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Best Evidence Structural Interventions for HIV Prevention



 Springer

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Chapter 1

Introduction

Functioning as a resource to HIV prevention service providers, planners, policy makers, funders, and others, this book includes information and materials to learn about, replicate, or adapt *structural interventions* (those that focus on the physical, social, cultural, political, economic, legal, and/or policy aspects of the environment) (Abdul-Quader & Collins, 2011) which have demonstrated efficacy in preventing HIV transmission in the United States (USA) and around the globe. Within this book, 18 subject-matter expert-selected structural interventions are presented according to their targeted risk behaviors (injection drug use, noncommercial sex, and commercial sex) and protective behaviors (utilization of testing and treatment).

Along with an introductory global discussion of structural interventions and their policy and program implications, this book provides a brief overview of each target risk behavior group and detailed descriptions of the selected structural interventions that positively impact that risk behavior group.

This book of evidence-based structural interventions for HIV prevention:

- Includes only rigorously evaluated programs
- Includes structural interventions that have been implemented in the USA and structural interventions implemented in international settings
- Provides historical context for different classes of interventions
- Includes detailed descriptions of all program implementation stages and steps
- Derives its content from multiple sources, including interviews with program developers and/or evaluators
- Facilitates comparability among structural interventions
- Serves as a teaching tool for public health administrators, evaluators, policy makers, funders, and others
- Has links to online materials
- Addresses the quintessential public health ethical dilemma regarding which types of structural changes should be mandatory via legislation and which should be voluntary, promoted via programmatic, practice, and policy change

Now in the fourth decade of the AIDS epidemic, an estimated 33.3 million people worldwide are living with HIV (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2010a), and the number of new infections continues to outpace the increased availability of antiretroviral therapy (ART) (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2010b). Nevertheless, worldwide, we have begun to see a reversal in the spread of HIV (UNAIDS, 2010a, p. 7). “The question remains how quickly the response can chart a new course toward UNAIDS’ vision of zero discrimination, zero new HIV infections, and zero AIDS-related deaths through universal access to effective HIV prevention, treatment, care and support” (UNAIDS, p. 7).

Many positive trends have emerged in recent years. For example, since 1999, when the epidemic peaked, new infections have decreased by 19 % worldwide. For people living with HIV/AIDS (PLWHA) in low- and middle-income countries (15 million), over one-third of those who need treatment have access (UNAIDS, 2010a). In several sub-Saharan African countries (Ethiopia, Nigeria, South Africa, Zambia, and Zimbabwe), HIV has either stabilized or begun to decline, demonstrating that positive behavior change and access to biomedical interventions can alter the course of the epidemic (UNAIDS). The complete elimination of mother-to-child transmission (MTCT) of HIV is within reach, as rates have declined dramatically around the world since 2001, and MTCT has been virtually removed from resource-rich nations. Since 2001, new infections among children have decreased as have AIDS-related deaths among children. The epidemic in Asia is largely stable although patterns vary among and within countries. Even though approximately 1 % of the adult population in the Caribbean is living with HIV, new infections in that region are declining slightly (UNAIDS). Condom availability and uptake is improving globally, and in some countries with high HIV prevalence, young men are getting circumcised (UNAIDS, 2011). In short, prevention and treatment are working.

On the other hand, in Eastern Europe and Central Asia, HIV incidence increased by more than 25 % between 2001 and 2009. In 2009, 72 % of the people who died from HIV-related causes lived in sub-Saharan Africa. AIDS continues stubbornly in higher-income countries, with, for example, a resurgence of the epidemic among men who have sex with men (MSM) and a disproportionate concentration among racial and ethnic minorities, with African American women 19 times as likely to acquire HIV as white women in the USA (UNAIDS, 2010a). Despite the lack of reliable data, it appears that HIV infections are on the rise in the Middle East and North Africa. The number of people living with HIV in Oceania nearly doubled from 2001 to 2009 (UNAIDS). Finally, “Worldwide, the vast majority (64 %) of people aged 15–24 living with HIV today are female. The rate is even higher in sub-Saharan Africa where girls and young women make up 71 % of all young people living with HIV—essentially because prevention strategies are not reaching them” (World Health Organization [WHO], 2011a, p. 1).

The epidemiological data (UNAIDS, 2010a) indicate that whereas treatment and prevention have helped reduce new infections in some countries with select target populations, the use of structural interventions may offer new population-level strategies to further reduce new HIV infections.

HIV Prevention Interventions: Theories and Models

HIV prevention interventions can be categorized according to different schemas. For example, they can be defined as behavioral versus structural (Cohen & Scribner, 2000); individual, organizational, environmental (Blankenship, Bray, & Merson, 2000); or behavioral, biomedical, and structural (Rotheram-Borus, Swendeman, & Chovnick, 2009). What appears to be clear about all these different schemas is that interventions aiming to change cognitive and emotional states or build skills such as condom application skills are generally classified as behavioral interventions. Interventions that assess a physiological state (such as HIV antibody testing) or impact a physiological state (such as antiretroviral treatment) are generally classified as biomedical interventions. Interventions that focus on the physical, social, cultural, political, economic, legal, and/or policy aspects of the environment are generally classified as structural interventions. We will use these distinctions when discussing behavioral, biomedical, and structural interventions throughout this book.

Because structural interventions include physical, social, cultural, political, economic, legal, and/or policy aspects of the environment, challenges arise when developing a taxonomy for classifying structural interventions or placing the broad range of structural interventions into a logically consistent framework. In a seminal article by Blankenship et al. (2000), the authors formulate a framework for classifying structural interventions based on three contextual approaches or factors that affect health: availability, acceptability, and accessibility. According to their framework, once the contextual approach has been determined, interventions may operate at the individual, organizational, or environmental level. For example, at the individual level, a prohibition against the possession of drug paraphernalia works by affecting “availability” while targeting the individual. Requirements that television networks devote time to anti-drug public service announcements (PSAs) work as a structural intervention because they change the “acceptability” of drugs while targeting the organizational level. Similarly, Medicaid coverage of drug treatment changes the “accessibility” of medications at the environmental level. Blankenship’s model delineates each category of structural intervention and the contextual factor or approach that affects that particular level. However, determining the target level becomes a challenging exercise since other authors refer to individual, small group, community, and structural levels to convey slightly different, overlapping concepts from the terms individual, organizational, and environmental as used by Blankenship et al.. Behavioral scientists often use the terms individual, small group, and community to designate how a behavioral intervention is delivered. This is a different conceptual framework than the Blankenship et al. framework described previously. For clarity purposes, when referring to behavioral interventions, we specify that the intervention is delivered at the individual level, small group level, or community level. When referring to structural interventions, we specify that the contextual factors of availability, acceptability, and accessibility will be applied at the individual, organizational, and/or environmental levels.

