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Understanding Factors Determining Early Termination from a Government Assistance Program for Maternal and Child Health: The Special Supplemental Nutrition Program for Women, Infants and Children (WIC)

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Understanding Factors Determining Early Termination from a Government Assistance Program for Maternal and Child Health: The Special Supplemental Nutrition Program for Women, Infants and Children (WIC)

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy
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Dedication

I dedicate this dissertation to the millions of hardworking mothers and families who struggle through daily routines and public programs to ensure that American children are cared for and are healthy, in the face of so many obstacles. I hope this work can make your experiences better.

I further dedicate my work to my family: John and Naomi Panzera, Janet Panzera, Ziggy Hernandez, Nicole, Andrew, AJ, and Hunter Owen (and my niece Emily, who is on the way), John Nicholas and Christina Panzera, my grandfather John Panzera and the multitude of aunts, uncles, cousins, and step siblings I am extremely fortunate to have in my life.

Last but certainly not least, I dedicate this dissertation to my husband, Michael Jarred Chiappa, who has put up with my intermittent academic pursuits throughout the years and endured countless airplane flights to accommodate -- I love you.
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Abstract

The purpose of this dissertation is to understand why individuals enrolled in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) fail to retrieve food vouchers, miss WIC appointments, and become inactive in program components. In Kentucky, mothers who fail to pick up food instruments for 60 days are automatically terminated from the program. The specific research questions that guided this study are: (1) Which segments of enrollees are at greatest and least risks of nonparticipation in the WIC program? (2) How do predisposing, enabling and need characteristics impact WIC nonparticipation among eligible mothers? (3) How do WIC enrollees describe their experiences using WIC? (4) What do WIC enrollees report as reasons for nonparticipation while still eligible? Addressing these research questions will inform the development of practical outreach solutions specifically tailored for the purpose of mitigating nonparticipation in WIC and contribute to our understanding of the factors that deter eligible families from using government assistance programs like WIC.
Chapter 1

Overview

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is effective at strengthening nutrition and health among low-income families. However, many families who qualify for the program fail to participate, and many who enroll in the program are terminated prematurely after extended periods of inactivity. A variety of barriers to participation have been identified, including confusion about eligibility requirements, customer dissatisfaction with the program, and embarrassment to accept government assistance (Bryant et al, 2001). Likewise, many families who enroll but stop using the program while still eligible have described dissatisfaction with how they have been treated, the services they receive, and resulting stigma. My goal is to understand these and other factors that impact participation in the WIC program and describe families’ reasons for stopping while still eligible.

Brief History of WIC

Malnutrition and food insecurity among low-income families combined with agricultural abundances led to a variety of experimental food assistance policies and programs during the 1960s in the United States. The Food Stamp program was resurrected, after being abandoned during the 1940s and ‘50s, the National School Lunch Program was expanded, and the National School Breakfast was created to complement the lunch program (Salmons, 2012, Bryant, et al., 2003). By 1970, the newly formed Food and Nutrition Service, housed in the U.S. Department of Agriculture, centralized many of the food distribution initiatives previously set forth by Congress to ensure America’s children were fed (Food and Nutrition Service, 2011).
In a unique effort to combine preventive health care with nutrition education and supplementation, The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) was established in 1972. After a rigorous, three year pilot study, the program was scaled up nationally with the mission to safeguard the health of needy women and their children until they reach five years of age by providing them with nutritional assessments, vouchers, checks, or electronic benefits transfer cards to purchase healthy food, information on healthy eating, referrals to health care, and immunizations (Colman et al., 2012).

Currently, the WIC program provides vouchers for specific foods, nutrition education, breastfeeding support, health screenings and social service referrals to women, infants and children up to age five (Stang & Bayerl, 2003). According to the available figures, WIC served more than 8.7 million participants nationally during fiscal year 2013 (Food and Nutrition Service, 2013). In the state of Kentucky, for instance, recent estimates place monthly enrollment averages at 127,965 women, infants, and young children under the age of five (Food and Nutrition Service, 2013). Eligibility for enrolling families is based on a combination of income and nutritional risk factors in addition to the broad categories of women, infant and children less than age five (Richards, Merrill, Baksh, & McGarry, 2011). Unlike other food distribution programs that are entitlement-based, WIC is discretionary (i.e., only able to serve as many income- or adjunctively-eligible enrollees at confirmed nutritional risk as resources allow) (Stang & Bayerl, 2003). The income eligibility ceiling for WIC is set at 185% of the Federal Poverty Level (United States Department of Agriculture, 2014). Each year, the number of people WIC is able to serve depends on funding and resource capacities.

**Certification Periods**

Women, infants and children who are eligible for the program must certify in order to
enroll and remain enrolled in WIC. Federal and state policies set certification standards that are implemented at local WIC clinics. These standards include categorical eligibility, residential eligibility, income eligibility and presence of nutritional risk (Food and Nutrition Service, 2014; United States Congress, 2010). Women are certified as early as pregnancy (United States Congress, 1985c). If certified during pregnancy, women remain certified until 6 weeks after giving birth, at which time they must physically attend the WIC office to be recertified (Kentucky Public Health, 2013c). Women who certify immediately following birth or thereafter are certified up to the six months after giving birth and must subsequently recertify. Women who choose to breastfeed starting immediately following the birth of their infant may retain certification for one year (Kentucky Public Health, 2013a; United States Congress, 1985c); should the mother discontinue breastfeeding during the first six months of their infant’s life, she will be recertified as a “postpartum woman” and retain certification up to the sixth month post-delivery (Kentucky Public Health, 2013a). Women who discontinue breastfeeding their children after six months post-delivery are terminated from the program (Kentucky Public Health, 2013a). Infants are recertified up to their first birthday, at which point they are recertified as children and are subsequently recertified every six months (Kentucky Public Health, 2013d).

Program Benefits and Issuance

According to Federal rules, states are allowed to issue food instruments, which includes cash-value paper coupons or electronic benefits, for between one- and three-month food packages (United States Congress, 1985b). State-level rules automatically terminate all enrolled individuals who do not receive their food instruments for two months after expiration of their last issuance (Kentucky Public Health, 2013e).
**Nutritional and Dietary Outcomes**

Many evaluations of WIC examine the program’s effect on maternal and child health, most notably conditions related to nutritional status including dietary intake, growth, weight, and anemia, to name a few (Colman, et al., 2012). The National WIC Evaluation found that mean daily intake of iron, vitamin C, niacin, and vitamin B-6 were increased among participant children compared to nonparticipating eligible children (Rush, Horvitz, et al., 1988), which provides a basis for the finding that WIC participants compared to eligible nonparticipants are less likely to have iron deficiency (OR: 0.72, 95% CI: 0.53, 0.99) (Schneider et al., 2008). An increase in daily allowance of zinc has also been found among food intakes of WIC individuals between 1989 and 1991 (Rose, Habicht, & Devaney, 1998). In addition, the average WIC mother is slightly more likely to initiate breastfeeding with her infant (Chatterji & Brooks-Gunn, 2004), which has well-known benefits for infants compared to other nutritional sources (Kramer, 2010).

**Impact on Pregnancy Outcomes**

A number of pregnancy-related outcomes, including birth weight, perinatal morbidity and mortality, and receipt of health services (Buescher et al., 2003; Colman, et al., 2012; Rush, Leighton, et al., 1988) are also related to WIC participation. With respect to mortality, an analysis of the 1988 National Maternal and Infant Health Survey found that participating WIC infants are less likely to die of endogenous causes, or causes related to genetics or conditions related to the birthing process or during the prenatal period, as compared to infants who do not participate in the program (OR = 0.64; 95% CI: 0.52, 0.77) (Moss & Carver, 1998). An early matched case-control study of participating and nonparticipating eligible mothers in Massachusetts found that birth weights of infants born to WIC mothers were higher than birth weights of infants born to eligible but nonparticipating mothers (Kennedy & Kotelchuck, 1984).
WIC infants weighed on average 31 grams more than nonparticipating infants at birth, according to a cross-sectional analysis of participant and nonparticipant birth records (Schramm, 1986).

**Impact on Infant and Child Health**

In addition to nutritional benefits and improved pregnancy outcomes, WIC provides access to other health services important to childhood developmental milestones. Children on WIC are more likely to have had their immunizations at recommended times (Cortese et al., 2004; Rush, Leighton, et al., 1988); however, evidence is mixed regarding the effect of program participation on attendance to well-child appointments. WIC participants are less likely to have had preventative and well-child appointments with healthcare providers (Buescher, et al., 2003; Chatterji & Brooks-Gunn, 2004; Lee, Rozier, Norton, Kotch, & Vann, 2004; Lee, Rozier, Norton, & Vann, 2005; Rush, Horvitz, et al., 1988). Yet, the interaction between WIC participation and family stressors, namely food insecurity and caregiver depressive symptoms, has been associated with lower odds of fair or poor health and increased odds of attending well-child visits for WIC children compared to nonparticipating children (Black et al., 2012).

**Nonparticipation after Enrollment**

Despite the numerous benefits of participation, a significant proportion of families who are eligible do not apply and an even more surprising proportion of those enrolled in the program stop using program services prematurely. The number of individuals eligible for WIC remained roughly constant between 1994 and 2003, when eligibility and participation were about 13.5 and 7.7 million people, respectively (Food & Nutrition Services, 2006). Currently, while the program still serves a majority of eligible individuals, the national coverage rate (proportion of eligible individuals actually receiving benefits) has fluctuated between 56% and 62%, with drops in the most recent years (Betson, Martinez-Schiferl, Giannearelli, & Zedlewski, 2011; Harper,
Hirschman, Mabli, Nelson, & Hourihan, 2009). Mountain Plains and Southeastern states have the lowest coverage rates, and children have lower coverage rates compared to infants and women (Betson, et al., 2011; Salmons, 2012).

Previously identified barriers to enrollment in WIC among women include confusion about eligibility, lack of referral to the program when healthcare providers indicate nutritional risk, and reluctance to accept government food assistance based on perceived stigmatization and experiences seeing other families use WIC benefits in grocery stores (C. A. Bryant et al., 2001). Methods used to identify these barriers included focus groups and quantitative surveys performed in Texas framed by a social marketing approach (C. A. Bryant et al., 2001). While such barriers were identified in Texas, they persist and reflect experiences in other states (Barents Group LLC, 2000; Gorman, Smith, Cimini, Halloran, & Lubiner, 2013) and other assistance programs (J. Stuber & Schlesinger, 2006b).

Even after an individual is enrolled in the program, some individuals cease to actively participate. Relatively little is known about the reasons for cessation of active WIC participation; however, studies have shown that children are the group with the lowest coverage rates (Betson et al., 2011). Research also has shown that compared to children who do not participate in the program, WIC children are economically worse off than eligible nonparticipants, less likely to have a U.S.-born parent, less likely to be white, and are more likely to be Hispanic, to live in a home that is neither owned nor being purchased, and to be in a household that is receiving other government assistance and federal programs such as SNAP or Medicaid (Salmons, 2012). Clearly, understanding national fluctuations in the average monthly coverage rates requires a closer look at local barriers and experiences.

Research about the reasons why enrolled participants stop participating actively is
lacking, but local WIC officials are interested in understanding more about how they can prevent nonparticipation (Klempin, 2012). In a previous survey of inactive WIC participants in North Carolina, barriers to continued participation included long wait times, lack of respectful treatment in grocery stores, embarrassment about using WIC, and grocery stores running out of WIC approved products such as food and formula (Bryant et al., 1996); these local experiences influence subsequent participation decisions.

Statement of the Problem

Termination as a Result of Nonparticipation. While outreach to eligible, currently non-enrolled individuals is important, nonparticipation by those already enrolled poses an equally powerful capacity barrier to the program. Nonparticipation and subsequent termination from the WIC program results in unrealized health and nutritional opportunities for eligible families. Increasing rates of termination, or the number of enrolled individuals who are dropped from the program prematurely because of inactivity for a prolonged period, has a compensatory minimizing effect on WIC resources – a portion of the amount of resources handed down to state and local WIC offices from the federal government partially depends on the previous year’s caseloads (United States Congress, 1985a). More importantly, surveillance of program participant health over time remains incomplete if participants are not active. While evaluations have reported program benefits, less scholarly literature exists that documents evidence-based outreach approaches for dealing with nonparticipation-related termination as a condition in government assistance programs.

Kentucky. As one of the first states to implement a permanent WIC site in 1974 (Oliveira, Racine, Olmsted, & Ghelfi, 2002), Kentucky currently provides program benefits (Kentucky Cabinet for Health and Family Services, 2013) to roughly 130,000 eligible residents
monthly (United States Department of Agriculture, 2013). Kentucky WIC has been recognized for its efforts to prevent childhood obesity, to promote breastfeeding (Schuchter, Besl, & Simpson, 2010a, 2010b), and to learn about participant attitudes and knowledge toward diet (Reed, 2012). Nevertheless, total average monthly participation in the program has decreased over the last two years (United States Department of Agriculture, 2013) (Figure 1).

Nonparticipation due to automatic termination after 60 days of non-issuance of benefits has become problematic for the Kentucky WIC program. Local, consumer-centered research is needed to identify possible causes of nonparticipation-related termination and inform successful outreach and recruitment activities to prevent termination.

**Specific Research Objectives**

This mixed methods study will examine the characteristics of nonparticipants and explore the factors that impact participation status in Kentucky WIC. In particular, the purpose of this study is to answer four main research questions with local WIC participants:

1. What characteristics describe unique groups of enrollees most likely and least likely to be terminated in WIC after enrollment?
2. What factors impact participation status among eligible mothers?
3. How do WIC enrollees describe their experiences using WIC?
4. What do WIC enrollees report as reasons for nonparticipation while still eligible?

**Rationale**

General consensus stipulates WIC is an effective federally-mandated, locally-operated, consumer-centered MCH program, yet: further scientific investigation is needed for primary and secondary prevention of nonparticipation through evidence-based outreach interventions that overcome specific methodological hurdles and biases related to intervention development, data
analysis, and public health program capacities. Finally, the influence of stigma on program participation outcomes in WIC is not frequently evaluated though it remains influential in the participant experience.

**Prevention of Nonparticipation.** Strategies to increase enrollments and initiation of participation in public health, community health and public assistance programs have been implemented (Bhatia, Jones, & Reicker, 2011; C. A. Bryant et al., 2001; Cancian, Noyes, & Ybarra, 2012; Gorman et al., 2013; Kaiser, 2008), yet less is known about premature dropout. This dissertation will attempt to shed light on nonparticipation in WIC defined by program policy as termination from the program after 60 days without issuance of benefits (Kentucky Public Health, 2013b) and recommend methods for retaining eligible participants.

**Broaden Empirical Knowledge on Outreach.** Review of peer-reviewed literature revealed a number of methods to explore and understand nonparticipation in public assistance and public health programs. Most quantitative analyses supplied descriptive statistics and employed simple hypothesis tests such as chi square tests for homogeneity (Kaiser, 2008; Martin, Cook, Rogers, & Joseph, 2003; Pati, Mohamad, Cnaan, Kavanagh, & Shea, 2010; Rosenberg, Alperen, & Chiasson, 2003) or estimation of Pearson correlation coefficients (Chance, 1999) to explore differences between participant and nonparticipant groups. Many scientists use multivariable, multiple, or multivariate logistic regression approaches to answer research questions related to understanding nonparticipation (Algert, Reibel, & Renvall, 2006; Cancian et al., 2012; Chance, 1999; Kaiser, 2008; Martin et al., 2003; Pati et al., 2010; Rosenberg et al., 2003; Woelfel et al., 2004).

However, a small group of studies employed clustering statistics to understand unique subgroups of nonparticipants within the framework of understanding the decision to participate
in public assistance and public health programs. Rhode Island’s WIC program combined factor and cluster analysis on geographic and program data (Buechner, Scott, Smith, & Humphrey, 1991) to understand local participation phenomena. Another WIC study conducted in Texas used chi-square automated interaction detection to delineate homogenous segments of the WIC eligible population while simultaneously building a visual “dendrogram” (tree diagram) to help rapidly translate statistical testing to practical understandings (C. A. Bryant et al., 2001). One study leveraged classification tree analysis to identify strongest predictors of participation (Woelfel et al., 2004).

Only a few of the studies on this subject matter coupled quantitative analyses with qualitative research approaches. The Texas WIC study used focus groups and in-depth interviews to help elaborate experiences, including perceived barriers to participation, of WIC-eligible individuals who have not yet enrolled as well as those who have stopped participating before their eligibility status was terminated (C. A. Bryant et al., 2001). The Rhode Island SNAP initiative took a community-based approach to inform chosen SNAP outreach efforts (Gorman et al., 2013). The California WIC research team categorized data coded from focus groups, in-person and telephone-based interviews as either “group consensus,” “incidental but seemingly important information,” or “interesting and related quotes and comments” (CSU Sacramento, 2001) to help mine qualitative data for information needed to shape outreach methods.

Though a wide variety of outreach planning methods have been used, the reality of the local WIC outreach official calls for efficient decisions that result in rapid and effective turnaround of participant loss. This study attempts to bridge the research-to-practice gap by showcasing an efficient and understandable data mining method for WIC outreach. In addition, it attempts to augment discoveries from this approach with deeper qualitative inquiry directly with
Kentucky WIC nonparticipants to help clarify an overall understanding of nonparticipation and to suggest state-specific solutions.

**Explore the Role of Stigma in Participation Decisions.** This study also helps understand the impact of experienced stigma in government assistance and maternal and child health programs. Stigma historically has been cited as a barrier to program participation, and prediction models estimate stigma’s effect on participation outcomes (Moffitt, 1983; Salmons, 2012). More recent conceptions of treatment and identity stigma fit into a more complex etiologic framework related to welfare program participation (J. Stuber & Schlesinger, 2006b; J. P. Stuber, 2002).

According to Stuber and Schlesinger, two distinct forms of stigma exist, one based on self-identity and the other based on expectations of negative treatment within community interactions, but all stigma is influenced by the community within which it is experienced (J. Stuber & Schlesinger, 2006b). Such stigma – “the perception that individuals who participate [in government assistance programs] lack the independence and autonomy that is expected when contending with vulnerable circumstances” – is exacerbated by poor health and minority status, and is influenced by the way in which welfare programs are implemented (J. Stuber & Schlesinger, 2006a). Reflecting on WIC, it is clear that clients’ “dignity and respect” depend on the clients’ interactions with the organization at all levels (Donovan & Henley, 2003), which makes enrolled families vulnerable to stigma throughout WIC-related services and interactions.

In Texas, WIC nonparticipants elaborated their reluctance to accept government assistance because of previous negative social experiences purchasing foods in grocery stores with WIC vouchers (C. A. Bryant et al., 2001). A survey of nonparticipants throughout the state of Texas showed that a stigmatizing “embarrassment” was more likely to be felt among Anglo
Americans, women with at least a high school education, and women not currently on food stamps, with the segment demonstrating the highest proportion of never-enrolled women who thought participation would be embarrassing consisting of Anglo and Asian Americans (C. A. Bryant et al., 2001). Thus, there is an opportunity to continue research on maternal and child health program participation-related stigma to help inform outreach practices by building valid measures of local stigma on valid customer experience survey instruments for reliable surveillance.

**Mixed methods.** Mixed methodologies are used for service utilization research concerning WIC and SNAP (C. A. Bryant et al., 2001; Gorman et al., 2013; Rosenberg et al., 2003). While methods should be chosen on the basis of their ability to respond to community-based research questions, the simultaneous or sequential use of qualitative and quantitative data in the design of solutions to mitigate nonparticipation seems most robust; in fact, a review prepared for the Agency for Health Research & Quality (AHRQ) recommends consumer-oriented, community-based approaches as well as evaluation study designs that compare various forms of outreach (Barents Group LLC, 2000). A deep understanding of affected communities as well as assessing the effect size of an outreach method has on enrollment and participation rates will inform the development of evidence-based outreach methods for State and local agencies.

**Hidden Knowledge.** Numerous program reports conducted by public health agencies and contracted research organizations have explored nonparticipation in WIC and proposed remedial strategies (C. Bryant et al., 1996; Lindenberger & Bryant, 2002). However, these reports fall outside of most literature database systems (Michigan Department of Community Health; North Carolina WIC Program, 2001; Program, 2005), and therefore, are not easily accessible to other programs. Moreover, it is unclear the extent to which participation barriers and strategies for
overcoming them are State- and local-program specific, e.g., impacted by State or local program guidelines, available resources, and participant characteristics. This study will contribute to a broader understanding of WIC participation examining participation in Kentucky and publishing findings in a variety of practitioner- and research-oriented, peer-reviewed journals and through technical products for the state of Kentucky to ensure access of research results and relevance to current issues in the program.

**Theoretical Framework**

As they enroll, participate, and subsequently leave program services (Figure 2), client interactions with WIC exists in a system where administration of program services influence client perceptions and satisfaction, self-reported and perceived health and professionally evaluated health over time. Arguably, notions such as stigma sourced from first-hand experiences or through expectations constructed on the shared experiences of others affects participation decisions. Thus, a theoretical or conceptual framework useful in the analysis of program data must be flexible enough to include both programmatic decisions made by operational protocols and staff as well as an individual’s decision to enroll and participate.

**Selection of Conceptual Framework.** At first inspection, Systems Theory and the General Ecological Model seem clearly relevant to the study of participation in WIC (Bronfenbrenner, 1997), yet the practicality of using these models for developing audience-centered outreach practices and materials for WIC must be evaluated. Further, consideration of the use of administrative data, which resembles longitudinal surveillance data, must be coupled with formative methods in instances when stigma is not currently monitored. In contrast to testing a theory, the general purpose of a useful conceptual framework to overcome practical
outreach hurdles in WIC must focus on providing order to local insights, both qualitative and quantitative, and provide direction for subsequent work.

Systems Theory provides a useful starting point for conceptualizing the interconnected nature of program utilization, user experience, and health and service outcomes in WIC. In its early iterations, (Open) Systems Theory developed from the biological and physical science fields (Von Bertalanffy, 1950) and has gained practical relevance in public health (Brailsford, Harper, LeRouge, & Payton, 2012). With the related term of Systems Thinking, system-focused approaches allow users to apply a holistic, rather than reductionist (Brailsford et al., 2012), scientific lens to health issues that are by nature contextualized by social interactions on multiple levels (Petula, 2005). Another related term, Systems Dynamics, is the methodology by which defined systems are analyzed and modeled (Brailsford et al., 2012).

Is Systems Theory Appropriate? When we evaluate Systems Theory’s utility for overcoming nonparticipation in WIC, we see insufficiencies. Swenson’s evaluative questions regarding parsimony, operationality and falsifiability (Swenson, 1999) when applied to Systems Theory result in unclear responses. The theory is arguably parsimonious depending on how detailed the system is defined; parsimony is not assured using Systems Theory. While the approach leads to clear implications for measurement, it is difficult to measure concepts such as “rules of transformation,” “variety,” “boundaries” and others. Therefore, without clear measurable constructs, the basic version of Systems Theory does not lead to falsifiable propositions since operational measures are unclear.

To design an instrument that confirms or rejects propositions within a Systems Theory framework is difficult. Strides have been made using novel approaches such as agent-based modeling (Rice, 2012), to simulate public health phenomena. Agent-based models allow
investigators to define a particular environment within which different agents interact according to defined behavioral rules. This approach has been used to model consumer grocery shopping (Schenk, Löffler, & Rauh, 2007). These novel approaches provide new methods for building empirical support for the relevance of Systems Theory to public health practice. However, using these simulation approaches may not be appropriate given the current capacities of local WIC outreach offices.

The broad scope of Systems Theory has attributes that make vetting the framework worthwhile. While the theoretical constructs are not easily quantified, the theory is excellent for generating hypotheses about what parts of a system should be investigated; even without specific rules of transformation, a researcher generates hypotheses by reflecting on the relationships among system components. When applications move toward defining these rules of transformation, Systems Theory gains power beyond describing phenomena; if operationalized, explanation, prediction and study design implications follow. However, prediction is limited if the propositions of Chaos Theory (Resnicow & Page, 2008) that our calculated expectations of future events contain much instability is accepted. Systems Theory is well organized and maintains internal consistency and, similar to parsimony, good definitions of the system, its components and its dynamics are needed to reinforce clarity and consistency.

While Systems Theory has good attributes, it does not include relevant *a priori* constructs from which to include previously collected, administrative, surveillance-type data. Often, program outreach occurs rapidly, responding to nascent community group changes without full empirical observation. Thus, a more practical model that leverages continuously collected program data and a systems-*based* framework is needed for investigations of client experiences that result in participation and health outcomes in WIC.
Andersen’s Behavioral Model of Medical Care Use. Since the 1960s, Andersen’s Behavioral Model of Medical Care Use links health and service outcomes to a system of contextualizing and individual-level factors (R. Andersen & Aday, 1978) and seems uniquely relevant to the nature of participation in welfare programs, in particular WIC. Within levels of the system, variables are categorized into predisposing, enabling, or need (P-E-N) characteristics that precede and are influenced by health behavior and a variety of outcomes (Davidson, Andersen, Wyn, & Brown, 2004). The Andersen Model places measured variables according to their source and their direction of influence (R. M. Andersen, 1995, 2008) (Figure 3).

Evaluating the Behavioral Model. Andersen’s model depicts a parsimonious path to health and consumer experiences and the assumptions needed to understand the model are neither unconventional nor unjustified (Swenson, 1999). The Behavioral Model is operational because it provides a framework for relating specific variables within the categories of predisposing, enabling, and need characteristics, and captures elements within boundaries of a defined system. The model notes contextual and individual characteristics that precede outcomes and behaviors. This hierarchy allows clear hypotheses to be generated and tested in a powerful manner, and this ability is demonstrated by the frequency of use of this model in scholarly works (Babitsch, Gohl, & von Lengerke, 2012). Applying the behavioral model to a WIC-centered issue highlights notable variables upon which outreach efforts may act to mitigate nonparticipation while taking into account experiences such as stigma.

Main Advantage of the Behavioral Model. The Behavioral Model generates hypotheses that are clearly testable and have a direct purpose for proposing where to intervene and how. The Behavioral Model makes it possible to organize measured variables in a directional path which, in the case of structural equation modeling, makes analysis of directional correlations easier than
in Systems Theory where all variables within the system are conceptual or latent and must be defined through a long, iterative process with communities (Fabrigar & Wegener, 2009). Thus, the Behavioral Model provides a more expeditious route to recommendations for practice given a set of variables previously defined and measured.

The Behavioral Model also offers a clear framework with which to arrange program data. An assay of all variables currently collected by Kentucky WIC indicates the presence of a variety of predisposing, enabling and need characteristics, at the individual and contextual levels, that can be effectively used in regression modeling that predicts nonparticipation as an outcome. However, what current WIC data systems lack are quantitative indicators of client satisfaction and aforementioned stigma (Moffitt, 1983; Salmons, 2012). The placement of stigma within this framework, if measured, also requires the researcher to specify the origin of the stigma; specifically, an item which measures stigma may indicate a community or contextually-sourced stigma or a stigma related to a person’s self-identify (treatment versus identity stigma) (J. Stuber & Schlesinger, 2006b). Thus further investigation of nonparticipation in WIC must make room for the construction of valid and reliable measures of stigma as well as modeling the effect of stigma on participation decisions and behavioral outcomes with respect to the Behavioral Model.

**Role of Stigma.** Economists have demonstrated through statistical modeling that welfare program participants experience stigma that determines program utilization to an extent (Moffitt, 1983; Salmons, 2012). Moffitt conceptualized nonparticipation in social service programs as a function of stigma, which is quantitatively interpreted as a utility-maximizing decision (that is, given a set of parameters like stigma, how an individual maximize benefits received) (Moffitt, 1983). Thus, mothers’ underlying decisions to participate in WIC will be determined by
weighing perceived costs of participation, inclusive of perceived stigma, with perceived WIC program benefits (Salmons, 2012).

Extensions on the use of econometric theories to explain nonparticipation involve elaborating the utility-maximization concept, and Salmons used the National Health and Nutrition Examination Survey to show that WIC participation and child health and well-being are functions of a number of factors, including household and health characteristics (Salmons, 2012). Though econometric estimates measure the impact of stigma, fewer applied outreach methods for government assistance programs are implied from these results. Put another way, we know stigma impacts outcomes, but we do not know how to mitigate it.

**Programmatic Definition of Stigma.** Stigma is a “negative attribution [that] involves the perception that individuals who participate [in anti-poverty programs] lack the independence and autonomy that is expected when contending with vulnerable circumstances” (Stuber & Schlesinger, 2006). Stigma has been shown to influence use of federal programs in econometric modeling (Moffitt, 1983). Operationally, conventional and expanded models encapsulate stigma and describe how stigma permeates within populations in poverty (Stuber & Schlesinger, 2006). The conventional model hypothesizes that “individual attributions of responsibility for poverty will lead to increased stigma, that societal attributions of responsibility for poverty will lead to decreased stigma, that negative experiences applying for benefits will lead to increased stigma, and that individuals in greater need will perceive less stigma with the exception of single mothers who may perceive more stigma” (Stuber & Schlesinger, 2006). In this conventional model stigma is the outcome of experiences of being identified as an anti-poverty program recipient.

As noted above, expansions on the conventional model include two distinct forms of
stigma experienced by government assistance recipients: treatment stigma and identity stigma. Identity stigma develops when the individual “internalize[s] negative stereotypes associated with means-tested program users” (J. Stuber & Schlesinger, 2006c). Treatment stigma refers to the “concern about being treated poorly by others,” especially employees of means-tested programs (J. Stuber & Schlesinger, 2006c). Stuber and Schlesinger found that treatment and identity stigma disproportionately impact welfare, as opposed to Medicaid, populations (2006). In this dissertation, I use these understandings of stigma to not only guide analysis of administrative program data but also to guide the development of grounded theory based on qualitative data describing lived experiences by WIC participants in the state of Kentucky.

**How does Welfare Differ from Entitlement?** Welfare is distinct from Medicaid in that benefits come in the form of cash assistance and can be used in a variety of settings whereas Medicaid is a benefit to be used in specific settings (Stuber & Schlesinger, 2006); examples of welfare programs in the U.S. include Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), and the Supplemental Nutrition Assistance Program (SNAP) (U.S. Congress, 1996). While Medicaid and welfare are both income-based means-tested programs, enrollment practices for each program are distinct and administration and use of program benefits and cash assistance are different (Stuber & Schlesinger, 2006). Entitlements are guaranteed whereas some welfare programs are not and operate like cash assistance; welfare reform in 1996 delinked Medicaid from cash assistance (Garrett & Holahan, 2000; U.S. Congress, 1996). Further, WIC is a distinctive type of welfare because nutrition education is coupled with benefits that must be redeemed for specific foods and the total number of people reached by the program is directly constrained by annual discretionary funding; unlike SNAP, WIC can be thought of as a discretionary public health program that focuses on maternal and
child health and nutrition. Thus, how participants use each type of program differs, and the effect stigma has on client participation decisions may differ from one program to the next.

Specific service-related experiences impact client perception of stigma. For example, perceptions of treatment stigma are significantly associated with long wait times while negative perceptions about the welfare recipient are associated with identity stigma. Black populations report higher perceptions of treatment stigma than other groups; and self-efficacy helps attenuate the effect of stigma (Stuber & Schlesinger, 2006). In WIC, these forms of stigma impact the client experience, as suggested by investigations in North Carolina and Texas (Bryant, et al., 1996; C. A. Bryant et al., 2001).

**The Benefit of Consumer Orientation.** A consumer-oriented investigation highlights factors that create stigma and identifies targets for practical solutions. Stigma is a significant part of welfare program participants’ experiences and conventional and expanded models of stigma attempt to map the outcome of stigma from program experience. However, local perceptions of the WIC program use may predate enrollment; public assistance, especially maternal and child health programs, exists within complex local community social systems. Analytically untangling stigma in WIC gives outreach workers a unique opportunity to address local stigma directly. Addressing barriers to participation alleviates the stigmatizing experience of being in the program while heightening the program’s community status, thereby actively addressing the community perception of the program.

**Contributions to Literature on Theory.** Andersen’s Behavioral Model allows public health practitioners to capture individual and contextually nested factors that already have valid and reliable measurement opportunities in place. This model combines nested features similar to the Social Ecological Model while taking directionality among factors from Systems Theory
Few studies apply this particular service-focused model to community-level nutrition assistance programs that interface directly with targeted clients. The Behavioral Model also allows inclusion of attitudes, perceptions and constructs such as stigma that are expected to influence service use, perceived needs, and health behaviors. Knowledge of how this model can be effectively used in the area of program outreach requires further exploration – the decision to use this model was made with the WIC outreach staff member in mind.

The research questions generated from the application of the Behavioral Model hypothesize that subgroups of WIC enrollees, both previous and current, will respond differentially to specific outreach efforts. The aim of this study is to define distinct segments of WIC enrollees that differ with respect to participation status, understand their experiences using the program, and identify points in participants’ experience that can benefit from change and intervention. While these inquiries refer to WIC, they have broad implications to health and social programs that provide services to eligible individuals and families.

References


Figure 1. Total Average Monthly Participation, Kentucky, 2012 & 2013

(WIC Agency Level Monthly Spreadsheets, 2013)
Figure 2. The Behavioral Model of Medical Care Use (Adapted from Anderson 1995).
Figure 3. Etiologic Period of Participation
Figure 4. Treatment and Identity Stigma as Individual Characteristics within the Behavioral Model
Chapter 2

Abstract

**Purpose.** The purpose of this study is compare women who are most and least likely to discontinue participation in the Special Supplemental Nutrition Program for Women, Infants and Children program (WIC) in Kentucky and describe characteristics of segments at greatest and least risk of nonparticipation.

**Design.** A retrospective, cross-sectional analysis was done of Kentucky WIC program administrative data between 2012 and 2013. Chi-square automated interaction detection (CHAID) was used to identify distinct audience segments within this population of program participants.

**Findings.** The strongest predictor of nonparticipation in the Kentucky WIC program was presumptive eligibility in Medicaid. Income and household WIC enrollment status were also important. Those at highest risk of nonparticipation were mothers who were presumptively eligible for Medicaid earning little to no income.

**Research limitations/implications.** Using CHAID, audience segmentation identified important groups of WIC mothers in Kentucky who are most similar across a series of examined characteristics. Further clustering methods should be explored.

**Practical implications.** Given identified segments, WIC outreach officials should aim outreach efforts to prevent nonparticipation among groups at highest risk - WIC mothers who earn the least, were presumptively eligible for Medicaid, and did not have family members in the household who were also on WIC (34.2%) (“Solely-Enrolled Mothers with No Income”).
**Originality.** Few have applied audience segmentation to administrative program data in MCH and this study provides a unique application of audience segmentation to understand termination due to nonparticipation specifically.

**Article Classification.** Research Paper

**Keywords.** Audience segmentation; CHAID; WIC; Nonparticipation.

**Background**

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) was piloted in 1972 after research demonstrated that poor health, pregnancy, and growth and developmental outcomes disproportionately burdened low-income families (Colman et al., 2012). Each year, the United States Department of Agriculture (USDA) estimates the number of infants and children income-eligible for WIC (Wimmer, 2003) and State WIC programs estimate the proportion of eligible families served (Buechner, Scott, Smith, & Humphrey, 1991). In addition to being an indicator of program success, this information helps programs develop strategies to increase their outreach to those in need (Buechner et al., 1991; Harper, Hirschman, Mabli, Nelson, & Hourihan, 2009).

States receive dedicated funds for outreach efforts as part of the Nutrition Services and Administration (NSA) federal resource allocation (United States Congress, 1985b). Although many definitions of outreach exist, most include goals of increasing enrollment and use of services (Barents Group LLC, 2000). The purpose of outreach initiatives in WIC, like other federal food assistance programs, is to inform eligible individuals about program components to increase participation and enrollment (Food and Nutrition Service, 2009). WIC Program policy guidelines also dictate the settings in which outreach may occur and give states guidelines on
establishing cooperative agreements with institutions (e.g., hospitals) to conduct outreach (United States Congress, 1985a).

Working within those general policy guidelines, local agencies must make decisions about which outreach activities to implement (Michigan Department of Community Health; North Carolina WIC Program, 2001), the placement of those activities, the information channels used to communicate with families, and how to design those communication messages (C. A. Bryant et al., 2001; J. H. Lindenberger & Bryant, 2000). WIC agencies also rely on local knowledge as well as quantitative analysis of dietary markers (Castañeda, Clayson, Rundall, Dong, & Sercaz, 2003; Caulfield, 2005), recommendations from WIC programs from other states, nationwide surveillance (United States Department of Agriculture, 2013), and the published literature (Colman et al., 2012).

A challenge for WIC is preventing families already enrolled in the program from terminating while they are still eligible. Referred to as “nonparticipation,” this problem occurs nationwide. Studies of nonparticipation have used marketing research to understand and ameliorate the problem (C. A. Bryant et al., 2001) (C. Bryant et al., 1996; J. Lindenberger & Bryant, 2002). This study builds on this previous work by using a consumer-oriented, marketing approach.

Typically logistic regression is used to evaluate the impact of several independent categorical characteristics on a particular outcome. Yet program officials needing to prevent nonparticipation must develop outreach approaches towards groups of eligible families as opposed to estimate risk at the individual level in order to be efficient with resources. Audience segmentation, a marketing technique, efficiently defines groups of enrollees that are readily targetable for outreach.
In this paper, we: (1) segment the population of women enrolled in WIC in the Commonwealth of Kentucky by participation status, that is, compare *nonparticipants* who have been terminated because of inactivity for 60 days, with *active participants* who have used the program continuously; and (2) describe characteristics of segments of enrollees at greatest and least risk of nonparticipation while still eligible.

**Methods**

**Kentucky WIC Program.** The approximately 127,965 monthly recipients of Kentucky WIC services (United States Department of Agriculture, 2013) include 30,922 women, 33,789 infants, and 63,254 children (United States Department of Agriculture, 2013). The Kentucky Cabinet for Family and Health Services manages WIC and administers it through local sites, including city and county health department offices in 120 counties (Kentucky Cabinet for Health and Family Services, 2014a). Kentucky, like many other states, has implemented an electronic benefit transfer (EBT) infrastructure to replace paper food vouchers (Program Analysis and Monitoring Brach, 2006); the Kentucky EBT system became operational in 2011. Latest estimates of cumulative fiscal year costs starting in October 2013 surpass $2.7 million (United States Department of Agriculture, 2014).

