

# Implementation partnerships in a community-based intergenerational oral health study

C.E. Huebner<sup>1</sup>, P. Milgrom<sup>1</sup>, L.A. Mancl<sup>1</sup>, D. Smolen<sup>1</sup>, M. Sutherland<sup>2</sup>, P. Weinstein<sup>1</sup> and C.A. Riedy<sup>3</sup>

<sup>1</sup>Northwest Center to Reduce Oral Health Disparities, University of Washington, Seattle, WA, USA; <sup>2</sup> Klamath County Public Health, Klamath Falls, OR, USA; <sup>3</sup> Harvard School of Dental Medicine, Boston, MA, USA

**Background:** University-community partnerships are a common strategy used in implementing community-based health promotion trials, yet few published studies report these interactions in detail. “Baby Smiles” was a five-year intervention study in Oregon, USA. The study involved 400 low-income women during and after pregnancy across four rural counties. In this report, we describe and assess four university-community health partnerships formed to support the intervention. **Methods:** A community health partnership advisory group for the study was established in each of the four participating counties. Group membership ranged from 9 to 23 individuals. A survey was administered to the groups five times in a 2.5 year period. The survey asked members’ opinions of the intervention’s goals, scientific basis and relevance to their organisation. Questions also asked about members’ knowledge of oral health, beliefs about access to dental care for low-income pregnant women and children in their county and how their organisation functioned. **Results:** There was strong overall support by each partnership group despite differences in the groups’ structure, foci and turnover in membership during intervention period. Responses to specific survey items indicating misinformation or negative opinions about oral health care were used to address weaknesses in study implementation throughout the conduct of the study. **Conclusion:** Systematic monitoring of community support for a multi-year oral health intervention is feasible and can identify potential barriers to address while the study is underway.

**Key words:** community health networks, dental care, low income populations, mothers, infant, community-based participatory research, Oregon

## Introduction

The use of community coalitions or task forces as a strategy for health promotion is increasingly common. Fully realised, these collaborations among public agencies, the private sector and concerned individuals are used to prioritise needs, act to address needs, evaluate impact and sustain effectiveness over time. Coalitions do not need external partners in order to be successful; however partners from outside the community can bring expertise, technical assistance and other resources to support coalitions’ goals. Partnerships with community health researchers that demonstrate mutual respect and recognise the unique strengths of each partner can improve community health and enhance the functioning of health systems to reduce disparities (Lasker *et al.*, 2001; Somerville *et al.*, 2012). In the USA, these potential benefits have led government and private sector funding agencies to encourage or require community coalition partnerships of funded projects (Cheadle *et al.*, 1997; IOM, 1996). There are numerous no-cost resources to assist organisations in different sectors such as schools, businesses, and public health build community partnerships based on common interests and shared goals (e.g., NBCH and CCHI, 2013). Less common are empirical reports that illustrate the process in action or over time.

In this report, we describe and assess university-community health partnerships we formed to support a

community-based preventive intervention study in four rural counties in the USA (Milgrom *et al.*, 2013). One novel aspect of our efforts was the design of a single tool to describe four diverse partnership organisations. A second was that we collected data from our partners multiple times over the course of the intervention period to gauge their opinions about the intervention’s goals, processes and relevance to their organisation. An anticipated benefit of repeated data collection was to keep apprised of misunderstandings or negative beliefs that might impede Baby Smiles’ success and respond to these while the intervention was underway.

The intervention program, called “Baby Smiles,” helped low-income women obtain dental care for themselves during pregnancy and for their infants by the infants’ first birthday. These goals are important for family health (Filstrup *et al.*, 2003). The design used to evaluate the intervention was predetermined by a cooperative agreement between the National Institute of Dental and Craniofacial Research and the University of Washington Northwest Center to Reduce Oral Health Disparities. It was conducted in collaboration with governmental public health departments of four rural counties in the state of Oregon, USA.

