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A Model for Strengthening Collaborative Research Capacity: Illustrations from the Atlanta Clinical Translational Science Institute

KC Rodgers^a, T Akintobi^b, WW Thompson^a, D Evans^b, C Escoffery^a, and MC Kegler^a

^aDepartment of Behavioral Sciences and Health Education, Rollins School of Public Health, Atlanta, Georgia

^bDepartment of Community Health and Prevention, Morehouse School of Medicine, Atlanta, Georgia

Introduction

The benefits of community-engaged research, particularly community-based participatory research (CBPR) have been well documented (Israel, Schulz, Parker, & Becker, 1998; Israel et al., 2006; Minkler, 2005; Minkler, Blackwell, Thompson & Tumir, 2003; Viswanathan, et al, 2004). Community engagement in research can result in greater relevance of research methods and intervention strategies, more nuanced understanding of health problems, greater reliability and validity of measures, and improved fit of research activities into local context (Cargo and Mercer, 2008; Minkler, 2005). CBPR can also contribute to higher response rates and lead to richer interpretation of findings (Cargo and Mercer, 2008; Jagosh et al., 2011). By strengthening community trust and ownership, CBPR also has the potential to result in research that is more likely to be translated and disseminated into community settings (Minkler, 2005; Minkler and Wallerstein, 2003; Wolff and Maurana, 2001).

Challenges can arise, however, in attempting to build and maintain a research partnership (Ahmed, Beck, Maurana & Newton, 2004; Norris et al, 2007; Silka, Gleghorn, Grullon, & Tellez, 2008). On the academic side of the partnership, challenges can stem from poor collaboration skills (e.g., making decisions without input, infrequent communication), lack of institutional incentives for community engagement, lack of researchers' time to develop and commit to the partnership and resistance to power sharing (Allen, Culhane-Pera, Pergament & Call, 2010; Tendulkar et al., 2011). From the community perspective, barriers can stem from unfamiliarity with the research process (e.g., Institutional Review Boards, research designs) and lack of trust due to past negative experiences with researchers (Norris et al., 2007; Silka et al., 2008; Allen et al., 2010; Tendulkar et al, 2011).

In the last two decades, the use of community-engaged research to address health disparities has increased markedly (Allen et al., 2010; Baiardi, Brush & Lapidis, 2010; Thompson, Ondelacy, Godina & Coronado, 2010; Ross et al., 2010; Pivik and Goelman, 2011;

Tendulkar et al., 2011, Baker, Homan, Schonhoff, & Kreuter, 1999; Brenner and Mannice, 2011). As a result, the need to build capacity for conducting participatory research among both academic institutions and community partners has grown. Relatively few studies have been conducted on how to build collaborative research capacity. Most of the literature on CBPR describes the initial process of engaging communities, immediate partnership outcomes, and short-term research results (Cargo and Mercer, 2008; Jagosh et al., 2011; Ross et al., 2010; Brenner and Manice, 2011; MacPhee, 2009; Tendulkar et al., 2011; Baker et al., 1999). The handful of studies on building collaborative research capacity describe small grants programs, and a partnership training program evaluation (Thompson et al., 2010, Tendulkar et al., 2011; Allen et al., 2010). Thompson et al. (2010) used a community grants model that directly funded community-based organizations to plan, implement, and evaluate a small grants program with the purpose of creating new partnerships for future research in shared interest areas. An advisory board was used to oversee the conduct of research. Key informant interviews were used following the completion of the research to assess the community advisory board's perspectives on the funded programs' partnership sustainability. Although the initiative funded ten research projects that contributed to cancer prevention, the interviews suggested that there was limited support including funding, time, and skill-building resources for sustained partnerships. Tendulkar et al. (2011) used a seed grant model to fund CBO's participation in community-academic partnerships to prepare CBOs for submission of a larger pilot grant. Technical assistance (TA) and training were offered to facilitate pilot proposal preparation. Program evaluation highlighted the need for increased commitment and time to build the partnership, flexibility, and barriers that kept CBOs from applying for pilot funding. Allen et al.'s (2010) capacity building model expanded evaluation strategies through using mixed-method assessment (interviews, process notes and surveys) and evaluated partnership perspectives of a CBO/researcher coupling program and tracked the success of partnerships in garnering grant support to sustain and expand their initiatives. Since the number of studies examining the process of building capacity in academic-community partnerships is limited, a model for practice is needed. This paper describes the theoretical background and rationale for a CBPR capacity building model and presents preliminary results of model implementation.

