IV. Surveillance and Evaluation

Justification

Publicly financed programs need to have accountability and demonstrate effectiveness, as well as have access to timely data that can be used for program improvement and decision making. Therefore, a critical infrastructure component of any comprehensive tobacco control program is a surveillance and evaluation system that can monitor and document key short-term, intermediate, and long-term outcomes within populations.[1,2] Data obtained from surveillance and evaluation systems can be used to inform program and policy direction, demonstrate program effectiveness, ensure accountability to those with fiscal oversight, and engage stakeholders.[2-6]

Surveillance and evaluation planning may be integrated into the overall strategic plan of a comprehensive tobacco control program and be compatible and comparable with systems in other states and nationally.[2] A strategic plan, with well-defined goals, objectives, and outcomes, requires appropriate data collection methods that can monitor the program, as well as evaluate key outcome indicators in a valid manner.[7]

Additionally, the collection of baseline data related to each objective and outcome indicator is critical to ensuring that program-related effects can be clearly measured.[3,5] For this reason, surveillance and evaluation systems must have priority in the strategic planning process.

Surveillance

Surveillance is the process of continuously monitoring attitudes, behaviors, and health outcomes over time.[8] Although data gathered by surveillance systems can be useful for evaluation, they serve other purposes besides evaluation. For example, data collection for the purposes of evaluation is more flexible than for surveillance and may allow program areas to be assessed in greater depth. Statewide tobacco control surveillance programs should consider monitoring the achievement of the four overarching goals of comprehensive tobacco control programs:

- Preventing initiation among youth and young adults
- Promoting quitting among adults and youth
- Eliminating exposure to secondhand smoke
- Identifying and eliminating tobacco-related disparities among population groups

Implementing state surveillance systems, such as the Behavioral Risk Factor Surveillance System (BRFSS), Youth Risk Behavior Surveillance System (YRBSS), Pregnancy Risk Assessment Monitoring System (PRAMS), and the Adult or Youth Tobacco Surveys (ATS, YTS), affords each state the opportunity to collect data on tobacco use behaviors and other important risk factors and health outcomes.[9–11] Data from these systems also allow a state to compare its individual program impact and long-term tobacco indicators with other states as well as with national benchmarks from national surveillance systems. In addition to the standard core questions included in these surveys, there is flexibility to add state-specific questions and modules. States also have the flexibility to increase sample size in order to capture local and specific population data or to provide more data on intermediate performance outcomes.

Evaluation

Evaluation has been defined as the systematic collection of information about the activities, characteristics, and results of programs to make judgments about the program, improve or further develop program effectiveness, inform decisions about future programming, and/or increase understanding.[12] Evaluation data can be used for assessing the effectiveness of individual program activities, program improvement, decision making, and to engage stakeholders. However, in order to do all these things, a written evaluation plan must first be integrated with the overall strategic plan. An effective evaluation plan:[13]

- Is collaboratively developed with a stakeholder workgroup
- Is responsive to program changes and priorities
- Covers multiple years if projects are ongoing

- Addresses the entire program rather than focusing on a single funding source, objective, or activity

States can also consider publishing their evaluation results in order to contribute to the scientific literature on best practices for tobacco control programs.[7]

A typical approach to evaluation in public health is to design data-collection systems that monitor progress toward meeting a program's process and outcome objectives.[8] Process evaluations are used to document how well a program has been implemented and are conducted periodically during a program.[8] This type of an evaluation is used to examine the program's operations, including which activities are taking place, who is conducting the activities, and who is reached through the activities. In contrast, outcome evaluations are used to assess the effectiveness of a program on the stated short-term, intermediate, and long-term objectives.[8] This type of evaluation assesses what has occurred because of the program and whether the program has achieved its objectives.