The process of identifying the four counties began with discussions between study-affiliated community liaisons and county public health department leaders who described widespread oral health problems among their

county's residents, barriers to dental care for low-income families, and a willingness to work with the university team on the proposed study. The final site selection was made by the university team based on these criteria and county-specific birth rate data indicating feasibility to enrol 100 pregnant women per county within the study timeline.

### Material and methods

Potential community partners were identified by public health leaders and our community liaisons who knew of local organisations that might share the intervention's goals. To minimise possible "burn-out" of volunteers within these small, poor, rural communities, we chose to approach existing organisations as potential partners, rather than establish new groups. The university team and community liaisons met with each organisation's membership face-to-face to review the study's goals and timeline, discuss expectations of study staff and of the financial arrangements between the university and the health departments for the costs associated with hiring, training and employing county residents as interventionists, called "Baby Smiles counsellors." All four organisations agreed to join us as community health partners (CHPs) for the period of the intervention. The organisations were typical of community health coalitions in the following respects: they were composed of volunteers, represented multiple sectors and had relatively broad missions (Weech-Maldonado *et al.*, 2000).

The Baby Smiles counsellors became members of their county's CHP to maintain members' awareness and interest in the intervention. The counsellors reported on the study's progress, successes and snags. CHP members assisted us with problem solving (e.g., whether exclude or include pregnant adolescents) and were asked to encourage their clients to consider enrolling in the study. CHP members expressed interest in oral health education. In response, Baby Smiles counsellors offered publicly-available and study-derived resources to them, their agencies and in turn, the larger community. These included no-cost dental education sessions for health, education and social service providers delivered by a professional expert, and free oral health education materials for pregnant women and caregivers of young children.

We developed a self-administered CHP survey to describe similarities and differences in how the four CHPs functioned, members' opinions of Baby Smiles, their knowledge of oral health and disease, and the perceived importance of Baby Smiles in the context of other priorities of the organisation and resource constraints within the county. The survey was pilot tested and the number of items reduced to create a one-page, two-sided survey that could typically be completed in under five minutes. The final version of the survey consisted of 31 Likert-scale items and two closed-ended questions, a total of 33 items. Items were worded using the term by which each CHP identified itself (e.g., "coordinating council" or "taskforce"). The survey is available at [depts.washington.edu/nacrohd/babysmiles](http://depts.washington.edu/nacrohd/babysmiles), Community Partners Survey.

Twenty-six of the 33 survey items reflect the Consolidated Framework for Implementation Research (CFIR) (Damschroder *et al.*, 2009). CFIR is a synthesis

of constructs and implementation theories presented as a framework of five domains. The domains pertain to: 1, aspects of the intervention, including its strength and quality; 2, the "outer" setting (e.g., the economic and social contexts of the organisation); 3, the "inner" setting" (e.g., structural characteristics and readiness of the organisation for the intervention); 4, characteristics of individuals including their beliefs about the intervention; and 5, process, or how the organisation carries out its activities. Two items were adapted from another source (Mattessich *et al.*, 2001) and three were written based on our previous experience. One example of a newly-written item is: *This organisation adapts quickly to address new issues or opportunities*. Sample items, corresponding constructs and sources are presented in Table 2. Two closed-ended survey questions asked the respondent's: gender (male or female) and the number of years they had been a member of the organisation (<1, 1-2, 3+ years).

Data collection occurred at CHP meetings five times from Winter 2011 (commencing six months after enrolment of the first study intervention participant) through Winter 2013. At each administration, Baby Smiles counsellors gave a verbal introduction and instructions on how to complete the survey. Survey responses were anonymous to encourage individuals' honesty in sharing opinions about sensitive topics for instance, their opinion about low-income mothers in their community.