**Study Design.** This cross-sectional study used an iterative data segmentation approach to identify unique subgroups of formerly or currently enrolled Kentucky WIC participants. For this study, administrative data that were collected continuously throughout the state program were used to estimate risk of early termination from Kentucky WIC. Program summary files included individual characteristics and information on program experiences, including dates of attendance at clinics by name, issuance of benefits, and terminations.
**Population Description.** The source population included women enrolled in WIC in the Commonwealth of Kentucky from January 1, 2012 through December 31, 2013. This population excluded individuals who were missing from administrative records and ineligible for the program (e.g., a mother may have been ineligible for the program while her young children still qualified for benefits). Individuals must have appeared in administrative records for inclusion. Five hundred and fifty two individuals were excluded because of reasons related to the study period, another 8 individuals were removed due to age, and 2 documented males were dropped. Examination of earliest dates of activity and termination dates identified 28 individuals who were active and terminated on the same day, 71 individuals that were prematurely terminated, and 9 whose total activity time could not be resolved; these further exclusions resulted in a final sample size of 83,969.

**Enrollment.** Continued enrollment for women and children requires periodic certifications (United States Congress, 2010). Pregnant women are certified for their entire pregnancy and the first six weeks postpartum (Kentucky Public Health, 2013b). If the woman breastfeeds, she is certified for one year after delivery as long as breastfeeding continues (Kentucky Public Health, 2013b). Participants must be “re-certified” at the end of each certification period to maintain active enrollment. Participants must also retrieve their food instruments (i.e., benefits contained on EBT cards) every month to remain an active participant in the Kentucky WIC system. Recertification and retrieval of food instruments may not always occur at the same appointment, but both require being physically present (United States Congress, 2010).

**Termination.** The WIC program terminates enrolled clients for a variety of reasons. If a person becomes categorically ineligible (e.g., when a child reaches its fifth birthday or a mother
stops breastfeeding and has reached her infant’s sixth month), termination occurs. Terminations
also occur if families move out of state, are no longer at nutritional risk, or they begin earning
above 185% of the federal poverty level (Kentucky Cabinet for Health and Family Services,
2014b).

**Nonparticipation.** Of principal interest in this study are women who are eligible to use
WIC but stop collecting food instruments for a period of 60 days (Kentucky Public Health,
2013a). The WIC system automatically terminates nonparticipants from the database (Kentucky
Public Health, 2013a), and labels these types of terminations as “nonparticipation.”

This binary nonparticipation variable – *nonparticipant or active participant* – was
constructed from information collected by the WIC system. A mother considered a
nonparticipant is one who was terminated by the WIC program due to nonparticipation. Mothers
not terminated due to nonparticipation were considered active participants.

**Conceptual Approach.** Audience segmentation was used to identify patterns and
structure in participation status of Kentucky WIC enrollees. Audience segmentation is a
systematic process of grouping individuals based on characteristics that influence their behavior
(Fonthofer & Bryant, 2000). In marketing research, audience segmentation identifies subgroups
within a broader source population that are likely to respond differently to marketing efforts,
thereby prioritizing those subgroups for outreach relative to resource efficiencies (Fonthofer &
Bryant, 2000).

Although many quantitative approaches such as cluster analysis, hierarchical modeling,
and discriminant analysis can differentiate groups (segments) from a source population
(Weinstein, 2004), chi-square automatic interaction detection, or CHAID, was used to identify
audience segments in this study. Once segmented, investments can be made to explicate unique
insights from chosen segment targets for better outreach design and consumer engagement (R. Donovan & Henley, 2003), ultimately attempting to strengthen behavior change strategies.

CHAID uses the chi-square test of independence with Bonferroni adjustment to identify statistically significant differences across groups on predictor variables while controlling for Type I errors due to sequential statistical tests (McCarty & Hastak, 2007). Nonparametric testing is one of CHAID’s important features because it allows use of either continuous or categorical variables (Myers, 1996c). CHAID also splits beyond binary groups (Myers, 1996c), providing an advantage over earlier automated interaction detection approaches. Further, CHAID tests whether any pair of responses on a variable is “homogenous” or not statistically different, highlighting only mutually exclusive nodes that are significantly different (Myers, 1996b) (Murphy & Comiskey, 2013). Finally, data do not have to be normally distributed for CHAID to function properly (Alfonso, 2007).

In this study, CHAID was used to segment the population of WIC mothers into groups across categories of nonparticipation and to identify people in the Kentucky WIC program data at greatest and least risk for termination due to nonparticipation. CHAID is the preferred statistical strategy when there are numerous categorical variables (McCarty & Hastak, 2007), such as those contained in the current dataset. CHAID results are displayed in a tree-like diagram that depicts unique groups that differ statistically (Chan, McMahon, Cheing, Rosenthal, & Bezyak, 2005; van Diepen & Franses, 2006) which lends itself to practical interpretation (Chan et al., 2005; McCarty & Hastak, 2007).

Sample Size. Large sample sizes are recommended for implementing CHAID. Whereas no distributional assumptions are made for this nonparametric test, large sample sizes ensure that the calculated test statistics approximate the chi-square distribution (van Diepen & Franses,
2006). The original study population (n= 84,077) is a complete census of women in the WIC program during the study period.

**Independent Characteristics.** All participant characteristics in the WIC program data set were considered for inclusion in the development of the final CHAID model. Any instances of missing information were coded as a separate response categories.

The sample characteristics of age and mean income were continuous variables in the analysis. Age was calculated from birthdate to the earliest visit documented WIC visit date. Mean income was calculated by averaging every documented income value for an individual. Mean, standard deviation, and ranges are reported. Same-day scheduling (SDS) is a clinic characteristic that is collected separately by the state WIC program. According to state-level guidance, health districts across the state of Kentucky have a certain number of clinics that employ SDS. Individuals that have visited a SDS clinic were coded as “yes” and those who did not were coded “no”. Individuals who could not be identified as having been or not been to a SDS clinic during the study period were coded as missing. The characteristics explore are listed in Table 1.

The WIC program collects a number of characteristics that describe participants’ experiences using other types of government assistance. For example, a woman is considered presumptively eligible for Medicaid (United States Congress, 1985d) if she is financially eligible for Medicaid but not yet enrolled. WIC participants are also characterized by whether or not they receive benefits from SNAP (food stamps) or the Kentucky Transitional Assistance Program (KTAP).

Household dynamics also have an impact on the food benefits issued to mothers. According to state procedures, when WIC eligible individuals move into a household where
others are enrolled in WIC, all members of a household receiving WIC must be coordinated so as
to issue all food instruments for that household on the same date (Kentucky Public Health,
2013d). This occurs in a variety of situations, such as when an already-enrolled pregnant mother
gives birth and the eligible newborn is part of her mother’s household.

Additionally, participants can choose to move from one WIC clinic site to another
through a verification of certification (VOC). The VOC process enables a participant to change
settings without being rescreened as a new enrollee at the receiving clinic (Kentucky Public
Health, 2013c). In this study, a response of “yes” indicated that a mother had changed clinic sites
from her previous visit, and “no” indicated that the mother was at the same clinic site as her
previous visit.

A similar dichotomous response was used for documenting migrant status. Migrant status
for the WIC program is defined by federal legislation as an individual who has worked in
agriculture seasonally, during the previous 24 months, and whose housing is temporary (United
States Congress, 1985c).

Finally, the number of visits was calculated for each individual by summing the number
of listed visit dates captured by the data set. The number of visits ranged from one to six.

**Statistical Analysis.** Frequencies, proportions, and, where appropriate, means and
standard deviations across categorical predictors were calculated. Exhaustive CHAID procedures
categorized study participants into a series of unique segments whose independent characteristics
differed significantly on the dependent variable – nonparticipation. Nonparticipation was coded
dichotomously. To validate the generated model, a split-sample procedure was used to create a
training model on 50% of randomly selected individuals from the total study population that was
then tested on the remaining 50% of cases. This approach determines if the generated model is
stable and generalizable (Sun, Wang, & Rodriguez, 2013). CHAID also calculated the relative risks of misclassifying women into the segments with the highest and lowest rates of nonparticipation. Relative risks were separately calculated for segments with the three highest and the three lowest rates of nonparticipation.

Descriptive analysis and CHAID were performed in the Decision Trees software (IBM Corp., 2014) with SPSS 22 (IBM Corp., 2013). Once segment frequencies were identified, estimation of relative risk with confidence intervals was performed in SAS 9.3 ® (SAS Institute Inc., 2011). Results of Pearson chi-square tests with degrees of freedom, p-values and measures of association using phi (ϕ) are reported. Fisher’s exact test was used when 2x2 contingency table cell frequencies were less than five.

Human Subjects Approval. The Internal Review Boards of the Cabinet approved study protocols for Health and Family Services of the Commonwealth of Kentucky and the University of South Florida.

Findings

Study Population. Of 84,077 total mothers in the study population, 71,231 were active WIC participants and 12,846 were nonparticipants. Participants and nonparticipants shared several characteristics. Most women in both categories were single mothers. An equal proportion of participant and nonparticipant women were migrants (p = 0.252). Approximately 3.7% of participants and nonparticipant mothers receive KTAP benefits in addition to WIC (p = 0.939). Very few women were homeless, a characteristic that did not differ by participation status (p = 0.816) (Table 2). Participants and nonparticipants did not differ significantly by age.

However, participants’ average earnings were greater than those of nonparticipants (95% C.I.: $1,591.55, $2,714.52). More Hispanic mothers were participants than nonparticipants (6.4%
Differences in participation status also existed by race (p < 0.001). More nonparticipants (30.8%) had attended clinics that use SDS than did participants (29.0%; p < 0.001). Other notable differences in government assistance program use appear in Table 2.

Visits. Total visits also varied by participant status ($\chi^2 = 1332.559, df = 5; p < 0.001$). Nonparticipants were more likely to have had only one visit in contrast to two or more visits for participants. Few WIC enrollees attended six appointments, with only four participants and no nonparticipants visiting the WIC clinic six times (Figure 5).

Model Construction. In the initial CHAID analysis performed on the training sample (n = 41,948) statistically significant predictors of nonparticipation included: presumptive eligibility in Medicaid, mean income, whether or not a mother’s household was enrolled in the program, limited English proficiency and primary language spoken. The training model’s overall structure was maintained in the test sample (n = 42,021). In both models, presumptive eligibility in Medicaid was the strongest predictor of nonparticipation status. Having other family members enrolled in WIC and primary language were the next predictors to enter the model, and income was an important predictor among newly enrolled Medicaid recipients.

Rates of misclassification in the training (15.2%; SE: 0.002) and testing (15.1%; SE: 0.002) samples were similar. The training model correctly classified 84.8% of mothers by nonparticipation status. According to the model built on a training sample (n = 41,985), presumptively eligible for Medicaid, mean income, whether or not a mother’s household was enrolled in the program, marital status, presentation of VOC, age and receiving food stamps best predict unique groups of WIC nonparticipant mothers. This set of characteristics was stable in the test sample (Figures 6 & 7).
Whereas it is important to know primary languages used among targeted populations when tailoring outreach strategies for public health programs, almost 60% of the study population had missing information about primary language spoken (Table 1) -- models were built to understand how this deficit affected results. When primary language was absent, presumptively eligible for Medicaid remained the strongest predictor of nonparticipation. However, a different variety of predictors of nonparticipation were validated in the test sample, including mean income, ethnicity, primary language, and household WIC enrollment. Results from the testing model reveal important differences in characteristics among those at greatest and least risk of nonparticipation.

**Predictors of Nonparticipation.** Presumptive eligibility for Medicaid was the strongest predictor of nonparticipation among WIC mothers ($\chi^2 = 359.045; p < 0.001$). Of mothers who were not presumptively eligible for Medicaid (Figure 2), mean income was the strongest predictor of nonparticipation ($\chi^2 = 152.006; p < 0.001$), resulting in seven separate categories of mothers. Categories of mean income were split by marital status ($\chi^2 = 11.087; p = 0.027$), whether or not a VOC was presented ($\chi^2 = 10.931; p = 0.002$), age ($\chi^2 = 22.673; p < 0.001$), receiving food stamps ($\chi^2 = 5.960.045; p = 0.015$), and household WIC enrollment ($\chi^2 = 66.937; p < 0.001$). These factors resulted in 15 segments of WIC enrolled mothers in Kentucky. Household WIC enrollment ($\chi^2 = 25.713; p < 0.001$) and mean income ($\chi^2 = 16.850; p = 0.001$) segmented WIC mothers who were presumptively eligible for Medicaid into three unique segments (Figure 3).

**Highest Rates of Nonparticipation.** The highest rate of nonparticipation occurred among WIC mothers who earn the least, were presumptively eligible for Medicaid, and did not have family members in the household who were also on WIC (34.2%) (“Solely-Enrolled Mothers
with No Income”). Compared to mothers from a related segment who earn more than $4,152 on average, mothers in this segment who earn the least were at about 28% increased risk of nonparticipation (Table 4).

The second highest rate of nonparticipation was found among mothers who earn more than $4,152 (25.7%) (“Solely-Enrolled Moms Earning Income”). Compared to Solely-Enrolled Mothers with No Income, Solely-Enrolled Mothers Earning Income had almost a 15% decreased risk of nonparticipation (Table 4).

Mothers who were not presumptively eligible for Medicaid and earned $4,152 or less on average represent the segment with the third highest rate of nonparticipation (18.1%; “Moms with the least resources”). Moms with little resources were at a 35% increased risk of nonparticipation compared to all other income categories (Table 4).

**Lowest Rates of Nonparticipation.** Having incomplete program data was related to the lowest proportion of nonparticipation: the group of Kentucky WIC mothers demonstrating the lowest proportion of nonparticipation were women who were not presumptively eligible in Medicaid and who had no missing income and household WIC enrollment information (0.7%) (“Moms missing information on household and income”). The client segment that had missing information on mean income and household WIC enrollment resulted in a relative risk of 0.039 compared to mothers who had documented mean income and household WIC enrollment (Table 4).

WIC mothers who were not presumptively eligible for Medicaid, earned no income, and were either widowed or had missing marital status information also present a low rate of nonparticipation (7.4%) (“Widows/Missing with few resources”). Those who were widows or are missing marital status information had more than a 50% decreased risk of nonparticipation
compared to similarly resourced mothers who were not widows or had undocumented marital status information.

WIC mothers who earned a relatively small average income (between $4,152 and $16,728) and had presented a VOC to change WIC clinic sites had the third lowest rate of nonparticipation (14.8%) ("Moms changing clinics"). Mothers who moved between WIC clinics were at slightly decreased risk of nonparticipation (0.9545) compared to mothers who return to the same WIC clinic (Table 4).

All risk comparisons were statistically significant except for the effect of presenting a VOC. This is indicated by p-values less than the critical value of 0.05 as well as confidence intervals that do not cross 1.0. Using the phi coefficient as a measure of association reveals effect sizes ranging from 0.0521 to 0.0903 (Table 4).

**Discussion**

The dual purpose of this study was to offer unique segments of the population of women in the Kentucky WIC program across participation status by comparing nonparticipants to participants and to describe segments at greatest and least risk of nonparticipation. Through the application of CHAID, audience segments that were statistically different from each other were created. No further segmentation within segments was identified as significant. Comparison of the segments at greatest and least risk of nonparticipation identified statistically significant relative risks with accompanying confidence intervals and effect sizes.

CHAID analysis indicated that presumptive eligibility in Medicaid was the best predictor of whether or not mothers are actively participating in the WIC program in Kentucky. Interestingly, the greatest proportion of nonparticipation occurred among mothers who were presumptively eligible for Medicaid. They were at even greater risk of nonparticipation if they
also were the only WIC-enrolled household member and had mean incomes at or below $4,152. In contrast, the lowest proportion of nonparticipation was found in mothers who were not presumptively eligible for Medicaid and whose information on household WIC enrollment and income were missing. Improved validation of Medicaid eligibility and enrollment could help refine outreach approaches by better clarifying characteristics of nonparticipants. In addition, once WIC identifies a person as presumptively eligible for Medicaid, they may be placed on a “watch list” to ensure that those at highest risk of nonparticipation receive enhanced attention.

Results from this study can be compared to findings from earlier studies of participation in public health and government assistance programs. Individuals most likely to be currently enrolled in Texas WIC were Hispanic, Spanish-speaking recipients of benefits from FSP/SNAP (C. A. Bryant et al., 2001). Whereas ethnicity and language were not found to be statistically important in the current work, analysis identified a segment in which food stamp program enrollment was statistically significant (Figure 3). Specifically, mothers not presumptively eligible for Medicaid who were higher earners and on SNAP had a higher proportion of nonparticipation compared to counterpart mothers not on SNAP. Multiple program enrollments and experiences in non-WIC programs such as SNAP may have influenced future participation in WIC. An example of such a scenario is when a mother, enrolled in both WIC and SNAP, has negative experiences in SNAP that affects her decisions to actively participate in WIC.

The Texas WIC study also identified statistically significant differences in awareness of income-eligibility in mothers who were not yet enrolled (C. A. Bryant et al., 2001). These results were further echoed in statements made by such mothers in focus groups, whereby mothers explained that they thought WIC was only for “very poor families” (C. A. Bryant et al., 2001). In the current study, mean income (calculated by the income reported at each documented visit)
was important in generating unique segments of mothers who were presumptively eligible for Medicaid and mothers who were not presumptively eligible for Medicaid as these characteristics relate to nonparticipation.

Looking at other public health and government assistance programs, higher earned income among participants in the Temporary Assistance for Needy Families decreases the likelihood of dropout, after controlling for characteristics such as race, education and marital status (Cancian, Noyes, & Ybarra, 2012). Although an inverse relationship between income and likelihood of dropout may occur in TANF, no clear linear relationship can be seen in the rates of nonparticipation and categories of mean income among WIC mothers in Kentucky; Medicaid eligibility could play a role in masking such a relationship. Also a third factor such as stigma could moderate the relationship among income, Medicaid enrollment and nonparticipation rates. Looking at Kentucky WIC mothers presumptively eligible for Medicaid, higher earners were less likely to be nonparticipants, although the magnitude of nonparticipation in this segment was higher compared to other segments resulting from analysis. However, comparison between TANF and WIC is problematic because of the nature of the product benefits offered and, thus, how each program interacts with its beneficiaries.

Previous research has found that participation in FSP/SNAP is higher among households of US-born individuals, those receiving other government assistance, the uninsured, single mothers, and those who were in foster care (Kaiser, 2008). Pregnant women and individuals who were not Hispanic/Latino are also more likely to be FSP/SNAP program participants (Kaiser, 2008). The proportion of migrants in the overall sample of Kentucky WIC mothers was low. Receipt of benefits and services from programs such as Medicaid and SNAP were important in identifying unique groups of Kentucky WIC mothers in the current data. Whereas pregnancy
status which may be indicated by certification category was not part of the analysis, it was expected that mothers who were the only ones in their households enrolled in WIC were pregnant women expecting to enroll their babies once they give birth. This situation may account for the importance of household WIC enrollment in the current model.

The resultant model illustrates how CHAID can be applied to program population to identify distinct segments at differential risk of nonparticipation (or other dependent variable) and validate this model by using a split sample design. Stability in future cross-sections must be explored (van Diepen & Franses, 2006). Researchers using CHAID have used 50% split samples (Alfonso, 2007) whereas others have used a 70% training and a 30% testing split-sample approach with other segmentation approaches (James, White, & Kraemer, 2005). Although CHAID results are at risk of describing more random error in sample data rather than underlying relationships (van Diepen & Franses, 2006), this issue was addressed by including the statewide population of WIC mothers at risk of being automatically terminated due to nonparticipation and only using variables available from the data source that have impact on outreach strategies to build the overall model (Khoshgoftaar & Allen, 2001).

Rarely are effect sizes for the relationship between program participation and independent characteristics published in the academic literature, which is especially important in designing outreach practices. Recommended practice in the social sciences is to calculate and report effect sizes when possible (Durlak, 2009) as doing so provides researchers of program outreach with information necessary to make decisions about observed relationships. Effects sizes based on calculation of relative risks are given in this study. An index of whether or not these estimates are large or small would help gauge the strengths of these observed relationships.
The strength of CHAID to model the cessation of active participation is limited to only those characteristics included in modeling. The amount of missing information on household WIC enrollment and primary language, for instance, was large enough to impact results. More complete information would improve predictive accuracy in classification of individuals by participation status.

A major strength of this study is the use of program data that included all women enrolled in WIC during the study period. This large “census” helped satisfy nonparametric assumptions. CHAID analysis allowed all possible interactions among collected variables to be tested for moderating effects on nonparticipation; this study used all possible state-level information currently available to WIC outreach staff. As a result, findings can be generalized to the statewide community of mothers enrolled in Kentucky WIC.

A clear operational definition of nonparticipation from the state program operations technical manual was used. All possible interactions are tested as they relate to nonparticipation. Inclusion and exclusion criteria allow the study sample to specifically reflect women at risk of termination from WIC. Effect sizes are reported where possible. A measure of misclassification is reported to improve understanding of the accuracy of the model.

Study findings have important implications for designing strategies to prevent terminations among WIC families while they remain eligible for program benefits. Medicaid eligibility, mean income, and household WIC enrollment reflect socioeconomic conditions that might be important in identifying women at greatest risk of premature termination and designing communications aimed at retaining them in the program. Program rules stipulate that when more than one person in a household is enrolled in WIC, the entire household must be issued food instruments on the same date (Kentucky Public Health, 2013d); development of outreach
strategies requires targeting mothers because they are often the gatekeepers to the program for their households.

Further research is needed to: 1) refine current segmentation models with data on participant experiences in the program to augment the currently collected universe of variables, 2) refine a framework for prioritizing segments, and, 3) use results to design and evaluate outreach activities for prioritized segments. Further audience segmentation inclusive of client perspective such as attitudes and knowledge could make future outreach developments more accurate and valid. Applying a prioritization framework to the resulting audience segments would help identify which of the 15 identified segments, if targeted, would provide the greatest return on outreach investment.

A number of WIC clinics across Kentucky perform small client satisfaction surveys that, in future administrations, could expose hindrances related to bureaucratic characteristics like physical attributes of the clinic, hours of operation, and families’ experiences enrolling in the program, scheduling appointments, and utilizing services and nutrition education. These surveys could be linked to state public health program surveillance. Such linkage could generate a dataset specifically useful for outreach practices that could then be made available to public health researchers and practitioners. Future collaboration between program officials in charge of program data management and other researchers could result in improved data collection instruments, e.g., inclusion of participant satisfaction with the program and identification of clinical procedures that are impacting nonparticipation.

Program officials also may use results of this study and future efforts to prioritize segments and select those that will give them the greatest return on their investment of outreach resources. Many social marketers have used the “TARPARE” framework to compare segments
systematically using the following attributes: the total number of people captured by the segment ("T"), the proportion of people at risk of termination within a segment ("AR"), how persuadable and accessible the target segment is ("PA"), the resources necessary to meet a particular segment’s needs ("R"), and how equitably services and outreach can be applied across segments ("E") (Donovan, Egger, & Francas, 1999). Audience segmentation approaches coupled with frameworks like TARPARE strike a balance between research and the realities of designing outreach strategies in the practice-based setting.

Communication between Kentucky WIC and eligible families about program participation should be placed where new mothers enroll in Medicaid. The messages and content designed for the purposes of outreach aimed at minimizing nonparticipation should include information specifically relevant to nonparticipation and the risk factors associated with being a nonparticipant. Further inquiry with nonparticipant segments will provide guidance about specific strategies, such as appointment reminders or scheduling practices that are particularly useful for the purposes of outreach.

With even stronger data sources and prioritization approaches, future efforts also should address primary prevention of nonparticipation (the necessary condition that precedes termination). Ongoing surveys about client experiences could enable WIC personnel to improve their understanding of how participants view the program, identify factors that may deter their continued participation, and inform the development of program improvements to attract and retain participants.

Once outreach methods are developed, future research also is needed to explore and compare the effectiveness of these outreach strategies. This could take the form of randomized cluster trials whereby individuals are exposed to outreach material according to their segment
grouping, and these individuals are compared to controls selected from their own segment (McGowan et al., 2013).

Conclusions

Now that distinct segments are identified, qualitative approaches among individuals within such segments will enrich practitioners’ understanding of WIC-related experiences within these unique subgroups. Mixed-methods research combines the power of qualitative and quantitative methods to hone in on information about an issue while attempting to neutralize biases and limitations in any one method or approach (Creswell, 2013). A mixed-methods stance overcomes limitations inherent in any one method.

Finally, audience segmentation should be further validated through use of other relevant statistical approaches aimed at predicting individuals’ classification as either a participant or nonparticipant. A method particularly adept at accomplishing this task is discriminant analysis, where a predictive discriminant function classifies individuals as participants or nonparticipants through individuals’ scores calculated through a linear combination of factors (Crocker & Algina, 2008).

References


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*Segmentation and positioning for strategic marketing decisions* (pp. 154-155): American Marketing Association.


Pagano, M., & Gauvreau, K. (2000). Multiple comparison procedures *Principles of biostatistics* (pp. 293).


### Table 1. Descriptions of Independent Characteristics\(^1,2\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Response Categories &amp; Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital Status</td>
<td>Single, Married, Widow, Divorced, Separated, Missing</td>
<td>Marital status of WIC mothers</td>
</tr>
<tr>
<td>Migrant status</td>
<td>Yes, No</td>
<td>Migrant status of WIC mothers</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Not Hispanic, Hispanic</td>
<td>Ethnicity of WIC mothers</td>
</tr>
<tr>
<td>Race</td>
<td>Asian, Black, Hawaiian/Pacific Islander, Native American/Indian, White</td>
<td>Racial categories of WIC mothers</td>
</tr>
<tr>
<td>Primary Language</td>
<td>English, Spanish, Other, Missing</td>
<td>Primary language spoken by WIC mothers</td>
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<td>Limited English Proficiency</td>
<td>Yes, No, Missing</td>
<td>Does a WIC mother have limited English proficiency?</td>
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<td>Home Contact Information Available</td>
<td>Yes, No, Missing</td>
<td>Is home contact information available for the WIC mother?</td>
</tr>
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<td>Attended SDS clinic</td>
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<td>Has the WIC mother ever attended a clinic that uses same-day scheduling (SDS)?</td>
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<tr>
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<td>Yes, No</td>
<td>Was the mother presumptively eligible for Medicaid?</td>
</tr>
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<td>Household WIC enrollment</td>
<td>Yes, No, Missing</td>
<td>Is the WIC mother's household enrolled in WIC?</td>
</tr>
<tr>
<td>KTAP enrollment</td>
<td>Yes, No</td>
<td>Has the WIC mother receiving benefits from the Kentucky Transitional Assistance Program (KTAP)?</td>
</tr>
<tr>
<td>SNAP enrollment</td>
<td>Yes, No</td>
<td>Has the WIC mother received food stamps?</td>
</tr>
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</tr>
<tr>
<td>VOC presented</td>
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<td>Has the WIC mother ever presented her VOC?</td>
</tr>
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<td>Age</td>
<td>Discrete integer values</td>
<td>Age of WIC mother in years</td>
</tr>
<tr>
<td>Mean income</td>
<td>Value in US dollars</td>
<td>Average value of non-missing values across six possible total visits</td>
</tr>
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\(^1\)All variables reflect values collected during January 1, 2012 through December 31, 2013. \(^2\)Missing values recoded as missing category.
<table>
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<tr>
<th></th>
<th>Participants</th>
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<th>Nonparticipants</th>
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<td>Married</td>
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<td>7.4%</td>
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<td>0.1%</td>
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<td>Divorced</td>
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<td>143</td>
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<td>381</td>
<td>0.5%</td>
<td>58</td>
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<td>70,850</td>
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<td>12,680</td>
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<td>Black</td>
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61
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<th>Variable</th>
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<th>Yes N</th>
<th>Yes %</th>
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<tr>
<td>Presumptive Eligible for Medicaid*</td>
<td>71,195</td>
<td>99.9</td>
<td>12,713</td>
<td>99.8</td>
<td>66,725</td>
<td>90.6</td>
<td>10,994</td>
<td>83.4</td>
<td>489,103</td>
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<td>Limited English Prof.*</td>
<td>10,886</td>
<td>15.3</td>
<td>2,096</td>
<td>16.5</td>
<td>58,478</td>
<td>82.1</td>
<td>10,437</td>
<td>81.9</td>
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<td>1,744</td>
<td>15.8%</td>
<td>1867</td>
<td>2.6</td>
<td>205</td>
<td>1.6</td>
<td>865.806</td>
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<td>Food Stamps</td>
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<td>15.3</td>
<td>2,096</td>
<td>16.5</td>
<td>66,490</td>
<td>93.3</td>
<td>12,280</td>
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<td>451</td>
<td>3.5%</td>
<td>446</td>
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<td>7</td>
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<td>423</td>
<td>3.3%</td>
<td>68,875</td>
<td>96.7</td>
<td>12,315</td>
<td>96.7</td>
<td>0.006</td>
<td>1</td>
<td>0.939</td>
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<td>VOC presented</td>
<td>1,266</td>
<td>1.8%</td>
<td>230</td>
<td>1.8%</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0.407</td>
<td>2</td>
<td>0.816</td>
</tr>
<tr>
<td>Attended a SDS clinic*</td>
<td>1,983</td>
<td>2.8%</td>
<td>226</td>
<td>1.8%</td>
<td>38</td>
<td>0.1</td>
<td>3</td>
<td>0</td>
<td>45.038</td>
<td>2</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

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Table 3. Age and Mean Income Among Mothers in the Kentucky WIC Program (2012-2013)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean (Years)</th>
<th>Std. Dev. (Years)</th>
<th>Std. Err. of Mean</th>
<th>Levene's Test, F*</th>
<th>t (df)</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>71,231</td>
<td>24.72</td>
<td>5.512</td>
<td>0.021</td>
<td></td>
<td></td>
<td>-6.662</td>
</tr>
<tr>
<td>Nonparticipants</td>
<td>12,738</td>
<td>24.37</td>
<td>5.433</td>
<td>0.048</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Levene's Test, F*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Income**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>55,553</td>
<td>$20,593.60</td>
<td>$26,660.51</td>
<td>113.114</td>
<td></td>
<td></td>
<td>$1,591.55, $2,714.52</td>
</tr>
<tr>
<td>Nonparticipants</td>
<td>9,712</td>
<td>$18,440.56</td>
<td>$25,935.57</td>
<td>263.17</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Statistically significant at $\alpha = 0.05$. * Mean income is calculated for individuals with non-missing values.
Table 4. Risk of Nonparticipation Across Six Segments of Kentucky WIC Mothers

<table>
<thead>
<tr>
<th>Segment</th>
<th>Relative Risk</th>
<th>95% Confidence Interval</th>
<th>$\chi^2$</th>
<th>p'</th>
<th>$\phi$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highest Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solely-enrolled moms earning little income</td>
<td>1.2837</td>
<td>[1.1662, 1.4130]</td>
<td>24.6744</td>
<td>&lt; 0.0001</td>
<td>0.0903</td>
</tr>
<tr>
<td>Solely-enrolled moms with greater earnings</td>
<td>0.8548</td>
<td>[0.8005, 0.9127]</td>
<td>24.6744</td>
<td>&lt; 0.0001</td>
<td>-0.0903</td>
</tr>
<tr>
<td>Moms with little resources overall</td>
<td>1.351</td>
<td>[1.2158, 1.5013]</td>
<td>31.0796</td>
<td>&lt; 0.0001</td>
<td>0.0283</td>
</tr>
<tr>
<td><strong>Lowest Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moms missing information on household and income*</td>
<td>0.039</td>
<td>[0.0055, 0.2782]</td>
<td>23.9546</td>
<td>9.54E-10</td>
<td>0.0521</td>
</tr>
<tr>
<td>Widows with little resources</td>
<td>0.4678</td>
<td>[0.2724, 0.8030]</td>
<td>8.067</td>
<td>0.0045</td>
<td>0.0339</td>
</tr>
<tr>
<td>Moms changing clinics</td>
<td>0.9545</td>
<td>[0.6370, 1.4302]</td>
<td>0.051</td>
<td>8.21E-01</td>
<td>0.0024</td>
</tr>
</tbody>
</table>

*Fisher's Exact test used when cell frequencies are less than 5.
* Level of significance ($\alpha$) = 0.05; degrees of freedom ($df$) = 1
Figures

Figure 5. Number of Visits by Participation Status
Figure 6. Characteristics of WIC Mother Segments Who Are Not Presumptively Eligible for Medicaid
Figure 7. Characteristics of WIC Mother Segments Presumptively Eligible for Medicaid
Chapter 3

Abstract

Objective. To estimate the effect of a variety of factors on time to inactivity that leads to automatic termination among WIC mothers in Kentucky.

Data sources/study setting. Secondary data in the form of routine administrative data between 2012 and 2013 were used. Data are collected at every WIC site throughout the state of Kentucky.

Study design. An extended, stratified Cox model was applied to retrospective, longitudinal administrative data. Andersen’s Behavioral Model of Medical Care use was used in the selection and organization of independent covariates. Measures were taken at each enrolled mother’s visit for up to six possible visits. The main outcome was termination due to nonparticipation.

Data collection/extraction methods. The state program provided a limited data set taken from the management information system. Program staff collected information on clinic site characteristics. Source data sets were merged to generate an analytic data file.

Principal findings. Age, ethnicity, marital status, English proficiency, homelessness, household WIC enrollment, presumptive eligibility in Medicaid, available home contact information, and clinic appointment scheduling type are associated with nonparticipation. Mothers have a lower risk of nonparticipation before attending appointments at clinics that use same-day scheduling.
Conclusions. Mothers who are younger, single and are homeless or lack home contact information are more likely than their counterparts to become nonparticipations. Outreach should be targeted across these characteristics to mitigate future nonparticipation. Further research is needed to control for within-individual random effects.

Keywords. Survival Analysis, WIC, Cox, proportional hazard, Maternal and Child Health.

Background

Government assistance programs provide resources to American families in a variety of forms, including supplemental food and income, employment, health and social service screening and counseling, and many other services. The goal of government assistance is to temporarily support families during times of economic hardship (Borjas, 2004). Eligibility criteria for these programs generally include an income roof above which individuals and families no longer qualify for benefits (Stuber & Kronebusch, 2004; United States Congress, 1985b). Eligibility criteria for certain food assistance programs specifically depend on risk categories relevant to documented nutritional risk in addition to income guidelines (United States Congress, 1985d). Regardless of the program, an enrollment period defines when an eligible individual becomes a program participant. After enrollment, active participation is maintained until the individual or family no longer meets eligibility criteria.

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) in particular is effective at strengthening nutrition and health among low-income families through administering food vouchers, nutrition education, screenings and referrals to other important health and social services. To enroll in WIC, women and their infants and children must be income eligible, be certified as nutritionally at-risk, or adjunctively qualify by proof of
enrollment in other government assistance (Food and Nutrition Service, 2012b). Pregnant and post-partum women, infants and children five years of age are eligible for the program and may receive program benefits until they no longer satisfy these requirements.

Women are certified for WIC as early as pregnancy (United States Congress, 1985c). If certified during pregnancy, women remain certified until 6 weeks after giving birth, at which time they must physically attend the WIC office to be recertified (Kentucky Public Health, 2013b). Women who certify immediately following birth or thereafter are certified up to six months after giving birth and must subsequently recertify. Women who choose to breastfeed starting immediately following the birth of their infant may retain certification for one year (Kentucky Public Health, 2013a; United States Congress, 1985c); should the mother discontinue breastfeeding during the first six months of their infant’s life, they will be recertified as a “postpartum woman” and retain certification up to the sixth month post-delivery (Kentucky Public Health, 2013a). Women who discontinue breastfeeding their children after six months post-delivery are terminated from the program (Kentucky Public Health, 2013a). Infants are recertified up to their first birthday, at which point they are recertified as children and are subsequently recertified every six months (Kentucky Public Health, 2013c).

Once enrolled in WIC, participation conveys a number of documented benefits to program clients. Many evaluations of WIC examine the program’s effect on maternal and child health, most notably conditions related to nutritional status including diet and dietary intake, growth, weight, and anemia, to name a few (Colman et al., 2012). The National WIC Evaluation found that mean daily intake of iron, vitamin C, niacin, and vitamin B-6 were increased among participant children compared to nonparticipating eligible children (Rush, Horvitz, et al., 1988), which provides a basis for the finding that WIC participants compared to eligible nonparticipants
are less likely to have iron deficiency (OR: 0.72, 95% CI: 0.53, 0.99) (Schneider et al., 2008). An increase in daily allowance of zinc has also been found among food intakes of WIC individuals between 1989 and 1991 (Rose, Habicht, & Devaney, 1998). In addition, the average WIC mother is slightly more likely to initiate breastfeeding with her infant (Chatterji & Brooks-Gunn, 2004), which has well-known benefits for healthy infants compared to other nutritional sources (Kramer, 2010).

A number of pregnancy-related outcomes, including birth weight, perinatal morbidity and mortality, and receipt of health services (Buescher et al., 2003; Colman et al., 2012; Rush, Leighton, et al., 1988), are also related to WIC participation. With regard to mortality, an analysis of the 1988 National Maternal and Infant Health Survey found that participating WIC infants are less likely to die of endogenous causes, or causes related to genetics or conditions related to the birthing process or during the prenatal period, as compared to infants who do not participate in the program (OR = 0.64; 95% CI: 0.52, 0.77) (Moss & Carver, 1998). An early matched case-control study of participating and nonparticipating eligible mothers in Massachusetts found that birth weights of infants born to WIC mothers were higher than birth weights of infants born to eligible but nonparticipating mothers (Kennedy & Kotelchuck, 1984). WIC infants weighed on average 31 grams more than nonparticipating infants at birth, according to a cross-sectional analysis of participant and nonparticipant birth records (Schramm, 1986).

In addition to nutritional benefits and impacts on pregnancy outcomes, WIC provides access to other health services important to childhood developmental milestones. Children on WIC are more likely to have had their immunizations at recommended times (Cortese et al., 2004; Rush, Leighton, et al., 1988); however, evidence is mixed regarding the effect of program participation on attendance to well-child appointments. WIC participants are less likely to have

Yet, among WIC families, as the number of family stressors increase, namely food insecurity and caregiver depressive symptoms, odds of fair or poor health increase and odds of attending well-child visits for WIC children decrease compared to nonparticipating children (Black et al., 2012).