In a relevant article by Rotheram-Borus, Swendeman, and Chovnick (2009), the authors focus on the integration of behavioral, biomedical, and structural intervention strategies, contending that the next generation of HIV prevention science “must draw from the successes of existing evidence-based interventions and the expertise of the market sector to integrate preventive innovations and behaviors into everyday routines” (Rotheram-Borus, Swendeman, & Chovnick, p. 143). They review the advantages and disadvantages of evidence-based behavioral interventions (EBIs) and distinguish biomedical interventions as the wave of the future in HIV prevention. According to this schema, biomedical interventions include HIV vaccines, male circumcision, barrier methods (e.g., condoms, microbicides), ART as prevention, treatment of other sexually transmitted infections (STIs), and rapid routine HIV testing. The authors note that all biomedical interventions are necessarily supported by behavioral and structural interventions. Furthermore, they state that structural interventions operate through “distal” or structural factors, and they divide structural interventions into four categories: community mobilization, service reform, economic interventions (e.g., microfinance), and contingent funding reform [e.g., harm reduction strategies for commercial sex workers (CSWs)]. Note that the comparison of Rotheram-Borus, Swendeman, and Chovnick categories with those delineated by Blankenship et al. (2000) is not immediately obvious.

Structural interventions are further subdivided depending on the framework of the authors. Excellent models to describe structural HIV prevention interventions have been proposed by more than a dozen researchers, including Gupta, Parkhurst, Ogden, Aggleton, and Mahal (2008); Latkin, Weeks, Glasman, Galletly, and Albarracin (2010); and Sweat and Denison (1995), to name a few. These models differently distinguish structural interventions by classifying (1) the levels of risk [e.g., micro (individual), intermediate (proximal), or macro (distal); individual, organizational, or environmental]; (2) conditions addressed (e.g., economic inequalities or cultural context); (3) environments [e.g., social, economic (infrastructure), or political]; or (4) the ways that behavior changes (e.g., fluidly through feedback loops vs. strictly hierarchical; intra- vs. interpersonal interactions). There is a plethora of potential lenses by which to explore the manner in which an environmental structure impacts a risk behavior but a dearth of unifying concepts or theory to facilitate the work of the scientists who publish in this field.

The difficulties in finding a clear definition for a structural intervention are in part due to the multidisciplinary nature of public health because the various contributing disciplines use dissimilar terms for parallel concepts (Bloom & Cohen, 2007). Hedges, Johnson, Semaan, and Sogolow (2002) emphasize the need for a synthesis of HIV prevention research, reiterating the problems in characterizing interventions according to various conceptual schemes. They point out that similar interventions can be grouped according to the goals of the program, the target population, treatment modality, or combinations thereof. We agree with Hedges and colleagues so long as literature reviews, meta-analysis, and research synthesis clearly state inclusion and exclusion criteria, in which case they serve as valuable resources for other researchers, program designers, funders, and policy makers.

The variety of ways to conceptualize and describe structural interventions creates complexity in the practical application of broad methods that ultimately may result in large-scale behavior change. Therefore, this book does not add to the plethora of theories and models but borrows heavily from an existing framework conceptualized in the Connect to Protect framework (Connect to Protect [C2P], 2008; Witt & Ellen, 2004), a part of the National Institutes of Health-funded Adolescent Medicine Trials Network. Much thought has gone into their model that offers a practical synthesis of the concepts used to describe structural interventions and that also explains the roles of coalitions and evaluation in structural interventions.

We selected the C2P model because its paradigm is generally inclusive of other theories/models, it makes a distinction between meta-structural and intermediate-structural determinants of HIV, it is influenced by feasibility, and it demonstrates how community-level interventions fall between intermediate-structural- and individual-level interventions, functioning at times in both capacities. It takes a socioeconomic approach, explaining interventions in terms of supply and demand for goods (e.g., condoms) and services (e.g., HIV testing). This in turn opens the door to include social marketing as a structural intervention strategy because social marketing strives to increase the demand (and to a lesser degree, the supply) of specific goods and services. The C2P model clearly describes the essential elements of structural interventions as stages in a process rather than non-mutually exclusive categories, avoiding a classification debate while honoring the complexity of structural intervention implementation. Further, it provides distinct terminology for cross-disciplinary dialogue.

Although structural interventions have been variously defined in accordance with the different overarching theories of HIV prevention, most researchers and practitioners agree on a core definition of a structural intervention similar to that provided by Abdul-Quader and Collins (2011) and described by the C2P model as an intervention designed to change laws, policies, physical structures, social or organizational structures, or standard operating procedures to affect environmental or societal change (Witt & Ellen, 2004) on an external level, outside individual control. We subscribe to this definition and hold that there are times when community interventions can be considered intermediate-structural-level interventions because they target relationships and social networks for change; therefore, the 18 selected case studies contain examples of such interventions.

Examples of Structural Interventions

A wide variety of actions have been identified by health researchers and practitioners as potential structural interventions. For example, the UNAIDS *Global Report 2010* identified the following activities intended to assist women and girls as potential structural interventions for the prevention of HIV:

- Reducing violence to women
- Microfinance for women

- Schooling for girls
- Cash transfers in education retention (paying children to stay in school)

These actions all operate by increasing accessibility, availability, and acceptability of education and economic independence for women, which in turn may leave them less vulnerable to intimate partner violence and/or unprotected sex. The UNAIDS report *Getting to Zero* (2010) calls for:

- Optimal drug regimens for PLWHA
- Provision of point-of-care diagnostics
- Reduction in the costs of ART

Changes in policy, practice, and programs can contribute to HIV prevention by increasing accessibility, availability, and acceptability of goods and services that decrease individual viral loads of PLWHA, resulting in less transmission of the virus to sexual or drug-sharing partners. Thus, increasing accessibility, availability, and acceptability of a biomedical intervention has the potential to be classified as a structural intervention. We wish to make this point early in the book. Whereas HIV rapid testing and antiretroviral therapy are clearly biomedical interventions, their accessibility, availability, and acceptability may be impacted by structural interventions which increase the uptake and use of these biomedical interventions, resulting in decreased HIV incidence.

