

# Prevention Research Centers

*Healthier Communities Together*

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## THE PREVENTION RESEARCH CENTERS PROGRAM: RESEARCHER-COMMUNITY PARTNERSHIPS FOR HIGH-IMPACT RESULTS

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• The Prevention Research Centers (PRC) Program, administered and funded by the Centers for Disease Control and Prevention (CDC), is a network of academic, community, and diverse public health partners that conducts research aimed at reducing the leading causes of death and disability. The researchers are based at schools of medicine and public health across the country; in 2011, 37 academic centers were funded. Each PRC focuses on an area of expertise (e.g., controlling obesity, preventing cancer, or enabling healthy aging). The centers analyze the effectiveness of public health policies, and produce interventions, training programs, dissemination approaches, and other strategies that align with national and global initiatives to improve public health (Ammerman, Harris, Brownson, Tovar-Aguilar, & PRC Steering Committee, 2011).

Each PRC's research is tailored to specific communities comprising largely underserved populations, such as Hispanics, older Americans, or rural residents, for whom the burden of chronic disease is greater than for the United States as a whole. The PRCs partner with members of the community that their research is intended to benefit; these partnerships give a voice to vulnerable populations not often heard in prevention research. Community members help choose research topics and assist in the research process, ensuring that real-world conditions are taken into consideration and thereby improving the contextual quality of the research. These collaborations increase the likelihood that successful research results will be appropriate for and used by the community. Other partners, including community-based organizations, health care systems, health advocacy groups, local and state health departments, and the business community, help in disseminating research results and effective programs by facilitating changes in policies, systems, and environments. These partnerships enable the results of the community research to spread well beyond the original study population. The PRC model is useful in targeting not only chronic disease but other public health problems as well, including immunization, infectious diseases such as HIV and sexually transmitted diseases, unintentional injury, and environmental health risks.

## About this Article

This entry describes the conception, growth, framework, activities, contributions, value, and vision of the CDC's PRC Program and the research centers it comprises. We convey the foresight of public health and academic leaders who recognized the need for and helped put in place a program that is both evidence-based and practical, locally focused yet globally applicable, and responsible for enhancing the capacity of present and future public health professionals as well as that of communities to address health inequities. We also describe how the structure and nature of the program have generated benefits such as a paradigm for sustainability, extensive collaboration among entities concerned with population health, and networks of subject specialists equipped to support the policy and environmental changes needed for public health and well-being. This entry is organized by the following headings:

### **Program Development**

Includes program initiation, inception of special interest projects, program evaluation, and descriptions of community-based participatory research and the National Community Committee

### **Program Structure and Activities**

Includes program framework; PRC eligibility requirements,

locations, research themes, and links to contact information; and partnerships

### **Projects**

Describes core research projects, thematic networks, and comparative effectiveness research projects

### **Training**

Includes examples of training available to medical and public health practitioners and employees, researchers, students, and youth advisory boards

### **Contributions of the Program**

Includes examples of successfully disseminated PRC programs, contributions to policy and environmental strategies, and contributions to the scientific literature

### **Program Value**

Portrays the PRC model in the context of U.S. and global public health

### **Future Directions**

Expresses the vision of the PRC Program and gives evidence of progress toward achieving that vision

Additionally, this entry is interspersed with three case studies—standalone pieces providing details on selected activities and research.

## Program Development

The PRC Program was conceived in the early 1980s, when key public health leaders recognized a need to strengthen links between schools of public health, public health practitioners, and federal public health agencies. Subsequently, Congress passed Public Law 98-551, the Health Promotion and Disease Prevention Amendments of 1984, which directed CDC to develop a network of academic centers to conduct “research and demonstration projects in health promotion, disease prevention, and improved methods of appraising health hazards and risk factors” and to serve as “demonstration sites for the use of new and innovative research in public health techniques to prevent chronic diseases.” The law further stipulates “an equitable geographical distribution of centers... among areas containing a wide range of population groups which exhibit incidences of diseases which are most amenable to preventive intervention,” a provision that laid the groundwork for diverse community engagement.

### Initial Advancements

Following a competitive peer-review application process, the PRC network began research in 1986 as three centers located at the University of North Carolina at Chapel Hill, University of Texas Health Science Center at Houston, and University of Washington. Early research laid the groundwork for some of the program’s most widely disseminated evidence-based programs, such as CATCH, a school-based physical activity and nutrition program (see third case study below); PEARLS, a treatment program for older adults with depression (see Table 2); and EnhanceFitness, a physical activity program for older adults (see Table 2). The North Carolina PRC began development of A New Leaf (Ammerman, Keyserling, Atwood, Hosking, Zayed, & Krasny, 2003; Keyserling, Samuel-Hodge, Jilcott, Johnston, Garcia, Gizlice, et al., 2008), a nutrition and physical activity intervention that was adapted and adopted by CDC’s WISEWOMAN program, a cardiovascular disease prevention program for low-income women. A New Leaf forms the basis of the interventions being tested by the North Carolina PRC in the 2010-2012 PRC Comparative Effectiveness Research Program (see heading below).

Throughout the 1990s, additional funding was appropriated for the PRC Program, and after additional competitive peer reviews, the network grew to 23 centers by 2000. During this period, seven PRCs conducted research for the Women’s Health Initiative, a project of the National Institutes of Health (NIH). The PRCs were the community prevention arm of the initiative, which focused on strategies for preventing heart disease, breast and colorectal cancer, and osteoporosis in postmenopausal women. The centers designed and tested interventions and developed

evaluation methods concerning the health needs of primarily minority women. These needs included cardiovascular risk reduction, osteoporosis prevention, physical activity, diabetes management, hysterectomy, and hormone replacement therapy. The PRC project produced more than 50 research and assessment tools (such as surveys, rating scales, focus group guides, and log books) and more than twenty training guides and instructional materials (Environmental Health Promotion, 2004).

### Special Interest Projects

The success of the NIH/PRC collaboration on the Women’s Health Initiative contributed to the establishment of a formal mechanism through which PRCs could conduct research for federal agencies. In 1993, the program introduced special interest projects (SIPs), which allow all government entities to sponsor research conducted by the PRCs. Through this mechanism, a sponsoring agency outlines broad goals for a project and publishes a request for research proposals that could meet those goals. Proposals may be submitted by PRCs only. Grantees are selected through a peer-review process, and the project is funded for one to five years.

One notable example of a SIP began in 2004 at the PRCs at the University of Colorado Denver and the University of Michigan to allow federal policymakers to gain input from the medical community. For this SIP, the CDC Immunization Services Division funds PRC researchers to help CDC understand health care providers’ attitudes about national immunization policies. As vaccine supplies change, new vaccines are developed, or urgent situations such as the H1N1 outbreak arise, the researchers survey pediatricians, family practitioners, and general internists about their concerns and experiences. Policymakers use data from the surveys in making vaccination recommendations and in developing strategies to improve immunization coverage.

### Institute of Medicine Review

In 1995, as the PRC Program approached its tenth anniversary, CDC asked the Institute of Medicine (IOM) to examine how well the program was working. The IOM established a 10-member committee, which published a review of the program, noting achievements and proposing an agenda for the next 10 years. In *Linking Research and Public Health Practice: A Review of CDC’s Program of Centers for Research and Demonstration of Health Promotion and Disease Prevention* (Stoto, Green, & Bailey, [Eds.], 1997), the committee concluded that the program’s successes were “genuine and important.” The committee noted several achievements, including the PRCs’ training of public health professionals; close linkages of centers and communities, illustrated

by the Columbia University PRC's collaboration with the Harlem community; and the PRCs' ability to leverage the government's investment in research projects by the development of successful proposals for additional projects funded by many sources (see **Leveraging Core Funding** below).

