

CenteringPregnancy Smiles: A Community Engagement to Develop and Implement a New Oral Health and Prenatal Care Model in Rural Kentucky

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Abstract

CenteringPregnancy Smiles™ (CPS) is a partnership between the University of Kentucky, Trover Health System, and Hopkins County Health Department. The purpose of the partnership is to: (1) establish an infrastructure to address health problems requiring research-based solutions, (2) develop a model for community partnership formation, and (3) address problems related to preterm births and low birth-weight infants and early childhood caries in a rural, seven-county region in western Kentucky. This area is below state and national norms in education level of the population, income, and oral and general health. The partnership implemented a new prenatal care model that significantly reduced preterm and low birth-weight births for participating women, thus significantly improving the infants' health while saving an estimated \$2.3 million dollars in health care costs for acute care of premature infants in this population and enabling the expansion of dental outreach services for children in Hopkins county.

Introduction

The Centers for Disease Control defines community engagement as “the process of working collaboratively with groups of people who are affiliated by geographic proximity, special interests, or similar situations with respect to issues affecting their well-being” (*Hatcher et al. 1997*). Community engagement is both a science and an art. The *science* comes from sociology, behavioral sciences, political science, cultural anthropology, organizational development, psychology, social work, and education (*Hallett et al. 2007; Lowman 1998; McLean et al. 2002; Michener et al. 2008; Robinson 2002; Wilson 2008*). The *art* comes from the ability of individuals to understand and apply the science in ways that respond to community needs through coalitions, partnerships, and collaborations. In recent years a great deal of literature has evolved providing guidance in community engagement to health professionals and community leaders.

This article will review a specific community-university engagement program—CenteringPregnancy Smiles™ (CPS) (Skelton *et al.* 2009). The partnership utilized traditional methods of outreach and engagement, including an assessment phase, planning, implementation, and evaluation of the program. The partnership was also strengthened by its multidisciplinary approach that included cooperation of oral health researchers, nurse midwives, obstetricians, dentists, behavioral scientists, health communication specialists, and agricultural extension agents. The result was a “first of its kind” program in the United States. CenteringPregnancy Smiles incorporates group-based prenatal care with oral health education and treatment to fundamentally improve the oral health status and prenatal health behaviors of pregnant women. The outcomes have improved the oral health of rural families and lowered the incidence of preterm/low birth-weight pregnancy outcomes in this community. This article describes the assessment of the problem, planning of the model, engagement and implementation processes, and preliminary outcomes of the CPS program. In addition, it reviews important steps in establishing a community-university partnership for translational science. These include establishing working interpersonal relationships with community leaders; clear, open communication as to the desired outcome of the collaboration for each partner; a formation of trust and mutual respect among the partners; and a continuing interaction among the partners during planning, implementation, and analysis of a given program.