The program's stages of development must be considered in the evaluation plan, particularly when determining the appropriate evaluation questions. Outcome evaluations are best conducted only when the program is mature enough to produce the intended outcome. However, consideration for future evaluations can be included in the evaluation plan so that programs can prepare datasets and baseline information for evaluations that consider more distal impacts and outcomes.[14]

An evaluation plan can include both process and outcome evaluation questions at the same time.[14] Program evaluation also requires that a wide range of short-term, intermediate, and long-term indicators of program effectiveness be measured, including changes in policies, social norms, and exposure of individuals and communities to statewide and local program efforts. For example, evaluation efforts might include countermarketing surveillance to track new products and examine the impact of pro-tobacco influences, including tobacco product marketing, pricing, and promotion. Additional indicators for program evaluation can include, but need not be limited to, vital statistics, quitline utilization, policy compliance and enforcement, air quality, or media related measures. Practice-based criteria to be considered in the selection of indicators for monitoring and evaluation have previously been listed elsewhere.[15]

Qualities of Effective Program Evaluations[2,13,16]

- Ongoing and include a written evaluation plan that is integrated with the program's overall strategic plan.
- Flexible, adaptive, transparent, and designed to inform and engage stakeholders at each step, including implementation, interpretation, dissemination, and utilization of results.
- Focus on priority evaluation questions and not special research interests or what is easiest to implement.
- Confirm that the methods align with the evaluation questions and objectives.
- Identify credible evidence and verify its accuracy and appropriateness with stakeholders.
- Make effective use of surveillance data by linking statewide and local program efforts to monitor progress toward program objectives.
- Plan for dissemination and sharing of lessons learned throughout the evaluation process.
- Include technical assistance to disseminate information on how to implement effective evaluations to funded sites, partners, stakeholders, and local programs.

Selected Surveillance and Evaluation Resources

Surveillance and evaluation can be conducted simultaneously.[8] To assess tobacco-use prevention and control efforts adequately, states will usually need to supplement surveillance data with data collected to answer specific evaluation questions. States can collect data on, for example, knowledge, attitudes, behaviors, and environmental indicators. They can also collect information on infrastructure, program planning, and implementation to document and measure the effectiveness of a program, including its policy and media efforts. Some existing tools for both surveillance and evaluation at the state and national levels include:

Adult Tobacco Survey (ATS): ATS is a state level landline and cellular telephone survey of adults aged 18 years or older.[17] Core questions assess adults' knowledge, attitudes, and behaviors related to tobacco use, secondhand smoke exposure, use of cessation assistance, and their awareness of and support for evidence-based policy interventions.

In addition to these core questions, ATS allows for the inclusion of questions addressing state-specific program activities. CDC's *Key Outcome Indicators for Evaluating Comprehensive Tobacco Control Programs* was used to inform the development of the ATS survey.[1] CDC's Office on Smoking and Health can provide technical assistance to states regarding the administration of ATS.

Behavioral Risk Factor Surveillance System (BRFSS): BRFSS is a state-based telephone survey of non-institutionalized U.S. adults aged 18 years or older that CDC initiated in 1984.[9] Data are currently collected annually in all 50 states, the District of Columbia, and five U.S. territories. With assistance from CDC, state health departments contract with telephone call centers to conduct BRFSS surveys continuously throughout the year using a standardized core questionnaire and optional modules plus additional state-added questions. Beginning in 2011, several enhancements were made to BRFSS to ensure optimal survey coverage and validity, including the addition of cellular telephone households and improvements to the sampling methods and statistical weighting.[18]

National Adult Tobacco Survey (NATS): NATS is a landline and cellular phone survey of U.S. adults aged 18 years or older.[19] NATS was first conducted during 2009–2010, and the sample was designed to provide data representative at both national and state levels.[19] Additional waves of NATS were fielded in 2012-2013 and 2013-2014 in collaboration with FDA; however state-level estimates will only be obtainable during 2009-2010.

National Youth Tobacco Survey (NYTS): NYTS is a nationally representative school-based survey of youth in middle school (grades 6–8) and high school (9–12).[20] NYTS cannot be used to obtain state-level estimates, but estimates from the survey can serve as a national benchmark for those obtained from state YTS surveys. NYTS is a multitopic survey that includes measures that assess tobacco use, cessation, knowledge and attitudes, access, media and advertising, and secondhand smoke exposure.[1] Survey years include 2000, 2002, 2004, 2006, 2009, 2011, and 2012. As of 2012, NYTS will be fielded annually until 2017 in collaboration with FDA.