The committee also stated that compared with other research programs in health promotion and disease prevention, the PRC Program was unique in its focus on communities and that this focus added value to the program. The report said there was a special need for CDC to nurture this approach, and that CDC should use the program to advance the science of community-based research. The committee recommended that the program increase interactions with state and local health departments and develop strategies to involve community representatives in all phases of research and demonstration activities. Additionally, the committee recommended that the program strengthen collaborative networks among the PRCs and that the program be reassessed at a later time (see **Blue Ribbon Panel** below).

### **Engagement of Communities**

In response to the IOM report, the PRC Program's 1998 Request for Applications (the announcement that academic institutions may apply or reapply to be part of the PRC network) specified for the first time that applicants demonstrate community engagement in research. The centers were required to create boards, committees, or coalitions comprising community members to advise the researchers about community needs and desires related to research. Over time, this approach evolved into community-based participatory research (CBPR), which involves researchers and community representatives as equal partners in all phases of research. CBPR, by including local knowledge, helps researchers understand the health problems in the community of focus. In addition, CBPR engages community members in helping with intervention design and dissemination (Israel, Schulz, Parker, & Becker, 1998).

### **National Community Committee**

Researcher-community relationships were again strengthened in 1999 after two PRC community representatives were invited to participate in the annual meeting of the PRC directors (each center is led by an academic director or principal investigator). No community representatives had attended a directors' meeting before. At this meeting, the representatives suggested that standards and expectations related to community members' PRC involvement be established both locally and nationally. This interaction led to the creation of the National Community Committee (NCC), which held its first official meeting in 2002. The NCC is made up of representatives from each PRC's community

committee or board. The NCC promotes equality in researcher-community relations across the network and helps community representatives share resources, knowledge, and skills. NCC members have received training in research methods and in evidence-based public health research. In 2003, the nonprofit education and health advocacy group Research!America conducted a workshop for the NCC to increase members' knowledge and skills. And in 2006, the St. Louis PRC collaborated with the NCC on a training project that helped members understand the concepts, language, and processes used in public health research. NCC members use what they learned to enhance communities' participation in research and to promote changes in health policy (White-Cooper, Lewis, Green-Moton, Grunbaum, & Gray, 2009). A booklet capturing the NCC's wide range of activities and impact was published in 2008 (Centers for Disease Control and Prevention [CDC], 2008).

### **Project DEFINE**

In further response to the IOM recommendations, in 2001 the PRC Program began a two-year evaluation called Project DEFINE (Developing an Evaluation Framework: Insuring National Excellence) (Wright, Anderson, Brownson, Gwaltney, Scherer, Cross, et al., 2008). PRC directors, researchers, community partners, CDC leadership, CBPR experts, and other stakeholders formed a collaborative evaluation design team to create a national logic model showing how the PRC Program is intended to improve public health. The model includes the inputs, activities, outputs, and outcomes that are common to all PRCs. Each PRC also creates a center-specific logic model, using the national model as a guide. The national model was developed using concept mapping, which is a conceptualization process that yields a visual representation of relationships among ideas (Anderson, Gwaltney, Sundra, Brownson, Kane, Cross, et al., 2006). The design team developed questions to generate ideas about the PRC Program's purpose and function and used those questions to gather input from nearly 300 diverse local and national stakeholders. The team sorted the ideas into themes and used multivariate statistical analyses to generate one national and one local PRC Program concept map. (See Anderson et al., 2006, for interactive images of the concept maps.) These maps became the basis of the program's national logic model, which helps ensure PRC Program accountability and helps guide program improvement.

## Blue Ribbon Panel

In 2008, CDC asked the Association of Schools of Public Health to take the lead in convening a panel of external experts to review the PRC Program. In a report summarizing its assessment, the panel found the program's response to the IOM recommendations "effective." The report said the program had made significant progress in adopting the recommendations; for example, the PRCs had been aggressive in fully integrating CBPR and other community-based approaches into their guiding principles and practices. The report noted that other recommendations regarding information sharing and communication practices had been implemented as well. The panel said the PRC Program had made "significant contributions to the science and

practice of public health" but that the program's capacity for research was not yet fully realized. The panel cited several instances of PRC collaboration with state and local health departments and other agencies, and suggested even stronger ties. Similarly, the report said that collaboration among the PRCs successfully leveraged the strengths of the centers, but that these networking opportunities could be enhanced. The report also called for increased funding, improved procedures in reporting requirements, and improved communication of PRCs' achievements to the public health science and practice communities, academia, and the general public (Association of Schools of Public Health, 2008).

## Program Structure and Activities

The administrative hub of the PRC Program is in the CDC's National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health, in Atlanta, Georgia. A PRC Program office provides assistance with the fiscal management of federal dollars allotted to each PRC, monitors PRCs' progress, evaluates the national program, facilitates networking across PRCs, disseminates research results, promotes the use of proven interventions by additional communities, maintains a program website ([www.cdc.gov/prc](http://www.cdc.gov/prc)), and educates new and potential partners about the program.

When CDC issues a new funding announcement for the program (now about every five years), academic institutions compete to be funded as a PRC and are chosen in a peer-review process modeled after that used by NIH. Each PRC is managed through a cooperative agreement, which allows CDC research and programmatic staff to advise researchers and provide technical assistance. Schools of public health and schools of medicine or osteopathy with an accredited residency in preventive medicine may apply to host a PRC if they have the following capacities (as stated in Public Law 98-551):

- ▶ Multidisciplinary faculty with expertise in public health and working relationships with relevant groups in such fields as medicine, psychology, nursing, social work, education, and business
- ▶ Graduate training programs relevant to disease prevention
- ▶ Core faculty in epidemiology, biostatistics, social sciences, behavioral and environmental sciences, and health administration
- ▶ Demonstrated curriculum in disease prevention

For the 2010–2014 funding cycle, CDC introduced two categories of centers: comprehensive and developmental.

Some academic institutions competed to become developmental centers because they are in the early stages of building the community relationships and developing the infrastructure needed to perform quality research. Other academic institutions, such as those previously funded as PRCs, competed to be funded as comprehensive PRCs because they already have the needed organizational infrastructure, community relationships, and plans in place for a core research project. Existing centers must re compete along with new applicants each time CDC announces another funding cycle.

## Locations and Themes

Each PRC focuses its core research on a public health issue of concern to particular communities. A list of the current centers and core research topics is available on the PRC Program website. The website also has a map showing the current distribution of PRCs across the country, as well as several previously funded centers. This map also links to center profiles that contain the website and contact information for each center.

## Partnerships

In addition to their community collaborators, PRCs work with a wide variety of other partners.

### Government Agencies

Among the most important partners are local and state health departments, which contribute to the PRCs' research and education work, and to which the PRCs render many services. For example, the North Carolina PRC is collaborating with state public health workers to implement and evaluate projects to improve access to healthy foods at corner stores and farmers markets. This work is conducted through a Community Transformation Grant (CTG), a federal program supporting community efforts to reduce chronic

diseases. In another project under the CTG program, the University of Rochester PRC is working with local health department officials on strategies to improve cardiovascular health in the deaf community and in the inner city of Rochester, New York, which has a particularly high concentration of deaf residents because of area schools for students who are deaf.

