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Bridging the Gap between Individual Level Risk for HIV and Structural Determinants: Using Root Cause Analysis in Strategic Planning

Nancy Willard¹, Kate Chutuape¹, Stephanie Stines², Jonathan Ellen¹, and the Adolescent Medicine Trials Network for HIV/AIDS Interventions

¹Johns Hopkins University School of Medicine, Department of Pediatrics, Baltimore, Maryland

²Children's National Medical Center, Division of Young Adult and Adolescent Medicine, Washington, DC

Abstract

HIV prevention efforts have expanded beyond individual-level interventions to address structural determinants of risk. Coalitions have been an important vehicle for addressing similar intractable and deeply rooted health-related issues. A root cause analysis process may aid coalitions in identifying fundamental, structural-level contributors to risk and in identifying appropriate solutions. For this paper, strategic plans for 13 coalitions were analyzed both before and after a root cause analysis approach was applied to determine the coalitions' strategic plans potential impact and comprehensiveness. After root cause analysis, strategic plans trended toward targeting policies and practices rather than on single agency programmatic changes. Plans expanded to target multiple sectors and several changes within sectors to penetrate deeply into a sector or system. Findings suggest that root cause analysis may be a viable tool to assist coalitions in identifying structural determinants and possible solutions for HIV risk.

Keywords

Structural Factors; Structural Interventions; HIV Prevention; HIV Risk Factors

Introduction

The first two decades of battling the HIV epidemic focused predominantly on addressing individual level risk through interventions that target behaviors such as condom use, attitudes and beliefs through educational programs and media campaigns. As the epidemic persists, prevention efforts have expanded to consider social and structural determinants contributing to HIV risk (Rotheram-Borus, 2000; Blankenship, Friedman, Dworkin, & Mantell, 2006; Gupta, Parkhurst, Ogden, Aggleton, & Mahal, 2008). A structural approach to improve community health targets factors in the environment for change that are beyond the individual's control, such as resource availability, the physical environment, laws, and policies (Blankenship, Bray, & Merson, 2000).

Coalitions have been an important vehicle for addressing similar health-related issues with intractable and deeply rooted social and structural features, such as substance abuse,

violence, pregnancy and chronic disease (Harachi, Ayers, Hawkins, & Catalano, 1996; Sege, 2004; Cassell et al., 2005; Butterfoss, Kelly, & Taylor-Fishwick, 2005). The necessary components needed for a productive coalition have been well documented and include strong leadership, diverse participation, and strategic planning (Roussos & Fawcett, 2000; Zakos & Edwards, 2006). However, coalitions continue to have mixed results in terms of their ability to impact community level outcomes, such as crime and disease rates or influencing risk behaviors (Roussos & Fawcett, 2000; Zakos & Edwards, 2006; Berkowitz, 2001).

One challenge is the ability of coalitions to formulate strategic plans with achievements that will result in desired outcomes (Roussos & Fawcett, 2000; Butterfoss, Goodman, & Wandersman, 1996). Strategic planning allows communities to move from a broad vision to specific goals (Roussos & Fawcett, 2000; Zakos & Edwards, 2006; Watson-Thompson & Fawcett, 2008). While previous work has illustrated how a systematic strategic planning process can contribute to an increase in the rate of proposed and achieved changes in communities, it does not report on how the planning process contributes to the quality (i.e., potential impact, comprehensiveness) of the strategic plan and proposed structural changes, especially in the context of HIV. Moreover, coalitions seeking to make structural level changes encounter the challenge of identifying the appropriate policies, laws, and changes to the physical environment that will result in the intended changes at the individual level. For example, coalitions may find it easier to identify more immediate, or proximal factors, like increasing knowledge about risk; while distal solutions that are far from an individual's control, such as economic issues, may be more difficult to identify. It is these fundamental causes of risk that coalitions will need to understand when taking a structural approach to HIV prevention (Sumartojo, 2000; Link & Phelan, 1995). Comprehensive plans will also require many changes both within targeted structures as well as across the spectrum of sectors (e.g., government, health care, business, criminal justice and schools) in communities (Sumartojo, 2000). Our work seeks to help coalitions close these gaps in knowledge.

