

## Attachment 2

### Evaluation Design Document

# UPDATED EVALUATION DESIGN DOCUMENT

## DRUG-FREE COMMUNITIES SUPPORT PROGRAM NATIONAL EVALUATION

Submitted to:

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Office of Administration  
Office of National Drug Control Policy

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## EXECUTIVE SUMMARY

The Office of National Drug Control Policy (ONDCP) funds the Drug-Free Communities Support Program (DFC) to build community capacity to prevent substance abuse among our nation’s youth. The DFC program has two primary goals: (1) to reduce substance abuse among youth by addressing local risk and protective factors to minimize the likelihood of subsequent substance abuse in the community, and (2) to support community anti-drug coalitions by establishing, strengthening, and fostering collaboration among public and private nonprofit agencies, as well as federal, state, local, and tribal governments to prevent and reduce substance abuse. Currently, 769 community anti-drug coalitions are receiving DFC grants.

ONDCP commissioned a national evaluation of the DFC program with the overall goal of assessing the program’s implementation and effectiveness. Three primary objectives of the evaluation are to (1) assess whether the DFC program has made an impact on reducing the substance abuse outcomes at the community, state, and national level; (2) determine if there are specific factors that can be identified that are related to increases in substance abuse prevention; and (3) assess whether the DFC program has increased the capacity and effectiveness of substance abuse coalitions. Within these broad objectives, there are a number of specific questions and hypotheses that will be addressed by the evaluation.

An evaluation framework that is based on a review of scientific literature for conducting evaluations of substance abuse coalitions will be used to guide the evaluation. This framework is based on a maturation of development stage typology that hypothesizes a causal chain between DFC coalitions’ functions and activities and immediate, intermediate, substance use/abuse, and long-term outcomes as the coalition “matures” and develops its capacity (see Figure E1). Each component of the framework represents a measurable hypothesis for the national evaluation to assess.

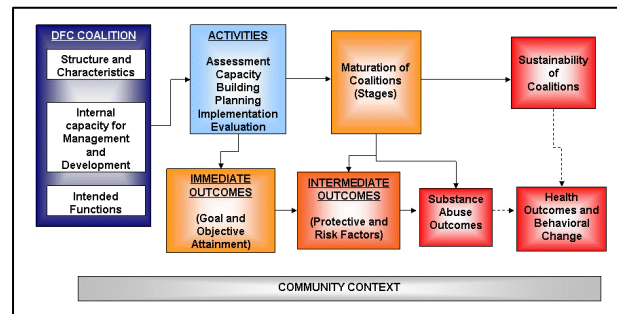


Figure E1. Evaluation Framework

Using the evaluation framework as a foundation, the evaluation will focus on assessing both a direct and indirect link of the success of the DFC Program in assisting coalitions in impacting substance abuse in their communities (see Figure E2). First, to estimate the effectiveness of the DFC program, we will examine whether the activities, initiatives, strategies, etc. of DFC coalitions have a direct impact on substance abuse outcome measures of interest, such as the proportion of youth who report using tobacco in the last 30

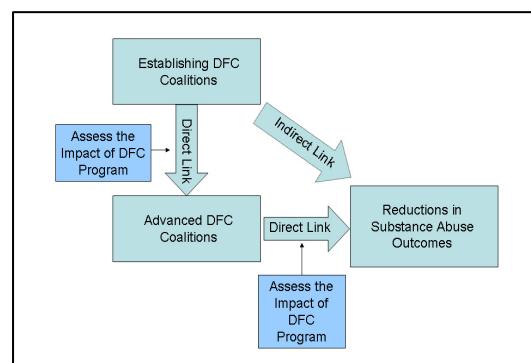
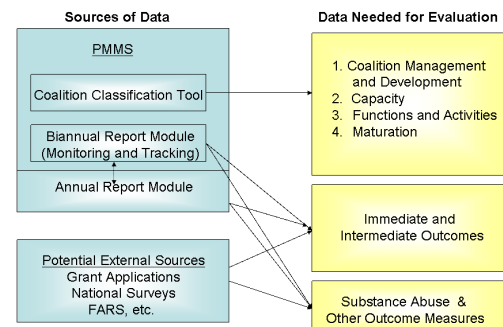


Figure E2. Overview of Evaluation Design

days. However, the greatest warrant for estimating the efficacy of the program will come from an outcomes analysis focused on those mature and sustaining coalitions that might be expected to have the greatest impact on youth substance use. Second, the indirect impact of the DFC program on enhancing grantee coalitions' ability to influence change in the community will be assessed by evaluating the degree to which coalitions participating in the DFC Program mature into advanced coalitions (i.e., build capacity). If coalitions that participate in the DFC program can be found to advance into mature coalitions, and if the link between mature coalitions and substance abuse outcomes can be established, then it would be logical and scientifically appropriate to conclude that the DFC program is effective in reducing substance abuse outcomes, directly for mature coalitions and indirectly for beginning coalitions, by fostering an environment where less mature coalitions can become mature coalitions.

The data for this evaluation will be drawn from semi-annual progress reports submitted by coalitions. This information will be collected through the use of a web-based system referred to as the Coalition On-line Management and Evaluation Tool (COMET). As illustrated in Figure E3, the COMET will capture information from coalitions on aspects related to structure and characteristics, internal capacity, intended functions, immediate and intermediate outcomes, and substance abuse outcomes in the coalition's targeted community. Semi-annual progress reports will contain information that may change on a semi-annual basis (such as coalition membership). An annual progress report will provide information on items that are expected to change less frequently, such as intermediate outcomes. Finally, a separate module of the COMET, the Coalition Classification Tool (CCT), will capture information that can be used to classify each coalition into their respective stage-of-development. Information from external sources will also be collected and utilized as part of the evaluation, particularly to obtain explanatory variables such as funding levels or comparative outcome measures, such as statewide substance abuse rates.



**Figure E3. Sources of Data for the Evaluation**

Although the information will be collected via the COMET in a standardized format, all of the information collected by the COMET represents self-reported information by coalitions. Therefore, as with any self-reported data, the quality of the data needs to be assessed prior to being used in the evaluation. One key concern is the consistency and reliability of the self-reported substance abuse outcome information. Many coalitions use different survey instruments, methods, and sample sizes for collecting and reporting substance abuse outcome information for their targeted communities. To be useful for the evaluation, inconsistencies in the various survey instruments need to be identified and resolved or these cases must be excluded. Coalitions that have employed unreliable or suspect methods when providing data will also be identified and excluded from the analysis if necessary. Finally, the variability and reliability associated with each outcome will be assessed through examining the sample sizes

that serve as a basis for each reported percentage. Outcomes that are based on too few samples to be statistically reliable also may be excluded from the analysis.

Within the evaluation framework, six different analyses will be conducted as part of the core evaluation effort: 1. exploratory/preliminary analyses, 2. assessing stage-of-development, 3. modeling substance abuse outcomes, 4. assessing additional evaluation questions and hypotheses, 5. analyses to support GPRA reporting, and 6. analysis of external data. Together, the analyses conducted for these six key areas will address the three primary objectives of the evaluation and their corresponding evaluation questions and hypotheses.

1. *Exploratory/Preliminary Analyses.* One implicit objective of this evaluation is to provide information to ONDCP and others regarding the status of the DFC program and the characteristics of the participating coalitions. This information will represent a useful context and background for the remaining analyses. It will also provide an initial overview of how the coalitions' characteristics (e.g., size, structure, degree of formalization, etc.) change over time. This information is important for refining the overall evaluation framework and stage-of-development typology.
2. *Assessing Stage-of-Development.* There are a number of steps that will be performed to assess whether DFC coalitions are maturing and to identify the characteristics associated with maturation. First, using information collected primarily through the CCT, coalitions will be classified into one of five specific stage-of-development groups; either 1) Pre-coalitions, 2) Establishing coalitions, 3) Functioning coalitions, 4) Maturing coalitions, or 5) Sustaining coalitions. This classification will be implemented using a theory-driven scale based on the hypothesized typology. Next, the quality of the classification will be assessed and the hypothesized typology refined. Significant predictors of a coalition's stage-of-development such as a coalition structure, capacity, and characteristics will be identified using statistical models. Finally, the progress of DFC coalitions in moving from the initial stages of development to more advanced stages of development will be assessed using a longitudinal model that examines trends in coalition development over time.
3. *Modeling Substance Abuse Outcomes.* Statistical models will also be used to identify significant predictors of reduced substance abuse. For example, we will assess whether being in an advanced stage of development (i.e., being a maturing or sustaining coalition) is significantly related to a decrease in the proportion of youth who report using alcohol in the last 30 days. This analysis will be conducted both for specific time points and using longitudinal models so that trends over time can be assessed.

Trends in substance abuse outcomes in communities targeted by DFC coalitions will be compared to the corresponding trends in communities that are not specifically targeted by a DFC coalition indirectly using state and national level data. This analysis differs from an approach where comparison communities are selected and matched to DFC coalition communities and a direct comparison is conducted between the two different types of communities. Employing a comparison-community type approach was determined to be

infeasible for this evaluation due to logistical considerations and resource constraints. Therefore, the evaluation will rely on extracting indirect surrogates for substance abuse outcomes for communities not targeted by a DFC coalition from existing national and state surveys to serve as a comparison to DFC communities. Although this approach will have the limitation that many of the explanatory factors will not be available for non-DFC communities, it has the decided advantage that it does not rely on a direct data collection activity conducted as part of this evaluation effort.

4. *Assessment of Additional Evaluation Questions and Hypotheses.* There are a number of additional evaluation questions that complement the three primary objectives of the evaluation. Several of these questions are focused on assessing the relationship between potential explanatory variables (e.g., coalition composition/collaboration, geographical focus of the coalition, and effectiveness of environmental strategies) and substance abuse outcomes. The other evaluation questions focus on coalition capacity and separate analyses will be conducted to investigate each of these evaluation questions. For example, the evaluation question “What evidence exists to demonstrate an increase in evidence-based programs, policies, and strategies in coalition communities?” will be addressed through examining the number of environmental strategies employed by coalitions in their first grant year to the number of environmental strategies employed by these same coalitions in subsequent years.

Assessing the impact of ONDCP’s mentoring program is hindered by the relatively small sample size associated with this program. However, the evaluation will include an attempt to assess the impact of this program by grouping the support activities of the mentoring coalitions to develop a scale related to the intensity of mentoring activities (i.e., a measure of dosage). The relationship between these intensity categories and capacity outcomes of the mentee coalitions (i.e. preparedness to implement Strategic Prevention Framework (SPF): governing body, baseline measures, strategic planning activities, collaboration of key sectors) will then be examined through exploratory analyses.

5. *Analyses to Support GPRA Reporting.* ONDCP is required to submit a Government Performance and Results Act (GPRA) report to Congress annually regarding the DFC Grant Program. Information on accomplishments towards these goals and objectives will primarily be captured through the COMET. Two types of analyses will be conducted in support of the GPRA reporting requirement. First, descriptive statistics or summaries for every data element in the COMET will be developed. Second, an analysis will be conducted to characterize progress toward reducing substance abuse in DFC communities through longitudinal models (for trends over time) and through characterizing the percentage of coalitions that have reported a positive change over time in a specific substance abuse outcome. Data collected on behalf of ONDCP prior to the initiation of this evaluation effort will be used to the extent possible as baseline information.
6. *Analysis of External Data.* There are a number of national surveys that collect information about substance abuse outcomes of interest to ONDCP. Many DFC coalitions rely on these

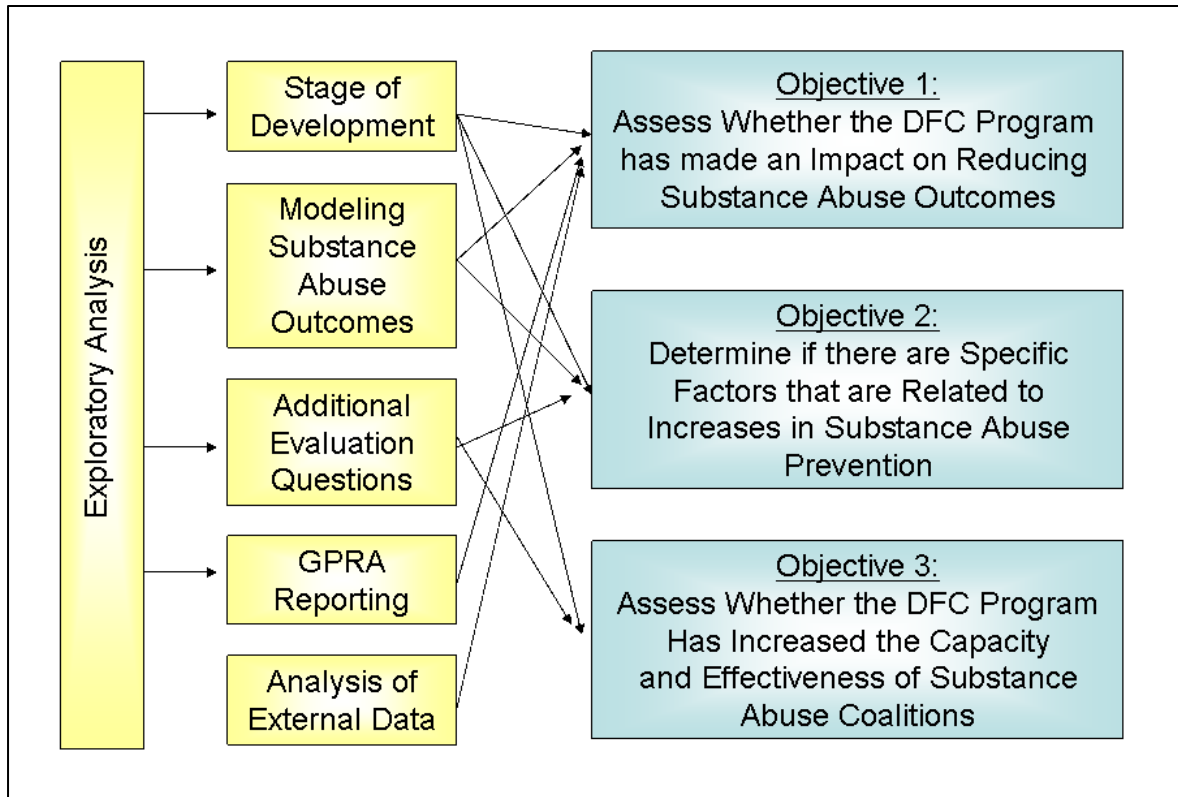
surveys for outcome measures that they then provide via their Semi-Annual Progress Report. Unfortunately, the public data sets associated with these efforts do not contain community-level data. Therefore, in January 2007, the evaluation team concluded a Feasibility Assessment, conducted to determine if community-level information could be obtained from some of the established national surveys. The results of this assessment follow.

