), the more resources needed. The dollar signs do not represent specific amounts because the actual cost of measuring and analyzing an indicator varies according to the existing capacity of a state health department or organization to evaluate its programs.

- **Strength of evaluation evidence.** The degree to which scientific evidence supports the assumption that implementing interventions to effect change in a given indicator (e.g., proportion of schools or school districts that provide program-specific training for teachers) will lead to measurable downstream outcome (e.g., reduced susceptibility to experimentation with tobacco products).

- **Utility.** The extent to which the indicator is useful for answering evaluation questions for comprehensive state tobacco control programs.

- **Face validity.** The degree to which data on the indicator would appear valid to tobacco program stakeholders, such as policy makers.

- **Accepted practice.** The degree to which using the indicator to measure a tobacco control program’s progress is consistent with accepted practice.

In addition, certain symbols are associated with some of the ratings:

- An asterisk (*) indicates low reviewer response: if less than 75% of experts rated the indicator or if more than 75% of experts gave a certain criterion an invalid rating (e.g., “don’t know”), we considered the indicator to have low reviewer response. A low response suggests a high degree of uncertainty among raters. An example of such an indicator is 2.3.2: Level of receptivity to media messages about secondhand smoke.

- A dagger (†) indicates a low level of agreement among reviewers: if less than 75% of the valid ratings were within one point of each other, we considered the rating to have a low level of agreement. An example of an indicator with a low level of agreement is 1.6.3: Proportion of students who would ever wear or use something with a tobacco company name or picture. This low level of agreement represents a relatively high degree of variability in the raters’ responses for the criterion.

- A diamond (◊) indicates that the “resources needed” rating for this indicator was modified by CDC after the experts provided their ratings for this criterion. An example of such an indicator is 1.9.1: Extent and type of retail tobacco advertising and promotions.
Indicator Profiles

Each indicator listed in this publication is associated with one short-term, intermediate, or long-term outcome component in a specific logic model for each of the NTCP’s first three goal areas. Several indicators, however, are associated with more than one NTCP goal area. These indicators may have different indicator ratings, depending on the NTCP goal area and logic model component. In addition, the number of indicators for each logic model component varies considerably; some have only one indicator, while others have many.

For each indicator, we provide an indicator profile. These profiles provide detailed information about each indicator, as follows:

- Indicator number and name. Each indicator is uniquely identified by three numbers. The first number represents the goal area, the second number represents the outcome component within the goal area logic model, and the third number represents the indicator. For example, indicator 1.6.3 is number 3 on the list of indicators associated with outcome component 6 in the logic model for NTCP goal area 1.

- Outcome component. The title of the outcome component (i.e., logic model box) is provided in the logic model.

- What to measure. A description is included of what to measure in order to gather data on the indicator.

- Why this indicator is useful. The rationale is provided for using the indicator as a measure of a specific outcome in the logic model.

- Example data source(s). Listed are some example surveys and sources of data to measure the indicator as well as the population from which the data could be collected (if not apparent from the title). Most sources we list are well known and widely used state or national surveys or surveillance systems. We also list non-standardized topic-specific data sources (e.g., media tracking, policy tracking, worksite surveys, environmental scans, and other tobacco-related state surveys) that may not be widely used by state tobacco programs but can be useful for evaluation. If similar survey questions are in multiple data sources, we list the data source most commonly available to state tobacco control programs. In addition to measuring the suggested indicator, evaluators may want to collect demographic data such as survey respondents’ age, sex, race, ethnicity, and city or county of residence.

- Population group(s). The population group(s) include(s) the individuals from which data about this indicator are most commonly collected, if applicable.

- Example survey question(s). These are usually survey questions from state or national surveys or surveillance systems. When appropriate, the range of possible responses to the survey questions is also given. If no state or national survey has an appropriate question, we created an example question.