Despite the program’s numerous benefits, WIC does not serve all those who are eligible. The number of individuals eligible for WIC remained roughly constant between 1994 and 2003; in 2003, 13.5 million women were eligible but only 7.7 million were enrolled (Food and Nutrition Service, 2012a). More recently, the proportion of eligible individuals actually served by the program has dropped from 62% to 56% (Betson, Martinez-Schiferl, Giannearelli, & Zedlewski, 2011). Mountain Plains and Southeastern states have the lowest coverage rates, and children have lower coverage rates compared to infants and women (Betson et al., 2011; Salmons, 2012).

Whereas coverage rates are lowest among children (Salmons, 2012), infants and children are not directly responsible for obtaining their own food benefits. Federal guidelines allow States to issue food instruments (cash-value paper coupons or electronic benefit transfer cards) that families can use to purchase nutritious food packages (United States Congress, 1985a). State-level rules automatically terminate all enrolled individuals who do not return to pick up their food instruments within two months of expiration of their last issuance (Kentucky Public Health, 2013e). The interval between food instrument issuance varies from one to three months.
Maternal participation in WIC is related to a number of characteristics. Geography played a role in WIC participation in Rhode Island, specifically initial enrollment (Buechner, Scott, Smith, & Humphrey, 1991). In the New York City WIC program, women who received WIC services for themselves and their children were more likely to participate than those who received WIC services for their children alone. Also, women with children enrolled in Medicaid and women with transportation problems, family illnesses and job conflicts were also more likely to leave the program (Rosenberg, Alperen, & Chiasson, 2003). Client experiences with the program (complaints about the clinical environment, wait times, and the quality of education) were associated with failure to use WIC checks (Woelfel et al., 2004). In contrast, customer focused clinic approaches were positively correlated with program participation in Virginia WIC (Chance, 1999).

Despite a long list of factors that are known to be associated with program participation in WIC, data sources that fully capture this array of client characteristics and experiences are rare. While primary data collection allows researchers to capture information on factors and experiences that may not typically be systematically and routinely collected by public health and government assistance programs, data collected by questionnaires are costly and requires an investment in the development of instruments (Saczynski, McManus, & Goldberg, 2013). National data sources such as the BRFSS (Centers for Disease Control & Prevention, 2013), the ECSL-B (Jacknowitz, Novillo, & Tiehen, 2007), the Current Population Survey and the Survey of Income and Program Participation (Bitler, Currie, & Scholz, 2003) collect broad lists of variables across a large geographic area with a large population in America (Boslaugh, 2007) but have limited utility for local targeted outreach.
Research on nonparticipation in WIC is expeditious and cost effective when data has already been collected. This reflects the overall “economy” of secondary data analysis (Boslaugh, 2007). Investment of money and time is much lower for studies that leverage previously collected data than for studies that collect data with new instruments, especially when considering the personnel needed to collect primary data (Boslaugh, 2007). Administrative and surveillance data provide an opportunity to begin investigation of nonparticipation in WIC. Data collected by WIC are systematic, routine and provide information on a basic set of client characteristics.

While six studies of participation in WIC utilized questionnaires developed specifically for their research (Bryant et al., 2001; Chance, 1999; CSU Sacramento, 2001; Pati, Mohamad, Cnaan, Kavanagh, & Shea, 2010; Rosenberg et al., 2003; Woelfel et al., 2004), none looked at early dropout from participation. Another three studies utilized state-operated surveillance and administrative data systems to gather information about study participants in the food stamp program (Bhatia, Jones, & Reicker, 2011), the Temporary Assistance for Needy Families program (Cancian, Noyes, & Ybarra, 2012) and WIC (Buechner et al., 1991).

The Behavioral Model of Medical Care Use guided organization and analysis of variables present in the data source. This model depicts contextual- and individual-level factors that influence subsequent medical service use and health outcomes (R. Andersen & Aday, 1978; R. M. Andersen, 1995). According to the latest iteration of this multilevel model, individual and contextual characteristics determine health and service-level outcomes (R. M. Andersen, 2008). Contextual level factors are aggregate measures of communities or organizations relevant to a set of individuals expressing a particular health behavior, status or other outcome (R. M. Andersen, 2008; Babitsch, Gohl, & von Lengerke, 2012). Within a particular context, predisposing factors
(such as community demographics or organizational norms), enabling factors (such as community-level resources and expenditures), and need (such as environmental and epidemiologic indicators) characteristics influence measures of service use and health outcomes (Babitsch et al., 2012).

Influenced by contextual factors, individual predisposing (e.g. demographic, social and mental indicators), enabling (e.g. financing factors, wealth and health insurance status), and need (e.g. self-perceived and professionally evaluated health status) characteristics (Babitsch et al., 2012) directly determine health behaviors and outcomes (R. M. Andersen, 2008). Likewise, individual-level factors influence contextual factors, and contextual factors have direct impact on service use and health outcome measures. In this investigation, individual-level predisposing and enabling factors as well as contextual enabling factors were available for analysis.

While regression techniques are frequently used in the study of factors related to a particular outcome, survival analysis provides unique insight about the timing of nonparticipation modeled from contextual and individual-level factors. Others have applied survival analysis to the investigation of time to prenatal enrollment in WIC (Swann, 2007) and the timing of breastfeeding cessation among WIC mothers (Tenfelde, Finnegan, Miller, & Hill, 2012). This study applied survival analysis of program participation from the date of certification to the first day of inactivity that resulted in automatic termination due to nonparticipation. The purpose of this study is to estimate the effect of a variety of factors on time to inactivity that leads to automatic termination among WIC mothers in Kentucky. The main research questions are: (1) what factors impact time to inactivity among WIC mothers, and (2) which factors are necessary for predicting time to inactivity?
Methods

Study Design. A retrospective study design using administrative data from the statewide Kentucky WIC program was used to identify and describe factors related nonparticipation. Program services after enrollment represent an important and relevant etiologic period whereby characteristics that predate enrollment influence with experiences during program utilization that result in participation outcomes. The outcome of this study was nonparticipation from WIC. Automatic termination due to nonparticipation occurs when a program enrollee has been inactive for 60 continuous days (Kentucky WIC, 2013; Kotelchuck, Schwartz, Anderka, & Finison, 1984). Kentucky WIC policies defined nonparticipation as the failure to attend monthly appointments to activate monthly food instruments over 60 continuous days (Kentucky WIC, 2013).

Study Period. The source population for this study included women who were currently or formerly enrolled in WIC in the state of Kentucky from January 1st, 2012 to December 31st, 2013. This time period was chosen because it began one year after the electronic benefit transfer (EBT) system was operational throughout the Kentucky WIC program.

Inclusions and Exclusions. The source population excluded individuals who were missing from administrative records, those not enrolled (which includes those eligible and not yet enrolled, and those who had attempted enrollment and were deemed ineligible). The original data file contained 130,757 records documenting the experiences of 84,637 unique WIC mothers during the stated time period. As many as six WIC visits were captured for each individual, although the prevalence of individuals who have visited the WIC clinic six times was extremely rare (n = 4). This person-period-formatted data file (Singer & Willett, 2003) was then reshaped to a person-level file containing 84,637 rows. Data values are inputted by local WIC staff and
are, thus, subject to mistakes in data entry. Therefore, exclusions were applied to the person-level file to account for individuals that fell out of the study period (n = 552), who were five years old and younger (n = 8) and who were coded as male (n = 2).

It was clear after further inspection of dates of earliest visit and termination that a number of individuals categorized as nonparticipants in the system were incorrectly labeled according to criteria set forth by the Kentucky WIC program policy (Kentucky Public Health, 2013d). As a result, some individuals were removed from the dataset because: their initial visit and termination dates were the same (n = 28); their termination date occurred prior to 60 days from their earliest visit, indicating premature termination (n = 71); and a small group had negative activity times (that is, the calculation of total activity time resulted in negative values) that could not be explained (n = 9). Thus the final analytic sample represents a census of total maternal participation within the two-year study period, reduced by the aforementioned exclusions (N = 83,969).

**Outcome.** The main outcome in this study is termination from Kentucky WIC 60 days after their last food instrument issuance even though they were still categorically eligible. The operational definition of the outcome was the same throughout the state of Kentucky. Individuals who were automatically terminated (electronically or manually by WIC staff members) were classified as (1) and all other terminations were coded as (0). Findings compared nonparticipants to participants.

**Time.** The first visit date, which was the date of certification, and automatic termination were used to identify the length of active participation measured in days. First, 60 days were subtracted from the date of termination to identify the first day of the inactivity period leading to nonparticipation, measured as a calendar date. Then the date of the first visit (date of
certification) was subtracted from the date of the first day of inactivity to measure the period of activity given in days.

**Censoring.** Censoring in survival analysis refers to events that limit the amount of information available to ascertain a study participant’s actual survival time (D. G. Kleinbaum & Klein, 2012g). Data can be right-censored when the study ends, when there is loss to follow up, or when a participant withdraws from the study (D. G. Kleinbaum & Klein, 2012f). Data can also be left-censored, which occurs when the time a participant leaves a study or program is known but not when they began, making it impossible to calculate an exact survival time (D. G. Kleinbaum & Klein, 2012ef). Censoring operates in this investigation through the study design and the termination process. Information from the source data identified right-censoring, including categorical ineligibility, dual participation, ineligibility due to no nutritional risk, over income guidelines for the program, participant choice to terminate, participant sanction, and reasons related to a transfer in or out of state. Terminations for any cause occurred for 80.9% of all women included in the study. Left censoring occurred for a small number of mothers when the earliest activity date captured by the study period was later than the termination date, minus 60 days.

**Selection of Covariates.** Independent characteristics for this study were limited to the variables included in the data set provided by the state program. The Behavioral Model and literature review aided covariate selection. Categorical covariates examined included marital status, migrant status, ethnicity and race, primary language and English proficiency, whether or not a mother’s home contact information was available, presumptive eligibility for Medicaid, whether or not a mother’s household was ever enrolled in WIC, whether the mother was on the Supplemental Nutrition Assistance Program (the food stamp program also known as SNAP), if
the mother was ever on the Kentucky Transitional Assistance Program (KTAP), and whether or not the mother was ever homeless during the study period. Information on the presentation of Verification of Certification information (VOC) was used to indicate whether or not a mother had changed clinic sites from one visit to another and was considered a contextual factor. Individuals with the VOC indicator had changed clinic locations. All missing values were recoded to their own response category.

Independent characteristics with continuous values selected for analysis included age in years (an individual level predisposing factor) and mean income (an individual level enabling factor). Age was calculated by subtracting birth dates from the date of the earliest visit. Mean income was calculated by taking the average of recorded income values for every mother’s visit. A large number of income values were either missing, incorrectly recorded, or surpassed WIC’s income threshold rule of 185% of the Federal Poverty Level (FPL). According to 2013 figures, 185% of FPL for a family of 8 is $73,315.50 (Centers for Medicare & Medicaid Services, 2013). Income was then recoded to a new income variable where a threshold of $74,000 was used to indicate valid, qualifying incomes for the WIC program, and all other incomes were considered missing (n = 23,663). The range of mean incomes varied between $0 and $73,599.33. Mean income was calculated across all available values per individual. Mean income categories were used in subsequent analysis. Age was used initially as a categorical in the unadjusted model and then, in the adjusted model, as a continuous covariate.

Additional information was obtained from Kentucky WIC state offices that indicated whether or not sites across the state utilized a same day scheduling (SDS) method (Napier, 2014). This information was originally collected by Excel spreadsheet and was systematically merged with the analytic file to indicate when a particular mother’s visit was at a clinic that used
the SDS method. The SDS method assigned by state and district health officers requires local sites to schedule appointments on the same day of desired attendance (C. Staff, 2013; W. Staff, 2013).

To merge the clinic scheduling method information with the analytic data file, an intermediate data file matching clinic names as they appeared in both the SDS and the analytic data files was created. Each pair of names was read individual for quality assurance. The intermediate file was then linked to the analytic file. This variable was considered a contextual enabling characteristic within the Behavioral Model framework.

**Statistical Analysis.** Frequencies and proportions across categories of independent covariates were used to describe the analytic sample population. Means and standard deviations were used to describe continuous scale covariates. Characteristics of women in the Kentucky WIC program were compared across participation status. A life table was built to describe inactivity over the course of time in days. This table describes events as the number of those turning from active to inactive status in a given time interval and the number who were censored and displays the proportion of women terminated because they had not picked up food instruments for 60 days. Figure 6 displays the change of hazard over time.

Univariate statistics were used to describe the distribution of time across the maternal population in the Kentucky WIC program during the study time period. Of special concern was a comparison of the time between enrollment and termination between program sites that use Same Day Scheduling (SDS) and those that use standard appointment scheduling methods (conventional scheduling method). Descriptive statistics as well as stem-and-leaf plots and histograms were compared to identify any differences in time across type of clinic site.
The Cox proportional hazard model was used to estimate covariate effects related to time to nonparticipation in the Kentucky WIC program. Similar to regression approaches (D. Kleinbaum & Klein, 2012a), the basic Cox model allows estimation of the impact a vector of covariates has on time to inactivity in an easily interpretable fashion. Further, it is semi-parametric, i.e., it does not require the estimation of baseline hazard (D. Kleinbaum & Klein, 2012a). This model assumed that the underlying hazard ratios among individuals across time were constantly proportional (D. Kleinbaum & Klein, 2012b).

First, a time-only Cox model was constructed. Due to the underlying assumption of proportional hazards, all proposed covariates were evaluated to see if this assumption was violated before and during construction of Cox models. Evaluation consisted of plotting individual Kaplan-Meier curves of survival functions and log-log survival functions for each covariate level. The Mantel-Cox log rank test was used to determine statistically significant differences among categories of covariates across survival time – a rejection of the null hypothesis indicates that survival times (and log-log survival times) are different across categories. Any two curves that crossed each other indicated a violation of the assumption of proportional hazards, meaning that differences among categories change over time (non-proportional).

Schoenfield partial residuals were constructed and compared to the ranked order of survival time to further test violations to the assumption of proportional hazards during the construction of the Cox model. A correlation matrix related partial residuals for each covariate level to partial residuals for every other covariate level as well as ranked order of survival time. A subsequent goodness of fit test identified violations to the proportional hazards assumption among the constructed correlation matrix (D. G. Kleinbaum & Klein, 2012c). If the goodness of
fit test resulted in a statistically significant difference at an alpha level of 0.05, the covariate was considered time-dependent. The null hypothesis of the goodness of fit test indicated whether or not the correlation between Schoenfield residuals and time is zero (D. G. Kleinbaum & Klein, 2012d).

Extended Cox modeling was used to include time-dependent covariates. The full model was stratified by presentation of VOC and program status (defined as fully breastfeeding, partially breastfeeding, or pregnant); a dummy variable was constructed based on these two characteristics and used for stratification. The time at which an individual switched from experiencing conventional scheduling methods to SDS was used as the time-varying covariate. Other characteristics shown to be time varying through tests of the proportional hazards assumption was included as interactions with the time-varying covariate. Likelihood ratio tests were used to determine models with all covariates differ significantly from unadjusted models including survival time alone. An additional Wald test indicated whether or not a hazard ratio in the final model differs significantly from 1.0. All statistical analysis was performed in SPSS 22 (IBM Corp., 2013).

**Human Subjects Approval.** The Internal Review Boards of the Cabinet for Health and Family Services and the University of South Florida approved study protocols.

**Findings**

In contrast to participants who were either post partum (42.3%) or pregnant (43.4%), three quarters of mothers classified as nonparticipants were pregnant. Mean age for participants and nonparticipants were 25 years and 24 years, respectively (p < 0.05). The range of ages for
participants (12-52 years) and nonparticipants (13-54 years) were similar. Most women in the Kentucky WIC program were single mothers (89.4%). Few mothers were migrant workers or come from migrant families and 1.8% of participants and nonparticipants were homeless. Migrant status and homelessness did not differ significantly across categories of participation status.

A vast majority of the program was non-Hispanic (93.8% of participants and 96% of nonparticipants). Most Kentucky WIC mothers were White or Black. Most mothers have no limitations in English proficiency. A majority of women had missing information on primary language (60.1%); cross-tabulation revealed that most mothers with missing primary language information were White or Black (98.2%), non-Hispanic (95.1%) mothers. Mothers missing information on primary language were reassigned to English. Small proportions of participant (2.5%) and nonparticipant (1.4%) groups spoke Spanish, with even smaller proportions of mothers speaking other primary languages (Table 5).

Almost a third of WIC mothers in Kentucky have missing income information (29.7%). Of those reporting income, most mothers earn less than $30,000 on average. A small proportion of women were presumptively eligible for Medicaid (9.4% of participants and 10.4% of nonparticipants), though this does not indicate that they are not currently enrolled in Medicaid or other health insurance programs. About 40% of participants and nonparticipants received SNAP between 2012 and 2013, and just 3.33% of participants and nonparticipants enrolled in the Kentucky Transitional Assistance Program (KTAP). KTAP did not differ significantly across categories of participation status. Only 6.1% of participants and 3.5% of nonparticipants were located in households that were also enrolled in the program. Almost all women had reported home contact information (100% of participants and 99.8% of nonparticipants) (Table 6).
Across participation categories, more women have attended a SDS clinic than have needed to present VOC. A small proportion of participants (2.8%) and of nonparticipants (1.8%) had to present VOC because they attended a new clinic that was different from the one they saw previously. About a third of participants (29.0%) and nonparticipants (30.8) had attended an SDS clinic (Table 6).

Table 7 is the life table describing hazard, survival and censorship over the course of the study period in discrete time intervals. Table 7 includes 83,907 mothers while 556 cases were excluded due to missing information. The range of survival time among study subjects was between 0 and 730 days. Average survival time was about 238 days. The difference in average survival times for clinic sites using SDS (236.83 days; s.d. 165.16) and clinic sites not using SDS (240.95 days; s.d 240.95) was statistically significant (95% CI: 1.64, 6.61; p = 0.001). While this difference exists, overall distribution of survival time in both non-SDS and SDS clinic sites were similar, as well as skewness (1.002 & 0.965, respectively) and kurtosis (0.575 & 0.456, respectively).

According to Table 7, all WIC mothers with documented time information were included in the initial risk set. During the first 100 days, almost 6,000 terminations due to nonparticipation occurred. Estimated hazard changed over the study period. The risk of termination due to nonparticipation decreased after the first interval, flattened between the second and third interval, continued decreasing between third and fifth interval, remained the same between the fifth and sixth intervals, and rose after the sixth interval.

Across all covariates, race, primary language, available home contact information, enrollment in KTAP, and categories of mean income do not have parallel survival curves and were later included as time-varying covariates. Migrant status, enrollment in KTAP and
enrollment in SNAP did not have statistically different survivorship across categories ($p$-values: 0.155, 0.298, and 0.370, respectively). Proportionality across curves of migrant status and food stamps could not be visually resolved and thus were evaluated further using Schoenfeld residuals.

Correlations between Schoenfeld partial residuals and ranked survival time revealed further violations to the proportional hazards assumption. While the initial tests of the PH assumption could not resolve whether or not migrant status and SNAP enrollment violated this assumption, analysis of their Schoenfeld partial residuals identified the SNAP enrollment varied significantly over time and thus was kept in further modeling as an interaction term with the time-varying covariate. Marital status, presumptive eligibility for Medicaid, household WIC enrollment, and mean income categories were also shown to be non-proportional through this analysis and were also kept in the model time-varying interaction terms.

The full model containing all covariates was specified. This model was significantly better at predicting time to nonparticipation than chance alone ($X^2 = 1064.987, df = 23, p < 0.001$). Coefficient estimates for homelessness increased over iterations but never converged. Homelessness was removed from subsequent analysis. Ethnicity, age, marital status, race, primary language, home contact information, enrollment in KTAP and SNAP, mean income, migrant status, presumptive eligibility in Medicaid and household WIC enrollment were present in the full model.

Table 8 presents the unadjusted Cox model and the adjusted model after stratifying by presentation of VOC and status as well as including time-varying covariates. In the stratified model, increasing age is associated with a decrease in the hazard of nonparticipation among WIC mothers. Hispanic mothers are at a 36% reduced hazard of nonparticipation compared to non-
Hispanic mothers. Married mothers are less likely to become nonparticipants compared to single mothers, whereas mothers who are divorced are almost 38% as likely as single mothers to become nonparticipants. Mothers with limited English proficiency have a reduced hazard of nonparticipation compared to mothers fluent in English. Homeless mothers are more likely to become nonparticipants than mothers who are not homeless. Mothers who live households enrolled in WIC are at reduced hazard of nonparticipation compared to mothers who are solely enrolled in the program. The hazard of nonparticipation increases with decreases mean income categories. Mothers who are presumptively eligible for Medicaid have an increased hazard of nonparticipation compared to mothers who are not. Lack of available home contact information places mothers at an increased hazard of nonparticipation. Attendance at a clinic that uses SDS places mothers at increased risk of nonparticipation.

**Discussion**

This study estimated the time between predisposing and enabling characteristics and automatic termination (“nonparticipation”) in the Kentucky WIC program. Use of Kaplan-Meier graphs showed that hazards of nonparticipation by race, primary language, documented home contact information, recent enrollment in KTAP during 2012 and 2013, and mean income were not proportional over time. Other characteristics including migrant status, ethnicity, presumptively eligibility for Medicaid, English proficiency, homelessness, age, status, VOC and the scheduling method a particular clinic uses play important roles in determining a WIC mother’s risk of nonparticipation in Kentucky.

The difference in average number of days between women ever attending SDS clinics and those who have not was four days. While this statistically significant difference seems small, stratified analysis demonstrated that the hazard of nonparticipation is smaller before mothers
attend SDS clinics. The appointment scheduling method has an impact on whether mothers become nonparticipants.

Presumptive eligibility for Medicaid places mothers at increased risk of nonparticipation. An attempt was made to better understand the role of insurance in nonparticipation outcomes. In the original data file, two binary indicators, for primary and supplemental insurance, were available. Using presumptive eligibility and these two insurance indicators resulted in a new variable that was not informative due to the high rate of missing information on insurance.

Results are comparable to previous work on enrollment in WIC. A study of Texas Medicaid enrollees eligible for WIC enrollment demonstrated that Hispanic mothers that primarily spoke Spanish and received food stamps had the highest proportion of enrolled WIC recipients (Bryant et al. 2001). Mothers who were Anglo and not receiving food stamps had the lowest rates of currently enrolled WIC women in Texas, while unmarried Anglo women who did not receive food stamps had the highest rate of women not currently enrolled in WIC (Bryant et al. 2001). While not statistically significant, Kentucky WIC mothers who do not receive food stamps have a reduced hazard of nonparticipation. While results on race were not statistically significant, trends across race categories in Kentucky indicate that all groups are less likely to become nonparticipants compared to white mothers. Taken together, results from Kentucky and Texas revealed that factors associated with the risk of early dropout were different than the factors associated with the risk of being eligible but not enrolling in WIC.

This follows other studies that use administrative data, surveillance data, or data linkage across the two in order to gain insight into the effects of government assistance participation on health and the impact of many factors on participation outcomes. One such approach linked WIC program data with vital statistics to investigate the impact of length of WIC enrollment on
gestational age characteristics of infants (Ahluwalia, Hogan, Grummer-Strawn, Colville, & Peterson, 1998). Other investigators have combined state-operated surveillance data systems with face-to-face and telephone-based primary data collection to increase participation in SNAP (Gorman, Smith, Cimini, Halloran, & Lubiner, 2013). A multitude of uses for routinely collected program data in the study of participation exist but more work is needed on using these data systems for mitigation of early dropout through outreach.

Whereas the approach taken in the current study had many advantages, this investigation also had a number of limitations. The covariates available for inclusion in analysis were limited to only those currently collected by Kentucky WIC. It is possible that other characteristics, such as stigma (Stuber & Schlesinger, 2006), might also influence activity and termination outcomes. In addition, sensitivity and specificity of measures currently collected by Kentucky WIC have not been explored.

The decision to use program data available between 2012 and 2013 exposed the study to selection bias. Negative times indicated individuals whose participation etiologies predated the study period and they were thus not included in analysis. Likewise, those mothers who were still actively participating by December 31, 2013 were given that date as the date of censorship, which did not truly capture total activity time for those mothers. Future investigations of this data should include counting process approaches that can account for left truncations (Hosmer & Lemeshow, 1999), and extended study periods could follow individuals until they are terminated as in cohort studies. Frailty models that account for within-person random effects could also be used in further efforts.

Recall bias might have impacted results in this study. As families attended WIC, program staff members collected attendance and other information using computer-based administrative
systems. Any collected variable that required the staff member to ask questions of the program participant without referring specifically to medical records, income records or other official forms may have put collected information at risk of recall bias. For instance, presumptive eligibility for Medicaid was often determined by asking a potential WIC participant about their income. Also, variation in coding and cataloguing information across sites of service may impart further limitations of using administrative data. Formal analysis of the validity and reliability of self-reported measures is needed.

While this study created a parsimonious model that incorporated multiple covariates predicting survival time, results may be over- or underestimated if other variables important in the participation process exist, such as treatment stigma or identity stigma (Stuber & Schlesinger, 2006). The Andersen Behavioral Model was useful in selecting and organizing covariates. While need characteristics defined by the Behavioral Model were not available, predisposing and enabling characteristics of contexts and individuals were used, with VOC and status categories used in stratification. Analysts exploring participation in government assistance programs under the Behavioral Model framework should continue exploring early dropout using multilevel modeling.

Though this study compared enrollees to each other, results are not generalizable to the greater population of eligible individuals not yet enrolled in WIC.

This study identified numerous characteristics that violate the proportional hazard assumption. As a result, this finding does not mean that those characteristics were not important in the etiology of early dropout from WIC. In fact, these findings suggest further statistical analysis using the Extended Cox model, which accounts for time-dependent covariates. With respect to the Behavioral Model, multilevel approaches most suitable for longitudinal data could
also be applied to explore nested contextual- and individual-level factors associated with the
moment inactivity begins.

Categorical factors not explored in this analysis included clinic names attended at each
visit and mothers’ ZIP as well as the county within which each mother resides. There are 898
unique zip codes among WIC mothers with only 96 missing values. WIC mothers reside across
120 different counties comprising 123 unique county codes (Jefferson County has 3 different
county codes) (Custom Data Processing EHS, 2014). WIC mothers were able to attend 181
different WIC sites throughout the state of Kentucky. These geographic variables might be useful
in a spatial analysis to understand contextual factors that are present in the Behavioral Model and
have implications on how outreach to eligible and enrolled mothers should be structured.

Finally, collection of attitudes, perceptions, knowledge and stigma is not routine at the
state-level. In particular, treatment and identity stigma are known to influence the decision to
participate in government assistance and means-tested public programs (Stuber & Kronebusch,
2004). Small satisfaction surveys are performed at a number of local health departments in
Kentucky (Goff, 2014). These types of surveys are appropriate starting points for elaborating
more sophisticated data collection instruments to not only target enrolled mothers at highest risk
of automatic termination due to nonparticipation but also make the program more satisfying.

Despite these limitations, a strength of this study was the use of survival analysis to build
a model that predicts the period of time leading to automatic termination due to nonparticipation
– the primary outcome and censoring were uniquely intertwined. Whereas specific prospective
cohort studies aim to minimize loss-to-follow-up and collect indicators of such situations, the
primary study outcome of this study was the cessation of active participation. Of all the methods
available within survival analysis, Cox proportional hazard regression is a semi-parametric
multivariate approach that allows estimation of survival time taking into account predictors and
covariates (Elwood, 2007) without the need to estimate baseline hazards, which is unavailable in
other survival analysis regression approaches such as the Kaplan-Meier method (Pagano &
Gauvreau, 2000). Accounting for time-varying covariates in the extended Cox model allows the
control immortal time bias in the Kentucky data. While enrollment has issues with selection bias
during analysis (Colman et al., 2012), the current study compares individuals already enrolled
rather than the universe of individuals eligible for the program.

Indeed, enrollment, active participation, and exits from WIC imply a participation
etiology for government assistance programs whereby the timing of participant experiences is
important (Swann, 2007). Longitudinal study designs are needed to continue examining aspects
of nonparticipation. A longitudinal prospective cohort design was able show that mothers with
better health literacy were more likely to participate in TANF compared to counterpart mothers
with limited health literacy (Pati et al., 2010). Another study instituted a case-control design to
explore what was known about program participation status given work and immigration-related
covariates (Rosenberg et al., 2003). Lee and colleagues applied a multivariate hazard model to
incorporate time of enrollment in assistance programs with nutrient deficiency outcomes (B. J.
Lee, Mackey-Bilaver, & Chin, 2006). Swann identified that previous WIC participation during
first pregnancies, poor health, as well as low insurance, income and education predispose women
to early WIC enrollment (Swann, 2007).

This study benefited from the Kentucky WIC Program’s statewide database. Use of this
type of data allowed the completion of an efficient, cost-effective study of nonparticipation
without requiring the initial development of new questionnaires or instruments. Study objectives
were achieved through standard reshaping the original data set from person-period format (the
format in which data are collected) to a person-level format (the proper format for survival analysis). It is my hope that study results will inform further efforts to mitigate nonparticipation from WIC in Kentucky by identifying important predisposing, enabling, and need factors determining nonparticipation, thus highlighting areas for outreach and intervention.

References


Custom Data Processing EHS. (Ed.) (2014).


Goff, R. (2014). [E-mail communication regarding customer satisfaction surveys at local health departments.].


Staff, C. (2013). Jessamine County Health Department to implement same-day scheduling. 

*Central Kentucky News.* Retrieved from 


*Social Science & Medicine, 63*(4), 934-935.


Subpart C -- Participant Eligibility, 50 FR 6121 C.F.R. § 246.7(d) (1985b).

Subpart C -- Participant Eligibility, 50 FR 6121 C.F.R. § 246.7 (1985c).

Subpart C -- Participant Eligibility, 50 FR 6121 C.F.R. § 246.7(e) (1985d).
### Table 5. Distribution of Predisposing Characteristics Among Kentucky WIC Mothers by Participation Status, 2012-2013

<table>
<thead>
<tr>
<th></th>
<th>Participant</th>
<th>Nonparticipant</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 71,231)</td>
<td>(n = 12,738)</td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>874</td>
<td>109</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Black</td>
<td>8,928</td>
<td>1,438</td>
<td></td>
</tr>
<tr>
<td>Hawaiian/Pacific Islander</td>
<td>226</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Native American/Indian</td>
<td>148</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>61,055</td>
<td>11,141</td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
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<td></td>
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</tr>
<tr>
<td>Not Hispanic</td>
<td>66,790</td>
<td>12,225</td>
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</tr>
<tr>
<td>Hispanic</td>
<td>4,441</td>
<td>513</td>
<td></td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
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<td></td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Single</td>
<td>62,582</td>
<td>11,382</td>
<td>89.4</td>
</tr>
<tr>
<td>Married</td>
<td>6,066</td>
<td>948</td>
<td>7.4</td>
</tr>
<tr>
<td>Widow</td>
<td>49</td>
<td>7</td>
<td>0.1</td>
</tr>
<tr>
<td>Divorced</td>
<td>546</td>
<td>143</td>
<td>1.1</td>
</tr>
<tr>
<td>Separated</td>
<td>543</td>
<td>120</td>
<td>0.9</td>
</tr>
<tr>
<td>Missing</td>
<td>1,445</td>
<td>138</td>
<td>1.1</td>
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<td><strong>Migrant Status</strong></td>
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<td>No</td>
<td>70,850</td>
<td>12,680</td>
<td>99.5</td>
</tr>
<tr>
<td>Yes</td>
<td>381</td>
<td>58</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Household WIC Enrollment Status</strong></td>
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</tr>
<tr>
<td>No</td>
<td>66,490</td>
<td>12,280</td>
<td>96.5</td>
</tr>
<tr>
<td>Yes</td>
<td>4,295</td>
<td>451</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Homelessness</strong></td>
<td></td>
<td></td>
<td>0.816</td>
</tr>
<tr>
<td>No</td>
<td>69,963</td>
<td>12,508</td>
<td>98.2</td>
</tr>
<tr>
<td>Yes</td>
<td>1,266</td>
<td>230</td>
<td>1.8</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td></td>
<td></td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Fully Breastfeeding</td>
<td>5,151</td>
<td>788</td>
<td>6.2</td>
</tr>
<tr>
<td>Partially Breastfeeding</td>
<td>5,033</td>
<td>428</td>
<td>3.4</td>
</tr>
<tr>
<td>Post Partum</td>
<td>30,137</td>
<td>1,986</td>
<td>15.6</td>
</tr>
<tr>
<td>Pregnant</td>
<td>30,910</td>
<td>9,536</td>
<td>74.9</td>
</tr>
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</table>
Table 6. Distribution of Enabling Characteristics Among Kentucky WIC Mothers by Participation Status, 2012-2013

<table>
<thead>
<tr>
<th></th>
<th>Participant (n = 71,231)</th>
<th>Nonparticipant (n = 12,738)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Language</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>68,992 (96.9)</td>
<td>12,501 (98.1)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Spanish</td>
<td>1,779 (2.5)</td>
<td>174 (1.4)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>460 (0.6)</td>
<td>63 (0.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Limited English Proficiency</strong></td>
<td></td>
<td></td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>No</td>
<td>58,478 (82.1)</td>
<td>10,437 (81.9)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1,867 (2.6)</td>
<td>205 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>10,886 (13)</td>
<td>2,096 (16.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Mean Income</strong></td>
<td></td>
<td></td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Up to $4,194</td>
<td>16,395 (23)</td>
<td>3,230 (25.4)</td>
<td></td>
</tr>
<tr>
<td>$4,194 to $16,739</td>
<td>16,390 (23)</td>
<td>3,187 (25)</td>
<td></td>
</tr>
<tr>
<td>$16,739 to $29,724</td>
<td>11,330 (15.9)</td>
<td>1,688 (13.3)</td>
<td></td>
</tr>
<tr>
<td>$29,724 and Above</td>
<td>5,951 (8.4)</td>
<td>724 (5.7)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>21,165 (29.7)</td>
<td>3,909 (30.7)</td>
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<tr>
<td><strong>Presumptively Eligible for Medicaid</strong></td>
<td></td>
<td></td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>No</td>
<td>64,514 (90.6)</td>
<td>10,709 (89.6)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6,717 (9.4)</td>
<td>2,029 (10.4)</td>
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<tr>
<td><strong>Food Stamp Enrollment</strong></td>
<td></td>
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<td>0.001</td>
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<tr>
<td>No</td>
<td>42,668 (59.9)</td>
<td>7,439 (58.4)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28,563 (40.1)</td>
<td>5,299 (41.6)</td>
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<tr>
<td><strong>KTAP Enrollment</strong></td>
<td></td>
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<td>0.938</td>
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<tr>
<td>No</td>
<td>68,875 (96.7)</td>
<td>12,315 (96.7)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2,356 (3.3)</td>
<td>423 (3.3)</td>
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<tr>
<td><strong>Available Home Contact Information</strong></td>
<td></td>
<td></td>
<td>&lt; 0.001</td>
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<tr>
<td>No</td>
<td>26 (0)</td>
<td>23 (0.2)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>71,195 (100)</td>
<td>12,713 (99.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Contextual-Level</strong></td>
<td></td>
<td></td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>No</td>
<td>50,581 (71)</td>
<td>8,812 (69.2)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20,650 (29)</td>
<td>3,926 (30.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Presentation of VOC</strong></td>
<td></td>
<td></td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>No</td>
<td>69,210 (97.2)</td>
<td>12,509 (98.2)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1,983 (2.8)</td>
<td>226 (1.8)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>38 (0.1)</td>
<td>3 (0)</td>
<td></td>
</tr>
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</table>
Table 7. Life Table Describing Terminations due to Nonparticipation among Kentucky WIC Mothers, 2012-2013

<table>
<thead>
<tr>
<th>Time Interval (Days)</th>
<th>Number Entering Interval</th>
<th>Number Censored During Interval</th>
<th>Number Exposed to Risk</th>
<th>Number of Terminations due to Nonparticipation</th>
<th>Proportion Terminated due to Nonparticipation</th>
<th>Proportion Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0,100)</td>
<td>83907</td>
<td>16849</td>
<td>75482.5</td>
<td>5935</td>
<td>0.08</td>
<td>0.92</td>
</tr>
<tr>
<td>[100, 200)</td>
<td>61123</td>
<td>16028</td>
<td>53109</td>
<td>3385</td>
<td>0.06</td>
<td>0.94</td>
</tr>
<tr>
<td>[200, 300)</td>
<td>41710</td>
<td>12504</td>
<td>35458</td>
<td>2030</td>
<td>0.06</td>
<td>0.94</td>
</tr>
<tr>
<td>[300, 400)</td>
<td>27176</td>
<td>14950</td>
<td>19701</td>
<td>706</td>
<td>0.04</td>
<td>0.96</td>
</tr>
<tr>
<td>[400, 500)</td>
<td>11520</td>
<td>4263</td>
<td>9388.5</td>
<td>281</td>
<td>0.03</td>
<td>0.97</td>
</tr>
<tr>
<td>[500, 600)</td>
<td>6976</td>
<td>2224</td>
<td>5864</td>
<td>199</td>
<td>0.03</td>
<td>0.97</td>
</tr>
<tr>
<td>[600, 700)</td>
<td>4553</td>
<td>3038</td>
<td>3034</td>
<td>162</td>
<td>0.05</td>
<td>0.95</td>
</tr>
<tr>
<td>≥700</td>
<td>1353</td>
<td>1313</td>
<td>696.5</td>
<td>40</td>
<td>0.06</td>
<td>0.94</td>
</tr>
</tbody>
</table>
Table 8. Unadjusted Cox Models & Adjusted Time-Varying Hazard Models of Nonparticipation from Kentucky WIC, 2012-2013

