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UNDERSTANDING AND IMPROVING THE WORK OF COMMUNITY HEALTH AND DEVELOPMENT

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*"You do not have to be mean-spirited to ignore societal problems,
you only have to believe that nothing can be done about them."*

--WILLIAM RASBERRY

Globally and locally, people work together to better understand and improve the health and development of those in their communities. For example, consistent with objectives of the World Health Organization, regional and local projects take action to reduce the incidence and prevalence of alcohol and drug abuse, HIV/AIDS, and chronic diseases such as diabetes (LEE Jong-wook, 2003). Similarly, aligned with the United Nations' Millennium Development goals, local development work attempts to reduce violence, assure adequate income and shelter, and improve education for all (Annan, 2000).

The common aim of such efforts is to create conditions in which health and development can occur (Institute of Medicine, 2003; World Bank, 2001; World Health Organization, 1986). In this collaborative work, people who share a common place, such as a city or barrio, or interest, such as in promoting child health or reducing

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poverty, plan and take action together. People and organizations from different parts of the community work together to create environments that support widespread behavior change, such as caring engagements or health-promoting behaviors, and improvement in population-level outcomes such as levels of childhood immunization or educational achievement (Fawcett, Francisco, Hyra, et al., 2000).

The essence of the behavioral-community paradigm is that problems and goals of individuals, communities and societies are represented in the *behavior* of people and the *environmental conditions* they experience (Baer, Wolf, and Risley, 1968, 1987; Fawcett, 1991; Fawcett, Mathews, and Fletcher, 1980). Similarly, when public health experts McGinnis and Foege (1993) cited the "real, real causes" of death in the United States, they focused on key health-related behaviors, such as tobacco use and diet, and the environmental conditions, such as governmental policies, that affect them. By viewing societal problems as "mere behavior", we avoid the trap of seeing them as "intractable" or objects for description but not intervention. Analyses yield potentially modifiable features of the environment and broader conditions that may affect relevant behaviors of key actors in communities.

This report provides an overview of what we—and our colleagues—have been learning about how communities affect conditions related to health and development. First, we describe briefly the *context for learning* including our research and training program at the University of Kansas, the related disciplines that have influenced our work, and some principles and values that guide community research and action. Second, we present a conceptual *framework* or theory of action for community efforts to create conditions that promote health and development. Third, we describe *how we are learning*—outlining the participatory research methods, and key measures, used to examine the functioning of collaborative partnerships for community health and development. Fourth, we describe *what we are learning*—including seven factors affecting the rate of community change and the conditions under which environmental change may contribute to improvement in population-level outcomes. Finally, we describe how we are using Internet-based capabilities to aid in *translation of knowledge to practice*.

Context for Learning and Contributing to This Work

Our attempts to learn and contribute to community efforts to promote health and development are grounded in the supportive context of our research group, influences from several related disciplines, and guiding principles and values.

KU Work Group (WHO Collaborating Center) for Community Health and Development

Operating since 1975 at the University of Kansas (KU), the mission of our KU Work Group <http://ctb.ku.edu/wg/> is to promote community health and development through collaborative research, teaching, and service. Consistent with this purpose, our new World Health Organization Collaborating Center for Community Health and Development at KU has two primary objectives: a) To expand the evidence base for community efforts to create conditions for health and development and b) To build capacity for this work including through dissemination of promising methods using Internet-based technologies.

We are supported by our home academic unit, the Department of Human Development, with its emphasis on applied behavioral science; and the broader research unit of which we are a part, the Schiefelbusch Institute for Life Span Studies, with its commitment to translating knowledge to practice. Throughout its nearly 30-year history, our KU Work Group has attempted to integrate the core university functions of research, teaching, and public service in all its activities. As such, our discernment criteria for selecting among possible projects include: a) opportunities to learn and contribute through research, b) potential for impact on important outcomes, c) client commitment to building capacity, discovery, and co-learning, d) long-term relationships and commitment to this work, e) potential links and synergies among projects, and f) opportunities to collaborate with outstanding national and global partners.

Some Disciplinary Influences on Our Work

Our KU Work Group's efforts have been informed by several disciplines and traditions for research and practice. First, the field of *applied behavior analysis* focuses attention on socially important behaviors and outcomes, such as childhood immunizations or violence, of people in their actual communities (Baer, Wolf, and Risley, 1968; 1987; Fawcett, 1991). The field's analytic criterion promotes use of appropriate experimental designs and research methods to help identify evidence-based practices that produce effects of social significance. Its technological criterion encourages dissemination of these innovations to those who can create environments that support valued behaviors and outcomes.