The forms were color-coded to differentiate individuals completing the survey for the first time from those who had completed it at least once in the past. The introduction, instructions, and survey completion took less than 10 minutes total. Surveys were collected in an envelope to be sent to the university-based research team for data entry and analysis. The data collection procedures, forms and timeline were reviewed by the University of Washington Institutional Review Board and qualified for exemption status. The trial is registered with ClinicalTrials.gov as NCT01120041.

The data were entered and analysed using SPSS v.19.0. Cronbach's alpha was computed to determine the internal consistency of items in each of the five constructs included in the survey. Mann-Whitney and Kruskal-Wallis tests were conducted to test associations between survey responses and both individuals' gender and years of partner organisation membership.

### Results

The partnership organisations ranged in size from 9 to 23 members, 16 on average. They varied in foci, characteristics of the members and frequency of meetings (Table 1) with the one with the most specific focus and smallest membership being a dental workgroup of a local hospital. Its mission was to improve the oral health of all county residents and it was the only organisation to seek lay people among its members. Two CHPs shared the focus of tackling perinatal substance abuse. These groups had the largest number of members who represented the broadest range of sectors including both public (e.g., public health, education, social services and policy makers) and private (business and religious) organisations.

**Table 1.** Description of the community health partnership (CHP) organisations

County & CHP N <sup>a</sup>	Focus of the CHP organisation	Meeting frequency	Number of members <sup>1</sup>
1	Perinatal substance use and its effects on county women and infants	Every 4 months	23
2	Dental health of all county residents	Monthly	9
3	Perinatal substance use and its effects on county women and infants	Every other month	18
4	Childcare, early childhood education and child maltreatment in county	Monthly	13

<sup>1</sup>Number of members is based on the maximum number present at a meeting during which the CHP survey was administered.

**Table 2.** Constructs and sample items of the CHP survey

Construct	Item total	Sample items	Construct and source <sup>1,2</sup>
Opinion about the intervention goals, methods, products and relevance	8	The scientific evidence that guides the goals of Baby Smiles is strong.	Intervention <sup>1</sup>
		Baby Smiles addresses a serious unmet need in this county.	Outer Setting <sup>1</sup>
Connections between the agency and intervention group and the relevance of the intervention to this organisation	8	Communication between Baby Smiles and this organisation is adequate to keep us informed.	Process <sup>1</sup>
		The goals of Baby Smiles fit easily within the mission of this organisation.	Inner Setting <sup>1</sup>
How the organisation functions	7	The people in this organisation communicate openly with one another.	Process <sup>1</sup>
		The people in this workgroup represent a cross section of people who have a stake in what we are trying to accomplish.	Process <sup>2</sup>
		This workgroup takes on the right amount of work at the right pace.	Process <sup>2</sup>
Beliefs about oral health of women and young children	4	Bacteria that cause caries (tooth decay) are transmissible from the mom to the baby.	Individual <sup>1</sup>
		It is safe to provide dental treatment to a pregnant woman.	Individual <sup>1</sup>
Opinion about dental care for low-income families in this county	4	It is hard to find a dentist who will accept low-income children as patients.	Outer Setting <sup>1</sup>
		There's not much that can be done to prevent cavities in low-income children.	Individual <sup>1</sup>

<sup>1</sup>Damschroder *et al.*, 2009; <sup>2</sup>Mattessich *et al.*, 2001

We did not anticipate high turn-over in the membership of our CHP organisations over the study period. However, at each data collection point, approximately six months apart, 26 to 35% of survey respondents reported they had been members of the organisation for less than one year. At the last data collection point, approximately 40% of the respondents indicated they joined the organisation after its relationship to Baby Smiles had been established.

Results from each administration of the survey were aggregated to combine all CHPs' responses and shared with the Baby Smiles counsellors throughout the study period. Among the items that showed greatest variability were two reflecting knowledge or opinions central to the intervention: It's safe to provide dental treatment to a pregnant woman; and, Mothers of low-income children value their children's oral health. Counsellors were encouraged to discuss these topics at CHP meetings by sharing facts about safety, professional recommendations for dental care during pregnancy and anecdotes from their experience with women enrolled in the study. Survey results were used also to identify topics for a newsletter we created for our CHP groups that provided updates on study progress.

