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PROMOTING HEALTHY EATING AND PHYSICAL ACTIVITY: A
QUALITATIVE EXAMINATION OF COMMUNITY-BASED OBESITY
INTERVENTIONS IN RURAL KENTUCKY

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Agriculture, Food and Environment at the University of Kentucky

By

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Lexington, Kentucky

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Lexington, Kentucky

2016

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ABSTRACT OF THESIS

PROMOTING HEALTHY EATING AND PHYSICAL ACTIVITY: A QUALITATIVE EXAMINATION OF COMMUNITY-BASED OBESITY INTERVENTIONS IN RURAL KENTUCKY

Rural Americans are medically underserved groups and are at greater risk of becoming obese than urban Americans. The purpose of this qualitative study was to determine the perceived causes of obesity in six counties of rural Kentucky and to determine how to customize strategies to reduce obesity in these areas. University of Kentucky Cooperative Extension Service Agents formed coalitions in each of the six counties to assess their communities' needs and assets to inform plans for implementing evidence-based obesity interventions. Between February and August of 2015, the coalitions were convened for a total of 11 meetings. Each of the coalition meetings was audio recorded, transcribed, and coded using NVivo 11 qualitative analysis software. Coalition members in these rural counties of Kentucky recognized aspects of their culture, poor dietary choices, and inactivity as the major reasons obesity is a problem in their county. Participants reported high prevalence of fast food restaurants, lack of access to healthy foods and physical activity resources, technology, and lack of time as barriers to healthy behaviors. These findings provide insight to inform tailored, evidence-based interventions for rural communities. Improving access to healthy foods and physical activity resources in rural areas may improve healthy behaviors and reduce obesity prevalence.

Keywords: obesity; rural; healthy eating; physical activity; community coalitions; socioecological model

Brooke Butterworth

July 11, 2016

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Chapter 1

Review of Literature

Introduction

Obesity is a major epidemic in the United States (U.S.). Since 1980, U.S. obesity rates have more than doubled (Centers for Disease Control and Prevention (CDC), 2013).

Rural Americans are one of the most medically underserved groups in the U.S. and are at greater risk of developing chronic diseases and obesity than urban Americans (Befort et al., 2012, Patterson et al., 2004). For all people in the U.S. to have equity in healthcare, more focus must be placed on the fundamental determinants of health where we live, learn, work, and play (The Robert Wood Foundation (TRWF), 2015). The unequal distribution of income, education, access, and services contribute to the health inequity between and within communities (Marmot et al., 2008).

This study examined the partnership of the University of Kentucky Cooperative Extension Service Agents, the College of Public Health, the Department of Nutrition and Dietetics, and community coalitions to choose appropriate interventions to implement in rural counties of Kentucky aimed at Supplemental Nutrition Assistance Program (SNAP)-eligible families. While literature on obesity prevention and treatment in America is extensive, there was a gap that can be addressed by this study. No one has fully investigated the process of implementing multi-level, collaborative obesity interventions utilizing the already existing Cooperative Extension Service in rural areas. This study filled this gap in the literature and led to a greater understanding of how rural

communities can come together to promote healthy eating and physical activity in partnership with a university to fight the obesity epidemic.

Obesity in Rural America

According to the Centers for Disease Control and Prevention (CDC), 34.9% of U.S. adults are now classified as obese (CDC, 2014). Obesity puts individuals at a greater risk of developing chronic and acute health conditions such as type 2 diabetes, stroke, and heart disease (CDC, 2014). In addition, rural Americans have a higher prevalence of obesity than urban Americans (Befort et al., 2012). In the mostly rural state of Kentucky, where approximately half of all residents live in rural areas, 34.9% of adults are considered overweight and 31.3% of adults are considered obese (CDC, 2012; Johnson and Johnson, 2015). Furthermore, six counties of Kentucky report an obesity rate above 40% (BRFSS, 2010). The population in these counties face high rates of poverty, geographic isolation, low education, low health literacy, limited food access and few opportunities for physical activity (Halverson et al., 2004).

The prevalence and risk factors associated with obesity in rural residents has been a popular topic of recent research. In an analysis of the National Health and Nutrition Examination Survey (NHANES), the prevalence of obesity in rural adults (39.6%) was observed to be higher than the prevalence of obesity in urban adults (33.4%, $p=0.006$), especially among women (Befort et al., 2012). Rural adults who were considered active were still more likely to be obese than their urban counterparts who were considered active (Befort et al., 2012). Rural residents consumed a larger percentage of total calories from fat than urban residents (Befort et al., 2012). These

findings indicate the obesity epidemic remains a concern for rural Americans and that interventions should address healthy eating and active living.

Fewer minorities live in rural areas compared to urban areas (Patterson et al., 2004). However, minority populations living in rural areas were more likely to be obese than their urban counterparts, especially women (Patterson et al., 2004). In addition, rural minorities tended to be less active than urban minorities (Patterson et al., 2004). These findings underscore the importance of environmental risk factors for obesity. Overall, this research emphasizes the issues of obesity in rural America and provides the framework for future research regarding the barriers for residents of all races to a healthier lifestyle.

Health disparities also exist between rural and urban children. A systematic review completed by Johnson et al. (2015) revealed that obesity was more prevalent among rural children than urban children. It was determined that rural obese children were more physically active than urban obese children; however, these results should be considered cautiously, as the studies differed substantially in methods used to analyze physical activity levels (Johnson and Johnson, 2015).

The 2003-2004 CDC National Survey of Children's Health (NSCH) suggest that interventions aimed at the entire family are promising. Rural children greater than five years of age were more likely to be overweight or obese, white rather than non-white, live below or slightly above poverty level, be uninsured, and not have received preventative care in the past 12 months when compared to children living in metropolitan areas (Lutfiyya et al., 2007). Rural-residing children were 25% more likely

to be obese than urban-residing children (Lutfiyya et al., 2007). Geographic location was acknowledged a unique characteristic for health issues, and that rural residency was in fact an independent risk factor of obesity (Lutfiyya et al., 2007). Effective partnerships in rural settings between healthcare practices, schools, and the community need to be mobilized in an attempt to lower the risk of obesity in children, increase preventative healthcare, and increased physical activity.

Given that obesity is more prevalent among rural adults than urban adults, Trivedi et al. (2015) set out to determine if there was a difference in obesity-related behaviors between rural and urban Americans. Using information from 1999 to 2006 NHANES data, Trivedi et al. concurred with previous research that rural adults had a higher rate of obesity than urban adults (35.6% versus 30.4%, respectively, p -value <0.01). However, this research project also determined that more rural adults reported no leisure time physical activity, fewer met the physical activity guidelines, fewer consumed enough fruits and fiber, and more consumed sugar-sweetened beverages (Trivedi et al., 2015). After adjusting for socioeconomic status, sedentary behavior, and physical activity, the likelihood of obesity among rural adults was 1.19 times higher than the likelihood of urban adults (Trivedi et al., 2015). Therefore, this research supports the observation that rural adults are more likely to take part in obesity-related behaviors than urban adults, leaving the question as to whether or not rural areas are more obesogenic, or encouraging of obesity-related behaviors, than urban areas.

The possible influence of the environment on obesity was first described by Hill and Peters in 1998 (Hill and Peters, 1998). They hypothesized that obesity is the body's natural response to the environment becoming increasingly more obesogenic (Hill and Peters, 1998). Continued research confirms that the built environment can either offer opportunities or barriers to promote or hinder healthy behaviors (Feng et al., 2010). A systematic review conducted by Booth et al. provides strong evidence of a relationship between the built environment (defined as the design, land use, public transportation, and available activity options in the community) and the prevalence of obesity. This was particularly true in lower socioeconomic status neighborhoods where walkability was low and access to fast food and convenience stores were high (Booth et al., 2005). Zoning restrictions create distinctions between residential and commercial areas and typically limit connectivity and walkability, therefore, increasing the risk for obesity (Booth et al., 2005). Residents with poor access to recreational activities were 68% more likely to be obese (Booth et al., 2005). Built environments with limited recreational amenities, safety concerns, uneven terrain, a lack of sidewalks, and insufficient lighting encourage inactivity and obesity (Booth et al., 2005).

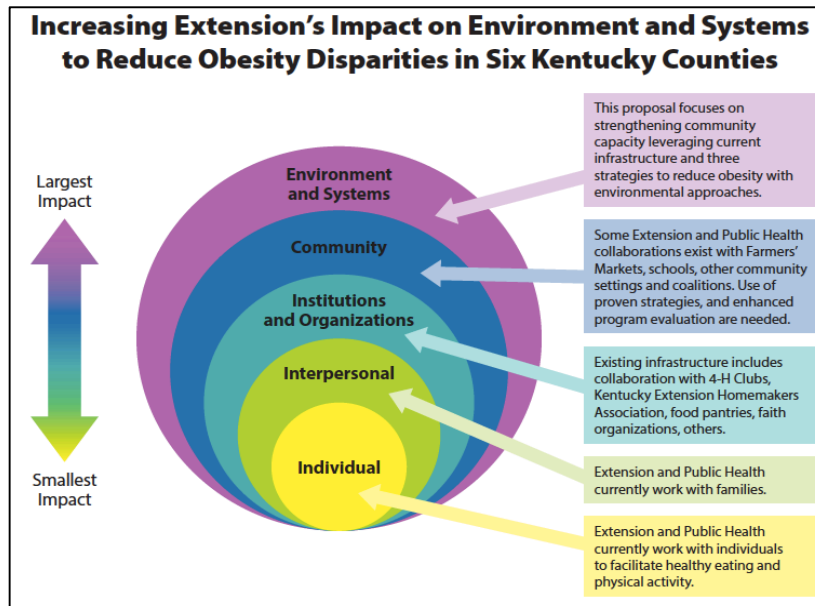
Hansen et al. also determined that rural environments promote obesity. A limited active living built environment that limits active living in rural communities was found to contribute to higher prevalence of obesity and obesity related chronic conditions among rural versus urban populations (Hansen et al., 2015). Researchers need to define individual's communities based on both objective and perceived

measures in order to understand the interaction between the individual and their environment (Booth et al., 2005).

The Socioecological Model

Many factors impact an individual's behavior, and many obesity interventions fail to recognize the underlying factors that cause obesity and, therefore, do not effectively treat it (Beydoun and Wang, 2007). Previous interventions have targeted the individual, while overlooking the impact that the community and environment have on an individual. The socioecological model, as seen in Figure 1, is useful in depicting this multifaceted interaction between community, environment, family, and individual (CDC, 2015). The overlapping rings of the model indicate that influences in one sphere impact the influences in all the spheres. Altering the environment tends to have the largest impact and is therefore, more efficient at addressing the fundamental determinants of health at the population level (Frieden, 2010).

Figure 1 – The Socioecological Model



Recent research highlights the importance of intervening at multiple levels in order to elicit lifestyle changes such as healthy eating and increased physical activity. However, there are barriers at each level that must be addressed. At the intrapersonal level, barriers such as taste preferences, lack of knowledge and skills, and physical limitations exist (Fitzgerald and Spaccarotella, 2009). These barriers are typically in the control of the individual and can be influenced using education and awareness. At the interpersonal level, family norms and acculturation are barriers, as well as lack of social and peer support (Fitzgerald and Spaccarotella, 2009). These can often be addressed by programs that increase awareness, knowledge, and skills, and also provide increased peer and social support. At the community level, the socioeconomic status of the neighborhood, access to resources, zoning, and the built environment are all barriers to healthy lifestyle behaviors (Fitzgerald and Spaccarotella, 2009). These are harder to

address and most likely require community partnerships, policy changes, and financial resources with a longer time frame. Lastly, at the public policy level, the price of food, increasing portion sizes, the complications of using food assistance programs for minorities, and the lack of school wellness policies are all barriers to healthy eating (Fitzgerald and Spaccarotella, 2009). These barriers are challenging to remedy and would require collaborative interventions by individual, communities, and organizations. For example, a research study involving middle school students and physical activity and nutrition used multi-level approaches and found that they were successful in increasing physical activity, but not reducing total fat intake (Fitzgerald and Spaccarotella, 2009). These results could be a result of financial barriers by both the school, family, and individuals. However, these barriers are important to recognize and overcome in order to implement multi-level approaches based on the socioecological model that effectively increase healthy behaviors in rural communities.

During interviews, Appalachian residents emphasized the negative impact that fast food, church dinners, cultural norms, and lack of nutritional knowledge has on healthy behaviors in their community (Schoenberg et al., 2013). In addition, their recommendations for fostering healthier behaviors in their community directly aligned with targeting the outer layers of the socioecological model (Schoenberg et al., 2013). Therefore, targeting the environment in the Appalachian area could be an effective way to increase health behaviors and decrease obesity prevalence.

The socioecological model is also a framework that can be applied to prevention efforts (CDC, 2015). When designing and evaluating effective prevention strategies, a

multi-level, ecological framework is necessary to understand the interplay of factors that shape health behaviors (Story et al., 2008). Four specific settings were recognized by Cornell University as most relevant to environmental obesity prevention strategies: nutrition educators' workplaces, adult organizations, schools or youth organizations, and community coalitions (Lu et al., 2014). The three tasks documented by nutrition educators as most performed in each setting were making recommendations and providing information to agency partners, collaborating to develop and implement action plans, and monitoring and evaluating progress of action plans (Lu et al., 2014). This illustrates how the socioecological model can be used to create a context-specific framework describing environmental strategies to target and prevent obesity.