Second, the field of *community psychology* (Jason, Keys, Suarez-Balcazar, et al., 2004; Rappaport, 1977; Tolan, Keys, Chertok, and Jason, 1990) offers an ecological perspective—the idea that multiple and interrelated factors, such as social support and access to resources, affect multiple and interrelated outcomes, such as school success or substance abuse. It highlights the process of collaboration (Himmelman, 1992): sharing risks, resources and responsibilities for the work among all those in a position to learn and contribute; including community people most affected, researchers and technical advisors, and those grantmakers who fund and support the work. It places a value on empowerment: the process by which people gain control over conditions and outcomes that matter to them (Fawcett, Paine-Andrews, Francisco, et al., 1995).

Third, the field of *public health* draws attention to “what we as a society do collectively to assure conditions in which people can be healthy” (Institute of Medicine, 1988: 1). Globally and locally, the vision of “healthy people in healthy communities” (DHHS, Healthy People 2010; World Health Organization, 1986) is made concrete in specific health objectives, such as reducing rates of HIV/AIDS and the associated risk behavior of unprotected sexual activity, and related environmental strategies such as making condoms more readily available and social consequences for their use more reinforcing. With its emphasis on population-level outcomes, such as the prevalence of diabetes in a particular group or place, public health emphasizes engagement of people from multiple sectors, such as education and non-governmental organizations, in changing community conditions that can affect widespread behavior change,

such as physical activity and diet, and related health outcomes for all (Institute of Medicine, 2003).

Some Principles, Assumptions, and Values Guiding the Work

Grounded in the above-noted traditions, Table 1 outlines some principles, assumptions, and values that guide the work of understanding and improving community health and development (Adapted from Fawcett, Francisco, Hyra, et al., 2000). For example, Value #1 reflects the public health goal of improving population-level outcomes. Value #2 directs attention to the behaviors and environmental conditions related to health and development goals. Value #4 acknowledges the importance of broader determinants of health and development (Tarlov and St. Peter, 2000)—especially social connectedness (Berkman and Syme, 1979; Kawachi, Kennedy, Lochner, and Prothrow-Stith, 1997), income inequality (Wilkinson, 1996), and efficacy or ability to influence one’s environment (Marmot, Bosma, Hemingway, et al., 1997). Values #3 and 5 highlight the collaborative processes and ecological perspective of community psychology. We use the term *value* as Skinner (1972) used it; to refer to a statement of what is important, of what practices, if adhered to, might produce positive reinforcement from important audiences such as those engaged in this work of understanding and improving community health and development (Fawcett, 1991).

A Framework for Community Efforts to Promote Change and Improvement

In this section, we outline a conceptual framework for community efforts to create change and improvement related to health and development. Adapted from Fawcett, Francisco, and Hyra, et al. (2000), and grounded in the logic of health promotion (CDC, 2002; Green and Kreuter, 1991), this model was used by the Institute of Medicine to characterize collaborative public health action by communities in its report on the future of public health in the 21st century (Institute of Medicine, 2003: Chapter on “Community”). Figure 1 presents this five-component framework: a) Assessment

Table 1

Some Principles, Assumptions, and Values Guiding the Work of Understanding and Improving Community Health and Development

1. Improvement in community health and development involves the *population* as a whole, not merely individuals at risk for specific physical, mental, or social conditions.
2. Community health and development requires changes in both the *behaviors* of large numbers of individuals and the *environment and broader conditions* that affect health and development.
3. A healthy community is a local product with priority issues and strategies best *determined by people most affected* by the concern.
4. Achieving health and development for all requires attention to key *social determinants*—in particular; income disparities, social connectedness, and efficacy or the ability to influence one’s environment.
5. Since health and development outcomes are caused by *multiple and interrelated factors*, single interventions are likely to be insufficient.
6. The conditions that affect a particular health or development outcome are often *interconnected* with those affecting other concerns.
7. Since the behaviors that affect health and development occur among a variety of people in an array of contexts, community improvement requires *engagement of diverse groups* bringing about change in *multiple sectors* of the community.
8. Community health and development involves interdependent relationships among multiple parties in which none can function fully without *collaboration* with others.
9. Collaborative partnerships, support organizations, and grantmakers work together as *catalysts for change*; they convene, broker relationships, and leverage resources for those doing the work of community change and improvement.
10. The aim of support organizations is to *build capacity* to address what matters to people over time and across concerns.