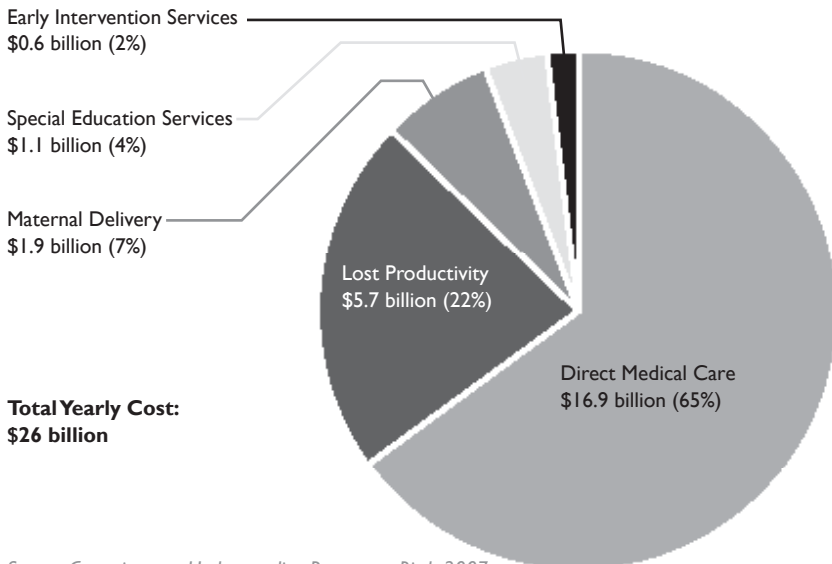
Assessment

In late 2005, a University of Kentucky faculty team, including researchers from the Center for Oral Health Research and the Division of Dental Public Health, met with health leaders in Hopkins County to discuss oral health and general health problems in their population. These discussions led to a service and research partnership among three main parties—University of Kentucky (UK), Hopkins County Health Department (HCHD), and Trover Health System (THS, a private regional clinic and hospital)—to address poor oral health, limited access to dental care, and poor birthing outcomes in the region. Preterm birth rates and low birth-weight outcomes are serious problems throughout the nation and have been increasing over the past ten years nationwide. The 2000 U. S. Surgeon General’s Report on Oral Health noted that preterm birth (PTB) and low birth-weight (LBW) deliveries are considered the leading perinatal problems in the United States (Chen 2000). PTB is defined as birth prior to thirty-seven weeks gestational

age; LBW is defined as less than 2,500 grams. Poor birth outcomes occur disproportionately in low socioeconomic groups, in certain racial/ethnic groups, and in rural areas throughout the United States (*Offenbacher et al. 1996*). Nationally, Kentucky ranks among the worst in terms of PTB/LBW. Moreover, poor, rural counties in Kentucky have an epidemic of oral disease and increased incidence of adverse pregnancy outcomes that are far worse than state norms. Several studies have shown an association between poor oral health and poor birth outcomes (*Champagne et al. 2000; Cohen et al. 2001; Jarjoura et al. 2005; Kim and Amar 2006; Offenbacher et al. 2006*). Statewide there has been a 24 percent increase in the rate of preterm births and a 22 percent increase in low birth-weight babies since 1994, giving Kentucky a high rank nationally in these unfavorable measures of health.

Hopkins County and its six surrounding counties have some of the worst birth outcomes in Kentucky. The average rate of preterm births in Hopkins County 2002–2005 was 18.2 percent, and the rate of preterm births had increased every year for ten consecutive years (*March of Dimes 2009*). The economic cost to Kentucky for each preterm birth is estimated to be approximately \$51,600 in added hospital costs for the mother and infant. The National Academy of Sciences estimated the cost of prematurity nationwide in the United States was \$26.2 billion (see figure 1) (*Committee on Understanding Premature Birth 2007*). Beyond direct medical costs,

Figure 1. Yearly Societal Economic Costs Associated with Preterm Birth, 2005



prematurity is the leading cause of infant deaths; one in four premature infants suffers lifelong disability or impairment such as cerebral palsy, mental retardation, neurological defects, developmental delay, impaired vision, and asthma.

This translational sciences study evaluated the effects of a new prenatal/oral health care delivery model, CenteringPregnancy Smiles, on birth outcomes in rural Kentucky. The model uses the CenteringPregnancy® method of group prenatal care (*Rising et al. 2004*) and provides oral health education and dental care to expectant mothers to eliminate oral infections (*Skelton et al. 2009*). All expectant mothers received a dental exam, tooth cleaning, treatment for tooth or gum infections, and a follow-up dental examination later in pregnancy to verify the absence of oral infection. While the program was initiated as a pilot demonstration project, it is now firmly established as a permanent prenatal program in the community, and over seven hundred expectant mothers have received their prenatal care in the CenteringPregnancy Smiles health care model. The expectant mothers enrolled in the program were among the most at-risk mothers in the community. Eighty percent of these mothers were on medical assistance. The population additionally had high rates of drug, alcohol, and tobacco use. Finally, this population of mothers had rates of dental infections that were three times that of the average rates in Kentucky. The CPS program dealt with all of these issues as they affect preterm births and low birth-weight babies using a group education and empowerment model to effect behavioral change. The program collected data for singleton (nonmultiple) births, as multiple births can result in PTB and LBW for other reasons. Data collected for the first 273 births in the program indicate that 19 of 273 singleton births were PTB (6.96%). This was significantly less than the 2005 singleton PTB rate in the seven-county region (14.4%). Similar improvements were seen in reducing the occurrence of low birth-weight infants, and these birth outcomes have been maintained as the program has matured into its fourth year. These results have made a large economic and social impact on pregnancy outcomes in this rural, underserved population, providing an estimated savings to the Medicaid system in the Commonwealth of Kentucky of \$2.3 million during the first two years of the program.