- *Adequate data are not available from all states and therefore not all DFC coalitions could be included in the same investigation using state-collected data.* The primary design of the DFC National Evaluation and GPRA reporting require data on all DFC program grantees and their communities. Therefore, under current conditions, the use of state-collected data or sources other than grantees is not feasible at this time.
- *Data from the National Youth Risk Behavior Survey (YRBS) is only available at the state level.* Data for the National YRBS are collected at the school level, but school identifiers are removed when states send the data to the CDC. The data can be used to compare states or region; otherwise, it has limited use to the DFC National Evaluation (i.e., as a comparison for core measure trends). The National Evaluation could also consider city/county comparisons using the data from the 23 YRBS participants in local communities for secondary analysis purposes. However, the YRBS only adequately includes two of the four core measures.
- *Some states administer different questionnaires to different populations in their states, some with overlapping participants.* The use of multiple questions and questionnaires would require an extensive data coordination and cleaning task if state-collected data were to be used.
- *Frequency of data collection across and within states is so varied that only comparisons of trends would be possible.* Dates of data collection and the intervals between them are inconsistent (e.g., two or three years apart). Having diverse data collection times limits the opportunity to look at absolute changes (i.e., a net change between two times) in local, state, and youth substance abuse. The National Evaluation would have to compare trends instead, requiring the collection of multiple data points. Comparing trends would allow the evaluation to indicate how many DFC coalitions report change, the average change they report, and difference in trends between DFC communities and national, state, or local communities. However, the evaluation would not be able to quantify the actual net change that DFC coalitions have on their communities from 2004 to 2009. Grantee-provided data faces the same challenge.

A similar assessment will be conducted to investigate the feasibility of assessing the differences between DFC communities and non-DFC communities with regard to distal outcomes such as drug-related traffic fatalities, hospital discharges, etc.



The results of the statistical analyses conducted in these six key areas will address all three of the primary objectives of the analysis, and will also answer virtually all of the additional questions and hypotheses posed for this evaluation. Figure E4 summarizes how the analyses in each of these areas come together to address the objectives of the evaluation.



**Figure E4. Cross-Link Between Evaluation Analysis and Objectives**

## 1.0 INTRODUCTION AND OBJECTIVES

The Office of National Drug Control Policy (ONDCP) funds the Drug-Free Communities Support Program (DFC) to build community capacity to prevent substance abuse among our nation's youth. The DFC program has two primary goals: (1) to reduce substance abuse among youth by addressing local risk and protective factors to minimize the likelihood of subsequent substance abuse in the community, and (2) to support community anti-drug coalitions by establishing, strengthening, and fostering collaboration among public and private nonprofit agencies, as well as federal, state, local, and tribal governments to prevent and reduce substance abuse.

The DFC Support Program funded five cohorts (1998–2002) of community anti-drug coalitions in its first five-year grant cycle, an additional five cohorts in its second five-year cycle, covering the period from FY 2003 through FY 2007, and is currently in its third five-year grant cycle covering the time period 2008 through 2012. Currently, 769 community anti-drug coalitions are receiving DFC grants. The DFC program anticipates awarding approximately 90 additional grants each year through FY 2012. The focus of this document is the design of a national evaluation of the DFC Support Program to assess the program's effectiveness.

The national evaluation of the DFC Program represents a unique opportunity to collect information and perform a comprehensive evaluation with a significant number of coalitions. As such, there are many different issues and hypotheses that could be addressed by this evaluation. However, the focus of this national evaluation of the DFC program will be to examine and evaluate hypotheses related to the following three primary objectives:

- Assess whether the DFC program has made an impact on reducing the substance abuse outcomes at the community, state, and national level.
- Determine if there are specific factors that can be identified that are related to effective substance abuse prevention.
- Assess whether the DFC program has increased the capacity and effectiveness of substance abuse coalitions.

Within these broad primary objectives, there are a number of specific questions and hypotheses of interest to the evaluation including questions and hypotheses related to capacity:

- Stage-of-development: What evidence exists to demonstrate whether DFC coalitions achieve their performance targets and transition to a higher level of development? What percentage move to a higher developmental level and what is the average length of time needed to advance? What are the critical factors necessary in moving to the next stage?
- Increase in Evidence-Based Programs, Policies, and Strategies: What evidence exists to demonstrate an increase in evidence-based programs, policies, and strategies in coalition communities?

- Sustainability: What evidence exists that demonstrates the sustainability of DFC coalitions?
- Increased National Capacity: To what extent has the number of communities with established coalitions increased?
- Successfulness of the DFC Mentoring Program: What evidence exists that demonstrates a relationship between DFC mentee success and any specific mentor characteristics or activities?
- Impact of Technical Assistance on Data Collection, Application, and Implementation of Environmental Strategies: What evidence exists that supports or negates an association between the provision of technical assistance and increased data collection and application and/or use of evidence-based strategies by coalitions? Does receiving technical assistance increase the likelihood that a new coalition will subsequently obtain new DFC funding? Do these relationships vary with the source of the technical assistance?

There are also several evaluation questions and hypotheses related to community outcomes including:

- Relationship Between Activities and Reduction in Substance Abuse Rates: What evidence exists to demonstrate a relationship between DFC coalition activities and reductions in substance abuse rates in their target communities for:
  - 30-day use (tobacco, alcohol, marijuana)
  - Age of onset (tobacco, alcohol, marijuana)
  - Other use measures
- Relationship Between Activities and Improvements to Risk and Protective Factors: What evidence exists to demonstrate a relationship between DFC coalition activities and improvements in their target communities' risk and protective factors, such as:
  - Perception of risk (tobacco, alcohol, and marijuana)
  - Perception of parental and/or peer disapproval (tobacco, alcohol, and marijuana)
  - Other factors
- Composition/Collaboration: What mix of agencies and types of collaboration are most associated with improvements in community substance use as well as risk and protective factor outcomes?
- Relationship Between Substance Abuse Outcomes and Explanatory Factors: What evidence, if any, illustrates an association between differences in outcomes and such factors as geographic location (urban/rural/suburban) or socio-economic status?
- Effectiveness of Strategies: What are the most effective strategies? What mix of strategies led to positive community changes? Is there any relationship to type, level, and coordination of outside funding streams?

This evaluation will largely rely on self-reported information from coalitions as the core data elements to address these questions. A combination of descriptive and more advanced statistical modeling will be employed to address specific questions.

## **2.0 EVALUATION FRAMEWORK, TYPOLOGY, AND DESIGN OVERVIEW**

An evaluation framework will be employed to guide the evaluation and to address the objectives presented in Section 1.0. This framework is based on an extensive review of scientific literature for conducting evaluations of substance abuse coalitions (Fawcett et al. 1997; Francisco et al. 1996; Goodman et al. 1996; Mitchell et al. 1996; Stevenson et al. 1996), and will be used to resolve the inherent difficulties and limitations associated with assessing changes in substance abuse outcomes at the community level.

One such limitation has been the number of coalitions that have been simultaneously examined. Typically, relatively few coalitions have been examined at the same time, reducing the ability of statistical tests to identify significant improvements. The DFC program, however, benefits from a relatively large number of participating coalitions with 769 current participants and the addition of approximately 300 participants anticipated during the evaluation period. However, most if not all of the information utilized in this evaluation will be self-reported by coalitions, including substance abuse outcomes and explanatory factors. One challenge of the evaluation will be to ensure that the amount and quality of the reported data is sufficient to facilitate reliable statistical analysis.

Previous evaluation efforts have also struggled to find significant impacts at the community level. During the past twenty years, community coalitions have been typically evaluated against ultimate substance abuse outcomes, such as the reduction in 30-day use of tobacco by youth, rather than against processes, capacity, and other immediate and intermediate outcomes appropriate to their developmental stages; thus, only modest impacts of these community-based efforts were found (Merzel and D’Afflitti 2003; Berkowitz 2001). To address this challenge, our evaluation framework views DFC coalitions as embedded in a developmental process that can be tracked across certain dimensions and different developmental stages to implement prevention interventions; to attain immediate outputs, intermediate outcomes, and substance abuse outcomes; and to achieve sustainability and long-term health and behavioral impact. Further, the framework recognizes that the actions, activities, outcomes, and impacts of DFC coalitions are conditioned by social, cultural, and environmental factors within communities, including technical assistance, training, and mentoring provided by ONDCP and others. DFC community coalitions at different stages of development likely use different processes, have different capacities, and produce different outcomes. The degree of success of a DFC community coalition should thus be evaluated against its ability to achieve targeted goals relative to its stage of development (i.e., goal attainment).

In short, the framework underlying the national evaluation is a causal chain showing that DFC coalition functions and activities lead to immediate, intermediate, substance use/abuse, and long-term outcomes as the coalition “matures” and develops its capacity (see Figure 1). Each component of the framework represents a measurable hypothesis for the national evaluation

to assess. DFC coalitions are the catalysts that influence community dynamics, community-level collaborative activities, and community strategic planning. The composition/structure, characteristics, and capacity of DFC coalitions determine coalition functions and activities, such as comprehensive strategic planning, community-wide collaboration, leveraging/redirection of funds, system changes, and enhancement of policies, programs, and strategies. These coalition functions and activities, in turn, are expected to produce immediate coalition outputs and outcomes, such as increased prevention capacity and increased use of evidence-based prevention programs, activities, and strategies. The combination of coalition functions and activities as well as the immediate outputs is expected to lead to intermediate outcomes, such as decreased risk and increased protective factors at the community level. These intermediate outcomes, in turn, are expected to lead to substance use/abuse outcomes, such as reduction in 30-day use of alcohol, tobacco, and marijuana. These behavioral changes in substance use/abuse are expected to lead to desired long-term outcomes relating to health, crime, and safety behaviors.

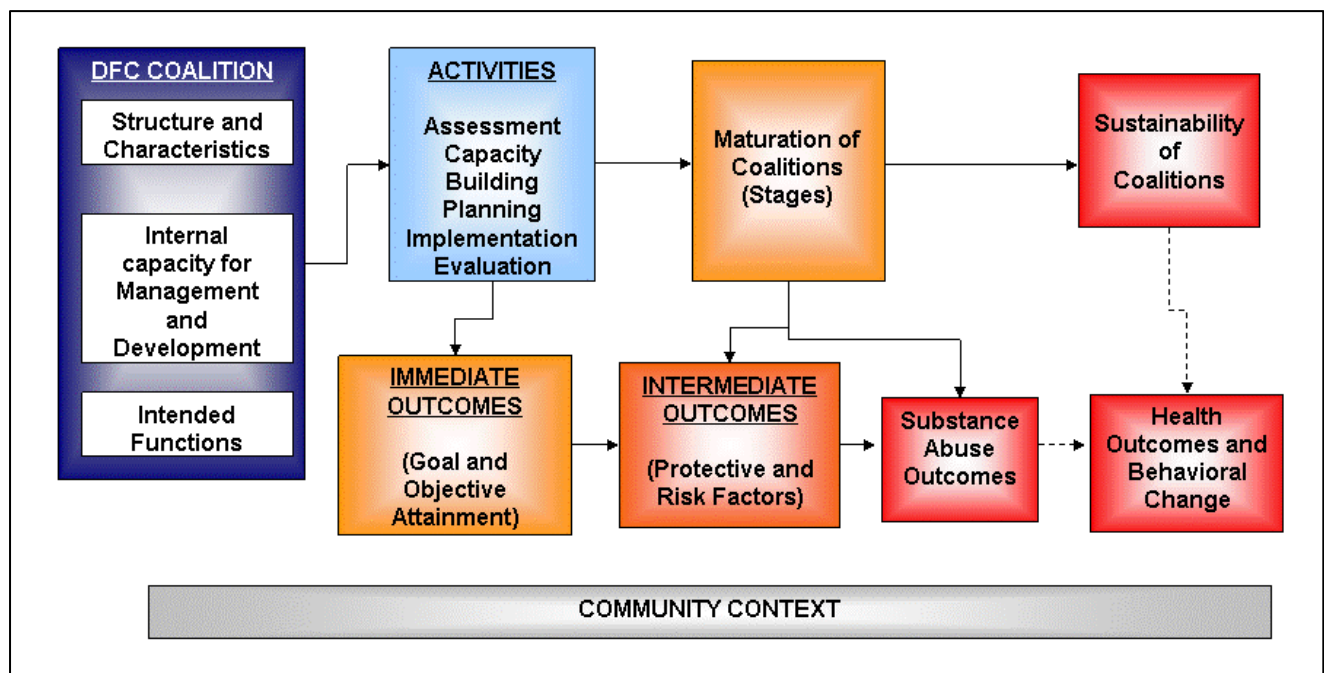


Figure 1. Evaluation Framework.

## 2.1 EVALUATION TYPOLOGY

The national evaluation of the Drug Free Communities Support Program is developing a typology of community coalitions in order to better understand how they successfully reduce substance abuse. A typology that is based on maturation or stages of development can demonstrate that as a coalition develops their capacities to conduct internal functions needed for its development and maintenance as well as the capacities for its external functions (those needed to prevent substance abuse), they are more likely to reduce substance abuse. A stages of development typology can also show how the support system (e.g. funding, technical

assistance and training, etc.) advances coalitions through the stages in order to enhance community-wide capacity to prevent substance abuse. The proposed coalition typology framework is developed from the existing research literature and the experience of practitioners. It merges three main themes in the literature: maturation (coalitions get better over time); coalition processes (e.g. strategic prevention framework); and coalition capacities (e.g. knowledge, skills, resources, and relationships needed to meet goals and achieve functions).

### **2.1.1 Defining Coalition Stages of Development**

Coalitions are dynamic entities embedded within dynamic contexts. Given the proper attention and nurturance, mature and sustainable coalitions may develop. That is, they may systematically progress from simpler to more complex durable forms of organization and activities. This typology rests upon a conceptualization of coalitions moving through four stages of development: (i) Establishing; (ii) Functioning; (iii) Maturing and (iv) Sustaining. Successful movement through the stages of development is determined by the extent to which the coalition has the capacity to perform requisite functions for each stage. Figure 2 displays a complete list of capacities. Here they are briefly summarized for each stage of development.

*Establishing coalitions* face having to learn complex tasks in the establishing stage of coalition development. They begin by recruiting a critical mass of active organizational members and engaging representation from a broad spectrum of key community sectors and constituencies. They must then establish an organizational structure and procedural operations which will produce, from among actors from different community sectors, a collaborative team which is both cohesive and task focused. After mobilization and initial structuring, the coalition must build its capacity for action by ensuring that its members have sufficient knowledge and skills to both participate (participation skills) and make informed decisions about substance abuse prevention activities (content skills). And of course the coalition members must reach consensus around the purpose or function(s) that the coalition will perform. Over time, coalitions can “cycle” back through these tasks, especially those where capacities are weak.

*Functioning coalitions* turn their attention from an internal focus to an external focus and are paying attention to the identification, coordination and integration of prevention programs and services delivered by partners in the community. Here the coalition identifies community needs and resources, prioritizes the needs and derives objectives and identifies an array of evidence-based prevention programs and services for partners to deliver to achieve objectives. Capacities must be built depending upon the activities, programs, or strategies chosen and implementation plans drawn up specifying responsibilities, timelines, and evaluation activities. The coalition continues to learn and begins to develop proficiency in performing its intended functions.

