Section 3

Health Program Development

Program Theory and Interventions Revealed

After developing statements about health problems that have been ranked as a high priority, the next steps in health program planning involve a more intellectual and creative effort to articulate an explanation of what caused the problem. This is a critical step toward identifying which intervention or group of interventions will be most effective in addressing the health problem. Wild guesses, past experience, and personal preferences might be used as the basis for decision making, but a more rational approach is to identify existing scientific knowledge and theories that can be used to develop a program theory.

A *theory* is a description of how something works. It is a set of statements or hypotheses about what will happen and, therefore, contains statements about the relationships among the variables. We use working theories in everyday life, usually in the form of working hypotheses, such as "If I ask the children to clean their rooms, they are not likely to do it." We also use theories based in science. For example, based on theories of thermodynamics and heat conduction, we can predict how long the turkey needs to roast.

With regard to planning a health program, a primary consideration is to specify what is to be explained or predicted with a theory. The health problem is what needs to be explained, from a programmatic perspective. To explain how to change or affect the health problem, a theory must contain relevant variables, or factors, and must indicate the direction of the interactions among those variables related to the health problem. Identifying the relevant antecedent, contributing, and determinant factors of the health problem gives planners the foundation for developing a working theory of how the programmatic interventions will lead to the desired health outcome. A difficult part of this task is to identify where a health programmatic intervention can have an effect on those factors. As more details and more factors are included in the explanation of the health problem and beliefs about how the programmatic interventions will work, the theory becomes increasingly more complex.

The theory development phase of program planning requires thinking rather than doing, so it often receives less attention than is needed to fully develop an effective health program. However, using a systematic approach to develop a program theory and to engage stakeholders in the development of the theory has big and long-term payoffs that outweigh any delay or costs associated with developing the theory.

PROGRAM THEORY

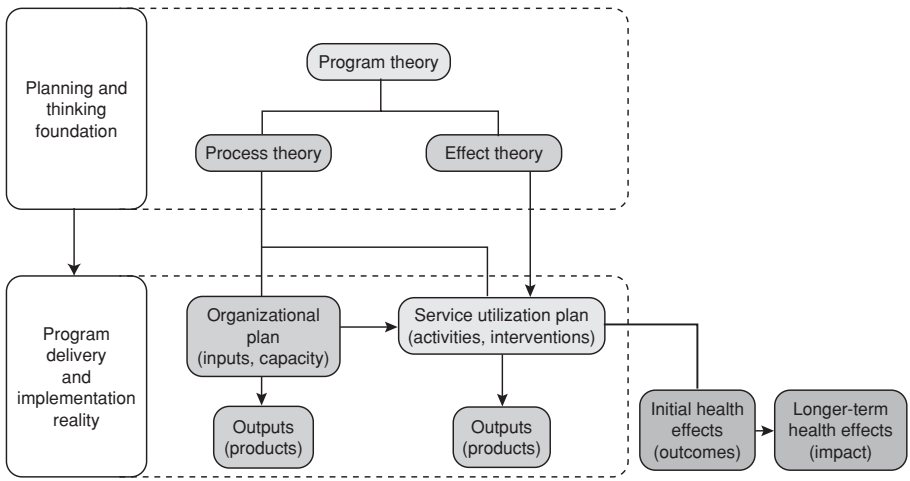
A sound basis for developing the health program and for guiding the program evaluation is the use of a program theory. Rossi, Freeman, and Lipsey (1999) acknowledged that the need for a program theory has long been recognized by evaluators in the social sciences. Only recently, however, has a program theory been advocated for as useful in public health program development (Potvin, Gendron, Bilodeau, & Chabot, 2005). *Program theory* is a conceptual plan, with some details about what the program is and how it is expected to work. The comprehensive overview of how the program is to work has various names; other names include logic model, causal model, outcome line, program model, and action theory. These names all refer to a conceptional plan of how the program will work. Whether one is developing a new health program or designing an evaluation for an existing health program, understanding and articulating the program theory is essential.

There are two main components of program theory, as shown in the top half of Figure 6.1. The theory about resources and actions is called the *process theory*, and the theory about interventions and outcomes is called the *effect theory*. The concept of program theory is used throughout this textbook rather than the more widely used term "logic model," as discussed in Chapter 8. The key difference is that a full program theory, as compared to a logic model, contains a far more explicit explanation of the relationship of the factors related to the health problem with the interventions. These relationships are the effect theory. Similarly, the process theory offers a more explicit and detailed description of the resources used than is normally found in a logic model. The major similarity is that both a logic model and the program theory provide road maps to creating a successful program. The development of a program theory and its components leads to a stronger program and a more convincing argument for the program's existence.

Process Theory

The process theory includes three components: the organizational plan, the service utilization plan, and specifications of their outputs (Rossi et al., 1999).

Figure 6.1 Model of Program Theory



Source: Adapted from Rossi, Freeman, and Lipsey, 1999.

Process theory can be integrated with the current public health language of inputs, which are part of the organizational plan; activities, which are part of the service utilization plan; and outputs, which are by-products of the organizational and service utilization plans.

The *organizational plan*, according to Rossi et al. (1999), encompasses the nature of the resources needed to implement and sustain the program. As such, it includes specifications about personnel, the organization of resources to be used in the program, and elements of capacity, such as infrastructure, information technology, fiscal resources, and personnel. It covers all the "behind the scenes" work needed to provide a program. The organizational plan implicitly contains "if–then" statements. For example, if program staff are adequately supported with regard to supplies and managerial support, then program staff will deliver the interventions as planned. These "if–then" statements are useful not only for checking the logic behind requesting specific resources, but also for guiding the portion of the evaluation plan that focuses on the processes behind the delivery of the health program.

The *service utilization plan*, according to Rossi et al. (1999), specifies how to reach the target audience and deliver the programmatic interventions and services to that audience. It constitutes the nuts and bolts of providing the program and of implementing the program plan. The service utilization plan

includes specifics about social marketing of the program, accessibility and availability of the program, screening procedures, and other logistics of providing the program. Development of the service plan ought to reflect cultural sensitivity and appropriateness of the services and intervention given the target audience.

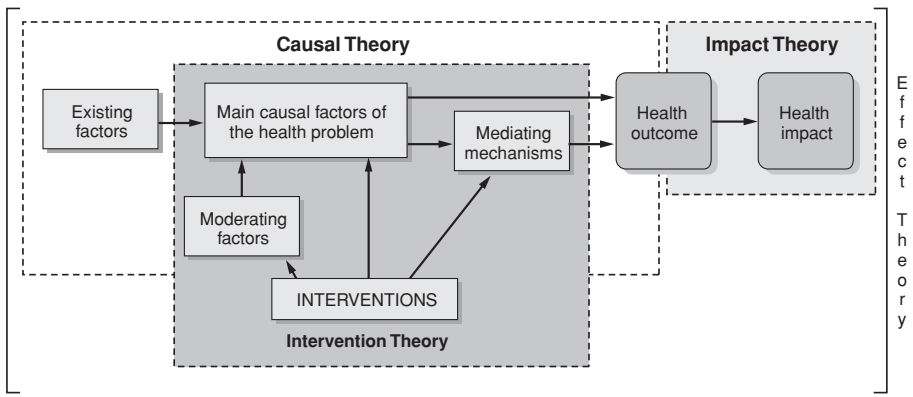
Within the context of planning a program, the organizational plan needs to be in place before the program can begin. Both the organizational plan and the service utilization plan need to be developed using the results of the organizational and community health assessments, particularly with regard to incorporating existing resources into the plans and addressing structural issues that can affect the delivery of the program. The organizational plan is influenced by the service utilization plan to the extent that the planned intervention must be adequately supported by the resources outlined in the organizational plan. As a consequence, the development of the organizational and service utilization plans is an iterative process, with considerable back-and-forth adjustments as each element is more fully explicated. Likewise, the service utilization plan evolves as the effect theory is revised, which then leads to adjustments in the organizational plan. Thus the process theory elements are continually adjusted throughout this phase of planning for the program. Although the time it takes to make adjustments and revisions may be frustrating, it is much easier to make the adjustments at this stage of planning than it is to do so after the program has begun.