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted HR (95% CI)</th>
<th>Adjusted HR (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)†</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 to 18</td>
<td>1.276 (0.985 - 1.654)</td>
<td>0.994 (0.991 - 0.998)</td>
</tr>
<tr>
<td>18 to 24</td>
<td>1.061 (0.988 - 1.139)</td>
<td></td>
</tr>
<tr>
<td>24 to 30</td>
<td>1.001 (0.943 - 1.063)</td>
<td></td>
</tr>
<tr>
<td>30 to 36</td>
<td>0.964 (0.906 - 1.026)</td>
<td></td>
</tr>
<tr>
<td>36 to 42</td>
<td>0.867 (0.808 - 0.931)</td>
<td></td>
</tr>
<tr>
<td>42 and older</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>0.7 (0.58 - 0.845)</td>
<td>0.599 (0.184 - 1.95)</td>
</tr>
<tr>
<td>Black</td>
<td>0.905 (0.857 - 0.956)</td>
<td>0.835 (0.554 - 1.258)</td>
</tr>
<tr>
<td>Hawaiian/Pacific Islander</td>
<td>0.704 (0.492 - 1.007)</td>
<td>2.071 (0.662 - 6.476)</td>
</tr>
<tr>
<td>Native American/Indian</td>
<td>0.816 (0.526 - 1.265)</td>
<td>0.803 (0.113 - 5.718)</td>
</tr>
<tr>
<td>White</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Ethnicity†</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Hispanic</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.677 (0.616 - 0.744)</td>
<td>0.677 (0.616-0.744)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Married</td>
<td>0.848 (0.794 - 0.906)</td>
<td>0.894 (0.836 - 0.956)</td>
</tr>
<tr>
<td>Widow</td>
<td>0.817 (0.389 - 1.714)</td>
<td>0.959 (0.457 - 2.014)</td>
</tr>
<tr>
<td>Divorced</td>
<td>1.347 (1.142 - 1.588)</td>
<td>1.28 (1.085 - 1.511)</td>
</tr>
<tr>
<td>Separated</td>
<td>1.206 (1.008 - 1.444)</td>
<td>1.179 (0.984 - 1.412)</td>
</tr>
<tr>
<td>Missing</td>
<td>0.588 (0.497 - 0.695)</td>
<td>0.557 (0.471 - 0.66)</td>
</tr>
<tr>
<td><strong>Migrant Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>0.83 (0.641 - 1.074)</td>
<td>3.247 (1.306 - 8.07)</td>
</tr>
<tr>
<td><strong>Household WIC Enrollment Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>0.567 (0.516 - 0.623)</td>
<td>.687 (0.625 - 0.755)</td>
</tr>
<tr>
<td><strong>Homelessness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>1.294 (1.135 - 1.474)</td>
<td>1.466 (1.274 - 1.686)</td>
</tr>
<tr>
<td>Missing</td>
<td>0.01 (0.0-2.07 x 10^-10)</td>
<td>0.01 (0.0-5.95 x 10^-27)</td>
</tr>
</tbody>
</table>

*Stratified by Status & Whether or not VOC was Presented
†Time-independent covariate
Table 8 (Continued). Unadjusted Cox Models & Adjusted Time-Varying Hazard Models of Nonparticipation from Kentucky WIC, 2012-2013

<table>
<thead>
<tr>
<th>Status</th>
<th>Unadjusted HR (95% CI)</th>
<th>Adjusted HR (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully Breastfeeding</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Partially Breastfeeding</td>
<td>0.635 (0.564 - 0.714)</td>
<td></td>
</tr>
<tr>
<td>Post Partum</td>
<td>0.535 (0.492 - 0.581)</td>
<td></td>
</tr>
<tr>
<td>Pregnant</td>
<td>2.021 (1.88 - 2.174)</td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Language</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>English</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Spanish</td>
<td>0.524 (0.451 - 0.609)</td>
<td>1.415 (0.83 - 2.415)</td>
</tr>
<tr>
<td>Limited English Proficiency</td>
<td>0.737 (0.575 - 0.944)</td>
<td>0.243 (0.032 - 1.862)</td>
</tr>
<tr>
<td>No</td>
<td>0.599 (0.521 - 0.687)</td>
<td>0.724 (0.626 - 0.837)</td>
</tr>
<tr>
<td>Missing</td>
<td>1.099 (1.049 - 1.152)</td>
<td>1.144 (1.091 - 1.2)</td>
</tr>
<tr>
<td>Mean Income</td>
<td>1.427 (1.316 - 1.546)</td>
<td>1.247 (0.867 - 1.795)</td>
</tr>
<tr>
<td>Up to $4,194</td>
<td>1.377 (1.270 - 1.493)</td>
<td>1.143 (0.797 - 1.641)</td>
</tr>
<tr>
<td>$4,194 to $16,739</td>
<td>1.125 (1.031 - 1.227)</td>
<td>1.091 (0.746 - 1.598)</td>
</tr>
<tr>
<td>$16,739 to $29,724</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>$29,724 and Above</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Missing</td>
<td>1.478 (1.365-1.600)</td>
<td>1.012 (0.69 - 1.484)</td>
</tr>
<tr>
<td>Presumptively Eligible for Medicaid</td>
<td>1.00 (1.371 - 1.507)</td>
<td>1.31 (1.238 - 1.375)</td>
</tr>
<tr>
<td>Food Stamp Enrollment</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>0.984 (0.950 - 1.019)</td>
<td>1.13 (0.956 - 1.335)</td>
</tr>
<tr>
<td>KTAP Enrollment</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td>0.950 (0.862 - 1.047)</td>
<td>1.339 (0.859 - 2.088)</td>
</tr>
<tr>
<td>Yes</td>
<td>4.267 (2.835-6.424)</td>
<td>13.687 (1.908 - 98.174)</td>
</tr>
<tr>
<td>Available Home Contact Information</td>
<td>1.00 (1.008 - 1.154)</td>
<td>1.00 (1.008 - 1.154)</td>
</tr>
<tr>
<td>No</td>
<td>0.941 (.906-.977)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Attendance at SDS Clinic</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>.941 (.906-.977)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Presentation of Verification of Certification</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td>.727 (0.638 - 0.83)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.636 (0.205 - 1.972)</td>
<td></td>
</tr>
<tr>
<td>Timing of SDS</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>After</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Before</td>
<td>0.241 (0.173-0.335)</td>
<td></td>
</tr>
</tbody>
</table>

*Stratified by Status & Whether or not VOC was Presented
Chapter Four

Background

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is effective at strengthening nutrition and health among low-income families (Colman et al., 2012). WIC provides nutritional subsidies, nutrition education, and referral to health and social services to women, infants, and children five years old and younger that have limited resources and are deemed nutritionally at-risk (Food and Nutrition Service, 2012). Since its launch as a permanent program in 1974 (Food and Nutrition Service, 2012), WIC has been able to positively impact childhood growth and weight, diets, morbidity and mortality, pregnancy outcomes (Colman et al., 2012; Rush et al., 1988), and immunizations (Cortese et al., 2004).

Termination after prolonged inactivity. Despite the program’s numerous benefits, many families who qualify for the program fail to enroll, and many who enroll stop actively participating. Further, prolonged periods of inactivity lead to automatic terminations (Kotelchuck, Schwartz, Anderka, & Finison, 1984). Terminated clients may still be eligible and need to certify to re-enter the program.

Looking at the program nationally, early exits from WIC result from losses of eligibility, reduced need for services and various difficulties accessing benefits (Tiehen, 2010). Reasons for nonparticipation in WIC programs in Texas, North Carolina, and California include confusion about eligibility requirements, customer dissatisfaction with the program, and embarrassment to
accept government assistance (C. Bryant et al., 1996; C. A. Bryant et al., 2001; Lindenberger & Bryant, 2002).

**Investigating nonparticipation to inform outreach.** Previous systematic efforts to mitigate nonparticipation in statewide WIC programs provide both insight into the nature of program enrollees’ decisions to actively participate and useful instruction on how to investigate participation experiences. These studies have quantitative and qualitative investigations to identify reasons for local nonparticipation and opportunities to enhance the program experience for WIC eligible individuals (C. A. Bryant et al., 2001). Because relatively little research has been done on nonparticipation, inactivity and early dropout, the literature on nonparticipation in other government assistance and Maternal & Child Health (MCH) programs is necessary.

**Approaches used to investigate participation status.** While many investigations primarily use quantitative methods to understand early dropout and inactivity (Algert, Reibel, & Renvall, 2006; Cancian, Noyes, & Ybarra, 2012; Chance, 1999; Kaiser, 2008; Martin, Cook, Rogers, & Joseph, 2003; Pati, Mohamad, Cnaan, Kavanagh, & Shea, 2010; Rosenberg, Alperen, & Chiasson, 2003; Woelfel et al., 2004), qualitative approaches have been used in three studies to examine reasons for participation experiences (C. A. Bryant et al., 2001; CSU Sacramento, 2001; Gorman, Smith, Cimini, Halloran, & Lubiner, 2013). The Texas WIC research team identified recurring themes in focus group and in-depth interview data, which was coupled with survey data analysis (C. A. Bryant et al., 2001). A Rhode Island-based food stamp initiative took qualitative community-based approaches to inform outreach efforts (Gorman et al., 2013). A California-based WIC project categorized data coded from focus groups, in-person and telephone-based interviews as either “group consensus,” “incidental but seemingly important information,” or “interesting and related quotes and comments” to efficiently mine qualitative
data for useful insights related to participation experience (CSU Sacramento, 2001). A quantitative study of the Temporary Assistance for Needy Families program (TANF) used caseworker notes to refine identification of a participation outcome (Cancian et al., 2012).

**Factors related to nonparticipation.** Through investigations across a number of government assistance and public health programs, important characteristics related to participation status have been previously identified. Eligible individuals that are less likely to participate in the food stamp program (now the Supplemental Nutrition Assistance Program or “SNAP”) are those that are homeless (Algert et al., 2006), have higher education (Algert et al., 2006), are older (Algert et al., 2006; Martin et al., 2003) and Black families are less likely than Hispanic/Latino families to receive food stamps (Martin et al., 2003). Stigma was also found to prevent individuals from applying for food stamps (Kaiser, 2008).

Differences in income also shape dropout rates among enrolled individuals. Dropout in Wisconsin TANF was associated with whether individuals had multiple applications to the program, and differences exist between program participants and those who were either denied services or missed appointments (Cancian et al., 2012). Applicants to the Wisconsin TANF program who missed appointments or were denied service received the lowest incomes within the program applicant population – TANF dropouts are more likely than participants to experience deep poverty (Cancian et al., 2012). Also, the number of children, age and income are statistically significant predictors of TANF participation (Pati et al., 2010).

Participation status was associated with the census tract where clients lived in Rhode Island (Buechner, Scott, Smith, & Humphrey, 1991), while individuals not enrolled in Texas WIC were different than those who enrolled geographic location where they resided as well as race, income, age, marital status, education, employment, and participation in multiple
government assistance programs (C. A. Bryant et al., 2001); Texans eligible for WIC who were not enrolled were more likely than those who participated in the program to be unmarried Anglo Americans who did not receive food stamps (C. A. Bryant et al., 2001).

Participants that left the New York City WIC program were more likely than participants who stayed in the program to be women who received WIC themselves, women who did not receive Medicaid for their children, and women experiencing transportation hurdles, family illnesses and job conflicts (Rosenberg et al., 2003). Client experience variables such as waiting too long, clinic environment characteristics and quality of education were related to failure to use WIC checks – each barrier cited led to a 2% increase in failure to use WIC food instruments in a New York City sample (Woelfel et al., 2004), and customer focused clinic approaches were associated with program participation in Virginia WIC (Chance, 1999).

**Kentucky.** As the first state to implement a permanent WIC site in 1974 (Oliveira, Racine, Olmsted, & Ghelfi, 2002), Kentucky currently provides many known program benefits (Kentucky Cabinet for Health and Family Services, 2013) to roughly 130,000 eligible residents monthly (United States Department of Agriculture, 2013). While Kentucky WIC addresses issues such as childhood obesity and breastfeeding promotion (Schuchter, Besl, & Simpson, 2010a, 2010b) and continues learning about participant attitudes and knowledge toward food and diets (Reed, 2012), total average monthly participation in the program has decreased overall after implementation of Electronic Benefit Transfer (EBT) (United States Department of Agriculture, 2013). Local research is needed to identify possible causes of nonparticipation to inform successful outreach and recruitment efforts.

**Study Aim.** As part of a larger mixed methods project, the aim of this qualitative study is to identify the reasons women enrolled in the Kentucky WIC program were terminated after 60
days without issuance of benefits. This paper describes these nonparticipants’ experiences using WIC and the reasons they discontinued using the program while they were still eligible. A list of recommendations from nonparticipants about how to prevent further nonparticipation is presented.

Methods

**Qualitative data source and setting.** A cross-sectional, qualitative study design was used to explore the Kentucky WIC nonparticipation experience with further depth. Customer journey mapping was performed to understand the process that a typical WIC participant encounters during enrollment and subsequent participation in the program.

**Recruitment.** To maintain logistical ease and confidentiality of potential research participants, direct recruitment efforts were made by Kentucky WIC personnel through in-person and telephone recruitment approaches. The researcher developed recruitment items such as invitations to participate, telephone recruitment call scripts, flyers and a listing of recruitment procedures (Appendices G-J). Dates, times and locations were arranged collaboratively with the Kentucky WIC program and depended on the availability of the site and the participants.

**Inclusion & exclusion criteria.** To be included in focus groups, participants were women who had been automatically terminated from the program because they failed to return for food instrument issuance while eligible. Some nonparticipants had been recertified at the time of the study, but others had not. English fluency also was required for inclusion. Individuals excluded from this study were unable to attend the focus group for scheduling or transportation reasons, did not respond to recruitment, declined participation, or had never been automatically terminated due to nonparticipation.
Relevant theories and concepts. Anderson’s Behavioral Model of Medical Care Use (Babitsch, Gohl, & von Lengerke, 2012) guided the study design and instrument development. Since the 1960s, this model has linked health and service outcomes to a system of contextualizing and individual-level factors (R. Andersen & Aday, 1978) and seems uniquely relevant to the nature of participation in public assistance programs, in particular WIC. Within levels of the system, variables are categorized into predisposing, enabling, or need (P-E-N) characteristics that precede and are influenced by health behavior and outcomes (Davidson, Andersen, Wyn, & Brown, 2004). The Andersen Model places measured variables according to their source and their direction of influence (R. M. Andersen, 1995, 2008).

Also, others have highlighted the importance of examining stigma within the context of welfare program use as a determinant of utilization (Salmons, 2012; Stuber & Schlesinger, 2006); such stigma originates from internalization of stereotypes (“identity stigma”) or from treatment of one by others (“treatment stigma”). Identity stigma and treatment stigma, as individual-level characteristics within the Behavioral Model, were also important in shaping data collection instruments and guiding qualitative analysis.

Question guide. The focus group route included questions about perceived benefits of WIC participation, barriers to WIC participation, and other questions regarding participants’ experiences with the program and was guided by the Behavioral Model. The researcher, a second social marketing expert (Carol Bryant), and Kentucky WIC administrators in Frankfurt, Kentucky (Ashley Napier, Rhonda Goff, and Fran Hawkins) collaboratively developed the question route in multiple iterations. Suggested probes were included.

Journey mapping. To gain insights into WIC participants’ experiences using program services, the researcher used journey mapping at the outset of the project. Journey mapping is a
participant observation technique; marketing researchers use this approach to gain firsthand knowledge of a product or service (Crosier & Handford, 2012; Liedtka, 2011; Noble, 2010). One notable goal of journey mapping is to identify the problems consumers encounter and their emotional response to specific service features. This can be accomplished in a number of ways. One way is direct observation of people using services and organizing those observations. Another way is for market researchers to participate in the service to understand customer journeys firsthand. This work utilized both approaches.

State level program staff made arrangements for the researcher to view the certification process, observe WIC health assessments, screenings, and nutrition education, and purchase food at a local grocery store using an electronic benefit transfer (EBT) card; however, the researcher did not take part in scheduling a WIC appointment. These events define major “touch points” of the WIC client experience (Wheelock, Miraldo, Parand, Vincent, & Sevdalis, 2014a). The rich insights gained from journey mapping have often been used to improve patient experiences in clinical settings (Hunter & Segrott, 2008; Trebble, Hansi, Hydes, Smith, & Baker, 2010; Westbrook, Coiera, Sophie Gosling, & Braithwaite, 2007). The approach taken for the current study was informed by previous studies using this technique (Crosier & Handford, 2012; Wheelock, Miraldo, Parand, Vincent, & Sevdalis, 2014b).

The food package given to the researcher was for a hypothetical post-partum, non-breastfeeding woman and her new infant. All food purchased through journey mapping was donated to a local family center in Frankfurt, Kentucky. The researcher also observed participants being served at a local clinic in Lexington, Kentucky. Observations and notes were taken in an examination room for six separate appointments.
After initial journey mapping was completed, further questions related to participant experiences that were not answered through the primary journey mapping steps were given to state program employees. Ashley Napier, the Procedures Development Coordinator for the Program Management Section of the Nutrition Services Branch of the Cabinet for Health and Family Services, provided information to settle questions.

Kentucky WIC personnel performed direct recruitment of eligible research subjects. Identification of individuals eligible for study participation was achieved by reviewing administrative records that indicate when nonparticipation occurs. Eligible individuals were then recruited by one of two methods. First, if the eligible individual had an appointment, WIC personnel offered them the chance to participate (in-person recruitment). Second, if the eligible individual was not currently enrolled, telephone recruitment calls by WIC personnel were made using the last recorded telephone number. WIC personnel made reminder calls one week and one day before each scheduled focus group took place.

**Focus Group Discussions.** Four focus groups were scheduled and completed. With active recruitment from local health departments, focus group sizes included one, ten, four and five mothers. In three focus groups, infants, children and one male partner attended focus groups in addition to the focus group participants. To honor and show appreciation to the participant who was the only person to show up for the first focus group, I administered the focus group question guide as if it were a semi-structured interview to give the participant an opportunity to provide her wisdom.

Childcare services were not offered during focus groups. During the focus group discussion that included ten participants, a number of children and infants as well as one male partner attended; the male partner became an impromptu babysitter while the mothers shared
discussions about their experiences in WIC. During discussions, one young child grabbed the audio recorded and pulled it apart. I was able to capture the missing information from a second audio file.

In addition, state program officers were interested in understanding the impact that scheduling approaches had on the nonparticipation outcome. At their recommendation, two of the four focus groups were performed at health departments that use “same day scheduling” (SDS), where a client can only schedule and attend an appointment on the same day, and two were performed at clinics using the conventional scheduling approach in which individuals can schedule an appointment more than a day in advance.

Participants in the focus group included 20 women between the age of 19 and 51 years with a median age of 27 years. Most participants self-identified as white while two participants self-identifying as mixed race or African American. One white participant indicated a Hispanic ethnicity. All participants reported receiving education about healthy eating from the program and all participants reported using the WIC food benefit when enrolled.

Focus groups lasted approximately one hour. Before arrival, the room was cleared so that chairs could be put in a circle with the audio recorder situated in the center. I moderated the focus group discussions. Additionally, an assistant captured insights such as services, barriers and solutions on flip chart paper mounted on walls in sight of the focus group participants. Light refreshments including fruits, vegetables, water and iced tea were provided.

I moderated the discussion while the assistant (Ashley Napier), provided by the Kentucky WIC program, took additional notes. In addition to note taking, any questions that I could not readily answer about the state WIC program Ashley provided useful explanations.
As participants entered the focus group setting, they were given a packet of documents including the participant consent form to be signed, a copy of the participant consent form to keep for themselves, and a 10-question intake form. Each participant was given a name tent with an identification code in the corner that linked intake forms to individuals. Participants were given a copy of the informed consent form and asked if they had any questions or concerns. After agreement to participate and signed informed consent was obtained, the participants completed a 10-item intake form that gathered information on demographics and service experiences.

At the end of the focus group the moderator thanked participants and provided Wal-mart gift card incentives in the amount of $20.00 each. Receipt of incentive was recorded with date and signature of each participant.

**Qualitative data preparation.** An audio recording of each interview was transcribed verbatim. Participants’ names were replaced with a unique identification code to assure anonymity while allowing statements to be matched with background experiences captured in intake forms. Photographs (JPEG) of flip chart papers were used as a quality check on the transcriptions as well as subsequent qualitative coding. All transcriptions were given a final review for accuracy while listening to the audio files.

**Qualitative data analysis.** An initial codebook was developed based on the focus group question route. A grounded theory approach (Glaser & Strauss, 2009) was applied to transcriptions to identify emergent themes and corresponding codes. Grounded theory allows individuals interested in analyzing qualitative text information to build a theory systematically through coding text and discussing the relationships among identified codes among coding team staff. Coding and discussion allows an emergent theory about phenomena in focus group
discussions to be developed in order to achieve work goals. All transcripts, audio files, and JPEG files were managed in N*Vivo 9 software (QSR International Pty Ltd, 2012) on a secured network server.

Another researcher (Tali Schneider) and I coded each transcript using N*Vivo 9 software (QSR International Pty Ltd, 2012). After one transcript was completed, initial average inter-rater reliability was $\kappa = 0.518$ (Brennan & Hays, 1992); after comparing and discussing differences as well as resolving issues with the codebook, final estimates of inter-rater reliability ranged from 0.54 to 0.91. In-person discussions and memo writing were used to resolve differences in application of codes and to refine the final codebook, in line with a constant comparative method (Glaser & Strauss, 2009). Matrices were used to compare statements made across focus group sites and among individuals within focus groups to aid exploration and concept discovery (Miles & Huberman, 1994b).

Data-grounded insights and perspectives regarding nonparticipation in the WIC program are reported in this article. Demonstrative quotes were used when necessary to augment data summary. Demographic information from intake forms is also summarized.

**Human subjects approvals.** The Internal Review Boards of the Cabinet for Family and Health Services of the Commonwealth of Kentucky and the University of South Florida approved the study protocols.

**Results**

The results section begins with an overview of the journey a woman would experience as she enrolled in WIC and used its services, followed by a summary of mothers’ perceptions of program benefits and the barriers that lead to nonparticipation. The section ends with a list of
recommendations focus group discussants offered for improving participants’ experiences using WIC and their recommendations for preventing nonparticipation.

The Journey Map. My observations of the WIC program, combined with general information about the program, is organized by the “touch points” that a participant would interact with the program, starting with their initial enrollment into WIC.

Initial Appointment. The initial, pre-appointment experience includes several touch points, such as certification, scheduling appointments in person and over the telephone, transportation experiences, negotiating childcare, and waiting in the lobby right before their scheduled appointment. Appointment experiences include touch points such as interactions with WIC staff including at the front desk and within appointment rooms where health screenings, nutrition education, and scheduling can occur. Post-appointment touch points such as shopping for groceries, which can be performed at any approved establishment such as grocery stores or farmers markets.

Certification. While not specifically observed during journey mapping, federal rules guide the certification process by which women may enroll in WIC and maintain enrollment throughout their eligibility. Women are certified for WIC as early as pregnancy (United States Congress, 1985). If certified during pregnancy, women remain certified until six weeks after giving birth, at which time they must physically attend the WIC office to be recertified (Kentucky Public Health, 2013b). Women who certify immediately following birth or thereafter are certified up to the six months after giving birth and must subsequently recertify. Women who choose to breastfeed starting immediately following the birth of their infant may retain certification for one year (Kentucky Public Health, 2013a; United States Congress, 1985); should the mother discontinue breastfeeding during the first six months of their infant’s life, they will be
recertified as a “postpartum woman” and retain certification up to the sixth month post-delivery (Kentucky Public Health, 2013a). Women who discontinue breastfeeding their children after six months post-delivery are terminated from the program (Kentucky Public Health, 2013a).

Many clinics are based inside of local health departments and adhere to normal operating hours between 8:00 am to 4:00 PM, yet many local health departments offer extended or alternative hours on certain days of the week (Cabinet for Family and Health Services, 2013). For instance, Adair health district offices in Lake Cumberland County are open from 8:00 AM to 4:30 PM, Monday through Friday, but are open 10:30 AM to 7:00 PM on the first Thursday and fourth Monday of each month (Cabinet for Family and Health Services, 2013). No local health department has weekend hours (Cabinet for Family and Health Services, 2013).

Generally, all appointments to WIC, including certification and follow-up appointments, must be scheduled. Scheduling occurs over the telephone or in-person at WIC clinics, which are normally at local health departments but may sometimes be in hospitals or in contracted health clinics. More specifically, “[a]ppointments are made at the prior clinic visit or over the phone. When a participant misses an appointment, clinics will make every effort to contact the participant which maybe via phone or an appointment reminder card” (Napier, 2014). “The follow-up timeframe is determined by the WIC health professional” and often the support service staff make the appointments (Napier, 2014). Program policy guides staff to schedule appointments for clients in a way that does not require clients to be absent from work and such policy urges that clients should not leave a current appointment without a scheduled follow-up appointment (Napier, 2014).

When journey mapping, I witnessed families scheduling their follow-up appointments after health screenings and nutrition education and further discussions families had with the WIC
nutritionist. Scheduling appointments happened quickly and, when the client could not offer a specific date, the WIC nutritionist offered a date and asked the clients whether or not the date was satisfactory.

After an appointment for either certification or a follow-up appointment was made, clients traveled to local clinics typically situated within a county or district health department (LHD). Families took busses, taxis, or their own vehicles to get to their appointments. The WIC program did not offer subsidies to assist mothers in getting to their WIC appointments (Napier, 2014).

**Waiting for Appointments.** While the program’s target clientele are mothers and their infants and young children, the program offers no childcare during visits. Additionally, play areas, changing tables, and toys are not ubiquitously offered in local health departments. The program also mandates that all enrolled family members in a household share the same date of food issuance each month (Kentucky Public Health, 2013b). Whereas children are required to be present at certification and recertification, scheduled appointments for issuance of food instruments only require a mother or caretaker (Kentucky Public Health, 2013b).

I observed waiting areas in four local health departments. In all locations they were large and filled with many chairs. Two of them also had televisions, and one had a box of toys for younger children. The floors were covered with carpet or linoleum. I did not observe a child play area anywhere.

After arriving at the WIC clinic, clients checked in at the front desk and remained in the lobby area until a WIC staff member called them for their appointment. The waiting time at each clinic varied, depending on caseloads and number of available staff. Some local agencies
administered small quality assurance surveys “for all integrated services provided” (Napier, 2014).

While I observed the WIC clinic in operation, WIC staff seated behind the front desk quickly updated client records, completed administrative tasks, answered telephones and communicated with clients as they checked in, sometimes using a telephone service to communicate with non-English speakers. Clients waited less than 30 minutes for their appointments.

**The Service Experience.** Once families arrive at their appointment, health screenings, nutrition education, and scheduling follow-up appointments occur in sequence. Periodic certifications can also occur during these appointments. WIC health professionals performing health screenings and nutrition education follow standard practices (Kentucky Public Health, 2013d).

The program provides food packages to individuals based on status, including a person’s nutrition risk assessment (Napier, 2014). Food packages consist of specified quantities of designated nutritious foods WIC health professionals have the option to adjust quantities as needed (Napier, 2014). Upon completion of a WIC visit, families are provided a pamphlet listing WIC approved items. Food manufacturers determine the sizes of each unit of food and, when questions arise at the supermarket checkout, a WIC Help Desk telephone number is provided to families to assist during the shopping experience (Napier, 2014). While the program collects information about unused food instruments each month, standardized reporting methods of this information have not been established (Napier, 2014).

The food package was specifically discussed toward the end of each appointment I observed during journey mapping. Women openly discussed with the WIC nutritionist what
foods their children enjoyed. The nutritionist also made suggestions about what to buy when families needed to make substitutions or wanted to try something different. Dates for subsequent appointments were often set according to families’ grocery shopping schedules.

**Redeeming Food Instruments.** Once food instruments are obtained, families attend WIC-approved supermarkets and other vendors to purchase items on their food package. Potential vendors must apply and pass an approval process as well as agree to specific terms of participation before WIC clients can use their food instruments at an approved vendor (Kentucky Public Health, 2013c). Food packages are now administered via electronic benefit transfer (EBT) cards instead of paper vouchers. Families redeem their food instruments for WIC-approved products when they complete their purchases at checkout. Any balance of purchases for foods not approved by the WIC program and not available on an individual’s food package must be paid for in cash or by some other means.

Confusion can emerge when mothers translate the information presented in the food package provided by the program. During my own shopping experience, reading information provided on a paper-based food package list required an understanding of what is allowed to be purchased; brand names and titles are abbreviated and total weights, volumes and counts that may be purchased of each item do not always reflect the weights and volumes of a particular product unit. My process of purchasing foods at the cash register was easy because all items and amounts chosen reflected what was approved on the food package and I had two assistants from the WIC program who accompanied me to the store. However, identifying a juice that conformed to brand and volume requirements was difficult even with assistance from the program. Interactions with store employees were positive but depended on the social situation.
**Perceptions of Program Benefits.** When asked about “what comes to mind when you think of WIC”, most mothers responded positively, describing the program as helpful, “quick and easy.” Most women felt strongly satisfied about the financial benefit WIC provides in the form of access to infant formula. Mothers favor WIC because it helps weather the monthly costs of infant formula.

One mother perceived the program as welcoming and educational. In one particular instance, a WIC mother turned to the program for advice and education because their own mother was suffering an illness. In such cases, WIC fills an educational gap that would otherwise be filled by family members.

Major benefits valued by mothers participating in WIC include access to nutritious foods and personalized advice provided by WIC employees regarding nutrition and health. While sometimes advice based on measurements conflicted with mothers’ perceptions (discussed later), mothers enjoy having access to a routine examination that helps track the progress of their families’ health. In addition to food instruments, health screening and advice on nutrition provide a valued benefit recognized by mothers.

It also was interesting to learn that many focus group discussants had participated in the WIC program since their own birth. These seasoned WIC users made their history with the program known to others and shared their extensive knowledge and experiences with enrollment and discontinuing participation in WIC across several pregnancies and children.

> [...]cause I’ve like, I am a veteran, and so I’ve been here for a decade, and I, you know, you get your little information packet, as far as explaining the rules, but 10 years down the road, even a year down the road, that information is lost, you know?
Women also appreciate the financial help that they receive for purchasing nutritious food. Many noted the high price of foods provided by WIC, such as milk, cereal and produce. Infant formula was the item that most mothers cited as the highest cost burden. They explained that the program was helpful to them when they were “broke” and money was scarce. They also liked that the WIC food packages ensured that their children have good nutrition daily in the face of “junk foods.”

*When I’m broke [laughs], and the kids need cereal and milk, that’s, I count on that…*

*Their every need. It’s not like the junk food that [you] just think you have to have. They actually give you the food that you would use on a daily basis.*

*Even decent money isn’t decent money anymore. It’s harder to, …I mean, growing up with my mother, she had five kids, but ya know still, it’s a lot harder to make ends meet than it did back then.*

*Cuz I got, I got two and a half years of college, I took law and government, I came from Chicago, but that don’t make me no better no less getting WIC, it helps me out financially, but it is very expensive it depends on what store you go to.*

**Perceived Barriers to Participation.** Following a discussion about perceived benefits of the program, mothers were then asked about reasons why they stopped actively participating. The major barriers discussed included: *difficulty scheduling appointments; lack of*
transportation; childcare; long waits; stigma; confusion about program eligibility criteria & procedures; negative interactions with program staff; problems redeeming program benefits.

**Scheduling Appointments.** Mothers named time as a major barrier that shaped not only scheduling WIC appointments, but also attendance at WIC clinics and the experiences they shared while at their WIC appointments. The act of scheduling appointments depended on a number of issues including use of SDS at WIC sites, customer service provided to mothers calling WIC clinics, and family schedules related to work and daily routines. Some mothers also held jobs, which imposed further time restrictions.

> Yeah, I mean there’s been months like if you look at my record there’s been months we’ve gone without it because, I mean either I can’t get off work, I’m not going to tell my work I’m not coming in because I have to, you know, pay the rent, so I have to go work but, and it’s hard to get an appointment, you know so, and I have a daughter that goes to school at 11:30 so it’s like if I make a morning appointment I don’t know that I’m going to be out of here in time to get her to school, and if I make an afternoon appointment I don’t know if I’ll be out of here in time to get her off the bus.

Difficulties scheduling an appointment by phone, or to a lesser extent, in person was frustration for many mothers. They were especially discouraged when attempts to schedule an appointment failed. In some cases mothers reported waiting on the telephone for more than an hour to schedule an appointment, at which point they either hung up the telephone or were disconnected.
I just hung up after, it was close to 2 hours when I hung up. And I’m, like, I guess you’ll go without WIC because I can’t schedule an appointment.

Participants also discussed the customer service they receive in person and over the telephone when scheduling their appointments and arriving at WIC clinics. The process of scheduling confused some mothers and one felt that WIC clinics “overbook…because people don’t show up.”

And when you call here, they always act like they don’t have an appointment for months.

And so it’s like, are they lying and they don’t want to give you the appointment, because they’re so busy?

And then they give you this spiel that they’re booked up for months, and I’m like there’s no way [...] I know people cancel every day, and that’s what I told her. She’s like, well we can get you in in 3 months, when I know someone’s going to cancel before then. Or they’ll tell you, well call in at the end of the day. Well I called when they told me to, and then you can’t get through because they’re closed, so I’m like, really?

Not all mothers encountered difficulty when scheduling appointments during regular clinic hours. This was especially true for those attending clinics using the SDS system.
I actually call at 10 in the morning and make my appointment and they make it over the phone with me, and it’s at 2.

However, even some of the women served at clinics that use conventional scheduling also reported positive experiences.

*Whenever I, I just tell them I need to schedule for this and they bring it up, and they’re really friendly over the phone, and I mean, it’s easy to make the schedule.*

One pregnant mother noted her dislike of SDS because she did not plan to get up early in the morning to make an appointment if she was not going to be successful. Other mothers assumed that once they were dropped from the program due to nonparticipation they were no longer eligible to participate, which is not necessarily true.

In some counties, WIC staff members also visited mothers in the hospital immediately following birth and, while those who were approached in hospitals appreciated this service, many were confused why such enrollment did not happen at subsequent births – inconsistency in this practice was confusing.

**Transportation.** Across all clinic types, transportation was challenging for some women who participated in focus groups, especially those without access to public transportation. Many participants relied on friends and family members to bring them to the WIC clinic. None of the focus group participants mentioned paying for rides provided to them by friends and family. However, one focus group included a discussion about how Medicaid offers travel subsidy and the difficulties related to trying to obtain such subsidies.
It does make it hard though, when you got one vehicle [...] some people don’t have vehicles at all.

We had an accident, and I didn’t have a car, and I had to get to my prenatal appointment. And we had no way of getting’ there, and we called everywhere. And [Medicaid] told me it would take 2 months to get approved to go on the bus.

**Childcare.** Mothers revealed that childcare factored into their decisions to participate in addition to scheduling and transportation. Notably, participants explained how their roles as mothers impacted their ability to participate. Three of the four groups of women brought their children with them to focus group discussions. Attendance at WIC appointments required mothers to bring their children along if other means of childcare are not obtainable, such as babysitters.

‘Cause, well for me, my husband works, and we have one vehicle. And so [...] in order for me to have the vehicle, I have to get them up, get me up, get everybody breakfast by six o’clock in the morning, take him to work and then come back home to just have the car. And if it’s, if it’s that, go recert and sit in the health department for six hours when they woke up like 2 hours early, it’s, it’s dedication for that day [...] 

**Waiting.** Childcare duties are also problematic for women as they wait to be served. Mothers report that parenting responsibilities interfere with optimizing their clinic experiences
due to fatigue and being distracted by their children when they attended WIC clinics. In some cases childcare duties and the waiting room experience directly impacted the decision to actively participate. Participants in one focus group noted the lack of changing tables at her health department.

And like, it’s not such a big area too so they’re like, not able to run around, and you have to chase them around. And that’s why I’ve been dropped, because I can’t, couldn’t get somebody to watch them [...].

Why don’t they have a changing table? This is a WIC office.

Additionally, mothers mentioned hygiene as an issue concerning their children’s presence at the health department. When other participants noted that the health department could offer toys for young children while they wait, others criticized that solution because of hygiene.

Well you know you probably wouldn’t want them playing with the toys [cross talk] germ infested [...].

Hygiene concerns also included mothers’ perceptions of other families who wait alongside them in lobby areas. Participants noted that they see families with children who they suspect are ill waiting in the front of the clinic. Participants wanted to avoid situations that may put their own children at risk of catching infections.
Some people here I found that they’ll just bring their children even if they’re sick, and I don’t know what it is or like, you know, some children here I feel like, yeah, I’m like oh, I feel guilty for them.

Many of the focus group participants expressed their dislike of waiting in health department lobbies. In three of the four group discussions, women complained about long waits to be served. They did not understand why they needed to wait so long for a procedure or service that could be accomplished relatively quickly, such as activating their food instruments on EBT cards. Many mothers reported waiting for anywhere between 45 minutes to several hours.

So it’s like you never know how long you’re going to be here, they won’t tell you, you know, it’s very hard to get in and out of here and know how long you’re going to be here.

**Stigma.** Embarrassment and pride also influenced mothers’ decisions to continue to participate in WIC. Many women reported feeling stigmatized because they had accepted governmental assistance. Women reported two types of stigma – identity stigma and treatment stigma.

Identity stigma was impacted by other people’s stereotypes of public program users.

As a parent you’re trying to do whatever you can whenever you can. And everybody, like I said, likes to take the cons and just go with it, and then that makes people afraid of like, “Aw, I don’t want to be associated with that.”
I think, too, that...there's stigmas attached to WIC and SNAP and...ya know, some people it's hard to get past that, or it's hard to make it okay for yourself to say “I need this and I'm gonna, I'm gonna use it.”

Yeah, I think unless you know somebody that's on it, like, I didn’t know for the longest time until my sister had her son and my mom and dad said, “you need to get on WIC,” and she wouldn’t do it because of embarrassment...

I know a lot of girls who don’t [enroll in WIC]. Like, new mothers who are coming out, I guess. If, for instance, you wouldn’t understand why, maybe they’re too proud to go on the WIC, and like “Nah I don’t need WIC.” No, but you really do.

Treatment stigma results when mothers’ encounter difficulties scheduling appointments and interacting with staff during clinical visits. For example, according to one mother, WIC employees repeatedly asked her what formula she fed her infant when she insisted she breastfed. Treatment stigma was especially problematic when shopping for food where other community members could identify them as program clients and treated them poorly. Embarrassment was especially likely to occur in the grocery store checkout line.