Furthermore, the *Global health sector strategy on HIV/AIDS 2011–2015* (World Health Organization [WHO], 2011b) recommends coordination and integration of health sector action on HIV, which the Centers for Disease Control and Prevention (CDC) also considers a type of structural intervention (Centers for Disease Control and Prevention [CDC], 2009) because it increases accessibility, availability, and acceptability of goods and services that protect the population from further HIV transmission. In addition, condom distribution (Centers for Disease Control and Prevention [CDC], 2010), access to HIV testing, expanded ART treatment options and availability, and the integration of diagnosis and treatment of other STIs with HIV screening and treatment are important structural interventions for the same reasons (Centers for Disease Control and Prevention [CDC], 2011). Using new programs and policies to decrease the availability of a drug such as methamphetamine constitutes a structural intervention since this may lead to a decline in HIV transmission from decreased sexual risk-taking (Centers for Disease Control and Prevention [CDC], 2007). Most approaches listed on the Global HIV Prevention Working Group's fact sheet on proven HIV prevention interventions (The Global HIV Prevention Working Group, 2009) would be considered structural, including increasing accessibility, availability, and acceptability of HIV testing and linkage to care, partner services, widespread availability of ART, substance abuse treatment, provision of condoms and sterile syringes, and screening for other STIs. Domestic research by Aidala, Cross, Stall, Harre, and Sumartojo (2005) studied the effect of providing housing as a structural intervention to reduce HIV and found a statistically significant relationship between housing and decreases in riskier sex and substance use behaviors. Kidder and colleagues also looked at housing as a

structural intervention to improve health among homeless PLWHA (2007). In the international literature, papers and reports have referred to increasing accessibility, availability, and acceptability of male circumcision (CDC, 2009) as a viable structural intervention.

Chersich, Rees, Scorgie, and Martin (2009) note that “Sub-Saharan Africa carries a massive dual burden of HIV and alcohol disease, and these pandemics are inextricably linked” (Chersich et al., p. 1). They go on to say that both physiological and behavioral research indicates that alcohol independently affects decisions about sex and the ability to negotiate condom use. They examine the relationship between reducing alcohol use through policy and social marketing and a decrease in HIV prevalence showing that indeed HIV decreases when the political and social environment for alcohol use is manipulated. They call for global mechanisms for alcohol control similar to those used for tobacco control, clear public messaging about unsafe alcohol use and its correlation with HIV, restricting advertising of alcohol, raising taxes on alcohol, and health-care provider screening for harmful use of alcohol by patients—all of which could be considered structural interventions in their own right.

Seemingly disparate, all of these examples fit the core definition of a structural intervention (see p. 1), even while they impact different levels of society (individual, community, environmental) and employ more macro- or intermediate-level strategies to achieve change.

Understanding Structural Versus Behavioral Interventions

Traditionally, public health HIV prevention programs in resource-rich countries have tended to focus on one-on-one- or small group-administered interventions aimed at changing the risky sexual and drug injection use behaviors responsible for the transmission of HIV. Biomedical interventions such as ART have been seen as part of clinical medicine rather than public health, while structural interventions may have been perceived as outside the purview of public health, belonging instead to the field of economic development (Gupta et al., 2008) or broader legislative action (Frieden, 2010). Behavioral interventions work at the personal level or among small groups to focus on directly changing the behavior of target individuals by altering their knowledge, attitudes, beliefs, and/or behaviors and practices related to HIV prevention or risk (Friedman & Knight, 2003), while structural interventions operate externally to the individual and on an environmental or societal level.

Behavioral interventions target the intrinsic link between an individual’s personal risk factors and his or her behavior but require much time and manpower to support and thus can usually only reach a subset of the target population (Frieden, 2010; Friedman & Knight, 2003). Although behavioral interventions may successfully change behavior in the short term, the majority of the population that did not have the opportunity to participate in the intervention may subsequently influence intervention participants and thus undermine intervention effects.

Additionally, behavioral interventions do not easily address or change the underlying contributions to society-wide health problems, such as poverty or power imbalances that influence individual behavior (Cohen & Scribner, 2000). Although many behavioral interventions include as a goal changing social norms (toward, e.g., safer sex), their reach is generally limited to a small portion of the at-risk community.

Determinants of HIV

HIV risk is determined by the likelihood of viral exposure and the efficiency of transmission once exposed (Witt & Ellen, 2004). Although individual-level characteristics (such as HIV transmission knowledge, risk perception, or motivation to engage in protective actions) and behavior influence the likelihood and efficiency of exposure, so too can more remote characteristics of one's community and environment. The Connect to Protect framework (C2P) (see Fig. 1.1) specifies that structural determinants of HIV infection are grounded in political, economic, social, and cultural conditions, as do many of the previously mentioned theories and models. According to this framework, determinants can occur at the individual, community, and structural levels. Examples of determinants include the following:

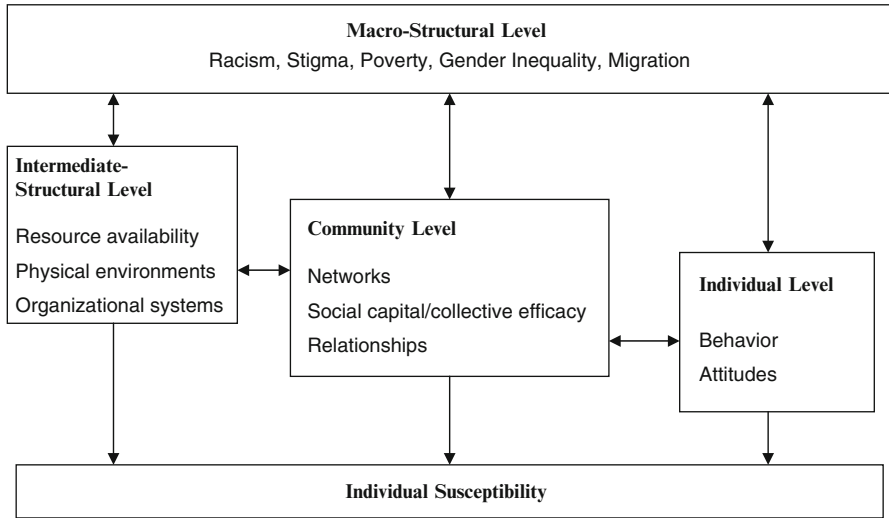
Individual-Level Determinants

- Anatomy/biology (women are more likely to become HIV infected than heterosexual men during penile/vaginal intercourse)
- Attitudes toward condom use (self-efficacy, outcome expectancies)
- Knowledge of how HIV is transmitted