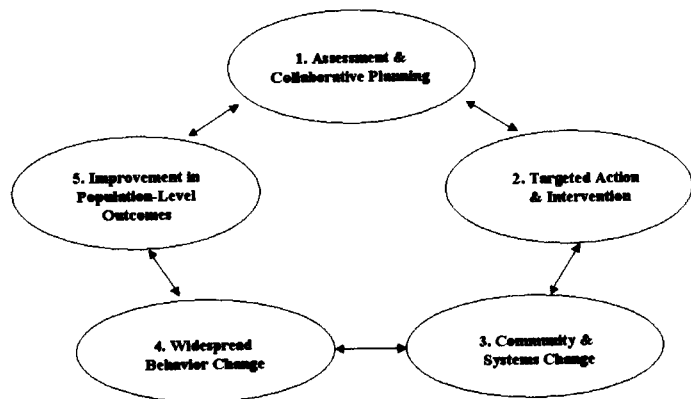


Figure 1. A framework for community efforts to promote change and improvement in population-level health and development.

and collaborative planning, b) Targeted action and intervention, c) Community and systems change, d) Widespread behavior change, and e) Improvement in population-level outcomes.

The model's components are *interactive*. For instance, assessment of community issues and concerns, such as levels of violence or safety, and developing plans to address them should inform targeted actions and interventions. Similarly, information about the unfolding of new programs and policies (community change), and associated changes in rates of behavior and population-level outcome, may prompt adjustments in action plans and interventions. The framework's components are also *iterative*, or part of a repeating cycle. For example, when the process yields improvement in targeted population-level outcomes, such as rates of childhood immunizations or adolescent pregnancy, this may be followed by a renewed cycle of collaborative planning and intervention for other issues, such as early childhood development, that matter to local communities. *Community capacity* may be reflected in the demonstrated ability of generations of people working together to effect change and improvement over time, and across issues (Fawcett, Paine-Andrews, Francisco, et al., 1995; Goodman, Speers, McLeroy, Fawcett, et al., 1998).

Assessment and Collaborative Planning

Community members and outside experts work together to gather and use quantitative data (Green and Kreuter, 1991; Institute

of Medicine, 1997) and information on community concerns (Fawcett, Seekins, et al., 1982; Paine, Francisco, and Fawcett, 1994) to target issues of importance, such as improved educational outcomes or caring engagements with children, that will be the focus of change efforts. In a multi-sectoral approach, representatives from different sectors of the community—such as schools, government, business, and faith communities—engage in the ongoing process of collaborative planning. The process should be inclusive; engaging those most affected by the issue, such as marginalized groups that traditionally lack power, as well as those in a position to effect needed changes such as elected officials and community leaders.

The products of strategic planning include a shared: a) Vision—the dream or what success would look like (e.g., “healthy children”, “safe streets”, “caring neighbors”), b) Mission—statement of what the group is going to do and why, c) Objectives—how much of what (e.g., increase/decrease in behavior or population-level outcome) will result by when, d) Strategies—how the effort will reach its objectives (e.g., providing information and enhancing skills, modifying access and opportunities, enhancing services and support, changing the consequences, modifying policies and broader systems), and e) Action plans—specific community changes to be sought and interventions to be implemented; including who will do what by when to bring them about (*Community Tool Box*, 2003).

Targeted Action and Intervention

Efforts often include targeted actions, such as personal contacts or group advocacy efforts, to bring about community and systems changes identified in action plans such as a new or modified program (e.g., after-school program for youth), policy (e.g., extended hours for access to service), or practice (e.g., more humane treatment of clients). They may also include implementation of evidence-based practices and interventions (e.g., Task Force on Community Preventive Services, 2000).

Community and Systems Change

Community and systems changes refer to new or modified programs, policies and practices facilitated by the effort and related to its mission (Francisco, Paine and Fawcett, 1993). For example, a community effort to reduce obesity and risk for diabetes might

include public information programs displaying modeling and social reinforcement from peers for engagement in physical activity, policies that assure availability of healthy school lunches, and prompts for healthy practices such as symbols for low-fat choices on restaurant menus and signs promoting use of stairs in public buildings. Community changes reflect the product of actions; an *intermediate outcome* between the process of collaborative planning and action and more distant changes in behaviors of group members and population-level outcomes (Fawcett, Francisco, Hyra, et al, 2000).

Widespread Behavior Change

The aim of targeted action and intervention—and resulting changes in communities and systems—is behavior change and improved health and development outcomes for the people in the defined community. For example, a citywide effort to reduce adolescent pregnancy would have behavioral objectives related to increased abstinence among unmarried teens and, for those who chose to be sexually active, increased use of appropriate contraceptives. Widespread change in targeted behaviors is more likely when community conditions address the array of relevant personal factors, such as knowledge and skill, and environmental factors, such as peer support and enhanced opportunities to respond. To affect behavior changes in the group, the specific components of a community intervention, such as the types of information or consequences, should reflect an analysis of the context and the environmental conditions that are associated with the behavioral problem or goal.