The socioecological model can be applied when exploring ways to improve dietary behaviors of low-income individuals or families. The current evidence base indicates that social norms and cultural beliefs play a key role in a person's health status, in concert with other factors such as access to preventative care, income, and food security (Robinson, 2008). It is well known that adequate fruit and vegetable consumption is associated with decreased risk of coronary artery disease, chronic diseases, and hypertension (Robinson, 2008). However, most Americans do not consume enough fruits and vegetables, especially those consumers with a low economic status or limited access to healthy foods (Robinson, 2008). After examining the barriers to increased fruit and vegetable intake and dietary behaviors of low-income African Americans, the conclusion was that effective intervention strategies integrated both environmental and individual strategies into multiple settings, with at least one

intervention targeting the individual and one targeting the environment (Robinson, 2008). Settings that were most effective for this group of African Americans were churches, neighborhoods, summer programs, grocery stores, restaurants, health care organizations, and health education organizations (Robinson, 2008). This study documents the importance of targeting both the individual and the environment in appropriate settings in order to increase fruit and vegetable consumption and other health behaviors.

The multi-level approach, targeting both the individual and the environment, has shown promise in changing behaviors (Gregson et al., 2001). However, using multiple interventions presents a challenge for the selection of appropriate evaluation methods. The changes that occur in the outer spheres of the socioecological model tend to reinforce the changes that occur in the intrapersonal and interpersonal levels (Gregson et al., 2001). Using an integrative framework to assess multi-level change shows great promise in nutrition education, especially in low-income populations, and should be considered when planning and evaluating nutrition education programs in such populations (Gregson et al., 2001; Story et al., 2008).

The Cooperative Extension Service

The Cooperative Extension Service, founded with the Smith-Lever Act of 1914, established the mission of land-grant universities to extend their resources and programming into local communities in order to fulfill local needs and deal with problems (Riley, 2008). It is considered a reliable and readily available service for

evidence-based adult education in rural America (Mullins et al., 2014). Wayne Ramussen, in his book *Taking the University to the People: Seventy-Five Years of Cooperative Extension*, described Extension as practically applying education by extending the knowledge base of land-grant universities to the environment of real life where people live and work (Ramussen, 1989). Currently there are approximately 2,900 Extension offices around the country (USDA, 2014). There are six major areas of Extension-related programming: 4-H youth development, agriculture, leadership development, natural resources, family and consumer sciences, and community and economic development (USDA, 2014). Consequently, improving the obesity epidemic directly relates to the family and consumer sciences sector and the goals of Extension overall.

At the University of Florida, the Cooperative Extension Service intervened in local communities of north central Florida, targeting both childhood obesity and lifestyle behaviors (Janicke et al., 2011). This study is a follow-up of a pilot study on the Translational Research for the Prevention and Control of Obesity and Diabetes, which determined that parent-only interventions could be a cost-effective and sustainable way to encourage healthy behaviors in rural areas instead of using family-based interventions (Janicke et al., 2011). Although the final results have yet to be published, this research documents the importance of the parent in the lifestyle behaviors of their children, especially in rural communities where infrastructure and programming are lacking (Janicke et al., 2011).

There is a gap in the literature regarding how evidence-based obesity interventions can be effectively translated into rural, medically underserved communities. This is, especially true for programs implemented by local agencies such as the Cooperative Extension Service. Land-grant universities can focus on expanding and building upon the programs and partnerships fostered through Cooperative Extension.

At the request of Extension Agents for an adult weight management program, a team of specialists from the University of Kentucky developed the program, Weight ~ The Reality Series which includes two curricula based on the Social Cognitive Theory (Mullins et al, 2014). In four years, the program was delivered to over 7,000 participants in 45 to 60 different Extension offices around the state. This evidence-based program, implemented by Extension Agents, resulted in weight loss by 30% of the participants by improving weight management behaviors, and 80% of a subset of 626 participants reported maintaining their weight loss on the three-month follow up survey (Mullins et al., 2014). These findings demonstrate the potential for Extension programs to have an impact on adult weight management of residents in rural Kentucky.

The Eat Smart, Move More, Weigh Less (ESMMWL) program was delivered through Cooperative Extension and local public health departments in worksites and community settings in 48 counties of North Carolina (Whetstone, 2011). The adult weight management program was centered on evidence-based eating and physical activity behaviors and incorporated mindful eating concepts (Whetstone, 2011). The program was effective in eliciting significant, positive changes in weight management in

the 1,162 participants, including 83% reporting moving toward or attaining their goal, 92% reporting an increase in confidence to eat healthy, and 82% reporting an increase in confidence to be physically active (Whetstone, 2011). These results demonstrate that evidence-based interventions from Cooperative Extension partnering with the local health department can make positive changes in individual behaviors related to healthy eating and physical activity. This study did not report the sustainability of the ESMMWL program and whether or not these positive behaviors continued over time.

Internet access has been made more readily available, especially in rural or low-income areas. In 2000, the percentage of adults using the internet in households that made less than \$30,000 a year was 28%; in 2011, the percentage of adults using the internet in households that made less than \$30,000 a year was 62% (Zickuhr and Smith, 2012). That is an increase of more than double in only a decade (Zickuhr and Smith, 2012). Online education has also increased in the past decade due to its convenience, on-demand accessibility, customization, and individualized pace (Zickuhr and Smith, 2012). In rural Oregon, a study conducted by the Cooperative Extension Offices determined that the perceptions about online education were positive and most frequently warranted for tips on cooking, stretching food resources, and recipes (Case et al., 2011). The use of online education for formal nutrition education was enhanced when extrinsic motivators were involved, such as entrance into a drawing or receiving coupons (Case et al., 2011). The likelihood of participating in online education programs also depended on the characteristics of the website, as well as its applicability and accessibility to the user (Case et al., 2011). Online education should be offered with

reinforcing direct education services such as classroom learning, hands-on demonstrations, or other techniques to maximize the benefits of online education (Case et al., 2011).

The Expanded Food and Nutrition Education Program (EFNEP) in Duplin County, North Carolina, a nutrition education program for limited resource families found that all participants answered “yes” or “possibly” when asked if they felt any barriers to participating in the Cooperative Extension program (Richardson et al., 2003). The major barriers identified were family responsibilities, transportation problems, trouble reading the information, lack of information on what was available, and not feeling comfortable in the group (Richardson et al., 2003).

When Extension works through community coalitions, the resulting partnership takes advantage of a participatory approach. Cooperative Extension brings resources to coalitions including content knowledge, university evidence-based research, physical offices and meeting facilities, and access to professional networks (Smathers and Lobb, 2015). Extension professionals can provide technical assistance, support, and leadership (Smathers and Lobb, 2015). Working in the community where they live puts Extension Agents in a valuable position to gain trust and establish long-term relationships with community stakeholders (Riley, 2008). These relationships are vital in the development and sustainability of a community coalition.

Community Coalitions

A coalition is an action-oriented organization, specifically “a formal alliance of organizations that come together to work for a common goal to establish a more sustainable collaboration” (Chavis and Florin, 1990; Kegler and Butterfoss, 2012). Forming a coalition, derived from the Latin root words *coalescere*, meaning to grow together, and *coalitio*, meaning a union, is like creating an alliance that maximizes the power of the individuals within the coalition in order to influence long-term health behaviors (Butterfoss, 2007). Coalitions are typically better suited to intervene at the organizational, community, environmental, or public policy levels, the outer rings of the socioecological model, and produce more sustainable and wide-spread changes within a community (Butterfoss, 2007; Kegler and Butterfoss, 2012).

Coalition building is essential to improving health outcomes in rural populations due to the geographic isolation, lack of infrastructure, public transportation, and healthcare providers, and funding in rural communities (Kegler and Butterfoss, 2012). In rural communities, distrust of the government is more common, and community values and norms will have an impact on the coalition’s prioritized goals (Kegler and Butterfoss, 2012). Rural communities with successful coalitions have a true sense of community and connectedness, a strong attachment to place, and typically have a wider reach with only modest effort (Kegler and Butterfoss, 2012). However, effective coalitions must acknowledge that each organization and individual within the group has self-interest (Kegler and Butterfoss, 2012). These coalitions allow for sharing of limited resources, accountability, responsibility, and authority (Kegler and Butterfoss, 2012). Furthermore,

coalitions share both the risk and reward, and typically achieve more than any of the organizations would have individually (Kegler and Butterfoss, 2012). One model that has worked well in rural areas is having a larger, external agency provide funding, while smaller, local agencies provide the coalition with programming and leadership (Kegler and Butterfoss, 2012).

There are three types of coalitions: grassroots coalitions, professional coalitions, and community-based coalitions (Kegler and Butterfoss, 2012). With community-based coalitions, community ownership is increased, but typically external funding is needed (Kegler and Butterfoss, 2012). However, risk and reward, and typically achieve more than any of the organizations would have individually (Kegler and Butterfoss, 2012). There are challenges that accompany community-based coalition work that can cause frustration. These include conflicting interests within the coalition, coalition leaders wearing multiple hats, resources that were promised but not available, and delayed recognition of successes since health outcomes may take years to realize (Kegler and Butterfoss, 2012).

Health disparities are the result of complex causes, and therefore, require complex solutions. Health coalitions are used to unite organizations, community groups, and stakeholders with a common goal of improving health disparities in the community. By combining resources and expertise, community coalitions can create efficient, effective, and sustainable changes within the community (Smathers and Lobb, 2015; Kegler and Butterfoss, 2012). Members are the greatest asset to any coalition (Kegler and Butterfoss, 2012). The extent to which individuals take part in health coalition

operations and activities impacts the capacity of the coalition as a whole to collaborate and achieve common goals (Barnes et al., 2014, Butterfoss, 2007). Furthermore, community impact influences the coalition's longevity and size (Smathers and Lobb, 2015). Using community-based coalitions in public health initiatives increases the ownership within the group and allows for the exchange of knowledge, ideas, and strategies as a unified group (Butterfoss, 2007).

The Consortium for Infant and Child Health (CINCH) was one of the first community coalition projects in the U.S., beginning in 1993 (CINCH, 2006). Receiving funding from the CDC, CINCH successfully increased the immunization rate of children in Norfolk by 17% in two years (CINCH, 2006). Later, CINCH was expanded to a focus on other infant and children health topics such as obesity, asthma, and injury prevention, especially in underserved populations (CINCH, 2006). Founding member and director, Dr. Butterfoss wrote that "CINCH has dedicated itself to one overarching principle; bringing community organizations together to contribute and work in partnership, we can achieve far more than any single organization can alone. We have always been committed to using research and data to drive programs and involving our partners in meaningful and direct ways to accomplish our objectives" (CINCH, 2006). CINCH is an example of the sustainable impact community coalitions can have on the health status of underserved populations as result of using evidence-based interventions.

The Active Living Coalition (ALC), which began in Monroe County, Indiana, in 2004, is now comprised of almost 100 individuals representing over 25 organizations (Barnes et al., 2014). Coalition participants were heterogeneous and could be

characterized in six ways: the newcomer, the silent participant, the connector, the helper, the visionary resource sharer, and the worker bee (Barnes et al., 2014). Coalition members can range from less active to very active with everyone bringing something different to the table (Kegler and Butterfoss, 2012). Coalition leaders can use this information to understand the composition of their coalition to leverage the strengths of coalition members. The participant continuum depicts the importance of having each type of participant represented in the coalition and understanding what the participant sees as his role in the coalition in order to have the most successful and comprehensive effect (Barnes et al., 2014). Representation of the entire community in coalitions is necessary to effectively address health behaviors in the community.

The California Endowment (TCE) funded nine to twelve local health coalitions over the course of eight years to focus on environmental triggers in three main areas: housing, schools, and outdoor air quality (Kreger et al., 2011). Using the “grassroots to treetops” approach, the idea that efforts should begin with the local community and build upon the existing activities and infrastructure, while also creating a larger network of all the coalitions working together to advocate for strategic policy changes from the local to the state level, succeeded in addressing disparities from a preventative environmental approach rather than an individual treatment approach (Kreger et al., 2011). When comparing across coalitions, those that had a strong community base, developed a peer learning environment, and had supportive technical assistance and training were more successful in childhood asthma reduction efforts (Kreger et al., 2011). The successful use of coalitions to change the environment, and in turn impact

asthma levels in children, shows promise that coalitions can work to improve other health outcomes in the future (Kreger et al., 2011).