*Maturing coalitions* engage in a transformation of function. That is, these coalitions recognize, either through its own internal evolution or external intervention, a mission or purpose broader than being solely a coordinator of programs and services. Sometimes this involves the incorporation of environmental strategies such as access, enforcement and policy change into

its prevention interventions. Coalitions soon recognize that they are ideal vehicles for environmental strategies because, unlike the delivery or coordination of programs, it often takes multi-sector collaboration to accomplish environmental change. A coalition that integrates programs, community-wide activities, and environmental strategies for synergistic impact is often called a “comprehensive community intervention”. Occasionally, coalitions further transform their functions into becoming an “intermediary or community support organization.” While not an inevitable result of maturation (that is, many coalitions remain “comprehensive community interventions”), these few coalitions have developed mastery in a broad array of capacities and are ready to teach others. The intermediary or community support organization creates community change indirectly, impacting communities by building the capacity of other local organizations and institutions, offering an array of training and technical assistance services.

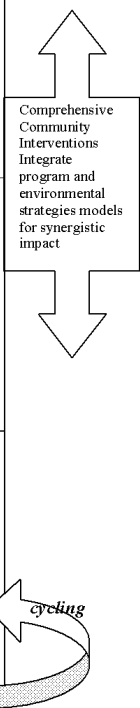
*Sustaining* coalitions have “institutionalized” themselves and their functions as an ongoing part of community operations. They have become not a three-year, grant-funded entity, but part of the fabric of the community. This can be as simple as having a community organization, such as a school, adopt a prevention program initially sponsored by the coalition as a permanent part of its curriculum, or as complex, having the coalition receive municipal funding for regular strategic planning and evaluation of community efforts to address substance abuse problems. The essential ingredient for the sustaining coalition is that its structure, procedures and functions are validated and affirmed through resources (e.g., money, space, staff) and recognition (e.g., it speaks with authority and is consulted by decision-makers for the functions it performs).

### **2.1.2 Operationalization of Typology**

The Coalition Classification Tool (CCT) is designed to describe and classify Drug Free Communities (DFC) coalitions. The DFC coalitions and their communities are as diverse as the U.S. in terms of cultural, sociopolitical, and historical context. Each coalition, furthermore, can implement a variety of different kinds of prevention interventions. Capturing and communicating this incredible diversity demands the development of commonly accepted coalition dimensions. The Coalition Classification Tool collects data which produces a succinct summary of important coalitional dimensions found throughout the literature: (i) Coalition Development and Maintenance; (ii) Primary Intervention Foci and (iii) Capacities. Coalitions develop as they increase their mastery of key functions needed to prevent substance abuse. Key functions include: coalition development and management, coordinating preventing programs /services, implementing environmental strategies, and serving as an intermediary support organization to build the capacity of other organizations to do their part in preventing substance abuse. Coalition development also entails mastery of capacities needed to perform each of the five steps of SAMSHA’s Strategic Prevention Framework: conduct assessments, mobilize and/or build capacity, develop a comprehensive plan, implement strategies, and evaluate and plan for sustainability. In Figure 2, each cell of the figure describes functions necessary for a coalition to engage in one of the five Strategic Prevention Framework (SPF) Steps.

<b>Coalition Primary Functions</b>	<b>Strategic Prevention Framework Steps</b>				
	<b>1) Profile community needs, resources and readiness</b> □□ →	<b>2) Mobilize and/or build capacity</b> □□ →	<b>3) Develop a comprehensive strategic plan</b> □□ →	<b>4) Implement program / strategies, develop infrastructure</b> □□ →	<b>5) Monitor process, evaluate, plan for sustainability</b> □□ →
<b>Intermediary or Community Support Organization</b>  <i>(impacts communities indirectly by building the capacities of other local organizations and institutions)</i>	<ul style="list-style-type: none"> <li>Identify lead agency and partners</li> <li>Assess need for services of an intermediary or community support organizations</li> </ul>	<ul style="list-style-type: none"> <li>Identify / develop constituents for intermediary support organization services (e.g., CBOs, coalitions, etc.)</li> <li>Identify cadre of trainers / consultants or build training and TA skills among staff</li> </ul>	<ul style="list-style-type: none"> <li>Determine / area to serve and scope of services to be offered</li> <li>Establish an array of training and technical assistance services and offerings</li> <li>Integrate with other relevant planning functions / taking</li> </ul>	<ul style="list-style-type: none"> <li>Establish the services</li> <li>Capacity building for other community organizations and institutions</li> <li>Expand scope of activities to larger and more systems</li> </ul>	<ul style="list-style-type: none"> <li>Monitor satisfaction / immediate skill gains from training and TA</li> <li>Evaluate impact of training and TA on outcomes</li> <li>Integrate ongoing monitoring / evaluation into systems operations</li> </ul>
<b>Environmental Strategies (e.g., access, policies, enforcement)</b>  <i>transforming</i>	<ul style="list-style-type: none"> <li>Assess environmental influences such as availability, media influence</li> <li>Measure compliance with local ordinances, extent of enforcement efforts</li> </ul>	<ul style="list-style-type: none"> <li>Build knowledge of environmental strategies among members</li> <li>Develop skill sets such as social marketing, policy analysis, advocacy</li> </ul>	<ul style="list-style-type: none"> <li>Selection of environmental strategies and "best fit(s)"</li> <li>Conduct "political mapping" to determine allies / opponents</li> </ul>	<ul style="list-style-type: none"> <li>Social marketing, media advocacy for environmental strategies</li> <li>Campaigns (e.g., for particular ordinances, policies, increased enforcement)</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate process of campaigns, revise strategies as needed</li> <li>Monitor enforcement of adopted policies</li> <li>Track impacts with social indicators</li> </ul>
<b>Identification and Coordination of Prevention Programs/Services</b>	<ul style="list-style-type: none"> <li>Compile consumption data</li> <li>Prioritize needs by magnitude of heal burden</li> <li>Identify program redundancies / gaps</li> </ul>	<ul style="list-style-type: none"> <li>Build knowledge of evidence-based programs among members</li> <li>Develop skills in program design and training</li> </ul>	<ul style="list-style-type: none"> <li>Selection of evidence-based programs and services / "best-fit(s)"</li> <li>Strategic plan for programs to produce combined or cumulative effects</li> </ul>	<ul style="list-style-type: none"> <li>Implement program(s) with fidelity</li> <li>Make necessary adaptations and refinements</li> </ul>	<ul style="list-style-type: none"> <li>Conduct process and outcome evaluations</li> <li>Identify programs / services for elimination/ retention</li> <li>Secure sustained funding or promote institutionalization</li> </ul>
<b>Coalition Development and Maintenance</b>	<ul style="list-style-type: none"> <li>Assessing which members / organizations need to be at the table (which skills &amp; resources will be required)</li> <li>Assessing what has (in the past) and what will work in terms of coalition structure and operating procedures in your community</li> <li>Assessing the types of data (internal to the coalition) that will be needed for coalition development and management</li> <li>Assessing desired training and TA skills relevant to building coalition structure and operations (e.g., meeting management, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Provide training and TA around leadership, cultural competence, and data / evaluation capacity</li> <li>Provide training and TA to build participation process skills (for interactions among members at coalition meetings)</li> <li>Provide training and TA to build collaboration skills (for interactions of member organizations outside of coalition meetings)</li> <li>Mobilize regular contacts between coalition and community sectors (relationships)</li> </ul>	<ul style="list-style-type: none"> <li>Build consensus around the nature and purpose of the coalition</li> <li>Develop mission statement and general goals for coalition</li> <li>Plan for communication among members</li> <li>Plan for member and leader succession</li> <li>Draft evaluation plan for monitoring coalition internal operations</li> </ul>	<ul style="list-style-type: none"> <li>Establish structure and operating procedures (e.g., committees, decision-making)</li> <li>Establish meeting schedule / develop agendas</li> <li>Facilitate discussions/ decision-making</li> <li>Surface and address conflicts that may emerge</li> </ul>	<ul style="list-style-type: none"> <li>Periodically assess member satisfaction (internal evaluation of coalition operations)</li> <li>Periodically assess skill development among members (internal evaluation of capacity building)</li> <li>Periodically assess collaborative relationship among member organizations and between coalition and wider community</li> <li>Development of recommendations for quality improvement</li> <li>Establish stable leadership (leadership succession) and "standardize" operating procedures and funding</li> </ul>

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**Figure 2. SPF Capacities Needed for Coalition Primary Functions**



Data collected by the Coalition Classification Tool (CCT) will be used to estimate a coalition’s knowledge and skill level (e.g., capacity) on a scale from one (Novice) to five (Mastery) and provide a rating of coalition capacity for each function. The overall balance among capacities and their particular configuration across intervention foci will be used to infer a coalition’s stage of development. Stage of development is intended to capture a dynamic process in which coalitions may systematically develop or progress from simpler to more complex forms of organization and activities (described below). The CCT thus captures the common pathways and the defining capacities associated with a growth trajectory that may be shared by otherwise diverse coalitions. More specifically, the CCT will facilitate comparisons of progress and effectiveness across coalitions, will assist the Coalition Institute in tailoring their training and technical assistance to match each coalition’s stage of development, and will provide more appropriate targeting of evaluation outcomes at both national and local levels based on stage of development. A description of each dimension, theoretical rationale for inclusion and a brief summary of supporting empirical evidence are provided below.

*Coalition Development and Maintenance* is the foundation upon which all other activities are built. Coalitions must first learn the fundamentals: their own organizational development and procedural management. Starting with varying levels of human and material resources (e.g., funding, technical assistance, and varied community representation), coalitions must develop rules and procedures for working together. This is no small task for a coalition, by definition a voluntary group of “equal” organizations that may have little history in working together. Figure 2 presents the kinds of capacities necessary for coalition development and maintenance at each of the five Strategic Prevention Framework steps. Notably, these capacities range from collaboration skills (e.g., recruitment of appropriate member organizations, establishing regular contact between coalition and community sectors) through leadership and participation skills (e.g., creating consensus, facilitating discussions, addressing conflicts), to specialized knowledge (e.g., developing cultural competence, establishing evaluation procedures). These are also not tasks that can be accomplished once and then forgotten. As indicated in Figure 2, coalitions may “cycle” back to previous steps (e.g., building content knowledge or participation skills among new members) because a capacity was initially inadequate to the task and produces later problems (e.g., proceeding to action without building a consensus on purpose leads to conflict among members).

Empirically, some of these capacities have been associated with intermediate outcomes. Kegler, Stecker, McLeroy and Malek (1998) found coalition factors such as communication, cohesion and complexity related to the extent of implementation in ten local tobacco control coalitions. Florin, Mitchell, Stevenson and Klein (2003), using data from thirty-five municipal substance abuse prevention coalitions, found that coalitions that “take care of business” in terms of building their own capacity were more likely to be viewed as producing community change. Specifically, coalitions that had done a better job in developing a task-focused social climate, in increasing their members’ perceived skills, and in making more extensive linkages with community organizations, were more likely to be rated by community leaders as producing effects (i.e., resources devoted to prevention, connections between organizations, community attitudes concerning alcohol and other drugs; policies of organizations) one year later.

*Primary Prevention Functions* include the actual approaches to prevention coalitions adopt after they have established their fundamental organizational structures and operating procedures. Coalitions then develop further by focusing on the identification and coordination of prevention programs and services or engaging in environment strategies (e.g., mobilizing inter-organizational collaboration for prevention policy, enforcement, media advocacy, etc.). Coalitions may choose to focus on both functions. Other coalitions may evolve into an “intermediary support organization” working indirectly on prevention by building the capacity of other organizations. Each primary prevention function requires specific capacities within each of the Strategic Prevention Framework steps that must be cultivated within the coalition to attain mastery of the function and thus progress through the stages of development. Most coalitions develop a combination of these functions. Not all coalitions will want to (or be capable of) attaining mastery in all functional areas.

Prevention programs and services in a community are often designed for specific populations (e.g., refusal skills for junior high students; parenting for single parents of elementary school children) and intended to change perceptions, attitudes or skills. In any particular community there might be one specific program or several prevention programs intended to produce cumulative or synergistic immediate outcomes on individually focused risk and protective factors. Empirical evidence for program effects continues to accumulate, as evidenced by SAMSHA’s growing list of NREPP programs (May 2005). The capacities necessary for this focus are displayed in Figure 2. Ineffectual and inadequately implemented programs not only waste resources, but they may also cause disillusionment among implementers and policymakers who see no impact. Therefore, interventions are necessary which help to influence the dissemination and adoption as well as the fidelity of implementation of research-based prevention programs at the local community level (Rohrbach, Graham & Hansen, 1993). The coordination, development, and integration of prevention services are a “natural” starting role or function for most coalitions.

Increasingly, coalitions realize the greater and unique impact they can have by engaging in environmental strategies—mobilizing inter-organizational collaboration for prevention policy, enforcement, and media advocacy. Such collaboration is seen as necessary because policy and media advocacy initiatives are difficult to implement and often require multi-sector efforts. For example, Klitzner (1998) articulated a distinction between prevention strategies that attempt to alter the environments in which individual children grow, learn, and mature and those that attempt to alter the shared environments which influence all children. Three factors in the shared environments that shape both positive (healthy) and negative (health-compromising) behavior are norms, availability, and regulations. Norms are basic orientations concerning the acceptability of specific behaviors for a specific group of individuals. Availability is defined in terms of the cost or difficulty of obtaining a commodity such as alcohol, marijuana and cigarettes. Regulations are formalized laws or policies (of governments, public agencies or private organizations) that control availability, codify norms and specify sanctions. Evidence has been mounting that environmental strategies can impact consumption of alcohol, tobacco, and other drugs and associated consequences (Birckmayer, Holder, Yacoubian and Friend, 2004). Figure 2 lists the capacities necessary for a coalition to engage in such environmental strategies and they are particularly suited to coalitions. In fact, there is growing agreement among many

prevention researchers and practitioners that coalitions will be most effective when they include strategies that attempt to change both community conditions and norms as well as those that focus only on changes in individual skills and competencies. “Comprehensive community interventions” combine two rows in Figure 2: individual (program) and environmental change strategies. Implemented across multiple settings, these interventions are designed to prevent dysfunction and promote well-being among population groups in a defined local community.

Although theoretically compelling, positive outcomes have been produced only approximately one-third of the time (Roussos and Fawcett, 2000; Wandersman and Florin, 2003), perhaps because of insufficient coalition capacity to undertake complex interventions. This has led some coalitions to evolve into intermediary or community support organizations. Intermediary or community support organizations support prevention interventions using a broad and multilevel array of strategies including: training programs for skills development; telephone and on-site consultation; information and referral services; mechanisms for creating linkages among coalitions; methods of recognizing group achievement; publications and other public education materials (Chavis, Florin, & Felix, 1992; Florin, Mitchell, & Stevenson, 1993). Coalitions which engage in this function focus on the conditions in which prevention programs are developed, implemented, and evaluated, and works to build the capacity of other organizations and institutions. Capacity building interventions have been advocated for many types of community-level interventions, from grassroots community coalitions to replications of community trials for prevention interventions (Pentz, 2000; Roussos & Fawcett, 2000; Wolff, 2001).

Capacities to perform these primary functions need to improve in order for coalitions to increase their impact. Coalition Capacities are the knowledge and skill sets necessary to successfully engage in each of the five steps of the Strategic Prevention Framework. Capacity must always be defined in terms of capacity “to do what?”. That is, capacities will vary by which step of the Strategic Prevention Framework is being addressed, whether a coalition’s basic foundations (structure and procedures) are in place and which primary focus (or foci) the coalition is choosing to implement. Crisp, Swerissen & Duckett (2000) described several kinds of professional, organizational, and systemic capacities. Capacities are important because intervention programs are characteristically difficult to implement (Lipsey & Cordray, 2000), and more so when they involve complex challenges in collaboration, organization, planning, and coordinating multiple programs and policies (e.g., Florin, Mitchell & Stevenson, 1993; Wandersman, Goodman & Butterfoss, 1997). Empirically, it has thus far been easier to demonstrate that capacities have been developed in the short-term, for example as the result of a training curriculum, than it has been to demonstrate that intentional capacity development delivered through training and technical assistance has produced improved outcomes (Florin et al, in press).