This paper describes how root cause analysis was incorporated into coalitions' strategic planning processes during the second year of coalition work to support the identification of more structural level solutions with the potential to impact underlying factors contributing to HIV risk among youth. The root cause analysis process emanated from the field of injury prevention and risk analysis in hospital and health care settings and in occupational health and safety (Wu, Lipschutz, & Pronovost, 2008; Bagian et al., 2002). This approach allows problem solvers to dissect the proximal causes of injuries and accidents to determine the underlying systems level causes of risk. Root cause analysis involves an iterative process designed to penetrate deep within a problem and examine a wide range of reasons why the problem exists. Once problems are sufficiently distilled, new participants with relevant insight and expertise are engaged to assist with problem solving. Overall, root cause analysis has had limited application in the context of community-level problem solving. To our knowledge, there is only mention of its potential by Altman (1994) and examples of a similar process in the training materials of the Community Anti-Drug Coalitions of America (CADCA) (2005).

The purpose of this paper is to describe how coalitions developed in 12 communities in the mainland U.S. and one in San Juan, Puerto Rico incorporated the root cause analysis into their strategic planning process in order to enhance their ability to consider the breadth and depth of factors related to HIV risk. The project, entitled *Connect To Protect*[®] (C2P), is the primary prevention effort of the Adolescent Trials Network for HIV/AIDS Interventions (ATN) and is implemented at each of their research sites (<https://www.atnonline.org>). Early phases of the project included coalition formation, selection of a primary geographic area

and population of focus in which to prioritize coalition efforts (Ziff et al., 2006; Geanuracos et al., 2007; Griffin-Deeds et al., 2008; Straub et al., 2007). The process described here includes an assessment of the coalitions' plans for the purposes of providing technical assistance, a description of root cause analysis process that was incorporated into the planning, and the results of an analysis of strategic plans both before and after root cause analysis was introduced. This study was reviewed and approved by Institutional Review Boards at each of the ATN sites and at the Johns Hopkins University.

Methods

Coalition Structure and Process

With guidance from two primary C2P staff members at each site, coalitions ranging in size from 10–25 members from various community sectors were assembled to begin a strategic planning process. Eleven sites started the planning process in the first six months of 2006, two sites began in early 2007. The C2P strategic planning process emphasizes development of a vision and mission and specific objectives, strategies, and ultimately, action plans detailing steps to bring about the objectives through the “VMOSA” strategic planning process (Community Tool Box, 2003; Fawcett et al., 2000; Fawcett, Francisco, Paine-Andrews, & Schultz, 2000; Francisco, Fawcett, Schultz, & Paine-Andrews, 2000). The VMOSA process was chosen because of its well documented success rate and because it is a component of a larger process of coalition infrastructure development that was compatible with C2P. In order to clearly communicate the new approach to community partners that C2P was attempting to enact, a specific definition for objectives was developed: Structural changes that result in new or modified programs, policies, and practices, that are logically linked to HIV, and can be sustained over time. Examples include modifying local health clinic hours to accommodate youth in school, instituting HIV testing policies in prison, and requiring cultural competency for grantees.

As guidance for their planning, the coalitions utilized a C2P logic model outlining the core risk factors contributing to acquisition (i.e., number of sex partners, high-risk sex partners and sex partner concurrency) and transmission (i.e., condom/clean needle use, sexually transmitted infection [STI] co-infection, and viral load) in order to develop relevant structural changes (Anderson & May, 1991). The coalitions met at least every 2–3 months, developed subcommittees focused on specific issues, and conducted in-depth reviews of their strategic plans at least every six months. Project infrastructure included: extensive documentation of planning and accomplishments to measure progress; a National Coordinating Center (NCC) that provided oversight in maintaining research plan fidelity, technical assistance, and guidance on mobilization strategies; and extensive capacity building of C2P staff members with materials that were then shared with coalition partners. Core capacity building consisted of new or adapted materials including a Strategic Planning Guide and a Structural Change Tutorial.

