

North Carolina Climate and Health Program BRACE Evaluation Plan for 2015-2016

Prepared by:

Sara J. Smith, M.A., CHES
Public Health Educator
Climate and Health Program, Occupational and Environmental Epidemiology Branch

Sarah Shaughnessy, MPH Candidate
Health Education Assistant
Climate and Health Program, Occupational and Environmental Epidemiology Branch

February 2017



Program Evaluation Plan

Introduction

This program evaluation is intended to identify existing data sources to create vulnerability maps, which will assist the development of vulnerable population maps and future program activities. The program evaluation will also inform BRACE program staff of the extent of current partner engagement in program activities by determining barriers and facilitators to participating in activities. This information will guide future partnership decisions (who to collaborate with, level of engagement, etc.), collaborative activities, and an action plan for increased partner engagement.

Evaluation Framework

The CDC’s Framework for Program Evaluation will be used to develop an effective program evaluation strategy to ensure the BRACE program is performing at its full potential and achieving the proposed goals, objectives and required outputs outlined in the work plan. The Framework is comprised of six key steps: 1) engage stakeholders, 2) describe the program, 3) focus the evaluation design, 4) gather credible evidence, 5) justify conclusions and 6) ensure use and share lessons learned.

STEP 1: Stakeholder Engagement

Stakeholders play a vital role in ensuring a comprehensive and unbiased perspective of program activities and methods. Their involvement also helps assess the extent to which the evaluation meets the needs of program funders, BRACE staff, and most importantly, our target communities. We will continue to strengthen our relationships with stakeholders through regular communication to build trust and responding efficiently and effectively to local concerns. Our stakeholders come from a variety of different disciplines, such as the National Weather Service, the North Carolina Department of Labor, and the Public Health Preparedness and Response Branch.

Table 1 defines the roles and expectations for stakeholder engagement.

Table 1. Stakeholder Assessment and Engagement Plan				
Stakeholders	*Stakeholder Category	Interest or Perspective	Role in the Evaluation	How and When to Engage
North Carolina Division of Public Health Building Resilience Against Climate Effects (BRACE) Program	Primary	<ul style="list-style-type: none"> Run and implement the BRACE program 	<ul style="list-style-type: none"> Define program and context Prioritize evaluation questions Identify data sources Provide scientific perspective on logic model and intervention development Projection of long-term outcomes 	<ul style="list-style-type: none"> Direct role in evaluation process Interpret findings Disseminate and implement evaluation findings Enhance/improve the BRACE program Contribute to the published literature
Federal agencies (CDC, NOAA, EPA)	Primary	<ul style="list-style-type: none"> Interested in potential to decrease 	<ul style="list-style-type: none"> Provide scientific perspective on logic model and intervention 	<ul style="list-style-type: none"> Receive snapshot of evaluation results in the form of briefs, white paper, etc.

		<p>negative health outcomes</p> <ul style="list-style-type: none"> Primary funding source for BRACE (CDC) 	<p>development</p> <ul style="list-style-type: none"> Project long-term outcomes 	<ul style="list-style-type: none"> Consult for evaluation deliverables Contact for feedback on program aspects
<p>State agencies (i.e. N.C. Division of Public Health; Division of Aging, Emergency Management, Department of Environmental Quality)</p>	Secondary	<ul style="list-style-type: none"> Interested in potential to decrease negative health outcomes Participate in implementation of BRACE activities 	<ul style="list-style-type: none"> Provide scientific perspective on logic model and intervention development Project long-term outcomes 	<ul style="list-style-type: none"> Receive snapshot of evaluation results in the form of briefs, white paper, etc. Increase support for legislation to address adaptive planning Increase support for interventions that address climate change and its effects on health
<p>Non-Profit agencies (Clean Air Carolina, Climate Justice, Sustainable Sandhills)</p>	Secondary	<ul style="list-style-type: none"> Interested in potential to decrease negative health outcomes 	<ul style="list-style-type: none"> Provide scientific perspective on logic model and intervention development Project long-term outcomes 	<ul style="list-style-type: none"> Receive snapshot of evaluation results in the form of briefs, white paper, etc. Increase support for legislation to address adaptive planning Increase support for interventions to address climate change and its effects on health
<p>Local universities (University of North Carolina at Chapel Hill and East Carolina University)</p>	Tertiary	<ul style="list-style-type: none"> Interested in potential to decrease negative health outcomes Participate in implementation of BRACE activities 	<ul style="list-style-type: none"> Provide scientific perspective on logic model and intervention development Project long-term outcomes 	<ul style="list-style-type: none"> Attend Evaluation Planning Team meetings Help analyze data from interventions Develop specific environmental health projects Create questions based on environmental health surveillance data