*Measuring Stage of Development* represents the overall balance among a coalition’s capacities and their particular configuration across intervention foci. Coalitions are dynamic entities embedded within dynamic contexts. As such, they may systematically develop or progress from simpler to more complex forms of organization and activities. For example, as indicated in

Figure 2, a coalition may transform its primary focus from one devoted exclusively to the identification, coordination, and integration of programs and services to a broader perspective on environmental strategies. Alternatively, many coalitions begin with the broad perspective, but lack the internal capacity to identify and implement environmental strategies. As coalitions mature through the stages of development, they progress from learning internal and external coalition capacities, to developing proficiency with them, to finally mastery. Coalitions are learners when they recognize their needs for capacity development and mentoring and need assistance finding resources. Proficient coalitions know how to implement environmental strategies and how to access resources, but they may need additional guidance to do so. They follow procedures and models mapped by others. A level of mastery is reached when coalitions “instinctively” assess, build capacity, implement, and evaluate prevention strategies and are able to design new and innovative ways of implementing environmental strategies that are tailored for their community. Coalitions with mastery of prevention functions are able to mentor others and have direct relations with the resources.

It is expected that establishing coalitions will primarily be at a learner level of capacity on internal and external functions. Functioning coalitions begin to reach a level of proficiency on most functions. Mature and sustaining coalitions have mastery of most functions. Sustaining coalitions are also institutionalized and sustainable within the community (see Table 1).

**Table 1. Prevention Coalition Stages of Development**

Stage of Development	Establishing	Functioning	Maturing	Sustaining
Description	Initial formation with small leadership core working on mobilization and direction	Follows the completion of initial activities, focus on structure and more long range programming	Stabilized roles, structures, and functions; Confronted with conflicts to transform and “growing pains”	Established organization and operations, focus on higher level changes and institutionalizing efforts
Level of Competency to Perform Functions	Primarily learner	Achieving proficiency; still learning and developing mastery	Achieved mastery; learning new areas; proficient in others	Mastery in primary functions; capacities in the community are sustainable and institutionalized

The classification of each coalition into a specific stage of the typology is an important outcome of the evaluation. This classification will initially be accomplished through an examination of the factors and characteristics expected to be necessary for a coalition to qualify for a specific stage. Following the first year of the evaluation and subsequent to the collection of detailed information from coalitions, statistical analysis techniques will be employed to test and modify the assumptions regarding the characteristics that are significant drivers for classifying a coalition into a specific stage of development (see Section 4.2). Again, the typology will provide a roadmap to guide the national evaluation in assessing progress toward established milestones by comparing current values on the classification algorithm with those at baseline and during previous years. The definitions of outcomes and measures for these outcomes in the typology

will help us to identify outcomes expected at each coalition stage, providing stage-specific criteria for measuring developmental progress. Similarly, the typology will facilitate evaluation of capacity and processes at each developmental stage.

## **2.2 OVERVIEW OF EVALUATION DESIGN**

Using the evaluation framework as a foundation, our evaluation will focus on both a direct and indirect assessment of the success of coalitions at impacting substance abuse in their communities. First, similar to previous evaluation efforts, we will examine whether the activities, initiatives, strategies, etc. of DFC coalitions have an impact on substance abuse outcome measures of interest, such as 30-day use of tobacco. However, as coalitions develop, we will focus the outcome analysis increasingly on Mature or Sustaining coalitions. The impact of DFC coalitions on substance abuse prevention will also be examined using an indirect approach because it may not be reasonable to evaluate a direct linkage for less advanced coalitions. However, if the DFC program can be found to be an important factor for helping coalitions mature into advanced coalitions (i.e., if characteristics related to advancement in development can be identified as components of the DFC Program), and if the link between advanced coalitions and substance abuse outcomes can be established, then it would be logical and scientifically appropriate to conclude that the DFC program is effective in reducing substance abuse outcomes; directly for advanced coalitions and indirectly by fostering an environment where less advanced coalitions can become advanced coalitions.

Trends in substance abuse outcomes in communities targeted by DFC coalitions will be compared to the corresponding trends in communities that are not specifically targeted by a DFC coalition indirectly using state and national level data. This analysis differs from an approach where comparison communities are selected and matched to DFC coalition communities and a direct comparison is conducted between the two different types of communities. Employing a comparison-community type approach has significant challenges and barriers to obtaining quality and comprehensive information. These challenges include the need to identify appropriate comparison communities that can be determined to be “similar” to a DFC coalition community, the need to identify key informants to provide community information (a significant challenge in communities that do not have a coalition), convincing the contact person to continue to provide this detailed information throughout the evaluation, and the questionable quality of the outcome information that could be obtained. Due to these limitations and resource constraints, our approach will rely on extracting indirect surrogates for substance abuse outcomes for communities not targeted by a DFC coalition from existing national and state surveys to serve as a comparison to DFC communities.

Although this approach will limit the number of explanatory factors available for advanced modeling, it has the decided advantage in that it does not rely on a direct data collection activity conducted as part of this evaluation effort. Unfortunately, publicly available information is typically only available at a broad geographic level, which prohibits specific community-to-community comparisons. However, as part of our approach, we intend to conduct a feasibility assessment to determine if community-level information could be obtained from some of the national surveys. If available, this information could be used to refine the comparative analysis.

### **2.2.1 Limitations of the Study**

As with any evaluation effort, there are competing constraints and resource needs that impact the design and implementation of the evaluation. In this evaluation, one primary consideration for the design is the ability to identify, recruit, and retain a suitable comparison community during the evaluation period. To be as robust as possible, the DFC evaluation will require information on substance abuse outcomes and covariates of interest from non-DFC communities as a basis of comparison. However, the acquisition of this data will be extremely difficult for a number of reasons, including the limited resources available for the evaluation; the nature of the outcomes in question requiring the examination of long-term trends; and the lack of a centralized substance abuse coalition infrastructure in comparison communities. As a result, collecting information from non-DFC coalitions or in communities that lack a substance abuse coalition was determined to be impractical for this evaluation. Instead, this evaluation will focus on using publicly available data sources such as the results of national surveys, and more intensive statistical analysis techniques to define substance abuse outcomes for comparison communities. This approach has the advantage in that outcome data will be available for trend comparison but has the limitation that many of the factors that are being collected through the COMET will not be available for the comparison analysis.

A second limitation of the study is that effecting positive changes in substance abuse at a community level often requires significant effort over a sustained period of time that may exceed the five year evaluation period. The evaluation will seek to overcome this challenge through the use of historical progress reports, and an examination of the influence of the DFC in helping coalitions become mature.

Finally, due to resource constraints, the evaluation is relying upon information that is self-reported by coalitions as the core information for analysis. This includes both explanatory and substance abuse outcome information. As with any self-reported information, the quality and the potential for bias in this information represent limitations of the study. While it will not be possible to completely verify the accuracy of the reported outcome information, the evaluation will include procedures to assess the quality of the collected information.

## **3.0 DATA COLLECTION AND MANAGEMENT**

### **3.1 DATA SOURCES**

There are several sources of information that will be utilized as part of this evaluation. However, the core information base for the evaluation will come from two primary sources—a Coalition Classification Tool (CCT) and a Semi-Annual Progress Report. All information for these core instruments will be self-reported by coalitions and will be completed by the director or assistant director of the grantee organization. This information will be collected through an on-line computer system (see Section 3.2).

*The Coalition Classification Tool (CCT).* This survey is a data collection tool based on the coalition typology developed for the national evaluation. It is used to collect information on the

coalition composition/structure, characteristics, capacity, functions, and activities for the purpose of classifying coalitions into different stages of development to facilitate the evaluation effort and to prioritize technical assistance and training activities. This CCT will be fielded once annually beginning in January 2006.

*The Semi-annual Progress Report.* The semi-annual progress report is a data collection instrument filled out by the director or evaluator of the grantee organization. Following a set of standard data requirements, the semi-annual progress report collects process, capacity, and outcome data covering the six months being reported. The focus of this progress report is to capture information that can be used to monitor and track the grantees, as included in their grant requirements.

While integrated, these two data sources represent different data collection activities and will therefore collect different data from coalitions. That is, coalitions will not need to provide the same information across both of these data collection tools. Also, it is again important to note that there are potential drawbacks to relying on this data as the core information for the evaluation. Because of staff turnover, consistent and systematic reporting will not be guaranteed. This can affect the reliability of reported data due to variability in understanding of the reporting requirements, familiarity with the coalition, and variability in interpreting items and measures. Despite these limitations, these sources will provide the most useful information for assessing the performance of the DFC coalitions because they can be collected at the coalition or community level, they are specific for a particular coalition, they can be readily linked with other data for a specific coalitions, and they will be consistent across all of the DFC coalitions for the duration of the evaluation. One critical component of the evaluation will be to assess the quality of the collected, self-reported data (see Section 3.3).

The self-reported core data described above will be supplemented, if available and attainable, with information from the coalitions grant applications, outcome information from prior years, and resource and budget information. Grant applications will be reviewed, and relevant data elements will be extracted to supplement the process, capacity, and outcome data collected. The key data elements to be extracted from the grantee applications include information on community baseline substance abuse, cultural and other contextual conditions, as well as information on resources and capacity at the time the grantee applied for the DFC funds. The DFC grant budget management systems currently managed and maintained by the Office of Juvenile Justice Delinquency Program (OJJDP) and SAMHSA collects information on funding by grantee and by year. We would like to be able to extract budget information from this system and merge it with the core evaluation data to establish level of funding as an additional covariate or factor of interest.

Information on substance abuse outcomes will be obtained from national and state-specific publicly available sources such as the National Household Survey on Drug Abuse (NHSDA), the Youth Risk Behavior Survey (YRBS), and others, to the extent possible. Only data sources that have consistent outcome measures to those collected directly from coalitions will be considered. Again, this information will be used to extract a surrogate measure for substance abuse outcomes in communities that are not targeted by a DFC coalition.

### **3.2 DATA COLLECTION APPROACH**

The primary source of data for this evaluation will be semi-annual progress reports submitted by coalitions. This information will be collected through the use of a web-based system, referred to as the Coalition On-line Management and Evaluation Tool (COMET). The COMET will provide a central data acquisition and management system that systematically collects information from all DFC grantees on an ongoing and annual basis. Battelle is responsible for determining the functional requirements of this computer system including content, flow, reporting and data extraction requirements, etc. However, the formal development and implementation of this system is outside of the scope of this evaluation effort.

The COMET will capture information from coalitions on aspects related to structure and characteristics, internal capacity, intended functions, immediate and intermediate outcomes, and substance abuse outcomes in the coalition's targeted community. Semi-annual progress reports will contain information such as coalition membership that may change on a semi-annual basis. An annual progress report will provide information on items that are expected to change less frequently, such as intermediate outcomes. Finally, a separate module of the COMET, the Coalition Classification Tool will capture information that can be used to classify each coalition into a stage of development. Information from external sources will also be collected and utilized as part of the evaluation, particularly to obtain explanatory variables such as funding levels or additional outcome measures, such as substance abuse outcomes.

The COMET will be designed to be consistent with the strategic prevention framework (SPF) and will have separate modules for the five elements of the SPF (assessment, capacity, planning, implementation, and evaluation). Additionally, the COMET will have separate modules for the typology instrument, administration, utilities, and reporting. Evaluation data as well as information needed by ONDCP and SAMHSA to monitor and track DFC Grantees will be captured within each of these modules. The COMET is envisioned as an interactive data system whereby the data elements, such as goals, objectives, and activities are linked by the grantee as they enter information.

Coalitions will have continuous access to the COMET and can enter information at any time. However, each Coalition will be required to submit progress data on a semi-annual basis and additional information to support the evaluation on an annual basis (e.g., the CCT). COMET is expected to have a number of features that will provide additional training and logistical support to DFC coalitions. For example, the COMET will have the capability of capturing profiles of coalition's members, thus serving as a database repository for each coalition to manage their mailing lists. Other features will include the ability to "stop-and-start" data reporting and collection, as well as the ability to generate and view standardized reports for their coalition or across all coalitions.



### **3.3 DATA ASSESSMENT AND MANAGEMENT**

#### **3.3.1 Data Quality Assessment**

As discussed in Section 3.2, the primary data utilized for this evaluation will be provided as self-reported information by coalitions either through the semi-annual progress reports or through the COMET. As with any self-reported data, it will be critical to assess the quality and reliability of these data prior to its inclusion in statistical analysis. For example, some coalitions may report outcome percentages that were not collected through a rigorous sampling design, have sample sizes too small to be meaningful, or are otherwise questionable.

A thorough data quality assessment (DQA) will be performed following each data collection to determine if there are any serious data quality issues that could impact the evaluation conclusions and should be addressed before conducting statistical analysis of the data. One focus of the DQA will be on the outcome measures as they represent response variables for the study. As noted, the outcome measures will be community-level statistics obtained from surveys that will be conducted independently from this evaluation. It is the coalition's responsibility to identify the appropriate data source, locate the data corresponding to the outcomes and strata requested in this evaluation, and enter them accurately into the data collection instrument. This process may potentially lead to data that are below the minimum data quality standards needed to conduct an unbiased evaluation. This can result from among other things, significant amounts of missing or invalid data, evidence of inaccurate data, and the use of unreliable methods by coalitions for collecting outcome measures.

Coalitions are asked to report outcome measures, but are not mandated as to how they obtain the requisite information. That is, each coalition may choose to employ a different survey technique to obtain this information. Therefore, there is the potential that some coalitions may rely on techniques that are known to be biased. As part of the information collected from coalitions, data on the instrument used for collecting outcome measures will be requested. For example, coalitions will be asked to indicate the source of their outcome data—state survey, established community survey, or custom survey, for example.

Outcome measures using an established state or community survey are more likely to yield scientifically valid and representative results for the community. Outcome measures collected using other methods (e.g. use of custom surveys) are more likely to be biased or nonrepresentative, and additional information will be sought from coalitions that report using these methods to evaluate the validity of the reported outcomes. If grantees indicate the use of a custom survey, they must have the survey reviewed by the evaluation team and approved by their Project Officer.

If data quality issues cannot be resolved by DFC Project Officers in conjunction with the coalition, data from that coalition may be excluded from the statistical analyses, which will reduce the effective sample sizes and resulting statistical power of hypothesis tests for the evaluation.

An additional data assessment that will be conducted will be to verify that the outcomes reported by coalitions represent their target community and not a larger or smaller geographic area. This assessment will be conducted by comparing the responses among coalitions within a particular State, comparing the responses of coalitions within a State to the YRBS state profiles, and examining responses to the data element “Is the geographic area covered by this data larger, smaller, or the same as your target area?” Coalitions that provide outcome data that is not focused on their target area may not be included in the analysis.