Approximately one year after the first coalition initiated strategic planning, the NCC conducted an assessment of active and completed structural changes to determine how well the coalitions were adapting to problem solving around structural determinants. The assessment entailed a review of changes to determine if the ultimate outcome resulted in changes to the risk environment (e.g., creating safe places for youth to socialize) or targeted youth for change (e.g. providing brochures in high-traffic hubs about ways to reduce risk). The strategic plans were reviewed, as a whole, to determine if they were beginning to add up to a possible solution by considering multiple causes of risk. During this review, as part of routine technical assistance calls, the NCC discussed the planning process with C2P staff members to determine how the coalition had identified problems affecting the target population, how they had moved from problem identification to solutions, and who was

involved with the planning. The NCC compared notes from technical assistance calls along with the structural change lists and determined that two-thirds of the changes had outcomes that targeted individuals at risk and did not focus on changing the risk environment. While strategies for planning varied somewhat across sites, the coalitions tended to brainstorm solutions around a HIV risk factor, such as STI co-infection, and then identify a sector where the factor could be addressed. This often led to a one-dimensional analysis of the problem without consideration for the behaviors or context contributing to risk. Individuals from the identified sector were not necessarily represented during this brainstorming process which made it difficult to sufficiently analyze the problem and assess the feasibility and relevance of a desired solution.

Rather than being a formal analysis, the NCC undertook this assessment to better understand where the coalitions were focusing their problem solving with the intent to develop additional resources to help guide them toward more structural solutions, as part of their routine technical assistance. This initial assessment resulted in the development of new planning materials that employed root cause analysis. A 'But why?' diagramming exercise was incorporated into the strategic planning process utilizing the C2P logic model, and aids, such as Figure 1, were developed and added to C2P materials. The root cause analysis process was determined to be a good fit for C2P because it: (1) addresses environmental factors rather than individual factors; (2) provides a concrete and simple series of steps that could be incorporated into the existing C2P process; and (3) allows those operating within the system to become problem solvers thereby supporting the potential for systemic changes. The purpose was to provide a way for the coalitions to dissect individual level risk to identify root causes and structural level changes that may impact these root causes.

Because of a variation in C2P project start dates across all 13 coalitions, eleven sites learned about the root cause approach 12–18 months after starting their strategic planning process, while two learned about it four months after initiating planning. Rather than being a onetime training, introduction of the root cause analysis was a progressive capacity building process in conjunction with the NCC's development of materials that were used to explain and teach the method. Training of C2P staff members started in April 2007 as part of on-going technical assistance calls. This in addition to new staff orientations resulted in all C2P staff members being introduced to the root cause process in the Spring/Summer of 2007. The NCC attended local coalition meetings and presented the process and examples between July 2007 and early 2008. Once introduced to the root cause analysis process, C2P staff members began to use this method with their coalitions during routine planning. The exercises and aids were incorporated into the C2P VMOSA materials and logic model.

In summary, the new strategic planning steps included: (1) framing the core individual risk factor (e.g., multiple sex partners) as an actual problem or behavior in the community; (2) asking why this problem exists through several layers to identify underlying factors; (3) identifying the systems/structures with influence over or related to the root cause; and (4) identifying and engaging key stakeholders and powerbrokers who have influence within the targeted system. Figure 1 illustrates this process.

As a hypothetical example, a coalition determined that their youth were engaged in sex with many people because they were exchanging sex for money (individual risk factor stated as a community-specific problem). Prior to root cause analysis, ideas for intervention targeted individuals in order to change their behavior (e.g., target the youth to improve their knowledge about risk). Using root cause analysis, the coalition explored underlying reasons by asking a series of 'But why?' questions (e.g., 'why do our young women have sex with older men?'; 'why do they have economic need?') to reveal a causal path. In this example, the coalition determined, through many renditions of the 'But why?' process, that economic

need, homelessness, access to adult venues and school drop-out rates were contributing to high-risk sex. Through further analysis, the coalition identified insufficient bus routes providing transportation to jobs, the need for a living wage ordinance, increased job training opportunities, and improved cultural competency training for school staff as opportunities for intervention. The public transportation authority, local legislature, schools, businesses and the chamber of commerce were targeted for some specific changes and key representatives associated with these sectors were engaged for continued problem solving.