Individual characteristics such as knowledge, attitudes, beliefs, perceptions, behaviors, and biology all contribute to an individual's risk of acquiring HIV (Witt & Ellen, 2004). For example, if an individual does not perceive unprotected sex to be risky, he or she may be more likely to discount the need for condoms. Similarly, if an individual views condoms as an impediment to pleasure, he or she may be more likely to engage in unprotected sex.

Community-Level Determinants

- High prevalence of community members who inject drugs
- Community leaders or adult role models who visibly engage in risk behaviors
- Lack of parental supervision for youth



Adapted from Witt & Ellen, 2004; C2P, 2008, p. 17

Fig. 1.1 Causes of and contributors to risk (Adapted from Witt and Ellen (2004), C2P (2008, p. 17))

- Expectations of early onset of sexual behavior among youth
- Availability of alcoholic beverages

Community characteristics that affect social interactions within the community also affect HIV risk. For example, community norms surrounding HIV risk-taking behaviors may be established or supported by local leaders, religious groups, or the general population. Peers may also play a role in fostering social norms that encourage injection drug use or unprotected sex (Witt & Ellen, 2004).

Structural-Level Determinants

- Existence of risky environments (crack houses) or safe environments (stable housing)
- Inability of injection drug users to acquire new injection equipment due to legal proscriptions
- Existence of low-cost, accessible health centers
- After-school programs for high-school-aged youth
- Increased taxation of alcoholic beverages

As defined within this framework, “only those factors that are found in available resources, the physical environment, organizational structures or laws and policies

are truly structural in form,” and they “are the features of the environment that exist completely outside of the individual participation or control” (Witt & Ellen, 2004).

As such, it is important to distinguish *macrostructural* from *intermediate-structural* determinants because although macrostructural determinants such as poverty, racism, migration, stigma, gender inequality, homophobia, and power imbalance potentially impact the spread of HIV, clear correlations are difficult to show (Blankenship, Friedman, Dworkin, & Mantell, 2006; Parker, Easton, & Klein, 2000; Sumartojo, 2000; Sumartojo, Doll, Holgrave, Gayle, & Merson, 2000). Whereas, intermediate-structural determinants such as increases in the availability, accessibility, and acceptability of condoms; antibody testing; and ART or drug-use treatment programs correlate more directly with changes in HIV risk behavior and transmission.

Public health officials have noted that intervening on the macro level (e.g., trying to reduce racism, homophobia, and poverty) may be outside the mandate and scope of public health interventions (Frieden, 2010). Other researchers (Parker, 1996; Parker et al., 2000; Gorbach, Ryan, Saphonn, & Detels, 2002; Solomon & Venkatesh, 2009) disagree, emphasizing the importance of macrostructural factors in the spread of HIV, and propose interventions designed to change various macrostructural aspects of society. Yet, examples of structural interventions that singularly focused on reducing racism, poverty, stigma, homophobia, and gender inequality were rare in the research literature, and this review did not find any such interventions that could be shown to result in improved HIV outcomes, although many of the programs included in this book do address some macro-level HIV determinants. One strength of the C2P framework is that it separates macrostructural from intermediate-structural determinants, providing multiple intervention points for structural change to be targeted. For those that design a structural intervention, it is important that feasibility of implementation and possibility of detecting a treatment effect be considered.

The interventions identified in this book include interventions implemented both in the USA and also in international settings. Cultural norms and context influence behavior, and changes that have occurred in the USA may not be replicated in other international settings. The establishment and enforcement of gender roles is one such social determinant that changes from culture to culture. Solomon and Venkatesh (2009) emphasize the importance of changing macro-level determinants of HIV, especially focusing on the role of women in traditional societies. They give many good examples of the ways in which gender power imbalance may lead to riskier behavior, arguing that interventions will have to go beyond the promotion of behavior change and condom use to reach at-risk women.

HIV Prevention Interventions: Implementation Level

Within the C2P (Witt & Ellen, 2004) framework, intervention strategies can be divided into three implementation levels distinct from their impact levels. That is to say that who, how, and where they are carried out (implementation level) may differ

slightly from who experiences the effects (impact level) of the interventions. Note also that the types of determinants targeted and the level of implementation do not necessarily match since determinants of all three types work interactively (see Fig. 1.1). Interventions include:

Individual/(small group)-level interventions operate on the level of the individual (one-on-one or in small groups) to directly change an individual's knowledge, attitudes, and behavior. Many times these interventions employ peer educators or other health professionals to teach individuals about HIV transmission and prevention.

Community-level interventions aim to influence interactions among community members through the participation of peers, local organizations, or local media campaigns. By changing community norms, these interventions indirectly influence individual decisions and behavior. In other words, community-level interventions may target individual risk determinants, making the intervention akin to the individual- and small group-level interventions. On the other hand, community-level interventions may be aimed at social structures within a community and in such cases are more akin to the intermediate-structural-level interventions. Often community-level interventions affect both individual and cultural perceptions, each aspect reinforcing the other. We take the position that the approaches, pathways, and strategies for a community-level intervention should be articulated and/or examined to determine whether they contribute to structural change.