### **3.3.2 Data Management**

Data are downloaded from the COMET by the COMET vendor and sent to Battelle at the conclusion of each semi-annual report period. Battelle backs the data up to a separate data system controlled by the evaluation team.

Data that is extracted from the COMET will be compiled into a SQL Server database, which will be stored on a secure server without outside access. This SQL Server database will serve as the main repository of data for the evaluation. As such, only permanent changes and corrections will be made to this database. Data for specific analyses will be automatically extracted and manipulated for statistical analysis using SAS<sup>®</sup>. Changes made to the data for a particular analysis will not be made in the SQL data unless this change will be applied to every analysis. Otherwise, data changes and modifications will be “soft-coded” into the analysis SAS<sup>®</sup> code. The Coalition’s grantee ID will be used as a unique identifier for all coalition records.

## **4.0 STATISTICAL ANALYSIS USING SELF-REPORTED DATA**

Under the evaluation framework discussed in Section 2.0, there will be five different statistical analyses conducted as part of the core evaluation effort: 1) descriptive analyses, 2) assessment of stage of development, 3) modeling substance abuse outcomes, 4) assessment of additional evaluation questions and hypotheses, and 5) analyses to support GPRA reporting. The combination of these five analyses frames will be used to determine whether the DFC program is having an impact on reducing substance abuse. Modeling substance abuse outcomes will provide a direct assessment of whether advanced coalitions are having an impact on substance abuse outcomes. Evaluating progress in stage of development will provide an indirect assessment of the likely positive impact of the DFC program through demonstrating a relationship between coalition characteristics and progression in development. That is, if the DFC program helps coalitions advance in their development, and coalitions who are advanced in development are effective in reducing substance abuse, then it may be logical to conclude that the DFC program is having an impact on reducing substance abuse, even if this evidence is not directly apparent for every coalition. Investigating additional evaluation questions regarding coalition capacity and conducting analyses to support GPRA reporting will help to illuminate inherent relationships in how coalitions operate and change over time.

#### 4.1 DESCRIPTIVE ANALYSIS

One of the implicit objectives of this evaluation is to provide information to ONDCP and others regarding the status of the DFC Program and nature of coalitions that are participating with this grant program. This information provides a useful context and background to the analysis and in understanding the conclusions reached by the evaluation. Generally, this characterization will be accomplished through descriptive statistics, graphical representations, etc. using information reported by coalitions. This characterization will be performed and summarized annually or on an ad-hoc basis as requested by ONDCP. Many descriptive statistics and reports will be available to ONDCP and coalitions as part of the COMET. The following describes the two aspects of this characterization, status of the DFC grant program and characterization of participating coalitions.

The DFC grant program is expected to grow and change over the course of the evaluation as current grantees complete their grants and new grantees are added. In assessing the DFC grant program, it is important to understand the state of the program at each assessment point. In particular, each year's grantees represent a natural cohort that can be followed and compared over time; due to economic, political, and other conditions this cohort may or may not be comparable to grantees in other cohorts. This component of the evaluation will describe the status of the program through summarizing elements such as:

- Number of coalitions
- The current and historical classification of coalitions
- Geographic representation of communities served
- Total population served by DFC coalitions

As with the overall program, the features and characteristics of coalitions are expected to change over time. Examining how these characteristics change will provide insight into testing and refining the overall evaluation framework and stage-of-development typology. The responses to each component of the four data collection instruments will be summarized using frequency distributions and other descriptive statistics. To facilitate the characterization of the relationship between coalition characteristics and outcomes, both cross-sectional (single point-in-time) and longitudinal (the same measure over time) summaries will be constructed. A cross-sectional descriptive analysis may be conducted annually following each phase of data collection while the longitudinal analysis will begin in the second evaluation year. The analyses presented here concentrate on summarizing the distribution of potential response variables, identifying important subsets of data that should be considered for future analyses, and identifying important explanatory variables. Simple descriptive summaries will be provided to describe the outcome data and other potential explanatory variables among the population of DFC coalitions that have met the minimum data requirements described earlier. As appropriate, side-by-side box plots, bar charts, and line graphs as well as descriptive statistical summary tables will be prepared to illustrate and summarize the distribution of substance abuse outcome measures as a function of community type, stage of development, and grade of school. The summary statistics provided in the tables will be sample size (number of

communities), mean, standard deviation, minimum, 10th percentile, 25th percentile, median, 75th percentile, 90th percentile, and maximum. For the outcome measures, these summary statistics will be provided for the whole community, as well as for each community type, stage of development, and school grade. Summary statistics will also be used to describe the distribution of covariates by community type and stage of development.

One significant component of the exploratory analysis will be to examine those coalitions that have the largest or most significant changes in substance abuse outcomes or the greatest progression in maturation. These coalitions will be examined to determine if there are key characteristics common to these coalitions that may be related to such a dramatic change in outcomes. If these characteristics can be successfully identified, they may be candidates for ONDCP to consider enhancing across all coalitions. Descriptive statistics such as the presence of a specific characteristic, activity, function, etc. will be cross-referenced with this group of coalitions to determine if it is a shared characteristic of the group.

## **4.2 ASSESSMENT OF STAGE OF DEVELOPMENT**

In this section we describe our approach to developing the coalition classification scheme as well as validation. Our approach classifies the coalitions along a dimension of less mature to more fully mature (see Table 1). The proposed coalition typology framework used by the study team is developed from the existing research literature and the experience of practitioners. It merges three main themes in the literature: maturation (coalitions get better over time); coalition processes (e.g., SAMHSA’s Strategic Prevention Framework) and coalition capacities (e.g., knowledge, skills, resources, and relationships needed to meet goals and achieve functions). This typology rests upon a conceptualization of coalitions moving through four “stages-of-development:” (1) Establishing; (2) Functioning; (3) Maturing; and, (4) Sustaining. As shown, as coalitions move through these stages, they acquire greater sophistication with respect to their organizational structure, capacity, and focus of efforts as well as in their levels of competency to perform vital functions necessary to impact change.

Our model recognizes, however, that developmental progression may not be linear; coalitions may progress and regress through developmental stages and change over the course of the evaluation. For example, a Functioning coalition that loses a key coalition leader may regress to an Establishing coalition while the coalition rebuilds, then become a Functioning coalition again at a later date. Therefore, when assessing whether the DFC program has had an impact on the stage of development for the grantee coalitions, it is important to assess the overall trend, recognizing the often cyclical nature of coalition development.

*Statistical approach.* The Coalition Classification Tool (CCT) contains four six-item scales measuring coalition capacity and functions. Items are coded on a 5-point scale as follows: “Novice” (or score of 1 on the 5-point scale) was defined that the coalition is still learning how to perform the function in the various areas and could therefore benefit from assistance from others; “Proficient” (or score of 3 on the 5-point scale) indicates that the coalition thought they were competent in performing the function; and, “Mastery” (or score of 5 on the 5-point scale) was indicated by those coalitions that believed they were at an expert level of performance in

the areas and could train or be of assistance to others in performing these functions. No labels were associated with scores of 2 or 4, but the intention of the scales was that a 2 represent a score between Novice and Proficient; and, 4 represent a score of between Proficient and Mastery. Table 2 below gives examples of the items included in the scale of coalition maturation.

**Table 2. Examples of Questions Included on the CTT Measuring Stage-of-Development Dimensions (Four Scale Items and 6 Sub-Items within Each Scale)**

Activity/ Functional Areas (Sub- items)	Stage-of-Development Dimension (Item text has been abbreviated) <i>Question Labels Novice=1; 3=Proficient; 5=Mastery</i>			
	Coalition Development and Maintenance	Coordination of Prevention Program/Services	Environmental Strategies	Intermediary or Community Support Organization
Assessment Scale (1-5)	Deciding which skills and resources will be needed, assessing which organization and/or individuals to recruit ...	Compiling prevalence and risk and protective factors data, prioritizing needs...	Determining retail and social sources of substance availability to underage youth, knowledge of community compliance with local ordinances...	Understanding current knowledge and skills among community leaders, staff and residents on prevention strategies...
Capacity (1-5)	Building member participation skills, providing desired training and technical assistance to develop coalition structure..	Build a solid knowledge base (e.g., familiarity with evidence-based programs and services) and required skills in program design, activity planning...	Developing a solid knowledge base (e.g., definition, rationales, and evidence for environmental strategies)...	The capacity of other organization, community leaders, and residents by recruiting highly skilled staff and consultants...
Planning (1-5)	Building consensus around coalition mission, develop a mission statement and general goals.	Analyzing and selecting programs, services, and activities that provides a best "fit" with community conditions...	Identifying a range of potential policy changes and enforcement activities, selection the best "fit with current community conditions...	Designing learning systems, communications and marketing plans, integrated technical assistance and training plans...
Implementa- tion (1-5)	Establishing the coalition structure and operating procedures...	Arranging settings for program delivery (e.g., school, CBO), creating public awareness, recruiting strategies...	Develop experience in carrying out a sequenced social marketing campaign..	Advertising, recruiting and conducting a series of workshops, developing resource centers or web site for the distribution of information, and brokering resources from state and national resources.

Activity/ Functional Areas (Sub- items)	Stage-of-Development Dimension (Item text has been abbreviated) <i>Question Labels Novice=1; 3=Proficient; 5=Mastery</i>			
	Coalition Development and Maintenance	Coordination of Prevention Program/Services	Environmental Strategies	Intermediary or Community Support Organization
Evaluation (1-5)	Assessing member satisfaction, skill development....	Conducting process and outcome evaluations to refine or eliminate programs.	Monitoring enforcement or documenting changes in social indicators to measure policy change.	(For example, training, technical assistance/ consultation, educational program, and material etc.) Monitoring satisfaction and evaluating changes in knowledge skills and resources.
Planning for Sustainability (1-5)	Planning for changes in leadership, standardizing operating procedures....	“Institutionalization” or incorporation of an evidence-based program as part of ongoing organizational operations in your community.	Arranging for regular prevention columns in local newspapers or securing line items in organizations’ budgets that institutionalize prevention strategies.	Planning for sustainability of capacity building functions. Securing ongoing funding or institutionalizing services into the ongoing operations of other community- based organizations.

### Classification Methodology and Empirical Validation of Typology

*Statistical approach.* The statistical approach to this analysis involves two steps: (1) creating the classification algorithm and (2) validation. To create the coalition typology, we will calculate a mean score across each of the items in each dimension and overall for each coalition. In addition, mean scores will be calculated for each of the three survey waves of the CCT. Coalitions reporting average scores overall that were between 1 – 1.999 (novice average rating) will be categorized as Establishing; Coalitions reporting average scores between 2 – 2.9999 (novice to proficient average rating) will be categorized as Functioning; Coalitions reporting average scores between 3- 3.9999 (proficient average rating) will be categorized as Maturing; and Coalitions reporting average scores between 4-5 (highly proficient to mastery average rating) will be categorized as Sustaining.

The typology will be validated using other items from the CCT and COMET. First, we will look for internal consistency by assessing whether similar question items show consistent patterns of response as those produced using the stage-of-development typology. For example, the CCT asks coalitions about their capacity to perform key functions (Q27), how respondents best describe your coalition (Q3), and whether the coalition has established a reputation for “being able to get things done” related to the area of substance abuse prevention (Q16). Responses to these items should map onto a coalitions’ status on the typology if the typology is valid. Second, we will use external data to examine whether the leveraging of funding was related to the proposed stage-of-development coalition typology. As coalitions become sustaining, they

should be less reliant on DFC funding (DFC funding should be a smaller percentage of the coalition’s total funding).

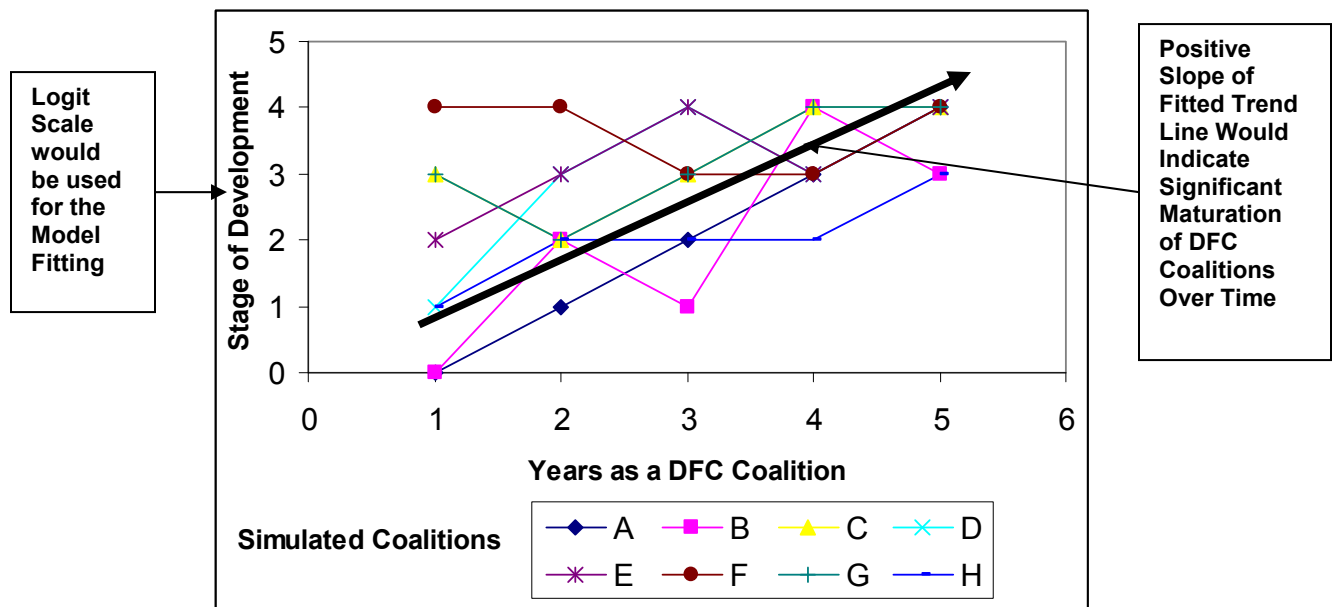
#### 4.2.1 Assessing Trends in Development

As previously described, one of the key questions of the evaluation will be to assess whether DFC coalitions are progressing in development over time. It is important to note that this progression may not be linear in nature and that coalitions may move forward and backwards in development over the course of the evaluation. For example, a Functioning coalition who loses a key coalition leader may change status to an Establishing coalition while they rebuild only to once again become a Functioning coalition at a later date. Therefore, when assessing whether the DFC program has had an impact on the stage of development for the grantee coalitions, it is important to assess the overall trend in coalitions, recognizing the often cyclic nature of coalition development.