Effect Theory

The *effect theory* consists of the explanations of how the programmatic interventions will affect the causal factors and moderating or mediating factors of the health problem and describes the relationship between the programmatic interventions and the desired immediate and long-term outcomes for program participants. Three sets of relationships, or theories, are part of the effect theory (Figure 6.2): the causal theory (introduced in Chapter 5) and the intervention and impact theories (discussed in this chapter). Depending on the health problem, it can be useful to develop each of these theories. Often these theories are implicitly stated and understood by health professionals and program staff. By explicitly expressing and discussing these theories, however, program planners can refine programmatic interventions, thereby increasing the likelihood of program success.

This set of three theories and the associated informally stated hypotheses constitute the effect theory portion of the program theory. The term “effect theory” makes it clear that this part of the program theory deals with both outcomes and impacts. Generating each of the theories that constitute the effect

Figure 6.2 The Effect Theory Showing the Causal Theory Using Community Diagnosis Elements



theory may seem complicated. Program experts agree on the complexity of constructing an effect theory as well as its central role in program evaluation (Patton, 1997; Rossi et al., 1999; Rossi & Freeman, 1993).

INTERVENTIONS

Interventions are those actions that are done intentionally to have a direct effect on persons with the health problem. In other words, interventions are the verbs that tell what is being done to make a change in program recipients. Using this definition allows for the inclusion of a broad range of actions, such as medical treatments, pharmacological treatments, and education, as well as psychological strategies and policy formulation. Such a broad definition also allows for the inclusion of strategies not typically considered treatments, such as providing transportation (an enabling service) or community development (an infrastructure-level intervention). Clearly identifying and labeling the interventions as such not only makes developing the intervention and outcome theories easier, but also facilitates developing outcome objectives and helps distinguish outcome and impact objectives from process objectives.

In some presentations about program planning, such as the United Way of America book (1996), interventions are couched in terms of "activities," so that they become indistinguishable from the myriad of activities done as part of the organizational or service utilization plans; the latter activities are supportive of the interventions but are not actions that will make a difference on the health problem. Interventions are the heart of all health programs. A clear

understanding and statement of the role of interventions is made in the intervention theory.

Finding and Identifying Interventions

Selecting and then articulating the chosen interventions are cornerstone activities of health program planning. It is important when planning a health program to draw upon existing knowledge in multiple disciplines. A literature review, for example, can generate ideas and information with regard to existing theories that have been used to explain what leads to the health problem, as well as explanations of why some interventions have been effective and others have not.

The use of existing theories can expedite the development of the effect theory and lend it credibility. Heaney and van Ryn (1996) provided a nice example of this phenomenon. In their case, the health problem was worksite stress. These authors wanted to develop a health program to reduce worksite stress but were concerned that existing programs had been designed for a target audience of middle-class employees within the cultural majority. Recognizing this fact, Heaney and van Ryn sought to improve the effectiveness of worksite stress-reduction programs for employees of low status or of a cultural minority. Their premise was that the potential exists for different subgroups to vary in both their participation in and benefit derived from a program.

Heaney and van Ryn (1996) began by reviewing the literature on stress and coping. From this literature, they constructed a theoretical model of stress and coping and identified the major variables, along with the direction of the interaction among those variables. They also reviewed the literature on the content of worksite stress-reduction programs and the sociological literature on status, class, culture, and stress. From their literature reviews, they were able to identify program interventions that might potentially alter specific variables in the stress and coping model. This information became part of their effect theory for the worksite stress-reduction program for low-status minority workers.

Unfortunately, for many health problems, widely accepted theories are not available to guide the development of an effect theory or the selection of interventions. However, health program planners and the planning team have options for how to proceed.

Types of Interventions

A simple starting point for thinking about types of interventions is to consider the levels of prevention. In the most common typology in public health, prevention activities are classified into three levels: primary, secondary, and

tertiary. *Primary prevention* includes those activities that are done to prevent a disease or illness from beginning. Getting adequate exercise, having good nutrition, being immunized, and wearing seat belts are examples of primary prevention. *Secondary prevention* involves screening for undiagnosed problems so that a disease can be treated before it manifests itself. Blood pressure screening at health fairs, fecal occult blood tests, and cholesterol tests are all secondary prevention activities. *Tertiary prevention* involves activities to limit the extent of an existing disease. For example, it includes taking blood pressure medications, receiving physical rehabilitation after an injury, and taking stress management classes for individuals with cardiac problems. The three levels of prevention provide a starting point, but are not sufficiently detailed to provide guidance in the development of programmatic interventions.

Another approach to thinking about types of interventions is to consult one of the various classification schemes of interventions that have been developed across the health disciplines. In medicine, the Current Procedural Terminology (CPT) Codes (American Medical Association, 2008) enumerate the various procedures that physicians perform. Excluding diagnostic procedures, all other procedures can be thought of interventions, in the sense that they are intended to affect the health of an individual. In nursing, the equally detailed Nursing Intervention Classification (Johnson et al., 2006) may be used to categorize interventions. Given the highly clinical nature of these intervention classifications, they would be helpful only in the development of health programs at the individual level. Nevertheless, their use with electronic medical or health records is a big advantage in subsequent program monitoring.

A more global intervention typology is needed to identify interventions across the public health pyramid levels. One such typology, as developed by Grobe and Hughes (1993), had seven categories of interventions; an eighth category was added by Issel (1997) when studying case management of pregnant women. This typology, by providing an encompassing perspective, can aid in identifying which activities are programmatic interventions.

Each of the eight types of interventions exists at the direct services, enabling services, and population levels of the public health pyramid (Table 6.1). The typology also accommodates both secondary and tertiary prevention, as these are activities of health professionals undertaken with the intent of having an effect on the health of the program participant. Primary prevention is not included in the typology, because providers cannot "do primary prevention" for or to the participant. Rather, primary prevention is a rubric for a variety of interventions: Individuals receive education about primary prevention, are encouraged to engage in primary prevention behaviors, and might be monitored for the extent to which they practice primary prevention behaviors. This is one example of how such a typology of interventions forces program planners to be

Table 6.1 Examples of Interventions by Type and Level of the Public Health Pyramid

Intervention Type	Direct Services Level	Enabling Services Level	Population Level
Treating	Medical or dental procedures, medications, physical manipulations, tertiary prevention, aromatherapy	Respite care, exercise classes or groups	Water treatment and fluoridation, mass immunizations
Assessing	Determination of needs and preferences by asking individuals, secondary prevention	Determination of needs and preferences by needs assessment	Use of epidemiological data to identify trends and rates of illnesses and conditions
Coordinating	Care coordination, client advocacy, referral, linking to services	Case coordination, local provider networks and collaborations	Systems integration, records and data sharing, disaster response planning
Monitoring	Reassessment, follow-up	Local trends and news reports	Trends analysis
Educating	Skills building, information giving	GED programs, job training programs	Media campaigns
Counseling	Psychotherapy, emotional support, marital counseling, cognitive behavioral therapy	Group counseling, family counseling, grief counseling for groups	News alerts and advice
Coaching	Role modeling, motivational interviewing, empowerment, encouragement, stress management	Community development	Policy formation
Giving tangibles	Giving vouchers for food or clothing	Medical supplies loan programs	Income supplements, insurance supplements

specific about the actions (as reflected in verbs in the written plan) that are undertaken to affect the health condition or situation of the target audience.