*The vouchers took longer or something for the cashiers, because people behind you would be like [heavy sigh sound].*
Program Eligibility Criteria and Procedures. In addition to stigma, knowledge and understanding of eligibility criteria, especially among pregnant women, affected whether or not families participated in the program. Mothers participating in the focus groups made it clear that financial status among WIC mothers is dynamic, and some mothers stopped participating when they felt they were no longer income-eligible.

*And my husband started working and like I said, I mean, I guess I felt like I didn’t really need it now, and I don’t, I mean, am I rich and have all kinds of money, no believe me we struggle week to week. But it’s not enough to where, I need to take away from others that really truly need it right now. I don’t need to, I can come up, I can go get, I mean, he’s not on formula anymore, I can go get my milk, I can go get my cereal, my bread, my fruit, whatever. When he was on formula, absolutely did I need it then and it helped me. So now, I don’t, so why take from people that truly need to have it right now I mean, you know? I mean, he does get the medical card, my pediatrician accepts it, you know; that I’ve been with for almost 15 years...*

Confusion about specific program procedures also deterred some women from returning to pick up food instruments. For instance, one mother assumed that once she was off the program because of nonparticipation that she was no longer eligible to be on the program, despite her true eligibility status. Another mother was unable to attend her appointment due to severe inclement weather and mistakenly concluded that the clinic would be closed and would call her to
reschedule the appointment. When that did not happen, she waited too long and was automatically termination.

 [...] my assumption is that because I was dropped, I’m not allowed to get back on it.

And I was like, “Well, they’ll call me and let me know if I still have it or if I need to reschedule it or something,” ‘cause, when business closes, of course it pushes everything back. So that’s [...] my thinking and I guess that was my fault, um, but they never called to remind me one, and never called to tell me that, “Hey, you missed your appointment, we’re gonna cancel your benefits if you don’t come in.”

**Interaction with Staff.** WIC mothers reported mixed views on the nutrition education they receive from the program. Most women appreciate the advice they receive from program staff and consider it helpful.

*It's good because, when I had my first child, my mother was going through cancer, so she couldn't be there for me. So, for other women to step in and kinda, not replace her, but to help guide me was helpful.*

*Generally, I just like the help they give [...] during the checkup where they, you don’t have to bring your child every time, but uh, when you come in it’s, it’s pretty much, it’s quick and easy.*
It’s nice that the nurse sits with you and explains everything to you, um, the servings you should provide to them and, you know like that, I like how they go over everything in the, in detail.

A few WIC participants’ complained about the guidance they were given, such as nutritionists’ assessment of their child as overweight.

The only bad thing I ever disliked about it was the whole weight and height chart, because every child is different, I mean, you know some have more muscle and some are, you know, just haven’t hit their growth spurt yet, and that’s just how they are.

Likewise women reported mixed opinions about their interaction with staff. While many women were grateful for staff assistance, others reported being treated "rudely" by program staff. In some instances, this was the result of children’s behavior when they became afraid. Others note being treated differently and their perceptions of why they feel they are being treated that way.

It’s a big, kind of, hassle, and then when my kids come here they associate it with them getting their finger stuck, so it’s like a nightmare to get them back here to see, I mean, my 18 month old throws up every time we walk through the back door...
I mean, you get people, I mean I understand everybody has a tough job, I get that. But sometimes you get people who are stuck in a rut sometimes, and they kind of sound so monotoned, or they're just aggravated, and it comes off kind of rudely.

Depending on your insurance, they treat you differently based on your insurance, and even from that, people won’t do programs like this, knowing that people will treat you different regardless.

Despite some mothers’ complaints about staff, most WIC mothers noticed how difficult it was to work in WIC and appreciate their efforts to serve them.

As I said, I know we all get stressed out in any work we do, as mothers we get stressed out. So I can understand as nurses, they can get just as stressed out.

My observations of staff-client interaction were positive. During the appointments I observed the nutritionist swiftly and kindly moved through the tasks of measuring mothers’ weights and heights, measuring children’s height, weight, length (for infants) and hemoglobin, and families were happy to see how they and their children have grown, discuss issues that arose since previous visits, and meal decisions related to the nutrition education provided. Throughout these experiences the nutritionist darted back and forth between eye contact with clients and the computer screen as she updated the database containing client records. A number of observed clients received printed information and those who did seemed to react positively to documents
given. Families were generally happy as they left their appointment and the WIC nutritionist seemed courteous and busy throughout the entire experience.

**Redemption of Program Benefits.** As I observed during my journey mapping experience, redeeming food instruments requires WIC participants to select the correct brands of foods in the permitted amounts by weight. While women I interviewed enjoyed many of the items they are able to get with WIC, at times these requirements created dissatisfaction with what they would like to serve their children.

Confusion about the food items and specific amounts allowed on WIC also predisposed women to unpleasant shopping-related experiences.

>You have to really track how much you have used, like, ounce-wise. So, your cereals, you get, ya know, so many ounces.

>We hardly ever got juice because it was like high in sugar and I don’t give him that. So, we never got the juice. I mean I coulda watered it down but, I mean, I just, I didn’t like it.

>I don’t understand potatoes. I don’t understand why potatoes are not under fruits and vegetables. They are just normal potatoes. I’ve been eating potatoes all my life...why?"

Some mothers misunderstood why certain items were on the approved food list and others were not (e.g., sweet potatoes are approved whereas potatoes are not). Newer WIC participants were especially likely to be confused when grocery shopping with WIC food instruments for the first time:
I was [...] totally confused, like when I went out for the first time to get, purchase my WIC, that first day, I’m like, ‘oh my gosh,’ I was asking another lady in the aisle to help me with it, ‘cause I had no clue, I mean, I worked as a cashier and have ringed people up with the papers and stuff, but ya know, had never been out and actually had to do it myself. And...it’s crazy.

In all four focus groups, mothers discussed the supermarkets where they prefer to redeem their WIC benefits and their experiences shopping there. Supermarkets that clearly label WIC-approved items on store shelves were preferred. When WIC labeling was not accurate in stores, mothers experienced problems at checkout. They preferred supermarkets where it was possible to check the remaining balance of the EBT card.

I think some stores are better at, um, recognizing the WIC things. Like I think Kroger’s I can really spot the WIC items...

And after my like, that the stores also put like, this is WIC approved and this is not. I absolute, I like that.

...but now there is so much more stuff that you can get now versus what you could get, they haven’t re-labeled all that stuff so you don’t see “WIC approved, WIC approved” kinda just, have to go by what you might of got before.
Recommendations to Prevent Nonparticipation. Mothers in focus groups also offered their ideas on how to prevent nonparticipation and develop strategies to retain women and families at risk of nonparticipation. In response to probing by the moderator, focus group participants defined solutions for the WIC program as well as desired experiences. These descriptions are outlined below.

- Make the clinic lobbies and waiting areas more conducive for children to play. Mothers would like the waiting areas to be cleaner and have ample space so children can play without distracting WIC staff members.

  Like a children’s area where it wouldn’t be so detrimental to parents to have to run around, because they get mad at kids for running out here, which I don’t blame them, ok...

In addition to delineated areas for children to play while families wait in lobby areas of local health departments, mothers with infants want access to changing tables. Focus group participants also mentioned items like coloring books and toys that are appropriate for children as they get older.

  Why don’t they have a changing table? This is a WIC office.

  Um, I’d like to see maybe a little more activities, like maybe coloring books or something, or a little, because I know in the middle they’ve got that little play area, but um,
personally my kid never, I’ve never really seen a lot of kids, like maybe the little, little ones ‘cause they’re everything’s like “oh wow look at this!” you know, but as far as my, the little bit older they get, they’re just bored here, and they’re stomping around, like no please, it’s too loud [...] or something else for the kids other than TV.

Right, so they’ll say stuff [crosstalk, laughing] they’ll tell the kids like, “you can’t run in here,” and I’m like okay, I get that, but then they have not 1 toy, not 1 table, nothing for the kids to do, not cartoons on the TV, I mean they have a little tiny TV.

- Offer childcare services for mothers attending clinics

Mothers suggest offering childcare at clinics as a solution. This was suggested for times when the mother had an appointment and the children did not need to be present in the examination room.

You know, even if, okay...big thing for me was with when having him was my OB appointments. Okay, if you have a mom comin’ in here to get women’s stuff checked out, if there was just one or two ladies that could sit out there in the waiting room and just supervised a little, to dump your kids, you know what I’m sayin’? If there is a personal thing that the mother has to do alone for a second to be able to do that. That would be really nice. That would be really nice.

- Use automated reminder systems to help mothers keep their appointments.
Focus group participants felt that automated reminders would help them remember to attend their appointments.

*Maybe like an automated phone call...[that] would say, I know they have a lot to confirm, but confirmation, even if it’s like a week before, you know...*

- Clearly stipulate what documents are required for participation

Appointment-based suggestions were related to paperwork and food package allotments. One participant emphasized that she would like to know exactly what forms she needed to bring before arriving at the clinic. Another participant was concerned that others’ inability to pay the fee associated with obtaining a birth certificate that they would be dropped from the program.

*I think...everything’s so difficult, like, she has to have a birth certificate, I mean it’s like that, on top they don’t say like, can you afford it? Because birth certificates are $25 a piece, if she can’t afford that by her next appointment, then I guess she’s just out.*

*I have to prove that I guess they’re citizens or who they, I don’t, I don’t know but I need birth certificate or social security card, which I’ll try to get but I just, I’d kind of like to know.*

- Make appointments that honor families’ routines and allow participants to drop off documents at any time without a separate appointment
WIC offers local agencies guidance for operational solutions related to active participation that attempt to relieve burdens placed on families. For instance, policies instruct WIC agencies to coordinate multiple WIC clients in one household to the same scheduled appointment and appointment scheduling should, according to policy, take into account clients’ possible work schedules, transportation and other needs:

*Scheduling should take into consideration applicant/participant/caretaker needs, minimizing time away from work for working individuals, and distances for travel for individuals who reside in rural areas. Accommodations can be made through extended hours, lunch hour appointments, use of proxies, three (3) months issuance, mailing food instruments, etc.* (Kentucky Public Health, 2013b)

The program should continue to be flexible in scheduling practices. One opportunity to minimize the number of scheduled appointments needed is to allow participants to drop off required and requested documents without needing a scheduled appointment.

*I think if you just need to drop documents off you should be able to just drop them off. And like, get maybe a paper confirmation that you dropped them off, instead of waiting...*

- Identify and implement methods to reduce waiting at all points in the clinic

Focus group participants also felt that ideal appointment experiences would entail the program to spread out people’s appointments more during a single day and they feel that the program overbooks appointments because they expect people to not show up. Focus group participants
felt that much of the process at the clinics could be condensed to minimize waiting, especially when it came to waiting for food packages to be loaded onto EBT cards, which they felt should be “quick and easy.”

Really space out the time, a little bit longer. I don’t know if they book every 5 minutes, every 10 minutes or whatever.

[…] I think you should be able to come out and ask the lady who’s loading the benefits if you can load your benefits, and it should be quick and easy, like right as soon as you, not even 10 minutes after you’re done with the nurse. I think you should be able to have your benefits loaded.

One 33-year-old focus group participant focused on reducing the amount of time spent at an appointment. Her suggestions included reducing the number of appointment slots during the day, increasing the number of nurses available, and a questionnaire that mothers can fill out while they are waiting to go into the office with the WIC health professional.

• Offer a special appointment or class for new mothers

Focus group participants reflected on feeling “overwhelmed” when they became mothers and suggested a general appointment for pregnant women would be ideal to get them enrolled. Focus group participants felt the program could explore incentives to participate. They also thought that clients attending local health departments for WIC or non-WIC programs should be in separate waiting lines.
Like, just if you’re like overwhelmed, you know, with the thought of having a child, maybe they could come here and just like, in general like, if they’re having a child, I didn’t know, my first one, what to expect for cost of diapers or anything. Maybe like a general appointment for, you know, somebody that’s pregnant where they can get information and then when they’re here maybe they can see if they qualify.

But, that is one thing, if you could, if, if, if it was just being an appointment, if they did the appointments separate than people who are here for shots, just getting recerted, if your appointment line was just in one line, and rotate that a little quicker, that might keep ‘em.

• Use messages that better display the benefits of the program

Mothers recommended that WIC specifically feature the benefits the program offers, especially the financial assistance and the health assessments such as blood iron and hemoglobin tests, offered to children.

Ya know when they’re teething and shaking, they tend to drink more bottles [...] that’s a comfort thing for ‘em. And, ya know, it shouldn’t be like “oh here’s your seven cans and that’s it,” ya know, a lot of people don’t have...[t]here has been times when I haven’t had that 16 dollars to go buy a can of formula. Ya know, it happens. I think we’ve all had hard times.
• Offer transportation services if possible, otherwise identify dependable transportation opportunities

Focus group participants would like the program to offer transportation services. Some have utilized transportation services provided to them by Medicaid for their primary care appointments. One 30-year-old mother had an “aggravating” and “discouraging” experience using Medicaid transportation services and a 51-year old mother noted that Medicaid charges “a fee for a certain income” to use those services. Referring back to these comments, focus group participants describe the kind of transportation services they would like to see for WIC. Notably, focus group participants envision a “big blue and white bus” with a “big logo.”

*It’s almost like a church bus, you know, kind of lite, it sits at the, it’d be sitting here at the office, and uh, having sign up sheets, look, “Hey you having trouble getting here? We will come and pick you up.”*

• Continue labeling WIC-approved items and monitor labeling accuracy in grocery stores

Focus group mothers felt that in an ideal setting they would be able to check their food package balance on their own. Participants mentioned the paper-based “little WIC approved food list” and suggested that they have someone in the store show you what foods are WIC approved. The ideal experience for shopping was described by one participant as “quick shopping.”

*It’d be nice if we could kind of just scan it ourselves, or, like, you know like an 800 number, plug in your social or something. That would be helpful, because I think I’ve lost*
[that paper] before because, you know mine expires today, today and I don’t even know what’s on there right now. But that would be like, I think that would be really helpful.

Well, like I was sayin’ about we’ve said to about the confusion when you go to the store, like especially when I first went. I mean, the little WIC approved food list, that’s great and all, but I don’t know if they, maybe, you know, maybe they go ‘up a level’ or somethin’ and show you more. I mean, I’m not sure they would have enough workers or something, to go and be able to show you that kind of think [...]

 [...] that’s the ideal experience, with WIC, is actually going and actually grabbing without having to stand there and think about it. The, I love quick shopping [...] 

- Create a peer counselor system to pair newer participants with those who have been actively participating for longer

Focus group participants also felt that a peer counselor to encourage participation would be ideal; one mother noted learning from other mothers on the program.

Well I think they, that WIC has peer counselors, and so people know that that’s out there if they, if they can encourage those who will use those resources, I think that would be good. So people know that it’s at least there and that you are not on your own.

Yes! The other mothers, and you’re getting information from them and go, “Oh! I never knew that.” It’s just education all the way around.
• Continue using EBT system

Focus group participants were “glad” that the program abandoned the use of paper vouchers and now uses EBT cards for administering food packages. The EBT card was seen as more “discreet” than paper vouchers when purchasing foods.

*I’m glad that the vouchers are gone.*

*I’m glad that the vouchers are gone.*

*It’s more discrete, I mean you don’t have to feel like you’re, you know, [broke].*

• Develop and use internet-based tools and resources when possible

One mother in particular urged the program to “take advantage of the internet.” The suggestion of Internet use primarily referred to checking the remaining balance of their EBT cards “online.” They also suggested using the Internet to submit paperwork that is required by the program.

• Develop a separate, stand-alone kiosk for families to check the balance of their monthly food package

Other focus group participants suggested a stand-alone, in-store kiosk to check remaining balances on EBT cards. Notably, focus group participants saw the Internet as another channel through which stigma about using public assistance emerges.
I do wish there were a number or online or a way to scan to see like, what are, what we have as opposed to like, I’ll go into Kroger’s and go to like customer service and ask them for a balance receipt.

Or if you know at the end of the night, the next day your card will be reloaded, I just think if they took more advantage of the Internet […].

That or like, do a lot of stuff online. I mean, information that, that you’re going to need or that you can maybe submit to them online, or mail in ahead of time, you know.

Even social media too, like Facebook, like, things about, like “you’re a horrible person,” blah, blah, blah, “livin’ off the government.”

- Use a variety of communication channels to promote use of the program.

Focus group participants offered suggestions about how to reach them through communication. Messages about the program including eligibility requirements should be communicated to them via commercials on television, online, or in healthcare settings where pregnant women are likely to attend. Some focus group participants mentioned they had “smart phones,” and one mother emphasized that emails and text messages are convenient for her; this focus group participant reported how often she checked her email.
But like, email’s awesome because you can save it and always go back to it. It’s a, that would be perfect for those who have email because you wouldn’t have to, you know, “could you re-mail that to me?”

I think that if it was advertised at all the offices where you go for being pregnant, people would know that WIC exists, and that they’re, they could be eligible for it. I think that’d be the first step in getting everybody to know that it’s around, and that they can apply.

What’s ever convenient, my convenience is text messaging and email [...] I check it once, twice today. So, there’s occasions that I’m like, I haven’t checked it in a week because I have sick children or whatever, but I do check it periodically during the day to make sure that I haven’t missed anything.

• Use broad promotion of the program, utilize similar promotion methods from other health department-based programs, and hire spokespeople to whom mothers will respond

Focus group participants also provided suggestions for promoting the WIC program. They suggested creating communications in a manner that is similar to “the whooping cough message” and having commercials about the program on television. They suggest placing information about the program in mailers that are sent to many people. They also noted “having successful” people who were previously on the program be part of these promotional strategies.

I mean, the same concept as they do the whooping cough message.
Or even advertise in, maybe the Reach catalogues that everybody gets, with the coupons. That would be good.

I think there should be a new way of advertising, a new way to approach WIC, because women who are pregnant or women who have children don’t necessarily understand what it is. So therefore they don’t sign up for it a lot of times.

Maybe have people who are successful, who were on the program... People who were on it... who were single mothers who work and provide for their kids, but still get that help and have them showing it’s not just low-lives, redneck people, families...

• Communicate promotional messages that directly address to fear, pride, confusion and stigma related to participation

Solutions suggested by focus group participants also were aimed at overcoming intangible barriers. Intangible barriers related to “fear,” “pride,” “confusion,” and “stigma.” While describing solutions, one mother noted an opportunity to engage potential WIC enrollees with the prospect of other assistance for which they may also qualify.

I mean you can have help, but it’s not like, it’s not the stigma that you have to be like, homeless and not having anything you want.

I say if they do somethin’ they get the WIC, ya know if they do have the fear of going, that could lead them to take advantage of other benefits they need, so it could help them in the
long run. Well, you know, if they approve to WIC maybe they can go and get some other kind of assistance that maybe help them with whatever they are possibly struggling with.

You might not even need it for long, but, just to get you over that hump.

Discussion

The first objective of this study was to describe program-related experiences of women enrolled in Kentucky WIC who have been dropped from the program because of prolonged inactivity. Mothers revealed their enjoyment of the benefits and services provided to them through WIC. Mothers acknowledged the value of the provided food instruments, especially with foods for children and infants such as infant formula, milk, and cereal. Although the method for scheduling appointments may vary across clinic sites throughout the state, mothers described positive and negative experiences in clinics using both systems.

Program services also were valued. Most focus group participants appreciate advice, health information and health assessments provided through their WIC appointment. However, a few focus group participants were confused about some program procedures.

Shopping for WIC-approved items was met with mixed feelings depending on the situations focus group participants encountered at supermarkets. While the EBT system reduces visibility of using WIC and resulting self-identify stigma, many women had difficulty selecting the correct food items. As a result, they encountered embarrassing moments when attempting to pay for selected foods with their EBT cards -- stigma while shopping is still experienced. Confusion about the amount of food package left on individuals’ EBT cards, as well as identifying WIC-approved foods in stores, led to negative experiences the frustrated mothers while grocery shopping.
The second objective of this study was to identify reasons why enrolled mothers in Kentucky WIC become inactive. There are five main reasons why mothers in Kentucky WIC become inactive including childcare, waiting, transportation, confusion, and stigma. While childcare, waiting and transportation were the most frequently cited barriers, all five provide insight into why mothers become nonparticipants in the Kentucky WIC program.

First, childcare is a primary duty that impinges on the ease with which mothers can attend WIC appointments. In other words, women’s roles as mothers and as WIC recipients conflict. Focus group participants also explained their need to pay attention to their children while trying to engage with clinic staff members and being mindful of other families at the clinic.

Secondly, long wait times at the WIC clinic create an unpleasant experience that forces mothers to make decisions about their daily routines and work schedules. Mothers noted times they wait in clinics before entering their appointment and times they wait for their food packages to be administered on their EBT card. Some mothers spoke of waiting for long periods of time (45 minutes and more) during their time at clinics.

Third, transportation is not assured in any capacity. Owning a car helps but when that car is shared with other adult household members, mothers lose the seeming dependability a car may provide. The quality and practicality of using public transportation differed across sites, according to WIC mothers.

Fourth, there is confusion about how and when absence from appointments is connected with automatic termination from WIC. Some mothers assumed they were no longer eligible once they were dropped from the program. Mothers also noted barriers to rescheduling appointments that prevented them from coming in for food instrument distribution.
Other factors impacting the decision to participate relate to stigma. Focus group participants described their expectation of how others view WIC enrollees and these mothers suspect this expectation impacts other eligible women’s pride and ultimate decision to participate in WIC. Treatment by WIC staff when scheduling an appointment and receiving services or by supermarket employees shape mothers’ perceptions of their program activity.

Persistent factors related to WIC participation described in previous literature emerged from mothers’ experiences in the Kentucky WIC program. These factors include confusion about eligibility and treatment and self-identity stigmas. Childcare duties were also important in participation decisions in Kentucky. Contextual characteristics and individual experiences such as waiting too long in clinics echo what was found in a sample of WIC mothers in New York City.

**Strengths and Limitations.** While a variety of qualitative data collection techniques can be used to elicit WIC participants’ opinions, journey mapping and focus groups were chosen for several reasons.

Journey mapping allowed the researcher to understand the process of participating in WIC. Health services research leverages journey mapping to understand procedural shortfalls to the targeted patient experience in order to tailor an ideal clinic operation. This method produced data that aided in the interpretation of focus group results.

Focus groups were selected because of previous success achieved with this technique by the Kentucky WIC program and others. Focus groups have been shown in other studies of WIC to be valuable in identifying organizational needs, understand the determinants of consumer satisfaction, and generate insights that can inform outreach strategies (C. A. Bryant et al., 2001; Krueger & Casey, 2009). Paired with previous quantitative analyses, this qualitative analysis, as
part of a broader mixed methods initiative, provides a triangulation (Miles & Huberman, 1994a) of the condition of nonparticipation vis-à-vis termination from WIC. The use of local WIC insights will guide the development of valid local outreach approaches that are relevant with respect to these perspectives.

Although focus groups have many advantages, their use in applied project like this one have certain drawbacks. Criticisms of focus groups include the intellectualization of real experiences, possible false representation by study participants, and potential lack of reliable and dependable results (Krueger & Casey, 2009).

The study sample also was limited in important ways that make it unwise to generalizable to local programs across the country. More specifically, the sample size and composition make it impossible to compare ethnic differences in women’s program experiences or generalize findings to other groups. All women spoke English but experiences of enrolled mothers who do not speak English may differ substantially than what was found in this study.

The current study was constrained to only four focus groups. While site selection and participant recruitment was designed to elicit a diversity of experiences in rural and urban communities, multiple focus groups in each site as well other parts of the state are needed before generalizing findings statewide. Ideally, results would then be used to design a participant satisfaction survey that is performed on a regular basis in all local clinics.

My journey mapping experience may have been influenced by the WIC program staff members’ selection of observation sites and assistance in access to an EBT card, transportation to and from the supermarket and the WIC clinic, as well as assistance throughout these experiences. I am also a White male who speaks English fluently. Taken together, while I
learned a great deal about the process of the WIC program, in reality, WIC mothers have separate experiences that should be included in future journey mapping.

Study results also may be biased by recruitment techniques employed. For instance, the WIC clinic where observations were taken had a positive reputation in the state program and may have been an outlier with respect to customer service, efficiency and other attributes that may vary across clinic sites. This selection bias combined with response bias makes it likely that some WIC participants’ views have not been captured.

While local WIC coordinators reached out to all eligible nonparticipant mothers in their districts, it is quite possible that women who participated had strong social ties with their local WIC employees, thus biasing the sample toward women who are well known by local WIC staff. Also, three of the four focus group discussions took place in the early afternoon; this prevented some mothers from participating because their children were coming home from school around the same time.

The study was conducted in four different locations that were spread out across the state. Two were in more urbanized areas while two were in more rural areas. While urban and rural settings had equal representation by number of focus groups performed, the landscape of ideas from mothers for urban and rural areas is most likely underreported.

All but one focus group had children in the room while discussions took place. One of these focus groups with children also had a mother’s male partner in the room. The presence of children and men provides further limitations. While mothers participated in the focus groups, often they had to switch their attentions to their children, which resulted in interruptions and incomplete statements that made transcription difficult. The presence of the male partner provided both a benefit and a limitation. As a benefit, he was able to take charge babysitting his
infant while the mother participated in focus group discussions. However, the presence of a man in the room might have influenced what other women, including his partner, had said during discussions and how comfortable focus groups participants felt sharing their experiences.

Likewise, Ashley Napier was present during the focus group discussions in an assistant capacity, while her actual job duties are at the state WIC offices. Her role in the WIC program was made aware to all focus group participants. This knowledge may have also biased what focus group participants chose to discuss.

Children who attended the focus group discussions were welcomed because childcare was not provided by me nor were childcare services offered by the Kentucky WIC program. However, children who attended were often loud and active, which was caught by the audio recorder and thus led to difficulties in transcription. To overcome this barrier, the moderator performed the transcriptions soon after discussions ended so as to fill in unintelligible stretches of audio with what the moderator remembered and had written down as notes.

The demographics of the small focus group participant sample are also skewed. The age range was wide (19 to 51) while the mean was 27, meaning that focus group participants were younger. The sample does not include adults who serve as proxies or other caretakers such as grandparents or foster parents. Results reflect more of the young, White, non-Hispanic WIC client base more than other groups. However, the small sample size also imposes a further limitation on generalizing even to the dominant age and racial categories represented.

**Implications for Outreach.** Information gathering methods about client experiences at local agencies will enhance the design of outreach strategies to prevent nonparticipation. State WIC officials report that precedent already exists for local agencies to gather information about client experiences related to participation, as well as barriers to participation that may arise.
Some clinics administer small quality assurance and satisfaction surveys to gauge certain aspect of participants’ experiences with the clinic, nutrition related knowledge and behavior, and services used.

For instance, Cumberland Valley District administered a satisfaction survey in 2011 (Goff, 2014). This survey found that out of 392 participants, more than 50% of respondents’ appointments took an hour or less, that 67% of respondents rated services received as “Excellent,” and that 35% of respondents had either been told “Often” or “Occasionally” by a store clerk that they picked a food that they could not get with their food instruments (Goff, 2014). Small agency surveys such as these provide opportunities for identification of local problems related to participation.

WIC officials concerned with outreach should continue using consumer oriented research methods such as journey mapping and focus groups for two reasons. First, qualitative insight allows program staff that closely operates the program’s front-end and state-level officials deeply involved in the procedural operations and regulations across state sites to understand issues with implementation. Secondly, having a listening presence among the client community enhances credibility and status within WIC families, which might impact stigma associated with program use. Results from journey mapping and focus group discussions indicated particular barriers to active participation that WIC mothers experience and identify the aspects of the program mothers prefer.

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Chapter 5

This dissertation used a mixed methods approach to understand the characteristics of WIC participants who are most and least likely to stop using program services while they are still eligible because of failure to attend food distribution appointments. This work also explores WIC mothers’ reasons for nonparticipation. Results from these three investigations confirm factors uncovered in previous studies, such as embarrassment about receiving government assistance, problems signing up, and confusion about eligibility (Bryant et al., 1996; Bryant et al., 2001; Huynh, 2013).

Findings related to each of the study aims are summarized below and compared. Following the summary of findings are comparisons of current findings to previous literature. A brief summary of limitations and short reflection about the scope of work conclude the chapter.

Summary of Findings

Audience segmentation was used to identify unique groups of WIC mothers most and least likely to be terminated due to nonparticipation. Continuously collected management information system (MIS) data throughout the statewide program were used to estimate segments at highest and least risk of early termination due to nonparticipation. The limited data file pulled from the MIS (“Kentucky WIC data”) included individual characteristics and information on program experiences, including dates of attendance to clinics, issuance of benefits, and terminations as well as information about the clinic sites where each individual was served.

CHAID analysis indicated that presumptive eligibility for Medicaid is the best predictor of whether mothers are actively participating in the WIC program in Kentucky. The greatest
proportion of nonparticipation occurred among mothers who were presumptively eligible for Medicaid. Mothers were at even greater risk of nonparticipation if they also were the only WIC-enrolled household member and had mean incomes at or below $4,152. In contrast, the lowest proportion of nonparticipation was found in mothers who were not presumptively eligible for Medicaid and whose information on household WIC enrollment and income were missing.

Survival analysis identified the characteristics related to participation outcomes while accounting for the individual time between enrollment and nonparticipation in the Kentucky WIC program. The Behavioral Model of Medical Care Use guided the selection of characteristics available in the Kentucky WIC data. Covariates examined encompassed predisposing and enabling characteristics at the individual and contextual levels. While Verification of Certification and Same-day Scheduling are indications of clinic characteristics, other important characteristics related to the clinic context were not available at the time of analysis.

Kaplan-Meier graphs showed that risks of nonparticipation by race, primary language, documented home contact information, KTAP enrollment, and mean income were not proportional over time. Other characteristics including migrant status, ethnicity, presumptive eligibility for Medicaid, English proficiency, homelessness, age, VOC and the scheduling method used by a particular clinic estimated the magnitude change in an instantaneous risk for an individual WIC recipient in Kentucky. To account for violations to the proportional hazards assumption, an extended Cox model stratified by contextual characteristics included a time-varying covariate (the time before and after attendance at a SDS clinic), which was then used in interaction terms with covariates that had violated the proportional hazards assumption.

The adjusted model, stratified by VOC and status, indicates that age, ethnicity, marital status, household WIC enrollment, homelessness, limited English proficiency, presumptive
eligibility for Medicaid, whether or not home contact information is available, and timing of first attendance at a SDS clinic all have a statistically significant impact on the time to nonparticipation. The omnibus test comparing this model to a model reduced of all covariates was statistically significant ($\chi^2 = 1370.490, df = 25; p < 0.001$). Results also showed that mothers who attended SDS clinics became inactive slightly earlier than mothers who do not attend SDS clinics. After stratifying the fully adjusted model by VOC and status category and considering the time to a first SDS clinic attendance as a time-varying covariate, the hazard of nonparticipation before an experience using SDS to schedule an appointment is less than the hazard of nonparticipation afterward.

Married mothers were less likely to be terminated for nonparticipation than single mothers, yet divorced mothers were at greater risk of nonparticipation than single mothers. The risk of nonparticipation among Hispanic mothers was less than the risk for non-Hispanic mothers and those with limited English proficiency were less likely than those without limited English proficiency to reach nonparticipation. Lacking home contact information in the MIS resulted in much higher risk of communication compared to mothers whose home contact information was present. Risk of nonparticipation decreased slightly with age. Presumptive eligibility for Medicaid increased the risk of nonparticipation while household enrollment in WIC reduces the risk of nonparticipation.

Survival analysis confirmed the importance of presumptive eligibility and household WIC enrollment on participation status. However, it went a step further than audience segmentation to estimate the magnitude and direction of effect each of available predisposing and enabling characteristics.
Taken together, audience segmentation and survival analysis depict those mothers at greatest risk of automatic termination due to nonparticipation as presumptively eligible for Medicaid, solely enrolled, and earning the least across the spectrum of incomes that qualify for WIC enrollment. The Kentucky WIC enrollee who is at greatest risk of nonparticipation is presumptively eligible for Medicaid, is a non-Hispanic Anglo who speaks English, is the only person in her household enrolled in WIC and earns very little income.

Journey mapping of the clinic waiting room, front desk, examination room, and shopping experiences and four focus groups were conducted to explore the experiences of nonparticipants and mothers enrolled in WIC. Observations of clinic experiences occurred at the Public Health North clinic in Lexington, Kentucky. The researcher was given a temporary EBT card with one food package to map the shopping experience at a local grocery store in Frankfort, Kentucky. All purchased food was donated to a local women’s shelter in Frankfort, Kentucky.

Journey mapping oriented the researcher to a number of important touch points WIC clients encounter. Within the clinic, important touch points included how arriving clients were greeted and treated by front-end staff as well as during their appointment with WIC nutritionists. At the clinic where interactions were observed, clients encountered a large waiting area with chairs and a television as well as friendly front desk staff members with accommodations for those who do not speak English. Observations during appointments emphasized that while the observed clinic and nutritionist may be highly performing, the landscape of clinics across the Commonwealth of Kentucky may not be similar. Barriers encountered during shopping for WIC approved foods at a local grocery store revealed the complexities of determining how much and what brand of food can be purchased and the social complexities attached to purchasing foods at the supermarket checkout counter using WIC food instruments.
Focus group results emphasized that mothers enjoy the benefits and services provided to them through WIC. Mothers often acknowledged the nutritional and financial value of the foods they can purchase on WIC, especially infant formula, milk, and cereal for their children. Although the method for scheduling appointments may vary across clinic sites throughout the state, mothers described positive and negative experiences for both types of scheduling systems. Program services also were valued -- most focus group participants appreciate advice, health information and health assessments provided through their WIC appointment. At times focus group participants felt confused with nutrition education and given advice.

Shopping for WIC-approved items was met with mixed feelings depending on situations encountered at supermarkets. While the EBT system reduces the visibility of using WIC, many women had difficulty selecting the correct food items. As a result, they reported embarrassing moments when checking out of the store. Confusion about the amount of food package left on individuals’ EBT cards, as well as identifying WIC-approved foods in stores, led to negative experiences that frustrated mothers while shopping.

Primarily, mothers in Kentucky WIC encounter the following barriers: childcare, waiting, transportation, confusion, and stigma. While childcare, waiting and transportation were most frequently cited in focus groups, all five provide insight into why mothers become nonparticipants in the Kentucky WIC program.

First, childcare is a primary duty that impinges on the ease with which mothers can attend WIC appointments. Simply stated, women’s roles as mothers and as WIC recipients conflict. Focus group participants also explained their need to pay attention to their children while trying to engage with clinic staff members and being mindful of other families at the clinic.
Secondly, long wait times at the WIC clinic create an unpleasant experience that forces mothers to make decisions about their daily routines and work schedules. Mothers noted times they wait in clinics before entering their appointment and times they wait for their food packages to be administered on their EBT card. Some mothers spoke of waiting for long periods of time (45 minutes and more) during their time at clinics.

Third, transportation is not assured in any capacity. Owning a car helps but when that car is shared with other adult household members, mothers lose the seeming dependability a car may provide. The quality and practicality of using public transportation differed across sites, according to WIC mothers.

Fourth, there is confusion about how and when absence from appointments is connected with automatic termination from WIC. Some mothers assumed they were no longer eligible once they were dropped from the program. Mothers also noted barriers to rescheduling appointments that prevented them from coming in for food instrument distribution.

Other factors impacting the decision to participate relate to stigma. Focus group participants described their expectation of how others view WIC enrollees and these mothers suspect this expectation impacts other eligible women’s pride and ultimate decision to participate in WIC. Treatment by WIC staff when scheduling an appointment and receiving services or by supermarket employees shape mothers’ perceptions of their program activity.

Focus group results reinforced findings from quantitative analyses by underscoring that mothers are sensitive to economic pressures and appreciate WIC’s help when times are tough economically. Income emerged as an important factor is all three study arms; however, they paint differing views of the impact income has on participation. Focus group participants valued WIC’s financial assistance in purchasing nutritious foods and some mistakenly thought they
were no longer qualified for the program when their incomes rose. These reports would suggest that higher income increases the risk of nonparticipation. Yet mothers with lower income were at higher risk of nonparticipation in the CHAID results, and survival analysis found no statistically significant effects across average income categories.

Both qualitative and quantitative findings point to the impact scheduling practices have on program participation. While focus group participants reported positive as well as negative experiences scheduling appointments at clinics using SDS and traditional procedures, survival analysis identified an increased risk when using SDS. The differences may reflect the fact that use of SDS scheduling is time-dependent. Audience segmentation looks at characteristics in a cross-sectional manner and included only the dichotomy of whether or not mothers had ever been to a SDS clinic; survival analysis was able to parse out risk of nonparticipation before and after experiences at a SDS clinic across all mothers. Survival analysis results and variations in experiences with SDS clinics expressed during focus group discussions seem reasonable when considered in the context participation experiences that change over time.

**Links to the broader literature**

This study contributes to our understanding of the factors that impact families’ use of WIC and other MCH Programs. In this section, I compare study findings with the research on government assistance program participation and the literature. The following section links these findings to Andersen’s Behavioral Model.

Given the importance of presumptive eligibility as a correlate to nonparticipation, this section begins with a definition of Medicaid presumptive eligibility and the opportunity it presents for recruitment into WIC. In the Commonwealth of Kentucky, women who test positive for pregnancy and not currently enrolled in health insurance are given Medicaid coverage for
prenatal care for sixty days while their application for Medicaid is processed and their eligibility determined (Department for Medicaid Services, 2014). Called “presumptive eligibility,” this variable was a significant correlate of nonparticipation in WIC, suggesting that participation rates could be increased if outreach strategies are targeted to this segment of the population.

While few if any previous studies have examined the impact of presumptive eligibility on WIC participation status, other studies have found significant relationships between participation in WIC and prenatal care. For example, a study of low-income women in San Antonio, Texas found that women enrolled in WIC are about 50% less likely to delay the use of prenatal care until after their first trimester (Sunil, Spears, Hook, Castillo, & Torres, 2010). Presumptive eligibility does not guarantee Medicaid enrollment, yet denial of Medicaid coverage may represent a barrier to continued WIC participation even though women above the Medicaid income requirement may still be eligible for WIC. As Bryant and her team found in Texas, many women do not realize they are still might be eligible for WIC when denied other government programs (Bryant et al., 2001).