Methods

The purpose of this paper is to present an approach for strengthening collaborative research capacity. Our model was developed as part of the Community Engagement Research Program (CERP) of the Atlanta Clinical and Translational Science Institute (ACTSI). ACTSI, part of NIH's Community and Translational Science Award program, is a collaborative effort between Emory University, Morehouse School of Medicine and Georgia Institute of Technology. ACTSI-CERP aims to support community-university research partnerships, to facilitate community input into university research, and to increase health research in community settings that is both responsive and relevant to the health needs of the community.

Figure 1 presents a model and evaluation framework for building collaborative research capacity. We define collaborative research capacity as the skills, values and resources needed to equitably engage all partners in the full research process. Based on a review of the

literature and our own experience, we have identified seven domains of collaborative research capacity: shared goals, attitudes toward collaboration, institutional factors, mutual respect, human and fiscal resources, partnering skills and research skills. Table 1 illustrates the linkages between each domain, implications for collaboration, and project activities of the model.

Inputs

Distribute Request for Applications (RFA)—A competitive RFA was distributed through two organizational listserves: to Morehouse School of Medicine's Prevention Research Center's five county metro-Atlanta service area and to the Emory Prevention Research Center's largely rural 32-county service area in southwest Georgia. The eligibility requirements included: being a not-for-profit organization, a demonstrated interest in partnering with an academic partner in addressing a defined health disparity, identification of at least two staff to participate in a research capacity training series, and serving communities in core metropolitan Atlanta counties or counties in southwest Georgia.

Award Grant to CBOs—In year one, each site received \$15,000 to develop a research plan for a pilot study. At least two members from the funded CBO were required to attend a series of four research capacity training workshops. At the end of year one, grantees submitted a continuation proposal and a final pilot study proposal. In year two, CBOs received an additional \$15,000 to implement the pilot study in collaboration with their academic partner and to submit a grant proposal to NIH or another major funding agency.

Match CBO to Faculty—Faculty at ACTSI universities were recruited and matched based on research interest, shared goals, and past experiences to work with the selected CBOs to develop a pilot project and ultimately a research proposal based on selected health topics. Academic partners were required to attend a separate 1 hour training on implementing the principles of CBPR. A small percent of faculty or graduate research assistant effort was covered by the grant.

Activities

Training—Training for CBO staff comprised four workshops, 24 total hours, on community assessment, program planning, evaluation, and grant writing. One-day trainings allowed time for instruction, application, and for CBOs to brainstorm about their individual research projects. Trainings were facilitated by a doctorate-level public health specialist who also served as the lead for technical assistance (TA). A baseline and follow-up survey were administered to assess what participants learned post training.

Technical Assistance—On-going TA with structured monthly phone meetings and e-mail check-ins were provided to all CBO members and to faculty partners. Structured TA continued through completion of pilot studies with TA upon request during grant proposal development. The purpose of the TA was to provide updated information on project requirements, inquire about the progress of the project, answer questions and address any challenges or concerns. TA activities were tailored to meet the needs of the partners and varied across partnerships. Challenges that were observed for CBOs included the

development, submission, and revision of research protocols for IRBs, carrying out research activities (focus groups and mailed surveys) under time constraints, recruiting participants, and data analysis. Challenges of the academic partners were observed to a lesser degree.