Pregnancy Risk Assessment Monitoring System (PRAMS): PRAMS is a surveillance system that CDC and state health departments have conducted in multiple phases since 1987; PRAMS data were most recently collected in 2011.[11] PRAMS collects state-specific, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy. The PRAMS questionnaire comprises two parts, including core questions that are asked by all states and a pretested list of standard questions that CDC or individual states develop. The core PRAMS questionnaire includes questions on maternal tobacco consumption.

Quitline Minimum Data Set (MDS): The quitline MDS identifies a recommended set of indicators to assist in assessing telephone quitline performance, improving the quality of telephone quitlines, identifying knowledge gaps, and designing new strategies to fill the identified gaps.[21]

State Tobacco Activities Tracking and Evaluation (STATE) System: The STATE System is an online data warehouse that includes epidemiologic data on many long-term key outcome indicators, as well as economic data and tobacco-related state legislation.[22]

Tobacco Use Supplement to the Current Population Survey (TUS-CPS): TUS-CPS is an in-person and telephone survey of U.S. adults aged 18 years and older that was administered during 1992–1993, 1995–1996, 1998–1999, 2002–2003,

2006–2007, and 2010–2011; the next wave is slated for 2014–2015.[23] These tobacco-use modules provide national and state-specific estimates on factors such as tobacco use, quit attempts, secondhand smoke exposure, smokefree policies, and clinician cessation counseling.

Youth Risk Behavior Surveillance System (YRBSS): YRBSS is a national school-based survey of middle and high school students conducted biennially by CDC.[10] YRBSS also includes state, territorial, tribal, and local surveys conducted by state, territorial, and local education and health agencies and tribal governments. YRBSS monitors six types of health-risk behaviors that contribute to leading causes of death and disability among youth and adults, including tobacco use.

Youth Tobacco Survey (YTS): YTS is a school-based, state-level survey of students in grades 6–12.[24] Core questions assess students' knowledge, attitudes, and behaviors related to tobacco use and exposure to secondhand smoke, as well as their exposure to prevention curricula, community programs, and media messages aimed at preventing and reducing youth tobacco use. In addition to the core set of questions, YTS allows for the inclusion of questions addressing state-specific program activities. CDC's *Key Outcome Indicators for Evaluating Comprehensive Tobacco Control Programs* was used to inform the development of the YTS survey.[1] CDC's Office on Smoking and Health can provide technical assistance to states regarding the administration of YTS.

In addition to the previously described surveillance and evaluation tools, several resources are available to provide guidance and support to states on the selection and implementation of appropriate surveillance and evaluation data systems.

Surveillance and Evaluation Resources

- ***Surveillance and Data Resources for Comprehensive Tobacco Control Programs*** provides a summary of tobacco-related measures, sampling frames, and methodology for multiple national and state surveys as well as tools for use in conducting surveillance and evaluation efforts.[25]
- ***Introduction to Program Evaluation for Comprehensive Tobacco Control Programs*** is a "how-to" guide for planning and implementing evaluation activities.[8]
- ***Key Outcomes Indicators for Evaluating Comprehensive Tobacco Control Programs*** provides information on selecting evidence-based indicators and linking them to program outcomes.[1]
- ***Introduction to Process Evaluation in Tobacco Use Prevention and Control*** provides guidance to states on how to evaluate inputs, activities, and outputs of a tobacco control logic model.[26]
- ***Developing an Effective Evaluation Plan*** can help public health program managers, administrators, and evaluators develop an effective evaluation plan in the context of the planning process. It is intended to be used along with other evaluation resources and is not a complete resource on how to implement program evaluation.[13] For example, disseminating surveillance and evaluation findings in brief updates or newsletters to key stakeholders may also be beneficial.
- ***Developing an Effective Evaluation Report*** can help public health program managers, administrators, and evaluators develop an effective evaluation report. It is intended to be used along with other evaluation resources and is not a complete resource on how to write reports or communicate and use your evaluation results.[14]
- ***Impact and Value: Telling Your Program's Story*** offers public health program managers practical steps for creating success stories that highlight their achievements.[27]