Improvement in Population-level Outcomes

Improvement in population-level outcomes is the ultimate goal of community efforts to create conditions that promote health and development. Such efforts may aim to reduce adverse outcomes, such as the prevalence of alcohol abuse or exposure to environmental toxins, or promote positive health and development such as increased rates of educational success or frequency of caring engagements with children. Often, a population-level outcome is the product of widespread change in multiple behaviors of those who share a place or group. For example, reduced prevalence of diabetes requires changes in engagement in physical activity and healthy diets

in all children and adults, including those with multiple risk markers for diabetes such as impaired glucose tolerance or a family history of diabetes.

How Are We Learning?—Using the Methodology of Community-Based Participatory Research to Document and Analyze the Contribution

This conceptual framework focuses our attention on: a) processes (assessment and collaborative planning), b) engagements (targeted action and intervention), c) intermediate outcomes (community and systems changes), and d) more distant outcomes (widespread behavior change and population-level outcomes). Since 1990, our research team has focused on two core questions: 1) What factors affect the rate of community and systems change (intermediate outcome)? and 2) Under what conditions are community changes associated with improvements (in population-level outcomes)? In this section, we describe how we are learning—the methodology of community-based participatory research—and the use of a common measurement system, multiple case studies, and interrupted time series designs to examine the two core questions.

Methodology of Community-Based Participatory Research

Our methodology for studying the functioning of community efforts to promote health and development is grounded in the traditions of behavioral measurement (Johnson and Pennypacker, 1980), participatory research (Green et al., 1995; Whyte, 1991), ethnography and action anthropology (e.g., Stull and Schensul, 1987), and empowerment evaluation (e.g., Fawcett, Paine-Andrews, Francisco, et al., 1996; Fetterman, Kaftarian, and Wandersman, 1996). A form of community-based participatory research (Fawcett, Schultz, Carson, et al., 2003; Minkler and Wallerstein, 2003), it builds on other efforts to evaluate comprehensive community initiatives (e.g., Connell, Kubish, Schorr, and Weiss, 1995; Fawcett, Paine-Andrews, Francisco, et al., 2001).

Figure 2 outlines our six-part framework for community-based participatory research (Fawcett, Boothroyd, Schultz, et al.,

2003). First, we support local community efforts in *naming and framing the problem or goal* (“What issues are we trying to address?”). For example, an initiative to reduce adolescent pregnancy would focus on key behaviors—abstinence and use of contraceptives—and the environmental conditions that would reduce risk and enhance protection. Second, we aid in developing a *logic model* or framework for achieving success (“How will we get from here to there?”) (See Figure 1, for a generic example of inputs, outputs, and an intended continuum of outcomes). Third, we collaborate with members of the local effort in *identifying research questions and appropriate methods* (“What do we want to know and how will we know it?”). For instance, key stakeholders, such as community leaders and grantmakers, might be interested in whether the effort results in environmental change and whether this yields improvements in population-level outcomes.

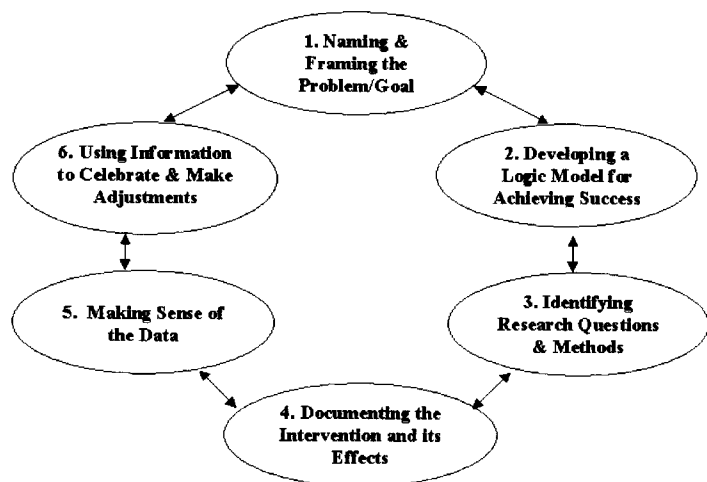


Figure 2. A framework for community-based participatory research.

Fourth, we assist in *documenting the intervention and its effects* (“What are we doing? Is it making a difference?”). For example, we use Internet-based systems to provide online reports of accomplishments and graphs of the rate of community/systems change over time (Fawcett, Schultz, Carson, et al., 2003). Fifth, outside researchers and group members work together to *make sense*

of the data (“What are we seeing? What does it mean?”). For instance, this may involve examining time series data for a population-level outcome, such as estimated pregnancy rates for young women aged 15-19 years, and comparing rates over time for both experimental and comparison communities. Finally, we support *using the information* to celebrate and make adjustments (“What do we do now, and how?”).