In addition to descriptive analyses assessing these trends, polytomous logistic regression will be used to assess the trends in development of the group of coalitions over time. Generalized logits will be assumed for the model, which relaxes the assumption that stage of development has to be an ordinal progression of growth with equal increases between stages. Under this model, exponentiating the estimated regression coefficients will yield the estimated odds of being in a particular stage of development versus a different stage of development. In statistical notation, let  $Y_{ikt} = 1$  if the  $i^{\text{th}}$  coalition has the  $k^{\text{th}}$  stage of development at time  $t$ . Then, let  $\pi_{ikt} = \text{Probability}(Y_{ikt} = 1 / x_{it}, \beta)$ , where  $x_{it}$  is a vector of covariates (explanatory variables) for the  $i^{\text{th}}$  coalition at time  $t$  and  $\beta$  is the parameters of interest estimated by the model. Then, the generalized logit model fits the marginal probabilities of interest denoted by  $\pi_{ik}$ , which corresponds to the probability of coalition  $i$  being in stage of development  $k$ , for particular values of the explanatory variables. The general form of this model is as follows:

$$\log \frac{\pi_k(x_i)}{\pi_K(x_i)} = \beta'_k x_i, \text{ for } k = 2, 3, 4 \text{ (the first stage-of-development serves as a reference).}$$

In this model, candidates for explanatory variables would include time and the coalition’s initial stage of development at baseline. Because there are multiple observations on the same coalition over time, it is necessary to use specialized software that accounts for this inherent clustering in the data. SUDAAN will be used to adapt this model for repeated measures using generalized estimating equations (GEEs). The assessment of whether the DFC grantees are progressing over time would be accomplished through examining the slope coefficient associated with time in the model. A positive and statistically significant slope coefficient would be an indication that DFC coalitions are advancing in development over time. A significant negative slope coefficient would be indicative that DFC coalitions are decreasing in development over time, while non-statistical significance of this slope coefficient would be indicative of no-change, on average, over time. An illustration of this methodology is presented in Figure 4, though not on a logit scale.



**Figure 4. Illustration of Modeling Stage of Development.**

The logistic regression model will provide odds ratios that will be used to interpret the odds of a coalition being in a higher stage of development compared to a lower stage of development as a function of time and starting stage of development. Additionally, this model will enable ONDCP to estimate the probability that a coalition who is in the program for X years and who started at a particular stage-of-development will be in a particular stage-of-development.

### 4.3 MODELING SUBSTANCE ABUSE OUTCOMES

The modeling of substance abuse outcomes has two purposes for this evaluation. First, these models will help to identify factors that are significant predictors of substance abuse outcomes. For example, these models will be used to assess whether the stage of development, coalition characteristics, capacity, activities, etc. are significantly related to substance abuse outcomes. These models will primarily focus on analyses of coalitions that are part of the DFC program and are described in Section 4.3.1. Another consideration of the evaluation is to evaluate trends in substance abuse outcomes in communities targeted by DFC coalitions to the corresponding trends in communities that are not specifically targeted by DFC coalitions (Section 4.3.2).

#### 4.3.1 Identifying Factors Associated with Substance Abuse Outcomes among DFC Coalitions

The COMET represents a rich source of data on a number of potential covariates that may have a relationship with reductions in substance abuse outcomes in DFC coalitions. One key covariate is the stage of coalition development. However, other covariates include coalition capacity, extent of activities, environmental strategies employed, and all other data elements collected as part of the COMET. Regression models will be fit using a GEE approach to account



for the anticipated positive correlation in substance abuse outcome measures on the same community over time. Specifically, the logistic regression models will express the proportion of positive responses within a community as a function of a number of covariates.

Fixed and random effects inverse variance weighted regression using logit transformed outcome proportions will be used to identify those covariates that are significantly associated with substance abuse outcomes after adjusting for the presence of other covariates. Stage of development and length of time that the coalition has existed will be retained in the model regardless of their significance because these variables will be used to test for the significance of any observed trends. The number of years of DFC funding will also be investigated as an alternative to this time measure. The number of potential covariates included in the model may need to be limited or reduced due to sample size considerations. Exploratory analysis may reveal that two variables are highly correlated, in which case only one of the variables would be included in the models at a time with preference in interpretation given to the more theory-defensible variable. Additionally, data reduction techniques such as principal components may be used to reduce the dimensionality of the data. Importantly, the stage-of-development classification described in Section 4.2 is expected to be an important predictor of substance abuse outcomes. Moreover, the classification itself is related and based on a number of factors, which essentially reduces the dimensionality of the data and could create collinear covariates if included in a model with the explanatory variables used to create the classification. Therefore, additional separate models will be fit with and without the classification to investigate the impact of specific factors before and after adjusting for stage of coalition development.

Other forms of the models may need to be fit if information on the number of youth that each percentage was based on are unavailable (i.e., sample size estimates for each outcome are not provided by coalitions). In this case, two alternative models may be employed. First, the data will be fit assuming that the percentages represent a continuous outcome. Second, an arc sine transformation of the percentages will be conducted and used as the dependent variable in the model. The arc sine transformation is a common technique used with percentages to stabilize the variance and to ensure that the model residuals are reasonably normally distributed.

#### **4.3.2 Comparison of DFC Communities to Non-DFC Communities**

The focus of this portion of the evaluation is to determine the impact of DFC coalitions on lowering the prevalence of past 30-day substance use in their communities when compared to communities without DFC coalitions. Conceptually, this contrast can be reduced to a comparison between two curves—one curve describing the outcome of interest among DFC communities while a second describes the curve for the same outcome measure among non-DFCs communities for the same period of time.

To be as robust as possible the DFC evaluation will require information on substance abuse outcomes and covariates of interest from non-DFC communities as a basis of comparison. However, the acquisition of this data will be extremely difficult for a number of reasons, including:

- The current DFC evaluation has limited resources to target, recruit, and retain participation from these non-DFC coalitions. Providing the substance abuse outcome data will be a non-trivial exercise for most coalitions—thus we will need to offer these coalitions proper incentive for their participation.
- Given that the evaluation focuses on long-term trends in substance abuse outcome measures, it will be important to include non-DFC coalitions that will provide information over the entire evaluation period (thus retention is a key component). A plan which includes sampling non-DFC coalitions as a basis of comparison will need to accommodate reasonable estimates for the fraction of coalitions that will either (1) not provide quality outcome data over the total evaluation period, or (2) join the DFC program mid-way through the evaluation (thereby minimizing their utility as a basis of comparison).
- Some non-DFC communities will represent communities without a centralized substance abuse coalition infrastructure. These communities are important to include in the DFC evaluation (as part of the basis of comparison), but will be nearly impossible to target and sample effectively.

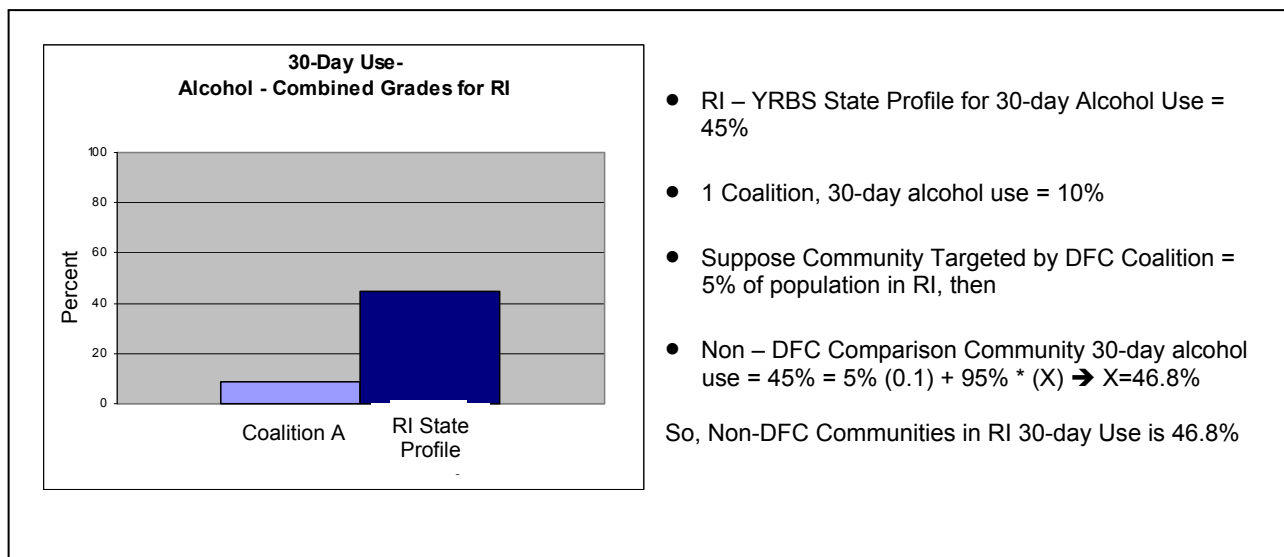
As a result of these factors and other considerations, collecting information from non-DFC coalitions or in communities that lack a substance abuse coalition was determined to be impractical for this evaluation. Instead, this evaluation will focus on using publicly available data sources such as the results of national surveys, and more intensive statistical analysis techniques to define substance abuse outcomes for comparison communities. More specifically, outcome data for the DFC coalitions will be gathered via self reported data through the planned semi-annual progress reporting system (as implemented by the COMET). Surrogates of outcome data for comparison communities (i.e., those that are not targeted by a DFC coalition) will be constructed by extracting outcome estimates from the Youth Risk Behavior Survey (YRBS) and other publicly available, and trusted, substance abuse data sources (e.g. the National Survey on Drug Use and Health (NSDUH), Pride) using a mathematical algorithm. Table 2 summarizes the substance abuse outcome information available from each of these three national surveys. It should be noted, however, that geocoded information is available only at the state or national level in these publicly available data. However, more refined geocodes may become available during the evaluation.

**Table 2. Summary of Substance Abuse Outcome Information Available from Three Large Survey Efforts.**

Outcome	PRIDE			YRBS			NHSDA		
	A	T	M	A	T	M	A	T	M
30-day use	N	N	N	Y	Y	Y	Y	Y	Y
Perception of Risk	Y	Y	Y	N	N	Y	Y	Y	Y
Perception of Parental Disapproval	Y	Y	Y	N	N	N	Y	Y	Y
Age of Onset	Y	Y	Y	Y	Y	Y	Y	Y	Y
Perceived Peer Approval	Y	Y	Y	N	N	N	Y	Y	Y
Perceived Norms and Beliefs	Y	Y	Y	N	N	N	Y	Y	Y
Perceived Availability	Y	Y	Y	N	N	N	N	N	Y
Availability of measures by grade	Yes			Yes			Yes		

Outcome	PRIDE			YRBS			NHSDA		
	A	T	M	A	T	M	A	T	M
Availability of measures by gender	Yes			Yes			Yes		
Respondents Age Range	8 to13+ 14 to 18			12-18			12+		
Respondents Grade Range	4-6 graders, 6- 12 graders			9 <sup>th</sup> -12 <sup>th</sup>			All		
Geographic Data Available	Fee-based			State			Conducted in All States		

With this approach, we will combine data sources so that within each state a time-series of substance abuse outcomes for each DFC coalition over the evaluation period can be derived. We will then construct a single time-series of substance abuse outcomes for the areas of the state that are not covered by the DFC program as a basis of comparison. Substance abuse outcome information for non-DFC communities will be constructed by subtracting substance abuse outcomes reported in DFC communities from published state or national outcomes. A high-level example of this technique is illustrated in Figure 5.



**Figure 5. Illustration of Calculating Non-DFC Community Substance Abuse Outcomes Using State Profiles.**

To illustrate this concept in mathematical terms, we adopt the following statistical notation:

Within each State (i), let

$Y_{ijk}$  = the substance abuse outcome measure for the  $j^{\text{th}}$  DFC coalition, in year k

$w_{ijk}$  = the estimated number of children represented in the service area of the  $j^{\text{th}}$  DFC program for year k (with respect to the outcome measure<sup>1</sup>)

<sup>1</sup> Note that the estimated number of children will vary based on the specific substance abuse outcome measure that is being investigated (i.e. these outcomes may be gender-, race-, or grade-specific)

$Y_{i.k}$  = the substance abuse outcome measure for state (i), in year k – derived from the analysis of existing data sources.

$w_{i.k}$  = the estimated number of children in state (i) in year k (with respect to the outcome measure<sup>1</sup>)

$n_{ik}$  = the number of active DFC coalitions during year k in state (i)

We then derive estimates of the outcome measure and number of youth for areas within state(i) that are not served by DFC coalitions as follows:

$$Y_{i0k} = \left[ \frac{\left( Y_{i.k} \cdot w_{i.k} - \sum_{j=1}^{n_{ik}} Y_{ijk} \cdot w_{ijk} \right)}{\left( w_{i.k} - \sum_{j=1}^{n_{ik}} w_{ijk} \right)} \right], \text{ and } w_{i0k} = w_{i.k} - \sum_{j=1}^{n_{ik}} w_{ijk}$$

In addition to the outcome variables and weights, we will also construct appropriate explanatory variables ( $X_{ijk}$ ) to utilize in the formal statistical models. For example, we could allow  $X_{ijk}$  to be a categorical variable that represents the stage of typology (1-5) for the  $j^{\text{th}}$  DFC coalition in state(i) during the  $k^{\text{th}}$  year of the DFC evaluation. For the areas of the state that are not participating in the DFC program (represented by the  $Y_{i0k}$  outcome and  $w_{i0k}$  weight), we would create a sixth level of typology (level zero) that indicates an area that is not part of the DFC program. We could also use this same 6<sup>th</sup> category for areas that join (or drop from) the DFC program midway through the evaluation, or we could create additional levels of the categorical variable to capture these particular areas differently (depending on the goals of the particular evaluation model).

Due to the fact that our outcome variables represent specific spatial areas (i.e., communities), we will also use the 2000 United States Census (and other spatial summary datasets) to create explanatory variables to use in the evaluation. Thus, we can adjust the evaluation statistical models for various community-level summary demographic factors such as income, ethnicity, education, population density, etc.

Note that there is an important difference between the two types of explanatory variables discussed above. The stage of typology variable for DFC coalitions is considered a time-varying covariate for which we would expect the value to change over time within each DFC program (to reflect the evolution and growth of each DFC coalition over the evaluation period). The demographic factors summarized in the US Census represent time-invariant covariates which are generally assumed to stay stable over the evaluation time frame.

Once the outcome variables, covariates, and other factors have been created, extensive statistical modeling with these variables will be accomplished to address the specific hypotheses of interest to the evaluation. Several different models will be explored and assessed as part of the evaluation, however, the following statistical model is an example of how the DFC

evaluation data will be combined to assess differences in trends over time in substance abuse outcome measures as a function of stage of typology:

$$Y_{ijk} = \beta_{0Z} \cdot I_{(X_{ijk}=Z)} + \beta_{1Z} \cdot I_{(X_{ijk}=Z)} \cdot Year(k) + \gamma_{0ij} + \gamma_{1ij} \cdot Year(k) + \varepsilon_{ijk}, \text{ where}$$

- $\beta_{0Z}$  and  $\beta_{1Z}$  represent separate fixed effect intercept and slope pairs for each stage of typology (Z ranges from zero to five) describing a linear trend over time across the nation for the substance abuse outcome measure  $Y_{ijk}$ ;
- $I_{(X_{ijk}=Z)}$  is an indicator variable whose value is one if  $X_{ijk}=Z$ , and zero otherwise
  - $X_{ijk}$  indicates the stage of typology for the  $j^{\text{th}}$  DFC coalition area within state (i) at time k
  - $X_{ijk}=0$  when  $j=0$  (for areas of the state not involved in the DFC program)
- $\gamma_{0ij}$  and  $\gamma_{1ij}$  represent random effect intercepts and slopes corresponding to each geographic area, allowing each area to have its own linear trend in substance abuse outcome measures. The actual  $\gamma_{0ij}$  and  $\gamma_{1ij}$  random effects represent deviations from the overall national trend captured by the  $\beta_{0Z}$  and  $\beta_{1Z}$  fixed effect parameters for the  $j^{\text{th}}$  area in state(i).
- $\varepsilon_{ijk}$  represents error not captured by the model (i.e. deviations from the area specific linear trend in substance abuse outcomes).