STEP 2: The BRACE Program in North Carolina

Context

Evidence suggests that the world's climate is becoming warmer, increasing the potential for extreme weather events around the world. Longer and more intense heat waves, more frequent and severe droughts, heavier and more frequent precipitation events, flooding, and additional air pollution are some of the potential consequences of the climate becoming warmer (CDC, 2014).

Climate-Related Health Concerns

These environmental changes have a significant impact on human health. In North Carolina, health impacts include heat-related illness, injuries or deaths due to air pollution, extreme weather, and water-borne pathogens.

Vulnerable Populations

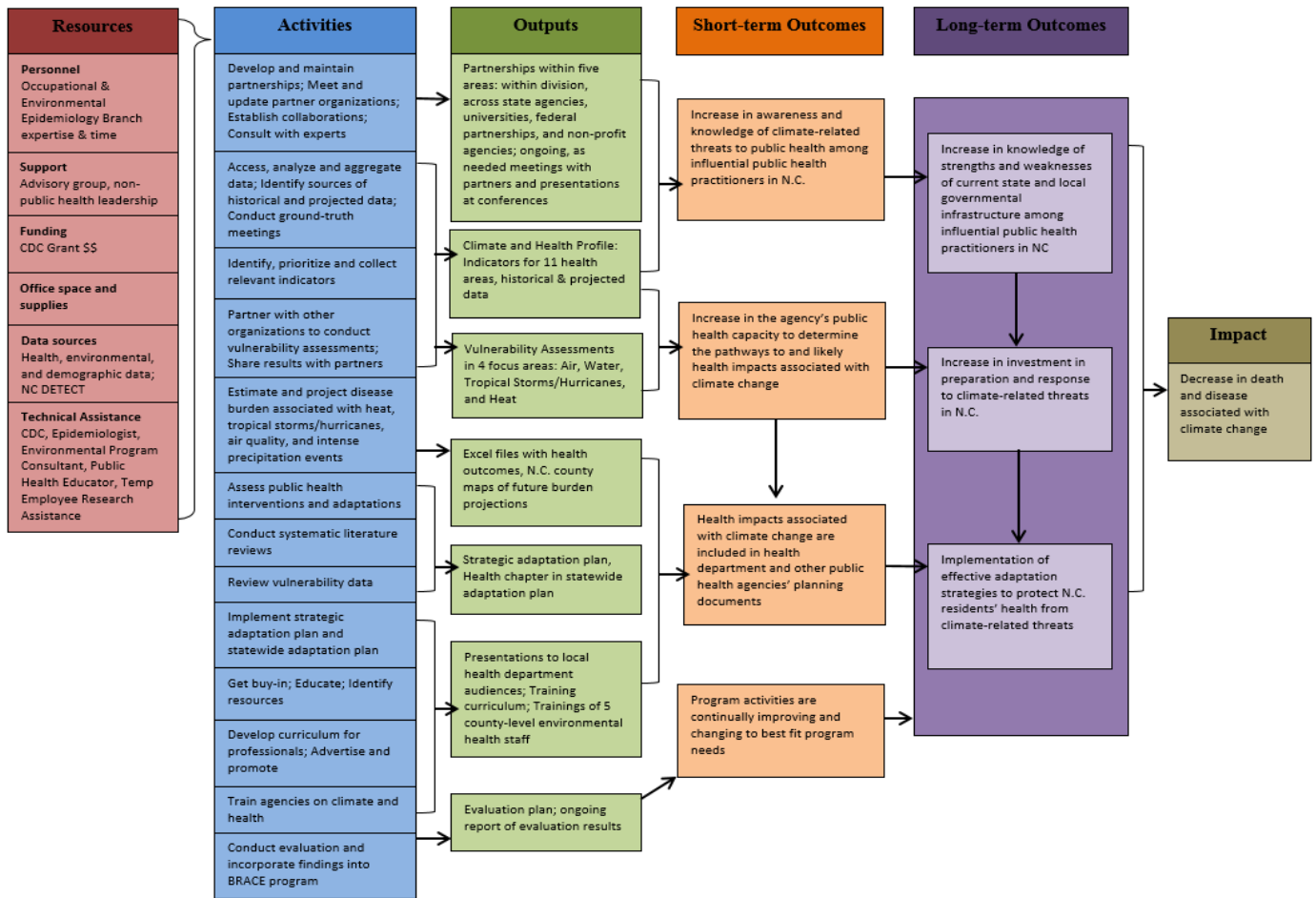
Peer-reviewed statistical analysis of data from our statewide syndromic surveillance system, North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT), has demonstrated that the highest rate of emergency department visits for heat-related illness occurs in the Sandhills – an 11-county region located in the Southeastern portion of North Carolina. To further refine our target population, we used Geographic Information Systems (GIS) as a tool to determine the counties most vulnerable to heat-related illness based on socioeconomic and health indicators of heat vulnerability. We met with local stakeholders to gather the most appropriate indicators of heat vulnerability in these communities. These indicators were mapped to illustrate the most vulnerable areas, and were overlaid with a map highlighting the areas with the highest rates of emergency department visits. The final maps indicated a five-county sub region in the Sandhills in which the population has both high vulnerability to heat-illness and a high burden of heat-related illness emergency department visits. During the next funding cycle, work will continue in these counties through implementation of public health interventions to assist in reducing the impact of heat-related illness.