Context and Collaborative Partners in Studying Community Change Efforts

Since 1990, our research group and collaborating partners have been studying the process, intermediate outcomes, and more distant population-level outcomes of community efforts to promote health and development (Fawcett, Paine-Andrews, Francisco, et al., 2001; Roussos and Fawcett, 2000). Typically, our KU Work Group provided integrated technical support and evaluation services as part of a broader collaboration that involved funded community or state initiatives, such as to reduce substance abuse or improve nutrition, and outside grantmakers such as private foundations or government agencies.

Throughout, we used the same measurement system to document the product of community actions, *community and systems change*—new or modified programs, policies, and practices related to the mission (Francisco et al., 1993). To help assure the quality of the data, we provided training for documentation of the onset of discrete instances of community/systems change—for example, a new program for occupational safety, a modified policy extending health insurance coverage to low-income children, or a new practice to provide needed child immunizations during regular health care visits. Training included use of response definitions and scoring instructions, examples and non-examples, opportunities to practice and receive feedback, and a mastery criterion of high levels of inter-observer agreement before completion. Independent scoring of community/systems change, and feedback on levels of inter-observer agreement, is used to help assess and assure consistency in the measurement system over time and across applications and contexts.

Consistent with the methodology of community-based participatory research (e.g., Minkler and Wallerstein, 2003), we supported community involvement in documenting the onset of discrete instances of community and systems change (i.e., new programs, policies and practices) facilitated by the local efforts. Ongoing feedback on the rate of community change was presented in the form of graphs of the cumulative number of changes (aggregated monthly) over the course of the effort. Sense making by community members and researchers focused on: a) examining discontinuities in rates of change and associated factors (e.g., marked increases in change following action planning; marked decreases following loss of leadership) and b) analyzing the contribution [i.e., pie charts showing the distribution of community changes by goal (e.g., substance abuse, jobs), duration (e.g., one-time event, ongoing), strategy (e.g., providing information, modifying policies), and other aspects].

We focused the measurement system on the intermediate outcome of community/systems change. This is particularly strategic since population-level outcomes are often too distant—perhaps taking 5-10 years or more to improve—to be useful in making necessary corrections in project efforts. Documentation and feedback—in the form of graphs of the rate and distribution of community change—permitted ongoing learning, adjustments, and accountability.

Since 1990, we have used this common measurement system—and, as available, appropriate indicators of population-level outcomes—to support and evaluate over 30 collaborative partnerships (e.g., Fawcett, Paine-Andrews, Francisco, et al., 2001). These community efforts have worked on a variety of issues/outcomes (e.g., adolescent pregnancy, substance abuse, nutrition, physical activity, childhood immunization, neighborhood development) in a diverse array of contexts (e.g., urban, rural, tribal communities). Taken together, this naturally unfolding social experiment might be considered a multiple case study design (Yin, 1988).

Core Research Questions and Related Method Systems

Our overarching research program has focused on two core questions: a) What factors affect the rate of community and systems

change? and b) Under what conditions are community changes associated with improvements in population-level outcomes?

To address the first question, we have used a natural social experiment involving different collaborative efforts that began and ended at different times and in different communities since 1990. For instance, the first initiative we studied, a community effort to reduce adolescent substance abuse in a Midwestern city, began in 1990 and concluded several years later (Fawcett, Lewis, Paine-Andrews, et al., 1997); other efforts began and ended in subsequent years. This might be considered a naturally-occurring multiple or interrupted time series design with the rate of community change as the dependent variable (Cook and Campbell, 1979; Johnson and Pennypacker, 1980).

Consistent with a natural science approach, investigators examined each case study for discontinuities—marked increases or decreases—in rates of community change. We also used qualitative methods, such as semi-structured interviews and reviews of archival records, to identify critical events or candidate factors associated with observed discontinuities (e.g., changes in leadership; completion of action planning; announced contingencies for higher rates of change). To facilitate visual inspection for each case study, we overlaid the critical events on time series graphs of the cumulative rates of community change. To identify candidate factors, such as action planning, we looked for associated marked acceleration or deceleration in rates of change—and systematic replication of these possible effects—in multiple case studies.

To address the second question, whenever possible, we used multiple time series designs to examine trends in population-level indicators (e.g., rates of adolescent pregnancy or childhood immunization) that may be associated with the unfolding of the independent variable (community change) over time. Consistent with a natural science approach, we looked for discontinuities in rates of population-level indicators and systematically analyzed the contribution of community changes to examine a possible a dose-response relationship. For instance, in an adolescent substance abuse prevention initiative, we noted decreases in rates of single-nighttime vehicle crashes (a population-level indicator) in an experimental community compared with another similar community; and, reductions in rates corresponded with the unfolding of over 200 community changes in the active community (Fawcett, Lewis, et al., 1997).