Specifying Intervention Administration and Dosage

Many health program interventions differ from medical interventions in that they are thought of in more general terms, such as "hand out informational flyers" or "provide emotional support." Nonetheless, health program interventions also need to be thought of in terms of dosage, route of administration, and site of administration.

Dosage refers to the amount and strength of the intervention required to have an effect, whether measured in terms of hours of education, days of respite, micrograms of fluoride, or weeks of counseling. We normally think of dosage in terms of a medication regimen or an exercise program. However, each intervention strategy that is included in a health program needs to be developed and tailored with regard to the dosage of the intervention exposure for the program participants. For example, Morone, Greco, and Weiner (2008), when providing a stress-reduction mindfulness program, described the dosage in terms of practicing the meditation three times per week, for a minimum of 50 minutes each time, over an eight-week period. Specifying the dosage is important for achieving the optimal program for the target audience; it also provides the information needed to adequately and appropriately develop the process theory. Once the dosage is specified, that information is incorporated into the service utilization plan and is used to modify the organizational plan to ensure that adequate resources have been allocated.

Dosage consists of five elements: frequency, duration, strength, route of administration, and administration credibility. The first four of these are fairly straightforward. *Frequency* is how often the intervention is received, such as hourly, daily, weekly, monthly. *Duration* specifies over what time period the intervention is delivered, such as one session, eight weeks of classes, or six months of exposure. *Strength of the intervention* refers to its powerfulness or potential for effectiveness. For example, a smoking-cessation mass-media campaign has less strength to stop a person's smoking behavior than smoking cessation counseling by that individual's primary care physician. The strength of an intervention can be determined from the literature and is reflected in a variety of statistics, such as beta weight, correlation coefficient, and difference score. *Route of administration* is the mechanism by which the intervention is delivered or the medium used to deliver the intervention, whether interpersonal communication, public mass media, educational brochures, or injection.

Administration credibility refers to the perceived degree to which the person or agency providing the health program is knowledgeable and believable.

In other words, it involves whether the intervention is provided by a health professional of a particular discipline, a lay health worker, or a paraprofessional. For some health problems, the cultural values attached to a physician may be a key factor in the effectiveness of the intervention, whereas for other health problems and programs, a community member will have more credibility. Thus, among facets of dosage, administration credibility is particularly relevant for health programs.

For many health problems, research reported in the literature or official documents can provide information on which doses are needed to be effective. For example, studies are now showing that a minimum of 30 minutes of moderately intense physical activity on most, but preferably all, days of the week is optimal for physical well-being (Myers, 2003). Stice, Shaw, and Marti (2007), in a meta-analytic review of programs to prevent eating disorders, found that larger effects existed in programs that were selective in their focus, had interactive elements rather than didactic elements, included multiple sessions, were offered only to women, and used professionals for delivering the intervention. Such findings highlight the need to be very specific in the development of not only the intervention, but also the target audience and the format elements of the service utilization plan.

Interventions and Program Components

One key challenge in selecting an intervention strategy is deciding whether a single intervention is warranted or whether a package of interventions would be more effective in addressing the health problem. A program component comprises an intervention or set of interventions, with the corresponding organizational plan. Thus, if a health program includes multiple interventions, each addressing one of several causes of the health problem or one of several moderating or mediating factors for the health problem, and these interventions are grouped in some way that makes sense for either effectiveness or efficiency reasons, then the program has multiple program components.

Using program components is appropriate if, to address the health problem, changes must occur across levels, such as at both the family and the community levels. Levels are nested within other levels, and each can be the focus of the program. It is extremely difficult to develop a single intervention that can affect all or most of the causes and moderating or mediating factors for a health problem at multiple levels. Instead, program components are typically needed. For example, if individuals as well as the community as a whole in which those individuals live are targets for the intervention, then interventions tailored to both individuals and communities will be needed. If, to address the problem of gunshot deaths, both individual behavior and actions of the gun

industry are targeted, then different interventions (program components) are needed.

Another reason to include multiple program components is to address micro and macro health problems. Blum (1982) suggested that some health problems or risks require individual behavioral changes, whereas others require group behavioral change. From a public health perspective, an individual behavioral change needed to protect against a health risk is called *active protection;* in contrast, protection that does not require individuals to make a behavioral change but is instituted through policy, laws, or some other means that does not involve the individual is called *passive protection*. Passive protection often occurs at a macro level, in that it encompasses more than a small group of individuals. However, macro-level changes can also involve active protection, such as the immunization of all infants and vulnerable adults. Immunization involves individual healthcare-seeking behavior but is intended to have a population effect. In contrast, fluoridation of the water supply and reduction of factory pollutant emissions as health programs are both intended to provide passive protection of a population. The distinctions between micro and macro programs, as well as between active and passive protection, may be important in developing the interventions and the effect theory. If the health program is intended to be community based or community focused, then it will likely include components at the micro level as well as at the macro level.

Of course, it is important to consider the package of interventions that the recipients actually receive. For example, Harris (2007) used dance and movement therapy as an intervention with African adolescents who were former child soldiers and survivors of torture. The group cohesion that developed during this program was important to the success (i.e., the effectiveness) of the intervention. Similarly, Lipman et al. (2007) identified group cohesion as being critical for program outcome. These examples highlight the synergistic effects of interventions that can occur when they are provided in a group context, as well as the delivery of a psychological intervention that may or may not have been planned. Understanding such interactions and identifying the presence of implicit interventions is critical to later evaluations of what made the difference in health outcomes.

Some interventions are packaged with mnemonics to assist practitioners with remembering the set of interventions. For example, the "five A's" consist of assess, advise, agree, assist, and arrange. Fisher et al. (2005) suggested that these interventions may be helpful in programs for diabetes self-management, in addition to drawing attention to the resources and support needed for successful self-management. Alternatively, for programs targeting diabetes and other chronic illnesses, standards have been developed by national associations that specify recommended interventions. Use of national standards is

encouraged, given that national standards tend to be evidence based, updated regularly, and used as the community standard of practice.

Because each program component will have a slightly different effect, acknowledging the individual components is important in subsequent evaluation plans. The intervention and outcome theories will vary slightly for each program component and for each of the different units of intervention of the program.

Criteria for Good Interventions

The final choice of an intervention or a package of interventions can be evaluated against a set of criteria for useful interventions. Having a list of criteria for good interventions is not new (Blum, 1982), but is helpful.

Evidence Based

As studies of health problems and their solutions accumulate, it becomes increasingly important to use interventions that have been shown to be effective. The increased awareness of the need to have an evidence-based practice has resulted in an increase in the number of meta-analyses and literature syntheses that provide a summary of the effectiveness of interventions for a specific health condition or problem. Some reviews provide information on which interventions are effective for a specific health problem (Waddell, Hua, Garland, Peters, & McEwan, 2007); other reviews provide information on the dosage characteristics of effective programs (Stice et al., 2007).

In choosing an intervention based on scientific evidence for its effectiveness, program planners sometimes face the question of what constitutes "evidence." The array of possibilities ranges from meta-analyses of existing studies, a single randomized clinical trial, qualitative reports, or practice guidelines. The other challenge when selecting an evidence-based intervention is dealing with equivocal findings. For example, Van der Molen, Lehtola, Lappalainem, Hoonakker, and Hsiao (2007), in a meta-analysis of interventions to prevent injuries at construction worksites, identified several intervention strategies that have been used, but found that none had been adequately studied. For this reason, they were reluctant to recommend one intervention over others. This ambiguity over the relative effectiveness of interventions is likely to be the case across many health areas.