Centers also collaborate with other government entities, such as boards of education and departments of transportation. Most PRCs partner with one or more Federally Qualified Health Centers (FQHCs), which are designated by the U.S. government to provide care for a medically underserved population. For example, the University of Arizona PRC subcontracts with two FQHCs in studying the impact of community health workers' advocacy activities on circumstances, such as socioeconomic status, that can affect health. In another example, researchers at the Texas A&M Health Science Center PRC provide grant writing, evaluation, and program design and implementation assistance for two FQHCs, which increases the FQHCs' capacity to secure funds and offer effective health programs.

Most centers team with government agencies in their state, but interstate collaborations are also fruitful. In 2000, the Harvard University PRC in Massachusetts joined with Maine health officials to create a new center focusing on the statewide problem of childhood obesity. The collaboration led to the establishment of the Maine-Harvard Prevention Research Center (MHPRC), now a partnership of the Harvard PRC, the Maine Department of Health and Human Services, and the University of New England Center for Community and Public Health. MHPRC research results led to a statewide ban in 2007 on advertising of unhealthy snacks on school property. Furthermore, MHPRC-sponsored conferences prompted advocacy that helped lead to a 2009 state law requiring calorie labeling on menus of chain restaurants in Maine. The partnership also led to the establishment of the Maine Youth Overweight Collaborative, an intervention to improve clinical and family management of risk behaviors for childhood obesity (Polacsek, Orr, Letourneau, Rogers, Holmberg, O'Rourke, et al., 2009).

### **Nongovernmental Organizations**

PRCs also ally with nongovernmental organizations. For example, the Harvard PRC works with the YMCA of the USA to develop youth nutrition and physical activity guidelines for after school programs. PRC researchers also evaluated the incorporation of the guidelines into after-school programs at YMCAs in several states and found significant improvements in the healthfulness of snacks served and the physical activity levels of children (Gortmaker, Lee, Mozaffarian, Sobol, Nelson, Roth, et al., 2012; Mozaffarian, Wiecha, Roth, Nelson, Lee, & Gortmaker, 2010).

Researchers often evaluate programs for or develop interventions with disease-specific health associations such as the American Cancer Society and the American Lung Association. The University of Washington PRC has worked with the American Cancer Society to develop and test two workplace programs to promote evidence-based practices that are recommended by *The Guide to Community Preventive Services* (see **Core Research Projects** below) and aimed at increasing cancer screening, healthy eating, physical activity, and smoking cessation. The first, called Workplace Solutions, targets large employers who may contract out their workplace wellness programs to third-party wellness companies (Harris, Cross, Hannon, Mahoney, Ross-Viles, & Kuniyuki, 2008). As of August 2011, nearly 1,400 employers across the country having a combined total of 2.5 million employees had used Workplace Solutions. The second program, called HealthLinks, targets small employers (20–250 employees) who have very limited resources and may not be able to contract out their programs. These companies employ predominantly low-wage workers who are at high risk for chronic disease yet unlikely to have health insurance. HealthLinks provides much more hands-on assistance than Workplace Solutions does in conducting educational talks and workplace physical activity programs and has reached more than 1,000 employers in Arizona, Colorado, New Mexico, Utah, and Washington.

In other collaborations, centers may partner with worker organizations; in one instance, the University of South Florida PRC worked with a farmworkers group to develop an eye safety program for citrus pickers (Monaghan, Forst, Tovar-Aguilar, Bryant, Israel, Galindo-Gonzalez, et al., 2011). Health care organizations such as health maintenance organizations and hospitals work closely with some PRCs' research. The Yale PRC, for example, is based in a hospital. Because policies in agriculture, transportation, housing, and economic development can affect public health, stakeholders in these sectors are encouraged to join in PRC research. An illustration of multisectoral collaboration involves the Case Western Reserve University PRC, the YMCA of Greater Cleveland, Cleveland's health department and school district, and the Rite Aid Cleveland Marathon. The partners formed the We Run This City initiative, aimed at teaching young people to increase their fitness and endurance and to set and achieve goals by preparing to run in a marathon (Borawski, Taylor, Kofron, Danosky, Brackett, Estes, et al., 2010).

### **Services Provided**

PRCs provide many services to their partners, which in turn benefits the centers' research. Partners may request evaluation or technical assistance in implementing health promotion strategies; for example, the New Mexico PRC is helping the rural town of Cuba, New Mexico, use evidence-

based approaches (adapted from recommendations in *The Guide to Community Preventive Services* [see **Core Research Projects** below]) to create a program to increase physical activity in the community. As the program progresses, the researchers will use what they learn to create a dissemination guide for rural areas that are looking for effective ways to increase physical activity. Centers also may perform surveillance work with partners. An illustration is work by Boston University PRC researchers with city and state health agencies to create surveillance methods for collecting health information from people living in public housing.

Data showed that compared with other city residents, public housing residents had poorer health (e.g., greater prevalence of obesity, diabetes, and hypertension) but were less likely to engage in binge or heavy drinking (Digenis-Bury, Brooks, Chen, Ostrem, & Horsburgh, 2008). The results were made available so that decision-makers could focus attention on public housing residents' most prevalent health needs. In other collaborations, center staff may serve on advisory boards of health or service agencies in their community, just as community members serve on the advisory boards of PRCs.

## Projects

### Core Research Projects

Each PRC conducts at least one core research project that reflects the center's main research focus. Many projects address obesity, poor nutrition, and inadequate physical activity, factors that contribute to many of the leading causes of death in the United States, including heart disease, stroke, diabetes, and some types of cancer. Other research projects address tobacco use cessation and control, and prevention of HIV/AIDS, sexually transmitted diseases, and teenage pregnancy.

Interventions tested by the PRCs are regularly reviewed by organizations and agencies that seek out and list effective strategies for use by practitioners. Databases that list PRC interventions include

- ▶ Research-tested Intervention Programs (sponsored by the Substance Abuse and Mental Health Services Administration [SAMHSA] and the National Cancer Institute)
- ▶ National Registry of Evidence-based Programs and Practices (a service of SAMHSA)
- ▶ Cochrane Reviews (systematic literature reviews by an international collaborative of experts in health care and research methodology)
- ▶ Center of Excellence for Training and Research Translation (see **Translation and Dissemination** below)

Applicants for PRC funding are encouraged to identify and propose evidence-based interventions in these and other databases for translation and dissemination research.

Many PRCs tackle topics addressed in *The Guide to Community Preventive Services* (*The Community Guide*), a resource that summarizes knowledge about the effectiveness,

economic efficiency, and feasibility of community health interventions. Some PRCs address issues designated by *The Community Guide* as questions for further study. Other centers modify *The Community Guide*-recommended strategies for new populations. In one project, members of the National Community Committee (see heading above) received training in adapting physical activity interventions for use in racial or ethnic minority communities. The members then adapted five approaches recommended by *The Community Guide* for use in their own communities. In another project, the PRC in St. Louis drew on the methodology of *The Community Guide* to conduct a review of physical activity interventions in Latin America. The review included literature from the Americas in Portuguese, Spanish, and English, and identified school physical education as a strongly recommended strategy for Latin American populations. The reviewers also highlighted a need for rigorous studies of physical activity interventions in Latin America (Hoehner, Soares, Perez, Ribeiro, Joshi, Pratt, et al., 2008). (See Project GUIA under **Leveraging Core Funding** below.)