Structured Communication—Each grantee was required to participate in a monthly call and a quarterly in person meeting. An additional phone meeting replaced the quarterly in-person meeting for CBO 2 to conserve resources given the distance from the university. The phone meetings consisted of the project coordinator, methodologist, at least one CBO member and the academic partner. Each call lasted approximately one hour and agendas included the IRB approval process, study updates, and proposal planning. The methodologist provided recommendations on study design and data analysis on each call. Quarterly meetings were hosted by the CBO and allowed CBO members and academic partners to present their progress to faculty.. Each of these meetings lasted approximately two hours.

Staged Longitudinal Design—Year two funding was contingent on the completion of year one deliverables: Institutional Review Board (IRB) approval and a pilot study research plan. CBO's presented preliminary pilot results at an in-person meeting with faculty partners and staff mid-year two. At the end of year two, CBOs were required to submit a report of pilot study results, and a draft grant proposal. Once each item was submitted, funds were released to CBOs.

Outputs

Conduct Pilot Study—Between September 2010 and July 2011, all CBO's were required to conduct a pilot study that informed their research question(s) and provide data for a larger grant proposal. Three out of the four CBOs completed the pilot study. One CBO was disbanded prior to completion. CBO members submitted a report to the TA provider with pilot results.

Disseminate Pilot Results: The three remaining CBOs presented their pilot study findings at a symposium hosted by the ACTSI institutions in April 2011. Faculty from ACTSI institutions and community members attended the 3 hour symposium. In addition, 2 of the CBO's disseminated their pilot study results at national conferences.

Submit Grant Proposal—Two of the four grantees submitted grant proposals to a federal RFA. The third remaining CBO revised their original research question based on the pilot data and planned to conduct a pilot study based on these changes. To date neither proposal submitted to federal agencies have been funded; however, both partnerships plan to submit proposals in the next year.

Outcomes—Outcomes focused on strengthening the seven domains of collaborative research capacity: Shared goals, attitudes toward collaboration, institutional factors, mutual respect, human and fiscal resources, partnering and research skills. The model suggests that increased collaborative research capacity leads to sustainable partnerships that improve community health.

Theoretical Development of Outcome Domains

Shared Goals: Research partnerships initiate from the alignment of goals and objectives between academic and community partners (Jagosh et al. 2011; Allen et al., 2010; Tendulkar et al., 2011). Academic partners rely on community-based organizations to inform them of the culture and practices from their experience in the community to increase the relevancy of their work. In return community-based organizations can benefit from rigorous methodology and health topic expertise of academicians. Shared goals emerge when research partners identify gaps in the literature and consult with communities to identify gaps in practice. It is the marrying of research questions and practice needs that result in the creation of multi-purposed short and long-term goals that equally benefit each partner. (Baker et al., 1999; Dobransky-Fasiska et al., 2009; Pivik and Goelman, 2011; Tendulkar et al., 2011). Shared goals can also include data for publications, health improvement, as well as additional funding.

Attitudes Supporting Collaboration: Attitudes of academicians and CBOs toward partnering can affect collaborative research outcomes. Faculty reported the following as adding to positive attitudes for collaboration: orientation to working in non-hierarchical ways, appreciation of multiple forms of knowledge, and willingness to work on projects that address community stated priorities (Allen et al, 2010). CBOs' attitudes toward collaboration can also affect partnership outcomes and depend greatly on historical experiences with research. Mistrust of research intentions, difficulty in scheduling meetings, and researcher's lack of CBPR knowledge and experience has led some CBOs to form negative attitudes toward research (Tendulkar et al., 2011; MacPhee, 2009; Pivik and Goelman, 2011; Dobransky-Fasiska et al., 2009). An infrastructure which supports the partnership through technical assistance and training for both partners can be helpful in creating equality and positive attitudes toward collaboration (Braun, Tsark, Santos, Aitaoto & Chong, 2006).