Tailored to the Target Population

A good intervention is tailored to the characteristics of the target population. Tailoring the intervention encompasses adapting the program for cultural

sensitivity, linguistic appropriateness, group similarity, cultural beliefs, and ethnic values. It can occur either through a modification of the intervention to fit the target audience or through screening the target audience for eligibility based on an important characteristic. Either approach achieves the goal of having an intervention that can be readily accepted by the program recipients.

Even widely accepted interventions may need tailoring. For example, Kelly, Baker, Brownson, and Schootman (2007) found that the standard interventions in *CDC's Guide to Community Preventive Services* (Zaza, Briss, & Harris, 2005) needed to be tailored to local conditions and preferences of specific communities. At the individual level, Kreuter and colleagues (2005) found that tailoring breast cancer prevention messages to both behavioral and cultural characteristics of African American women older than age 40 led to their being 2.6 times more likely to adhere to follow-up screening than the comparison control group. However, the difficulty in tailoring interventions—and especially public health prevention messages—can be very difficult, as Perchmann and Reibing (2006) discovered when comparing seven different antismoking messages.

Conducive to Health Gains

A third criterion is that health gains must result from the intervention. That is, the problem must be able to be changed with the available knowledge of how to change it. This criterion acknowledges that some interventions may have unintended consequences or side effects. For example, at the population level, welfare reform had the unintended effect of decreasing access to health services for vulnerable women (Cawley, Schroeder, & Simon, 2006). Other programs are simply ineffective, such as the Drug Abuse Resistance Education (DARE) program, which has been widely adopted but is ineffective (Brown, 2001; Des Jarlais et al., 2006).

This criterion also speaks to an advantage of fully articulating the effect theory. A common tendency among health professionals and program planners is to jump to a favorite solution, albeit one that may not necessarily be a good match for addressing the health problem. One technique that helps avoid this tendency is to specify the mechanisms and processes that would result in the health gains. In some scenarios, interventions could be useful and effective with regard to one type of outcome, but may not lead to the outcome or impact of interest. For example, health education about family planning methods may be effective in reducing the birth rate in a target audience but may not be effective in reducing rates of sexually transmitted diseases. Again, having done the work of developing the effect theory helps program planners be certain that the intervention will lead specifically to the desired health gains.

In addition, the program planners need to have the requisite expertise for designing the intervention and activities so that those activities will actually

affect the health problem. As was discussed earlier in terms of prioritizing the health problems, the changeability of a health problem is considered to be one aspect of its importance. In terms of interventions, a more technologically feasible intervention ought to result in a more changeable health problem.

Manipulable

The fourth criterion is that the intervention must be manipulable (Rossi & Freeman, 1993). *Manipulability* refers to the ability of the program planners and program staff to adjust the intervention to the specific needs of the participants. A major element of manipulability is dosage, as discussed earlier in this chapter. If the dosage of the intervention can be tailored to the target audience, then the intervention meets the manipulability criterion. Effective and efficient interventions are customized to some extent to account for the variations among potential participants.

Related to manipulability is the ability to achieve synergy by taking into account other programmatic interventions that are already in place. For example, Guidotti, Ford, and Wheeler (2000) described a project that was specifically designed to be delivered along with existing community initiatives. By building on existing programs and interventions, the new program could mutually reinforce the effects of the other programs. Thus the intervention was manipulated to be compatible with existing interventions. The approach of intentionally developing a program intervention to maximize the effects of all programs being delivered to a community is increasingly important as communities become saturated with health promotion programs.

Another aspect of manipulability is the notion that the intervention must be designed to overcome influences on the health problem that are not directly addressed by the health program. The intervention needs to have sufficient strength to overcome those factors. In some instances, existing theories can be helpful in manipulating the intervention so that it is sufficiently strong.

An example of a theory-based nutritional intervention is the Gimme 5 intervention (Baranowski et al., 2000). Guided by social cognitive theory, the researchers designed this intervention to address interrelated environmental, personal, and behavioral factors. The use of social cognitive theory facilitated manipulating the interventions in ways that increased the likelihood that the interventions would be effective with the school-age children in the program.

Another example is provided by Brenton (1999), who argued for the use of chaos theory in planning prevention and mental health interventions. In chaos theory, critical moments are followed by transitions and then stable states that are better adapted to the existing environment. Based on this theory, Brenton argued that prevention programs could focus on the critical moments, thereby better targeting the groups at risk. Based on the concept of sensitivity to initial

conditions, he suggested that programs would have the greatest impact at the beginning of life. Brenton's work is just one example of how a theory that is not typically used by health professionals can nevertheless guide thinking and foster creativity in the selection of interventions and the planning of health programs.

Technologically and Logistically Feasible

Feasibility of an intervention needs to be considered from the point of view of whether it is technologically realistic and logistically doable within the context in which the intervention will be provided. These aspects of an intervention could be determined through a pilot study in which the intervention is provided on a small scale and on a trial basis. For example, Filiatrault and colleagues (2007), before attempting to bring a falls prevention program into the community, conducted a feasibility study. Also, ensuring involvement of the stakeholders—and particularly those likely to be providing the intervention—in the planning can provide insights into the feasibility of providing the intervention within an everyday context.

Another aspect of feasibility considers the technology to be used as part of the intervention. In some settings or situations the availability or acceptability of technology is minimal, limiting the nature of interventions. For example, use of mammography for early detection of breast cancer would not be possible in undeveloped nations, but it also might not be possible in some remote and impoverished regions in the United States.

Reasonable Cost

The sixth criterion is that the cost of the intervention must be reasonable rather than prohibitive. The cost of the intervention will depend on many factors, such as the extent to which the health behavior or problem is resistant to change, the duration of the program, and the number of program components. Estimating the cost of the intervention, generally considered under the organizational plan, is discussed more fully in subsequent chapters.

Politically Feasible

The seventh criterion of a good intervention is that it be politically feasible. Not all interventions are equally acceptable to the target audience, to funding agencies, or to other stakeholders. During the assessment phase, program planners ought to have determined the preferences and willingness of various stakeholders to endorse different types of interventions. Interventions need to be culturally appropriate and sensitive as a first step toward being politically feasible. Various strategies, such as conducting focus groups and pretesting an intervention, can be used to design culturally sensitive and competent health program interventions for use with ethnically or racially distinct target populations.

A corollary to the political feasibility criterion is that meeting this criterion helps the program planner, as well as the program, to survive. Proposing interventions that are not politically feasible can result in the planner being used as a scapegoat and blamed for a "bad" intervention. Worse yet, politically sensitive programs run the risk of not being funded, which will reflect poorly on the qualifications of the program planner.

Addresses Societal Priorities

The last criterion is that the intervention must address societal priorities; in other words, the problem must be important in the larger picture. Sufficient agreement first needs to exist with regard to the importance of the health problem. This consensus should have been established during the priority-setting and assessment phases. A lack of the desired health or a high prevalence of the problem may contribute to its high priority. By contrast, many effective interventions can be used to address trivial problems of low priority.

Health program planners and evaluators might potentially play a role in raising the priority of the issue so that the health problem takes a more prominent place. To some extent, societal priority is set by celebrity spokespersons for specific health problems or by the nightly news covering the current health research. These societal pressures may conflict with the local assessment data. Nevertheless, the intervention must be aligned with the societal priorities assigned to health problems if it is to receive public credibility and backing. Also, the new behavior or health state must be important to the target audience, or else they will not make attempts to change. Although the importance of the health problem to the target audience may have been included as an element in the community needs assessment, this issue can resurface during program theory development in terms of societal versus public health priorities.