State-Level Examples

Surveillance and evaluation data can be used by states in multiple ways to help inform and sustain comprehensive state tobacco control programs. For example, states can collect their own state-level surveillance and evaluation data using previously developed instruments and resources, supplement existing surveillance systems with indicators related to specific state tobacco control program objectives, or utilize secondary data sources to assess key indicators and make comparisons with other states or national benchmarks. Examples of some recent state-level surveillance and evaluation activities are described below.

The New York Tobacco Control Program has fielded variations of the ATS and YTS questionnaires regularly for more than a decade. The program utilizes these data to provide a comprehensive summary of multiple key outcomes indicators in its annual *Independent Evaluation Report*.[28] These reports help to clearly and objectively illustrate the impact that the state tobacco control program has had on key outcome indicators, as well as to highlight gaps that need to be addressed in the future.

Multiple states supplement the core BRFSS questionnaire with optional modules to inform state-level tobacco control program efforts.[9] For example, in 2011, two optional modules pertaining to smoking cessation and secondhand smoke were proposed and ratified. The smoking cessation module was administered by Arizona, Guam, Kentucky, Louisiana, Maryland, and Nebraska; the secondhand smoke module was administered by Guam, Indiana, Kentucky, Louisiana, and Mississippi.

The Public Health Division of the Wyoming Department of Health recently utilized state-level data from the 2009–2010 NATS to measure progress toward attaining the objectives of Wyoming's Tobacco Prevention and Control Program. A summary of the findings were described in a comprehensive report organized according to CDC's four overarching goals for comprehensive tobacco control programs.[7,29]

Achieving Equity to Eliminate Tobacco-Related Disparities

Dissemination of surveillance and evaluation data that show disparities can be very effective in mobilizing community involvement. In order to develop effective interventions and monitor progress, most states need more information on populations disproportionately affected by tobacco use.[7] Many of the surveillance and evaluation resources described in this report include questions related to population characteristics for which tobacco-related disparities have been shown to exist, including but not limited to: race/ethnicity, educational attainment, income, occupation, geographic location, sex, age, sexual orientation and gender identity, veteran and military status, disability status, mental health status, and substance abuse conditions.

However, it is important to note that existing surveillance and evaluation methods may not provide adequate sample size or enough information to fully characterize health disparities related to tobacco use. Therefore, additional data collection systems or approaches may be needed. For example, the use of oversampling, combining multiple years of data, and qualitative methods are often necessary to adequately assess these outcomes among some population groups.

Budget

All federally funded tobacco prevention and control programs are expected to engage in strategic surveillance and program evaluation activities. To accomplish this, best practices dictate that 10% of total annual tobacco control program funds be allocated for surveillance and evaluation.

It is important that tobacco control programs develop and maintain the appropriate infrastructure to enhance their surveillance and evaluation resources as needed. For example, conducting a detailed evaluation of a specific intervention, such as a cohort study to assess the effectiveness of a media campaign, can be resource intensive.[7,30] Similarly, additional resources beyond the standard 10% of tobacco control program funds may also be required for developing increased technical capacity of local programs to perform process and outcome evaluation.[7,30] For example, in California, every grantee was required to spend 10% of its budget on evaluating its own activities. To aid this activity, the state program published a directory of evaluation consultants and funded a local program evaluation center that provides technical assistance to contractors.[31]

In addition, programs may need to be flexible in shifting funding to address new and emerging products or trends of public health concern. For example, recent increases in electronic cigarette marketing and use warrant targeted surveillance, monitoring, and evaluation that may not have been recognized if a program's plan was developed several years ago.

Realizing the national goal of eliminating tobacco-related disparities will require improved collection and use of standardized data to correctly identify disparities in both health outcomes and interventional efficacy.[7] Accordingly, additional resources may also be required to fund data collection mechanisms and standardized systems to better characterize health disparities related to tobacco use among special populations and to effectively measure progress.

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