Structural-level changes modify an aspect of a risk environment without directly targeting individuals and result in new or modified *programs, practices, or policies*. Many times structural changes include alterations to laws or policies or influence on a large scale the availability, accessibility, and acceptability of resources. In addition, structural changes:

- Are logically linkable to HIV acquisition and transmission
- Are sustained over time even when key actors and initial resources required to make the change are no longer involved
- Produce changes that directly or indirectly impact individuals
- Can pertain to changes in the physical structures of the built environment (C2P, 2008)

Although the C2P model distinguishes among the three implementation levels (individual, community, and structural), they all may work simultaneously and interactively upon individuals so that often HIV prevention interventions address several levels at once. For example, if stigma is reduced through social marketing (structural level), people's perceptions of vulnerability (individual level) will change, allowing them to feel freer to access voluntary counseling and testing (VCT) and antiretroviral therapy (ART) (community level). The improved prognosis and lower HIV transmission rate associated with ART may in turn result in reduced stigma attached to HIV. Many researchers and program developers have recognized the power of employing "multi-level" approaches and have thus sought

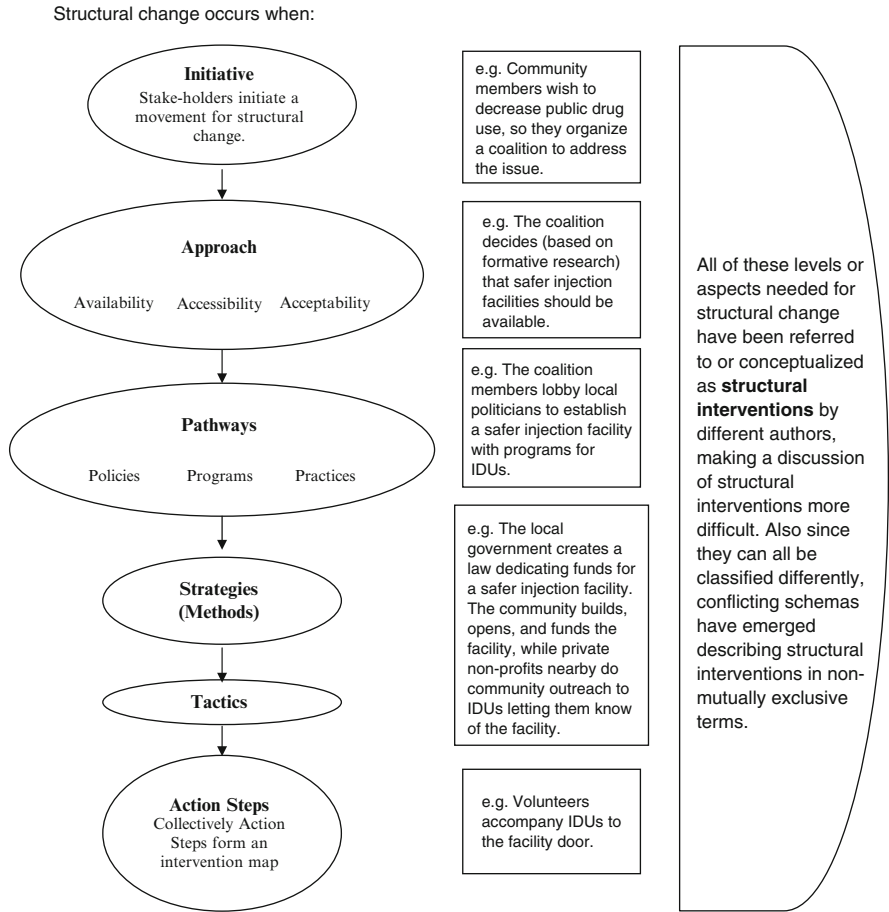
to incorporate strategies addressing determinants at all levels into their programs as have many of the entries included in this book (e.g., Sonagachi in India, 100 % *Jeune* in Cameroon, and the China-Vietnam Cross Border Project).

Within several of the other theoretical models mentioned earlier, the definition of structural interventions incorporates some aspects of what the C2P framework classifies as community-level change. For example, Cohen and Scribner (2000) define structural interventions as “influencing four conditions: accessibility, physical structures, social structures, and media messages.” Indeed, the programs in this book using social marketing campaigns might be classified by some as community-level interventions, but they are included because, as noted by Cohen and Scribner, media messages form an integral part of our environment over which we have little control but which affect our perceptions. As such, changes in mass media messages equate to structural changes within the C2P framework. In fact, as early as 1998, UNAIDS published a booklet called *Social marketing: An effective tool in the global response to HIV/AIDS*, which defines “social marketing” as “the adaptation of commercial marketing techniques to social goals” (Joint United Nations Programme on HIV/AIDS [UNAIDS], 1998, p. 1). In other words “social marketing makes needed products available and affordable to low-income people, while encouraging the adoption of healthier behavior” (UNAIDS, p. 1), thereby making goods, services, and information available, accessible, and acceptable by altering the social and media environment in which people live. (For more on social marketing as a structural intervention, please see Chap. 2.)

What Element of Structural Change Constitutes the Intervention?

Even within this well-formulated C2P framework, the exact definition of a structural “intervention” remains difficult to pin down. Instead, the model refers to structural “change,” leaving the following questions open for discussion. What part of structural change constitutes the intervention? Is it the overarching policy movement for structural change, the approaches employed, or pathways followed to create change? Or is it the specific strategies and tactics used or individual action steps taken to promote change? The terms have reasonably been used interchangeably in the literature. (Please see Fig. 1.2.) We feel that, taken as a whole, it is advisable to view the overarching policy movement for change as the structural intervention, with other aspects of the model, such as strategies, methods, tactics, and action steps, serving to guide in the implementation of the structural intervention.

Abdul-Quader and Collins (2011) conducted a “concept mapping” exercise with respect to HIV structural interventions by seeking input from subject-matter experts across disciplines. First, the subject-matter experts generated a list of potential structural HIV prevention interventions that fit the study definition and analyzed them on multiple criteria, forming cluster concepts. Then they sorted and rated the



*Adapted from Witt & Ellen (2004)

Fig. 1.2 Structural intervention implementation framework (Adapted from Witt and Ellen (2004))

concepts based on potential impact and feasibility. The clusters that emerged included community building, drug-use law reform, economic reform, litigation, access to medical interventions, integrating prevention into care, prisons, risk context, harm reduction/substance abuse treatment promotion, stigma reduction, and taxes. Some of these concepts could be considered structural interventions in and of themselves, but so too can the more specific interventions listed in each category. The method used by Abdul-Quader and Collins (2011) thus generated overarching structural interventions as well as specific strategies, methods, tactics, and action steps that may be considered as implementation steps under a large structural intervention framework.