OUTCOMES AND IMPACTS IN PUBLIC HEALTH

Just as it is important to carefully consider which interventions will be used in the health program, so too must program planners carefully consider which effects are anticipated from the program. In evaluation science, authors do not seem to follow any convention regarding the use of the words "impact" and "outcome." These terms are not used consistently in the literature, in practice, or in government. Therefore, it is prudent to look beyond the words themselves and ask for definitions.

In this book, *outcome* refers to the immediate effects resulting from an intervention, whereas *impact* refers to the long-term or cumulative effects attributable in part to the programmatic interventions. The term *effect* generically refers to changes or consequences of an intervention, regardless of whether the changes are immediate, proximal outcomes or longer-term, distal impacts.

Several factors can distract program planners from having a clear vision of the relevant effect. For example, a plethora of possible outcomes from programmatic interventions may exist. There may also be many ways to think about changes resulting from programs (Patton, 1997, p. 160). Yet another distraction is that with extensive stakeholder involvement, it is quite possible to become sidetracked and end up with an extensive list of what "our program could do." For these reasons, having the community diagnosis, as written at the conclusion of the community needs assessment, is important because it helps those involved in the planning process stay focused on both the health problem and those health outcomes and impacts that are directly related to the health program.

Further complicating the choice of key health outcomes and impacts is the reality that change is not always the purpose of health programs: some programs are, in fact, intended to stabilize, prevent, or maintain a health state. Because health is multidimensional, Patton (1997) has suggested that changes can occur in multiple arenas: in life circumstances, health or economic status, behavior, functioning, attitudes, knowledge, or skills. This is true if the health problem being addressed has causal factors that are not physiologically based but relate to one of these other arenas.

Behaviors, such as primary prevention behaviors, are often the focus of health and public health programs. If the desired health outcome is a new or modified behavior, criteria must exist for selecting which behavior ought to be changed. Ideally, the behavior ought to be free from outside influences, such as peer groups or economic factors beyond the control of the program. The behavior also ought to be critical to achieving the desired health outcome. In addition, knowledge of how to develop the preferred behavior needs to exist; in other words, the behavioral intervention needs to have a scientific basis. Naturally, the new behavior must be important to the learner, in the same way that a health state ought to be important to the target audience. Experts need to agree that the new behavior is an important link to the health outcome. The pervasive lack of the behavior would be equivalent to a health problem of large magnitude and would influence the choice of the behavior as the focus of a health program.

Another challenge in developing the effect theory is to match the level of intervention with the level of the public health pyramid at which the outcomes and impacts are expected. Target audiences may consist of individuals, families, aggregates, or populations, with effects occurring at each of the levels. Program interventions need to be tailored to reach that specific target audience, essentially matching the level at which the intervention is aimed to the level at which the target audience exists and the level at which the outcome is desired. For example, if the intervention is designed to affect family eating patterns, then the health outcome sought ought to be family nutritional health,

rather than reducing anemia in children or increasing the daily consumption of milk in a neighborhood. The latter two effects would be impacts. Being clear about the level or unit for the intervention is pivotal because that unit of intervention becomes the unit of analysis in the evaluation phase (Jackson, Altman, Howard-Pitney, & Farquhar, 1989).

Generate the Effect Theory

After having considered the type of intervention and the criteria for choosing an intervention, the next step is to more fully articulate the effect theory by enumerating the causal, intervention, and impact theories that constitute the effect theory. This iterative process requires going back and forth between the needs assessment, priorities, and intervention choice. Developing or generating the effect theory is guided by several strategies suggested by Patton (1997).

Both inductive and deductive approaches can be used to generate an effect theory. In other words, theory development can proceed through a deductive process that uses reason and existing knowledge, or it can occur through an inductive process that uses experience and intuition. Either approach will lead to an effect theory. In practice, a combination of both inductive and deductive approaches is typically used and yields the optimal results.

Generating an effect theory need not be a daunting task. This process includes several steps, which can be done either in sequence or iteratively. Elements of the effect theory draw upon the community diagnosis developed for each of the high-priority health problems as well as the literature. Recall the template for the community diagnosis: Risk of [*health problem*] among [*population/community*], indicated in [*health indicators or measures*], is caused by [*causative factors*], but is mediated by [*mediating factors*] given that [*moderating factors*] moderate the causes and that [*exiting factors*] exist prior to the causes. The literature can be particularly helpful in identifying and incorporating mediating and moderating factors. For example, Marcus, Pahl, Ning, and Brook (2007), in studying smoking cessation, identified positive family relationships as an antecedent or existing factor and maladaptive personality attributes as causal factors leading to substance use. This type of research, in combination with the community assessment information, enhances the clarity and specificity of the effect theory.

Causal Theory

The first theory to be developed or understood is the *causal theory,* which is an explanation of the process that currently underlies the health problem. It includes statements or hypotheses that describe which causal factors are directly responsible for the health problem. The causal theory ought to include

the factors found present through the community needs assessment and draw upon the scientific literature to justify the causal theory.

For example, we can use the community diagnosis related to deaths from gunshot wounds from Chapter 5 to develop a causal theory. The causal theory states that deaths from gunshot wounds stem from causal factors of local gang activity, lack of conflict resolution skills, being a school dropout, and gun availability. Individual resilience, adequacy of policing, and quality of emergency medical care are mediating factors that determine whether the causal factors actually result in a death. In addition, the adolescent's developmental stage, local history of violence, lack of job opportunities, and state laws, as preexisting forces, influence whether the causal factors exist. Lastly, community action, parental supervision, and school antiviolence programs all have the potential to moderate—either decreasing or increasing—the potency of the causal factors.

Similarly, the community diagnosis for birth defects is the basis for a causal theory of birth defects in Bowe County. The causal theory states that birth defects among residents of Bowe County are caused by low folic acid intake, parental exposure to organic solvents, and prenatal exposure to chlorine. However, preconception nutritional status and biological processes (mediating factors) influence whether the causal factors actually result in a birth defect. In addition, the mother's age, type of employment, and availability of food high in folic acid, as contextual preexisting factors, determine whether the causal factors exist. Lastly, genetic counseling, use of prenatal vitamins, knowledge about folic acid, and cultural practices all have the potential to moderate the influence of the causal factors, by either increasing or decreasing their potency.

Intervention Theory

The *intervention theory* explains how interventions affect the causal factors, or possibly the moderating or mediating factors. It contains hypotheses about the relationships of the programmatic interventions to the factors in the causal theory that the interventions are intended to affect. More importantly, it must address how the intervention alters the causal factors or breaks the chain between causal factors and health outcome. The intervention theory includes statements describing the relationships connecting interventions and outcomes. The intervention might also affect some of the moderating or mediating factors. Thus the intervention theory articulates the connection between the programmatic intervention and the intended effects on the health problem. Having the intervention theory explicitly stated and understood by the program staff contributes to the success of the program. Because clarity about interventions is so important, what the interventions are and how to identify them are discussed in a separate section later in this chapter.

The intervention theory describes how the program "works its magic." Developing an intervention theory is useful to refine the number, types, and quality of interventions that are carried out as part of the health program. Interventions that are not likely to alter or change the key factors in the causal theory can, in turn, be eliminated, which results in a more effective and efficient program.

In the birth defects health problem, planners might identify several possible points at which to intervene to ensure that the causal factors do not lead to neural tube defects. For example, the program might target the moderating factor regarding knowledge about the importance of folic acid. Accordingly, one part of the intervention theory would state that nutritional education [intervention] changes the behavior of the woman with regard to eating dark green vegetables. Another point at which to intervene on the causal factors might be by encouraging the use of prenatal vitamins [intervention] to remove the causal factor of inadequate folic acid intake. Also, screening for occupational exposures followed by an early ultrasound [intervention] could identify fetuses with abnormalities. Together, receiving nutritional education, taking supplements, and making changes in prenatal care can alter the biological processes that result in a neural tube defect.