Data Analysis

Approximately two years after the root cause analysis process was introduced, the NCC conducted a formal assessment. Each structural change was coded on three characteristics, and the codes assigned to structural changes that occurred prior to the introduction of root cause analyses were compared to those that occurred after root cause analyses. The characteristics were derived from the initial review process as well as a review of the literature in which other researchers have contemplated similar changes (Hirsch, Levine & Miller, 2007; Mensah et al., 2004; Brownson, Haire-Joshu, & Luke, 2006) and associated contextual factors (Buffardi, Thomas, Holmes, & Manhart, 2008). The three characteristics were: (1) the organizational level at which the structural changes were focused: an agency or a system such as a governmental department; (2) the focus of the structural changes: traditional HIV risk factors (such as behavior, attitudes and knowledge) or more innovative solutions that address underlying issues in a specific community (such as policies to expand testing in prisons, cultural competency requirements for grant applicants, and mechanisms to improve reporting of sexual abuse); and (3) the concentration of structural changes targeting a specific sector of the community (e.g., health care, social service, education). This third characteristic was used to determine if plans were penetrating more deeply into a sector by developing a package of solutions.

Structural changes were coded on the three variables by one of three NCC members that worked directly with each site. A secondary individual conducted a simultaneous coding of the complete list, in order to assess inter-rater reliability. Incongruous coding was discussed by the entire team to reconcile coding.

Results

Prior to using root cause analysis, 69% of the initial structural changes objectives ($n = 51$) focused on a single agency or organization to make programmatic changes. For example, many early objectives resulted in modifying the distribution of information pamphlets, developing periodic workshops, or planning a community health event. Once root cause analysis was introduced, there was a gradual trend toward objectives targeting policies and practices within systems and structures ($n = 211$) to change the way they operated (43%), an increase from 31% prior to root cause analysis. Systems and structures that were targeted included the local departments of health, mental health, and human services; juvenile detention centers; school systems; area hospitals; office of parks and recreation; as well as others (see Figure 2).

Second, prior to the root cause analysis, coalitions focused their structural changes on a range of one to five sectors with the average number of two sectors targeted. Of note, only three coalitions had more than two objectives within a sector, indicating a lack of penetration for a comprehensive solution. Following the introduction of the root cause analysis process, the range of sectors targeted was three to seven with the average being five sectors. All coalitions had at least one sector with a “package” of more than two structural changes and one-third of the coalitions developed two or more objectives in three or four sectors.

Before using root cause analysis, 64% of initial structural changes focused on traditional approaches to HIV prevention such as sharing information about risk, improving and expanding education programming, and increasing condom distribution. After the root cause analysis process was introduced, 66% of changes were nontraditional solutions that focused on underlying factors contributing to risk, such as expansion of homeless shelters for youth, registering prison and church testing sites with the department of health to ensure follow-up support for counseling and testing services, and establishment of a neighborhood watch program to address sexual abuse in public housing communities.

Figure 3 provides an example of the strategic plan focus for one coalition before and after root cause analysis was conducted. The coalition was initially focused on targeting single agencies to make programmatic changes, often resulting in improved information distribution. After root cause analysis was introduced, their focus became more diversified by targeting systems and addressing underlying issues such as age discordant relationships and the need to expand mental health services.