However, while income level is related to program participation in this and other studies, results are mixed. Studies have found that government assistance programs aids those in most financial need. Participation in TANF and SNAP are higher among families with the greatest financial need (Pati, Mohamad, Kavanagh, & Shea, 2010). Tiehen and Jacknowitz found that eligible women who choose to participate in WIC were more likely to have incomes at or below the Federal Poverty Line compared to eligible mothers who chose not to enroll in WIC (2008). Women participating in TANF, SNAP and Medicaid after giving birth are also more likely to enroll in WIC (Tiehen & Jacknowitz, 2008).
Yet, in a study of women eligible for WIC during the 1990s, Bittler, Currie, and Scholz (2002) found that participation was negatively associated with income. Those who missed their TANF appointments earned the lowest incomes (Cancian, Noyes, & Ybarra, 2012). In the current study, those with the lowest income were more likely to be automatically terminated due to nonparticipation. Mixed results may reflect income’s differential impact on participation at various time points. Income is negatively correlated with enrollment but positively correlated with nonparticipation.

Mothers in Kentucky cited several barriers to participation in focus groups. In particular, childcare, long waits in clinics, transportation, confusion about program eligibility, scheduling conflicts and stigma are the major barriers preventing them from attending their food distribution appointments. These findings are similar to other studies of WIC participation. Major barriers to enrollment in the Texas WIC program included confusion about eligibility, not being referred to WIC through Medicaid when nutritional risk was present, problems during the enrollment process, and particularly negative perceptions about participating in the program and reluctance to accept government assistance (Bryant et al., 2001).

Kentucky mothers who are solely enrolled in WIC among their household members are at greater risk of nonparticipation. Likewise, in New York City “leavers” (those mothers who had left the program voluntarily or because they failed to pick up their food vouchers) were more likely to be pregnant and receiving WIC for themselves in New York City (Rosenberg, Alperen, & Chiasson, 2003). Rosenberg, Alperen and Chiasson also found that job conflicts substantially increased the odds of failure to pick up food vouchers (Rosenberg, Alperen, & Chiasson, 2003). While waiting was cited more among enrolled WIC clients, leavers cited transportation, illness,
job conflicts, and perceptions about eligibility as major barriers to their participation (Rosenberg, Alperen, & Chiasson, 2003), which was true for Kentucky WIC mothers.

Key informant interviews in Minnesota (Huynh, 2013) also identified many of the same participation barriers identified in Texas, North Carolina, and New York City. However, few former participants in Minnesota reported problems with transportation, work schedules or childcare (Huynh, 2013). This may be due to the fact that Huynh focused on initial enrollment rather than termination for nonparticipation (Huynh, 2013).

Stigma also emerged as an important deterrent to program participation in this and other studies. In focus groups conducted in Kentucky, women who had been terminated from the program reported that “embarrassment” and “pride” were reasons for not using WIC. These forms of stigma have been shown to influence participation in a variety of government assistance programs (Stuber & Schlesinger, 2006). Among many important findings, Stuber and Schlesinger identified that longer waiting times made welfare program participants experience treatment stigma more strongly (2006).

Consistent with previous research on stigma among means-tested program users, Kentucky WIC mothers described embarrassment and pride as reasons for dropping off of WIC. In North Carolina, the vast majority (81%) of 1,500 inactive WIC participants were automatically terminated due to nonparticipation for reasons including long waiting times, experience disrespectful treatment in grocery stores, lack of access to WIC-approved foods because grocery stores had run out of those items, and embarrassment about using WIC (Bryant et al., 1996). On the other hand, inactive North Carolina WIC participants were more likely to compliment the program if they perceived that the clinic staff made attempts to help them (Bryant et al., 1996).
Finally, the characteristics of families most and least likely to use WIC in Kentucky also align with studies in other states. Bryant and colleagues identified unmarried English-speaking Anglo Americans not receiving food stamps as the segment of Texas WIC-eligible mothers with the highest proportion who were not enrolled (2001). In Kentucky, non-Hispanic White mothers who are presumptively eligible for Medicaid and earning little to no income were most likely to be terminated prematurely. Enrollment in and early dropout from WIC are different ends of a program participant journey, but in both studies Anglo Americans were more likely than minorities to drop off the WIC program.

**Links to the Behavioral Model**

In keeping with Andersen’s Behavioral Model, presumptive eligibility for Medicaid, income, and experiences at SDS clinics were important individual-level enabling characteristics identified in the CHAID and survival analyses. Mothers who are solely enrolled in WIC and earning little income are at the highest risk of nonparticipation. Household WIC enrollment predisposes women to nonparticipation as well as earning little income. The interplay of predisposing and enabling characteristics within identified segments calls attention to interaction effects among these variables on nonparticipation. Statistical analysis that parses out the causal and correlational pathways between predisposing and enabling characteristics and nonparticipation should be explored.

The finding that solely-enrolled moms are at greater risk suggests a number of possibilities. While there are a multitude of family types, it seems that familial support and co-participation with other members in the household have an enabling effect on participation. Also, single and divorced mothers are more likely than other mothers to drop from the program due to
nonparticipation. Social, monetary and other types of resources that are accessed through specific family situations play an important enabling role in WIC participation.

Unfortunately, this study was unable to examine interactions between individual and contextual factors specified in the Behavioral Model. Whereas individual level characteristics are nested within contexts in the model, individual WIC mothers are nested within a variety of contexts: their homes, their communities, and their WIC clinics. While each context can be analyzed individually and interpreted through the lens of the framework, it was not possible to examine individuals and contexts over time without repeated measurements nested within an individual, and individuals within a context. Although the complexities of estimating risk and hazard from a variety of contexts have associated power and study design issues, linking surveillance and administrative data would be necessary.

While not generalizable, focus group discussions provided insight into how context and individual-level factors impact participation status and what they mean to real mothers who need to attend their food instrument distribution appointments. Enabling characteristics, like Medicaid and SNAP enrollment, provided a lens through which focus group participants could relate their WIC experience; the perceptions and attitudes toward WIC enrollment were influenced by experiences in other programs. An example is the observation by focus group participants that Medicaid offers a transportation benefit and WIC does not.

Interestingly, focus group discussions demonstrated the impact that family and social factors play in participation outcomes. Often, family members and children accompanied mothers. During journey mapping, mothers accompanied by other adults often consulted with these adults to answer the questions posed by the WIC nutritionist. For instance, the WIC
nutritionist asked if the mother was available on a specific date for a subsequent appointment and the mother turned to the other adult, either her partner or her own mother, to deliberate.

The study dealt with status (that is, “pregnant,” “post partum,” “fully breastfeeding,” “partially breastfeeding”) in different ways. The survival analysis approach controlled for status category through stratification. Despite the fact that all focus group participants had experienced nonparticipation in the past, unique perspectives can be seen across status categories. One focus group participant, for instance, explained that she was pregnant and that she was not going to wake up early in the morning to schedule an appointment at a SDS clinic if success in such an attempt was not assured. Likewise, mothers who had many children felt that attending appointments on time was taxing for childcare reasons.

Income plays a large role in mothers’ perceptions about program participation. Despite their appreciation of program benefits, focus group discussants’ use of WIC is encountered with feelings of embarrassment and frustration. Still, they felt it was good to use the program if necessary. While not collected through MIS data, focus group discussions pointed to stigma as an important intangible covariate preventing active participation and enrollment. Experiences using SDS clinics, redeeming food instruments at stores, and interactions with other people in the community are potential sources of this embarrassment and frustration. Thus, further exploration can measure contextual characteristics that are not currently collected by the MIS but suggested by the Behavioral Model, and subsequently tease out their impact on automatic termination due to nonparticipation.

The picture of the Kentucky WIC mother is clearer when looking at results across the three studies. Living with limited resources creates a real need, both perceived by mothers and evaluated by program eligibility criteria, for families to find solutions to avoid nutritional
deficiencies. Predisposing characteristics such as age, ethnicity and marital status impact program perceptions and the risk of nonparticipation. Further, enabling characteristics such as income and English proficiency impacts the risk of nonparticipation. Focus group participants voided their appreciation of the benefits provided to them by the program in times of need.

**Practice Implications**

Study findings have important implications for designing strategies to prevent automatic terminations due to nonparticipation among WIC families while they remain eligible for program benefits. Those women presumptively eligible for Medicaid, living in homes where they are the only WIC enrolled person, that earn very little average income (at or below $4,152) are at greatest risk and should receive special attention from the program. Resulting segments from CHAID analysis may be compared and prioritized to structure targeted outreach efforts for the greatest return on investment (Donovan, Egger, & Francas, 1999).

For Kentucky, presumptive eligibility for Medicaid provides access to prenatal care services and enables a woman to receive WIC services for 60 days. The way WIC enrollment and information about WIC’s eligibility requirements are communicated may prevent presumptively eligible women from leaving the program unnecessarily. While some presumptively eligible women are determined ineligible for Medicaid, it is important to emphasize the benefits of WIC with all presumpively eligible women.

In a meeting with Kentucky WIC officials to review study results and discuss their implications, they acknowledged the importance of communicating WIC eligibility and enrollment possibilities to pregnant women as soon as they are deemed presumptively eligible. They noted that at the moment presumptive eligibility is granted, needy women are given access to a number of other supportive programs of which WIC is just one. One official noted that WIC
eligibility is “automatic” once a woman is granted presumptive eligibility, and such women may
be “overwhelmed [by the amount of information] and not even realize she’s eligible” for WIC
specifically. It is important for the program to competitively position the value of WIC among
other service provisions to ensure presumptively eligible women are motivated to accept WIC
benefits by attending follow-up appointments for food instrument distribution.

Kentucky WIC officials also discussed stakeholders’ perceptions of WIC and the need to
provide them with a better understanding of eligibility guidelines and program benefits. This
knowledge is important in developing a stronger perceived value among these stakeholders as
Kentucky WIC continues enhancing its brand.

One possible way to enhance the perceived value of participating in WIC is to emphasize
the integrated services provided by Kentucky WIC. According to state officials, integrated
services allow families to gain more out of a single appointment. During an appointment with
integrated services, mothers can get well child checkups completed and have children’s periodic
immunizations and boosters administered in addition to the normal services provided during a
WIC appointment, including health screenings, nutrition education and counseling, referrals to
other health and social services, as well as distribution of food instruments.

Household enrollment was also important in defining audience segments. Program rules
stipulate that when more than one person in a household is enrolled in WIC, the entire household
must be issued food instruments on the same date. Program staff in charge of scheduling can
continue to monitor their local enrollments to identify cases where multiple appointments per
household can be merged to a single appointment. These cases provide opportunities to minimize
family burden. While a deterrent to participation was the need to bring children to the clinic,
efforts to make children’s presence at clinics easier and more enjoyable are relevant. Program
staff have the unique power to increase efficiency, provide practical solutions for WIC mothers, and subsequently prevent nonparticipations.

Kentucky WIC officials were not surprised by the finding that families without home contact information were at greater risk of nonparticipation compared to families who reported that information. Officials explained that those without home contact information specifically chose not to provide any information. Opting out of providing home contact information limits the outreach opportunities Kentucky, making it difficult to prevent automatic termination due to nonparticipation among these families. Formally employing a framework to prioritize audience segments will help estimate value in targeting these families while further research into these families could help identify an effective outreach tactic.

Another finding with practical implications is the increased risk of nonparticipation among women who change to a new WIC clinic. These families might have different knowledge, perceptions and expectations about attending a new WIC clinic that is closer to their new home. Movement among communities within Kentucky requires learning about where WIC clinics are, how to get to WIC clinics, and how families feel about the services provided at the first attendance to the new clinic. This was especially true for one focus group participant who was informed by a fellow focus group participant that she could attend a different clinic closer to her home than where she was currently attending. As WIC families move while they are still eligible for WIC, outreach material can be created that both prepares families for leaving one clinic site and welcomes that family at a new WIC clinic.

In addition, health departments across the state of Kentucky have different scheduling methods. An important study finding was that the risk of nonparticipation was much lower for women before they attend a clinic that uses SDS. Given a particular WIC site, a mother’s
experience scheduling her next appointment and her subsequent attendance or absence is greatly impacted by the method by which the clinic schedules appointments. Clinics across the state using the same scheduling method can share best practices for making the scheduling method work optimally for local WIC populations.

An important observation about SDS made by WIC officials is that, due to the nature of the scheduling method, it is not possible to reschedule a food distribution appointment. This poses a possible threat to nonparticipation prevention in SDS clinics. Arriving late to clinics also places mothers who already have an appointment at risk of needing to reschedule. In line with efforts to prevent nonparticipation, clinics of all scheduling method types have an opportunity to develop effective protocols for mothers to successfully reschedule food instrument distribution appointments.

Current nonparticipation prevention strategies can use findings from survival analysis to hone individual-targeted strategies more accurate. Armed with the knowledge about these characteristics, staff members can triage clients and counsel them on their intentions to attend subsequent appointments or probe clients about barriers they are facing to participation. Gaining these insights can help clinic staff develop enrollee schedules to meet specific and real needs.

Solutions that operate on organizational characteristics such as scheduling methods, hours of operations, and the structure of clinic lobbies can mitigate direct barriers noted by WIC mothers who participated in focus groups. Changes to the clinic environment that, for instance, relieve problems related to childcare and the total time spent at clinics can have an impact on mothers’ decisions to attend appointments. One example of decreasing the total amount of time spent at the clinic would be to reduce the amount of time waiting for food packages to be loaded on EBT cards. Also, providing babysitting or creating delineated areas for children to play while
at clinics might help to relieve some of the within-clinic hurdles to attendance WIC mothers reported.

Kentucky WIC has already begun efforts to enhance clients’ experiences redeeming food instruments in supermarkets. Through collaborating with approved vendors, the program helps stores improve WIC-approved food labeling. A system that allows women to easily check the balance of their food package is already in place. Notably, a website as well as a mobile application open up access to checking food package balances easily. Direct training or a peer network may augment participation and help mothers overcome barriers to food instrument redemption.

WIC mothers noted pride, fear, embarrassment and stigma are related to how others perceive program clients, and these perceptions also result from how others treat WIC mothers. To combat perceived stigma, the content and design of targeted outreach could focus on the nutrition education and health benefits WIC provides and reposition the program as a health program instead of a food assistance program. The Kentucky WIC program has already made a step toward mitigation of stigma – in 2011, the statewide program abandoned paper vouchers for the EBT system that, according to WIC mothers in focus groups, suppressed some of the perceived stigma and embarrassment.

Journey mapping identified touch points between the program and participants. Telephone-based interactions can include an automated reminder system to help families remember to attend scheduled appointments. Changes to the front-end of WIC clinics such as the client queue and the time spent waiting for appointments can help make in-person interactions better. Further mapping of a larger pool of clinics can help refine the state program’s understanding of where time pitfalls exist throughout the client journey.
Research Implications

Continued research is needed to understand differences in risk across segments of WIC mothers by characteristics not included in this study. While presumptive eligibility for Medicaid provides a unique condition in the state of Kentucky that is relevant to outreach, it does not serve as a clear operational insurance variable with which to examine the impact of health insurance status on participation and nonparticipation. A data linkage across available state data source will allow a more nuanced investigation on this topic.

Since no precise insurance information was available in the Kentucky WIC data, it is assumed that the population of Kentucky WIC mothers who are not presumptively eligible for Medicaid includes women from a variety of insurance backgrounds. Of note, state healthcare exchanges installed by the Affordable Care Act were available beginning in 2014 and insurance enrollments in these exchanges began at the end of 2013 (Commonwealth of Kentucky, 2014), meaning that all Kentuckians should have access to health insurance. Limitations in the data set prevented more granular analysis by insurance enrollment and type. However, a re-analysis of data from this study period and an analysis of data after this study period would need to account for the changing insurance landscape in Kentucky.

A number of technical issues regarding the use of MIS data should be noted. A preliminary examination of the data set found a number of variables with a high level of missing information, such as income and primary language. Diligence in asking women about these characteristics at each visit and subsequent documentation in the MIS will refine future audience segmentations and analyses.

Information absent from the MIS but captured by small local clinic surveys includes client satisfaction with the program and other characteristics related to the client experience.
These types of surveys are appropriate starting points for elaborating more sophisticated data collection instruments to not only provide surveillance and target enrolled mothers at highest risk of automatic termination due to nonparticipation but also to make participation more enjoyable. Linkage of these small surveys to statewide databases could also help enhance collaboration between state and local officials concerned with outreach to prevent nonparticipation.

Further research is needed to: 1) refine current segmentation models with data on participant experiences in the program to augment the currently collected universe of variables, 2) use a framework like TARPARE to prioritize segments for outreach, and 3) implement and evaluate subsequent outreach approaches. These three avenues represent major research areas for building knowledge around public health program outreach in order to strengthen evidence-based practice. Further routine data collection that includes aspects of satisfaction and stigma as well as testing outreach strategies in comparison to standard outreach practices will provide practitioners with robust methods vetted by practice-based research.

Additional research is needed for a more thorough understanding of nonparticipation. Additional multivariate methods could be used to examine the interaction of contextual- and individual-level factors predicting nonparticipation. For instance, discriminant analysis could be used to validate results of CHAID. Multilevel modeling could estimate the impact of a series of contextual- and individual-level characteristics on participation outcomes. Additional qualitative inquiries could explore the nonparticipant experience in more detail and guide the development of client satisfaction survey items.

Research also is needed to enhance our understanding of the sources of stigma experienced by WIC participants and uncover effective strategies to mitigate stigma, including more effective communication guidelines for promoting the program.
Stigma should be part of future surveying of WIC nonparticipants. Valid and reliable instruments are needed to examine the impact of stigma on participation over time. Measurement and surveillance of stigma would help outreach understand a very important local barrier and empower outreach strategies.

Linkage of local satisfaction surveys to statewide data would make it possible to examine the impact customer satisfaction, in general, and specific service features have on participation status. Although not routine, the Pregnancy Risk Assessment Monitoring System is another valuable data source with which to gather more information about nonparticipants. By coordinating multiple data sources, more complex analyses could be performed.

Limitations

Using MIS data to examine nonparticipation offered many advantages. However, audience segmentation and survival analysis have notable limitations. CHAID observes Kentucky WIC mothers as a cross section as opposed to considering time-varying circumstances. A 2-year study period necessarily imposed censoring that could have artificially underestimated the number of women who are on well on their way to being automatically terminated.

While journey mapping was key to the researcher’s understanding of program operations and experiences, results are biased because state officials selected clinic site and organized the grocery store experience. Recruitment and other factors related to focus group operations also introduced selection and response bias to the qualitative findings. With only four focus groups, it is unlikely that saturation of possible concepts, feelings and perceptions was met. Further focus groups would be needed to account for geography beyond the four sites that were sampled and perspectives from a much more racially, ethnically and financially diverse population would further refine qualitative results.
Conclusions

This dissertation used a mix of quantitative and qualitative methods to explore nonparticipation in the Kentucky WIC program. Audience segmentation and survival analysis identified the characteristics of WIC mothers most and least likely to drop out of the program prematurely and estimate the relationships between covariates and the amount of time mothers spend in the program. Focus group discussions with WIC mothers who have experienced nonparticipation provided insight into perceived program benefits and barriers and recommendations for making the participant experience even better. This work provides the first step in an effort to understand and reduce nonparticipation in the Kentucky WIC program.

Applying mixed methodologies to the issue of nonparticipation in the Kentucky WIC program has shed light on contributors to risk that would not have been captured by one method alone. Whereas audience segmentation was efficient at identifying interactions among presumptive eligibility for Medicaid and income, survival analysis was better at identifying the individual impact of each examined covariate as well as the influence of attending a SDS clinic on risk of nonparticipation. Journey mapping identified process-related moments where waiting at clinics may occur. Focus groups with WIC nonparticipants identified transportation, childcare, confusion about eligibility, scheduling conflicts and feelings such as stigma that prevent them from attending appointments for food instrument distribution.

References


Patient Protection and Affordable Care Act § 2001.(a).(1).(A) (2010).


Appendix A:

Social Marketing as a Planning Approach

The purpose of the following literature review is to describe the distinctiveness of social marketing from other planning approaches in public health. The chapter begins by describing qualities of social marketing and comparing them to other frequently used planning approaches in public health to expose distinguishing characteristics as well as commonalities. Social marketing is then applied to two situations: the development of a downstream, behavior change program and the development of an upstream, policy-focused intervention.

Planning Approaches in Public Health. Social marketing is unique among planning approaches used in public health. Social marketing is a theory-based (Donovon, 2011; Lefebvre, 2011), consumer-oriented planning framework. The function of a planning model or framework in public health is to organize health promotion efforts to reduce disease and increase health and well being through step-by-step processes (Crosby & Noar, 2011). The primary function of planning approaches, models and frameworks is to plan health promotion programs. More precisely, theory-based planning frameworks guide assessments of needs and assets of particular communities around a particular health or programmatic issue which are then translated into actions, including health promotion programs, service provisions and interventions (Crosby, Kegler, & Diclemente, 2009; Crosby & Noar, 2011).

Planning models are not theories. Planning models and frameworks do not predict or explain particular outcomes (K. Glanz & Rimer, 1997). In contrast to the role of planning models, theories are “set[s] of interrelated concepts, definitions, and
propositions that present…systematic view[s] of events or situations by specifying relations among variables, in order to explain and predict the events or situations” (K. Glanz, Rimer, & Viswanath, 2008). Planning models may, however, “draw on a number of theories to help understand a specific problem in a particular setting or context” (K. Glanz et al., 2008).

**Social Marketing.** Social marketing grew from an interest to broaden the scope of the marketing discipline to embrace socially beneficial goals in both business and nonbusiness settings (Andreasen, 1994; Philip Kotler & Levy, 1969a). This “approach to planned social change” leverages the exchanges, or “market transaction,” that occur between two defined parties (Philip Kotler & Zaltman, 1971), a concept that is shared with the traditional definition of marketing (Philip Kotler & Levy, 1969b; Luck, 1969). The original definition, drawing from the observations of Paul F. Lazarsfeld, Robert K. Merton, G.D. Wiebe among others, is comparable to and distinguishable from commonly used planning approaches in public health:

> Social marketing is the design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution, and marketing research (Philip Kotler & Zaltman, 1971).

Social ideas can be tangible products, healthy behaviors, or services (Andreasen, 1994). Examples of products include condom use and family planning services (Lutalo et al., 2010; Van Rossem & Meekers, 2000), breastfeeding (J. H. Lindenberger & Bryant, 2000; Perez-Escamilla, 2012) and quality and use of services in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) in the U.S. (C. A. Bryant et
al., 2001), and offering new services like transportation to those in need (M. Rothschild, 2003). Social marketing applied to public health involves the application of marketing principles and processes to said products and services.

**Definitions and Controversies.** Expansions on social marketing’s definition attempt to compensate for an ever-broadening scope. Major academic controversies in the social marketing arena emerged over whether or not the approach was specifically intended for nonprofit and public sectors, whether or not the approach should be narrowly defined around tangible products such as birth control, whether or not attitudes and ideas were appropriate social marketing targets themselves, differentiating social marketing from health education and health promotion fields, and whether or not policy and regulatory changes are appropriate social marketing strategies (Andreasen, 1994).

Current wisdom suggests public policies are indeed within social marketing’s purview, although historically such implementation has been weak or incomplete (French, 2011). Even with discernible features and individual behavior foci, social marketing can parallel and augment other community-focused and empowerment approaches (C. A. Bryant et al., 2009).

In 2002, Andreasen attempted to settle the definition by asserting six criteria that differentiate social marketing from other approaches, which were formally accepted by organizations in the field: (1) a behavior change bottom line, (2) a consistent use of audience research, (3) careful segmentation of target audiences, (4) creation of attractive and motivating exchanges with target audiences, (5) a strategy that attempts to use all 4Ps and (6) attention given to the competition faced by the desired behavior change (Andreasen, 1994). While elements of other planning approaches may fall into one of
these categories, a social marketing approach is identifiable if it satisfies these criteria (C. A. Bryant, Mayer, McDermott, Panzera, & Trainor, 2011). Evident in the maturing knowledge base is an acceptance that policy change and individual behavior change are both acceptable goals for social marketing methods.

Social Marketing in Practice: Two Case Studies

To demonstrate the application of social marketing, two different situations (one completed downstream project and one upstream study currently being conducted) will describe use of the planning approach. Comparisons and differences will be drawn among social marketing and other planning approaches commonly used in public health to map social marketing within the landscape of planning approaches for health promotion.

**Downstream Social Marketing: The Texas WIC Study.** A community-based social marketing approach is downstream when it conceives of communities as either segmentation variables or geopolitical designations and focuses specifically on individuals performing (or not performing) a health behavior of interest (Andreasen, 2006a). In the early 1990s, the state of Texas commissioned research to enhance its statewide WIC program with the aim of increasing enrollment (C. A. Bryant et al., 2001). Researchers accomplished this task with a thorough social marketing strategy that focused on the experiences and perceptions of women who were currently enrolled, who had once been enrolled, and who had never enrolled but were eligible (C. A. Bryant et al., 2001). In addition, researchers listened to the professional staff that regularly interfaced with program participants (C. A. Bryant et al., 2001). Through the social marketing process researchers were able to promote change within the organization of the Texas
WIC program by creating an environment where enrollment was easier, more accessible, and less stigmatizing (C. A. Bryant et al., 2001). Initiatives with the shared purpose of increasing and retaining enrollment in WIC occurred in California (J. Lindenberger & Bryant, 2002) and North Carolina (C. Bryant et al., 1996).

**Upstream Social Marketing: Tweens Nutrition & Fitness Coalition.**

Community-based social marketing is upstream when the community itself is treated as an intervener in the health behavior of interest (Andreasen, 2006a). In this sense, upstream refers to “the environmental and social structural factors” that permit or inhibit health behaviors (Grier & Bryant, 2005). Broadly defined, the upstream approach directs social marketers to tackle institutional policies and practices as much as it implies a legal focus on policies and regulations governing environments in local, state or national jurisdictions.

One example of an upstream social marketing approach is a coalition based initiative attempting to impact childhood obesity in Lexington, Kentucky by targeting institutional and governmental policies in the local community. The Tweens Nutrition & Fitness Coalition (The Tweens Coalition), currently part of a CDC Prevention Research Center core grant project, is addressing childhood obesity through a community-based social marketing approach (C. A. Bryant et al., 2013).

**Consumer Orientation.** The driving force behind social marketing is its commitment to understanding the experience and concerns of consumers (Grier & Bryant, 2005). Without consumers, both profit-generating and non-profit organizations would not exist (Donovan & Henley, 2003); social marketing hones in on benefits to consumers to ultimately influence behavior change (Storey, Saffitz, & Rimon, 2008c).
What this means practically is that throughout a social marketing effort, decisions are made in reference to formative research about the consumers’ wants, needs and expectations as well as perceptions related to a defined behavioral change goal. Moreover, when resources are available, intervention elements are developed through pretesting with targeted segments of consumers (Andreasen, 1994; MacDonald, Cairns, Angus, & Stead, 2012). Consumer orientation also means that social marketers “tend not to treat their targets as mass markets (Andreasen, 1995).

Consumer orientation is characteristic of social marketing. The Texas WIC study focused on experiences of Texan women eligible for the program throughout initial planning and formative research phases. Through quantitative surveys, focus groups and in-depth interviews, women’s reasons for not enrolling in WIC as well as emergent conditions such as confusion about eligibility and perceptions of stigmatization drove decisions about how to restructure the WIC clinic experience as well as how to package and promote WIC to overcome these stated barriers (C. A. Bryant et al., 2001). The Tweens Coalition, using Community Based Prevention Marketing for Policy Development (CBPM-Policy Development), makes decisions about nutrition and fitness policy initiatives based on their collective understanding of the local community’s needs (“community as geopolitical designation”) as well as learned insights from local government officials and stakeholders (“community as intervener”) (C. A. Bryant et al., 2013); (Andreasen, 2006b).

Other planning approaches also incorporate listening and engagement to those affected by public health programs and interventions. PRECEDE-PROCEED, an approach that systematically applies theories and concepts to the planning and evaluation
of health behavior change programs, maintains a fundamental principle of audience involvement (Gielen, McDonald, Gary, & Bone, 2008b). Audience involvement means the inclusion of community participants in “defining their own high priority problems and goals and in developing and implementing solutions” (Gielen, McDonald, Gary, & Bone, 2008f). Gielen and colleagues suggest developing planning committees, community forums, and conducting surveys and focus groups to ensure communities remain engaged in the process (Gielen, McDonald, Gary, & Bone, 2008c).

Another approach, Intervention Mapping, is an iterative series of steps that also asserts the importance of broad participation of community members who are often the recipients of intervention elements and products (L K. Bartholomew, Parcel, Kok, Gottlieb, & Fernandez, 2011). The aim of Intervention Mapping is to empower program users by including them actively as developers of program components. A social marketing effort is consumer-orientated, as opposed to audience involved, because of a reliance on specific formative research practices that aim to understand benefits, barriers, costs, perceptions and other important factors with respect to a goal health behavior or policy instrument among other competing behaviors and policies by listening to audience targets (Grier & Bryant, 2005). The goal with social marketing is that continuous consumer-orientation shapes the offered “product” over time, helps frame the position of the product with respect to competing options and opportunities, and directly involves and honors the targeted community members in the planning process rather than solely respecting them as a source of data. In Intervention Mapping, data is used to confirm or disconfirm a particular theory about determinants of outcomes (L Kay Bartholomew, Parcel, & Kok, 1998a).
For emphasis, social marketing’s consumer orientation diverges from most traditional public health planning frameworks in two ways. First, the performed formative research relies heavily on a conceptual framework that explores competing behaviors, desired products, channels through which communication with target audiences must occur to receive the likeliest chance of behavior change, and the costs associated with performing a target health behavior or edifying a particular policy (Grier & Bryant, 2005) -- social marketers directly involve targeted audiences through explorative tasks. In the Texas WIC study, consumer research drove all of the decisions made about how to change WIC in Texas primarily to increase enrollment by overcoming barriers but also to enhance current client experiences (C. A. Bryant et al., 2001). The collaborative process of selecting a single policy initiative in Kentucky from a list of choices allowed the Tweens Coalition to match the needs of the community with upstream insights regarding likelihood of success (C. A. Bryant et al., 2013).

Second, the intervention products that are developed after formative research are not static. Social marketers are willing to change the intervention and related products based on iterative formative research to meet the evolving needs and preferences of targeted consumers (Grier & Bryant, 2005) and communities (Andreasen, 2006a). The promises made to consumers through a social marketing approach are continuously responsive to their needs and aspirations by offering products and services that also evolve through continual formative research.

**Exchange and Transaction.** Marketing is built on an understanding of the concept of exchanges. A condition that indicates whether or not marketing occurs is the
presence of “two or more parties, each with something to exchange, and both able to carry out communication and distribution” (Philip Kotler & Zaltman, 1971). Theories on exchanges suppose that individuals act out of self-interest to enhance perceived personal benefit while minimizing perceived personal costs (Bagozzi, 1978; Grier & Bryant, 2005). Risk, however small or large, real or perceived, is involved in the transfer of benefits with respect to each social actor participating in an exchange dyad (Bagozzi, 1978; M. L. Rothschild, 1999). To summarize exchange theory, three components are necessary for an exchange to occur: (1) a seller, producer or service provider, (2) the buyer or consumer, and (3) a defined product or service (Saren, 2011). Exchange theory focuses social marketing efforts on providing value-laden benefits to consumers and not organizations, remaining inclusive of intangible definitions of perceive costs with respect to consumers who decide whether or not to engage in a health behavior, and equalizing the effort placed into an exchange by all actors to match the value of benefits received (Grier & Bryant, 2005). Thus, the task is to convince all market stakeholders to exchange by convincing them of the value to act.

The Texas WIC study confirmed what other research identified about barriers to participation in the exchange of benefits offered through government assistance. In particular, results showed that the costs to participate in WIC were perceived by eligible nonparticipating women as too high relative to their understanding of the benefits they would receive should they participate (C. A. Bryant et al., 2001). Looking upstream at transactions and exchanges that result in policy-level changes, the Tweens Coalition held group activities where members estimated the expected return on investment a particular policy option might have when enacted or instituted (C. A. Bryant et al., 2013). Meetings
with local institutional and governmental officials as well as community members concerned with children’s health such as families and neighborhood store owners allowed the coalition to learn what terms are required for stakeholders to engage in the policy initiative (C. A. Bryant et al., 2013). The policy finally selected was to tackle childhood obesity in locations that are food deserts (C. A. Bryant et al., 2013).

The concept of exchanges distinguishes social marketing from a planning approach like PRECEDE-PROCEED. In particular, any information that will define terms for getting target audiences engaged in a particular health or health-related behavior in PRECEDE-PROCEED occurs in Phase 3 of the planning approach (“Educational and Ecological Assessment”), whereby “predisposing,” “enabling,” and “reinforcing” factors are delineated, categorized and related to behavioral outcomes (Gielen, McDonald, Gary, & Bone, 2008a). However, the literature on PRECEDE-PROCEED does not specifically cite exchanges or exchange theory in historic uses of the approach. Researchers stipulate that theories used to identify “behavioral and environmental influencing factors” depend on the level that a particular issue or problem operates (interpersonal or organizational) (Gielen, McDonald, Gary, & Bone, 2008d), those that utilize PRECEDE-PROCEED have a variety of theories about health behavior from which to choose (Gielen, McDonald, Gary, & Bone, 2008e).

Similarly, Intervention Mapping lays out specific tasks to be completed within a step-wise process, constructed on the ecological notion of determinants of health and health behaviors (L Kay Bartholomew et al., 1998a) (Table A1).

Although most planning frameworks attempt to supply health program developers with an ecologically informed, systematic approach, Intervention Mapping supplies
practitioners with a framework that explicitly embraces a social ecological framework (Diclemente, Crosby, & Kegler, 2009). Intervention Mapping allows researchers to choose theory-driven methods when determining strategies for achieving proximal program objectives (L. Kay Bartholomew et al., 1998a). While social marketing is also a systematic planning approach, it is grounded on the concept of exchanges and competing market transactions.

Selection of Target Markets. Social marketing leverages a variety of techniques to hone in on very specific audiences (Philip Kotler & Zaltman, 1971) that are specified through an approach known as segmentation (Grier & Bryant, 2005; Weinstein, 2004a). Segments are subgroups of a larger population that are identified through an analysis of geographic, demographic, behavioral, and psychographic variables (P. Kotler & Lee, 2008). Following this process, each segment is evaluated thoroughly, and one or more of the segments are targeted by campaign or program components (P. Kotler & Lee, 2008). Through segmentation, a larger population is divided into subgroups of individuals who are expected to respond similarly to the same influence (Myers, 1996). Individuals within segments are expected to respond more similarly to an approach than to individuals from different segments. Often segmentation is done quantitatively and involves differentiating, concentrating or atomizing for a group of potential consumers (Weinstein, 2004b). Audience segmentation, together with a consumer-oriented process that focuses on exchanges, further distinguishes social marketing from other frameworks in its initial planning and approach to formative research.

Role of Competition and Positioning. The decision to participate in a behavior is based on choosing an action from a variety of options. Within a conceptual market,
“ideas, priorities and choices” compete for the attention and resources of consumers (Storey, Saffitz, & Rimon, 2008b). Social marketing takes into account the role of competition, often coming from “past habits or from inertia,” “the behavior currently practiced,” and categorizes such competition by how it operates (Andreasen, 1995; Noble & Basil, 2011a, 2011b). Social marketers examine the landscape of competition to identify where the products and voluntary behaviors they are promoting are positioned with respect to the benefits and promises of other products and behaviors (Grier & Bryant, 2005). A position is crafted after understanding priority groups’ needs, the strengths and weaknesses of the organization providing a package of benefits (“product”), and knowledge about the competition (Lefebvre, 2012). Competition may exist between two behaviors, such as bottle-feeding versus breastfeeding (J. H. Lindenberger & Bryant, 2000) or between perceptions of that behavior. For instance, the second phase of the Brazilian National Breastfeeding Program developed communication with target mothers by identifying that the benefits of breastfeeding competed with pediatricians’ professional preferences for recommending formula feeding (Perez-Escamilla, 2012).

The Texas WIC study recognized and overcame competing behaviors to enrollment by identifying the perceived benefits of WIC among segments of eligible women and leveraging focus groups, interviews and surveys to identify barriers that make the decision to enroll less attractive (C. A. Bryant et al., 2001). After selecting the policy initiative, the Tweens Coalition has worked toward this goal through two creations: the Good Neighbor Store initiative and the Better Bites initiative (C. A. Bryant et al., 2013). In particular, the Better Bites initiative urges state officials to adjust institutional policies in recreational facilities to offer program products defined as
healthier alternative foods to what was offered (C. A. Bryant et al., 2013). Formative research with youth after the first summer when the initiative was piloted led to significant menu changes that allowed Better Bites to offer more attractive qualities (for instance, better taste) which empowers Better Bites foods to directly compete with other, less healthier options such as candy bars (C. A. Bryant et al., 2013).

**Marketing Mix.** Certain control variables, which include product, place, price and promotion (referred to as the 4Ps), constitute what marketers call the marketing mix (P. Kotler & Lee, 2008). These control variables are “key elements…central to the planning and implementation of an integrated marketing strategy” (Grier & Bryant, 2005). The 4Ps provide a path to increase the chances that individuals within targeted segments engage in the goal behavior and participate in an exchange (Siegel & Lotenberg, 2007).

**Product.** The product in a social marketing exchange is a bundle of benefits (Siegel & Lotenberg, 2007) and can be broken down into a core set of features that are enhanced by additions that augment the value of the basic bundle. Storey, Saffitz and Ramon describe a product as “a constellation of benefits that can be offered to consumers” in a way that is “enticing” (Storey et al., 2008b). In the Texas WIC study, the majority of survey respondents (59%) had an unclear impression of the program’s benefits, and focus group participants identified resources to purchase infant formula as the most attractive product feature (C. A. Bryant et al., 2001). Further inquiry discovered that knowledge of other WIC program components such as nutritional risk assessment and counseling, education and immunizations was low, but respondents were attracted to these qualities once informed of them by the moderator (C. A. Bryant et al., 2001). The
Tweens Coalition specifically offers healthy food items whose attractiveness is determined and informed by the local youth and communities the Coalition serves (C. A. Bryant et al., 2013).