Institutional Factors: Academic institutions tend to operate as systems based on traditional research in which community members are involved only as research participants. While the purpose is to protect research participants, institutional review boards can limit the participation of community members and create obstacles to those in the community serving as co-investigators and full research partners. Moreover, the culture of the academic institution can have a profound effect on the willingness one has to involve the community in research (Baker, 1999). Allen et al. (2010) conducted key informant interviews with faculty who engaged in collaborative research and found that supportive environments contribute to ease of collaborative work. Overall, community research partners tend to find the academic institutional processes (subcontracts, late payments) cumbersome (Baker, 1999).

Mutual Respect: Shared authority in collaborative research partnerships requires the mutual respect of each partner (Minkler and Wallerstein, 1998). Mutual respect develops from discussion, negotiation, and acknowledgment of each partner's needs and contribution to the research plan (Dobransky-Fasiska et al., 2009). Building and maintaining trust between researchers and community partners is an ongoing challenge because of historical

experiences of collecting data without sharing results or providing tangible benefits to the community; therefore, researchers need to ensure that communities have access to and are benefitting from research deliverables (Brenner and Manice, 2011; Dobransky-Fasiska et al., 2009). A challenge that exists in building mutual respect is the time and commitment that it takes from each partner. Baker et al. (1999) acknowledges that building this type of relationship takes much more effort than that of conducting traditional research. Setting realistic time expectations before the collaborative research begins helps to build and maintain mutual respect (Tendulkar et al., 2011).

Human and Fiscal Resources: Allocation of resources is key to both partners feeling equally valued and prepared to carry out the research tasks (Minkler and Wallerstein, 1998). Building a collaborative culture among stakeholders requires skilled leadership and change management strategies (MacPhee, 2009). This leadership commitment helps to establish trust in the partnership and reduces staff turnover (Andrews, Newman, Meadows, Cox & Bunting, 2010). If power sharing is a challenge, one way to equalize the power within the partnership is to direct fiscal resources to community partners (Thompson et al., 2010). Others have noted that fiscal resources often fall short of the actual resources needed to engage in a truly collaborative research process, so setting realistic expectations for all partners involved prevents researcher and staff burnout (Brenner and Manice, 2011; Tendulkar et al., 2011). Incentivizing work through non-fiscal means such as co-authoring papers, public acknowledgement within the community, through presentations, and at meetings can also help keep partners involved in the research (Browne et al., 2009).

Research Skills: High quality research requires a unique set of skills and typically requires advanced training. Academic partners usually have these skills while community partners may not. This imbalance contributes to power differentials in research partnerships (Allen et al., 2010; Dobransky-Fasiska et al., 2009). As part of the co-learning involved in CBPR, academic partners can transfer skills to community partners through training and experiential learning. In turn, academicians must acknowledge non-traditional skills and assets brought to the team by the community partner, such as understanding the local culture, connections to formal and informal community leaders, knowledge of community history, and access to priority populations (Baiardi et al., 2010). Academic partners, even experienced researchers, may lack skills in conducting and negotiating CBPR within the traditional academic setting.

Partnering skills: General partnering skills such as regular and open communication, shared decision-making, conflict resolution and group process are integral to the smooth functioning of a research partnership. When mistakes are made, partners need to work together to develop specific strategies to address them and make sure that they are not repeated (Baker et al., 1999). In initial phases of building partnering skills, it is crucial that partners are knowledgeable about CBPR, are willing to share resources, extend their project goals, develop new collaborations, and assign defined roles and responsibilities (Wells et al., 2006; Allen et al., 2010). Flexible project management, an openness to learning, and conflict resolution skills contribute to successful partnerships (Allen et al., 2010).

Results

The RFA resulted in 29 applicants and 4 CBOs were selected in February 2010 based on the strength of their application. Selection included review and input by the CERP Community Steering Board. Since the funding was from the American Recovery and Reinvestment Act of 2009, applicants were required to describe how the funds would be used to create, expand or retain jobs within the CBO. A brief description of each awarded organization, the topic of their proposed pilot study, and their academic partner are described below.