- Comments. Here we provide any additional information we have on this indicator. For example, we may suggest other uses for the indicator, the indicator’s limitations (if any) as a measure of a program’s progress, or sources of information on data collection methods.
Reviewers’ ratings. The rating tables include the criterion ratings given to the indicator by the panel of experts and Battelle Centers for Public Health Research and Evaluation (“strength of evaluation evidence” criterion only).

Using This Book to Plan a State Tobacco Control Program Evaluation

State tobacco control program managers need to evaluate their programs to demonstrate their effects, account for their funding, and improve their programs. Effective tobacco control programs require careful planning, implementation, and evaluation. To develop a successful program and a useful evaluation, program staff and program evaluators must work collaboratively on program planning and evaluation planning. A strong evaluation will not salvage a weak program, and a strong program cannot be proven effective without a defensible evaluation.

Managers and evaluators can use this publication to help them select the program’s outcomes and the key indicators for evaluating the program’s success in achieving the selected outcomes. Programs need to avoid two common pitfalls: (1) choosing interventions without sufficient plans or funds for evaluation; and (2) only selecting indicators primarily for research purposes rather than for program evaluation.

Seven major steps are involved in planning an effective program and program evaluation. The order in which each step is taken can vary depending on the program’s circumstances. For example, the first step of a program with limited funds for evaluation might be to examine the indicator rating tables to see which indicators require the fewest resources for data collection and analysis. Alternatively, the first step might be to review Appendix D (Data Source Indicator Table) to determine which indicators are being measured by surveillance and evaluation methods already in place in the state. Another program might be given funds specifically to reduce nonsmokers’ exposure to secondhand smoke. Since the funders selected this program’s long-term outcome, the planners’ first step could be to examine the logic model of goal area 2 (eliminating nonsmokers’ exposure to secondhand smoke) to select the short-term and intermediate outcomes they will work toward achieving.

Below are the seven major steps involved in planning and evaluating a state tobacco control program. This book provides assistance for steps 1–4 and step 7.

States are not restricted to addressing one goal area. In fact, we encourage programs to work across several goal areas. However, it is best to go through the steps separately for each selected goal area and then consider program strategies and indicators across goal areas. This approach can help produce efficiencies of scale in both operating programs and in evaluating them.

Step 1. Select the NTCP goal area that suits your program best.

Look at the logic models for each NTCP goal area carefully, keeping in mind that we do not list outcome indicators for goal area 4 in this publication (see page 5 in this chapter and page 269 in Chapter 5 for an explanation). For program planning, it is often helpful to read logic models backward; that is, begin with the long-term outcomes and trace a causal pathway back through intermediate outcomes, to short-
term outcomes, to program outputs and program activities. After reviewing the logic models and your state’s circumstances (e.g., political situation, resources, and tobacco-related statistics), select the goal area(s) that best fit your state’s needs.

Step 2. Select long-term outcomes for your program.

Read the outcome overviews for the long-term outcome components in the selected goal area’s logic model. This information will help you understand the rationale and empirical support for the logic model pathway that links specific program activities with specific outcomes. If you need more information, read some of the related articles listed after the references for each outcome overview in the section titled “For Further Reading.” Then, on the basis of this information, select one or more long-term outcomes, again keeping in mind your state’s circumstances, resources, and needs.

Step 3. Select short-term and intermediate outcomes for your program.

Read the outcome overviews for each short-term and intermediate outcome component that is linked to your selected long-term outcomes. If you need more information, read some of the related articles listed after the references for each outcome overview in the section titled “For Further Reading.” Based on what you have read and your program’s circumstances, select short-term and intermediate outcomes that will lead to your selected long-term outcomes.

Step 4. Select indicators of progress toward your selected short-term, intermediate, and long-term outcomes.

Examine the indicator rating tables relevant to the long-term, intermediate, and short-term outcomes you have selected. Compare ratings pertaining to the indicators’ overall quality, resources needed, strength of evaluation evidence, utility, face validity, and accepted practice. Select candidate indicators and learn more about them by reading each indicator profile. On the basis of your reading and your program’s circumstances, select indicators to show progress toward your selected short-term, intermediate, and long-term outcomes.