However, some of the potential structural intervention concepts generated by this exercise could be stand-alone, concise actions with potential impact. For example, some researchers would consider harm reduction and substance abuse treatment promotion to be a structural intervention, while others might say that example constitutes an overall approach, pointing to the individual examples given as the interventions, such as providing federal funding for syringe exchange with linkage to treatment, increasing the availability of drug treatment on demand, setting up public health-oriented injection rooms, or establishing a policy that all substance abuse treatment centers obtaining federal funds must have mandatory HIV prevention for clients—a partial list. Some researchers and community workers consider even more proximate actions to be interventions. For example, they might refer to the creation of a safe injection facility or handing out clean syringes as the intervention.

Building on the work of Abdul-Quader and Collins, we propose that a structural intervention conceptual and implementation framework is needed to organize and differentiate between concepts that may be approaches, pathways, strategies, tactics, or action steps. Figure 1.2 has utility not only to explain the vast semantic differences when subject-matter experts describe structural interventions, but this diagram actually conveys a manner in which structural interventions can be conceptualized and implemented systematically. For example, the pathways (policies, programs, and practices) must be determined before the strategies/methods are selected. Likewise, the strategies/methods must be determined before development of tactics and then assignment of individual roles and responsibilities found in the action steps. This approach does not contradict or negate the possibility that a discrete action taken at a specific time and place may have disease prevention potential. A single community-based organization (CBO) that has convinced a motion picture theater to have free condoms available in the restrooms is implementing a structural intervention. The CBO may not have undertaken a planning process of determining their approach (availability, accessibility, and/or acceptability) and may have adopted a practice (condoms in motion picture theaters) without considering policies and formalized programs, yet their decision-making processes have led them to a small, feasible, and potentially impactful structural intervention.

According to the C2P (Witt & Ellen, 2004) framework, the overarching policy movement for structural change should be referred to as the initiative for change. We see this aspect of the model as the essence of structural change. We made this determination based on the assumption that policy is more enduring than program or practice. Policy may be more sustainable than program and practice primarily because of the considerable input of stakeholders, subject-matter expertise, resource reallocation, and community will that is required of a policy change as compared to a program or practice change.

Structural initiatives depend on general approaches to change that target the availability, accessibility, and acceptability of resources (goods and services). Similarly, structural interventions depend on specific pathways to change that alter policies, programs, and practices. These, in turn, rely on specific strategies and methods, which depend on site-specific tactics based on action steps. (Please see Fig. 1.2.) All aspects of the model should be carefully considered when

contemplating political, social, or environmental changes designed to reduce HIV transmission.

To focus at the strategy level, for example, and say “changing syringe access laws” is the structural intervention, sidesteps the reasons that syringe access laws may be desirable. Structural interventions, like any public health intervention, should go through an initial stage of developing the problem statement, articulating the contributing factors and social determinants to that problem, and then weighing the pros and cons of maintaining the status quo as compared to the pros and cons projected if the structural intervention is fully implemented. Policy makers and practitioners should demonstrate how availability, accessibility, and acceptability of clean syringes at the approach level played a role in the decision to move forward with “changing syringe access laws.” The same applies to the policies, programs, and practices consideration that takes place when deciding which pathways will result in beneficial structural change.

An example may be helpful in illustrating our point. One of the coauthors of this book worked for a university and was engaged in HIV prevention research with injecting drug users. A group of medical students approached the coauthor and indicated they wished to start a syringe access program. The group had not studied the drug paraphernalia laws however and did not recognize that in that particular state, syringes were not considered as paraphernalia, that no prescription was required to purchase syringes, that syringes were readily available in pharmacies, and that no form of identification was required to purchase a package of syringes. The epidemiological profile for the state indicated low prevalence of HIV for injecting drug users, but other studies indicated much higher prevalence of HIV for non-injecting crack cocaine smokers. A fully articulated problem statement, review of extant surveillance and epidemiological studies and reports, and a deliberation of the pros and cons of maintaining the status quo or starting a new initiative had not been undertaken. A syringe access program may not have been the most pressing structural intervention needed in this location, and ready access to drug treatment programs may have been a higher HIV prevention priority.

According to Blankenship et al. (2000), “*availability* interventions” comprise the most common and familiar structural interventions in public health. Often these interventions consist of explicit restrictions on, prohibitions against, and penalties for unsafe or risky behavior, such as seat belt and helmet laws. Another type of “*availability* interventions” impacts the distribution of dangerous or healthy products and services, such as background checks prior to firearms purchases and the prohibitions on the sale of alcohol or tobacco to youth (Blankenship et al.). The efficacy research has continued to support condom distribution as a structural intervention with an emphasis on making condoms more available in the environment (Charania et al., 2011). The New York City, Los Angeles, and Washington, D.C., health departments have adopted this approach and illustrate the ways in which accessibility and acceptability may also be addressed in the same structural intervention along with availability.

“*Accessibility* interventions” operate on public health by changing the unequal distribution of resources and power for marginalized populations. Commonly such

programs will provide prevention materials or tools to individuals free of charge, such as condom distribution, bicycle helmets, and free lunch distribution programs. Public funding for Medicare qualifies as an “accessibility intervention” because without it, many people would not be able to access health care. Structural interventions may increase accessibility or decrease accessibility, depending on the structural intervention model implemented. For example, when smoking restrictions require employees to leave their office and go to a designated smoking area outside the building, access to cigarette smoking has been limited. This inconvenience of having to leave the office to go smoke in a designated outdoor area is an example of how accessibility to smoking is limited as part of the structural intervention design.

In contrast, “*acceptability* interventions” focus on changing social norms to increase healthy and decrease risky health behaviors. In addition, such interventions may influence consumer perceptions about a product. For example, condom distribution as a structural intervention is enhanced when a social marketing strategy to make condoms more appealing is included in the overarching structural intervention. Making condoms more desirable and increasing consumer knowledge of condom efficacy would be greatly enhanced through condom advertisements during prime-time television broadcasts. However, television stations and national networks have been reluctant to advertise products of a sexual nature during prime time, until recently when Viagra commercials began to appear in certain viewing regions. This is an example where the structural intervention involves an overarching policy component (changing broadcaster policies/restrictions against condom advertisement) before the specific method is implemented (social marketing of condoms via national broadcasts). Such acceptability interventions may also operate through incentive structures, such as free T-shirt giveaways in schools of T-shirts promoting anti-drug messages. Industry boycotts of specific companies may harm an agency’s public image, making use of their products less socially acceptable. Counter ads against tobacco in California have changed the social image of smokers. All of these qualify as “acceptability interventions” (Blankenship et al., 2000).