Program Development

The Climate and Health Program was established through CDC's Climate-Ready States and Cities Initiative (CRSCI) in 2010. During this period, the program has developed heat-illness prevention toolkits for children, older adults, and outdoors, developed a communication plan for disseminating time-sensitive heat warning messaging, established partnerships with stakeholders across the state, enhanced surveillance capacity of heat morbidity and mortality, and developed GIS maps of vulnerable population distribution across the state.

The Climate and Health Program has received additional funding through CDC to implement the "Building Resilience against Climate Effects" (BRACE) framework into program activities over the next three years. The program will continue addressing heat-related illnesses as well as branch out to other climate and health effects such as drought, vector-borne diseases, wildfires, flash flooding, and air quality. The following logic model details the components of the program to address heat-related illness in North Carolina moving forward.

Building Resilience Against Climate Effects (BRACE) in North Carolina



STEP 3: Evaluation Focus (DESIGN)

After collecting on climate-related health impacts and vulnerabilities in North Carolina, a framework was designed for evaluating the effectiveness of our program. This process included developing specific evaluation questions, data sources, modes of data collection, and appropriate indicators, as outlined in the table below.

Table 2. Evaluation Questions					
Logic Model/Program Component	Evaluation Question	Data Source	Data Collection Method	Indicators	How findings will be used
INPUTS/RESOURCES: Data	<ul style="list-style-type: none"> What are the existing data sources that can be used to create vulnerability maps? 	<ul style="list-style-type: none"> OEE staff 	<ul style="list-style-type: none"> Content Scan of p drive for GIS data 	<ul style="list-style-type: none"> # and type of existing data sources for vulnerability mapping 	<ul style="list-style-type: none"> To map vulnerable populations To inform future feasible activities
INPUTS/RESOURCES: Partnerships	<ul style="list-style-type: none"> To what extent are current partners engaged in BRACE activities? What are the barriers and facilitators to participating in BRACE activities experienced by partners? 	<ul style="list-style-type: none"> Partners/meeting notes Partners Advisory group Main partners 	<ul style="list-style-type: none"> Survey Review and content analysis of meeting notes Survey Questions (Focus group? Interviews?) 	<ul style="list-style-type: none"> Utilization of information shared at meetings % hours of time devoted to BRACE activities Heat working group engagement Programmatic decisions informed by Climate and Health Profile Verbal participation (y/n) Identification of barriers and facilitators to BRACE work 	<ul style="list-style-type: none"> Inform partnerships decisions (who to collaborate with), how much to ask for in partnerships Inform future activities by addressing barriers and facilitators Develop action plan for conducting more engaging meetings

STEP 4: Building Credible Evidence (DATA COLLECTION)

The information below describes how evaluation data were collected and summarizes the information collected in response to the evaluation questions created in step 3. This is the first of several program evaluations we will conduct over the next funding cycle as more specific adaptation and interventions are developed. The findings from this evaluation will be used to inform future activities and ways to improve program performance during the next funding cycle.