Step 5. Select or design activities to achieve your selected outcomes.

Program activities should be designed to achieve intended outcomes. To learn more about designing, planning, and implementing evidence-based tobacco control activities, managers and evaluators should refer to several evidence-based publications, such as:

- Best Practices for Comprehensive Tobacco Control Programs
- Reducing Tobacco Use: A Report of the Surgeon General
- The Guide to Community Preventive Services: Tobacco Use Prevention and Control
- Treating Tobacco Use and Dependence: Clinical Practice Guideline
We also encourage managers and evaluators to contact their state’s program consultant at CDC.

**Step 6. Implement your selected intervention activities.**

Program staff should implement intervention activities and monitor them to determine the degree to which activities have been implemented as intended.\(^{11}\)

**Step 7. Evaluate your progress toward achieving your selected outcomes.**

Monitor indicators selected in step 4 to assess your program’s progress over time and to compare your data with those of other states. Focus your evaluation design on answering your evaluation questions within your state context by creating program objectives. Good program objectives are SMART (i.e., they are specific, measurable, achievable, relevant, and time-bound). An example of a SMART objective is increasing the percentage of young people in a given state who have confirmed awareness of anti-tobacco messages on the dangers of secondhand smoke from 25% in January 2005 to 50% in January 2006. For more information on creating SMART objectives, see *Introduction to Program Evaluation for Comprehensive Tobacco Control Programs*\(^2\).

### The Importance of Merging Program and Evaluation Planning Early in the Program Planning Process

When a program is organized and planned on the basis of the goal area’s logic model, managers and evaluators essentially have an outline of their outcome evaluation plan early in the program planning process. As the program evolves, managers and staff can make adjustments to program activities and, at the same time, the evaluation plan. Evaluation data can be used to show the program’s effect and to inform planning and implementation of program activities.

For information on program planning, see the publications listed in step 5 (page 10).
Planning an Evaluation of a State Tobacco Control Program:  
A Hypothetical Example

In this example, assume that recent data from a state’s adult tobacco survey show an increase in nonsmokers’ exposure to secondhand smoke among adults, and state legislators are concerned about this increase. The legislators let it be known that new funds may become available if the state tobacco program can show that it is effective in reducing nonsmokers’ exposure to secondhand smoke.

On the basis of these factors, the state tobacco control program follows the steps described above:

Step 1. Select the NTCP goal area that suits your program best.

The legislature is providing funds specifically to eliminate nonsmokers’ exposure to secondhand smoke. Therefore, the state tobacco control program chooses NTCP goal area 2: Eliminating nonsmokers’ exposure to secondhand smoke.

Step 2. Select long-term outcomes for your program.

Program staff and evaluators review the logic model for NTCP goal area 2 (page 123) and select two long-term outcomes that they aim to achieve:

- Outcome 7. Reduced exposure to secondhand smoke
- Outcome 8. Reduced tobacco consumption

To learn about these long-term outcomes, they study the relevant outcome component overviews (pages 174 and 184) and read several articles listed after the references for each overview in the section titled “For Further Reading.”

Step 3. Select short-term and intermediate outcomes for your program.

Following our recommendations, the program planners and evaluators read the logic model for NTCP goal area 2 backward (starting at long-term outcomes) to select intermediate and short-term outcomes. They select one intermediate outcome:

- Outcome 6. Compliance with tobacco-free policies

This outcome serves as a funnel between the long-term outcomes (selected in step 2) and three short-term outcomes in the logic model of NTCP goal area 2:

- Outcome 3. Increased knowledge of, improved attitudes toward, and increased support for the creation and active enforcement of tobacco-free policies
- Outcome 4. Creation of tobacco-free policies
- Outcome 5. Enforcement of tobacco-free public policies
The program planners and evaluators understand that achieving one or more of these short-term and intermediate outcomes will lead to achieving the selected long-term outcomes and then to the distal outcomes of reducing tobacco-related morbidity and mortality and decreasing tobacco-related disparities. The planners and evaluators select the suggested short-term and intermediate outcomes with the intention of learning more about them before making a final decision about which outcomes are most relevant to their program.