Description of Funded Sites and Academic Partners

HIV/AIDS Outreach Program—The first organization (CBO 1) was an HIV not-for-profit that aimed to enhance the quality of life and extend long-term survival for people living with HIV. CBO staff were matched with a professor in the Department of Community Health & Preventive Medicine at the Morehouse School of Medicine with a strong track record in HIV research and community engagement. Their pilot project was a mixed methods study which involved interviews and surveys of their clients for re-engagement into services and to explore outreach efforts for those who refuse treatment or who are unaware of their HIV status.

Informed Consent for Clinical Trials Patient Program—The second organization (CBO 2) was a cancer center in southwest Georgia that provides cancer prevention, cancer diagnosis and cancer treatment to patients. This center was paired with a physician who specializes in family medicine and general preventive medicine/public health in the School of Medicine at Emory University. She had a track record in issues related to informed consent. Their pilot study involved surveys to explore cancer patients' level of understanding of informed consent for clinical cancer studies.

Cervical and Breast Cancer Screening Education and Outreach Program—The next organization (CBO 3) provides support, services and advocacy to LGBT individuals and their families. The CBO staff were paired with an assistant professor in the Epidemiology Department of the Rollins School of Public Health, Emory University with an interest in cancer prevention. For the pilot project, they conducted focus groups about breast and cervical cancer screening behavior and messaging in the LGBT population, particularly African American, masculine-identifying lesbians (STUDS or BOIS).

Hepatitis B Screening, Vaccination, and Treatment Program—The final funded organization (CBO 4) offers culturally and linguistically appropriate health services to meet needs of the Vietnamese community. CBO staff members were paired with an assistant professor of Medicine within the Division of Infectious Diseases at Emory University School of Medicine with interest in vaccine medicine. The pilot study involved surveys and focus groups with Vietnamese adults to identify motivational and prohibitive factors that shape Hepatitis B screening, vaccination, and treatment behaviors.

Each partnership completed the required trainings and technical assistance in year one. In year 2, two CBOs (CBO 3 and CBO 4) participated in all required TA and structured communication. CBO 2 participated in all but 2 required TA calls due to the inability to

schedule a time that worked for the researcher and CBO. Activities were tailored by the TA provider based on the organization's stage of research. For example, CBO 2 developed a questionnaire to learn about the patient consent process in cancer clinical trials. Most of the TA provided focused on the development and dissemination of the survey. CBO 3 used focus groups to learn more about breast cancer screening so TA was focused on the conduct of focus groups and the analysis of qualitative data.

Deliverables varied across CBOs. Table 2 illustrates the deliverables achieved by each partnership over the course of the project. In addition to the pilot study plan and IRB approval, two out of the four grantees completed an expected outcome, a grant proposal submission. The CBO affiliated with one of the partnerships that did not complete a grant proposal submission was disbanded in early 2011 and; therefore, ceased participation in the project. Two of the partnerships (CBOs) received other related service-focused grants, and presented poster presentations at professional conferences. Service-focused grants were related to the pilot study but they were not required. The additional funding obtained by the CBOs helped to improve the quality and reach of their services. One of the grantees completed all of the required deliverables in addition to an oral presentation at a professional conference and submission of a paper for publication in a scientific journal.

As a result of the study, two partnerships have been sustained to date. Both research partnerships meet quarterly to revise grant applications that were developed during the course of the ACTSI CERP project. Partnership (CBO3) has increased the number of participants and qualitative analysis in their pilot study to gain a better understanding of screening determinants in their population. Partnership (CBO4) plans to resubmit their proposal to a federal agency in September 2013.

Discussion

The ACTSI CERP Model for Building Collaborative Research Capacity may offer an innovative approach to building research capacity for academic and community partners by strengthening the seven identified domains: shared goals, attitudes supporting collaboration, institutional factors, mutual respect, human and fiscal resources, partnering and research skills. The model encompasses the collaborative nature of community engaged research by allocating monies to the community partner, matching academic partners based on shared goals and research interests, and providing training and TA to both partners. By shifting typical power dynamics through directly funding CBOs and providing partnership support throughout the research process, each partner had the opportunity to practice community-engaged research in a structured, and supportive way.