**Place.** Place refers to where exchanges take place and where the consumer is reached by the product and its promotion (Storey et al., 2008b). An example of placement is the location where mothers receive information regarding infant feeding, which could be clinics, media like television, radio and the internet, as well as their social networks (J. H. Lindenberger & Bryant, 2000). Placement can also refer to where individuals enroll in WIC, as well as where they receive program services and where they redeem program vouchers and instruments.

The Texas WIC study identified family members and relatives who have historically participated in WIC as a major information source for study participants regarding information about the package of benefits offered by the program. Other places where women learned about Texas WIC included friends, public health clinics and social service agencies, doctor’s offices and mass media (C. A. Bryant et al., 2001). After listening to segments (including neighborhood store owners, residents in food deserts, and city government officials including city council and the mayor) and the Better Bites pilot period, the Tweens Coalition placed the offered product of healthy food options in government-operated recreational parks, facilities, and public schools (C. A. Bryant et al., 2013).

**Price.** The marketplace where consumers can choose from a buffet of behavior options is governed by an economy that is theoretically based on the concept of exchange. Value within this economy is measured by price. Practically, “price” refers to
barriers and costs associated with performing the targeted behavior or accepting the promoted product (Storey et al., 2008b). Price can be tangible like money or intangible like psychological concerns or energy investment (Philip Kotler & Zaltman, 1971).

Texan women eligible for the WIC program elaborated barriers and costs to enrollment. First, many were confused about their own eligibility opportunities; study data also indicated problems encountered during attempts to enroll (C. A. Bryant et al., 2001). The other barriers involved perceptions of being stigmatized, expectations of embarrassment if enrolled, and being treated rudely (C. A. Bryant et al., 2001). Stigma, poor treatment, long waits and lack of Spanish-speaking staff painted the experience of participating in WIC among nonenrollees as a “shameful” venture (C. A. Bryant et al., 2001). Interviews with Lexington, Kentucky residents helped the Tweens Coalition understand benefits and barriers that impact citizens’ decisions to purchase healthy foods. Notably, offering healthy foods like fresh fruits and vegetables in neighborhood stores, while convenient, was not seen as a necessarily good opportunity because residents felt the convenience would be coupled with higher prices than what they could get at farther supermarkets (Tweens Coalition, 2011).

**Promotion.** The product is promoted through the best communication channels for a particular target segment (Philip Kotler & Zaltman, 1971). Promotional tools are commonly thought about when they think of social marketing. While promotions are important and crucial for a project’s success, they indeed are just a single component of the much larger social marketing framework. Promotion allows marketers to directly inform potential consumers about the product and its benefits, costs and barriers associated with use or performance in the case of behaviors, and where consumers can
receive the product (Storey, Saffitz, & Rimon, 2008a). Promotion involves the development of messages, identification of audience-specific communication channels and overall communication strategies and objectives (Grier & Bryant, 2005).

WIC uses promotional activities that elicit response from its targeted consumers regarding breastfeeding through ads, pamphlets, staff support kits, and local WIC agencies are able to use the “Loving Support” brand in locally developed breastfeeding promotion strategies (Perez-Escamilla, 2012). While participants in the Texas WIC Study were focused on improving product features, guidelines were developed to aid the creative crafting of electronic and print messaging that directly addressed elaborated barriers and benefits from audience segmentation and formative research, and pretesting of these promotional instruments fine-tuned these strategies (C. A. Bryant et al., 2001). The Tweens Coalition, through the Better Bites initiative, took a proactive approach to promotion of its healthy food products. Promotion kits including instructions and signage, coupon instruments, graphics, flyers and menus, aided local brand identity of Better Bites to its consumers while promoting the benefits associated with purchasing healthy foods by youth and families (C. A. Bryant et al., 2013).

**Comparison to Ecological Models.** Upon inspection, social marketing, PRECEDE-PROCEED and Intervention Mapping share certain features, but all are distinguishable. All assert that the process of developing a health promotion program or intervention is iterative. However, Intervention Mapping is a “problem-oriented” framework and is used to “design evaluation studies and measurement instruments” (L Kay Bartholomew, Parcel, & Kok, 1998b). PRECEDE-PROCEED is said to be a “road
map” and relies heavily on behavior change theories as “specific directions to a
destination” (Gielen, McDonald, Gary, & Bone, 2008).

Social marketing also contrasts to other ecological models. Models such as
Systems Theory include a focus on individual health relative to contextualizing
circumstances that have a direct effect on behavior (Sallis, Owen, & Fisher, 2008). In
Systems Theory, also known as the General Ecological Model, individual health is the
result of a series of interactions among nested environments over time (Bronfenbrenner,
1997). Systems Theory diverges from social marketing because it focuses on causal
pathways instead on specific and practical components and products; the results of social
marketing are clearly defined intervention, program and policy tools. However, social
marketing methods may be applicable at each level of nested systems, so potential exists
for using social marketing within system-based approaches and systems thinking (Novelli
& Workman, 2011) – generally, ecological perspective is also maintained by social
marketing.

The Model of Community Food Systems takes a systems approach and is most
related to the field of consumer psychology, thus, comparable to social marketing (Karen
Glanz, Sallis, Saelens, & Frank, 2005). This model identifies four nutrition environments
(Community Nutrition Environment, Organizational Nutrition Environment, Consumer
Nutrition Environment, and Information Environment) that are affected by government
and industry policies but impact socio-demographics and eating patterns (Karen Glanz et
al., 2005). This model diverges from Systems Theory because it is explicitly geared
toward developing measures of the environments influencing nutritional outcomes and
interestingly shares similarity with social marketing in that it examines barriers, pricing, promotion, placement, and products (healthy food options) (Karen Glanz et al., 2005).

Social Marketing’s Strengths and Weaknesses. Social marketing gains specific strength in its attention to understanding audiences, its acceptance of qualitative and quantitative formative research methods, and incentivizing healthy practices by positioning them desirably among a market of competitors (Ling, Franklin, Lindsteadt, & Gearon, 1992). The results of formative research and pretesting messaging accomplish two important things: (1) the best communication channels to reach identified segments are identified by segment members and (2) material is pretested before it becomes a full-on campaign, which is similar to methods of instrument development (Groves et al., 2004) – failure to pretest, as Crocker and Algina note on survey instrument development, “may in part account for the conflicting or ambiguous results that so often characterize educational and social science research” (Crocker & Algina, 2008). Social Marketing maintains monitoring to track progress longitudinally when possible, which is distinct and separate from iteration (see Appendix) (Ling et al., 1992). Finally, as new media technologies are created,

Like other public health endeavors, time, money and staff are large investments that are not always present in abundance (Ling et al., 1992). As a result, continuous monitoring and response to consumer changes with concomitant product updates is many times limited (Ling et al., 1992). Implementing systems for continuous learning and formative research is good in theory and tough in practice to sustain, even for well-positioned initiatives.
**Summary.** This chapter defined and depicted the major components of social marketing while pitting it against other planning frameworks. It also served to demonstrate these aspects by briefly describing an upstream social marketing-based childhood nutrition initiative and a downstream service-focused initiative to enroll eligible individuals in the Texas WIC program. Social marketing, while different from the likes of PRECEDE-PROCEED and Intervention Mapping, shares broad categories of steps with these public health planning frameworks. It is clear that systems of determinants result in particular health behavior outcomes, and social marketing uses consumer-sourced information to help develop strategies from the beginning step.
### Appendix A: Social Marketing as a Planning Approach

#### Table A1. Comparing Social Marketing to PRECEDE-PROCEED and Intervention Mapping

<table>
<thead>
<tr>
<th>Social Marketing</th>
<th>PRECEDE-PROCEED</th>
<th>Intervention Mapping</th>
<th>Groupings</th>
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<td>Phases</td>
<td>Steps</td>
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<td>Needs Assessment</td>
<td>Setting Agenda</td>
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<td>2 Formative research</td>
<td>Epidemiological, Behavioral, and Environmental Assessment</td>
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<td>3 Strategy development</td>
<td>Educational and Ecological Assessment</td>
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<td>4 Program development and pretesting of material and nonmaterial interventions</td>
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<td>7 Impact Evaluation</td>
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APPENDIX B:

Nonparticipation in Public Assistance

The following text provides a review of the existing literature on nonparticipation in WIC and similar government assistance programs and identifies critical knowledge areas where further research is required to improve policy and practice. To accomplish these tasks, a broad review of scholarly and gray literatures identified the current knowledge base concerning government assistance program nonparticipation. A systematic review was done to identify experimental and non-experimental studies whose purposes were to either explore or address nonparticipation in a set of government assistance programs. Through this process, relevant literature was identified that qualified for abstraction while others were excluded for specific reasons. While excluded items did not meet the criteria for inclusion in the abstraction process, those that were most relevant help build the context as well as aid interpretation of the results of the systematic review. The review concludes with a summary of the critical knowledge areas where further research can improve policy and practice concerned with nonparticipation.

Background

Government assistance programs provide resources to American families in a variety of forms, including supplemental food and income, employment, health and social service screening and counseling, and many other services. The goal of government assistance is to temporarily support families during times of economic hardship (Borjas, 2004). Eligibility criteria for these programs generally include an income roof above which individuals and families no longer qualify for benefits; more specific eligibility criteria depend on risk categories
relevant to the particular assistance program. Regardless of the program, an enrollment period defines when an eligible individual becomes a program participant. After enrollment, active participation is maintained until the individual or family no longer meets eligibility criteria or has repeatedly failed to attend scheduled appointments or retrieve benefits such as vouchers or subsidies.

WIC

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is particularly effective at strengthening nutrition and health among low-income families through administering food vouchers, nutrition education, screenings and referrals to other important health and social services. To enroll in WIC, women and their infants and children must be income eligible and be certified as nutritionally at-risk, or adjunctively qualify by proof of enrollment in other government assistance (Food and Nutrition Service, 2012b). Pregnant and post-partum women, infants and children up to age 5 are eligible for the program and may receive program benefits until they no longer satisfy these requirements.

Nonparticipation in WIC. However, many families who qualify for the program fail to participate. A variety of barriers to participation have been previously identified, including confusion about eligibility requirements, customer dissatisfaction with the program, and embarrassment to accept government assistance. Likewise, many families who enroll but stop using the program while still eligible have described dissatisfaction with how they have been treated, the services they receive, and resulting stigma.

Despite the numerous benefits of participation, a significant proportion of families who are eligible do not apply and an even more surprising proportion of those enrolled in the program stop using program services. The number of individuals eligible for WIC remained roughly
constant between 1994 and 2003, and in 2003 numbers for eligibility and participation were about 13.5 and 7.7 million people, respectively (Food and Nutrition Service, 2012a). Currently, while the program serves the majority of eligible individuals, the national coverage rate (proportion of eligible individuals actually served by the program) has fluctuated between 56 and 62% with drops in the most recent years (Betson, Martinez-Schiferl, Giannearelli, & Zedlewski, 2011). Mountain Plains and Southeastern states have the lowest coverage rates, and children have lower coverage rates compared to infants and women (Betson et al., 2011; Salmons, 2012).

Initial enrollment is the appropriate moment for primary prevention approaches (that is, getting eligible individuals enrolled who are not currently and have never been enrolled) (Aschengrau & Seage, 2003). Previously identified barriers to enrollment in WIC among women include confusion about eligibility, lack of referral to the program when healthcare providers indicate nutritional risk, and reluctance to accept government food assistance based on perceived stigmatization and experiences seeing other families use WIC benefits in grocery stores (C. A. Bryant et al., 2001).

Even after an individual is considered covered by the program, some individuals who enroll cease to actively participate; the 60-day time period between individuals missing their food instrument issuance and being automatically dropped from the program is an appropriate moment for secondary prevention (Aschengrau & Seage, 2003). Relatively little is known about the reasons for cessation of active WIC participation; however, studies have shown that children are the group with the lowest coverage rates. Compared to children who do not participate in the program, WIC children are generally worse off economically than eligible nonparticipants. WIC children are also less likely to have a U.S.-born parent, less like to be white, and are more likely to be Hispanic, to live in a home that is neither owned nor being purchased, and to be in a
household that is receiving other government assistance and federal programs such as SNAP or Medicaid (Salmons, 2012). Clearly, understanding national fluctuations in the average monthly coverage rates requires a closer look at local barriers, experiences, and coverage rate dynamics.

National research on the reasons enrolled participants stop participating actively is lacking, but WIC officials are poised to identify reasons for local cases of nonparticipation. In a previous survey of inactive WIC participants in North Carolina, barriers to continued participation included long wait times, lack of respectful treatment in grocery stores, embarrassment about using WIC, and grocery stores running out of WIC approved products such as food and formula (C. Bryant et al., 1996); these experiences influence subsequent participation decisions.

While individual case studies that demonstrate effective methods for increasing enrollment exist, the knowledge base supporting local methods for maintaining participation in government assistance programs like WIC and how current methods of outreach can be adapted is unclear. The purpose of this systematic review of scholarly and grey literature is to broadly survey what is known about nonparticipation in government assistance programs in order to identify knowledge gaps where further research is needed.

**Methods**

**Strategy Overview.** A systematic literature review was performed to gain a complete understanding of nonparticipation in government-assistance programs based in the United States, with a special focus on WIC. Using the Matrix Method (Garrard, 2004), two strategies were employed. The first strategy explored databases of peer-reviewed scholarly literature to uncover studies of nonparticipation in government assistance programs. Electronic databases include MEDLINE, PsycINFO, CINAHL and Web of Knowledge. Keywords were combined with
Boolean operators or truncation symbols to return an initial list of items that was screened for duplication and relevance.

Keywords are grouped into two categories: participation descriptors and government assistance programs. General keywords include nonparticipation, non-participation, participation and government assistance. Government assistance program keywords included: special supplemental nutrition program for women, infants, and children; WIC; temporary assistance for needy families; TANF; assistance for families with dependent children; AFDC; special nutrition assistance program; SNAP; food stamp program; national school lunch program; NSLP; school breakfast program; SBP; child and adult care food program; CACFP; supplemental security income; SSI; Medicaid. The Medical Subject Heading “Public Assistance” was also included in searches where available.

To augment literature review, a second strategy surveyed grey literature to find reports and documents describing Federal- or state-sponsored efforts to reduce non-participation in WIC. Searches powered by the New York Academy of Medicine’s Grey Literature Report, ProQuest Dissertations and Theses, and Federal and state agency websites. Retrieved items also included papers and reports published by private organizations.

The author (ADP) performed all database searches. Initial searches with keywords and structured vocabulary returned items with varying degrees of relevance to the purpose of this review. Application of inclusion and exclusion criteria filtered the total yielded search to the sample list of articles for review. A time period was not imposed because most government assistance programs began in the 20th century, thus lack of imposed time criteria allowed searches of all possible efforts on such programs across time.
**Inclusion and Exclusion Criteria.** An item is included from the peer-reviewed scholarly literature if (1) it was returned through use of the presented keywords and structured vocabulary, (2) was original research depicting experimental or non-experimental study, (3) was published in English, (4) and the main purpose of the work complied with the focus of this review (exploration of or addressing nonparticipation in government assistance programs). Qualitative and quantitative studies published in the scholarly literature both qualified for review. Literature reviews or reviews of case studies did not meet the criteria for inclusion. Peer-reviewed literature was excluded if (1) it was not returned through use of keywords and structured vocabulary, (2) it was not original research reporting on interventions or programs to explore or reduce nonparticipation in government assistance programs, including meta-analyses, systematic reviews, or editorials, and (3) published in non-English language journals.

An item is included from gray literature if (1) the item is returned through keyword searching in gray literature databases and internet searches or (2) was sent directly to the author from government offices, and (3) reported findings of a qualitative or quantitative study of efforts to explore or reduce nonparticipation in government assistance programs. All reviewed items in gray literature were in English. Items were also included if Federal or state agencies commissioned the work. Items were excluded from review if (1) the item was a review of research in the form of a literature or case study reviews, (2) provided no information on methods of original qualitative, quantitative, or mixed approach research, (3) was non-English, (4) focused on measuring non-participation as opposed to reducing non-participation in WIC. (5) Items that only provide recommendations or tools for practice

**Data abstraction.** Information abstracted from each article falls into the following categories: authors and date; item source; stated purpose; participation and nonparticipation-
related definitions; study design; stated theories or conceptual frameworks, (if any); sampling technique; analytic approach; and main findings. Results are presented in a table where rows are items or studies and columns are depict the aforementioned study attributes.

**Items Reviewed.** The following narrative summarizes the process of retrieving peer-reviewed studies and applying inclusion and exclusion criteria to generate a final pool of articles for analysis (Moher, Altman, Liberati, & Tetzlaff, 2011). Searches through peer-reviewed literature database conducted in July and August of 2013 resulted in 4,440 records. An initial search of gray literature produced 1,209 records. 5,683 items, titles and abstracts were initially screened and excluded for relevance, and 99 qualified to be reviewed using the inclusion and exclusion criteria. After application of inclusion and exclusion criteria and removing duplicate items, 86 records were officially excluded from review. 13 records (11 scholarly articles and 2 pieces of gray literature) satisfied inclusion criteria and qualified for final review.

**Results**

**Government Assistance Programs.** Six of the 13 reviewed studies focused on nonparticipation in the WIC program, including enrollment issues as well as post-enrollment activity (C. A. Bryant et al., 2001; Buechner, Scott, Smith, & Humphrey, 1991; Chance, 1999; CSU Sacramento, 2001; Rosenberg, Alperen, & Chiasson, 2003; Woelfel et al., 2004). Four focused on the food stamp program (FSP) (Algert, Reibel, & Renvall, 2006; Gorman, Smith, Cimini, Halloran, & Lubiner, 2013; Kaiser, 2008; Martin, Cook, Rogers, & Joseph, 2003), including one recent study referring to the program as SNAP (Gorman et al., 2013). One reviewed study focused on TANF (Cancian, Noyes, & Ybarra, 2012) and another study focused on NSLP (Bhatia, Jones, & Reicker, 2011). One study examined participation outcomes across a wide range of programs including TANF, FSP, WIC, childcare subsidy programs and public
housing (Pati, Mohamad, Cnaan, Kavanagh, & Shea, 2010). Two reviewed items predate 2000 (Buechner et al., 1991; Chance, 1999). Two pieces of grey literature qualified for review (Chance, 1999; CSU Sacramento, 2001), while the remaining eleven were sourced from peer-reviewed scholarly journals (Algert et al., 2006; C. A. Bryant et al., 2001; Buechner et al., 1991; Cancian et al., 2012; CSU Sacramento, 2001; Gorman et al., 2013; Kaiser, 2008; Martin et al., 2003; Pati et al., 2010; Rosenberg et al., 2003; Woelfel et al., 2004).

**Description of Study Purposes.** Study purposes ranged from exploring factors associated with participation status (e.g. participation vs. nonparticipation and enrolled vs. non-enrolled individuals) to interventions that aim to minimize nonparticipation or increase enrollments in government assistance programs. Three studies focused specifically on recruiting new participants to government assistance programs (Bhatia et al., 2011; C. A. Bryant et al., 2001; Gorman et al., 2013). One study looked both at how Rhode Island’s WIC program reached the eligible population and new methods for selecting targets for outreach (Buechner et al., 1991). One initiative aimed to improve content, administration and outreach efforts of California’s WIC program (CSU Sacramento, 2001). The purposes of the remaining eight studies were to examine relationships among participation variables and demographic, behavioral and other related factors 8, 9, 10, 11, 13) (Algert et al., 2006; Cancian et al., 2012; Chance, 1999; Kaiser, 2008; Martin et al., 2003; Pati et al., 2010; Rosenberg et al., 2003; Woelfel et al., 2004).

**Participation Indicators Used.** The method each study used to ascertain participation varied substantially, which is expected given the varied nature of eligibility criteria across different government assistance programs. Regarding FSP/SNAP, participation was ascertained by self-reported food stamp income amount (Algert et al., 2006), enrollment status according to state surveillance systems (Gorman et al., 2013), or an answer of yes or no to a question
regarding receipt of food stamp instruments (Kaiser, 2008; Martin et al., 2003). Studies of the WIC program ascertained participation status by enrollment in WIC (Buechner et al., 1991), survey items that ask if the respondent was either a current or previous recipient of program benefits or never received benefits (C. A. Bryant et al., 2001), presence in clinic waiting rooms and documented absence in the form of a “void” or “void unclaimed” code in program systems (Rosenberg et al., 2003), and having a child enrolled in WIC (Woelfel et al., 2004). One WIC study did not report participant ascertainment procedures (CSU Sacramento, 2001) and another WIC study focused on WIC staff (Chance, 1999).

TANF participants were identified as those meeting eligibility requirements and “dropouts” referred to individuals who left the application process because they were either declined or denied service or missed appointments (Cancian et al., 2012). Participation in NSLP was determined by identifying qualifying purchases made by students (Bhatia et al., 2011). The study that examined a number of government assistance programs identified participation through self-report items administered to respondents (Pati et al., 2010).

**Study Populations.** All study populations reflected the populations eligible to participate in respective government assistance programs.

**Data Sources.** Three studies utilized state-operated surveillance data systems to gather information about study participants (Bhatia et al., 2011; Buechner et al., 1991; Cancian et al., 2012). One study combined state-operated surveillance data systems with primary data collection (Gorman et al., 2013). The remaining eight studies collected primary data through validated survey instruments (Algert et al., 2006; C. A. Bryant et al., 2001; Chance, 1999; CSU Sacramento, 2001; Martin et al., 2003; Pati et al., 2010; Rosenberg et al., 2003; Woelfel et al., 2004).
Sample Sizes & Sampling Techniques. Sample size varied widely across studies. Five studies recruited sample sizes of more than 100 individuals but less than 1,000 (Chance, 1999; CSU Sacramento, 2001; Martin et al., 2003; Pati et al., 2010; Rosenberg et al., 2003). Seven studies were able to recruit more than 1,000 study participants (Algert et al., 2006; Bhatia et al., 2011; C. A. Bryant et al., 2001; Buechner et al., 1991; Cancian et al., 2012; Kaiser, 2008; Woelfel et al., 2004). Sample sizes for one study were not clearly reported (Gorman et al., 2013).

Only three studies used random sampling techniques, including one study that used random digit telephone dialing (Kaiser, 2008); another study used random selection of households from residential listings (Martin et al., 2003) and another recruited a random sample from Medicaid enrollment files (C. A. Bryant et al., 2001). One study used non-random recruitment to meet sample size requirements indicated through power analysis (Rosenberg et al., 2003). Other sampling techniques were non-random, with one study using convenience sampling (Gorman et al., 2013), five studies recruited as many eligible individuals as possible at a specific location during specified time periods (Algert et al., 2006; Chance, 1999; CSU Sacramento, 2001; Pati et al., 2010; Woelfel et al., 2004), and three studies taking program surveillance data of all individuals eligible for participation in respective studies (Buechner et al., 1991) (Bhatia et al., 2011; Cancian et al., 2012).

Study Designs. Nine studies employed a cross-sectional, non-experimental, observational study design (Algert et al., 2006; C. A. Bryant et al., 2001; Buechner et al., 1991; Cancian et al., 2012; Chance, 1999; CSU Sacramento, 2001; Kaiser, 2008; Martin et al., 2003; Woelfel et al., 2004). One study used a pre-post intervention study design with no control group (Bhatia et al., 2011). The study examining participation in a number of government assistance programs used a prospective, longitudinal cohort study design (Pati et al., 2010). A study
examining the association between work or immigration concerns affecting WIC participation used a case-control study design (Rosenberg et al., 2003). Three studies used mixed methods approaches to answer research questions (Algert et al., 2006; C. A. Bryant et al., 2001; Gorman et al., 2013; Rosenberg et al., 2003) and one study used qualitative techniques alone (Woelfel et al., 2004).

**Theories.** No studies qualifying for this review employed an explicit theory or theoretical framework.

**Analytic Approaches.** Eight studies collecting quantitative data use multivariable, multiple or multivariate logistic regression to answer research questions (Algert et al., 2006; Cancian et al., 2012; Chance, 1999; Kaiser, 2008; Martin et al., 2003; Pati et al., 2010; Rosenberg et al., 2003; Woelfel et al., 2004). A study of Rhode Island’s WIC program combined factor and cluster analysis on geographic and program data (Buechner et al., 1991). Another WIC study in Texas use chi-square automated interaction detection to delineate homogenous segments of the WIC eligible population (C. A. Bryant et al., 2001). One study leveraged classification tree analysis to identify strongest predictors of participation (Woelfel et al., 2004). All quantitative data was summarized in frequencies and proportions, and differences in the number and proportion of participants and nonparticipants across categories of independent variables were subjected to simple hypothesis testing such as chi square tests (Kaiser, 2008; Martin et al., 2003; Pati et al., 2010; Rosenberg et al., 2003) or estimation of Pearson correlation coefficients (Chance, 1999).

Qualitative data were used in three studies to examine participation (C. A. Bryant et al., 2001; CSU Sacramento, 2001; Gorman et al., 2013). The Texas WIC research team used qualitative coding to identify recurring themes in focus group and in-depth interview data (C. A.
Bryant et al., 2001). The Rhode Island SNAP initiative took a community-based approach to inform SNAP outreach efforts (Gorman et al., 2013). The California WIC research team categorized data coded from focus groups, in-person and telephone-based interviews as either “group consensus,” “incidental but seemingly important information,” or “interesting and related quotes and comments” (CSU Sacramento, 2001). One quantitative study used caseworker notes to refine participant identification (Cancian et al., 2012).

**Main Findings.** Exploration of nonparticipation. Important characteristics related to participation status were identified. Eligible individuals that are less likely to participate in FSP/SNAP are those that are homeless (Algert et al., 2006), have higher education (Algert et al., 2006), are older (Algert et al., 2006; Martin et al., 2003) and Black families are less likely than Hispanic/Latino families to receive food stamps (Martin et al., 2003). Stigma was cited as a reason for not applying for food stamps (Kaiser, 2008).

Dropout in the Wisconsin TANF program was associated with whether individuals had multiple applications to the program, and differences exist between program participants and those who were either denied services or missed appointments (Cancian et al., 2012). Applicants to the Wisconsin TANF program who missed appointments or were denied service experienced the lowest incomes within the program applicant population – TANF dropouts are more likely than participants to experience deep poverty (Cancian et al., 2012). Also, number of children, age and income are statistically significant predictors of TANF participation (Pati et al., 2010).

Census tract was related to outcomes and WIC participation status in Rhode Island (Buechner et al., 1991). Individuals not enrolled in Texas WIC were different than those who enrolled across race, income, age, marital status, education, employment, and geographic location categories as well as whether or not individuals participated in multiple government
assistance programs (C. A. Bryant et al., 2001); Texans eligible for WIC that were not enrolled were unmarried Anglo Americans not received food stamps (C. A. Bryant et al., 2001). Those that left the New York City WIC program were more likely to be women who received WIC themselves, women who did not receive Medicaid for their children, and women who transportation problems, family illnesses and job conflicts (Rosenberg et al., 2003). Client experience variables such as waiting too long, clinic environment characteristics and quality of education were related to failure to use WIC checks – each barrier cited led to a 2% increase in failure to use WIC checks in a New York City sample (Woelfel et al., 2004), and customer focused clinic approaches were associated with program participation in Virginia WIC (Chance, 1999).

**Exploration of participation.** Individuals most likely to be currently enrolled in Texas WIC are Hispanic, Spanish-speaking recipients of benefits from FSP/SNAP (C. A. Bryant et al., 2001). Higher earned income among participants in TANF decreases the likelihood of dropout and source of income from participants versus individuals who dropped out of TANF vary considerably (Cancian et al., 2012). Participation in FSP/SNAP is higher among households of US-born individuals, individuals receiving other government assistance, the uninsured, single mothers and those who were in foster care (Kaiser, 2008). Those who participate in FSP/SNAP are more likely to have experienced domestic violence or to have poor physical or mental health (Kaiser, 2008). Pregnant women and individuals who are not Hispanic/Latino are also more likely to be FSP/SNAP program participants (Kaiser, 2008).

**Mitigation of nonparticipation.** Some studies depict approaches to mitigate nonparticipation in government assistance programs. Community-based research in Rhode Island was able to use outreach staff to aid individuals eligible for FSP/SNAP in completing their
application through direct, face-to-face assistance as well as engaging the eligible population through radio advertisements and assistance through hotline telephone-based resources (Gorman et al., 2013). Officials attempting to increase participation in the San Francisco NSLP middle and high schools were able to increase participation in the program by eliminating a la carte purchasing by both eligible and ineligible students (Bhatia et al., 2011). A 12-day application process resulted in successful and unsuccessful applications to the Wisconsin TANF program (Cancian et al., 2012). A social marketing strategy and plan led to infrastructural and resource changes in the Texas WIC program; five years after the implementation of the social marketing plan, Texas WIC experienced and increase in participation of almost 200,000 participants (C. A. Bryant et al., 2001).

**Discussion**

This focused systematic review highlights what is known about factors influencing participation in government assistance programs, research approaches taken to identify associations with participation status, and developments of nonparticipation mitigation methods. 13 unique studies published or reported from as early as 1991 contextualize what is known about participation in government assistance programs succinctly and describe interventions generally aimed at enrollment issues. Inclusion and exclusion criteria narrowed down a set of studies and initiatives from a broad literature base to address the review’s purpose.

**Limitations.** Systematic reviews are not without limitations. In this review, only one individual (the author) applied inclusion and exclusion criteria to items retrieved from literature databases and sources, read through each qualifying paper or report, and abstracted information for synthesis, which makes this review biased toward the author’s consistency in his approach to these tasks.
While inclusion and exclusion criteria narrowed down a clear set of items, other relevant knowledge about factors that influence participation in government assistance programs may be captured in pieces that were either excluded from review or not identified through the employed search strategies. Searching for gray literature is less structured than identifying scholarly literature. Given more time, a stronger gray literature search of government assistance program participation should include active communication between those conducting the systematic literature review and officials of government assistance programs who have had documented experiences and attempts to mitigate nonparticipation. Scholarly literature is biased toward studies that show success (Dickersin, 1990), and it is conceivable that unsuccessful initiatives on the issue of participation in government assistance programs may have less documentation or reporting. Publication bias operates when researchers and practitioners choose to submit and publish manuscripts based on the strengths or weaknesses of the performed study.

In addition, definitions used for participation (and nonparticipation) vary from one study to the next. Thus, nonparticipation is less specific and could refer to eligible individuals who do not enroll in government assistance or it may refer to individuals who enroll in government assistance but dropout prematurely or fail to actively engage in program components. This lack of specificity makes comparisons from one study to the next unclear.

**Gaps in the Research.** Several opportunities for strengthening knowledge concerning participation in a variety of government assistance and maternal and child health programs exist. First, much literature exists on nonparticipation in the WIC program, but many items retrieved through database searching did not qualify for review (Salmons, 2012) (Alwitt, 1995; Cunnyngham & Castner, 2010; Dye, Wojtowycz, Applegate, & Aubry, 2002; Heathcote, Perri, & Violante, 2010; Lloyd, 2008; School Nutrition Association, 2008; Slomba, McCarthy, Herzog, 2008; Slomba, McCarthy, Herzog,
Results found in studies and reports excluded from this review can be used to augment decision making in community-based research that tests the effectiveness of different methods to government assistance program outreach highlighted by studies and initiatives that qualified for this review.

**Theories.** Specifically, no reviewed study or initiative designed nonparticipation mitigation approaches that were theory-driven. However, the social marketing planning approach were explicitly used in the Texas WIC program (C. A. Bryant et al., 2001), and other studies of WIC leveraged audience segmentation, like cluster and classification tree analysis (Buechner et al., 1991; Woelfel et al., 2004). Still, the relevance and active use of theories and conceptual models that explain or predict participation outcomes are worth exploration, especially if such theories and models can be designed with practicality in mind. Perhaps the marketing mindset could be a useful starting point in the fight against participation loss in WIC and other government assistance programs and in the development of an understanding of why individuals fail to enroll or actively participate in program features.

**Definitions.** Further, most reviewed literature focuses on enrollment issues as opposed to post enrollment nonparticipation cases. Officials operating outreach initiatives for government assistance programs and researchers need clearer definitions of nonparticipation so examination of the knowledge base on the subject can lead to more practical and relevant solutions for clinics and services.

**Mixed methods approaches.** It is possible that a reviewed study only reports a piece of an overall intervention. In such cases, said pieces should be considered in the context of the whole
intervention. Mixed methodologies were only identifiable in three of the 13 reviewed studies (C. A. Bryant et al., 2001; Gorman et al., 2013; Rosenberg et al., 2003). While methods should be chosen on the basis of their ability to respond to community-based research questions, the simultaneous use of qualitative and quantitative data in the design of solutions to mitigate nonparticipation seems most robust – a deep understanding of affected communities as well as measuring the size of effect an outreach method has at getting individuals enrolled or actively participating allows the identification and development of strong, practical, evidence-based methods to be reported and disseminated to local agencies, resources allowing.

**Primary versus secondary data.** A mix of data sources pervades the reviewed literature. The determination to collect primary data or use previously collected secondary data, or use surveillance systems, rests on a number of factors including available resources, the research questions to be answered, and the willingness of community members to work together. Mixed methods that involve qualitative and quantitative data systematically through a planning approach like social marketing overcome limitations any one approach might have individually by leveraging the strengths of other methods. It seems best, and others have demonstrated, that a mixed methods social marketing approach is useful to address nonparticipation in government assistance, especially in WIC.

**Sample size & power analysis.** Power analyses and a priori sample size selection are dependent on what is known about the condition or situation quantitatively and the hypotheses to be tested through a particular study. While much scholarly evidence provides information about participation and enrollment rates across demographic and psychographic groupings, little evidence exists that quantifies the experience of enrolled nonparticipants compared to enrolled participants in the WIC program and other forms of government assistance. Future efforts,
especially in the marketing literature concerning consumer experiences, should help fill this knowledge gap so future studies looking to choose a sample size before selection and recruitment may do so.

**Stigma.** Further, it is the goal of this researcher to begin inquiries into understanding and quantifying forms of experienced stigma in government assistance and maternal and child health programs because stigmatization has been historically cited as a barrier to participation. In order to study stigma in the real world setting, more knowledge about who experiences stigma, and to what magnitude, is needed to help researchers choose adequate sample sizes that are most likely to produce informative results. While stigma is gaining a solid literature base in quantitative investigations (J. Stuber & Schlesinger, 2006) (Moffitt, 1983; Salmons, 2012), items measuring stigma constructs must be inspected for their utility in the rapid and fast-paced setting of government assistance outreach offices.

**Hidden knowledge.** Much community health literature in the form of reports generated from agencies like local departments of health encapsulate proactive initiatives to learn and rapidly respond to the issue of nonparticipation (C. Bryant et al., 1996; J. Lindenberger & Bryant, 2002). Such literature exists outside of the reaches of database searching. A systematic approach of gathering further evidence to augment results of this review should concatenate solutions developed in the community setting by dedicated public health workforce members who interface with the eligible population directly. Though not systematically retrieved, outreach material from local departments of health are available (Michigan Department of Community Health; North Carolina WIC Program, 2001; Program, 2005).

**Maternal & Child Health Programs and Policy.** This review’s purpose focused on government assistance programs, which include a variety of nutrition-related programs that
tackle food insecurity and hunger among women, children and the underserved. Further review should describe what is known about nonparticipation in maternal and child health programs for which there are national appropriations from Title V of the Social Security Act and Title X of the Public Health Service Act fund. Some have noted changing institutional policy to overcome nonparticipation (C. A. Bryant et al., 2001) and further study should investigate how upstream approaches can overcome nonparticipation.

**Areas for Further Exploration.** Most study designs used to tackle nonparticipation in government assistance are cross-sectional studies that claim to identify factors that predict participation outcomes, yet cross-sectional studies by nature lack a time component. One reviewed study depicted a longitudinal prospective cohort design, and one other instituted a case-control study when the participation outcome was known (Pati et al., 2010; Rosenberg et al., 2003). The use of epidemiological study designs in the community setting where time and money are quickly fleeting resources is an issue of much discussion and debate (Green & Mercer, 2001). Yet, funding agencies value of gold-standard experimental designs (Rothman & Greenland, 1998a) such as randomized controlled trials and quasi-experimental (Miller & Salkind, 2002; Rothman & Greenland, 1998b) approaches such as prospective field experiments (Haynes, Service, Goldacre, & Torgerson, 2012).

Though the process may be complex, it is possible to successfully implement and complete the randomized cluster trial or randomized control trial while maintaining respect for community-based human subjects research. Social marketing approaches offer the opportunity to develop practical and relevant consumer-oriented solutions that can be tested through such study designs. These study designs are possible only when performance of the study protocol does not conflict with the study subject’s best interests (Rothman & Greenland, 1998b).
References


### Appendix B: Nonparticipation in Public Assistance

#### Table B1. Attributes of Investigations of Nonparticipation in Government Assistance Programs in the U.S.

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Government Assistance Program</th>
<th>Stated Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algert, S.J., Reibel, M., &amp; Renvall, M.J. (2006).</td>
<td>2006</td>
<td>FSP</td>
<td>To compare socio-demographic characteristics of food pantry clients who are food stamp recipients versus non-recipients; To provide information helpful in improving food stamp outreach and enrollment.</td>
</tr>
<tr>
<td>Beuchner, J.S., Scott, H.D., Smith, J.L., &amp; Humphrey, A.B. (1991).</td>
<td>1991</td>
<td>WIC</td>
<td>To examine the performance of Rhode Island’s WIC Program in serving persons at highest risk among WIC eligible; To provide the Rhode Island WIC Program with an improved basis for selecting geographic areas in which to concentrate its future outreach efforts.</td>
</tr>
<tr>
<td>Cancian, M, Noyes, J.L., &amp; Ybarra, M. (2012).</td>
<td>2012</td>
<td>TANF</td>
<td>To analyze the effects of Wisconsin’s 12-day application process on diversion and the later economic well being of TANF applicants and their families.</td>
</tr>
<tr>
<td>Reference</td>
<td>Year</td>
<td>Program</td>
<td>Summary</td>
</tr>
<tr>
<td>-----------</td>
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</tr>
<tr>
<td>Gorman, K.S., Smith, A.M., Cimini M.E., Halloran, K.M., &amp; Lubiner, A. (2013).</td>
<td>2013</td>
<td>SNAP</td>
<td>To increase participation in SNAP by addressing the particular challenges facing eligible individuals and groups. To eliminate or mitigate barriers to participation by (a) raising awareness of and decreasing stigma surrounding the SNAP program, (b) disseminating information about SNAP eligibility and application processes via trainings and print material, and (c) providing direct client assistance to potentially eligible individuals through direct, one-on-one outreach activities and a toll-free hotline.</td>
</tr>
<tr>
<td>Rosenberg, T.J., Alperen, J.K., &amp; Chiasson, M.A. (2003).</td>
<td>2003</td>
<td>WIC</td>
<td>To explore whether work or immigration concerns affect women’s participation in WIC.</td>
</tr>
</tbody>
</table>
## Appendix B: Nonparticipation in Public Assistance

Table B1 (continued). Attributes of Investigations of Nonparticipation in Government Assistance Programs in the U.S.