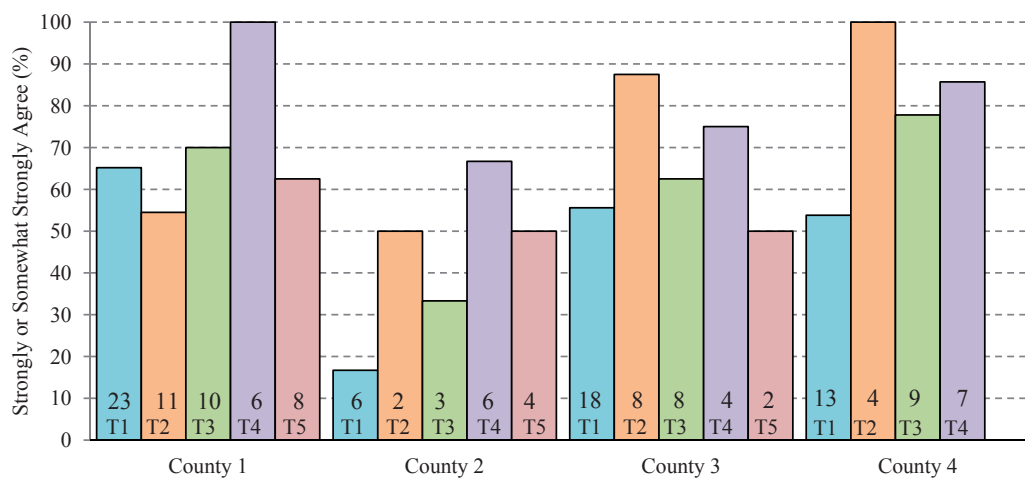
Items on the CHP survey were grouped as five constructs presented in Table 2. Analyses of all first-time respondents' surveys showed high internal consistency among the items within three of the five constructs, specifically: opinions about the Baby Smiles program (8 items), the CHP's connection to Baby Smiles (8 items), and how the CHP functions as an organisation (7 items). Internal consistencies, based on Cronbach's alpha and indicating adequate scale properties, were: 0.86, 0.94 and 0.95 respectively.

Table 3 displays the median scores of the first two of these scales (i.e., individuals' opinions about the program goals and products and the connection between the CHP and Baby Smiles) within each CHP over the study period. The scores presented are the average item scores for each scale; scores can range from 1 (indicating low support for Baby Smiles) to 5 (high support). At Time 1, median scores among the CHPs ranged from 3.8 to 4.9. Median scores were at or above 4.0 (with one exception) for all CHPs at all subsequent data collection points. We used the data from first-time respondents, to assure only one response per individual was included

**Table 3.** Community health partners' opinions of the Baby Smiles intervention over time

Construct	County	Scale Score: Median (25% - 75% percentiles)				
		Time 1(n=58)	Time 2(n=40)	Time 3(n=44)	Time 4(n=36)	Time 5(n=14) <sup>1</sup>
Baby Smiles Goals and Products	1	3.8 (3.5-4.5)	4.3 (3.9-4.6)	4.3 (3.8-4.8)	4.6 (4.1-4.9)	4.4 (3.8-4.6)
	2	4.7 (4.5-4.9)	4.6 (4.6-4.6)	4.6 (4.3-4.8)	4.6 (3.9-4.8)	4.6 (4.5-4.8)
	3	4.4 (4.0-4.8)	4.3 (4.1-4.5)	4.5 (3.8-4.8)	4.5 (4.4-4.8)	4.8 (4.6-5.0)
	4	4.5 (4.0-4.8)	4.5 (3.9-5.0)	4.8 (4.5-5.0)	4.6 (4.5-5.0)	-
Connection to the Partnership Organisation	1	4.0 (3.3-4.5)	4.0 (3.6-4.9)	4.4 (3.8-4.9)	3.8 (3.6-5.0)	4.3 (3.9-4.8)
	2	4.9 (4.8-5.0)	5.0 (4.3-5.0)	4.4 (4.3-4.6)	4.1 (4.0-4.6)	4.6 (4.4-4.8)
	3	4.5 (4.0-4.9)	4.6 (4.0-4.9)	4.9 (4.5-5.0)	4.9 (4.6-5.0)	4.8 (4.6-5.0)
	4	4.5 (4.3-4.8)	4.9 (4.0-5.0)	4.5 (4.3-4.8)	4.8 (4.3-5.0)	-