Deliverables among partnerships varied with one CBO exceeding project expectations. From our experience, several capacity domains were stronger in partnerships that exceeded and met project expectations compared to partnerships that did not meet project expectations. In the case of the highest functioning partnership, the CBO was highly motivated and had broad organizational and volunteer support (human and fiscal resources). The matched-academic partner had extensive experience in conducting similar studies and the CBO had strong, overlapping research interests with the faculty partner (shared goals). Keys to this

successful partnership were an existing study protocol that only required amending for IRB purposes, a clear study aim, and existing community events that could be used for recruitment (research skills). The other CBOs encountered barriers which slowed down the research process (institutional factors). Many of these were attributed to the academic institution's strict IRB policies which were not sensitive to community led studies. This led to frustration for both partners and decreased positive attitudes toward collaboration (attitudes supporting collaboration).

While there is a plethora of studies on benefits and challenges of CBPR (Israel, et al., 2006; Ross et al., 2010), few studies that build research capacity through community-academic partnerships exist. The Model for Building Collaborative Research Capacity provides a framework for practitioners who plan to partner academic and community organizations for the purpose of research. By identifying seven research-supported domains that build effective academic-community research partnerships, this model provides a process in which collaborative research partnerships may be formed. Through the use of the model, we measured the productivity of each research partnership. As a next step, we will measure the changes in each domain as a result of this model and document sustainability and the long term outcomes of the new partnerships. In doing so, we also hope to gain more in-depth knowledge about the needs of each partner and the factors that contribute to sustained partnerships. Future research in developing and testing the seven domains of collaborative research will substantiate the impact of these partnerships and contribute to the literature on strengthening community research capacity.

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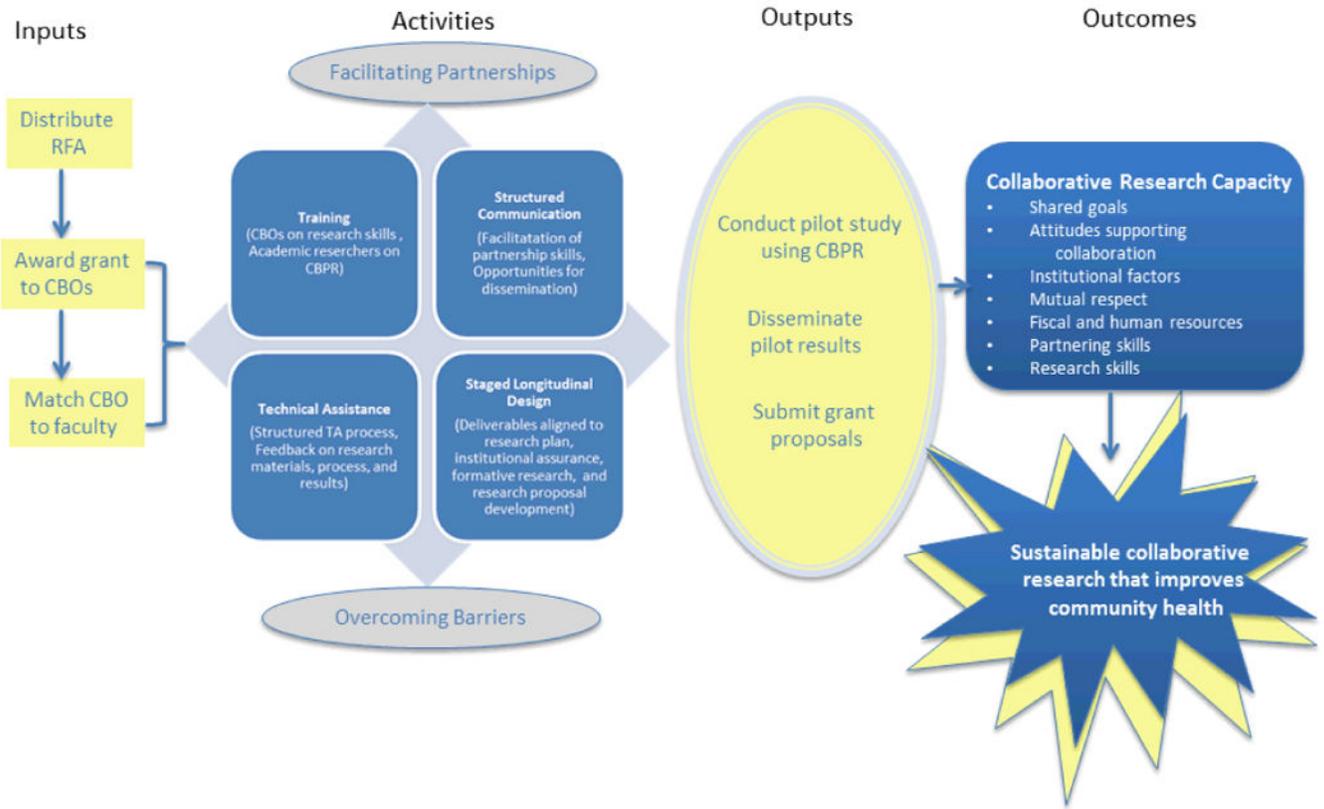