As this example shows, not all moderating, causal, or mediating factors need to be, or can be, addressed by a single health program. An equally plausible intervention theory might state that education about occupational exposures [intervention] leads to decreased exposures and subsequently fewer infants with neural tube defects. The decision regarding which intervention theory to use as the basis of a program is influenced by the preferences of stakeholders, the mission of the organization, and the science regarding which factors are more readily changeable.

Impact Theory

The final element of effect theory is the *impact theory*, which is akin to the conceptual theory described by Rossi et al. (1999), in which statements about how the outcomes lead to impacts are explicated. Usually, a health program has a very limited number of health outcomes that it seeks to affect. Impact theory helps substantiate the sometimes seemingly wild and wishful claims of program planners about the effects of their program, by specifying the relationship between the immediate outcome of the program and the long-term, ultimate changes to the health problem. It is possible to have multiple impact theories for one long-range impact, especially if multiple intervention theories are used within a single program. Given the complex nature of many health problems and conditions, this is a likely scenario. Continuing with the birth defects example, the impact theory states that fewer infants

born with neural tube defects leads to a decrease in the rate of birth defects of all types.

Funding agencies commonly specify program impacts—for example, a decrease in infant mortality or an increase in early detection of preventable disease. These impacts might be stated as program goals that the funded programs are to achieve. In such cases, program planners must essentially work backward to generate the impact theory and the intervention theory. In addition, impact theories show the links and explain the relationships between objectives and goals—an important factor that is discussed in detail in Chapter 7.

In summary, the effect theory encompasses the causal, intervention, and impact theories. These theories are all needed to explain the complexity of a health problem. Figure 6.3 brings together all of the components of the effect theory in the birth defects example.

Involve Key Stakeholders

Generating a program theory is not a solitary task; it is a task that requires brain power, diverse ideas, and sustained energy. Involving key stakeholders not only makes good ideas evident, but also encourages stakeholders to become invested in the health program and to address the health problem. This type of involvement is a critical step toward having a politically feasible intervention.

Potential program participants and providers typically have their own working explanation, or theory, of how a program will affect participants. One type of theory they may advocate is an espoused theory. Agryis and Schon (1974) were among the first to understand the importance of espoused theories. They found that employees had explanations for why things happen in their organizations; these stated explanations are the espoused theories. People know what they are supposed to do or say, regardless of whether they actually do or say it. The espoused theory consists of this stated and repeated explanation. For example, staff providing a diabetes management program may say that the program works because they are teaching the patients what to eat and how to exercise. This contention is the espoused theory of how the program improves participants' control of blood sugar levels.

Agryis and Schon (1974) also found that espoused theories were not always congruent with the behaviors they observed. What people do to achieve their ends is termed their theory-in-use, sometimes called a theory-in-action. The theory-in-use is crucial in program evaluation, because it consists of t he interventions that actually make up the health program and affect participants. Returning to the diabetes management example, if the staff in the diabetes management program become friends with the patients and provide

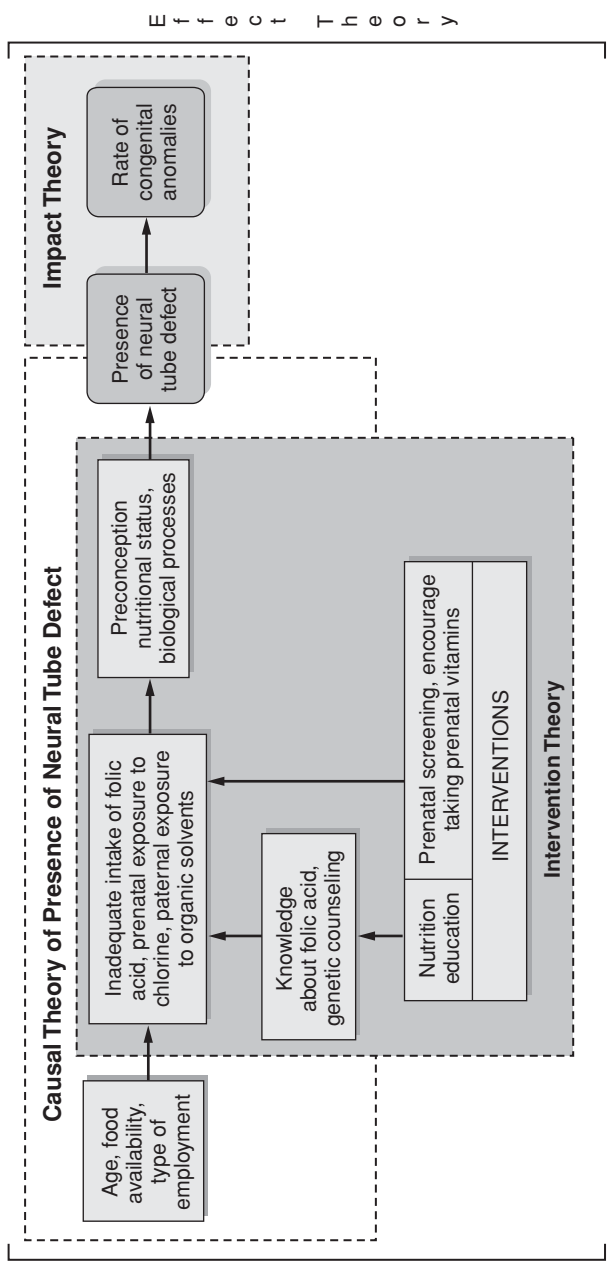


Figure 6.3 Effect Theory Example: Effect Theory for Reducing the Rate of Congenital Anomalies

encouragement in a supportive manner but rarely focus on teaching patients, then their theory-in-use is coaching or social support rather than education.

As seen in the diabetes management example, espoused theories and theories-in-use may not be congruent. It is the theories-in-use that denote how the program is implemented and are the source of the effects on participants. One way to avoid incongruity between the espoused theory and the theory-in-use is to explicitly include the theory-in-use in the effect theory. Being aware of the differences among espoused theories, theories-in-use, and effect theories (Table 6.2) can help planners to generate an effect theory that incorporates useful elements of both the espoused theories and the theories-in-use. If the program has been in existence for some time, an alternative is to decide either to incorporate the theory-in-use into the program theory or to explicitly exclude the theory-in-use as an element of the program. Modifying the program theory based on the practical experience gained through the theory-in-use may be efficient and prudent if the theory-in-use has had the desired effect on program participants.

Table 6.2 Comparison of Effect Theory, Espoused Theory, and Theory-in-Use

	Effect Theory	**Espoused Theory**	**Theory-in-Use**
What it is	Explanation of how program interventions affect participants	What staff say about how the program affects participants	What staff do to affect participants
Where it resides	Manuals and procedures; program descriptions	Minds of program staff; program manuals and descriptions	Actions of program staff; on-the-job training
How it is identified	Review of scientific literature, program materials	Listen to staff describe the program, read program materials	Watch what staff do in providing the program
Importance	Guides program and evaluation; basis for claiming outcomes	Becomes what staff, clients, and stakeholders believe and expect of the program	Is the actual cause of program outcomes

Draw upon the Scientific Literature

Program planners should review articles published across the health disciplines for information that can help them generate the theories by providing information on the relationships among the antecedents, causal, moderating, and mediating factors. Abstracts available through online databases are another good source of ideas that can be incorporated into the effect theory. The published literature is also helpful in developing the process theory, particularly with regard to the service utilization elements.