Discussion

We analyzed strategic plans before and after a root cause analysis process was introduced to assist community coalitions in their strategic planning for HIV prevention. After the root cause analysis process was introduced, results indicated a shift from individual level solutions to those that targeted the risk environment. This is important because in order for structural level solutions to have an impact on HIV risk, fundamental causes of risk will have to be understood and addressed (Sumartojo, 2000; Link & Phelan, 1995). C2P's positive progress in coalition development, as indicated by active and engaged community members, employed many of the factors important for coalition success (e.g., strong leadership, active and diverse participation, and strategic planning) (Roussos & Fawcett, 2000; Zakos & Edwards, 2006; Butterfoss, Goodman & Wandersman, 1996). However, early indications suggested that the coalitions were struggling with the new concepts of structural determinants and lacked tools to bridge the gap between risk at the individual level and relevant structural changes.

Quality of strategic plans, and their ability to lead to intended outcomes, have been analyzed based on such factors as whether objectives were measurable, focused on a specific population, tailored to the local level, steps were detailed, persons responsible were identified, timelines were clear and plans were comprehensive (Butterfoss, Goodman & Wandersman, 1996; Florin, Mitchell and Stevenson, 1993). Based on prior research, C2P had many of these elements incorporated into the strategic planning and coalition development process (e.g., definition of a specific population of focus, detailed action plans for each structural change); in this study we examined quality of strategic plans based on their ability to move beyond traditional HIV prevention strategies to address underlying structural determinants of risk.

In our analysis, all coalitions showed movement toward more structural level solutions and the process clearly worked better for two thirds of the coalitions. Where it did not take hold as quickly may have been due to the manner in which the process was introduced and applied by C2P staff members. Leadership capacity, including the ability to articulate a vision, guide the coalition towards goals, nurture commitment and adapt to changing circumstances have been well defined in the literature (Kegler, Steckler, McIeroy, & Malek, 1998; Wolf, 2001; Zacoks & Edwards, 2006). Many C2P staff members were intentional about integrating the root cause analysis process into their planning efforts, used the tools provided, and partnered with other coalition members to facilitate the process, as evident in project documentation. In those instances, there was resurgence in coalition effort and

productivity (i.e., greater involvement of coalition members and completion of action steps) and a greater understanding of the determinants of risk influencing HIV transmission with a package of solutions. For the coalitions that were slow to adapt the root cause analysis process, their plans lacked focus and continued strategizing around individual level risk factors.

Coalition structure has also been identified as an important element related to coalition success (Watson-Thomson, Fawcett & Schultz, 2008; Kegler, Steckler, Mcleroy & Malek, 1998; Zacoks & Edwards, 2006). C2P coalitions varied in their formalized structure which may have influenced how well the root cause process was adopted. Specifically, some coalitions were already organized into subcommittees around sectors making it more challenging to think holistically. Coalitions accustomed to more cross sharing and group problem solving were better able to adapt the process. Furthermore, those coalitions that had stronger decision making mechanisms (e.g., rules about how to prioritize and who could contribute to decisions) in place were able to move more swiftly through the root cause analysis process and hone in on relevant and meaningful problems and solutions.

Collaborative problem solving that includes multi-sector representation has been an important element to problem solving at this level (Watson-Thomson, Fawcett & Schultz, 2008). C2P coalitions that were able to identify and engage key stakeholders in the process of dissecting the problem and identifying solutions were more successful in effectively shaping and activating their strategic plans. For example, engagement of the Superintendent at the Department of Juvenile Justice and a Health Service Manager at the local health department resulted in some early policy changes such as providing HIV prevention information counseling and testing to incarcerated youth; maintaining on-site records for youth who were transferred and for those who returned to the system; and creating linkage to care upon release.

Finally, we observed that those coalitions that developed a ‘package’ of objectives within a system tended to experience greater success. For example, the diversity of objectives (i.e., spanning multiple types of outcomes within a system, such as professional training, creation of incentives/disincentives, and policy changes) allowed the coalition to achieve some “quick wins” early on, gain entry into a system and engage key individuals who were critical to subsequent longer term or more controversial changes.