Question #1 – What are the existing data sources that can be used to create vulnerability maps?

In September 2015, a temporary employee with expertise in Geographic Information Systems (GIS) was hired to begin vulnerability mapping. The first task was to perform a content scan of our shared drive to determine what types of data were currently available. The existing data informed how vulnerability maps were developed.

The content scan examined existing data and data needed to assess the following health impacts – Air quality and respiratory disease (indoor air quality and wildfires), heat-related illness, mental health, waterborne diseases, and deaths and injuries due to hurricanes, tropical storms, and floods. Needed data were broken down into three categories - past exposure, social vulnerability, and mortality and morbidity. Existing data were documented for each category and a note was made if no relevant data were found. If additional data were needed to assess particular health impacts, the type of data was recorded in a separate column.

The inventory identified mapping resources that allowed our program to conduct activities required by CDC for vulnerability assessment. The content scan demonstrated the majority of data housed on the shared drive pertained to deaths and injuries due to hurricanes, tropical storms, and floods, air quality and respiratory diseases and heat-related illnesses. Based on input from stakeholders and results from our Climate and Health Profile, we decided to narrow our focus down to two health impacts - wildfire smoke and heat-related illnesses.

Question #2 and #3 – To what extent are current partners engaged in BRACE activities? What are the barriers and facilitators to participating in BRACE activities experienced by partners?

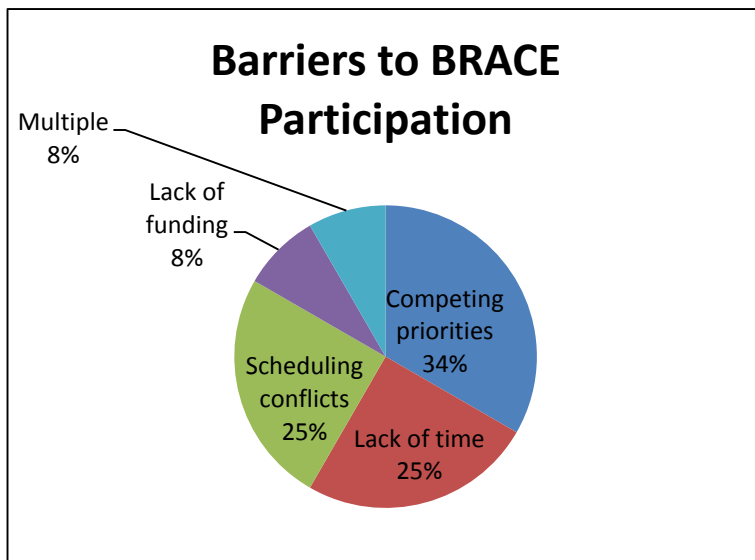
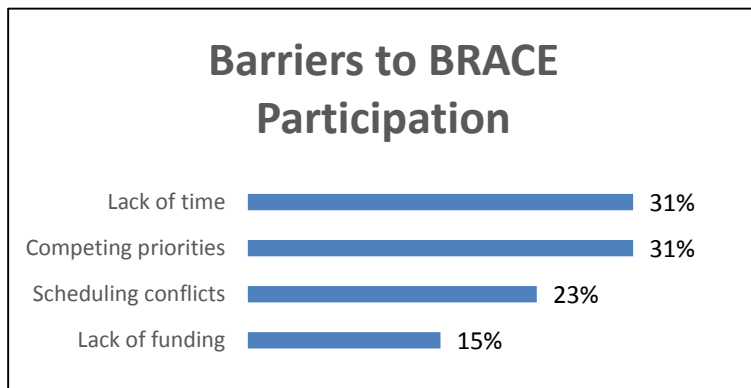
A survey was sent out to a total of 88 stakeholders. The survey consisted of nine questions such as which agency was represented, which activities they participated in, which barriers and facilitators of participation stakeholders encountered, and how stakeholders utilized program information. Recipients included advisory group, evaluation team, and heat illness working group members. A content scan of our shared drive looked at meeting agendas notes for our major meetings (i.e. advisory group, evaluation, heat illness). A spreadsheet was developed to track what was found during the content scan.