In this model, it is assumed that  $\delta_{0ij}$  and  $\delta_{1ij}$  jointly follow a multivariate normal distribution with mean zero and covariance matrix  $\Sigma = \begin{bmatrix} \sigma_{11}^2 & \sigma_{12}^2 \\ \sigma_{21}^2 & \sigma_{22}^2 \end{bmatrix}$ , and that  $\varepsilon_{ijk}$  follows a normal distribution with mean zero and variance  $\sigma_{Error}^2$ .

This mixed models analysis of variance would be fit using the weights ( $w_{ijk}$ ) described earlier so that the results of the analysis can be generalized to the entire United States population of adolescents. Note that the fixed effects parameter estimates ( $\hat{\beta}_{0Z}$  and  $\hat{\beta}_{1Z}$ ) that result from fitting this model will allow us to compare the average trend across the nation in substance abuse outcomes between coalitions in different stages of typology, as well as between each stage of DFC typology and non-DFC areas. In addition, we can easily collapse the 6-level  $X_{ijk}$  stage-of-typology explanatory variable to a 2-level variable that indicates whether the  $j^{\text{th}}$  area of state(i) is an active DFC coalition area in year(k) to allow for a global comparison of whether trends in substance abuse outcomes are different between DFC and non-DFC areas of the country. This model can easily be expanded to allow for non-linear trends over time in substance abuse outcome measures by adding appropriate fixed effect and random effect terms. This model can also accommodate the inclusion of other explanatory variables (including both time-varying factors and factors that stay stable over time) as long as these variables are measured both for the DFC and non-DFC communities.

There are a number of significant challenges with this approach that will be addressed in the statistical analysis. One such challenge is that DFC coalitions may submit outcome data that represent geographic areas that differ from their true sphere of influence. This is important because the substance abuse outcome information for non-DFC coalitions will essentially be constructed through subtraction. Another related challenge will be situations where there are multiple DFC coalitions targeting the same community. These and other anticipated challenges to this analysis, along with our method for overcoming these issues are summarized in Table 3.

**Table 3. Summary of Anticipated Analysis Issues and Methods to Overcome these Issues.**

Description of Issue	How this Issue Will Be Identified	Method for Addressing the Issue
Coalition reports outcome information that covers a different geographical area than that targeted by Coalition.	Included as a data element in COMET.	<ul style="list-style-type: none"> <li>▪ Exclude these coalitions from analysis.</li> <li>▪ Training/Technical Assistance by PO to resolve.</li> </ul>
There are multiple DFC coalitions operating within the same community, all reporting the same substance abuse outcome data.	Target community provided as data elements in COMET.	<ul style="list-style-type: none"> <li>▪ Treat Coalitions as “super-coalition” and adjust covariates appropriately (e.g., if either coalition has a capacity, then the “super-coalition” does).</li> <li>▪ Include a covariate in the model to indicate the number of DFC coalitions having influence on the outcome.</li> </ul>
There are multiple DFC coalitions operating within the same community, all reporting different substance abuse outcome data.	Comparison of outcome information reported in COMET.	<ul style="list-style-type: none"> <li>▪ Identify portion of community being focused on by each coalition if possible, then consider this to be the target community.</li> <li>▪ For overlapping portions of the community, use the average of the substance abuse outcomes, create a “super-coalition” for that portion of the community.</li> <li>▪ Include a covariate in the model to indicate the number of DFC coalitions having influence on the outcome.</li> </ul>

Description of Issue	How this Issue Will Be Identified	Method for Addressing the Issue
There are DFC and non-DFC coalitions targeting the same community.	Cross-reference DFC communities with CADCA, SIG, and other known coalition efforts.	<ul style="list-style-type: none"> <li>▪ If there is a complete overlap, then this would be considered a “DFC community.” A variable indicating the number of Non-DFC coalitions that affect the outcomes will be included in the model.</li> <li>▪ If there is incomplete overlap, then the portion of the community being focused on by each coalition will be identified if possible, then consider this to be the target community.</li> </ul>
Poor quality or missing data on substance abuse outcomes reported by Coalitions.	Screening during reporting period; comparison to State profiles; comparison to other Coalitions in State.	<ul style="list-style-type: none"> <li>▪ Substance abuse outcomes from coalitions that are determined to be unreliable will be excluded from the analyses. Validation will be performed using a subjective assessment and a statistically-based outlier analysis.</li> <li>▪ Outcomes with missing information such as associated sample sizes will have sample sizes imputed.</li> </ul>

#### 4.4 ASSESSMENT OF ADDITIONAL EVALUATION QUESTIONS AND HYPOTHESES

As discussed in Section 1.0, there are a number of specific evaluation questions in addition to the three primary objectives of the evaluation. Three of these questions are focused on assessing the relationship between potential explanatory variables and substance abuse outcomes. However, the majority of these questions are focused on understanding and evaluating the relationships between activities, strategies, and coalition capacity. Regardless, all of these evaluation questions will be assessed through statistical modeling using data self-reported by coalitions.

For those three questions that are focused on the relationship between particular factors and substance abuse outcomes, the primary approach will be to include these factors as explanatory variables in the models described in Section 4.3. Unlike other potential explanatory variables, however, these factors will be forced to remain in the models so that statistical significance of the relationship between these factors and substance abuse outcomes can be assessed. Table 4 summarizes the three evaluation questions that will be assessed with this method along with proposed hypotheses that will be specifically assessed.

**Table 4. Additional Evaluation Questions Regarding Relationships to Substance Abuse Outcomes.**

Evaluation Question	Study Hypotheses	Analysis Method
Composition/Collaboration: What mix of agencies and types of collaboration are most associated with improvements in community substance use as well as risk and protective factor outcomes?	A. There are specific activities, and/or collaborations that are associated with substance abuse outcomes and risk/protective factors.	Included as Covariates in Substance Abuse Outcome Models
Outcomes vs. Geography and Socio-economic status: What evidence, if any, illustrates an association between differences in outcomes and such factors as geographic location (urban/rural/ suburban) or socio-economic status?	A. There are specific relationships between geography and socioeconomic status and substance abuse outcomes and risk/protective factors.	
Effectiveness of Strategies: What are the most effective strategies? What mix of strategies led to positive community changes? Is there any relationship to type, level, and coordination of outside funding streams?	A. There are specific relationships between use of specific strategies and substance abuse outcomes and risk/protective factors. B. There are specific relationships between type, level, and coordination of outside funding and substance abuse outcomes and risk/protective factors.	

The other additional evaluation questions focused on coalition capacity will also be addressed through statistical models, though a separate model will be used for each question. Generally, these models will consist of the family of general linear models with repeated measures to account for multiple observations from the same coalitions over time. The specific form of the model will depend on the nature of the outcome variable but will include Poisson regression for modeling outcomes that are counts, logistic and polytomous logistic regression models for categorical outcomes, and linear regression models for continuous outcomes. All models will employ GEE techniques to partition the variance components. To facilitate statistical analysis, the equation questions have been translated into specific hypotheses of interest that can be tested using a statistical model. Table 5 summarizes the specific modeling technique that is anticipated for each evaluation question and related hypotheses.

The impact of ONDCP’s Mentoring program is hindered by the relatively small sample size associated with this program (approximately thirty to forty coalitions participating in the mentoring program). This small sample size may limit the ability to identify significant relationships. However, we will attempt to quantitatively assess the impact of this program by coding support activities of the mentoring coalitions to develop categories of activities (i.e., a measure of dosage). Next, summary statistics and logistic regression models will be used to examine the relationship between these categories or level of effort and capacity outcomes of the mentee coalitions (i.e. preparedness to implement SPF: governing body, baseline measures, strategic planning activities, collaboration of key sectors).



**Table 5. Analysis Approach for Capacity Related Evaluation Questions.**

Evaluation Question	Study Hypotheses	Analysis Method
Increase in Evidence-Based Programs, Policies, and Strategies: What evidence exists to demonstrate an increase in evidence-based programs, policies, and strategies in coalition communities?	A. DFC Grantees have increased their use of evidence-based programs. B. DFC grantees have had an increase in their impact on substance abuse policies. C. DFC grantees have increased the use of environmental strategies to reduce substance abuse	Poisson Regression and Logistic Regression
Sustainability: What evidence exists that demonstrates the sustainability of DFC coalitions?	A. DFC coalitions become (are) sustainable	Logistic Regression, Linear Regression
Increased National Capacity: To what extent has the number of communities with established coalitions increased (a Healthy People 2010 requirement)?	A. The DFC grant program has increased the number of communities with established coalitions. B. DFC coalitions that have received funding advance in development (i.e., become more established)	Poisson Regression  Hypothesis B will be examined through the Stage-of-development Analysis
Impact of Technical Assistance on Data Collection, Application, and implementation of Environmental Strategies: What evidence exists that supports or negates an association between the provision of technical assistance and increased data collection and application and/or use of evidence-based strategies by coalitions? Does receiving technical assistance increase the likelihood that a new coalition will subsequently obtain new DFC funding? Do these relationships vary with the source of the technical assistance?	A. Coalitions receipt of technical assistance is positively correlated with stage-of-development (i.e., more technical assistance results in higher stages of development) B. Some sources/types of technical assistance are more effective than others C. Technical assistance results in increased data collection D. Technical assistance results in increased use of evidence-based strategies	Hypothesis A will be examined through Stage-of-development analysis  Logistic Regression

**4.5 ANALYSES TO SUPPORT GPRA REPORTING**

ONDCP is required to submit a Government Performance and Results Act (GPRA) report to Congress annually regarding the DFC grant program. The specific goals and objectives to be addressed may vary somewhat from year-to-year. Table 6 summarizes ONDCP’s goals and objectives for Fiscal Year 2005.

**Table 6. ONDCP’s FY2008 GPRA Goals and Objectives.**

GPRA Goals	Primary Objectives
Goal 1: Improve Coalition Effectiveness	Enhance and strengthen infrastructure <ul style="list-style-type: none"> <li>▪ Increase citizen participation in prevention efforts</li> <li>▪ Improve coalition capabilities</li> <li>▪ Increase intergovernmental and interagency collaboration in coalitions</li> <li>▪ Ensure prevention efforts are more comprehensive and evidence-based and consistent with identified needs</li> </ul>
	Enhance prevention efforts <ul style="list-style-type: none"> <li>▪ Strengthen coalitions in their prevention efforts to decrease risk factors in the community</li> <li>▪ Strengthen coalitions in their prevention efforts to increase protective factors</li> <li>▪ Strengthen coalitions in their prevention efforts to decrease substance abuse indicators.</li> </ul>
Goal 2: Strengthen technical assistance to community coalitions	Implement and Assess Strategies of the National Community Anti-Drug Coalition Institute.
	Implement and assess the efficacy of a mentoring coalition demonstration program.

*Statistical approach for establishing targets.* Targets for annual GPRA performance were established by calculating the upper 95% confidence interval for each baseline proportion and for each successive year’s target value. That is, the upper 95% boundary value for each baseline proportion became the second program year’s target value. The upper 95% boundary value for the second year’s target, was selected as the third year’s target, and so on.

The 95% confidence interval was calculated using Logit transformed proportions (see Formula 1) with the standard error of the proportion calculated using Formula 2 and an assumed sample size of 700 (the approximate number of coalitions in the first year of DFC-funding). The actual upper boundary of the confidence interval was calculated using Formula 3 and transformed back into its associated proportion using Formula 4.

*Calculating the logit transformed proportion*

$$ES_L = \log_e \left[ \frac{p}{1-p} \right] \tag{Formula 1}$$

Where  $\log_e$  = the natural log and  $p$  = the proportion of subjects in the category of interest (i.e., the baseline or current target).

*Calculating the standard error*

$$SE_L = \sqrt{\frac{1}{np} + \frac{1}{n(1-p)}} \tag{Formula 2}$$

Where  $n = 700$  and  $p$  = the proportion of subjects in the category of interest.

*Calculating the upper 95% confidence interval*

$$T = ES_L + (1.96 * SE_L) \quad \text{Formula 3}$$

Where T = the new target expressed as a logit,  $ES_L$  is the logit transformed target, and  $SE_L$  is the standard error for the logit transformed target.

*Transforming the logit target (T) back into its associated proportion*

$$p = \frac{e^{ES_L}}{e^{ES_L} + 1} \quad \text{Formula 4}$$

Where  $e^{ES_L}$  is the base of the natural logarithm raised to the power of the logit transformed proportion.

Because DFC outcomes are collected on alternating years, the target values calculated using this method are ambitious in that they project statistically significant change in DFC coalition performance between each anticipated wave of coalition reporting. Because the number of funded DFC coalitions is expected to grow, the assumption of 700 coalitions contributing data is conservative for estimating upper 95% confidence intervals.

*Statistical approach for estimating GPRA actuals.* Actual performance of the DFC coalitions on the GPRA outcome measures is calculated by estimating the cumulative performance of coalitions on each GPRA measure over baseline relative to the total number of coalitions for which performance could be calculated. That is, only coalitions providing two or more years of performance data for the same grade respondents are eligible to contribute to the estimate.

All calculations for GPRA performance measures follow the same basic logic: the number of programs demonstrating success on a performance measure is divided by the total number of DFC funded programs that provided a baseline estimate and some follow-up estimate for each measure. For the non-past 30-day use items (Age Of Onset, Parental Disapproval or Perception of Risk) a coalition is counted as successful if there is any improvement from baseline (i.e., a later measured outcome indicates improvement in performance over baseline). For past 30-day substance use measures the same basic logic is employed, except that it involves a calculation in addition to the logical rule. If past 30-day substance use decreases by 5% or more in two or more grades, then a coalition is counted as successful.

As each coalition provides its own baseline, the 5% reduction necessary to be identified as successful is calculated according to Formula 5, the value representing a 5% reduction in the proportion of users over baseline for each substance and grade. A coalition is counted as successful when two or more grades within the coalition provide subsequent past 30-day use proportions that are less than or equal to each grade and substance's referent criterion proportion.

*Calculating each grade by substance 5% reduction criterion value*

$$C_A = p_B * .95$$

Formula 5

Where  $C_A$  is the criterion to be met or exceeded for success and  $p_B$  is the baseline performance for each grade and substance within a coalition.

The proportion of successful coalitions for each GPRA measure is calculated as the number of successful coalitions divided by the total number of coalitions providing two or more waves of data (see Formula 6).

*Calculating the proportion of successful coalitions*

$$p_{SC} = \frac{S_C}{T_C}$$

Formula 6

Where  $S_C$  is the number of coalitions meeting or exceeding the performance criterion and  $T_C$  is the total number of coalitions providing two or more waves of data.