PRC researchers often partner with faculty outside of the PRC to form multidisciplinary collaborations. At the Texas A&M PRC, researchers work with the Department of Environmental and Occupational Health to design and test "standing desks" for school-aged children. Use of these desks is believed to improve attendance and attention in the classroom and to increase energy expenditure throughout the school day (Benden, Blake, Wendel, & Huber, 2011). The project is supported by a CDC grant funded through the Small Business Innovation Research program, a federal program coordinated by the Small Business Administration, which encourages research of commercial potential.



## Case Study – Not on Tobacco (NOT)

In the mid-1990s, the PRC at West Virginia University formed a partnership with the West Virginia health and education departments, the Coalition for a Tobacco-Free West Virginia, and the American Lung Association (ALA) to develop Not on Tobacco (NOT), a smoking cessation program for teenagers. NOT consists of ten 50-minute, gender-specific group sessions led by trained facilitators, usually in schools during school hours. The sessions, conducted in small groups of no more than 12 teens, focus on motivation, stress management, the effects of smoking, preparing to quit, relapse prevention, dealing with peer pressure, media awareness, support networks, and healthy lifestyles. The program includes group activities, journaling, role-playing, and discussions.

NOT was rigorously evaluated in six studies conducted in West Virginia, Florida, and North Carolina. A review of these studies compared data from 44 schools that had enrolled smokers into NOT with data from 44 matched schools that had offered a standard intervention instead (15 minutes of advice to quit). Among the 1,131 youths who participated, findings showed the NOT program to be more effective; the quit rate was 15% for NOT enrollees and 8% for students who received only the standard intervention ( $p < 0.01$ ). Multivariate analysis showed a nearly twofold greater quit rate among NOT participants ( $OR = 1.89$ ,  $p = 0.003$ ) (Horn, Dino, Kalsekar, & Mody, 2005).

Even among participating teens who continued to smoke, NOT enrollees smoked significantly fewer cigarettes per day than their peers. In studies that included measurement of addiction, NOT appeared to be effective among highly addicted smokers as well as among teens in a broad range of stages of change. Less rigorous evaluations of field-based NOT programs that included 4,568 youths similarly showed success; the overall reported quit rate was 26 percent (Horn et al., 2005). Follow-up surveys showed that participants enjoy the sessions (96 percent) and find them relevant and helpful for quitting smoking (>80 percent). Facilitators reported that the facilitator training is helpful and that the program is highly worthwhile and compatible with school policies.

Given NOT's effectiveness and feasibility, the ALA began disseminating NOT in the late 1990s. The ALA trains facilitators and produces, packages, disseminates, and tracks participation in NOT, while the PRC provides scientific oversight, technical assistance, data management, and evaluation. Since 2009, the ALA has maintained a website, developed with the PRC, to support training and dissemination of NOT.

More than 150,000 teens in 48 states have participated in NOT. The intervention has been deemed effective by the National Registry of Evidence-based Programs and Practices and is listed on the Substance Abuse and Mental Health Services Administration's Model Programs website.

### Leveraging Core Funding

A key strength of the PRCs is the ability to leverage resources—that is, to use funds received from CDC to build expertise and thereby attract additional funding from other potential partners for an expanded research portfolio. In 2010, for every \$1 the centers received in direct core funding, they leveraged on average \$5.38 from other sources for SIPs (described under **Special Interest Projects** above) and other research. Sources include other CDC programs and divisions, NIH, other federal agencies, state and local agencies, and foundations.

Because SIPs allow wide access to the PRC network's expertise, the program sometimes has global reach. Under SIPs conducted by the PRCs in St. Louis and San Diego, researchers are working with colleagues in Brazil (Project GUIA) (Pratt, Brownson, Ramos, Malta, Hallal, Reis, et al., 2010) and Mexico (Project GOL) developing and scaling up evidence-based strategies to increase physical activity in the United States and collaborating countries. GUIA researchers also evaluated a community physical activity program in Recife,

Brazil, and found it effective; subsequently, the Brazilian Congress approved a budget item facilitating nationwide use of the program.

Under two other SIPs, PRC researchers at the University of Washington and Columbia University are working with local and national health officials in African countries and in India as part of the President's Emergency Plan for AIDS Relief (PEPFAR). The researchers are training colleagues in Africa and India, developing research facilities, and helping health care systems increase efficiency and use international aid effectively. Another SIP, awarded to the University of North Carolina PRC in 2001, allowed CDC researchers to work with university researchers in Malawi on HIV research. The project found that antiretroviral drug regimens are effective in preventing HIV transmission through breast milk (Chasela, Hudgens, Jamieson, Kayira, Hosseinipour, Kourtis, et al., 2010). The results contributed to new World Health Organization recommendations on breastfeeding by HIV-positive mothers living in low-resource settings.

## Thematic Research Networks

PRC thematic networks are a type of SIP that enables multiple centers to collaborate in research on a specific health issue. The networks emphasize dissemination of evidence-based strategies and translation of strategies for new populations. Centers began collaborating in thematic networks in the 1990s; early topics included school health, oral health, and control and prevention of tobacco use. Currently, five thematic networks are active on the following topics:

- ▶ **Cancer Prevention and Control Research** (since 2003)  
Research focuses primarily on disseminating, implementing, and evaluating cancer prevention strategies recommended by the Task Force on Community Preventive Services. This thematic network includes collaboration with cancer divisions from CDC and the National Cancer Institute (Harris, Brown, Coughlin, Fernandez, Hebert, Kerner, et al., 2005).
- ▶ **Epilepsy Self-Management** (since 2007)  
Members work to promote epilepsy self-management research and improve the quality of life for people with epilepsy by developing and adapting interventions for this population (Dilorio, Bamps, Edwards, Escoffery, Thompson, Begley, et al., 2010).
- ▶ **Nutrition and Obesity Policy Research** (since 2009)  
This network conducts policy research and evaluation within topical working groups that focus on subjects such as access to drinking water and to healthy food in rural areas. The network designs studies, implements data collection, and disseminates findings to public health agencies, policymakers, and others.
- ▶ **Physical Activity Policy Research** (since 2003)  
Researchers address physical activity policy across local, state, and national levels and work to make physical activity a priority in settings such as schools and workplaces.
- ▶ **Healthy Aging Research** (since 2002) See case study.

## Case Study – Healthy Aging Research Network (HAN)

Funded by CDC's Healthy Aging Program, this thematic network focuses on strategies for keeping older adults healthy and independent and helping those adults who have chronic disease manage their condition and avoid complications (The Healthy Aging Research Network Writing Group, 2006). In the HAN, nine PRCs collaborate with a range of external partners, including

- ▶ CDC's Division of Nutrition, Physical Activity and Obesity
- ▶ AARP (formerly American Association of Retired Persons)
- ▶ Administration on Aging
- ▶ Alzheimer's Association
- ▶ American Medical Association
- ▶ Easter Seals
- ▶ Environmental Protection Agency
- ▶ Health Foundation of South Florida
- ▶ National Association of Chronic Disease Directors
- ▶ National Council on Aging

The HAN develops, tests, and implements evidence-based interventions and tools for promotion of physical and mental well-being in older adults, such as an environmental audit tool and protocol for assessing the walkability of streets and communities. The tool supports assessment of environmental factors that may influence the likelihood of older adults walking. When used with a photo audit, observers may gain the detail necessary to specify desirable changes to the walking environment. To plan a neighborhood walkability program (Walk Wise, Drive Smart), officials in Hendersonville, North Carolina, used the HAN audit tool to assess walking conditions in 10 neighborhoods, and complemented the data with a series of neighborhood meetings and interviews with residents. The results pointed to the need to provide walking programs for people at different levels of fitness and to improve pedestrian facilities (e.g., sidewalks, crosswalks, traffic signals) to reduce walking hazards for older adults.