Our working hypothesis is that improvement in population-level outcomes (the intended “response”) is more likely when community changes (the “dose”) are of sufficient: a) *amount by goal* (e.g., targeted to one or a few goals, not distributed among many), b) *intensity of behavior change strategy* (e.g., not merely weak behavior-change approaches such as providing information; but also stronger variables such as modifying access and changing the consequences), c) *duration* (e.g., not merely one-time events, but including ongoing events such as policy changes), and d) *penetration* to reach intended *targets* (e.g., including all those at risk as well as those with multiple risk markers) through appropriate *sectors* (e.g., schools, business, government agencies) in specific *places* (e.g., areas with a high incidence of the problem). To make salient this *analysis of contribution* of community changes to more distant outcomes, we provide Internet-based feedback to community efforts in the form of pie charts displaying the distribution of community/systems changes for each dimension of contribution (e.g., by goal, by behavior change strategy, by neighborhood) (Fawcett, Schultz, Carson, et al., 2003; Paine-Andrews, Fisher, et al, 2002).

What Are We Learning?—Some Factors and Conditions Affecting Community Change and Improvement

Based on these multiple case studies, and the work of other colleagues, we can summarize preliminary learning on two core questions: a) factors affecting rates of community (systems) change and b) conditions under which these environmental changes may “tip” or bring about improvements in population-level outcomes (Gladwell, 2000).

Some Factors Affecting Community and Systems Change

Reviewed elsewhere (Fawcett, Francisco, Paine-Andrews, and Schultz, 2000; Roussos and Fawcett, 2000), we have identified seven factors associated with increases (or decreases) in rates of community (and systems) change:

1. Clear vision and mission—We have noted five- to six-fold higher rates of community change when community initiatives have agreed on a clear vision and targeted mission (Francisco, Fawcett, Wolff, and Foster, unpublished data).

In our observations, more targeted community efforts, such as those addressing substance abuse or nutrition, are associated with higher rates of change than diffuse efforts such as those addressing “healthy communities”.

2. Action planning—Identifying specific community and systems changes to be sought in each relevant sector, such as an expanded after-school program or a new childcare policy in business—and who would do what to bring them about—has been consistently followed by increases in rates of community change (e.g., Fawcett, Lewis, et al, 1997; Lewis, Paine-Andrews, Fisher, et al., 1999; Paine-Andrews, Harris, Fawcett, et al, 1997). Action planning may be the single most important modifiable factor in accelerating change; leadership is very important, but not particularly modifiable.
3. Leadership—In the first community effort we studied, there was a marked decrease in the rate of community change following loss of leadership (Fawcett, Lewis, et al., 1997), a pattern that we have seen repeated fairly consistently when leaders have left community efforts. In some cases, a change in leadership, such as to those with strong commitment and social ties, had a facilitative effect (Lewis, et al., 1999). Although challenging to assure, continuous leadership, including distributed among multiple group members, may be a critical protective factor for continued high rates of change (e.g., Kegler, Steckler, McLeroy, and Malek, 1998; Paine-Andrews, Harris, Fawcett, et al., 1997).
4. Responsible community organizers—Hiring community organizers with responsibility for assuring implementation of action plans has consistently led to increased rates of community change (e.g., Fawcett, Lewis, et al., 1997; Lewis et al., 1999; Paine-Andrews, Fawcett, Richter, et al., 1996; Paine-Andrews, Harris, Fawcett, et al., 1997; Paine-Andrews, Harris, Fisher, et al., 1999). When community workers are paid there is often better accountability for the work of community change than when efforts rely solely on volunteers.
5. Documentation and feedback on intermediate outcomes—To provide a functional measure of intermediate outcome, we supported ongoing documentation of the unfolding of community change over time; and feedback, in the form of

time series graphs of cumulative rates of change that are annotated to show factors (e.g., change in leadership) associated with discontinuities (Francisco, Paine, and Fawcett, 1993). Since documentation and feedback are integral to the measurement system, we cannot tease out their separate effects on rates of community change. Functionally, such information may permit ongoing learning, adjustments, and accountability in the effort.

6. Technical assistance—To support community efforts, outside intermediary organizations, such as our KU Work Group, use training and technical consultation to build local capacity for key tasks such as community assessment, strategic planning, and leadership development. Although not examined separately, such technical support may prompt and provide modeling for appropriate activities, occasion reinforcement for these practices, and make them easier through Internet-based supports (Fawcett, Schultz, Carson, et al., 2003).
7. Making outcome matter—Although we might expect intrinsic rewards for progress, tangible contingencies of reinforcement for productivity, such as increased resources for high rates of change and improvement, are rare. Following introduction of announced contingencies of reinforcement (i.e., grant renewal based on evidence of progress by a grantmaker), we saw marked increases in rates of community change (Fawcett, Lewis, et al., 1997). Other contingencies—including bonus grants for particularly high rates of change and outcome dividends for improvement in population-level outcomes (e.g., decreased rates of adolescent pregnancy)—merit further examination (Fawcett, Francisco, Paine-Andrews, and Schultz, 2000).