## **5.0 STATISTICAL ANALYSIS OF EXTERNAL DATA**

Although this evaluation effort is in its initial phases, efforts to understand and collect information on substance abuse in communities have been ongoing for decades. In some cases, this information may be captured for the same communities that have been targeted by DFC coalitions. This information may therefore provide a valuable source of additional outcome information for understanding trends and progress of reducing substance abuse in DFC communities. Generally, there are two types of outcome information that will be examined and included as part of the statistical analysis if possible: (1) information on substance abuse outcomes, and (2) information on distal outcomes. The following two sections discuss the approach for assessing the feasibility of incorporating this data, and if feasible, our approach for conducting statistical analysis.

### **5.1 MODELING SUBSTANCE ABUSE OUTCOME DATA COLLECTED THROUGH EXTERNAL SOURCES**

One of the drawbacks of the modeling approach described in Section 4.3 is that it can only distinguish between DFC and non-DFC communities for comparison of substance abuse outcomes. Acquiring external substance abuse data at a more refined geographic level such as counties, municipalities, etc. will enable a comparison of DFC coalitions to non-DFC coalitions, and to communities that do not have a coalition at all. However, because the collection of this data is outside of the control of the evaluation, there are significant considerations that must be addressed before attempting a meaningful statistical analysis. These considerations are discussed in Section 5.1.1. The statistical methodology that would be employed if appropriate data can be obtained is presented in Section 5.1.2.

### 5.1.1 Feasibility Assessment

Whenever external outcome data is used to evaluate a specific program there are a number of questions that need to be addressed regarding access to the data and the validity of applying the data to the current analysis. For this evaluation the primary questions regarding the use of external substance abuse outcome information include (1) can the substance abuse outcome data be acquired at a meaningful level of geography? (2) is the outcome data that is available representative of DFC coalitions as a whole? and (3) will there be sufficient sample sizes and power for statistical analysis? Addressing each of these questions forms the core of the activities associated with the feasibility assessment. Failure to successfully address any one of these three key questions would result in not moving forward with the statistical analysis.

#### *Availability of Substance Abuse Outcomes from External Sources*

As described in Table 1, there are at least four large surveys that collect information on substance abuse outcomes of interest. These surveys include the National Household Survey on Drug Use (NHSDU), both national and state-specific components of the Youth Risk Behavior Survey (YRBS), Monitoring the Future (MTF), and the National Parents Resources Information for Drug Education (PRIDE) Survey. However, local geographical information such as county or community-level information is not typically included in the public release version of these files.

Obtaining access to the identity of the primary sampling units (PSUs) and segments from one or more national surveys will enable the construction of substance abuse outcome measures for specific geographic areas across the country (at the county, zip-code, or census-tract level, depending on the design of each survey). If the survey sponsors (or contractors who perform the surveys) are unwilling to provide the geographic identity of the PSUs and segments from their surveys, we could alternatively request that they provide the aggregated substance abuse outcome measures at the highest level of geographic specificity. This may be more feasible and palatable to the survey sponsors, as there would be no possibility of identifying a single study subject from this aggregated data. As part of the feasibility assessment, the evaluation team will initiate contact with the various survey sponsors to discuss how the data will be used and the rationale behind the request. This contact may also include a formal briefing to the survey sponsors. ONDCP would also likely be required to initiate a formal interagency request for this information.

A second thrust of the feasibility assessment regarding the availability of data will be to conduct a literature and Internet review to determine the extent to which published substance abuse outcome information is available over time.

#### *Representativeness of the Communities where Data is Available to all DFC Communities*

Assuming that data at a community level is available, the next consideration will be to assess whether this data is representative of the DFC communities. Again, the evaluation team will not have the ability to control the geographic locations that the data represent. National surveys are typically conducted using a probability sampling scheme, with inclusion probabilities

weighted by population density or related factor. They may or may not include stratification to ensure that the sample is distributed throughout all types of geographic entities (e.g., urban, suburban, and rural communities). For example, because the focus of many of these surveys is on calculating a national or state-level estimate, it would be logical to oversample the large population centers because this is where the largest segments of the population reside. Therefore, it will be important to map the communities that are included in each national survey or other data source to ensure that the communities included in this sample are “similar” to DFC communities in terms of various demographic and socioeconomic characteristics so that the results of analyses conducted with this data can be expanded to the entire group of communities targeted by DFC coalitions.

Another consideration will be the “appropriateness” of the comparison communities for the evaluation. That is, are the non-DFC communities where data is available suitable to serve as comparisons to DFC communities? For this evaluation the gender, race/ethnicity, age, population density, and economic status for each community that data is available will be collected and used to determine whether a community has a similar demographic and socioeconomic composition as a DFC community. As an initial step, we will utilize an algorithm to compute a “similarity” measure between DFC communities and non-DFC communities. Communities with roughly equivalent similarity scores will be considered to be candidate communities for further investigation.

#### *Evaluation of Sample Sizes and Statistical Power*

Even if community-level data are available from these sources, it is extremely unlikely that representative outcome data will be available for every DFC community, especially for the same communities over a five-year period. Data will be much more likely to be available for some DFC communities for some years and unavailable in others. A similar phenomenon could be expected for non-DFC communities. Therefore, if community-level data are available, an assessment will be conducted to determine if sufficient data is available for DFC and comparison communities over time for the statistical analysis to be meaningful (i.e., have sufficient power to detect differences). Simulation techniques will be used to establish minimum sample size criteria needed in each year and across all years of the evaluation to ensure a specific targeted power level.

#### **5.1.2 Statistical Methods**

There is a very important distinction between the modeling approach discussed in Section 4.3 and the modeling approach that will be conducted using external data sources. In Section 4.3, the substance abuse outcome data will be obtained through actual repeated measures of the same communities (via the self-reported mechanism). With the external data, the substance abuse outcome data will be constructed by integrating the results from a series of ongoing cross-sectional surveys. In some cases, a survey may repeatedly target the same geographic area, but in many instances the survey will target different communities each year. Nevertheless, the statistical methodology for external substance abuse outcome data is similar

to that employed for the self-reported outcome data, although a simpler model would be utilized:

$$Y_{ijk} = \beta_{0Z} \cdot I_{(X_{ijk}=Z)} + \beta_{1Z} \cdot I_{(X_{ijk}=Z)} \cdot Year(k) + \gamma_{0ij} + \varepsilon_{ijk}$$

This model is essentially the same as described in Section 4.3, with the following two important distinctions:

- In the models with the self-reported outcome data, Z ranged from 0 to 5 providing an index for the various different stages of typology captured by the categorical explanatory  $X_{ijk}$  variable. For this analysis, we anticipate expanding this range to allow  $X_{ijk}$  to capture additional information (e.g. different levels for each stage-of-typology among DFC programs, different levels capturing similar pseudo-typology information for non-DFC areas if available, and a single level corresponding to areas with no known substance abuse coalition).
- In the models for the self-reported outcome data, both intercept and slope random effects ( $\delta_{0ij}$  and  $\delta_{1ij}$ ) for each coalition area were included because we anticipated having at least two repeated measure substance abuse outcome measures for each participating community, thereby allowing us to determine a linear trend for each coalition area at a minimum. Because many geographic areas may only be surveyed on one occasion over the evaluation period (among the limited number of targeted surveys), the random effect slope term cannot be included in this model at the current time. Removal of this term means that specific areas will be allowed to deviate from the fixed-effect national trends by an additive factor that stays stable over time. The fixed effects parameter estimates (and associated standard errors) should be robust to this subtle reduction in the model because the potential correlation among repeated measures on a community will still be accounted for by including the random intercept ( $\delta_{0ij}$ ).

Similar to the model used for the self-reported data, the above mixed models analysis of variance will be fit using weights ( $w_{ijk}$ ) so that the results of the analysis can be generalized to the entire U.S. population. The fixed effects parameter estimates that result from fitting this model will allow us to compare the average trend across the nation in substance abuse outcomes between DFC coalitions in different stages of typology, between DFC coalitions and non-DFC coalitions in similar stages (based on any constructed pseudo-typology explanatory variables), and between areas served by DFC (or non-DFC) coalitions and areas that are not served by any known substance abuse coalition. This model could also be expanded (in the fixed effects only) to explore non-linear (quadratic or cubic) trends over time in substance abuse outcome measures and to adjust for demographic factors that are available through the United States Census or other spatial data sources.

## 5.2 EVALUATING DISTAL OUTCOMES

According to the hypothesized typology, some of the DFC coalitions, particularly the more advanced coalitions, have the potential to be impacting long-term or distal outcomes. These distal outcomes include reductions in medical treatment for substance abuse related medical conditions, reduced substance abuse related traffic incidents and accidents, a reduction in the number of drug-related crimes, reductions in mental illness, school failures, teen pregnancies, etc. For this evaluation, if ONDCP so desires, we will focus on assessing the relationships between DFC program participants and two distal outcomes, (1) hospital discharges for treatment related to substance abuse, and (2) traffic-related fatalities as a result of substance use/abuse. Given the relatively low funding level of DFC coalitions, the length of time that the DFC program has existed, the variable nature of distal outcomes, and the number of coalitions that could be expected to have a measurable impact on these distal outcomes, we do not anticipate that an analysis of distal outcomes will be a meaningful and significant portion of the evaluation. However, we will conduct a feasibility study to determine the appropriateness of the analysis and to support a decision of whether or not to include these outcomes as part of the evaluation analysis.

The feasibility assessment related to distal outcomes will need to address many of the same issues that were described for external substance abuse outcomes (Section 5.1.1). However, there are two primary issues that need to be addressed in this feasibility analysis. First, what sources of information will be used, and can this information be readily linked to a particular DFC coalition's targeted community? Second, are there a significant number of DFC coalitions that are sufficiently advanced so that it would be reasonable to expect that these coalitions may have had an impact on the distal outcomes?

### *Potential Data Sources*

Hospital discharge information is available from a variety of different sources, including the National Hospital Discharge Survey (NHDS), which is a well-accepted source of reports for the number of national hospital discharges for specific reasons. While the NHDS is a true probability sample, its relatively small size implies that it may not provide useful information at the community level for this evaluation. Another alternative is the Nationwide Inpatient Sample (NIS), which contains the ICD-9-CM N-codes corresponding to the diagnosis. The NIS consists of all patients discharged in a single year from a stratified sample of about 1000 community hospitals. The most recent NIS samples have been selected from state-based hospital discharge databases from about one-half of the states, including nearly all the most populous ones. More states are scheduled to join the HCUP in the next few years. The NIS will be the primary data source investigated for this evaluation. All of the salient issues pertaining to matching this data to DFC and non-DFC comparison communities previously discussed will also need to be addressed for this data.

Information on fatal accidents at a community level is available in the Fatal Accidents Reporting System (FARS) created by the National Highway Traffic Safety Administration (NHTSA) in the 1970s. This database contains information for all crashes that involve a motor vehicle traveling



on a traffic way customarily open to the public and that results in the death of a person (either an occupant of a vehicle or a non-motorist). This information includes over 100 different data elements related to the fatality and often includes information on the precise location of the crash. However, the location information is not always available for geographic areas below the county level.

#### *Evaluation of Sample Sizes and Statistical Power*

Under the hypothesized typology, the impacts to distal outcomes are not expected for beginning, functioning, and even maturing coalitions. Therefore, only a subset of DFC coalitions is expected to be sufficiently advanced enough to have influence on these distal outcomes. Minimal sample size calculations together with a statistical power analysis will be conducted using simulation techniques to determine if there are enough DFC coalitions that are expected to have an impact on these distal outcomes, and the degree to which a change in the distal outcomes can be reliably assessed. If sufficient numbers of coalitions cannot be identified to facilitate a statistical analysis that can identify a meaningful change in the outcome with a high degree of statistical power, then this analysis would not be conducted.

## **6.0 SUMMARY**

As discussed in the previous sections of this document, there are many different activities and assessments that will be conducted to accomplish the goals and objectives of this evaluation. Many of these tasks will be completed during the first year of the evaluation, including the formulation of the typology, data collection system, and the evaluation design. The core components of the statistical analyses will be initiated following the collection of the first wave of data from coalitions and will continue throughout the remainder of the evaluation. Ultimately, the analyses described in Section 4.0 and Section 5.0 of this document will provide a comprehensive examination of the DFC program and will provide answers to all of the evaluation questions and hypotheses. Figure 6 summarizes how each of these analyses will be combined to address the three key evaluation objectives.

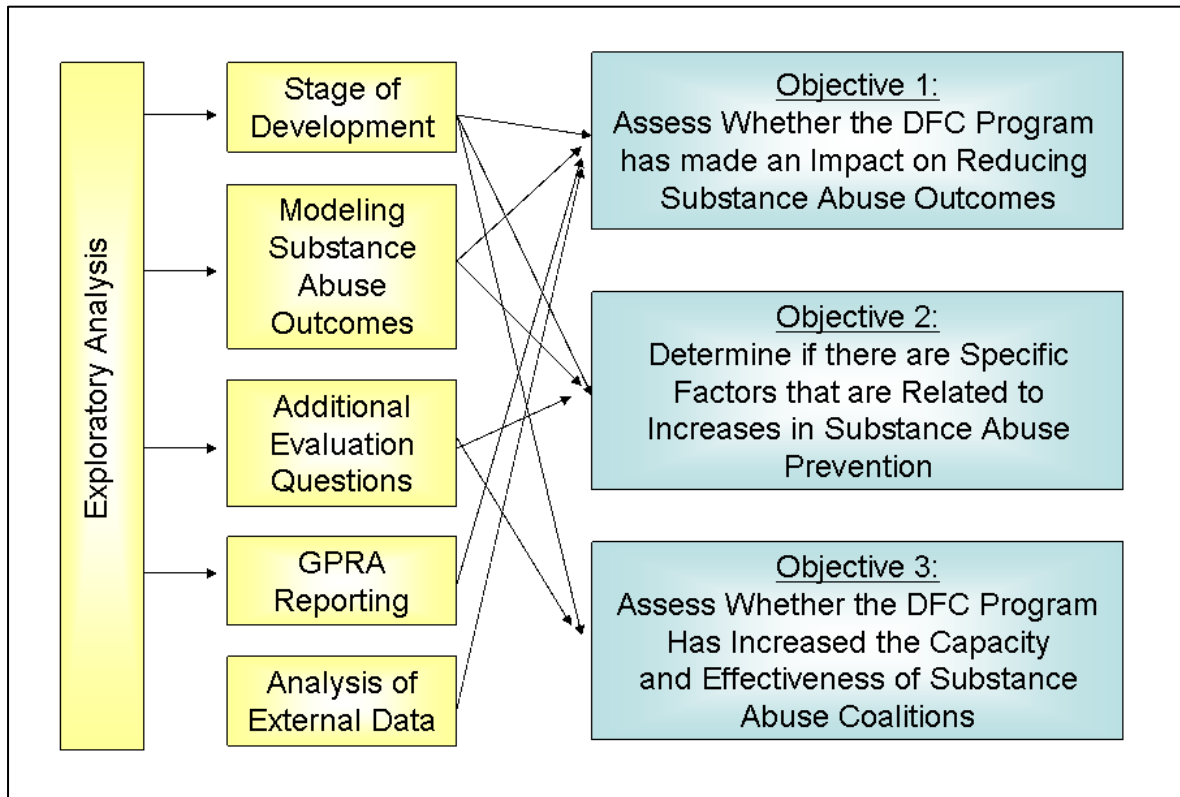


Figure 6. Cross-Link Between Evaluation Analysis and Objectives

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