The HAN and its partners also survey and review interventions, tools, and policies relating to older adults in use across the country. Results are made available to practitioners, researchers, service providers, and policymakers via web-based databases, publications, and periodic symposiums. Additionally, the network publishes and distributes reports and online modules that present new strategies, practical ideas, and helpful tools for practitioners. For instance, in 2009, the HAN and partners sponsored a symposium about promotion of environmental and policy changes to support healthy aging. More than 150 practitioners, academicians, advocates for livable communities, and professionals in business, planning, engineering, and recreation attended. The symposium helped lead to the development of a searchable online database of tools and resources on topics such as livable communities, transportation, older pedestrians and drivers, and rural issues.

The network also contributes to the scientific literature; it has been responsible for dozens of scientific journal articles and chapters, special journal issues, reports, and webinars. A summary of the HAN's accomplishments is available at [www.cdc.gov/prc/pdf/han-booklet.pdf](http://www.cdc.gov/prc/pdf/han-booklet.pdf).

## Comparative Effectiveness Research

In 2010, the PRC Program received funding through the 2009 American Recovery and Reinvestment Act to support comparative effectiveness research (CER), which compares health treatments, interventions, and strategies to enable clinicians, policymakers, and the public to decide on the best approaches to improve health. The PRC Program administers four two-year CER projects to compare the benefits and harms of different public health strategies to prevent disease and disability and promote health in populations. Comparative effectiveness has most often been used in research comparing two or more treatment options in a clinical setting. An example of public health CER, however, is comparing two or more strategies to help people quit smoking; knowing which strategy works best for specific groups of people can help policymakers choose the most appropriate strategy for a population. The four PRC grantees and their CER topics are listed at right.

## Training

Training is considered a key element of PRCs. Applicants to the PRC network submit evidence of previous training of, technical assistance to, and mentoring of community partners, practitioners, researchers, and students, and a training plan that reflects the mission of the PRC. Because PRCs connect academic study and community application of research results, PRCs are uniquely positioned as a resource for public health training. The centers offer more than 100 formal training programs; in 2010 these programs served nearly 9,500 people. The PRC Program maintains an online catalog ([www.cdc.gov/prc/training](http://www.cdc.gov/prc/training)) of selected courses offered or sponsored by the centers and some of their affiliates. Courses listed in the catalog are designed for public health practitioners, public health advocates, or students, and some courses serve multiple audiences (see Table 1 for selected examples). Several of the PRCs' courses (Evidence-Based Public Health Training, Physical Activity and Public Health Practitioners Course, and Social Marketing) are made available through the CARMEN initiative, a program of the Pan American Health Organization that promotes community-based chronic disease prevention programs in Latin American and Caribbean nations.

Centers also conduct numerous specialized medical and public health trainings for medical practitioners, public health employees, researchers, and members of the general public. For example, the Robert Wood Johnson Clinical Scholars Program, available at the Michigan, UCLA, and Yale PRCs, is a two-year post-residency course for young physicians that focuses on training in the non-biological sciences. The program aims to integrate the physicians' previous clinical training with skills in program development and research methodology to help them

- ▶ **University of North Carolina at Chapel Hill:** Reducing risk of cardiovascular disease by changing behaviors and encouraging appropriate use of medication through a web-based versus a counselor-based program
- ▶ **University of Pittsburgh:** Preventing falls among older adults through usual care, an education program, or an education-plus-exercise program
- ▶ **New York University School of Medicine:** Reducing blood pressure and colorectal cancer among African-American men by encouraging behavioral changes, guiding them through the health care system, or using a combination of the two approaches
- ▶ **Oregon Health & Science University:** Detecting diabetic retinopathy among American Indians and Alaska Natives through eye examinations by traditional means (in eye care providers' offices) or by telemedicine

tackle issues in public policy, community health, and health services research.

All PRCs are expected to train students through research assistantships, independent study, practicums, internships, fellowships, or other activities to ensure adequate training of the next generation of public health professionals. The centers train or mentor more than 1,000 students from high school to postdoctoral levels per year, nearly 800 of which are at the graduate level or higher (2010 data). As an example, the University of Kentucky PRC hosts an elective rotation on rural cancer research for family medicine and preventive medicine residents at the University of Kentucky's College of Public Health. In another example, a PRC Minority Fellowship, conducted from 2002-2012 in collaboration with the Association of Schools of Public Health, selected doctoral-level students of ethnic or racial minority origin for two years of training and guided research at a PRC. Forty-two fellows were mentored by researchers and community participants as they conducted research with the center's partnering community.

Several PRCs— Harvard, Johns Hopkins, Minnesota, Texas/Houston, and UCLA— work with youth advisory boards. Here, education works both ways. The young people, through their interactions with researchers, learn about health issues and help make meaningful decisions about real world research, and the researchers gain insights into ways to make their research relevant to youth. The Youth Advisory Group at the University of Texas Houston PRC, made up of middle and high school students, gives researchers advice about social media advocacy and other teen issues that relate to the PRC's work on preventing sexually transmitted diseases and unintended pregnancy

among teenagers. Members of the UCLA PRC's Youth Advisory Board learn public presentation, interviewing, community research, and other leadership skills, and

then use these skills to give feedback on surveys, focus group protocols, interventions, and methodology used in research projects.

**TABLE 1—SELECTED EXAMPLES OF PRC TRAINING**

Training Title	PRC	Description
Evidence-Based Public Health Training	St. Louis University and Washington University in St. Louis	A 2 ½- to 4 ½-day course that focuses on skills to improve public health practice among public health employees who do not necessarily have a public health background. The course has been replicated in 12 states and 7 countries and has been extensively evaluated (Baker, Brownson, Dreisinger, McIntosh, & Karamehic-Muratovic, 2009; Brownson, Diem, Grabauskas, Legetic, Potemkina, Shatchkute, et al., 2007; Dreisinger, Leet, Baker, Gillespie, Haas, & Brownson, 2008).
Physical Activity and Public Health Practitioners Course Physical Activity and Public Health: A Postgraduate Course on Research Directions and Strategies	University of South Carolina	The 6-day practitioners course helps public health practitioners create a logic model for evidence-based efforts to improve health through physical activity (Brown, Pate, Pratt, Wheeler, Buchner, Ainsworth, et al., 2001). The course started in 1996 and has trained almost 400 people. An accompanying postgraduate course on research started in 1995 and has trained almost 500 people. In 2011, a special edition of the <i>Journal of Physical Activity and Health</i> featured 16 original research papers written by alumni of the postgraduate course (Brown, Gay, Pratt, & Pate [Eds.], 2011).
Social Marketing Field School, Public Health Training Workshops, and Public Health Graduate Certificate	University of South Florida	The field school is a selection of 5-day courses in social marketing for students and public health professionals. The training workshops are designed for practitioners in state and local health departments across the country. The graduate certificate is a 6-course 18-credit hour program for experienced Masters-level public health professionals who want to develop, implement, and evaluate social marketing programs.
Continuing Education <i>Promotores</i> Certificate Program	San Diego State University (with University of California at San Diego)	A 2-part bilingual course for Spanish-speaking community health workers (CHWs). The PRC also offers an annual training conference for Spanish-speaking CHWs.
Obesity Prevention in Public Health: Translating Intervention Research into Practice	University of North Carolina at Chapel Hill	A 5-day training course for public health practitioners offering strategies for public policy and environmental change in states and communities.