There are two major theories for collaboration efforts across sectors in health promotion: the community coalition action theory (CCAT) and the collective impact (CI) model (Kania and Kramer, 2011; Flood et al., 2015, Kegler and Swan, 2011). CCAT is rooted in the idea that a group of individuals are more likely to successfully deal with a shared concern together instead of independently (Flood et al., 2015). CI is an action-oriented, large-scale social change model that aligns organizations and individuals to address a communal problem (Kania and Kramer, 2011). The CI framework is based on the idea that no one organization alone can tackle complex issues such as obesity and health disparities and collaboration is necessary between organizations, government agencies, and community members (Kania and Kramer, 2011). Kania and Kramer (2011) said "... we believe that there is no other way society will achieve large-scale progress against the urgent and complex problems of our time, unless a collective impact approach becomes the accepted way of doing business." The five common elements in CI are a common agenda, common process measures, mutually reinforcing activities, communication, and a backbone organization (Kania and Kramer, 2011). Efforts by a San Francisco coalition depict how CI has led to community and policy changes to reduce tobacco and alcohol advertising, while improving food access in a low-resource environment (Flood et al., 2015). In addition, interviews from policy makers in the community identified the coalition as playing a prominent role in shaping policy (Flood

et al., 2015). This illustrates the importance of community coalitions in shaping policy and the effect that coming together to solve a shared concern has on a community.

The CCAT is used to explain how coalitions, rather than single entities, can lead to improved health outcomes. The three phases of the CCAT are formation, maintenance, and institutionalization (Flood et al., 2015). The most prominent pathway depicted by the CCAT is from member engagement to coalition factors and community capacity outcomes, possibly mediated by participation and satisfaction (Kegler and Swan, 2011). The CCAT suggests that resources pooled by the coalition members can mediate the relationship between coalition factors and community capacity outcomes (Kegler and Swan, 2011). This approach recognizes that the coalition itself does not create change, but rather it is the people that make up the coalition, the resources they bring to the table, and their engagement that can lead to better community outcomes (Kegler and Swan, 2011).

Sustainability is also important when it comes to coalitions. The strategies implemented by a coalition must become embedded into the community norms in order to have a lasting impact (Kegler and Butterfoss, 2012). Furthermore, coalitions that conduct comprehensive assessments are at a relative advantage when selecting and implementing strategies that will have a positive impact on health outcomes, and be sustainable over time (Kegler and Butterfoss, 2012). Some characteristics of effective and sustainable coalitions are: strong leadership, deep community ties, coordinated efforts, evidence-based strategies, and planning for sustainability from the beginning (Kegler and Butterfoss, 2012).

For coalitions to be successful, the benefits of being a member must outweigh the costs of participation (Kegler and Butterfoss, 2012). Insufficient or poor leadership can drastically impact the success of the coalition, especially in rural areas (Kegler and Butterfoss, 2012). Rural areas present a unique set of challenges including fewer agencies, limited resources, and a lack of diversity that can alter the effectiveness of a coalition's work. However, the underlying rationale for community-based coalitions in rural areas is that members of the community should have a voice in determining what happens in the community, and that communities themselves have the ability to solve their own problems (Kegler and Butterfoss, 2012). Coalitions empower the community to implement effective and sustainable changes at all levels of the socioecological model.

Community-Based Policy, System, and Environmental Approaches

Community-engaged research has been shown to be effective in reducing health inequities (Kreger et al., 2011). No one knows more about the community than the people that live there. Community members should have input regarding decisions that directly impact them as individuals and their community as a whole (Sloane et al., 2003). However, in the past community initiatives led by coalitions did not often address the environmental components that could foster healthier behaviors and instead have focused more on individual strategies (Kreger et al., 2011). Recent research emphasizes the importance of targeting the outer layers of the socioecological model in order to address the challenges of eating healthy, especially in rural areas (Schoenberg et al.,

2013). There is a gap in the literature on the outcomes of using community-based policy, system, and environment (PSE) interventions to increase healthy behaviors.

The CDC is a leader of PSE efforts and recommends them as a prevention strategy to reduce prevalence of chronic diseases. Grounded in the Health Impact Pyramid, PSE strategies modify the environment to foster healthier choices by making them the easy and convenient (default) choice (Bunnell et al., 2012; Frieden, 2010). PSE efforts are believed to be more economically sustainable over time because they reduce health disparities, create a more supportive environment, and can be widely implemented (Bunnell et al., 2012; Batan et al.). Although PSE strategies typically have a larger reach, that does not mean that individual counseling and education interventions are not also beneficial and can be used in combination with PSE approaches (Frieden, 2010).

An example of successful community-based policy and environmental efforts is the Healthy Maine Partnership. University of Maine Cooperative Extension, state and local governments, community organizations, and schools partnered to reduce tobacco use and increase healthy eating and physical activity using PSE approaches in the mostly rural state of Maine. Implementing a smoke-free housing policy, a smoke-free public park policy, and smoking policies at hospitals, schools and workplaces, among other things, led to a decrease in smoking in these areas (Martin et al., 2009). This study found most of the work was done by the local partnerships, highlighting the importance for these partnerships in rural areas (Martin et al., 2009).

The literature is plentiful regarding the difference in obesity prevalence between rural and urban populations; recent research has focused on determining causative factors for this disparity. Michimi et al. assessed the association of the natural environmental with the obesity rates and physical activity levels in rural, U.S. areas and determined that the prevalence of obesity decreased, while physical activity intention increased as the number of physical activity opportunities increased (Michimi and Wimberly, 2012). The limitations of the natural and built environment influence physical activity levels of those within the community (Michimi and Wimberly, 2012). In rural areas in particular, the geography and environment can discourage physical activity (Michimi and Wimberly, 2012). In urban areas, there is an association between green space and human health. However, this is not found to be true in rural areas, as green space is in excess (Michimi and Wimberly, 2012). In North Carolina, Jilcott et al. determined there was a negative association between natural amenities offered in a county and the BMI of its residents with physical activity as a mediator (Jilcott et al., 2011). However, interactions between the environment and the individual are complex and interventions must be tailored in order to enhance both the natural and built environment to increase healthy behaviors.

Extension Agents are in an ideal position to make PSE strategies a reality, despite traditionally working primarily in direct education programs for individuals and families (Johnson and Johnson, 2015; Smathers and Lobb, 2015). Since they live in the community where they work in, they are trusted by community members and can include the community in developing programming and approaches that can improve

health outcomes. For example, the University of California's Cooperative Extension and community coalitions successfully implemented PSE strategies to prevent childhood obesity (Espinosa-Hall, 2007). Two PSE strategies used were safer ways for children to walk or bike to school and advocating for increased healthy food access (Espinosa-Hall, 2007). However, not all Extension staff are confident leading PSE efforts. In a survey conducted by Bunnell et al., some Extension staff were unsure what PSE strategies were and could not give appropriate examples (Bunnell, et al., 2012). This indicates the need for Extension Agents to participate in training and professional development in order to be skilled and confident leading PSE efforts.

Conclusion

Obesity is a growing epidemic, especially in rural America. Kentucky is no different, with over half of its residents living in rural areas (Johnson and Johnson, 2015). Many factors influence a person's weight including diet, physical activity, access to healthy foods, healthcare, areas to be physically active, and screen time. Improving these health behaviors means addressing them on multiple levels, in accordance with the socioecological model. Access to healthy foods, barriers in the physical activity environment, and a lack of education need to be targeted to promote an increase in health behaviors in rural Kentucky. Cooperative Extension already has a presence in rural areas and can be used as a vehicle to deliver education and programming to residents of the community, while also changing the environment. Cooperative Extension Agents are in a great position to work with community members through

coalitions to implement evidence-based, collaborative interventions within their county. This project will fill a gap in the literature by evaluating the process in which community-based obesity interventions are chosen and implemented in rural Kentucky.

Chapter 2

Introduction

The prevalence of obesity continues to rise in the United States (U.S.), especially in rural areas (CDC, 2013; Befort et al., 2012; Patterson et al., 2004). Rural Americans are one of the most medically underserved groups and are at greater risk of developing chronic diseases and obesity than urban Americans (Befort et al., 2012, Patterson et al., 2004). In the mostly rural state of Kentucky, where the obesity rate is already at 33.2% statewide, six counties report an obesity rate of above 40% (BRFSS, 2011). The population in these counties face high rates of poverty, geographic isolation, low education, low health literacy, limited food access and few opportunities for physical activity (Halverson et al., 2004). Research provides support that rural adults are more likely to take part in obesity-related behaviors than urban adults, leaving the question as to whether or not rural areas are more obesogenic, or encouraging obesity-related behaviors, than urban environments (Trivedi et al., 2015).

Health disparities are the result of complex causes, and therefore, require complex solutions. Previous interventions have targeted the individual, while overlooking the impact that the community and environment have on an individual. The socioecological model is useful in depicting the multifaceted interaction between community, environment, family, and individual (CDC, 2015). Altering the environment tends to have the largest impact and is more efficient at addressing health disparities in communities (Frieden, 2010). Grounded in the Health Impact Pyramid, policy, systems, and environmental (PSE) strategies modify the environment in hopes of making the

healthier choice the easy and convenient choice (Bunnell et al., 2012). In rural areas in particular, the geography and environment can discourage physical activity (Michimi and Wimberly, 2012). Interactions between the environment and the individual are complex and interventions must be tailored in order to enhance both the natural and built environment to increase healthy behaviors within the community.

Involving the community in the process and implementation of health efforts has demonstrated effectiveness in reducing health inequities (Kreger et al., 2011). Coalition building is essential to increasing health outcomes in rural populations due to the geographic isolation, lack of infrastructure, public transportation, and healthcare providers, and funding challenges that rural communities face (Kegler and Butterfoss, 2012). Coalitions allow for the sharing of limited resources, accountability, responsibility, risk, and authority, and they typically achieve more than any of the organizations would have individually (Kegler and Butterfoss, 2012). Furthermore, coalitions are often better suited to intervene at the outer rings of the socioecologic model and produce more sustainable and wide-spread changes within a community (Butterfoss, 2007; Kegler and Butterfoss, 2012).

Cooperative Extension already has a presence in rural areas and can be used as a vehicle to deliver education and programming to residents of the community, while also changing the environment. When Cooperative Extension works through community coalitions, the resulting partnership takes advantage of a participatory approach. Resources that Cooperative Extension brings to coalitions include content knowledge, university evidence-based research, resources, and access to professional networks

(Smathers and Lobb, 2015). Furthermore, Extension professionals can provide technical assistance, support, and leadership (Smathers and Lobb, 2015). Working in the community in which they live puts Cooperative Extension Agents in a valuable position to gain trust and establish long-term relationships with community stakeholders (Riley, 2008). These relationships are vital in the development and implementation of health promoting PSE strategies (Johnson and Johnson, 2015; Smathers and Lobb, 2015).

Previous research has highlighted the success of community-based interventions utilizing a combination of dietary and physical activity approaches to combat obesity among children (Bleich et al., 2013). However, there remains limited understanding of how best to tailor these strategies based on community-specific needs in the rural United States. The purpose of this research study is to evaluate the process in which community-based obesity interventions are chosen and implemented in six counties of rural Kentucky with adult obesity rates above 40%.

Methods

This qualitative study consisted of 11 coalition meetings conducted between February 2015 and August 2015 as part of the CDC 1416 Obesity Grant in six counties of rural Kentucky with adult obesity rates above 40%. These counties were chosen based on Behavioral Risk Factor Surveillance Survey (BRFSS) data from 2010, which was provided by the CDC. Each of the 11 coalition meetings was recorded and transcribed verbatim. There was one transcript that was lost due to technical difficulties.

Furthermore, Extension Agents completed a Qualtrics survey in April of 2016 to document the environmental changes and programming related to the grant that was conducted between September 2015 and March 2016 (Appendix A). This survey was mostly open-ended questions that asked for details on direct education programming, promotion and marketing, environmental enhancements, and the Extension Agent's role in the coalition. Coalition members completed the Program to Analyze, Record, and Track Networks to Enhance Relationships (PARTNER) survey online after the second coalition meeting to determine the greatest outcomes and perceived success of the coalition efforts (Appendix B). This study was approved by the Institutional Review Board at the University of Kentucky in Lexington, Kentucky.

Coalition Meetings

The Extension Agents in each county formed coalitions with representation from all major stakeholders in the community including local government, the school system, church groups, the health department, grocery store owners, and other members of the

community. On average, the attendance of the coalition meetings ranged from 12 to 23 stakeholders. Coalition meetings were held at the Cooperative Extension Office in each respective county. The coalition meetings were moderated by two experienced facilitators using a focus group guide (Appendix C). Each coalition meeting lasted approximately 60 to 90 minutes and was audio recorded.

At the first coalition meeting, the grant was described and a previous needs assessment handout was given to the coalition members. Community members then verbalized ongoing initiatives in the community that aligned with the grant goals. Lastly, in small groups, community members stated causes of obesity in their county and mapped these causes onto the county assets. At the second coalition meeting, coalition members prioritized the evidence-based interventions from a menu of options offered by the grant using the community-based participatory research theory (Appendix D). The menu of options was presented by a strategy leader on the grant team.

Data Analysis

A general inductive approach consistent with grounded theory principles was used to guide the data analysis of the 11 coalition meeting transcripts. The transcripts were coded using QSR NVIVO 11 software (QSR International) by one qualitative analyst, who was immersed in both data collection and analysis (Cooper et al., 2016; Schreier, 2012). This method ensured that the coding adequately depicts the content of the coalition meetings. Initially, the qualitative analyst read all of the transcripts and developed the first version of the codebook with thematic open codes and definitions

(Appendix E). After the development of the codebook by one qualitative analyst, a second qualitative analyst randomly selected and coded 25% of the transcripts to confirm the comprehensiveness and reliability of the open-coding scheme (Myers, 2012). The second analyst also used QSR NVIVO 11 software (QSR International) to code, and the inter-rater reliability rate of the two coders was 95%. Then, the open codes were collapsed into higher-level axial codes to identify patterns and relationships within the data and to identify salient themes.