The response rate of 15% was lower than expected. A reminder email was sent out to participants, which resulted in additional submissions. The majority of respondents are members of the advisory group and heat-illness working group. The majority of respondents also share the information presented at meetings with their partners and colleagues in different ways, including informing public health surveillance, informing local climate adaptation and hazard mitigation planning, and use in the development of the Cumberland County Climate Resiliency Plan. Approximately 40% of respondents spend between 4-9 hours annually on BRACE activities, while 31% spend 10-15 hours annually. The major barrier for stakeholders to participate in BRACE activities is time, while facilitators include information accessibility, and flexibility and adaptability of BRACE staff to accommodate and coordinate collaboration.

The inventory revealed that there was a limited number of meeting agendas and notes. Some agendas had no corresponding notes and vice versa. This is due to only having one full-time person employed by the grant for the first 4 years of funding. There are currently 2 full-time and 1 part-time grant employees, giving the program the ability to have a meeting facilitator and note taker for each meeting, moving forward. This will ensure that all important and pertinent information is captured for every meeting and will increase program communication and ensure the program is running at its full potential.

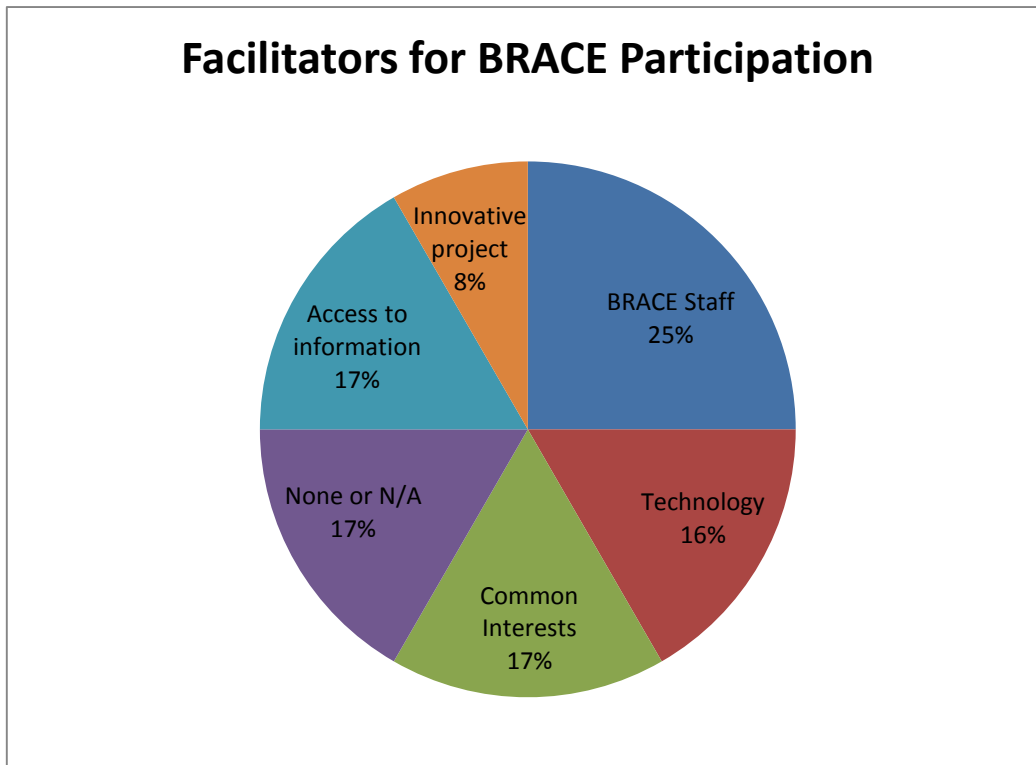
Barriers to BRACE Participation

The most common barriers to BRACE participation are lack of time and competing priorities.



Facilitators to BRACE Participation

The most common facilitator to BRACE participation is the BRACE staff.