A catalog of offerings by PRCs is available at [www.cdc.gov/prc/training](http://www.cdc.gov/prc/training).

## Contributions of the Program

### Translation and Dissemination

In addition to the training, technical assistance, and research support (such as surveillance) the PRCs offer to numerous entities across the country, the PRCs significantly contribute to developing the field of public health research. By working with partners, the PRCs develop and disseminate evidence-based interventions, and test modifications of interventions for translation to different populations or settings. Interventions are developed for use in diverse settings, including homes, community centers, clinical sites, schools, child care venues, churches, and work sites, and they may be tailored for specific cultural groups (such as urban, rural, African-American, Hispanic). Interventions developed cover a wide variety of ages from infant to old age, and health topics from arthritis to teen pregnancy.

To enhance efforts to identify, modify, test, and disseminate interventions that target obesity, the North Carolina PRC established the Center of Excellence for Training and Research Translation. This program, funded as a SIP (see **Special Interest Projects** above) by CDC's Division of Nutrition, Physical Activity and Obesity, aims to extend the reach, improve the effectiveness, and strengthen the adoption of interventions in real-world settings (Leeman, Sommers, Leung, & Ammerman, 2011). See Table 2 for other examples of PRCs' research, dissemination, and translation work.

**TABLE 2—SELECTED PRC-DEVELOPED PROGRAMS**

<b>Program</b>	<b>PRC</b>	<b>Description</b>
CBITS (Cognitive Behavioral Intervention for Trauma in Schools)	University of California at Los Angeles	An intervention to reduce symptoms of post-traumatic stress disorder, depression, and behavioral problems in fifth- to twelfth-grade students who have witnessed or experienced traumatic events such as violence, abuse, or injuries (Stein, Jaycox, Kataoka, Wong, Tu, Elliott, et al., 2003).
EnhanceFitness	University of Washington	An exercise program effective for improving strength, balance, flexibility, and heart health in older adults (Ackermann, Cheadle, Sandhu, Madsen, Wagner, & LoGerfo, 2003; Belza, Shumway-Cook, Phelan, Williams, Snyder, & LoGerfo, 2006; Wallace, Buchner, Grothaus, Leveille, Tyll, LaCroix, et al., 1998). Also effective for helping people with arthritis; one of 6 evidence-based physical activity programs the CDC Arthritis Program includes on its menu of approved interventions.
EnhanceWellness	University of Washington	A motivational intervention designed to help participants with challenges such as depression, weight control, and chronic disease management (Fitts, Won, Williams, Snyder, Yukawa, Legner, et al., 2008).
It's Your Game: Keep It Real	University of Texas Health Science Center at Houston	A classroom- and computer-based program for middle school students that helps reduce sexually transmitted diseases and unintended pregnancy among teenagers (Tortolero, Markham, Peskin, Shegog, Addy, Escobar-Chaves, et al., 2010).
NAP SACC (Nutrition and Physical Activity Self-Assessment for Child Care )	University of North Carolina at Chapel Hill	Aims to improve nutrition and physical activity environments, policies, and practices in child care centers through self-assessment and technical assistance (Ammerman, Ward, Benjamin, Ball, Sommers, Malloy, et al., 2007; Benjamin, Ammerman, Sommers, Dodds, Neelon, & Ward, 2007).
<i>Pasos Adelante</i>	University of Arizona	A chronic disease prevention program, led by community health workers, that includes walking groups and educational sessions on nutrition, physical activity, and other risk factors; designed for Mexican Americans living on the U.S.-Mexico border (Staten, Scheu, Bronson, Peña, & Elenes, 2005).
PEARLS	University of Washington	A low-cost program, consisting of 6 to 8 sessions in the participant's home, that reduces depression in older adults (Ciechanowski, Wagner, Schmaling, Schwartz, Williams, & Diehr, 2004) and in all-age adults with epilepsy (Ciechanowski, Chaytor, Miller, Fraser, Russo, Unutzer, et al., 2010).
Planet Health	Harvard University	An interdisciplinary curriculum for sixth- through eighth-grade students focuses on improving nutrition and physical activity levels while building and reinforcing skills in language arts, math, science, social studies, and physical education (Gortmaker, Peterson, Wiecha, Sobol, Dixit, Fox, et al., 1999).
Project Joy	Johns Hopkins University	A campaign of nutrition and physical activity interventions developed to improve cardiovascular health in African-American women in church settings (Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001).
Project UPLIFT (Using Practice and Learning to Increase Favorable Thoughts)	Emory University	An 8-session depression reduction program for people with epilepsy delivered via Internet or by telephone (Walker, Obolensky, Dini, & Thompson, 2010).
Verb Summer Scorecard	University of South Florida	A physical activity intervention for children aged 9–13 years based on the CDC's national Verb™ Campaign. Enables youth to participate in community-organized physical activity events (Alfonso, McDermott, Thompson, Bryant, Courtney, Jones, et al., 2011).
WebEase (Web Epilepsy, Awareness, Support and Education)	Emory University	An online self-management program for people with epilepsy (Dilorio, Escoffery, McCarty, Yeager, Henry, Koganti, et al., 2009).

## Policy and Environmental Change

Some of the world's most significant public health advances have resulted from changes in policies or environments, such as enactment of new regulations or modifications of community surroundings. For example, restrictions on smoking in public places, increased taxation, and enforcement of laws restricting minors' access to tobacco all contribute to reducing smoking prevalence (Centers for Disease Control and Prevention [CDC], 1999).

PRCs' research helps facilitate new approaches to such changes. In one example, the PRCs' Physical Activity Policy Research Network (see **Thematic Research Networks** above) solicited input from hundreds of researchers and practitioners to develop a research agenda for promoting physical activity through environmental and policy interventions. The study determined that identifying barriers to physical activity in low-income urban areas is one of the most important and most feasible issues to tackle (Brownson, Kelly, Eyer, Carnoske, Grost, Handy, et al., 2008). The thematic network also analyzed hundreds of state physical education bills, finding that a low proportion of the legislation contained evidence-based elements (Eyer, Brownson, Aytur, Craddock, Doescher, Evenson, et al., 2010).

The analysis showed that future research is needed to provide the types of evidence required for quality physical education legislation.

Important policy and environmental changes at local, state, and national levels stem from PRC work. At the North Carolina PRC, researchers examined the sales and marketing practices of cigarette vendors who sell over the Internet, looking at such factors as cigarette excise tax evasion and youth access to tobacco (Ribisl, Kim, & Williams, 2007; Ribisl, Williams, & Kim, 2003). They brought their findings to the attention of state and federal policymakers, and 33 states passed laws regulating Internet and mail order cigarette sales. In 2010, the U.S. Senate cited the PRC study in its unanimous passage of the Prevent All Cigarette Trafficking Act, which curtails the sale of untaxed cigarettes and other tobacco products over the Internet and bans the delivery of tobacco products through U.S. mail. In another example, a Tulane University PRC intervention reduced children's exposure to lead-based paint in New Orleans. The PRC spearheaded a working group with the mayor's office that evaluated the exposure hazard from dry-sanding exterior leaded paint. This evaluation led to the implementation of a city ordinance regulating the practice (Rabito, White, & Shorter, 2004).