Structural changes to *programs* improve upon the availability, accessibility, and acceptability of resources (such as goods like condoms, services like health exams, and expansion or creation of mobile health clinics/testing centers to provide wider STI treatment to at-risk populations). This aligns with the framework proposed by Blankenship and colleagues (2000) who use these three approaches or contextual factors to explain public health issues within a social, political, and economic context. For example, syringe access programs increase the availability, accessibility, and acceptability of sterile equipment for injection drug users, changing the structural environment in which injection risk behaviors take place (Witt & Ellen, 2004). Changes to *practices* reflect new or different ways that organizations, businesses, or institutions operate and may arise from collaborations between organizations or changes in the physical environment. An example of this type of pathway to structural change would include the integration of disease prevention messages given by medical providers during medical treatment or integration of services such as offering both HIV, hepatitis, and STI screenings simultaneously. A *program* is typically formally articulated by an agency, and responsibility for implementation of the

program lies at the agency level. A *practice* is typically conducted by individuals during routine accomplishment of their employment. Both may be the target for structural change. Also structural changes in *programs* may result in structural changes in *practice*. An example would be a health department beginning a new *program* by opening a storefront clinic in a poor neighborhood where the public health employees in the program implement a new *practice* of integrating HIV, hepatitis, TB, and STI services. Changes to *policies or laws* create new guidelines for individuals to abide by. Law or policy changes can be written or unwritten and may create social structures that indirectly enable or deter certain behaviors (Cohen & Scribner, 2000). In one case study included in this book, countrywide laws throughout Thailand enacted to mandate the use of condoms with CSWs illustrate this type of structural change (Celentano et al., 1998; Rojanapithayakorn, 2006).

Within the C2P framework, effective prevention and risk-reduction *strategies* increase protective and decrease risk factors, are appropriate to specific target populations, make the best available use of resources (Connect to Protect [C2P], 2012), and may target determinants on multiple levels (individual, community, and/or structural). They seek to broadly change aspects of the economic, physical, social, cultural, political, legal, and media environments of the target population. The individual actions taken to implement a strategy are *tactics* for change, while the specific steps necessary are known as “action steps.” Altogether, a series of action steps specifying who will do what and when form the basis of a community action plan or a structural intervention map.

The following would be considered strategies but do not form a comprehensive list:

- Public awareness
- Community assessment and monitoring
- Coalition building
- Changing access to resources
- Enforcement of existing laws
- Advocacy and nonviolent protest
- Modifying access, barriers, and opportunities
- Changing policies
- Changing the physical and social environment

In contrast, some common tactics include the following:

- Street outreach
- Community outreach (door-to-door)
- Direct action (e.g., demonstrations, sit-ins)
- Use of billboards and other public media
- Engaging informal community leaders such as trusted elders
- Engaging formal community leaders such as mayors and city councilpersons
- Changing clinic or social service agency hours to better meet the needs of consumers
- Clustering social service agencies in the same building or shopping center to enhance utility

- Placing social service agencies at public transportation transfer points to enhance accessibility
- Integrating HIV and STI services within health departments to ensure all persons tested for STIs are also tested for HIV

Drawing the line between strategies and tactics is not a precise science—the concepts overlap and are somewhat subjective. In addition, such strategies and tactics may be considered interventions by some researchers. Therefore, this book makes note of the main approaches, pathways, strategies, and tactics employed by each program discussed.

Why Implement Structural Changes?

Public health organizations and government programs have designed and employed various behavioral, biomedical, and structural interventions to help control and prevent HIV epidemics since HIV was first recognized as a serious public health threat in the 1980s. Yet, behavioral interventions have historically dominated the HIV prevention effort in resource-rich countries (Gupta et al., 2008) and only fairly recently have structural changes begun to receive due attention. Cohen and Scribner (2000) concisely express the sentiment behind the movement toward structural interventions in the field of HIV prevention, noting that:

In the area of sexuality, which many empirically believe to represent purely voluntary behaviors under individual control, for too long we have neglected structural approaches to prevention... high-risk sex may have more to do with environments that promote risk behavior and the limited accessibility of condoms than with individual knowledge, attitudes, and beliefs. (Cohen & Scribner, 2000, p. 44)

Designed to reach a large number of individuals, structural interventions usually occur across entire communities, cities, or countries. As a result, the resources required to initiate structural interventions can far exceed those required for smaller-scale behavioral programs. However, since changes from structural interventions have the potential to reach large numbers of people and to last over time (even after the programs have ended), they may be more cost-effective than behavioral interventions. For example, one of the case studies found in this book is a condom social marketing campaign implemented across the entire state of Louisiana, costing \$3 million to maintain over the entire 3-year program (\$1,815,000 for condoms) or approximately \$11 per person reached. The authors estimate that 170 HIV infections were prevented, saving 1,909 quality of life years (QALYs). For each case of HIV averted (assuming 26 years of age at infection), the quality of life years saved came to 11.23. As a result, more than \$33 million in medical care costs were avoided for a total savings of \$15,809 per quality of life year (Bedimo, Pinkerton, Cohen, Gray, & Farley, 2002).

Rarely caused by only behavioral *or* structural factors, complex public health problems result from a combination of risks contributing to the spread and continuation of unhealthy behaviors. Ideally, structural and behavioral interventions work

in tandem to obtain the greatest positive change from as many individuals as possible (Gupta et al., 2008). To illustrate the point, imagine that an intervention developer wishes to decrease injection equipment sharing in a given city. He or she might first ask why drug users share needles/syringes, finding from a survey that they share because they do not have access to enough new, clean needles and syringes (structural problem). But the same survey revealed that many injection drug users throughout the community had little awareness of the risks of sharing drug injection equipment (behavioral problem) (Cohen & Scribner, 2000). A structural intervention might include a needle-exchange program to increase safer injecting behaviors, while a behavioral intervention might employ the use of peer educators to teach injection drug users why they should not share injection equipment. When employing both types of interventions, the likelihood of safer injection practices in this population increases (Gupta et al., 2008), and the likelihood of HIV infection decreases.