Results

County Demographics

Baseline data (Table 1) were collected from secondary sources for the six counties in this study: Clinton, Elliott, Letcher, Lewis, Logan, and Martin (United States Census Bureau, 2013; USDA, 2012; Kentucky Cabinet for Health and Family Services, 2013). The prevalence of obesity and other obesity-related chronic diseases in each of the counties was compared to both state and national averages (Table 2) (Foundation for a Health Kentucky, 2008-2010; BRFSS, 2010).

Table 1. Demographic Characteristics of Six Kentucky Counties

	Clinton	Elliott	Letcher	Lewis	Logan	Martin
Population	10,244	7,774	24,336	13,889	26,786	12,934
Poverty	28.0%	33.7%	25.7%	31.7%	19.2%	35.7%
Food Insecurity	17.1%	18.8%	18.6%	18.5%	15.2%	20.1%
SNAP Recipients	1,419	1,089	4,051	1,900	2,334	2,218
Unemployment Rate	9.6%	11.6%	17.3%	12.2%	7.1%	11.6%
Number of families	2,581	1,747	6,504	3,577	7,553	3,296
Education Attainment (Associate's degree or higher)	13.0%	9.9%	19.4%	15.4%	16.5%	15.2%
Families with children at or below poverty	25.0%	27.9%	23.6%	21.0%	29.2%	18.4%
Children at or below poverty	61.2%	57.9%	67.9%	54.5%	68.9%	46.9%
Grocery stores per 10,000 people	2.1	1.4	2.92	5.05	1.85	2.58

Table 2. Prevalence of Obesity and Related Conditions of Six Kentucky Counties

	Clinton	Elliott	Letcher	Lewis	Logan	Martin	Kentucky	Nation
Obesity	40.1%*	41.1%*	43.0%*	41.6%*	43.5%*	43.6%*	31.3%	27.6%
Diabetes	8%	7%	11%*	7%	3%	9%*	8%	8.4% Avg BRFSS
High blood pressure	39.6%*	33.6%*	43.7%*	29.8%	34.4%*	32.4%*	38.0% BRF2011	30.8% 2011BRF
Heart Disease	326.5*	139.0	295.7*	232.2*	214*	358.7*	224.0	184.6
Stroke (deaths/100,000)	24.9	29.7	59.2*	45.0*	42.6*	39.9	47.0	40.2
All cancer (age adj. rate/100,000)	231*	214*	236*	234*	240*	217*	212	174.2

Notes for Table 2: **Bold** indicates greater than state averages, and * indicates greater than national averages.

Themes/Subthemes

The final sample included eleven coalition meetings, representing the stakeholders from six different counties in rural Kentucky. Four main themes emerged from data analysis of the transcripts: cultural influences, poor diet, inactivity, and lack of community-involvement. These themes were recognized by the coalition members as discouraging healthy behaviors such as healthy eating and physical activity, which directly impact the obesity rate.

Theme 1: Cultural Influences

Subtheme 1.1: Food-Centered Culture

A food-centered culture was recognized by the coalitions as a major facilitator of the obesity rate. In Appalachia, participants reported that social activities revolve

around food, specifically unhealthy, cultural foods. Foods such as chicken and dumplings, cakes, and cookies were recognized as commonly found at social events, community parties, church events, and other gatherings. Coalitions recognized the possibility of highlighting healthier foods at community events or focusing on something other than food at social events.

Our culture is centered around food. That is what we do when we get together.

When we get together you bring food and share food. (Coalition Member, Martin County)

Subtheme 1.2: Traditions

The residents of these counties are proud people and rely on traditions that are passed down from generation to generation. Those that still cook do so like their ancestors, which might not be the healthiest way. For example, many participants discussed how their grandmothers cooked with bacon grease and how they continue to do that. Specifically, many participants emphasized being taught to clean their plates, no matter how much food is on it, which they admitted means they are often overeating.

Culture in general. The way people were taught; traditions; the foods they were taught to make growing up; upbringings; don't be wasteful; eat everything on

your plate. So if you get five portions, you better eat it all and don't waste it.

(Coalition Member, Lewis County)

Three of the six county coalitions mentioned a significant number of grandparents are raising grandchildren in their counties. This illustrated a unique set of challenges that grandparents raising grandchildren face. Grandparents have a harder time being physically active with their grandchildren and are passing on the traditional ways of cooking.

Some of the kids who go there are raised by their grandparents. That is a huge issue in our area. And they are taught the old way of cooking. And the old way of cooking is not always the best way. (Coalition Member, Lewis County)

Subtheme 1.3: Lack of Time and Motivation

Participants recognized a lack of time as one of the biggest barriers to healthy eating. Rural areas produce a unique set of challenges for those who live there, as they are geographically isolated and have fewer resources than urban areas. Rural residents typically spent more time commuting, which left less time for healthy behaviors. Most people acknowledged that they often relied on convenience foods in their diet due to a lack of time.

Convenience...people don't have time to prepare healthy foods or if you are the mother of any child that has sporting events and things like that you are running back and forth and eating in the car. (Coalition Member, Letcher County)

In addition to those that did not have time, some acknowledged knowing what to do to be healthy, but not having the discipline or motivation to choose those behaviors. A few participants mentioned that they were more likely to take part in healthy behaviors if their friends or family do so (positive peer pressure). Competitions were proposed as possible solutions to the lack of motivation.

So what they found is that healthy behaviors are contagious just like unhealthy behaviors are...I would have taken the escalator, but none of my peers were taking the escalator, so I climbed the stairs. I'm serious, when your peers do something healthy, you are not going to be the only unhealthy one. (Coalition Member, Elliott County)

Theme 2: Poor Diet

Subtheme 2.1: Accessibility of Healthy Foods

In these rural counties, there was a high concentration of fast food restaurants and few other options. A lack of access to healthy foods was recognized by the coalitions as a barrier to eating better. When time was scarce and options were limited, healthy eating became an even greater burden.

Accessibility. We don't have many restaurants. Maybe Subway is the only one with a healthy menu...We have fast food only. (Coalition Member, Lewis County)

In addition, the coalitions acknowledged a need for food retail enhancements because there are limited healthy options at local grocery stores. Some people were even traveling into the next county to grocery shop.

Limited resources...there are three grocery stores out here and they don't always have the best choices...We just don't have the variety, the produce is bad and the meat doesn't last long. (Coalition Member, Martin County)

Subtheme 2.2: Affordability of Healthy Foods

Access was not the only barrier to eating healthy that was recognized by the coalitions. Affordability of healthy foods was also determined to be an obstacle to eating healthy, especially for low income families. The high cost of healthy, fresh foods perpetuates an unhealthy eating cycle and higher obesity rates in these areas. Furthermore, since many were traveling further to the grocery store, they were grocery shopping less often and buying more shelf stable foods.

People in this community can't afford healthy foods. It is easier and cheaper to get unhealthy items. (Coalition Member, Lewis County)

Participants discussed how high rates of poverty and unemployment in these counties discourage healthy eating and taking part in preventive health measures. Participants noted food assistance programs as a possible solution to the lack of affordable, healthy foods. Ideas that were discussed included Kid's Bucks, Travel Vouchers and Double Dollars for SNAP recipients at the Farmers' Market.

Subtheme 2.3: Meal Planning and Preparation

Coalition participants acknowledged a gap in health literacy and nutrition education, specifically with meal planning and preparation. Some people shopping at the farmers' markets admitted to not buying a certain produce item because they were unsure how to prepare it. They could not risk spending money on something their family might not like. A possible solution to this barrier was taste testing and cooking demonstrations, so that buying a new food item was less of a risk for low-income families.

I am very afraid to waste food. So I don't cook it unless I've tried it somewhere else or tried someone else's recipe or seen it prepared. (Coalition Member, Lewis County)

We did a spaghetti squash demonstration and now I fix it all the time. But before I wouldn't touch it because I didn't know what to do with it. (Coalition Member, Lewis County)

In addition, people were interested in learning how to prepare what they were currently buying in a healthier manner. Hands-on demonstrations for quick, easy, and healthy meals were specifically mentioned as a way to overcome time, while improving diets.

We have always been kind of criticized in Eastern Kentucky for our foods and so we look at them and see how they can be tweaked to make them more nutritious and still have the same flavor. (Coalition Member, Elliott County)

Theme 3: Inactivity

Subtheme 3.1: Lack of Opportunity for Physical Activity

In rural areas, there are many barriers to participating in physical activity. The built environment discouraged physical activity among residents, and a lack of adequate physical activity resources and infrastructure were noted as contributors to obesity among rural residents. Many people stated that safety was a barrier to participating in physical activity, due to a lack of sidewalks, trails, and parks in the community.

You have to have a safe place to go. There's no place to go and ride a bike. There are people who ride bikes on county roads, state roads, city roads, but there is always a good chance you could get hit by a car, and you're always looking over your shoulder. People need a place they don't have to worry about. They can go to a certain spot and do their activity. (Coalition Member, Letcher County)

A lack of formal recess during the school day exacerbated the inactivity problem among school-aged children, especially for those who could not walk to school due to geographic isolation.

Subtheme 3.2: Need for Physical Activity Infrastructure Enhancements

Coalition members observed that the parks and playgrounds existing in the counties are outdated and in need of renovations and updates to make them more appealing to families and individuals. One mother talked about how she does not go to the park because she has young children, and there is no working bathroom at the park. The coalition members also highlighted an interest in equipment at the park that was more tailored to adults, such as exercise stations.

Well as you are talking about these enhancements, I was thinking about playground equipment that's geared toward fitness. We have swings and slides and those kinds of things...We have a walking trail and decent playground equipment, but it needs to be updated. (Coalition Member, Elliott County)

Subtheme 3.3: Technology as Part of Problem

Technology was recognized as directly influencing the obesity rate. Every coalition agreed that children spent more time on their phones, computers, and iPads now than they did playing outside and being physically active, and some parents do not

encourage physical activity after school. Furthermore, geographic isolation made it difficult for children to safely walk to school, parks, and other activities, especially with the limited number of sidewalks in most of the counties.

Everything is so focused on technology. Our noses are in our phones, iPads, and videogames. (Coalition Member, Martin County)

Too many electronics. They come in and that's the first thing they do. (Coalition Member, Lewis County)

The TV is being used as a babysitter. (Coalition Member, Clinton County)

Three of the counties, though they recognized technology is part of the problem, also discussed that it could be a part of the solution.

We like the app idea. We talked about the idea of competitions with each other.

We talked about maybe start challenging a group to do something or maybe have each school compete against each other. (Coalition Member, Martin

County)

Theme 4: Community-Involvement

Some coalitions recognized that it feels like they are being “fixed” when professionals come to their community and perform research without allowing them to have a say in what is happening in their counties. The culture in these counties foster independence

and pride, and those are not things that community members are willing to compromise, even when trying to reduce the rate of obesity in their community.

Our...successes build on things that are basic to our culture, but I think if we don't build it that way, then it feels like someone is trying to fix me. And I'm not going to let you fix me. (Coalition Member, Letcher County)

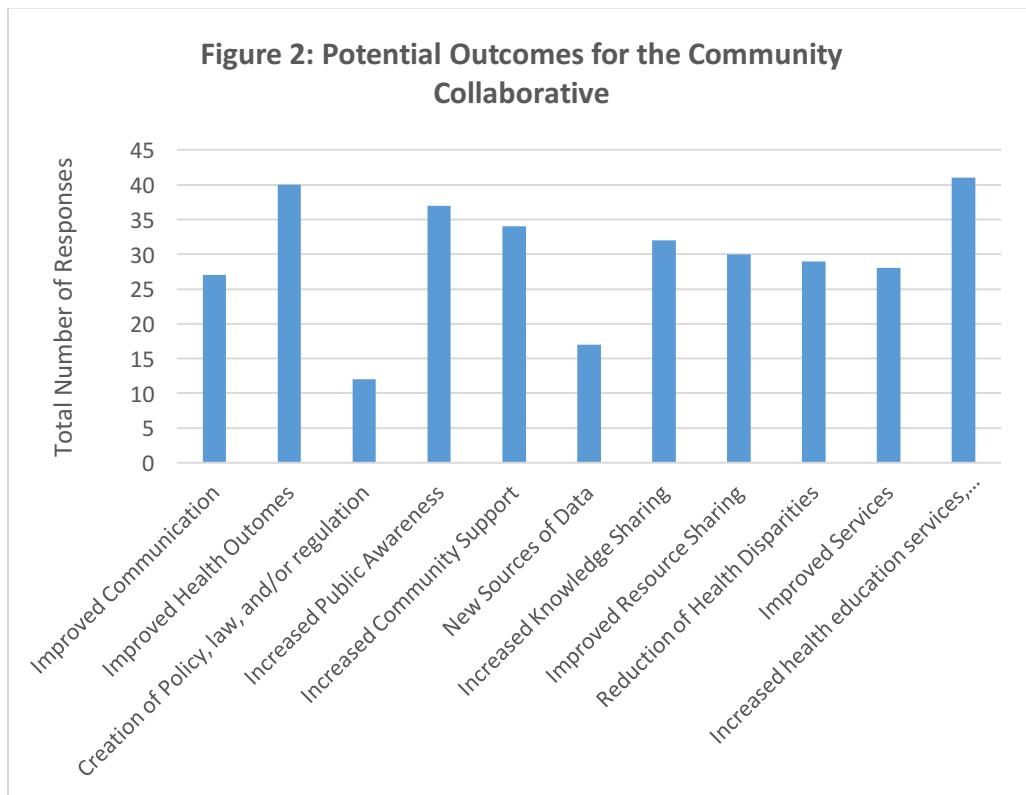
PARTNER Survey

The PARTNER survey was used to determine the perceived effectiveness and success of the coalitions, although the low response rate of the survey is a limitation of these findings (Table 3). The coalition members recognized potential outcomes of this work to be improved health outcomes, increased community support, increased knowledge sharing, increased public awareness, and increased healthy education services, health literacy, and education resources (Figure 1). The least popular answer for a potential outcome from this collaboration was the creation of policy, law, or regulations in the community. When asked the most important outcome of the community collaborations thus far, coalition members listed improved health outcomes and increased health education services, health literacy, and education resources in their community (Figure 2). The least popular answers were improved services, improved resource sharing, and increased public awareness within the community. At the second quarter of the second grant year, the perceived success of the coalitions was mixed (Appendix D). However, most coalition members felt that the coalitions were