Existing theories from multiple disciplines can be used to develop the effect theory. If the health program is intended to have a physiological effect or address a certain pathology, then theories from genomics, biochemistry, pharmacology, or physiology might be useful. If the health program addresses mental health or family problems, then theories from psychology or social work about psychopathology, stress, coping, or family functioning might be used to explain the health problem. If the health problem is related to the knowledge and abilities of individuals, then theories from psychology, education, decision sciences, or public health about learning, cognition, memory, and attention could be used to explain how knowledge, skills, and abilities are gained and retained. If a health program is intended to foster or maintain lifestyle behaviors and self-care, then theories from nursing, public health, and psychology about motivation, decision making, change, and self-efficacy might be suitable candidates.

Many existing theories can help health program planners develop causal theories for health problems and situations. The examples listed in Table 6.3 are grouped by the domain of health outcomes anticipated by the program, as a reminder that ultimately the program intervention theory must be matched with both the health problem and the desired outcomes of the program. In addition, existing theories can be used in developing the process theory; examples of such theories are shown in Table 6.4.

The theories used by program planners are generally specific to the level of the public health pyramid. In this section, the examples are largely at the individual level. For problems at the other levels of the pyramid, theories can be found in the literature. For example, Gay (2004) relied on the theory of disease transmission as a framework for understanding what is required to develop a program to eliminate measles, an infectious disease. Although measles is an individual illness, the elimination of any infectious disease—whether measles, tuberculosis, or HIV/AIDS—requires thinking in terms of populations as well as individual susceptibility. To change population behaviors related to alcohol use problems, Wallin (2007) reported that the successful program was based on the diffusion of innovation theory.

Table 6.3 Examples of Types of Theories Relevant to Developing Causative Theories Within the Effect Theory, by Four Health Domain Outcomes

Physical Health	Psychosocial Health	Knowledge and Abilities	Self-Care and Lifestyle Behaviors
Pathophysiology	Psychopathology	Learning	Peer pressure
Immunology	Social cognition	Communication	Decision making
Endocrinology	Stress and coping	Cognition	Self-efficacy
Pharmacology	Family functioning	Attention	Self-worth
Wound healing	Addiction	Memory	Risk taking
Biochemistry	Violence	Diffusion of innovation	Social stratification
Metabolism	Resilience	Acculturation	Motivational

Diagram the Causal Chain of Events

Drawing or creating a visual representation of the various theories is important, given the complex nature of the causes of health problems and the equally complex systems of services required to address health problems (Joffe & Mindell, 2006). Diagrams that depict the effect theory, the process theory, and the program theory can be created with pencil and paper or by using graphics software. Most software packages include some kind of drawing feature that can be used to create such a diagram.

Table 6.4 Examples of Types of Theories Relevant to Developing the-Organizational Plan and Service Utilization Plan Components of the Process Theory

Organizational Plan	Service Utilization Plan
Social network	Social marketing
Communication	Marketing
Leadership	Cueing
Accounting	
Quality improvement	

A picture showing how each intervention changes a characteristic of the participants provides an expedient means of engaging program staff and getting feedback from other professionals in the field. As the scientific literature is reviewed and assimilated, additional relevant variables and their interrelationships can be incorporated into the map of the causal chain of events. Including every possible variable is neither realistic nor desirable, of course; instead, program planners should include only those variables that relate to the essence of the program and that, according to the community health assessment and available scientific literature, are mostly likely to influence the success of the proposed interventions.

In some instances, a health program is started in response to a mandate or a health policy initiative and, therefore, may not have an explicit program theory. If a program has been in existence or is ongoing, the development of a program theory is still possible, and, its creation instead can contribute to program improvements. In such cases, the espoused theory of program staff is a good starting point for the development of a program theory. Observation of program staff would then help identify the theory-in-use. Together with findings from the literature, these elements could be formalized into a program theory. It is quite possible that new areas for program monitoring and evaluation would emerge from such an exercise with program staff. In addition, program staff may come to see the value of their work and become more committed to the program and the participants. Involving program staff in reconciling their espoused theories and theories-in-use can lead to new program approaches and the identification of areas of inefficiencies.

For some health programs, timing is critical, such that some intervention components must be accomplished before other intervention components are implemented. If either the intervention or the outcomes must proceed in stages, these increments need to be reflected in the effect theory of the causal chain of events leading to the health outcome.

Check Against Assumptions

The program theory—and the effect theory in particular—needs to be checked against alternative assumptions about theories. Patton (1997) referred to these points as validity assumptions. One assumption is that the theory is really about the phenomenon of interest. In other words, program planners assume that the program theory truly deals with the health problem or condition that is the focus of the health program. Through the multiple interactions and discussions with stakeholders, this assumption can inadvertently be violated.

Another assumption relates to parsimony. Improving the health of individuals, families, and communities is a complex task, so most health programs

address only one aspect of a complex puzzle of factors affecting health. Including too much in a program theory can lead to confusion, diffuse interventions, and frustration, not to mention exorbitant expenditures. Parsimony is a crucial characteristic of a good theory, including a program theory or an effect theory. Relying on the priorities set earlier in the planning process by focusing on the most important factors about the target audience helps achieve parsimony.

FUNCTIONS OF PROGRAM THEORY

Having an articulated theory of how the health program will lead to improved health, and specifically how the interventions will affect participants, serves several purposes (Bickman, 1987) that range from providing guidance and enabling explanation to forming a basis for communication.

Provide Guidance

A program theory that can be stated in one or two sentences provides a description of what is being implemented. To say that a program is helping asthmatic children is less compelling or descriptive than saying that a program teaches children how to be aware of their bodies and thereby avoid situations that may trigger an asthma attack. The latter is a description of how the program works to reduce asthma attacks and provides direct guidance on what to include in the program.

In a world of complex and interactive health problems, identifying the specific health problem and the appropriate target audience for a program can be difficult. Blum's (1982) caution against failure to analyze problems adequately is avoided by developing the program theory, which specifies the problem and the target audience. If the program theory is inordinately difficult to develop, it may indicate that the health problem has not been sufficiently narrowed, the target audience is not specific enough, or too many program components have been included. Having a target audience that is too broad can lead to a program theory that is too complex to be of value in designing and implementing the program.

The program theory guides what to measure in both the process and the effect evaluations of the program. In terms of the process evaluation, it specifies what needs to be measured with regard to the delivery of the intervention. In terms of the effect evaluation, the effect theory specifies the desired effects and, therefore, what needs to be measured. When a health program has several possible outcomes, the effect theory clarifies which outcome is most directly a result of the intervention. This information makes the evaluation of outcomes more efficient and enables program planners and evaluators to design an evaluation that will find those program effects that are arguably the result of the program.

Just as theory is used to guide the development of the health program, so theory can be used to guide the development of the evaluation. For example, Newes-Adeyi, Helitzer, Caulfield, and Bronner (2000) used ecological theory to guide their formative evaluation of the New York State's Women, Infants, and Children (WIC) nutritional program. Their use of ecological theory strengthened the evaluation in terms of its design and ability to explain how the program worked. Their report also serves as a reminder that the same underlying social or psychological theory that guides the effect theory can be applied to the effect evaluation as well.

When a new health program is first provided, its evaluation helps refine the subsequent delivery of the program. A program theory helps identify needed inputs and determine what needs to be evaluated and where improvements or changes in the delivery of the interventions are appropriate.