<sup>1</sup>Includes all responses except first-time respondents at Time 5.



Time 1 (T1) data include all responses whereas first-time respondents were excluded from T2-T5.

**Figure 1.** Community health partners' average scores by county and survey collection point (T) for the survey item "Mothers of low-income children value their children's oral health" as percentage rating it strongly agree or somewhat agree with number of respondents present included in each data bar

in each test, to determine if responses were associated with gender or length of membership with the partner organisations. Women held more favourable opinions than did men about the intervention and about the connection and communication between the intervention and their organisation ( $p=0.035$  for each test). Membership of one year or more, versus less than one year, was also associated with more favourable opinions about the intervention and the connection between the intervention and the partner organisation ( $p<0.001$  and  $p=0.005$  respectively).

Two constructs assessed by the survey showed relatively low internal consistency. The first was the 4-item set pertaining to oral health beliefs. We found little variability in individual's responses these questions; most individuals answered favourably and correctly, e.g., that it is safe to provide dental care to pregnant women. In contrast, individuals were inconsistent in their responses to the four questions about the use and effectiveness of dental care among low-income individuals.

We chose to track one item: "Mothers of low-income children value their children's oral health" as a sentinel indicator of CHP support for the intervention's goals. This

item was chosen because it reflects the premise of the intervention: that low-income mothers of young children will seek dental care for their children if barriers to access are reduced and personal motivation to act is sufficient. At the first data collection point in each county (T1, Figure 1), the proportion of CHP members who agreed with this item ranged from 17 to 65%. Responses fluctuated between and within CHPs and over time: e.g. in County 1 at Time 4 (T4), all 6 respondents agreed that mothers of low-income children value their children's oral health, and six months later (T5) this had fallen to 5 out of 8 respondents.

## Discussion

In this study, a single survey was created to gauge support of members of four community-based organisations for a multi-year intervention research study. Survey data were collected five times over the intervention period and identified ample support for the intervention's goals, methods and materials by organisations that varied considerably in their focus and composition. The interventionists, Baby Smiles counsellors, were county residents and joined the



partner organisations as liaison points with the study. Their familiarity to CHP members and regular updates at CHP meetings may have maintained the CHPs generally favourable opinion of Baby Smiles over time.

Survey data documented considerable change in the membership of each CHP organisation over the intervention period. At the end point, only 60% of the existing members had been members when the university-community health partnership was formed. Additionally, we found that new members of the organisation held less favourable opinions of the intervention than did members of one year or more. These findings underscore the need to nurture partnerships over an entire project period. When turnover is high, these activities should include revisiting the goals of the partnership, the goals of the intervention or project, and its methods.

At the outset of this project we choose to establish partnerships with existing groups to minimise the burden on volunteers who had responsibilities to standing committees already. We were however ambivalent about having partner groups who varied widely in their own goals. In fact, our survey data showed no association between characteristics of the organisations and support for the intervention. On average, they were supportive. Also, specific survey items identified differences in individual members' opinions both within and between CHPs and over time. For instance, the proportion of CHP members in County No. 2 who agreed "Mothers of low-income children value their children's oral health," was consistently the lowest among the four counties.