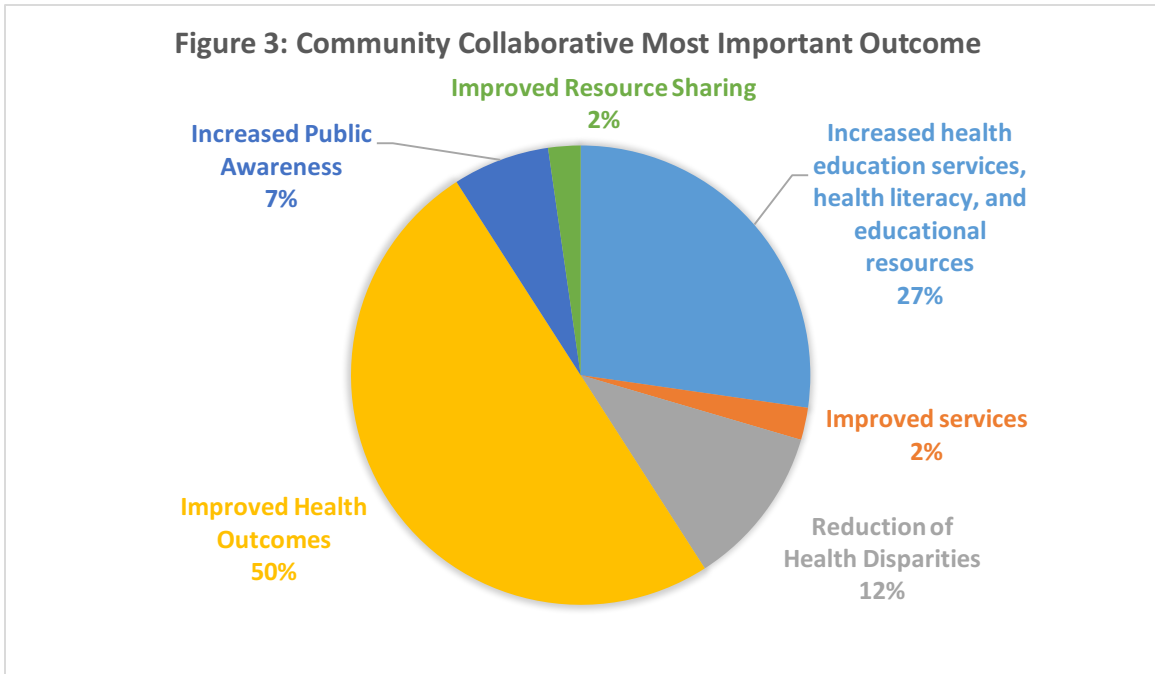
either successful or somewhat successful at this stage of the work (Figure 3). Bringing together diverse stakeholders, the exchanging of information and knowledge, sharing resources, and having a shared mission and goal were identified as contributing to the success of the coalitions (Figure 4).

Table 3: Response Rates for PARTNER Survey

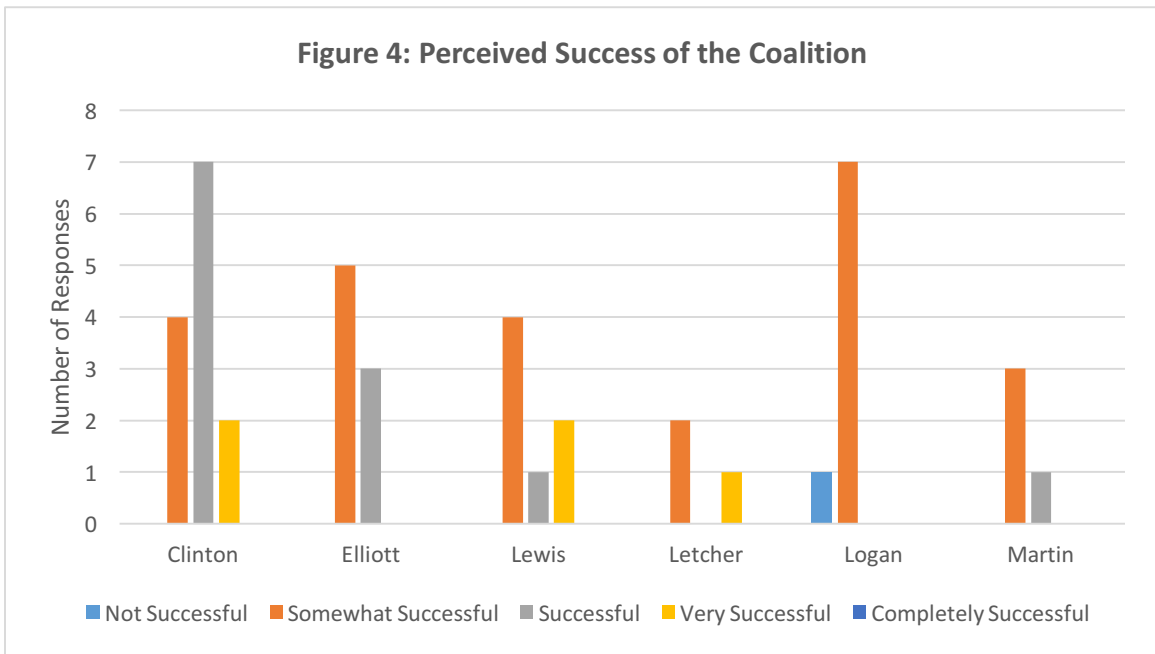
County	Number of Responses	Percentage
Clinton	13/23	57%
Elliot	8/20	40%
Letcher	3/12	25%
Logan	8/13	62%
Lewis	7/14	50%
Martin	5/17	29%
Total	44/99	44%



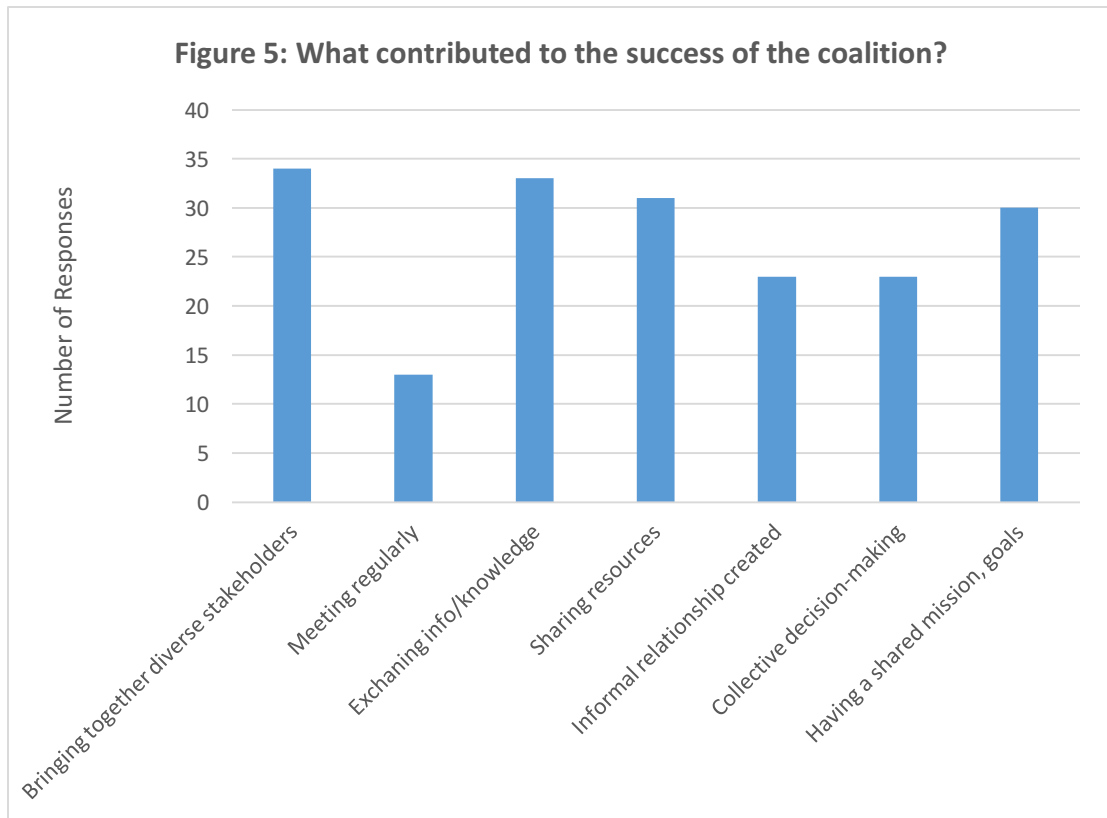
The coalition members were asked what they thought potential outcomes for this community collaborative could be.



The coalition members were asked what they thought the most important outcome of the community collaborative would be.



The coalition members were asked to rate the success of the coalition's efforts at the second quarter of the second year of the grant.



The coalition members were asked what characteristics of collaboration contributed to the success of the coalition.

Discussion

Cultural Influences

Coalition members in this study reported a strong sense of culture in regard to traditions and community norms. Participants recognized that culture has a direct influence on health behaviors. Participants stated that social events revolve around food, specifically traditional, mountain cuisine and fried, southern foods. However, participants did show an interest in learning how to make these traditional recipes healthier. Finding ways to make their culture more health focused, but without losing the basis of their traditions, is important to obesity-reducing strategies in these counties. These conclusions support previous findings that social norms and cultural beliefs play a key role in a person's health status (Robinson, 2008). Results from the coalition meetings are insightful into how culture plays a role in both individual and community health behaviors. Culture and tradition vary by community and, therefore, need to be considered before obesity-reducing strategies are implemented in rural communities.

Some of the participants reported understanding what they should do to be healthy, but acknowledged to not having the time or motivation to actually do it. Cooking healthy foods and taking part in physical activity are considered chores that often do not get completed when time is limited. Therefore, making the healthy choice the easy and convenient choice using PSE changes could be an effective strategy in reducing the obesity rate in these counties. Previous research shows that PSE strategies have the ability to reduce health disparities, create a more supportive environment, and

be widely implemented (Bunnell et al., 2012; Batan et al.). Furthermore, this supports previous research showing that the availability of physical activity resources might be one of a few factors that influence an individual's physical activity level (Diez Roux et al., 2007). When developing obesity-reducing strategies, it is important to consider both the resources available and how to make those resources the most convenient and easily accessible in order to minimize the barriers of lack of time and motivation.

Participants stated they were more likely to take part in healthy behaviors if their peers and family were adopting healthy behaviors. Competitions were proposed as a way to motivate community members to be more physically active. Therefore, interventions should consider ways to get the entire community involved and use their tight-knit culture as a health advantage. There is evidence that competition is a motivator for males to participate in physical activity (Molanorouzi et al., 2015). However, there is a gender difference in motivation to take part in physical activity, as females are more motivated by intrinsic factors such as body composition and appearance (Molanorouzi et al., 2015). Therefore, using both competitions in combination with physical activity and weight tracking might increase motivation in both women and men in these rural areas.

Poor Diet

The accessibility and affordability of quality, healthy foods in these communities were consistent topics of conversation among the coalition members. These barriers supported the findings of Yousefian et al., who found that cost, travel distance, and

quality of foods were the biggest influences in the ability of rural families to purchase healthy foods (Yousefian et al., 2011). Coalition members recognized the need for improving access to healthier foods, while also noting the need for education about healthy meal planning and preparation. These results reinforce previous studies that concluded targeting both the individual and the environment has shown promise in changing behaviors (Gregson et al., 2001; Story et al., 2008; Robinson, 2008; Booth et al., 2005). Furthermore, these results support findings from Schoenberg et al. in which Appalachian residents emphasized the negative impact that fast food, church dinners, cultural norms, and lack of nutritional knowledge have on healthy behaviors in their community (Schoenberg et al., 2013). Their recommendations to foster healthy behaviors in their community was directly aligned with targeting the outer layers of the socioecological model (Schoenberg et al., 2013).