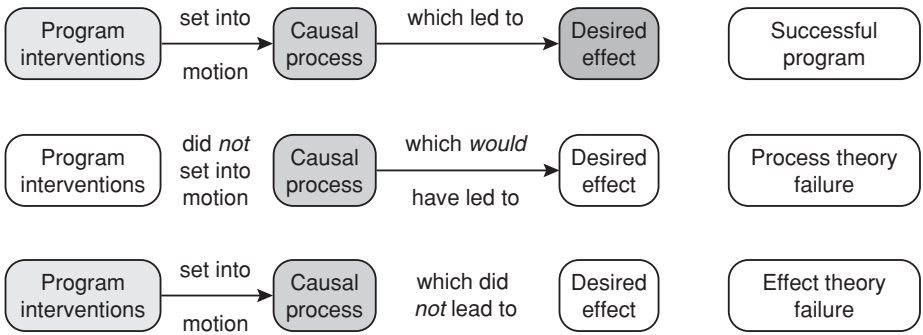
Enable Explanations

The program theory helps identify which interventions are likely to have the greatest effect on program participants and clarify how the interventions cause the desired effect in program participants. In this way, the theory enables planners and evaluators to more easily explain how the program should and does work.

One task of program planners is to anticipate the unintended. Careful attention to the development of the program theory can help uncover unintended consequences that may result from the program. The development of an effect theory, in turn, helps generate plausible explanations for those unintended consequences. Engaging in this kind of exercise in speculation helps program planners avoid another source of unsuccessful programs: failure to examine and compare relevant possible interventions (Blum, 1982).

A program theory also enables the evaluators to distinguish between process theory failure and effect theory failure (Figure 6.4). If the evaluation results show no effect on program participants, then the evaluator must explain what failed. A successful program sets into motion the interventions (causal processes) that lead to the desired outcome. However, if a program is not effective, the evaluator needs to identify the roots of that failure. A lack of program success can result from the program not being provided—a process theory failure. A lack of program success also can result from an ineffective intervention—an effect theory failure. This distinction between process and effect theory failures, based on the notions of program and theory failure put forth by Weiss (1972), helps evaluators sort out what went wrong or right with the program and explain the evaluation findings to stakeholders.

Figure 6.4 Two Roots of Program Failure



Form a Basis for Communication

Health programs compete for resources. A program theory helps convince organizational or legislative policy makers that the program is worthy and deserving of support. The causal chain of events outlined in the effect theory serves to frame discussions on a more rational basis, leading to a more rational decision-making process about the health program. The effect theory also helps policy makers understand the extent to which the program interventions are ideologically compatible with their stance and are based on science rather than biases and opinions. In other words, the effect theory provides a basis for clear communication of the program intent and content.

Starting and maintaining a program requires that key stakeholders agree on supporting the program. Gaining consensus from stakeholders—whether program staff, administrators, or legislators—is an important step in ensuring the success and acceptance of the health program. If stakeholders understand the program theory, it becomes easier to gain consensus on the usefulness of the program. Having gone through the exercise of developing the causal, intervention, and impact theories, the program planners are in the position of being better able to anticipate questions and provide alternative rationales for the health program. As mentioned earlier, stakeholders can be included in the development of the program theory as a way to gain consensus on the program interventions. For controversial programs, such as those dealing with sexuality education or family planning for adolescents, consensus on the program theory could be critical to the program's survival.

Make a Scientific Contribution

In a sense, every health program is an experiment that tests the program theory. In other words, every evaluation has the potential to contribute to our understanding of human nature and health. Evaluations based on the program theory can be used to modify existing theories relevant to the target population and types of interventions used.

ACROSS THE PYRAMID

At the direct services level of the public health pyramid, because the health problems are related to specific individuals, the relevant theories will focus on individual behavior and intra-individual responses to treatment or pathology. In other words, the focus is on the micro level. As a result, the interventions delivered are one-on-one, with providers directly delivering the interventions to their clients. (Examples of direct services interventions appear in Table 6.1.) If the program will have subcomponents, those components would involve different types of interventions that are delivered directly to individuals.

At the enabling services level, because the health problems are related to aggregates of individuals, the relevant theories will focus on the interactions of individuals with family or community characteristics. Because enabling services are still provided to individuals, the focus continues to be at the micro level. Hence, interventions are delivered on a one-on-one basis, as well as to groups with similar characteristics. Different intervention types can be applied at the enabling services level (Table 6.1).

At the population level, because the health problems are related to entire populations, the relevant theories will focus on group responses that lead to the health problem, cultural theories that explain behaviors and beliefs related to the health problem, and social theories about interactions among groups. Liddle and Hogue (2000), for example, described an intervention for high-risk adolescents. One key feature of their intervention model was that the theoretical foundation included risk and protection theory, developmental psychopathology theory, and ecological theory. This blend of theories is consistent with the intent of the program. In terms of the public health pyramid, however, the use of ecological theory reflects the theoretical awareness of the program planners that the population level influences both the enabling level (i.e., the family) and the individual level. At the population level, the interventions are designed and intended to have a universal focus. Such interventions are more likely to be delivered though the mass media or to involve policy formation. Although having program components at the population level may create synergies that enhance the intervention, such components may be prohibitive in terms of feasibility, manipulability, and cost.

At the infrastructure level, because the problems are related not to individuals but rather to processes and structures that enable the delivery of health programs, relevant theories might focus on organizational behavior, management and leadership style, personnel motivation, political action, and communication. The interventions can be delivered one-on-one with personnel, as well as with groups of workers or entire organizations. Because workforce capacity building is a key focus at the infrastructure level, it may be appropriate to use individual-level theories. For example, Kirk, Tonkin, and Burke (2008) used the theory of planned behavior as the basis for enhancing genetics literacy among health professionals.

DISCUSSION QUESTIONS AND ACTIVITIES

1. Select a health program with which you are familiar.
   a. Briefly state the hypotheses that constitute the effect theory of the program.
   b. What are the intervention components and the specific interventions?
   c. Develop an effect theory of the program theory used by the program.
   d. Do a brief literature search to determine whether the scientific evidence supports the interventions used.
2. What are the relationships among the possible functions of effect theory and the selection of optimal interventions?
3. Which of the theories that make up the effect theory are likely to be affected by the cultural, ethnic, or racial differences of target populations? In what ways might you make those theories culturally appropriate or sensitive?
4. Identify possible primary, secondary, and tertiary prevention interventions for each level of the public health pyramid.
5. Figure 6.4 shows a possible effect theory, with the interventions, to address the health problem of congenital anomalies. It builds on the causal theory shown in Figure 5.4. Try developing an effect theory diagram for one of the other health problems presented in Chapter 5: (a) vaccine-preventable hospitalization, (b) child abuse rate, (c) adolescent death rate due to gunshot wound, or (d) morbidity due to chronic illness.

INTERNET RESOURCES

University of Iowa, College of Nursing

This website (http://www.nursing.uiowa.edu/excellence/nursing_knowledge/clinical_effectiveness/index.htm) provides an overview of standard nursing interventions (NIC) and outcomes (NOC). The detailed list can be helpful to show the level of specificity for interventions, which may be needed for some programs.

International Development Research Centre

A notable amount of health program planning and evaluation occurs in an international context. This website (http://network.idrc.ca/ev.php?ID=28377_201&ID2=DO_TOPIC) has a focus on international programs, and the content is applicable globally.

Understanding Change and Theories Critical in Developing Program Theory

The following websites focus on understanding and generating change. For example, the Change Project (http://www.changeproject.org/) has some interesting and practical applications in health. The chapter found at http://cancer.gov/cancerinformation/theory-at-a-glance/page8 is part of a short, online text and nicely summarizes the theories often used in public health. If you want to broaden your repertoire of change theories, then the information at the Communication Initiative Network (http://www.comminit.com) would be helpful.

Social Marketing Institute

This article (in pdf format) is provocative and addresses the ethical issues in developing change programs: http://www.social-marketing.org/papers/carrotarticle.pdf.

Community Guide to Preventive Services

This website lists interventions for various health topics and the degree of scientific evidence for the use of the intervention: http://www.thecommunityguide.org.

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