Conditions Under Which Environmental Change May Be Related to Improvement in Population-level Outcomes

Ultimately, community efforts must address the question: Whether (and under what conditions) community/systems changes—those scores of new programs, policies and practices resulting from targeted action and intervention—actually yield improvements in population-level outcomes (Fawcett, Francisco, Hyra, et al., 2000; Institute of Medicine, 2003). In complex adaptive systems (Eoyang,

1997), where multiple and interrelated factors affect multiple and interrelated outcomes, attribution of cause and effect can be difficult to impossible. Appropriate to such complex environments, the “proof” game may switch to the “plausibility” game (Baer, 1985; Fawcett, 1991); we adjust the analytic work from “attribution” to “analysis of contribution” (Fawcett, Boothroyd, Schultz, et al., 2003; Milstein and Wetherall, 2001).

In an *analysis of contribution*, we examine how the “dose” of environmental change might contribute to the “response” of improvement in population-level outcome. To analyze the contribution of community health and development efforts, we use a *working hypothesis* of the conditions under which environmental (community/systems) change might “tip”, or bring about marked improvements in, outcomes for the population (Gladwell, 2000). Based on our research and that of colleagues, we expect improvements in population-level outcomes to be more likely when community/systems changes are of sufficient:

1. *Amount by goal*—When the environmental changes are many and focused on a few targeted categorical outcomes (e.g., substance abuse; nutrition; education).
2. *Intensity of behavior change strategy*—When the community/systems changes resulting from the targeted action/intervention go beyond weak behavior change approaches, such as providing information, to use more potent strategies, such as modifying barriers and opportunities (e.g., reducing the time and effort for the desired behavior) and changing the consequences (e.g., price of tobacco products).
3. *Duration*—When community changes include more ongoing events (e.g., policy changes) than one-time events (e.g., one-shot “health fairs”).
4. *Penetration/exposure*:
 - a. To reach *targets*—When community/systems changes are directed in a universal approach toward all those at risk or who could benefit (e.g., all adults in a place); and, in a targeted approach, toward those with multiple risk markers (e.g., for depression—family history, unemployment, social isolation and other factors that increase risk for depression).

- b. Through appropriate *sectors* or channels of influence—When community changes, such as new programs or policies, occur in community sectors through which targets can be reached (e.g., health organizations; faith communities; business; government; community/non-governmental organizations).
- c. In local *places*—When community changes are concentrated in places (e.g., cities, neighborhoods) where there is high incidence or prevalence of the concern.

For instance, we used this working hypothesis to analyze the contribution of community change to improvement in population-level rates of adolescent pregnancy in an urban community (Paine-Andrews, Fisher, Patton, et al., 2002). A reduced rate of adolescent pregnancy (the intended “response”) was noted in the neighborhood in which a large number of community changes (the estimated “dose”) were facilitated; but not in the contiguous neighborhood in which few environmental changes were made. Since other correlated events and associated conditions may account for differences, these findings are merely suggestive of how an analysis of contribution can contribute to our understanding of the functioning of community-level change efforts. Further research, perhaps using multiple case studies or interrupted time series designs, may help clarify how we can use this metric of community/systems change—a measure of the independent variable—to better understand the functioning of community efforts to improve population-level outcomes.

Using Internet-based Capabilities in Translating Knowledge to Practice

How do we translate emerging knowledge—what we are learning about community-based efforts—into supports for best practice? Those working on community efforts to improve health and development often find it difficult to gain access to the knowledge and support they need, when they need it, at an affordable cost. Internet technology can help communities become more capable of understanding and effecting community-determined improvements by providing training and support for critical skills, processes and practices (Fawcett, Francisco, Schultz, et al., 2000; Schultz, Fawcett, Francisco, et al., 2003).

Core Competencies in the Work

Based on our experience and that of colleagues, we identified 16 core competencies for the shared work of promoting community health and development. Adapted from Fawcett, Schultz, Carson et al. (2003), Figure 3 and the description that follows describes these abilities in relation to a framework for creating conditions for community health and development (see Figure 1).

Core Competencies for Assessment and Collaborative Planning. Six core competencies contribute to the work of assessment and collaborative planning. First, *creating and maintaining coalitions* is a common strategy for engaging individuals and organizations from a variety of sectors of the community, such as government or business, in common purpose. Second, *assessing community needs and resources* grounds the work in what is locally important and available. Third, working with community partners in *analyzing problems and goals* helps pinpoint the personal/group factors and environmental factors that may affect the current problem and future prospects for goal attainment. Fourth, *developing a framework or model of change*—including inputs, outputs and a continuum of outcomes—helps define how the community intends to go from a problematic situation to sustained improvements in population-level outcomes. Fifth, *developing strategic and action plans* sets the blueprint for getting from a community’s vision and mission to improvements in population-level outcomes. Sixth, *building leadership* helps people to develop and sustain relationships and transform conditions necessary for community improvement.