Formation of the Partnership

Formation of community partnerships does not happen quickly or easily. Anytime universities, state agencies, private institutions, and/or businesses form partnerships, there is typically some level

of give-and-take between partners in order to foster a successful relationship. It is very important that all partners give and receive resources to create a sustainable program. In addition, all partners must provide expertise and leadership within the project. Various community, academic, and business entities have differing organizational goals and priorities; however, community partnerships cannot be designed so that every aspect of the partnership completely supports the mission of every partner. The key elements to an optimal partnership are building trust among the partners, allowing everyone an equal voice throughout the engagement, and developing an atmosphere of mutual respect. In addition, sustainability of the project requires partners who are strongly committed to improving the health of individuals and populations within their community. Much of the success of this community engagement project can be directly linked to the commitment of all partners to the pregnant mothers in the prenatal program. When problems occurred, there was a strong commitment by all partners to solve those problems for the benefit of the mothers.

“The key elements to an optimal partnership are building trust among the partners, allowing everyone an equal voice throughout the engagement, and developing an atmosphere of mutual respect.”

Clear, open, and frequent communication is essential to community outreach and engagement partnerships, but is not easy. Successful communication is built on trust, and trust is only achieved over time. Good communication must be above all clear and open. In addition, this communication should be respectful, frequent, and face-to-face as often as is feasible. Common courtesy, as well as a few ground rules stated up front (such as “risk-taking is welcome”), will facilitate communication. Regularly scheduled times for meetings are essential. Establishing a detailed schedule is most helpful so that everyone can weave this activity into already full schedules and plan for the specific agenda. Face-to-face meetings enable the best communication and build a better working relationship among partners; however, time constraints and distance often make that difficult. Our partnership involved a community two hundred miles west of the university, so direct communications were supplemented by conference calls, which were scheduled on a regular basis at a consistent time. These conference calls occurred weekly for twelve months, then biweekly,

and then monthly as everyone in the partnership developed a better understanding of the program. Availability of videoconferencing further enhances the effectiveness of these long-distance partnerships, offering an easier way to communicate with partners in different locations.

Selection and role delineation of partners is also an important consideration in the development of engagement activities.

“Existing relationships provide a strong foundation for new partnerships.”

Existing relationships provide a strong foundation for new partnerships. UK’s College of Dentistry has partnered with numerous communities in the past. For example, in this community, UK College of Dentistry, HCHD, and THS had previously partnered to provide a mobile dental van offering dental services at local schools to serve poor, rural children in western

Kentucky. These previous and/or existing partnerships provide an underpinning of trust and a demonstration that the partners have held to commitments in the past.

Possible funding sources and funding obligations must be established as the project plan is developed. The current project resulted from a grant funded by the Health Resources and Services Administration (HRSA) to the UK Center for Oral Health Research to address health disparities in rural, underserved populations. This grant did not dictate the exact research, but rather provided funding for the development of infrastructure, including personnel, facilities, and administration that would address health problems identified by the community itself. Funding from the grant was not adequate to cover all costs involved with building a new dental clinic and hiring dental professionals and study coordinators. Additional funds were provided by both community and state partners. The university and the community partners were equal partners in this collaboration. The key community and state partners were the Hopkins County Health Department, the Kentucky Department of Public Health, and the Trover Health System. The University of Kentucky’s role as a partner is the contribution of a multidisciplinary group that includes students and faculty from the Center for Oral Health Research, the College of Dentistry, the College of Journalism and Communication Sciences, and the College of Medicine. These students and faculty contributed to the partnership by providing expert consultation, writing grants for additional funding, and preparing manuscripts for publication.

In addition to funding, UK developed the protocol for documenting the effects of group prenatal care and oral health on birthing outcomes and provided training on the CenteringPregnancy Smiles model, clinical research techniques, and dental outreach. The university also provided funding to support the data collection and research process.

The community and state partners provided funding to support the infrastructure development and funds for a portion of the research personnel. Trover Health System provided space in their OB clinic to house two temporary dental operatories and office space for a clinical research coordinator. The Hopkins County Health Department, using local and state support, provided 1,500 square feet of space for renovation in their medical facility and a new dental program, including a permanent four-chair dental clinic and an expanded dental outreach program for children.