In analyzing this process as a component of VMOSA, applying root cause analysis to HIV prevention planning can promote a deeper level of problem identification *before* developing possible objectives; thereby, allowing for more comprehensive and meaningful solutions to unfold. While the VMOSA process allowed the coalitions to move from broad visions to specific goals and objectives, the objectives, for the most part, continued to employ traditional approaches in the first year of coalition planning. Applying the root cause analysis strategy provided coalitions a process for moving beyond the individual as the cause for their risk, to examining underlying factors that were often structural in nature. Limitations of the root cause analysis approach in this context include: a) the risk of following only one causal pathway, albeit, in-depth, however potentially missing other relevant causes; b) knowing when enough “investigating” has occurred, root causes are sufficiently distilled, and feasible solutions can be generated; and c) retaining focus on the ultimate outcome when the causal pathway is so complex. Strategies to address these challenges include integrating an ongoing six-month review of the strategic plan into the action plan process and encouraging immediate action on identified objectives. Without such mechanisms, coalitions may become caught in a cycle of planning without action and outcomes.

There are several limitations to our analysis and findings. First, other factors likely contributed to the coalition's progress, including group cohesion over time and better understanding of the coalition's purpose and goals. Second, some coalitions were introduced to the root cause analysis progress within four to six months of starting their strategic planning work while other coalitions had been operating for 12–18 months before this process was introduced, making it more difficult to “switch gears” and fully utilize this new approach. Finally, we anticipate that better planning and development of more impactful structural changes will result in desired behavioral outcomes (i.e., reduction in risk behaviors), however this will not be clear until the next phase of study is completed.

Conclusion

An approach which addresses structural determinants of risk requires a fundamental paradigm shift in our thinking about cause and effect in HIV prevention planning. Community coalitions are a powerful force in identifying and bringing about those changes. In order to support the paradigm shift and improve coalition problem solving around structural changes for HIV risk, coalitions need tools to better dissect risk in communities so that they can identify the distal causes, and thereby structural solutions, of risk. Root cause analysis is a potential tool for this process. A fundamental component of root cause analysis is an assumption that causal factors that are beyond individual control are at work in creating risk and leading to disease and injury. This approach to problem solving complements the structural change approach because of its intended target to change those environmental elements that are beyond the individual's control. Root cause analysis also illustrates the necessity of having key people involved who bring varying perspectives and can serve as catalysts for change. Because there is no “silver bullet” for HIV prevention, developing tools that assist communities in harnessing their own power and potential will be necessary in this next generation of HIV prevention strategies.

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Figure 1.
Four Steps of Root Cause Analysis for Structural Solutions

Figure 2.
Structural Change Level and Focus Prior to and After Root Cause Analysis (RCA) was Introduced

Strategic Plans Prior to Root Cause Analysis		Structural Changes with Root Cause Analysis	
	Structural Change		Structural Change
Strategic Plan Focus: Improve HIV prevention information and programming for youth	By January 2007, the coalition will integrate domestic violence, sex abuse and parenting themes and education into existing community health fairs.	Strategic Plan Focus: Sexual abuse/age discordant relationships	By July, 2008 the public housing authority will establish neighborhood watch programs at their housing sites.
	By March, 2007, the coalition will hold an annual youth health rally to coincide with national women and girls HIVAIDS awareness day.		By October, 2008 the public housing neighborhood watch program will educate members and residents about child sexual abuse and will provide connections to appropriate services.
	By May 2007, Agency A will stock high traffic locations with prevention brochures.	With engagement of public housing authority, plans expand to consider other changes to support families and school retention	By June 2009, the public housing authority will partner with the local middle school to begin a new policy of providing after school and weekend tutoring for students performing under grade level.
	By May 2007, Agency A will begin distribution of HIV testing information cards at 5 high-traffic venues.	Plans expand to consider mental health issues and engagement of several churches	By April 2009, three churches in central city will begin a new mental health crisis response program.
	By July 2007, Agency B will begin a new program that provides young women with HIV prevention biannual workshops.		By December 2009, five churches in central city will register as HIV testing sites with the department of health.
	By January 2008, five agencies will include a link to school GED classes.		By March 2010, 10 churches in the central city area will begin to provide quarterly mental health screenings.

Figure 3.
Examples of Structural Changes Prior to and After Root Cause Analysis was Introduced