In addition, the built environment plays a role in the lack of healthy foods offered in these counties. Previous research indicated that residents with limited access to healthy foods, especially in rural areas, are at a disadvantage of meeting the Dietary Guidelines for Americans (Liese et al., 2007). These six counties are geographically isolated and participants recognized high concentration of fast food restaurants with unhealthy options. The food retail built environment, combined with the lack of time many residents face, results in convenience often taking priority over eating healthy. Research suggests that working with grocery stores and convenience stores is a promising strategy to increase healthy food access in rural areas (Jaskiewicz et al., 2013; Pitts et al., 2013). In addition, working with larger supermarkets, even in neighboring

counties, could be an effective strategy as many participants are driving to larger stores at a further distance to do the majority of their food shopping.

Inactivity

Coalition members recognized inactivity as a major cause of obesity in their county. Specifically, they recognized a lack of access to physical activity opportunities, safety, and time and a need for improvements to current physical activity assets as barriers to taking part in physical activity. These results are consistent with previous findings that access to convenient and safe places to take part in physical activity is associated with greater levels of physical activity (Findholt et al., 2011; Banda et al., 2014; Lawman and Wilson, 2014). Furthermore, research has linked poor access to physical activity resources and low walkability communities to higher prevalence of obesity (Hansen et al., 2015; Booth et al., 2005). People who perceived their physical activity environment as more favorable are more likely to meet the Physical Activity Guidelines for Americans (Cleland et al., 2015; Jilcott et al., 2007). The findings from this study support the observation that the built environment in rural areas discourages physical activity and that people will be more likely to take part in physical activity if it becomes a more convenient and favorable choice (Booth et al., 2005; Cleland et al., 2015).

Technology was identified as a major barrier to an active lifestyle. The coalitions identified that too much time was spent on phones, computers, and video games and that children were no longer using their free time to play outdoors and be active.

However, three of the six coalitions indicated that technology could be a possible solution to the obesity epidemic, instead of a barrier. Preliminary research has indicated that smartphone applications can be beneficial for short-term weight loss and adherence (Jacobs et al., 2016; Payne et al., 2015). Therefore, tailoring an application to the culture and needs of the community, including physical activity and dietary tracking, could have a significant impact on the obesity rate in these areas.

Community-involvement

Coalition members want a voice in what happens in their community. They do not want to feel like they are being “fixed.” Community members are one of the most important assets in a rural community (Kegler and Butterfoss, 2012). For interventions to be successful, there needs to be buy-in from the community especially with regard to health initiatives (Kegler and Butterfoss, 2012). When Cooperative Extension Service Agents, who are already respected within their communities, work through community coalitions, the resulting partnership takes advantage of a participatory approach. However, the perceived success of the coalition could be attributable to the turnover of Extension Agents in two of the counties. The Extension Agents are often considered the backbone of the coalition, so therefore, the coalition is only as strong as the backbone. Research supports the use of coalitions to successfully intervene at the organizational, community, environmental, or public policy levels, the outer rings of the socioecological model, and produce more sustainable and wide-spread changes within a community by

combining resources and expertise (Kegler and Butterfoss, 2012; Kreger et al., 2011; Smathers and Lobb, 2015).

Limitations

The results of this study may be limited in that only six counties in rural Kentucky participated. However, these were the counties with the highest obesity prevalence in the state according to the 2010 BRFSS data. The PARTNER survey had a low response rate in some of the counties, which limits the validity of those results. An online survey did not seem to be the most effective way to obtain data from the coalitions in these rural counties. There were two counties in which Extension staff transferred to other positions during the course of the project, which disrupted the work of those coalitions. Lastly, since the study was only conducted in rural Kentucky, the findings might not be generalizable to all rural areas.

Conclusions and Future Implications

These qualitative findings provide insight regarding why there are high rates of obesity in rural Kentucky and how best to tailor obesity interventions based on community-specific needs. The Cooperative Extension Service already has a presence in rural areas and can be used as a vehicle to deliver education and programming to individuals, while also changing the environment. Future studies are needed to further evaluate the effectiveness of evidence-based interventions that are implemented using already existing Extension Offices.

In these six counties, there is a need for intervention at both the individual and the environmental level in accordance with the socioecological model. Data from this study show that the environment is obesogenic and that access to healthy foods and physical activity opportunities are perceived as vital to reducing the obesity rate. Future research should evaluate if environmental changes of the built environments in rural areas can make them more conducive to healthy behaviors and improve the obesity rate. A multi-level, collaborative approach using a partnership between Cooperative Extension and community stakeholders to make the healthy choice the easy choice shows promise in reducing the obesity rate in rural Kentucky.

The findings of this qualitative study were used by the research team to partner with the coalitions to prioritize and implement evidence-based, environmental obesity interventions in rural Kentucky. Each county is conducting Plate It Up! Kentucky Proud, which involves working with food retail to offer healthy, fresh foods and recipe tasting in order to get customers to try and buy healthier items. Two of the counties installed water filling stations in their schools to promote healthy beverages and decrease the consumption of sugar-sweetened, high calorie beverages. One county hosted a two-part walkability summit; while another county installed a fit trail. Two counties received disc golf courses. Many of the counties received park and trail enhancements such as bike racks, bike helmets, benches, picnic tables, and trash cans. Three of the six counties used technology as an obesity-reducing strategy in the form of a smartphone application. Finally, direct education programming accompanied all of the environmental level interventions to provide the education and knowledge to live a

healthier lifestyle. Future research will consider whether these community-engaged, environmental obesity strategies have an effect on the long-term obesity rate in these six counties.

Appendix A: Agent Survey

To be completed via Qualtrics: March 2016, October 2016, March 2017

Each of the six Kentucky counties participating in the CDC Extension grant is asked to complete this survey reporting six months of activities from October 1, 2015 – March 31, 2016.

This survey collects information about direct education programs, marketing and promotional activities, and environmental changes related to these three strategies:

- Increased knowledge about healthy eating or physical activity
- Increased access to healthy food retail
- Increased opportunities for physical activity

PLEASE COMPLETE THIS SURVEY BY APRIL 15, 2016.

DIRECT EDUCATION PROGRAMS

For each relevant direct education program offered October 1 2015 – March 31, 2016:

- Program Title
- Brief Program Description:
- Date(s) Program was Offered:
- Number of Participants:
- Community Organizations Involved:
- Any additional information you'd like to report about this program:

PROMOTIONAL AND MARKETING ACTIVITIES

What promotional and marketing activities occurred October 1 2015 – March 31, 2016? Please report significant community events, marketing campaigns, news articles, social media, TV or radio appearances or other ways you have communicated to the community about work related to the CDC grant. We are interested in hearing about coalition and community efforts to promote healthy eating and active living. No need to be formal here, a bulleted list would be fine!

(Text Box)

PARTNERSHIPS

Think about how your partners have worked and interacted with you and the community over the past six months. Please respond to these questions about partnerships.

How well do you think coalition members and community partners are satisfied with the work of this CDC grant? Please use an overall assessment to respond to the scale below and provide additional comments in the text box.

(Scale of 1 to 5: Very Satisfied, Satisfied, Neither Satisfied or Dissatisfied, Slightly Dissatisfied, Very Dissatisfied)

We'd like to know about partner perceptions regarding how priorities were established, how programs have been implemented, and how communications are happening. Please tell us about what you are hearing from partners about this grant work. Describe what coalition members are telling you about the greatest challenges and what has worked well during the past six months of implementation of the CDC grant. Do you think the community feels they have had a voice in decisions and activities?

(Text Box)

COMMUNITY APPROACHES

The work of this CDC grant is focused on environmental or community-level approaches to reduce obesity. Please use the text boxes below to report your observations about how this work has gone in your county over the last six months. **Be sure to include success stories and challenges.**

How do you think **knowledge** among community members has changed with regard to knowledge about healthy eating or physical activity? (Text Box)

How has access to healthy food changed? Be sure to include your work with Farmers' Markets, grocery stores, and corner stores. Also include information about access to drinking water.

(Text Box)

How have opportunities for physical activity changed?

(Text Box)

Since the CDC grant started in fall of 2014, you've had an opportunity to engage with your community in new ways. Please use the text box below to tell us how the grant has influence your work and the community. What has occurred during the last six months that is important for understanding what has been accomplished and what could be better in the future? What has been your greatest challenge? What has been your greatest success? Include a description of any community circumstances, like loss of an employer or significant weather events, which have influenced your work.

Appendix B: PARTNER Survey

Please select your organization/program/department from the list: [choose from list]

What is your job title? [open ended]

How long have you been in this position (in months)? [numerical answers only]

Please indicate what your organization/program/department contributes, or can potentially contribute, to this community collaborative (choose as many as apply).

- Funding
- In-kind Resources (e.g. meeting space)
- Paid Staff
- Volunteers and Volunteer Staff
- Data Resources including data sets, collection and analysis
- Info/ Feedback
- Specific Health Expertise
- Expertise Other Than in Health
- Community Connections
- Fiscal Management (e.g. acting as fiscal agent)
- Facilitation/Leadership
- Advocacy
- IT/web resources (e.g. server space, web site development, social media)

What is your organization's most important contribution to this community collaborative?

- Funding
- In-kind Resources (e.g. meeting space)
- Paid Staff
- Volunteers and Volunteer Staff
- Data Resources including data sets, collection and analysis
- Info/ Feedback
- Specific Health Expertise
- Expertise Other Than in Health
- Community Connections
- Fiscal Management (e.g. acting as fiscal agent)
- Facilitation/Leadership
- Advocacy
- IT/web resources (e.g. server space, web site development, social media)

Outcomes of this community collaborative's work include (or could potentially include): (choose all that apply)

- Health education services, health literacy, educational resources

- Improved services
- Reduction of Health Disparities
- Improved Resource Sharing
- Increased Knowledge Sharing
- New Sources of Data
- Community Support
- Public Awareness
- Policy, law and/or regulation
- Improved Health Outcomes
- Improved communication

Which is this community collaborative's most important outcome?

- Health education services, health literacy, educational resources
- Improved services
- Reduction of Health Disparities
- Improved Resource Sharing
- Increased Knowledge Sharing
- New Sources of Data
- Community Support
- Public Awareness
- Policy, law and/or regulation
- Improved Health Outcomes
- Improved communication

How successful has this community collaborative been at reaching its goals?

- Not successful
- Somewhat successful
- Successful
- Very successful
- Completely successful

What aspects of collaboration contribute to this success? (Choose all that apply)

- Bringing together diverse stakeholders
- Meeting regularly
- Exchanging info/knowledge
- Sharing resources
- Informal relationships created
- Collective decision-making
- Having a shared mission, goals

From the list, select organizations/programs/departments with which you have an established relationship (either formal or informal). In subsequent questions you will be asked about your relationships with these organizations/programs/departments in the context of this community collaborative.

How frequently does your organization/program/department work with this organization/program/department on issues related to this community collaborative's goals?

- Never/We only interact on issues unrelated to the collaborative
- Once a year or less
- About once a quarter
- About once a month
- Every week
- Every day

What kinds of activities does your relationship with this organization/program/department entail [note: the responses increase in level of collaboration]?

- None
- Cooperative Activities: involves exchanging information, attending meetings together, and offering resources to partners (Example: Informs other programs of RFA release)
- Coordinated Activities: Include cooperative activities in addition to intentional efforts to enhance each other's capacity for the mutual benefit of programs. (Example: Separate granting programs utilizing shared administrative processes and forms for application review and selection.)
- Integrated Activities: In addition to cooperative and coordinated activities, this is the act of using commonalities to create a unified center of knowledge and programming that supports work in related content areas. (Example: Developing and utilizing shared priorities for funding effective prevention strategies. Funding pools may be combined.)

How valuable is this organization/program/department's power and influence to achieving the overall mission of this community collaborative? *Power/Influence: The organization/program/department holds a prominent position in the community being powerful, having influence, success as a change agent, and showing leadership.

- Not at all
- A small amount
- A fair amount
- A great deal

How valuable is this organization/program/department's level of involvement to achieving the overall mission of this community collaborative? *Level of Involvement: The organization/program/department is strongly committed and active in the partnership and gets things done.

- Not at all
- A small amount
- A fair amount

- A great deal

How valuable is this organization/program/department/s resource contribution to achieving the overall mission of this community collaborative? *Contributing Resources: The organization/program/department brings resources to the partnership like funding, information, or other resources.

- Not at all
- A small amount
- A fair amount
- A great deal

How reliable is the organization/program/department? *Reliable: this organization/program/department is reliable in terms of following through on commitments.

- Not at all
- A small amount
- A fair amount
- A great deal

To what extent does the organization/program/department share a mission with this community collaborative's mission and goals? *Mission Congruence: this organization/program/department shares a common vision of the end goal of what working together should accomplish.