## Case Study – CATCH

An intervention from the University of Texas at Houston PRC contributed to the implementation of a Texas law mandating that all elementary schools have a coordinated school health program that incorporates four components: health curriculum, physical education, school lunch program, and family involvement.

PRC researchers, in conjunction with colleagues from Tulane University, the University of California at San Diego, and the University of Minnesota, developed an interdisciplinary health program for elementary schools, using funding from NIH. The program, now called CATCH (Coordinated Approach to Child Health), includes a classroom curriculum along with components involving school physical education, school food service, and family, with the intent of improving environmental influences to support behavior change in nutrition and physical activity.

The PRC conducted a three-year randomized controlled trial in 56 intervention and 40 control schools in Texas, Minnesota, California, and Louisiana to evaluate CATCH and found that children significantly increased (from 40% to 50%) time spent in moderate to vigorous physical activity in physical education classes, as well as significantly decreased consumption of fat (from 39% to 32% of calories) in school meals (Luepker, Perry, McKinlay, Nader, Parcel, Stone, et al., 1996). Follow-up surveys showed these changes persisted over three consecutive years without additional intervention (Nader, Stone, Lytle, Perry, Osganian, Kelder, et al., 1999). A subsequent study in an economically disadvantaged community on the Texas-Mexico border showed that CATCH significantly reduced the increase in the proportion of overweight children between third and fifth grades. In CATCH schools, the proportion of overweight girls increased only from 30% to 32%, and the proportion of overweight boys increased only from 40% to 41%. In control schools, the proportion of overweight children increased in these grades from 26% to 39% for girls and 40% to 49% for boys (Coleman, Tiller, Sanchez, Heath, Sy, Milliken, et al., 2005).

The successful trial results led to dissemination partnerships with many organizations, including the Texas Department of State Health Services; Paso del Norte Health Foundation; National Heart, Lung and Blood Institute; American Heart Association; and Texas Medical Association. In 2001, the Texas state legislature passed a bill authorizing the state Board of Education to require all school systems in Texas to provide 30 minutes per day of school-based physical activity and to implement a coordinated school health curriculum. The Texas Education Agency approved CATCH for this purpose. CATCH now reaches more than 750,000 children in more than 1,500 schools in Texas. Schools in several other states and in Department of Defense schools overseas use the program as well. Furthermore, researchers have adapted CATCH for low-income Hispanic communities in the United States (Coleman et al., 2005).

## Scientific Literature

The PRC network makes significant contributions to the scientific literature. In 2010 alone, PRCs published approximately 425 journal articles and 25 books or book chapters. They also made nearly 700 presentations, most of which shared scientific data or methodology. Over the years, PRCs have been responsible for special issues of scientific journals; here are a few examples:

- ▶ *Advances in Health Promotion for Adolescents and Young Adults*, an issue of *Adolescent Medicine: State of the Art Reviews (AM:STARS)* (December 2011, Volume 22, Number 3)
- ▶ *Physical Activity Research in Latin America*, a special issue of the *Journal of Physical Activity and Health* (July 2010, Volume 7, Supplement)
- ▶ *Community Health Development*, a special issue of the *Journal of Primary Prevention* (April 2010, Volume 31, Numbers 1-2)
- ▶ *The Dissemination and Utilization of Prevention Research: Increasing Our Knowledge and Understanding*, a special issue of the *American Journal of Preventive Medicine* (July 2007, Volume 33, Number 1, Supplement)
- ▶ *Community-based Prevention*, a special issue of the *Journal of Public Health Management & Practice* (March 1998, Volume 4, Issue 2)

Two recently published books demonstrate the range of scientific work of the PRCs. *The Teen Years Explained: A Guide to Healthy Adolescent Development* was published by researchers from the Johns Hopkins PRC in April 2010

to translate research for public use. This book describes the latest scientific findings about the physical, cognitive, emotional, sexual, social, and spiritual growth of teenagers, and describes how adults can promote healthy teen development. The guide is intended for anyone who works with young people, as well as parents and teens themselves. The PRC has sold more than 14,000 hard copies, and the electronic version has been downloaded more than 6,000 times. The guide is used in health departments across Maryland, health and education departments in several other states, and by many nonprofit organizations. Additionally, it is sold in several university bookstores. After receiving hundreds of requests for training to accompany the book, the researchers began testing a newly developed curriculum.

*Evidence-Based Public Health*, written by researchers from the PRC in St. Louis in 2002, was updated in a second edition in 2011. The book, which has sold about 8,000 copies, defines a fundamental concept of public health practice and provides practical guidance on how to choose, carry out, and evaluate evidence-based public health programs and policies. The updated version incorporates additional information, including a new chapter on emerging issues in evidence-based public health. The book is intended for public health practitioners, policymakers, researchers, managers in state and local health agencies, and other stakeholders concerned with public health. It is also used in courses on topics including health services leadership, management, and community program evaluation.

## Program Value

### Global Significance

The mission of the PRC Program carries increasing relevance and worth as the prevalence of chronic diseases increases not only in the United States but worldwide. Seven out of ten deaths in the United States are from chronic conditions, such as heart disease, stroke, diabetes, and lung disease (Heron, Hoyert, Murphy, Xu, Kochanek, & Tejada-Vera, 2009). Even in less-developed nations, the prevalence of chronic diseases is outpacing that of infectious diseases, which had been the world's main health threat. Global health has witnessed dramatic changes: for the first time in history, more people live in urban than rural areas; more people are overweight than underweight; and chronic diseases, which kill more than 35 million people worldwide each year, account for nearly two-thirds of the world's deaths (Alwan, 2011).

Global awareness of the risks posed by chronic disease has risen, and in 2011, the United Nations held a summit on noncommunicable (chronic) diseases; this event was only

the second time that the U.N. General Assembly convened solely for the purpose of discussing an emerging health issue and its socioeconomic impact. The assembly adopted a declaration that said prevention must be the cornerstone of a global response to noncommunicable diseases. The declaration commits to strengthening national capacity for high-quality research, developing evidence-based strategies and programs, and advancing implementation of multisectoral, cost-effective, population-wide interventions to reduce the impact of noncommunicable disease risk factors. These aims directly align with principles and practices of the PRC Program.

As global public health efforts focus increasingly on chronic disease, the PRC Program offers a model for those efforts. Although the prevalence of chronic disease is now a worldwide problem, many decisions affecting that prevalence are made locally. However, local decision-makers often lack adequate data and are unable to measure community health or track performance of public health initiatives (Murray & Frenk, 2008). In the United States, the PRCs'

community-centered research provides local and state health departments and policymakers with a model for making health measurements specific to their constituency, thereby enabling them to enact meaningful strategies to improve health. This model may be appropriate for communities around the globe.