Two limitations of the study are worth emphasising and could be addressed in future research. First, we chose to keep individuals' responses anonymous to encourage candid replies and to protect identities especially in small organisations. This choice prevented an analysis of specific individual's responses over time. Larger studies, or other methods to minimise concerns about confidentiality, could be used to assess the phenomena at an individual, rather than aggregate, level. A second limitation was our choice to use a self-report survey. This method was chosen to accommodate organisations' time constraints. Future researchers might choose to use focus groups or interviews to gain more in-depth information about partners' opinions and relationships to a community-based intervention such as Baby Smiles.

The Baby Smiles intervention was completed in spring 2013. Intervention outcomes, determined as the percentage of mothers and infants who received dental care during the study period, are now being examined. If the intervention is effective, sustainability depends in part on the strength of community support. The survey presented here assessed community partners' opinions of the intervention's goals, its connection and relevance to the organisation's mission, and how the well their organisation functioned. Our survey data showed strong overall support for Baby Smiles and well-functioning partner organisations. Different circumstances might yield different results and this information, collected in advance, could be used to guide planning. In our experience, the value of the survey was its ability to assess support for a long-term intervention across scattered and diverse community organisations and identify specific aspects of the partnership needing attention once the intervention was underway.

## Conclusions

This study demonstrated that systematic monitoring of community support for a multi-year oral health intervention is feasible and can identify potential barriers to address while the study is underway. The methods used were low-cost, not time-intensive and did not interfere with the productivity of the community health partnership organisations.

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## References

- Cheadle, A., Beery, W., Wagner, E., Fawcett, S., Green, L., Moss, D., Plough, A., Wandersman, A. and Woods, I. (1997): Conference report: Community-based health promotion: state of the art and recommendations for the future. *American Journal of Preventive Medicine* **13**, 240-243.
- Damschroder, L.J., Aron, D.C., Keith, R.E., Kirsh, S.R., Alexander, J.A. and Lowery, J.C. (2009): Fostering implementation of health sciences research findings into practice: a consolidated framework for advancing implementation science. *Implementation Science* **4**, 50.
- Filstrup, S.L., Briskie, D., da Fonseca, M., Lawrence, L., Wandera, A. and Inglehart, M.R. (2003): Early childhood caries and quality of life: child and parent perspectives. *Pediatric Dentistry* **25**, 431-440.
- Institute of Medicine (1996): *Healthy communities: New partnerships for the future of public health*. Washington, DC: National Academies Press.
- Lasker, R.D., Weiss, R. and Miller, R. (2001): Promoting collaborations that improve health. *Education for Health* **14**, 163-172.
- Mattessich, P., Murray-Close, M. and Monsey, B. (2001): *Wilder Collaboration Factors Inventory*. St. Paul, MN: Wilder Research.
- Milgrom, P., Riedy, C.A., Weinstein, P., Mancl, L.A., Garson, G., Huebner, C.E., Smolen, D. and Sutherland, M. (2013): Design of a community-based intergenerational oral health study: "Baby Smiles." *BMC Oral Health* **13**, 38.
- National Business Coalition on Health and the Community Coalitions Health Institute (2013): *Community Health Partnerships: Tools and Information for Development and Support*. [www.nbch.org/NBCH/files/ccLibraryFiles/File/000000000353/Community\\_Health\\_Partnerships\\_tools.pdf](http://www.nbch.org/NBCH/files/ccLibraryFiles/File/000000000353/Community_Health_Partnerships_tools.pdf)
- Somerville, M.H., Mueller C.H., Boddie-Willis, C.L., Folkemer, D.C. and Grossman, E.R. (2012): *Hospital community benefits after the ACA: Partnerships for community health improvement*. Baltimore, MD: The Hilltop Institute.
- Weech-Maldonado, R. and Merrill, S.B. (2000): Building partnerships with the community: Lessons from the Camden Health Improvement Learning Collaborative. *Journal of Healthcare Management* **45**, 189-205.