Another challenge with behavioral interventions, mentioned earlier, results when high-risk individuals, after receiving behavioral interventions, return to the unhealthy environment where the risk behavior originated, possibly undercutting the gains from a behavioral intervention. Changes implemented at the structural level, while potentially more challenging than behavioral interventions to implement and evaluate, offer tremendous long-term potential (Gupta et al., 2008) due to their ability to reach large populations rather than changing individuals one at a time, which is labor-intensive and costly over the long run. Therein lies the primary appeal of structural interventions.

Why Compile a Book of Structural Interventions?

Behavioral HIV prevention programs have shown some positive outcomes with individuals and groups from diverse cultural and social backgrounds, including men who have sex with men (MSM), women, youth, HIV-positive individuals, and members of particular racial or ethnic groups (Card, 2001; Card, Lessard, & Benner, 2007; Crepaz et al., 2006, 2007). Replicating well-established, effective behavioral interventions can save time and money while increasing the likelihood of achieving successful outcomes (Card, Solomon, & Cunningham, 2011). To encourage such cost-effective replication, several collections of evidence-based packaged behavioral HIV prevention programs have been established. Chief among these are the HIV prevention interventions available from:

- The Centers for Disease Control and Prevention's DEBI program (Diffusion of Effective Behavioral Interventions; <http://www.effectiveinterventions.org/>)
- The National Institutes of Health-sponsored effective HIV/STI prevention collections at Sociometrics known as HAPPA (HIV/AIDS Prevention Program Archive; <http://www.socio.com/happa.htm>) and PASHA (Program Archive on Sexuality, Health & Adolescence; <http://www.socio.com/pasha.htm>)

To make the best use of limited resources, over the past several years, researchers, practitioners, and funding agencies have increasingly emphasized the importance of disseminating and implementing evidence-based behavioral interventions for HIV prevention (National Institutes of Health [NIH], 2008; Norton, Amico, Cornman, Fisher, & Fisher, 2009; Rotheram-Borus, Swendeman, Flannery, et al., 2009).

Scale-up of evidence-based behavioral interventions through the DEBI, HAPPA, and PASHA projects has helped lay the groundwork for eventual dissemination of evidence-based structural interventions. However, it may be that structural interventions, by their nature, do not lend themselves to packaging and uniformity and are highly dependent on the various macrostructural-, intermediate-structural-, and community-level influences that may be unique for a particular community, city, county, state, or nation. For this reason, dissemination of best-practice structural interventions may require dispersion of principles and processes that are highly adaptable from community to community that will aid in the development of a highly specific and tailored structural intervention to meet a clearly articulated need. For example, formative research/evaluation and development of a clear problem statement would appear to be essential to initiation of any structural intervention. Best practices in formative research/evaluation would be a useful design and planning tool for any group that may wish to initiate a structural intervention. For all these reasons, we advocate conceptualizing and implementing a structural intervention according to the stages in Figure 1.2.

How This Book Was Developed

The first step in the creation of this book of evidence-based structural interventions was the establishment of the panel of the following five scientist experts nationally recognized in HIV/AIDS prevention research: Drs. Don Des Jarlais (Beth Israel Medical Center), Ralph DiClemente (Emory University), Seth Kalichman (University of Connecticut), Don Morisky (University of California, Los Angeles), and Gina Wingood (Emory University). Next, HAPPA staff worked with the panel to create the objective criteria used for assessing the evidence of efficacy of diverse HIV/AIDS prevention programs (Appendix 1). Based on a comprehensive search throughout the peer-reviewed literature, these criteria included:

- Quality of program implementation (content quality, implementation fidelity)
- Scientific rigor of the evaluation (which would include appropriate evaluation design, adequate sample size, articulated and well-defined sampling procedures, use of a control or comparison group where feasible, otherwise, another appropriate design such as time series analysis, adequate instrumentation and data collection procedures, adequate subject retention across follow-up data collection periods, and appropriate analytic procedures)
- Adequacy of follow-up time (minimum of 6 months after intervention initiation)

- Positive impact on HIV risk behavior or STI/HIV infection rates for one or more of the following: sexual risk behaviors, drug injection risk behaviors, prenatal and perinatal transmission risk behaviors, ART adherence, STI/HIV infection rates, and viral load (among PLWHAs)

Using these criteria, project staff generated a list of 24 published, peer-reviewed evaluations of candidate structural interventions, identifying potentially eligible interventions through an extensive search of peer-reviewed scientific literature, contacting funding agencies and development organizations, and soliciting nominations by expert panel members, researchers, program directors, and evaluators working in the field. Peer-reviewed publications that met our inclusion criteria published between 1995 and 2009 were included in the review. No articles published after December 2009 were considered for the review. To assist the panel in making final selection decisions, HAPPA staff prepared 4–6-page summaries for each candidate program consisting of the name(s) of the original developer(s) and evaluator(s), a description of the program intervention and program materials, a description of the evaluation methods and findings, and a list of references. Each summary was accompanied by one or more key journal articles providing further detail on the program and its evaluation.

Panel members received the briefing materials and reviewed them based on the selection criteria described above, assigning each candidate program an overall priority score from 1 (weakest evidence of efficacy, lowest priority for HAPPA) to 10 (strongest evidence of efficacy, highest priority). They were informed that HAPPA staff would try to include all programs receiving an average score of 7 or higher. In order to avoid any conflicts of interest, panel members were asked to abstain from voting on their own programs.

Following the selection of interventions by the expert panel, project staff attempted to contact the original developer(s) of each intervention to solicit their participation, schedule a time to set up an interview, and obtain relevant materials. The selected interventions were then summarized according to a template designed for this book, including the following sections: Abstract, Program at a Glance, Program Information (Rationale and History, Implementation), The Original Evaluation (Study Design, Data Collection and Analysis, Research Sample, Results, Conclusions), and Lessons Learned.

Case Studies Summary: Intervention Implementation

Table 1.1 summarizes the structural interventions included in this book. The intervention entries are categorized by their desired behavioral outcome. Within each outcome group, interventions are listed in chronological order by the year in which they were first implemented. In this book, each outcome group of interventions begins with an introductory section explaining the rationale for targeting the specific population and behavior as well as the policy implications of focusing on the