Outcomes for Kentucky Citizens, the University, and Community Partners

Significant outcomes for the target population include improved oral health and birth outcomes, awareness of health care workers, and community pride. State spending for premature and low birth-weight births for this region has declined significantly. Further positive impacts include:

- A significant reduction in preterm and low birth-weight birthing outcomes at the Center for Women's Health. The rate of preterm births among CenteringPregnancy Smiles patients was 6.96 percent, compared to the 2005 regional rate of 14.4 percent (comparing single births only).
- An improvement in the oral health of pregnant mothers in the program.
- An empowerment of women in the community to take a more active role in their oral and general health care.
- A significant improvement in good health behaviors for mothers and their infants, including an increase in breastfeeding, a decrease in smoking, and an empowerment of these women to know more and participate in their health care decisions and treatment.
- Implementation of a countywide dental outreach program for children by incorporating oral health into ten school-based

health centers (serving Head Start and elementary school populations).

The success of this collaboration has allowed the College of Dentistry to expand its outreach research program. UK is now supporting this outreach program as well as additional pilot projects through its newly established Center for Clinical and Translational Sciences. Plans exist to establish a Kentucky Oral Health Network (KOHN) across the state in order to bring the CenteringPregnancy Smiles health care and dental outreach models to other rural areas. In addition, the university has benefited by:

- Establishing a network of health providers in Hopkins County for future collaboration
- Accessing a large patient population that enabled performing clinical and translational research
- Receiving regional and national recognition for the research activity and expanding new knowledge in the prevention of preterm and low birth-weight birth outcomes
- Increased interest from rural communities to join KOHN to develop collaborative service research partnerships

Trover Health System has benefited by:

- Receiving funds to transform their prenatal care model to a group prenatal care model, resulting in a 50 percent reduction in preterm births
- Having several clinicians become much more proficient at conducting clinical research and fulfill their desire to increase the research mission of the hospital
- Increasing awareness in the community of advances that Trover Health System is making in providing state-of-the-art prenatal care
- Receiving recognition from the national CenteringPregnancy organization as a “Best Practice” prenatal care site

Hopkins County Health Department has benefited by:

- Receiving partial funding to support a new dentist and hygienist, hired by the Hopkins County Health Department, to provide clinical care for the research effort as well as much-needed services for the community.

- Developing a much closer working relationship with the university, leading to the development of other projects. For example, the Hopkins County Health Department is currently working with UK in setting up an outreach program to provide dental prevention and dental treatment linked with the school-based health centers in Hopkins County—a direct result of the initial Centering Pregnancy with Smiles project.
- Increasing statewide recognition for providing dental and prenatal care in the community, which has led to additional support from the state of Kentucky for oral and health care for the community.

From the inception of this project, decision making has been shared between Trover Health System, the Hopkins County Health Department, and the UK College of Dentistry. This includes decisions about the type of clinical research that would be conducted and the exact methods within the protocol. Regular face-to-face visits were scheduled frequently during the first year of the project. Additionally, during twenty-four months throughout the project, conference calls were held twice a month, gathering both community leaders and local clinicians and connecting them with the UK researchers. Partners were involved in all hiring and implementation decisions. Partners were also invited to participate in all manuscript development and professional presentations. Activities of the local partnership were also meshed with state developments by close coordination with the Kentucky Department of Public Health.

In addition to the benefits to the partners, the Commonwealth of Kentucky received national recognition for creating the CenteringPregnancy Smiles program. This program led to the state of Kentucky receiving a \$2 million March of Dimes grant directed toward reducing preterm births and low birth-weight outcomes in Kentucky.

Lessons Learned and Best Practices

Over the thirty-six months of this community engagement collaboration, many lessons were learned. It was critically important that local community leaders develop ownership for the collaboration and that all partners participate equally in decision making. The single most important lesson we learned was that each partner must openly communicate its needs on an ongoing basis, for a partner's situation can change over the course of the collaboration. All partners must be able to achieve their individual mission and goals.

For example, in this program, the primary community goal was not research but rather improved health care through the implementation of a new, economically sustainable prenatal care delivery model. The university's primary goal was the creation of a research infrastructure to support clinical and translational sciences. While these two goals are not mutually exclusive, they are different in their main focus, and it was important to enable the achievement of both.

In summary, this partnership achieved the initial goals of all parties. The Center for Women's Health at Trover has achieved its goal of changing its prenatal care model in a successful effort to address the region's high rate of preterm and low birth-weight births. Single preterm births went from 14.4 percent in 2005 to 6.9 percent in 2006–7. The Hopkins County Health Department has a new dental program with a state-of-the-art dental facility staffed by a full-time dental team who provide much-needed services to the community. The university partner has increased infrastructure potential, formed a state network for translational science, and increased scholarship through a number of national presentations, abstracts, refereed publications, and new grant opportunities.

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