### **A Standard for Community Engagement**

The PRCs also set a precedent for emerging community-engaged health research programs. The Clinical and Translational Science Awards (CTSA) program is an example. This program, launched by NIH in 2006, aims to accelerate the translation of research results into practice. As do members of the PRC network, medical research institutes that are part of the CTSA network engage community partners to connect scientists with people who are underrepresented in research and could benefit from that research. CDC and NIH encourage PRC-CTSA teamwork; about two dozen of the institutions that host PRCs also host CTSA. The University of Rochester offers a model of PRC-CTSA collaboration; there, the PRC is co-located with the university's CTSA program, and both programs operate under the same director. The PRC is helping the CTSA program make critical connections with Rochester's deaf community; the PRC's community committee is formally represented on the CTSA program's advisory council. PRC faculty routinely participate in CTSA educational programs, such as seminars and skill-building workshops. Additionally, CTSA personnel have provided data collection and management support for PRC surveys and trials.

In another instance of collaboration with a developing health research program, researchers from several PRCs work on projects within the Public Health Practice-Based Research Networks (PBRN), a program of the Robert Wood Johnson Foundation. The program, which launched in 2008, aims to improve delivery of public health services by supporting development of research networks for studying the comparative effectiveness, efficiency, and equity of public health strategies in real-world practice settings. An example is in Colorado, which in 2008 enacted a law designed to ensure that core public health services

are available to every person in the state at a consistent standard of quality. At the University of Colorado Denver, PRC and PBRN staffs are working together to understand the impact of the law on structure, financing, and core services of local public health agencies. The partners are also studying how the law impacts sharing of public health services across jurisdictional boundaries, and in another study they are investigating the barriers and facilitators to creating environments and policies that promote breast-feeding, healthy eating, and physical activity. In addition to such collaborative projects, PRC researchers also serve on the PBRN national advisory committee.

### **A Model of Sustainability**

A vital component of the PRC model is the sustainability of its research. Each center is now approved for funding by cooperative agreements that span five-year cycles, instead of by short-term grants of one or two years. The longer funding cycle increases the likelihood that measurable effects will occur during the research period. For example, many PRCs research ways to reduce obesity, a health condition that can take many years to resolve. A simulation model estimates that for each reduction of 10 calories a person takes in per day, he or she will eventually achieve a one-pound weight loss; however, about 50% of the loss happens after about one year, and 95% of the loss in three years. Consequently, research conducted under a short-term grant would be unable to determine the success or failure of a weight-control intervention—i.e., one that not only helps people reduce weight in a healthy way but also encourages sustained weight loss (Hall, Sacks, Chandramohan, Chow, Wang, Gortmaker, et al., 2011). As the PRCs' research has shown, success also depends on offering a program that resonates with and is acceptable to a particular group of people. Understanding and knowing how to incorporate community values, norms, and beliefs into interventions requires close relationships with community members and organizations, and trusted relationships in themselves take time to develop and maintain. Commitment to long-term change is needed for nearly all areas of prevention research.

## **Future Directions**

The PRC Program envisions that (1) people in all communities are empowered to enjoy good health and quality of life, (2) the physical and social environments of these communities are safe and support the adoption and maintenance of attitudes and behaviors that promote health and well-being, (3) policies are in place that facilitate these environments, and (4) the communities effectively engage services and programs to promote health across all populations and to prevent or minimize the impact of acute and chronic disease.

Such scenarios are beginning to emerge in PRCs' partner communities. In the wake of Hurricane Katrina (2005), for example, the Tulane University PRC began developing ways for New Orleans to not just rebuild, but to build a city where the infrastructure and policies promote public health. Before the hurricane, CDC health indicators showed that Louisiana was consistently among the worst states in the country for obesity, cancer, and infant mortality, and many health problems were traceable to unhealthy diets among residents of poor, urban areas where few, if



any, options for buying fresh fruits and vegetables were available. Tulane researchers explored multiple ways to address this situation. One of these was the Healthy Food Retail Study Group, established by the Louisiana Senate in 2008. The researchers coordinated the group, provided technical assistance and data analysis, and prepared the report that made recommendations for a Louisiana Healthy Food Retail Financing Program, which was enacted in 2009. The law provides grants and loans to supermarkets, farmers' markets, and food retailers to make fresh fruits and vegetables available in low-income communities. Thus, a favorable consequence of a disastrous storm has been the opportunity to rebuild New Orleans using best practices for developing communities that support healthy living.

Work by the University of Rochester PRC is another example. The PRC is increasing the ability of the deaf community in Rochester, New York, to identify and tackle its most pressing health problems. Most information about health behaviors is collected from a sample of the U.S. population by using a telephone-based system. Because deaf people cannot readily use this system, the deaf community generally has been omitted from public health data. Researchers from the Rochester PRC developed a video-based survey, administered it to members of the deaf community, and analyzed results (Barnett, Klein, Pollard, Samar, Schlehofer, Starr, et al., 2011). The researchers and their community partners are developing interventions to address the high-

priority topics (obesity, suicide, and relationship violence) the survey revealed. The Rochester PRC researchers also worked with researchers from other PRCs to help assess the health needs of deaf communities in other parts of the country and to translate evidence-based interventions. Additionally, the PRC partnered with CDC to create informational videos in American Sign Language (ASL) about seasonal flu, now available nationwide. Before these videos were made, people who use ASL had scant information about influenza—information that was easily available to the general population.

As another example, the University of Michigan PRC conducts a biannual survey in Genesee County, Michigan, that community members use to bring about policy change. The survey is designed by community, health department, and university partners to monitor and understand community health concerns. A community group shared with county commissioners the results of one survey that showed the limited extent of health insurance coverage and the high proportion of residents who needed to visit a doctor but could not afford the cost. The group requested a ballot measure to raise taxes in the county to create a health plan for county residents without insurance. The measure passed in 2006, making basic health care available to nearly all of Genesee County's uninsured, low-income adults (Kruger, Hamacher, Strugar-Fritsch, Shirey, Renda, & Zimmerman, 2010).

## Conclusion

The examples cited throughout this entry illustrate the varied ways in which the PRCs' research translates into concrete actions and achievements in and for specific communities. Very often these achievements are spearheaded by members of the communities that participated in and made possible the original research. Thus, byproducts of the research include not only increased community capacity to address health issues but the tools, strategies, and support that can produce and sustain health improvements.

The examples also illustrate the local nature of many results. While local improvements are important, when change stops at the local level, the full potential of a health promotion strategy is not realized. The PRC Program's

future may rest in whether and how well the PRCs' effective strategies are brought to scale—statewide, regionally, nationally, or globally. PRC collaboration with disseminators, including nonprofit organizations, foundations, and governmental organizations, is key (Harris, Cheadle, Hannon, Forehand, Lichiello, Mahoney, et al., 2012). Only widespread application of the PRCs' findings, along with those from other research endeavors, can bring about the profound improvement in people's health needed to reduce the worldwide burden of chronic disease. The PRC Program's future calls for increased emphasis on research translation and dissemination of interventions as well as ongoing innovations in policy and environmental change approaches.

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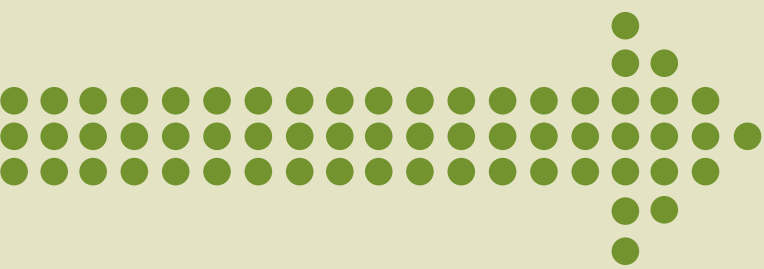
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