- Not at all
- A small amount
- A fair amount
- A great deal

How open to discussion is the organization/program/department? *Open to Discussion: this organization/program/department is willing to engage in frank, open and civil discussion (especially when disagreement exists). The organization/program/department is willing to consider a variety of viewpoints and talk together (rather than at each other). You are able to communicate with this organization/program/department in an open, trusting manner.

- Not at all
- A small amount
- A fair amount
- A great deal

Do you have any questions or comments? [open ended]

Appendix C: Focus Group Guide

Session 1 Agenda

**IRB Script read and explained

1. Welcome and Introductions – Coalition Participants/UK Team – Roundtable
 - Note-taker keeps track of all participants and the organizations they represent.

 2. Understanding the coalition (Facilitated Discussion)
 - a. Structure – leadership team; meeting frequency; membership
 - Specific Questions for Discussion
 - How often does the coalition meet?
 - Is there a person or organization that takes responsibility for calling meetings, leading sessions, etc.?
 - Are there members who could not be here today?
 - Begin a list – flipchart

 - b. Community Needs Assessment – What has been done in the past? Data availability
 - Specific Questions for Discussion
 - Has the coalition completed a community needs assessment during the past three years?
 - If yes, is a copy of the community needs assessment available for the UK team to review?
 - If yes, please describe the process for developing the community needs assessment, including data collection.
 - If no, then describe any other recent efforts to assess community health needs and assets.

 3. CDC Project Description/Goals (UK team)
 - UK Team describes the CDC grant
 - Application requirements:
 - University like UK (land-grant university)
 - Use of County Extension
 - Counties with obesity rates at 40% or greater (Logan, Letcher, Lewis, Martin, Elliott, Clinton)
- ❖ After explaining the overall goals, facilitator introduces the county FCS agent. Invites

the agent to explain briefly what they do in the community. Facilitator uses this explanation to support the CDC's decision to direct this grant through extension.

- ❖ Distribute County Profiles – provide an opportunity for participants to review the information and discuss

- Goals of the Grant/Project
 - Prevent Obesity and Support Health through:
 - ❖ Work with communities/coalitions
 - ❖ Support healthy food and beverage consumption
 - ❖ Support physical activity

a. Cross-walk current coalition work with project goals (Facilitated Discussion)

- Facilitator displays, via flipcharts, the main goals of the project
- Coalition participants are asked to answer the following questions:
 - What projects and/or activities has the coalition been involved in during the past three years that match any of the goals of the CDC project?
 - Are the coalition projects listed on-going or completed?

4. Cause and Effect Exercise using Facilitated Fishbone Diagram Activity – Why Obesity in this County?

- Facilitator walks the group through creation of a Cause and Effect/Fishbone Diagram to identify causes of obesity in the community

5. Resources and Champions (Nominal Group Technique)

a. Asset Mapping Exercise

- Facilitator provides each coalition member with post-it notes asking each member to answer questions individually (one question per post-it note):
 - Considering this community and the causes of obesity identified, list the resources you feel are available here

that could help further the goals of this project (e.g., strong school system, etc.)

- b. Identification of New Coalition Members/Project Champions
 - SNAP Participants, WIC families
 - Facilitator gives a brief description of the Public Health System
 - Specific Questions for Discussion: Considering the individuals or organizations in this community, list those individuals and/or organizations you feel could be helpful in moving the obesity reduction/prevention efforts forward.

6. Next Steps

- a. Invite new members identified in Step 5. We believe in the power of coalitions.
- b. In consideration of our discussion of the causes of obesity and the assets the community has to impact obesity, Session 2 will include an overview of interventions we believe can supplement and expand your efforts.

Session 2 Agenda

1. Welcome and Introductions – UK Team/New and returning partners
2. Brief Review of Session 1 (UK Team)
 - Facilitator brings a visual (flipcharts etc) to show the coalition's activities cross walked with the grant objectives and the Cause and Effect diagram of "Why obesity in this county?"
 - Facilitator also brings the list of community assets and champions previously identified.
3. Brief Overview of Intervention Options (UK Team)
 - UK team member briefly describes the evidence-based intervention options using the socioecological model.
4. Facilitator lead discussion:
 - Which of the interventions would address the previously identified causes of obesity in the county?

- Discussion of previously identified assets and champions in the community that could help support interventions
 - Prioritization Activity of Four Major Grant Activities: Which intervention(s) should we start with in our community? Which intervention(s) would make the biggest impact on obesity in our community? (Nominal Group Technique)
 - Consensus Activity: Which optional or additional activities would this community like implement?
5. Missing Information: What do we need to know from our community before we decide how to implement these interventions (Small Group/Report Out)
- a. Community Input
- Facilitator describes the concept of community “buy-in” to assure implementation and sustainability success of obesity reduction/prevention interventions.
 - Specific Questions for Discussion: Who are the target audiences for each project focus area (i.e., school children, families, store owners, etc.) SNAP Participants
 - Should we ask the target audiences what they need and what activities/interventions might work for them?
 - Small groups of coalition participants are asked to identify specific questions (Example – Where do you shop?) for target audiences and report out.
6. Data Collection Tools and Methods (Facilitated Discussion)
- Facilitator leads the group in a consensus activity to select a method to asking target audiences the questions developed in the last step.
- Best methods for obtaining input
- Surveys?
 - Focus Groups?
 - Others?
7. Next Steps
- a. Timeline for data collection
- b. Session 3: review community input from data collection and identify action steps for implementation.

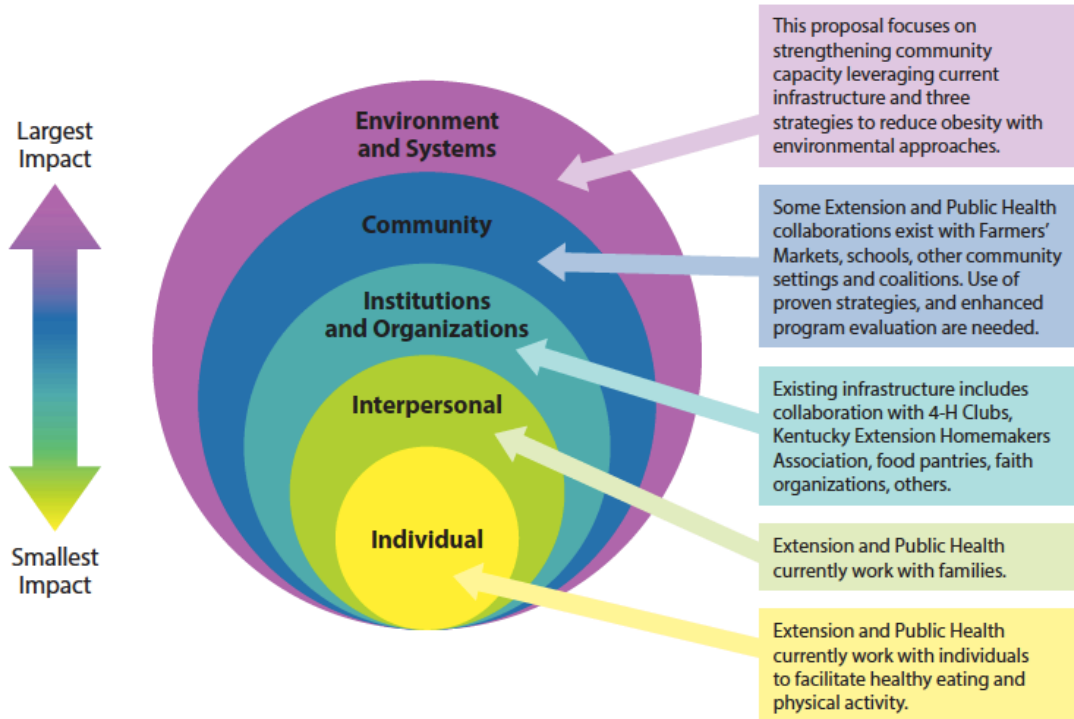
Session 3 Agenda

1. Welcome and Introductions – UK Team/New and returning partners
2. Brief Review of Session 1 & 2 (UK Team)
3. Review Community Input Data (Facilitated Discussion)
4. Action Step Planning: Bring in intervention content experts to help small groups plan the action steps of interventions selected in consensus activity. (Small Group Activity)
5. Next Steps
 - a. Implementation Timeline
 - b. Future Training Discussion

Appendix D: Menu of Options

EPHECT Coalitions CDC Extension Project

Increasing Extension's Impact on Environment and Systems to Reduce Obesity Disparities in Six Kentucky Counties



Traditionally, Extension and public health have focused on individual and interpersonal programs (inner circles). In recent years, seeking a larger impact, CDC and USDA are supporting work that improves the food and activity environment (see outer circles). Using the existing Extension system and community coalitions, this project will use powerful approaches to improve the food system and community environment to make it easier for everyone to enjoy healthy eating and active living.

This grant supports work to accomplish two short-term outcomes:

1. Increase knowledge of children and families about healthy eating and active living
2. Increase the number of community-wide practices that promote healthy eating and active living

These are some examples of Extension programs offered in _____ county in the past two years that help children and families access healthy food and physical activity:

Program	Description	Target Audience	Program Type
Get Moving Kentucky (GMK)	GMK was created as a tool for communities to use to encourage physical activity. GMK has several options for agents to use the materials: materials can be used together for a complete program or pieces can be used as supplements to other programs or handouts.	Children; Adults; Small groups	Physical activities; Lessons; PPT presentation
LEAP	Literacy, Eating and Activity for Preschool or Primary is a series of 22 lessons using storybooks to teach children about staying healthy, being physically active and eating more fruits and vegetables, low-fat dairy products, and whole grains.	Children, ages 2-8	Interactive curriculum
BodyWorks	BodyWorks is a community-based obesity prevention program designed to help parents/caregivers of adolescents improve family eating and physical activity behaviors. BodyWorks targets parents/caregivers directly because research strongly suggests they play a critical role in shaping habits of children.	Small groups; Media; Public display	Curriculum, Hands on activities
2S (Formerly 2nd Sunday)	2S showcases community programs that are positively affecting the community's health, economy and environment. Through collaborative alliances, 2S can serve as the first step in improving the physical, environmental and economic health of all Kentuckians.	Children; Adults; Older Adults	Community Event; Social media
Share our Strength Cooking Matters®	Teaches families at risk of hunger how to get more food for and better nourishment from those foods. Volunteers lead six-week cooking and nutrition courses and hour-long Shopping Matters® grocery store tours. Participants learn how to select nutritious and low-cost ingredients and prepare them in ways that are delicious and healthy.	Families	Hands on activities; groups
Super Star Chef	This hands-on cooking school covers safety in the kitchen; reading a recipe; cooking techniques; nutrition facts; and dietary and physical activity information to assist the	Youth; Adults	Small groups; Media; Public display

	student in making good choices for a healthy lifestyle. Each lesson can be used alone or in sequence as a cooking school.		
Taking Ownership of Your Diabetes	This curriculum is based on “4 Steps to Control Your Diabetes For Life.” Lessons address the American Association of Diabetes Educators 7 Self-care behaviors such as physical activity, healthy eating, monitoring of blood glucose and provide opportunities for participants to modify lifestyle risks.	Adults diagnosed with type 2 diabetes	Small groups; media; public display
Weight: The Reality Series	This curriculum includes a recruitment session and ten classes. Participants learn basic skills and about their relationship with food, activity, and weight.	Adults; Small group	An 11-week curriculum
Wellness in Kentucky (WIN)	Series of ten lessons concentrating on nutrition and physical activity with the goal to improve the health of Kentucky youth and their families. Included in the curriculum are pre and post tests for each lesson, as well as an overall evaluation. The curriculum is an adaptation of Wellness in the Rockies.	Youth - ages 9 – 13	A 10 week curriculum

Think about the community needs – and assets – that you discussed during the first coalition meeting. Remember your county profiles and the information about health and food security. Some of the assets your county might have would include:

- **A Farmers’ Market**
- **Farm-to-School Programs**
- **Food Retailers**
- **Food Pantries**
- **Parks**
- **Walking Trails**
- **Sidewalks**

Because this grant supports work at community, systems, and, environment levels all community members can benefit. However, we want to be sure that limited-resource families are a priority. Families eligible for SNAP benefits are the primary target audience for this proposal. Other community members can certainly benefit from the work supported by this grant. In fact, we know that the more members of a community who practice healthy eating and active living, the easier it is for more people the make better food and activity choices.