Figure 1. Model for Building Collaborative Research Capacity

Table 1
Seven Domains for Building Collaborative Research Capacity and CRCGP Activities

Domain	Definition	Implications for Collaboration	CRCGP Program Activities	CRCGP Tailored TA Activities
Shared Goals	Existence of common objectives and/or collaborative activities that contribute to sustaining the partnership	Project remains focused and partners share successes and failures	Academic-community match, TA, Structured communication	Revisit shared goals based on partner experience Provide introductions to other researchers to serve as resources for partners
Attitudes and Culture Supporting Collaboration	Attitudes and organizational cultures that encourage and support community-engaged research	Increases desired outcomes and sustained collaboration Acknowledges potential negative experiences from collaboration in the past	Training, TA, Structured communication	Provide examples of successful collaborative research Use facilitation skills to limit dissatisfaction from previous experience
Institutional Factors	Factors that exist in academic/CBO systems that encourage or hinder collaborative research	Challenges at the institutional level are recognized and addressed when feasible early in the research process	Training, TA, Structured communication	Facilitate partners in navigation of IRB process Ensure timely invoicing
Mutual Respect	Established rapport or sense of trust	Limits conflict by providing tangible benefits to each partner	TA, Structured communication	Provide a comfortable environment that allows for collaborative discussion Present partner strengths and rationale for academic-community match
Human and Fiscal Resources	The staff, monies, and space to carry out the research	Allocation of monies and resources impact partner equity and ability to carry out research tasks	Request for application, Grant funding, Training	Funding directed to CBO in timely manner Provide faculty support
Research Skills	A set of skills require to carry out research, such as study design, instrument development, data analysis	Enhances partner equity and increases likelihood for future collaboration	TA, Training	Provide resources Answer questions Provide referrals to research experts
Partnering skills	A set of skills required to effectively work with others, such as communication, dependability, and transparency	Opens channels of communication and builds trust among partners	TA, Training, Structured communication	Encourage open communication on TA calls and quarterly meetings Provide bi-weekly emails to partners Recognize dissent and address using conflict management skills

Table 2
Deliverables by CBO

	CBO 1	CBO 2	CBO 3	CBO 4
Pilot study proposal	X	X	X	X
IRB approved study protocols	X	X	X	X
Pilot study results		X	X	X
Grant proposal submission			X	X
Other grant proposal submissions through February 2012 (optional)			X	X
Additional funding received (optional)			X	X
Conference poster presentations (optional)			X	X
Conference oral presentations (optional)				X
Journal manuscript submission (optional)				X

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