The partnership survey highlighted limited time as the most common barrier to participating in BRACE activities. This is a common issue since our partners are employed by other agencies and have competing priorities and responsibilities. Unfortunately, given the NCDHHS’s limited funding and capacity there is not much we can do to resolve this issue. The survey also highlighted that work shared at our advisory group, evaluation team, and heat illness group is being utilized outside of the meetings. Participants are distributing the information to colleagues, incorporating it into teaching, and using it to inform local climate adaptation.

STEP 5: Drawing Conclusions (DATA ANALYSIS)

It is important to make claims about the program based on the analysis, and to justify the claims by comparing the evidence against stakeholder values, as the evidence doesn’t always speak for itself. Table 3 displays an overview of the data analysis process and a general interpretation of evaluation data.

Table 3. Data Analysis	
Question	Response
Who analyzed the data (and who coordinated this effort)?	The program health educator/temporary GIS analyst.
How were the data analyzed and displayed?	The survey was analyzed and displayed in Google Forms. The content scan was analyzed and displayed in word document.
How did you deal with conflicting interpretations and judgments?	Discuss the source of conflict and come to a compromise on the interpretations and judgments.

Are your results similar to what you expected? If not, why do you think they are different?	Yes
Are there alternative explanations for your results?	No

STEP 6: Ensuring Sustainability

The purpose of this evaluation is to identify barriers and facilitators that may be addresses to improve the function of the program, reduce the incidence of heat-related illness in North Carolina, and build the capacity of local communities to adapt to climate effects.

Table 4 below indicates the protocol for disseminating evaluation results.

Table 4. Evaluation Results Dissemination		
Evaluation Results	Target Audience	Dissemination Method
Accessibility of data on EPHT portal and OEE's drives	N.C. BRACE program	Summary report shared via OEE website
Results of partner survey administered to determine partnership engagement and barriers/facilitators to participation	Program partners (state agencies, heat-illness working group, advisory group)	Email, OEE website, evaluation team meeting and advisory group meeting

Continued Monitoring and Quality Improvement

This section provides an overview of how the evaluation findings will be used to continually improve the North Carolina BRACE Program.

Question #1 – What are the existing data sources that can be used to create vulnerability maps?

The content scan has already been used to improve aspects of our program. The results of the content scan enabled our program to determine the two health impacts to focus on during our next funding cycle. The existing data provided information to develop heat-related illness and wildfire smoke vulnerability maps. These maps have subsequently informed our decision-making process on which jurisdictions to focus our adaptation work on.

Question #2 and #3 –To what extent are current partners engaged in BRACE activities? What are the barriers and facilitators to participating in BRACE activities experienced by partners?

One main area of improvement was not captured in the stakeholder survey. A thorough inventory of folders on our shared drive highlighted a need for consistent development of meeting agendas and thorough meeting notes. This will enable our program to keep a record of what is being discussed during stakeholder meetings and any action items that may come up. This will give us the opportunity to better focus our efforts to accomplish grant objectives.

REFERENCES

- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Centers for Disease Control and Prevention, National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Air Pollution and Respiratory Health Branch. *Learning and Growing through Evaluation: State Asthma Program Evaluation Guide*. Atlanta, GA: April 2010.
- JBS International, Inc., Aguirre Division. *Project Star: Study Designs for Program Evaluation*. Bethesda, MD: 2006.
- Knowlton, L.W. & Phillips, C.C. (2009). *The Logic Model Guidebook: Better Strategies for Great Results*. Thousand Oaks, CA: Sage Publications.
- Kovach, et al. (2015). Area-level risk factors for heat-related illness in rural and urban locations across North Carolina, USA. *Applied Geography*, 60, 175-183.
- Patton, M.Q. (2008). *Utilization-Focused Evaluation* (4th ed.). Thousand Oaks, CA: Sage Publications.
- U.S. Department of Health and Human Services Centers for Disease Control and Prevention. Office of the Director, Office of Strategy and Innovation. *Introduction to program evaluation for public health programs: A self-study guide*. Atlanta, GA: Centers for Disease Control and Prevention, 2011.
- W.K. Kellogg Foundation. *Logic Model Development Guide*. Battle Creek, MI: January 2004.