These four options were given high priority in the grant proposal and this is what the grant brings to each county. You may also choose to include choices from the table of things the grant can support. You might choose to continue to do programs listed in the first table that Extension has offered previously.:

Plate It Up! Kentucky Proud at Farmers' Markets	PIU-KP is a series of resources to promote fruit and vegetable purchase, preparation, and consumption within the context of Kentucky's local food system. Recipe cards, demonstration guides, and media scripts are used to create point of purchase awareness through social marketing and face-to-face programs. Extension agents work with local producers and consumers at farmers markets to encourage redemption of FMNP vouchers or SNAP EBT, encourage development of farmer's markets, and promote healthy eating and active living. Bring-A-Friend social marketing campaign.	All County residents; Local producers	Demonstration; Social marketing
Food Retailers	Forms a liaison between residents, store owners and food suppliers to help increase the amount of healthy food stocked and make changes in store safety, appearance, and community relations. Participating stores receive support to get the information, connections and supplies to make these changes easier. Residents give input, can attend food demonstrations and receive store coupons.	County residents; Store owners; Food suppliers	Social marketing campaign
Food and Activity Website and App	Extends the reach of successful evidence-based programs through the development of a website and a mobile app to support and improve these programs. The website and supporting app would include the educational materials, recipes, videos, etc. that already exist as part of these programs. In addition to this material, we will add tracking or self-monitoring features to the website and app.	County Residents	Website and Social Media
Physical Activity Environment	Use community assessments for walkability and other opportunities for active living. Work with community leaders to implement joint-use agreements, walk/bike to school programs, and other ways to create or enhance access to safe opportunities for physical activity.	Community leaders and county residents	Assessments and environmental changes

These are some of the kinds of things this grant can support:

Program	Description	Target Audience	Program Type
All Star Dads	This program encourages fathers to spend time doing physical activity with their child(ren). The program utilizes a Scorecard to track the 30 minutes of physical activity completed by the father and child.	Children; Adults; Families	Community Event; 6 wks physical activity
Better Bites/ Snack Strong	Better Bites brings healthy food to the places where youth convene: recreational facilities, sports events, after school programs, school concessions, camps and restaurants.	Communities; Youth	Social Marketing
Champion Food Volunteer	This 40 hours of training includes basic nutrition; food safety; cooking methods; and food science. Upon completion, volunteers will work with Extension to promote healthy lifestyle choices and help combat chronic disease and obesity in their communities.	Adults; Older adults	Hands-on activities; groups of various sizes
Farm to School or Institution Programs	Extension agents work with local producers, schools, parks and other organizations to promote partnerships and collaborations to support the purchase and preparation of farm foods in local institutions.	Farmers; Schools; Nursing homes;	Curriculum; hands on activities
Gardening Programs	A variety of gardening programs are offered through FCS Extension to teach resource management, healthy food preparation and meal choices. Gardening promotes healthy eating and active living.	Schools; Adults; Clubs; Camps	Gardening; Curriculum
VERB Summer Scorecard	The VERB campaign encourages tweens (children aged 9–13 years) to be physically active every day. The campaign uses a social marketing framework and has been adapted for use in Kentucky with a Summer Scorecard “passport” for tweens.	Communities; Youth	Social marketing campaign

Water First: Think your Drink	Water First is a project of the Tweens Nutrition and Fitness Coalition of Lexington, KY. (9-13 year olds) in their homes, schools and communities. It puts water first and let the sweet drinks take a back seat.	County residents	Social marketing campaign
5-2-1-0	The campaign is designed to give parents, healthcare professionals and day care operators a memorable way to talk about the key evidence-based behaviors that reduce childhood obesity.	Communities; parents; healthcare	Public displays; media campaign

Your choices should include activities to support each of these three strategies:

1. Provide community-wide programs to increase knowledge among children and families to increase healthy eating and physical activity behaviors.
2. Increase access to and promote healthier food retail.
3. Increase opportunities for physical activity through joint-use agreements, Safe Routes to School, walk/bike programs, walkability and other assessments.

Appendix E: Codebook

Name	Sources	References	Created On	Created By	Modified On	Modified By
Access to healthy foods and beverages	10	28	Dec 23, 2015, 3:36:11 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Affordability of Healthy Foods	6	16	Dec 23, 2015, 3:29:27 PM	BFB	Jan 26, 2016, 9:36:15 PM	BFB
Behavior Change Starts at Home	7	18	Dec 23, 2015, 3:24:29 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Breastfeeding Education	1	2	Dec 27, 2015, 1:47:54 PM	BFB	Dec 27, 2015, 1:50:31 PM	BFB
Chronic disease and its complications	6	9	Dec 27, 2015, 11:53:42 AM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Community Assessments	3	5	Dec 23, 2015, 3:01:16 PM	BFB	Dec 30, 2015, 3:28:04 PM	BFB
Community	6	13	Dec 24, 2015,	BFB	Jan 25, 2016,	BFB

Events			10:35:23 AM		7:14:27 PM	
Competition as a Motivator	3	4	Jan 25, 2016, 6:52:24 PM	BFB	Feb 15, 2016, 6:22:46 PM	BFB
Crime Rates	1	1	Dec 27, 2015, 11:56:38 AM	BFB	Feb 15, 2016, 2:15:45 PM	BFB
Culture	9	40	Dec 23, 2015, 3:36:57 PM	BFB	Feb 15, 2016, 2:17:16 PM	BFB
Current Physical Activity Assets	8	28	Dec 30, 2015, 4:57:51 PM	BFB	Feb 4, 2016, 9:29:40 PM	BFB
Dental Issues	1	1	Dec 31, 2015, 3:42:44 PM	BFB	Feb 15, 2016, 2:17:46 PM	BFB
Diabetes Education	7	16	Dec 23, 2015, 2:32:02 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Extension Programming	7	17	Dec 27, 2015, 1:23:18	BFB	Feb 15, 2016, 2:18:09	BFB

			PM		PM	
Faith-based community	7	11	Dec 23, 2015, 2:58:08 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Farmers' Market Programs	7	22	Dec 23, 2015, 2:52:28 PM	BFB	Jan 26, 2016, 5:02:21 PM	BFB
Fast food	5	16	Jan 6, 2016, 5:35:09 PM	BFB	Jan 27, 2016, 4:25:02 PM	BFB
Food Assistance Programs	7	21	Dec 24, 2015, 10:08:24 AM	BFB	Feb 15, 2016, 2:19:59 PM	BFB
Food Waste	2	2	Dec 30, 2015, 5:21:03 PM	BFB	Feb 15, 2016, 2:20:41 PM	BFB
Further Grant Support	6	10	Dec 23, 2015, 2:39:30 PM	BFB	Jan 27, 2016, 3:40:03 PM	BFB
Gardening Initiatives	5	12	Dec 23, 2015, 2:42:28 PM	BFB	Feb 4, 2016, 9:03:47 PM	BFB

Geographically diverse	3	4	Dec 23, 2015, 3:53:45 PM	BFB	Jan 24, 2016, 9:30:37 PM	BFB
Grandparents Raising Grandchildren	4	7	Dec 23, 2015, 2:56:23 PM	BFB	Feb 15, 2016, 2:21:40 PM	BFB
Grocery Store Programming	6	10	Dec 24, 2015, 10:21:37 AM	BFB	Jan 26, 2016, 4:46:58 PM	BFB
Health Literacy and Education	10	34	Dec 23, 2015, 3:33:22 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Healthcare - barrier	2	2	Feb 15, 2016, 2:23:25 PM	BFB	Feb 15, 2016, 2:24:37 PM	BFB
Healthcare - motivator	5	9	Dec 31, 2015, 9:41:25 PM	BFB	Feb 15, 2016, 2:24:41 PM	BFB
Inactivity	9	28	Dec 23, 2015, 3:31:18 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Joint-use	2	2	Jan 17, 2016,	BFB	Feb 15, 2016,	BFB

Agreements			4:47:45 PM		2:25:59 PM	
Lack of motivation or desire	7	25	Dec 23, 2015, 3:40:27 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Lack of opportunity for physical activity	8	25	Dec 23, 2015, 3:35:07 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Lack of time	9	16	Dec 23, 2015, 3:52:12 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Marketing of current programs	5	8	Jan 10, 2016, 12:12:58 PM	BFB	Jan 26, 2016, 9:50:26 PM	BFB
Meal Planning and Preparation	9	24	Dec 23, 2015, 2:57:10 PM	BFB	Feb 15, 2016, 2:26:57 PM	BFB
Narratives for Diabetes or Weight Management	5	7	Dec 23, 2015, 2:44:47 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Narratives on Food Access or Affordability	4	8	Dec 27, 2015, 1:30:05	BFB	Feb 4, 2016, 8:58:22	BFB

			PM		PM	
Nutrition Education	10	21	Jan 10, 2016, 11:53:08 AM	BFB	Feb 4, 2016, 9:53:36 PM	BFB
Obesity rate doesn't tell full story	3	3	Dec 23, 2015, 3:22:55 PM	BFB	Jan 27, 2016, 3:48:34 PM	BFB
Physical Activity Infrastructure Enhancements	5	20	Jan 17, 2016, 4:27:32 PM	BFB	Jan 27, 2016, 3:39:40 PM	BFB
Physical Activity Programming	11	36	Dec 23, 2015, 2:49:52 PM	BFB	Feb 15, 2016, 2:28:06 PM	BFB
Plate It Up	9	17	Dec 27, 2015, 1:40:46 PM	BFB	Feb 15, 2016, 2:28:34 PM	BFB
Poor Dietary Choices	7	32	Dec 23, 2015, 3:50:17 PM	BFB	Feb 15, 2016, 2:28:55 PM	BFB
Poverty	7	13	Dec 27, 2015, 11:55:03 AM	BFB	Jan 26, 2016, 9:14:40 PM	BFB

Purchase Local	4	6	Dec 24, 2015, 10:27:48 AM	BFB	Jan 18, 2016, 7:35:44 PM	BFB
Reaction to High Obesity Rate	3	5	Dec 23, 2015, 3:18:30 PM	BFB	Jan 26, 2016, 4:41:09 PM	BFB
Regulation and Support	2	4	Dec 23, 2015, 3:56:50 PM	BFB	Jan 24, 2016, 8:22:07 PM	BFB
Senior Programming	5	7	Dec 27, 2015, 1:24:17 PM	BFB	Jan 18, 2016, 3:48:47 PM	BFB
Shop Fresh, Shop Local	2	2	Jan 17, 2016, 4:36:40 PM	BFB	Feb 15, 2016, 2:30:39 PM	BFB
Smoking	2	6	Dec 27, 2015, 11:54:36 AM	BFB	Feb 15, 2016, 2:31:04 PM	BFB
Social activities revolve around food	5	5	Feb 15, 2016, 6:21:05 PM	BFB	Feb 15, 2016, 6:26:46 PM	BFB
Stress and	5	7	Dec 27, 2015,	BFB	Jan 27, 2016,	BFB

Depression			12:49:15 PM		4:07:36 PM	
Struggle with Participation or Retention	5	12	Dec 23, 2015, 3:19:59 PM	BFB	Jan 26, 2016, 5:20:55 PM	BFB
Substance Abuse and Prevention	6	13	Dec 27, 2015, 11:55:37 AM	BFB	Jan 27, 2016, 3:40:52 PM	BFB
Technology as part of problem	9	21	Dec 23, 2015, 3:32:04 PM	BFB	Jan 27, 2016, 4:07:36 PM	BFB
Technology as part of solution	4	8	Jan 18, 2016, 3:35:08 PM	BFB	Feb 15, 2016, 2:32:18 PM	BFB
Teen pregnancy	1	2	Dec 27, 2015, 11:57:19 AM	BFB	Feb 15, 2016, 2:32:34 PM	BFB
Transportation Infrastructure	2	4	Jan 24, 2016, 9:22:14 PM	BFB	Feb 15, 2016, 2:33:01 PM	BFB
Unemployment	2	2	Jan 11, 2016, 2:13:53	BFB	Feb 15, 2016, 2:33:21	BFB

			PM		PM	
Unhealthy Beverage Consumption	6	9	Jan 17, 2016, 4:48:20 PM	BFB	Feb 15, 2016, 2:33:46 PM	BFB
Worksite Wellness	3	3	Dec 27, 2015, 1:35:17 PM	BFB	Feb 15, 2016, 2:34:29 PM	BFB
Youth Education on Healthy Behaviors	10	34	Dec 23, 2015, 2:47:28 PM	BFB	Jan 26, 2016, 4:50:48 PM	BFB

Appendix F: Project Timeline

Project Activity	2014	2015				2016				2017		
	4th Q	1 st Q	2 nd Q	3 rd Q	4 th Q	1 st Q	2 nd Q	3 rd Q	4 th Q	1 st Q	2 nd Q	3 rd Q
Quarterly Project Team Meetings												
Cross-Cutting Activities												
Partnership Engagement												
<ul style="list-style-type: none"> Form State Steering Committee 												
<ul style="list-style-type: none"> County Coalition Formation or Capacity Building, Peer Learning 												
<ul style="list-style-type: none"> Coalitions Select Interventions 												
Guidance/Support for County Programs												
<ul style="list-style-type: none"> Conduct/Gather Assessments 												
<ul style="list-style-type: none"> County engagement and TA on implementation and evaluation 												
Strategic Communication (Two-Way)												
<ul style="list-style-type: none"> Establish listservs, Facebook pages 												
<ul style="list-style-type: none"> Quarterly technical assistance calls 												
<ul style="list-style-type: none"> Coalitions Report to Communities 												
Evaluation: Develop Plan with CDC												
<ul style="list-style-type: none"> Partnerships 												
<ul style="list-style-type: none"> Process Performance Measures 												
<ul style="list-style-type: none"> Outcome Indicators 												
<ul style="list-style-type: none"> Data Analysis & Reporting 												
Strategy 1 Extension and Outreach												
Strategy 1 Engage/Sustain Coalitions												
Strategy 2 Food Access												
Strategy 3 Physical Activity												

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