The planners and evaluators read the outcome component overviews on the candidate short-term outcomes (pages 127, 147, 159) and intermediate outcome (page 165). They also read several of the articles listed after the references for each outcome component overview in the section titled “For Further Reading” to determine the degree to which selected outcomes are relevant to their program.

**Step 4. Select indicators of progress toward your selected short-term, intermediate, and long-term outcomes.**

Next, the planners and evaluators look at the list of indicators associated with each selected outcome component (3–8), and they begin with outcome 3.

First the planners and evaluators examine the indicator rating table for outcome 3 (page 131). By doing so, they can assess which indicators meet the criteria (e.g., overall quality, resources needed, strength of evaluation evidence, utility, face validity, and accepted practice) that are most important to the program. Because the available funds are not sufficient for an expensive evaluation, the planners pay special attention to the “resources needed” criterion in the indicator rating table to avoid selecting indicators that are too costly to measure. In addition, since the state legislature expressed an interest in this effort, program managers want to select indicators that have a high rating for face validity to policy makers.

Before making a decision about which indicators to select, however, the planners and evaluators read the information in the indicator profiles associated with outcome component 3 (pages 132–146).

The planners and evaluators realize that data collection for all the indicators would be equally expensive if they were to design and implement a new survey. But, because they have studied the indicator information carefully, they realize that three indicators associated with outcome component 3 can be measured using CDC Recommended Questions in the State’s Adult Tobacco Survey:

2.3.5  Proportion of the population that thinks secondhand smoke is harmful

2.3.6  Proportion of the population that thinks secondhand smoke is harmful to children and pregnant women

2.3.7  Level of support for creating tobacco-free policies in public places and workplaces
Another indicator can be measured using CDC’s Recommended Questions in Supplemental Section D: Environmental Tobacco Smoke in the State’s Adult Tobacco Survey:

2.3.4 Proportion of the population willing to ask someone not to smoke in their presence

In addition, another indicator can be measured using the CDC’s Recommended Questions in Supplemental Section F: Policy Issues in the State’s Adult Tobacco Survey:

2.3.10 Level of support for creating policies in schools

The planners and evaluators also understand that short-term changes in the knowledge and attitudes of young people are important contributors to successful enforcement of, and compliance with, tobacco-free policies. They therefore decide to monitor indicator 2.3.5, which can be measured using CDC’s Recommended Core Questions in the State’s Youth Tobacco Survey:

2.3.5. Proportion of the population that thinks secondhand smoke is harmful

The planners and evaluators use the same process to select indicators for each of the other selected outcome components (4, 5, 6, 7, and 8).

Step 5. Select or design activities to achieve your selected outcomes.

The program planners select and design evidence-based interventions, such as countermarketing campaigns focused on the dangers of secondhand smoke; activities to create tobacco-free school, home, and workplace policies; and activities to mobilize decision makers to promote bans on secondhand smoke. See Appendix A for more information on program strategies.

Step 6. Implement your selected intervention activities.

The program staff implements the intervention activities and continuously monitors (1) whether the activities are being implemented as intended and (2) the extent to which the program is reaching its target audiences.

Step 7. Evaluate your progress toward achieving your selected outcomes.

The planners and evaluators translate indicators into SMART program objectives. For example, for indicator 2.3.7 (level of support for creating tobacco-free policies in public places and workplaces), they create the following objective: Increase the percentage of adults in the state who believe that smoking should not be allowed at all in indoor workplaces from 20% in January 2005 to at least 50% in June 2006. In addition, the planners and evaluators measure the selected indicators, track changes over time, and compare their data to data from similar states.
References