Core Competencies for Targeted Action and Intervention. Three additional core competencies apply to taking action. Seventh, *developing an intervention* involves selecting and using intervention components and elements based on an analysis of contributing factors and available resources. Eighth, *increasing participation and membership* promotes voice and influence from those with deep experience, such as youth or ethnic minorities, but limited prior engagement in the effort. Ninth, *enhancing cultural competence* helps build cross-cultural relationships and create more inclusive and respectful organizations and communities.

Core Competencies for Community and Systems Change. Several additional core abilities are associated with bringing about community and systems change. Tenth, *advocating for change* involves overcoming resistance and barriers to bring about new programs

TRANSLATING KNOWLEDGE TO PRACTICE IN PROMOTING COMMUNITY HEALTH AND DEVELOPMENT Community Tool Box (http://ctb.ku.edu/)			
Assessment and Collaborative Planning	Targeted Action and Intervention	Community and Systems Change	Widespread Behavior Change and Improvement in Population-level Outcomes
Sustaining the Effort			
16 CORE COMPETENCIES SUPPORTED BY THE COMMUNITY TOOL BOX & CUSTOMIZED WORKSTATIONS <i>What kind of community work do you want to do today?</i>			
1. Create and maintain coalitions and partnerships			
2. Assess community needs and resources			
3. Analyze problems and goals			
4. Develop a framework or model of change			
5. Develop a strategic or action plan			
6. Build leadership			
7. Develop an intervention			
8. Increase participation and membership			
9. Enhance cultural competence			
10. Advocate for change			
11. Influence policy development			
12. Evaluate the initiative			
13. Implement a social marketing effort			
14. Write a grant application for funding			
15. Improve organizational management and development			
16. Sustain the work or initiative			
CAPABILITIES OF CUSTOMIZED ONLINE WORKSTATIONS <i>What kinds of support do I need?</i>			
Building Capacity	<ul style="list-style-type: none"> Help planning the work Solve a common problem Quick tips and tools for how to do the work See a story or example Learn a specific skill 	Co-Learning and Adjustments	<ul style="list-style-type: none"> Link to other online resources Connect with others about this work Ask a question of an advisor Knowledge base from collective experience See how this work fits together
		Documentation, Evaluation, and Analysis of Contribution	<ul style="list-style-type: none"> Document community and systems change Enter or see community-level indicators Display trends and discontinuities Analyze the contribution Sense making and adjustments Capture success stories Online and print reporting
CTB TRAINING CURRICULUM—16 Modules, one for each core competency—AND GRADUATE CERTIFICATION			

and policies related to the effort. Eleventh, *influencing policy development* requires being able to affect the policy agenda and the array of policy options presented to decision makers for consideration. Twelfth, *evaluating the initiative* includes being able to document the unfolding of community and systems changes over time and its potential impact on more distant population-level indicators of success.

Core Competencies for Widespread Behavior Change and Improvement in Population-level Outcomes. Thirteenth, *implementing a social marketing effort* involves using promotional techniques to effect widespread behavior change related to socially-important goals. Other previously noted abilities, such as building leadership and evaluating the initiative, also have relevance to this aspect of the work.

Core Competencies for Sustaining the Effort. Several of the 16 core competencies are particularly important to this final aspect. Fourteenth, *writing a grant application for funding* can help gain access to financial and other resources needed for the work. Fifteenth, *improving organizational management and development* can create and enhance the needed institutional supports. Finally, developing a plan for *sustaining the work or initiative*, such as how to share positions between agencies, helps ensure that human and financial resources are available long enough to make a difference.

Building Capacity Through the Community Tool Box and Customized Workstations

We have developed Internet-based resources and a training curriculum to support translation of knowledge—about factors affecting community efforts—into practice, such as enhanced skills in planning and other core competencies.

Community Tool Box. In 1994, we began development of the Community Tool Box™ <http://ctb.ku.edu/>, a comprehensive and widely used Internet-based resource for building capacity, or enhancing core competencies, among those involved in community efforts (Fawcett, Francisco, Schultz, et al., 2000). The mission of the Community Tool Box (CTB) is to promote community health and development by connecting people, ideas, and resources. The CTB has over 6,000 pages of how-to information relevant to the 16 core competencies just discussed (e.g., assessing community resources and needs, facilitating meetings, evaluating programs). In a related effort, the KU Work Group has developed an Internet-based system for