<table>
<thead>
<tr>
<th>Study</th>
<th>Participation indicator</th>
<th>Study Population</th>
</tr>
</thead>
</table>
 • Clients attending 2 different food pantries  
 • Pomona and Ontario, California |
 • WIC-enrolled pregnant women  
 • Births to WIC-eligible pregnant women  
 • Geographic analysis |
| Bhatia, R., Jones, P., & Reicker, Z. (2011).                         | Purchases qualifying for free or reduced priced lunch        | • Year of data: 2009-2010  
 • Middle and High School students  
 • San Francisco, California |
| Bryant, C., Lindenberger, J., Brown, C., Kent, E., Schreiber, J.M.,  | Current/previous/never participants, ascertained by survey   | Income-eligible women on Medicaid in Texas                                                                                                      |
| Cancian, M, Noyes, J.L., & Ybarra, M. (2012).                       | • Participant: those who entered TANF according to stipulated requirements  
 • Dropouts: those who exited the extended application period by reason of dropout, including decline or denial of service or missed appointments. | • Women who applied to the Wisconsin TANF program in September and October of 2006                                                             |
<table>
<thead>
<tr>
<th>Source</th>
<th>Methodology</th>
<th>Participants</th>
<th>Nonparticipants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorman, K.S., Smith, A.M., Cimini M.E., Halloran, K.M., &amp; Lubiner, A. (2013). Initiative, Journal of Community Practice, 21:1-2, 105-123, DOI: 10.1080/10705422.2013.788369</td>
<td>* Current Nonparticipants: eligible families and individuals that are either seniors, individuals with disabilities, eligible immigrants, or low-income working households&lt;br&gt;  * Nonparticipants are eligible individuals currently not enrolled in the Rhode Island SNAP program&lt;br&gt;  * Participants are those that are enrolled at a particular time point</td>
<td>* Seniors, individuals with disabilities, eligible immigrants, Low-income working households&lt;br&gt;  * Social service staff, who have direct interactions with eligible clients</td>
<td>&lt;br&gt;</td>
</tr>
<tr>
<td>Kaiser, L. (2008).</td>
<td>* Participation was ascertained with a yes/no question asking if the respondent received FSP in the last 12 months&lt;br&gt;  * Potentially eligible for FSP was defined as those individuals with household incomes less than 130% of FPL and not denied FSP</td>
<td>Women in California, aged 18 or older</td>
<td>&lt;br&gt;</td>
</tr>
<tr>
<td>Martin, K.S., Cook, J.T., Rogers, B.L., &amp; Joseph, H.M. (2003).</td>
<td>Participation ascertained by asking respondents whether or not they participated in food stamp, food pantry, or soup kitchen programs during the past year</td>
<td>Individuals from low-income households in Hartford, Connecticut</td>
<td>&lt;br&gt;</td>
</tr>
<tr>
<td>Source</td>
<td>Methodology</td>
<td>Findings</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| Rosenberg, T.J., Alperen, J.K., & Chiasson, M.A. (2003). | • Clients identified as currently participating as indicated by presence in waiting rooms at 1 clinic in New York City during a day of recertification  
• Leavers, or persons who were enrolled and have left the program, were identified by examining September and October 2000 check registers and identifying individuals with either “void” or “void unclaimed” | Women currently and formerly participating in WIC at 1 center in New York City during January through March of 2001 at a WIC center that serves a predominantly immigrant population. |
| Woelfel, M.L., Abusabha, R., Pruzek, R., Stratton, H., Chen, S.G., & Edmunds, L.S. (2004). | • All surveyed parents/caretakers had children and/or infants enrolled in WIC. | • Parents/caretakers of infants and children enrolled in WIC at 51 New York State WIC local agencies |
| California Department of Health Services (2001). | Current Participants and WIC-eligible respondents who never participated | • WIC-eligible respondents  
• WIC participants  
• WIC staff  
• Opinion leaders of organizations serving populations similar to WIC eligibles |
| Chance, K.G. (1998). | • Study of WIC staff, not WIC participants | • Full- and part-time WIC staff members |
### Appendix B: Nonparticipation in Public Assistance

**Table B1 (continued). Attributes of Investigations of Nonparticipation in Government Assistance Programs in the U.S.**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Size</th>
<th>Data sources</th>
<th>Theory</th>
<th>Study design</th>
<th>Sampling technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algert, S.J., Reibel, M., &amp; Renvall, M.J. (2006).</td>
<td>N = 14,317</td>
<td>Interviews with clients provided data that was entered an Access software program.</td>
<td>None</td>
<td>Cross-Sectional Study</td>
<td>Non-random in-person enrollment during a time period</td>
</tr>
</tbody>
</table>
• WIC program files  
• Vital statistics records | None | Cross-Sectional Study | Surveillance |
<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhatia, R., Jones, P., &amp; Reicker, Z. (2011).</td>
<td></td>
<td>• Balboa High School: $N_{\text{pre}} = 1,025; N_{\text{post}} = 1,313$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Francisco Middle School: $N_{\text{pre}} = 700; N_{\text{post}} = 700$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lowell High School: $N_{\text{pre}} = 2,579; N_{\text{post}} = 2,579$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Daily participation and enrollment provided by school district offices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Collection through point-of-service system</td>
</tr>
<tr>
<td>Bryant, C., Lindenberger, J., Brown, C., Kent, E., Schreiber, J.M.,</td>
<td>2,944</td>
<td>None</td>
</tr>
<tr>
<td>Study</td>
<td>Sample Size</td>
<td>Data Sources</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Cancian, M, Noyes, J.L., & Ybarra, M. (2012).                       | N = 1,664   | • Computerized administrative data  
• Data from systematic review of caseworker notes | None         | Non-experimental, observational, cross-sectional study | All eligible individuals included within the study period from the program |
| Kaiser, L. (2008).                                                  |             | • 527 FSP participants  
• 1405 potentially eligible nonparticipants | None         | Cross-sectional sample | Screened, telephone-based random digit dialing |
<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Size</th>
<th>Methodology</th>
<th>Design</th>
<th>Recruitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pati, S., Mohamad, Z., Cnaan, A., Kavanagh, J., &amp; Shea, J.A. (2010).</td>
<td>N = 744</td>
<td>Health Insurance Improvement Project</td>
<td>None</td>
<td>Prospective, longitudinal cohort study</td>
</tr>
<tr>
<td>Rosenberg, T.J., Alperen, J.K., &amp; Chiasson, M.A. (2003).</td>
<td>Total N = 468 • 280 Clients • 188 Leavers</td>
<td>Structured in-person and telephone-based questionnaires with open- and closed-ended questions</td>
<td>None</td>
<td>Case-control study</td>
</tr>
<tr>
<td>Woelfel, M.L., Abusabha, R., Pruzek, R., Stratton, H., Chen, S.G., &amp; Edmunds, L.S. (2004).</td>
<td>N = 3,167 parents/caretakers of infants and children enrolled in WIC</td>
<td>A survey that collected data on barriers to WIC services, barriers to using WIC checks as an indicator of program retention, and demographic and personal information.</td>
<td>None</td>
<td>Cross-sectional design</td>
</tr>
<tr>
<td>Source</td>
<td>Sample Size</td>
<td>Data Collection</td>
<td>Study Design</td>
<td>Recruitment Method</td>
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<td>--------------------</td>
</tr>
<tr>
<td>California Department of Health Services (2001).</td>
<td>N = 80 WIC-eligible respondents, N = 92 WIC participants, N = 56 WIC staff, N = 20 Opinion leaders from 10 different cities</td>
<td>Primary data collected</td>
<td>Cross-sectional qualitative inquiries utilizing focus groups, in-person interviews and telephone interviews</td>
<td>Non-random in-person enrollment during a time period</td>
</tr>
</tbody>
</table>
Appendix B: Nonparticipation in Public Assistance

Table B1 (continued). Attributes of Investigations of Nonparticipation in Government Assistance Programs in the U.S.

<table>
<thead>
<tr>
<th>Study</th>
<th>Analytic approach</th>
<th>Main findings</th>
<th>Type of Work</th>
</tr>
</thead>
</table>
• Outcome: Food stamp participation (binary)  
• H1: Single-parent families with children would be more likely to receive food stamps  
• H2: English language ability would encourage food stamp program participation  
• H3: Homeless clients would be less likely to receive food stamps. | • Single parents and English speakers more likely to receive food stamps  
• Homelessness increased likelihood of non-participation in food stamp program  
• More education and older age were also associated with non-participation in food stamp program | Peer-Reviewed Literature |
• Enrolled vs. eligible women proportion compared across resulting clusters | • Contextualizing variables according to census tract correlated strongly with four indexes: risk, socioeconomic status, family size, and birth outcomes.  
• Risk and outcome indexes resulted in 8 clusters of census tracts  
• Cluster analysis identified census tracts where measures of outcomes and risks do not coincide with each other  
• Clusters vary in the proportions of WIC-eligible women and WIC-enrolled women. | Peer-Reviewed Literature |
| Bhatia, R., Jones, P., & Reicker, Z. (2011). | • Number and % change in participation before and after intervention | • Elimination of a la carte purchasing increased NSLP lunch eating by qualified students  
• Increases occurred for both students who qualify for free lunch and students who qualify for reduced priced lunch | Peer-Reviewed Literature |

- Quantitative: Frequency distributions, cross tabulations, and chi-square automatic interaction detection analyses
- Qualitative: identification of recurring themes and range of diversity in responses

- 40% of non-enrollees did not know they were eligible to participate in WIC
- Perception that WIC serves only the “very poor”
- Many focus group participants had false assumptions regarding their own eligibility
- Many did not know they qualified, as well as their children
- Some not referred to WIC even after healthcare provider documents a nutritional risk
- Statistically significant differences between enrollees and non-enrollees on race, income, age, marital status, education, employment, geographic location, and participation in Food Stamps and AFDC.
- Segment with highest proportion of non-participating women: unmarried Anglo Americans not receiving food stamps
- Segment with highest proportion of currently enrolled participants: Spanish-speaking Hispanic food stamp recipients.

Peer-Reviewed Literature

<table>
<thead>
<tr>
<th>Tested differences in characteristics between participants and dropouts</th>
<th>Those that earn income during the program are less likely to drop out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multivariate regression analysis, with applicant characteristics and dropping out as outcomes</td>
<td>Pregnant women with children are less likely to drop out than women with children</td>
</tr>
<tr>
<td></td>
<td>Individuals who have multiple applications during the study period are more likely to drop out.</td>
</tr>
<tr>
<td></td>
<td>Source of income differences exist between participants and dropouts</td>
</tr>
<tr>
<td></td>
<td>Bigger differences exist between participants and dropouts due to denied services, and between participants and those who missed appointments</td>
</tr>
<tr>
<td></td>
<td>Lowest incomes experienced by those who were denied services or missed appointments</td>
</tr>
<tr>
<td></td>
<td>Almost all enrollees on Medicaid</td>
</tr>
<tr>
<td></td>
<td>TANF dropouts experience higher levels of deep poverty compared to participants</td>
</tr>
</tbody>
</table>

Peer-Reviewed Literature

- Basic percentages and means, displays of frequencies and proportions
- Qualitative reporting and discussion
- Individuals who are potentially eligible for SNAP services who are encountered with direct, face-to-face outreach staff completed applications
- “Direct positive relationship” between radio advertisements and hotline calls
- Number of participants increase with increasing outreach efforts

Peer-Reviewed Literature
- Data were weighted to reflect age and race/ethnicity distributions  
- Chi square tests used to estimate whether or not variables were associated with FSP participation alone  
- Stepwise “Multivariate” logistic regression used to identify whether or not a series of variables were associated with FSP participation, while holding other variables constant  
- FSP participation higher among households with US-born individuals  
- FSP participants more likely to be on other government assistance, uninsured, single mothers and formerly in foster care  
- FSP participants are more likely to have experienced domestic violence, be pregnant, have poor physical and mental health, and were less likely to be Hispanic/Latino  
- FSP participants are more likely to be middle-aged  
- Associations that were significant holding other variables constant include single motherhood, unemployment, other government assistance (welfare and WIC), and being US-born.  
- Stigma cited as the reasons potentially eligible women do not apply

- Chi square tests for relationships between program participation and nominal variables  
- Logistic regression to identify factors associated with an increased odds of participation adjusting for potential confounders  
- Sample population was food insecure, predominantly Hispanic or non-Hispanic Black, more than half of respondents were in households below FPL, and many lacked an adult household member with a high school degree, and over half of the households lacked car ownership  
- 45%, 67%, and 78% of households reporting incidence of hunger within the past twelve months did not receive food stamps, did not go to a food pantry, and did not go to a soup kitchen, respectively.  
- Black households are half as likely as Hispanic households to receive food stamps, elderly households are less than half as likely to receive food stamps, and households with school children are less likely to attend soup kitchens.
| Pati, S., Mohamad, Z., Cnaan, A., Kavanagh, J., & Shea, J.A. (2010). | • Chi Square 2 test to compare the rate of participation in each social welfare program among the literacy levels  
• best subsets multivariate logistic regression to estimate the relation between maternal health literacy and program participation  
• assessed associations between explanatory variables to exclude multicollinearity | • Children whose mothers had adequate or marginal health literacy were more than twice as likely to participate in TANF  
• Number of children, income, and age predicted participation in TANF with SS | Peer-Reviewed Literature |
| --- | --- | --- | --- |
| Rosenberg, T.J., Alperen, J.K., & Chiasson, M.A. (2003). | • Chi square tests to identify differences between participation categories  
• Logistic regression to describe odds of failure to pick up checks | • Leavers were more likely to report problems with transportation, family illnesses, job conflicts, and perceptions of increased income affecting eligibility as possible barriers to WIC participation than were Clients, who were more likely than Leavers to cite “long waits” as barriers to participation  
• Leavers were more likely to be: women who received WIC themselves, women who did not received Medicaid for their children, those who experienced transportation problems, family illnesses and job conflicts  
• Those women who cited transportation, family illnesses or job conflicts as barriers were 2 to 3 times more likely to leave the program  
• Another model demonstrated that women who cited family illnesses and job conflicts were more likely than those women not citing those reasons to fail to pick up checks | Peer-Reviewed Literature |
<table>
<thead>
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<th>Reference</th>
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• Classification tree analysis to identify interacting characteristics that predict WIC check usage.  
• Logistic regression to examine association between total number of barriers experienced and WIC check usage. |
| California Department of Health Services (2001). | Categorization of quotes and statements into (1) “Group consensus,” (2) “Incidental but seemingly important information,” (3) “Interesting and related quotes and comments.” | Confusion of California WIC’s mission among WIC-eligible individuals was related to a lack of proper positioning of WIC within the community.  
• Many eligible women believed WIC was a “welfare program.”  
• Confusion existed regarding services provided by WIC.  
• Eligible respondents thought they were not eligible.  
• Eligible women believed WIC is meant for other women “in greater need than themselves.”  
• Travel, transportation and WIC hours of operation important factors in participation. |
| Chance, K.G. (1998). | • Frequencies and proportions to describe distribution of variables.  
• Magnitude of correlations between independent predictors and dependent variable (program participation rates) estimated with Pearson correlation coefficients.  
• Multiple regression identified independent variables explaining the greatest variability. | High correlation between overall customer focus and program participation rates ($r = 0.55$).  
• Program promotion and services coordination best predictors of participation.  
• Other predictors of participation rates include clinic space, technology and clinic hours. |
Appendix C:

Participation Concerns in the Special Supplemental Nutrition Program
For Women, Infants and Children

Cover Page

Participation Concerns in the Special Supplemental Nutrition Program
For Women, Infants and Children

Kentucky

Focus Group Question Route

Draft: April 2014

Objectives

The main objectives of this project are (1) to identify the reasons WIC participants discontinue using the program while they are still eligible and (2) to describe WIC participants’ perceptions of program services.
Instructions

- The question route provides a general guide to the concepts that need to be addressed.
- Allow the discussion to flow as naturally as possible, checking off the concepts on the Concepts Checklist sheet as they are addressed.
- Record field notes on copies of this question route.
- *Italicized content* is to be read aloud.
- Content in [brackets] is instructions for the Moderator and is not to be read aloud.
- *Bold content* indicates when the focus of inquiry shifts.

Welcome

*I would like to first start by thanking you all for participating in this focus group discussion. We understand it takes time and effort to attend this discussion, and we want you to know your participation is much appreciated.*

*You were chosen for this focus group because you had been dropped from the program after 60 days of inactivity, and we want your input on how to prevent such terminations from happening to other mothers.*

*My assistant (say name of colleague) is here to help jot down notes and write out some things as you say them on the pieces of paper on the wall. Later on, I will refer to these items to help jog your memory or ask you more about them.*

[Opener]: *What comes to mind when you think about WIC?*

[Allow discussion until at least every participant has spoken]

[Assistant records list on posted paper in marker so everyone can see (List of Services)]

*Now, I’d like you to imagine you have a close friend who you realize is eligible for the program but is not on it.*

1. *What would you tell them?*
2. Please describe your experience in using the Program.

3. What have you liked most about WIC?

4. What have you disliked most about WIC?

[Assistant records list on posted paper in marker so everyone can see (List of Barriers)]

I’d like to shift gears a little bit and talk about what might make people stop participating even though they are still eligible.

[Allow a pause in case participants begin speaking immediately. If not, ask “What makes participants who are still eligible stop using the program?”]

5. Why did you stop participating?
6. What has made it hard for you to keep appointments?

[Probe]: What kind of experiences did you have when you scheduled appointments?

Now let’s imagine I appoint all of you to a special advisory committee to help WIC make services better for people who actively participate on WIC.

[Refer to “List of Barriers” on the wall]

7. What would you suggest WIC to do to overcome [say one barrier from List of Barriers]?

[Use the following style to record notes for this question]

___[First Barrier Name]_______

[Field notes]

[Closing]: Fantastic! To close, I would like to offer you the opportunity to elaborate on anything that was discussed, or bring up something that you feel is important that we have not covered.

Thank You

I would like to express my sincerest gratitude to you all for participating in today’s focus group. Your insights and comments will help the WIC program improve for children and mothers just like you. We would like to honor your participation with a gift card. Again, thank you so much and feel free to contact me if you have further questions in the future.
Concept Checklist
For Moderator

☐ List of Services completed

☐ What they would tell a friend

☐ Description of their own experiences

☐ Likes

☐ Dislikes

☐ List of Barriers completed

☐ Barriers to participation

☐ Reasons for missing appointments

☐ Suggestions for WIC
Appendix D:

Journey Mapping

Overview

The following journey mapping experience depicts activities performed on March 26 through April 3, 2014. The goal of this exercise was to begin understanding the WIC enrollee experience during recertification appointments and shopping for a given package of approved food in a supermarket. Journey Mapping is a consumer-oriented social marketing technique that can provide researchers and practitioners with insights from users of public health programs.

Journey maps arrange the user experience into moments when the user of a program directly interacts with a particular program component. At each step of this process, the user’s perceptions, attitudes, thoughts and ideas are captured, either through notes that user takes or through interviewing. The resulting journey map collates this documentation graphically, highlighting where the user experience needs improvement.

Two journeys were undertaken to understand the WIC enrollee experience in Kentucky. First, a test WIC electronic benefit transfer (EBT) card was issued to the researcher who is a 30-year old male doctoral student who grew up in the northeast United States. The EBT card was linked to a specific food package reflective of what would be given to an enrolled mother with an
infant who was consuming formula and baby food. Two state WIC employees brought the researcher with the test EBT card to a local supermarket. One of the employees has current experience being on the program. The goal of this experience was to expose the experience of shopping for foods in fulfillment of a monthly WIC food package to the male researcher.

The second journey consisted of quiet, non-interactive observations of real certification and recertification appointments. The goal of this journey was to show the researcher interactions and information shared as well as measurements taken during a WIC employment. WIC (re)certification appointments consist of a health professional, normally a credentialed nutritionist, welcoming a family to a room where weight, height and hemoglobin are measured for all enrolled participants. Nutrition education is then administered after biomarkers are updated in a computer-based database.

Based on a series of information gathering questions to the family as well as review of information presented to the nutritionist through the database and newly updated biomarker data, general nutrition education is tailored and specified immediately during the important. The participants divulge their experiences, needs and ask questions, and the nutritionist provides guidance and suggestions for future nutrition-related behaviors, including food preparation suggestions. A follow-up recertification appointment is set when possible before the family leaves the room. After the family has left, the nutritionist finalizes the appointment on the computer as well as in paper patient records. The researcher sat in on 5 of these appointments. This journey took place in the Public Health North clinic located in Lexington, Kentucky.

**Arrival.** We arrived at the Kroger’s supermarket by a car that was barrowed from the state department of health. The store seemed centrally located, although I do not know the public transportation routes.
Review food package. Once inside, I pulled out the printed list of foods available to me through purchase with my WIC EBT card. My first reaction was that the list of items was straightforward; I am able to purchase a particular product from a particular brand in a particular quantity. I could see that, theoretically, I was shopping for a mother and her infant. I paid little attention to the quantity of each product because at first glance it seemed confusing. This would soon prove to be a fundamental problem.

Shop for food. My reaction to shopping for WIC food was dynamic. When I found the correct product in easily understood quantities, I had a strong feeling of success, and the majority of my shopping consisted of this. I spent some time at the beginning trying to understand what I was purchasing in terms of baby food and formula, but I quickly got the hang of it. However, when I looked for 100% juice in the right amount (that is, containers of either 46 or 48 ounces), I spent much time walking up and down the juice aisle not finding anything that fit my requirements. I found V8 tomato juice in a 48 ounce can and eventually found a 48-ounce container of white grape juice. I felt lost at times and then determined to make sure I used the entire value of my WIC benefit. I began to consider what a mother must feel performing this exercise with potentially other children by her side.

Checkout. As I arrived at the cashier’s line, I was confident that I had purchased exactly what was available to me through my WIC benefit. After unloading the contents of my carriage onto the conveyor belt, I pulled out my EBT card as I would a debit card. Once prompted to pay by the cashier, I swiped my EBT card, punched in the pin number that was given to me, and anxiously waited to see the result of the transaction. Notably, the anxiety stemmed from a feeling of dread if I had done something wrong, the expectation of that happening and how the cashier would react, and how I would manage either pay for what was not available through WIC or
separating out what was not covered. If I had to leave food at the cashier, I expected I would feel embarrassed. However, the entire food list was in fact covered, and my transaction cleared.

**Overall reaction.** Even though I come from having years of education and experiences shopping, there was a constant thought of surveillance in my head as I walked the aisles of the supermarket and approached checkout. Walking the aisles in search for the items on my WIC food package was objectively easy but subjectively confusing especially when trying to locate the right quantity of a particular product. Even though I only chose items listed on my food package document, I still felt anxious when standing on line at the cashier. Thoughts that went through my mind included second-guessing if I read the list correctly and being a little angry that the list was not visually pleasing.

**Welcome.** During each appointment, there was much excitement when enrollees entered the room, especially those with children. Infants were brought in with carriers and were mostly quiet throughout the appointment when present. Older children were curious and inquisitive and moved about the room, looking at scales, posters and other objects around the room.

**Measurement.** Infants are weighed and measured on a scale that allows them to lay down on their backs. Children and adults are weight and measured on a normal scale found in any physician’s office. The process of measuring infant height and weight is positive and the nutritionist and the parent dote lovingly on the infant. Both children and adults seemed curious to find out how much they weigh and how tall they are. Hemoglobin is measured in two ways: by taking a blood sample from a needle prick or by a machine (“Pronto device”) that attaches to a finger much like a heart rate monitor on a piece of exercise equipment. Children receiving a pinprick weathered the discomfort astonishingly well. Infants and children measured using the Pronto device were also pleasant during measurement, although some of those children needed to
be measured at least twice to get an accurate reading. In sum, the period of time when measurements were taken seemed pleasant with minimal frustration on all parties.

**Discussion & Record Review.** The consultation and counseling portion of the appointment seemed like what I expected. The nutritionist sat behind a desk and began asking questions to the families as she entered information into a computer database. Parents and caregivers answered questions and asked questions to the nutritionist. The nutritionist, when reviewing information from previous visits, would note on children’s growth or follow-up on concerns voiced at previous appointments. For instance, one mother anxiously waited to hear about how her child had grown since the last appointment and she seemed relieved after being told. Another mother had mentioned at an earlier appointment she did not find out she was pregnant until weeks into the pregnancy and, during the time when she did not know her pregnancy status, she had consumed alcohol. The nutritionist specifically followed up with this mother regarding this concern.

**Nutrition Education.** The information regarding nutrition seemed to happen mainly after the nutritionist was able to update each enrollee’s biomarker information, but it also seemed to informally occur throughout the appointment. The interaction seemed extremely enrolled-focused and the nutritionist was adept at relaying professional recommendations while also tailoring those recommendations based on enrollee concerns. One mother and father attended together and a mother and grandmother also attended together, and this made me feel like there was a strong team that was taking care of the enrolled children. One pregnant mother attended with the father, but the father spent the entire time on his smartphone; his disengagement seemed by choice. The nutritionist focused on supporting the pregnant mother’s decision to breastfeed and made attempts at gaining the support of the disengaged father.
Scheduling next appointment. Scheduling appointments happens quickly and it was obvious that families would make quick mental calculations about the date of the next appointment and their weekly routines including work schedules and grocery shopping outings. Dates were set.

Exit. All exits by families felt pleasant and everyone left smiling. Immediately after the family left the room, the nutritionist feverishly completed all lingering tasks on the exiting families’ profiles, printed out information and then placed those forms into the families paper file and then brought the file to another room. The nutritionist’s ability to multitask was astonishing. I could feel her efforts in maintaining eye contact with the clients, and after clients had left she made sure to complete what she did not complete during the visit. After completing the file, the nutritionist picked up the next client’s file to review and prepare.

Overall reaction. I think the clinic I attended was unique in its abilities. The nutritionist was stellar and able to complete a large number of tasks while keeping attention on the enrollee and their questions. Each client had unique needs and the nutritionist, based on the information and resources she had in front of her, was able to provide useful and tailored feedback. I thought this process was efficient. However, after three appointments, I felt extremely tired. The nutritionist kept going. Her energy was commendable and almost inexplicable. I had many thoughts about what it must be like to be the nutritionist and how long it would take before I felt like I needed to leave this job.

Recommendations & Touch Points of Interest

Shopping

- Make a user-friendly printed food package list
- Explore the food package available through the WIC app (ask Rhonda and Ashley about this…an app is available)
• Can the WIC app use the camera to scan a product UPC and indicate if it is available through the package?
• Can the app be linked to the public transportation maps? Does DOT have a real-time map that can be linked to the app?
• Can store cashiers be trained in how to manage problems with WIC purchasing? Role playing or mock shoppers?

Certification Appointments
• I had a suspiciously positive experience at Public Health North.
• How does the scheduling type affect the consumer experience?
• The Pronto machine allows situations where an infant or child who is accompanied by a proxy for their caregiver to get a hemoglobin reading without drawing blood. This is a good solution to get around the rule that WIC staff must get in-person permission from legal guardian to draw blood.

Employee Journey Mapping
• While the nutritionist at the certification experience was seemingly exceptional, it must be noted that persistence of this achievement may not be sustainable. More should be explored regarding the employee journey and the factors related to employee departure from WIC staff positions.
• More should be understood regarding how to retain strong employees.
Appendix D: Journey Mapping

Figure D1. Researcher’s Emotional Reactions and Observations: Supermarket Shopping
Appendix D: Journey Mapping

**Figure D2.** Researcher’s Emotional Reactions and Observations: Certification Experience
Appendix E:

USF Institutional Review Board Research Protocol Approval

4/28/2014

Anthony Panzera, MPH
Community and Family Health
12001 Bruce B. Downs Blvd. MDC 56
Tampa, FL 33612

RE: Expedited Approval for Initial Review
IRB#: Pre00016732
Title: Understanding Nonparticipation in Kentucky WIC: Implications for Outreach


Dear Dr. Panzera:

On 4/28/2014, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents outlined below.

Approved Item(s):
Protocol Document(s):
Protocol_Kentucky WIC_Nonparticipation

Consent/Assent Document(s)*:
Kentucky WIC IRB, approved by CHFS.pdf
USF Informed Consent for Kentucky WIC Project.pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consen/assent document(s) are only valid during the approval period indicated at the top of the form(s). Please use only one of the two documents noted above (for consistency).

Please submit an amendment within two (2) weeks of the date of this letter for the following:

1 - Based on confirmation from the faculty advisor, no one under the age of 18 will be enrolled in this study. The PI is requested to revise the application via an amendment submission to remove the notation of the children population and revise the age range to
include only adults 18 years of age and older (or submit a parental permission and assent document for minors).

2 – For consistency, only one of the approved informed consent documents listed above should be used to consent subjects. The other documents uploaded to 7.2.1 of the application should be removed via the amendment. It is recommended the study team use the informed consent document that is also approved by the Kentucky CHFS IRB.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review categories:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

This research, which will potentially involve pregnant women as subjects, was reviewed and approved according to 45 CFR 46.204.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

John Schinka, Ph.D., Chairperson
USF Institutional Review Board
Appendix F:

CHFS Institutional Review Board Research Protocol Approval

February 10, 2014

Anthony Dominic Panzera
Graduate Research Associate & Doctoral Student
Florida Prevention Research Center
College of Public Health, University of South Florida
13201 Bruce B. Downs Blvd. MDC 56
Tampa, FL 33612

Dear Mr. Panzera:

Your research project titled “Understanding Nonparticipation in Kentucky WIC: Implications for Outreach” was approved by the Cabinet for Health and Family Services Institutional Review Board (CHFS IRB) through the expedited review procedure on February 10, 2014. This approval expires February 9, 2015.

In addition to all other requirements of 45 CFR 46.101-46.409, it is the responsibility of the researcher to:

1. obtain approval by the CHFS IRB for any modification in the research protocol or design that may increase the level of risk to a subject or a subject’s confidentiality prior to implementation;

2. advise the CHFS IRB of any unanticipated problem involving a risk to a subject or another individual as a result of the research activity as soon as possible;

3. submit to the CHFS IRB an electronic copy of the final research findings and conclusions;

4. if the study will extend beyond February 9, 2015, submit a Continuation Review Form and Status Report to the CHFS IRB on or before January 9, 2015; and

5. provide the CHFS IRB, in advance of its presentation or submission for publication, a copy of any presentation, manuscript or other public disclosure document.
If you have any questions about any of the above or need additional information, please contact me at (502) 564-3418 x4315 or Bob Blackburn, CHFS IRB Administrator, at (502) 564-5497 x3711.

Respectfully,

Doug Thoroughman, Ph.D., MS
Co-Chair
Cabinet for Health and Family Services
Institutional Review Board
Appendix G:
Planning Guide for Nonparticipation Study

What is the purpose of this group discussion?

The purpose of the group discussion is to talk with current and previous WIC enrollees about their participation experiences.

Who can and cannot participate?

*Can:* Persons who are not currently enrolled in WIC due to non-participation, or current participants who have been terminated in the past for nonparticipation.

*Cannot:* Persons, who have never been enrolled in WIC, have never had dependents enrolled in WIC, or individuals who were found categorically ineligible to participate in WIC.

Who is conducting this project?

Anthony “Tony” Panzera will lead the group discussion. Tony is a doctoral student from the University of South Florida who is working closely with the Kentucky WIC Program to understand enrollees’ experiences participating in the WIC program since 2012.

How will this effect participant services?

Being part of the group will not affect participants’ WIC services. Discussion groups will be scheduled outside participants’ regularly scheduled WIC appointments.

How will information be kept private?

Participants’ names will never be used in any reports or any documents that are shared with others.

Why should participants sign up?

The discussion is a chance for past and current participants to give input on the quality of their program experience, barriers they encountered, and anything that is important that they would like to communicate to WIC.

How and when will participants be paid?
Participants will be given a gift card with a value of $20 at the conclusion of the group discussion.

Is childcare available?
Childcare is not available during the discussion. However, participants are not barred from bringing their children to the group discussion.

Is transportation available?
No, transportation is not available.

Can participants bring someone along, like a friend?
Participants are allowed to bring a friend or family member along to cover needed transportation and childcare. However, accompanying friends and family members will not participate in group discussions.

Who should I call if I have more questions?
If you have questions, please feel free to contact Gloria Aponte Clarke at mailto:gloria.aponteclarke@altarum.org (xxx)xxx-xxxx
Appendix H:

Kentucky Recruitment Steps for Focus Group Interviews

Recruitment Strategies
Recruitment will begin two weeks before the group interview date. WIC nutrition educators and front office staff will recruit focus group participants in the clinics. Recruitment fliers will be posted in the Health Department. Quarter cards will be provided to local staff in charge of recruitment to mail to nonparticipants whom staff members identify. Scripts will also be provided to recruitment staff for those reaching out to potential participants over the telephone.

Registration
A registration list will be kept with the front desk clinic staff on a dedicated clipboard. Ten WIC clients will be registered for each group interview with the expectation that some will not show up. This allows for a likely minimum of 5 individuals per group.

Location and incentives
The focus group interviews will be held at your Local Health Department. Each participant will receive an honorarium of $20 gift card to thank them for their time. The incentive will be provided to each participant who is present. Anthony “Tony” Panzera will provide the incentive.

Site level contact person
Each Health Department will identify a contact person who will assist Tony Panzera and Ashley Napier to assure adequate participation for the focus group interviews. Dates and locations will be determined by local health department staff in collaboration with Rhonda Goff, Ashley Napier and Tony Panzera.

The site contact would be responsible for:
1. Posting the recruitment fliers in the Health Department (two weeks before group date)
2. Encouraging terminated WIC clients to register for the focus group (during the 10 working days prior to the scheduled group interview at the site)
3. Registering participants for the group(s) (taking down name, phone number to be reached the day before the group interview).

Recruitment Timeline
Three weeks prior to group discussion:
• Recruitment materials sent to participating sites

Two weeks prior to group discussion:
• Fliers will be posted in WIC client areas
• Site contact person begins recruiting participants according to criteria

Persons who agree to participate will receive a reminder call the day before the group interview by Ashley Napier.

Staffing
When possible, Tony Panzera will have one staff member present at each group interview. This staff person will assist with registering participants, manage any issues that arise while the focus group is being conducted (e.g. outside noise, the need for additional chairs, late-arriving participants, etc.), and take notes.
Appendix I:

Script for Telephone Recruitment

Hello!

My name is [state your full name] and I work at [state your county] WIC.

We are contacting you because you are or have participated in WIC and we want to hear about your experience.

To do this, we are hosting group discussion with previous and current WIC mothers.

If you are available, we would love to hear your story!

Taking part in the discussion is confidential and your privacy is important to us. The discussion will begin with a short registration survey and will then be followed by a group discussion led by Tony Panzera, a student who is working with WIC.

The discussion will last one hour, and at the end we will provide you with a $20 gift card! Light refreshments will also be provided.

Would you like to participate?

[If NO]: Thank you so much for your time and you have a wonderful day.

[If YES]: That’s wonderful!

We have a couple of dates available to you.

[Recruiter lists dates and writes down the preferred date below]

Recruited Participant Name: ____________________________

Telephone Number: ______________________________________

Date of Recruitment: _____________________________________

Preferred Date: __________________________________________
Before I let you go, just a couple of things.  

First, we don’t have childcare available, but your children are welcomed. If you would like to bring a friend or family member to help with childcare or transportation, that is fine.

Any questions or concerns?

[If YES]:

[Recruiter writes questions and concerns below]

Notes:

[Recruiter answers questions to best of their ability; otherwise, tell the participant we will call them back to answer their questions]

[If NO… Continue to Closing]

[Closing]

Thank you so much for your time and decision to participate. As the discussion group date approaches, we will call you at this number to remind you.

Is there a better number to reach you?

[If YES]: __________________________

[IF NO…Continue]

Great! Looking forward to seeing you on the ______[date of discussion group]______

Bye now!

[End of Call]
Appendix J:

Double-sided recruitment postcard

Please Tell Us What You Think!
We will give you a $20.00 gift card for your time
Study # CHFS-28B-DPR-F714-98

When: 
Time: 
Where: 
To sign up for this group, contact your Local Health Department at

We want to hear your thoughts about participating in WIC!

What is the purpose of this group discussion?
- The purpose is to talk with current and previous WIC enrollees about their participation experiences.

What will the group discussion be like?
- Discussion will last no longer than 1 hour
- Each group will have between 5 and 8 people
- Two very short forms will be completed at the beginning
- Discussions will be audio recorded
- All discussions are confidential
- $20 gift card will be provided to each participant at the end of the discussion

Light snacks will be served
Appendix K:

Approved Participant Consent Form

Participant Consent Form

(IRB # CHFS-IRB-DPH-FY14-25)

You are invited to participate in a focus group discussion about your experiences participating in WIC. WIC, partnering with researchers from the University of South Florida, is interested in learning about the factors that influence your WIC experience. Anthony Dominic Panzera, a researcher and doctoral student with the University of South Florida, will be conducting focus groups. During the focus group discussion, you will be asked questions about your suggestions, perspectives and opinions regarding your WIC experience.

Participation in this discussion will take approximately 60 to 120 minutes. We will use your responses to identify what works well, challenges that you mothers like you face when attending WIC clinic appointments, and things that make participation easier for you. Our goal is to help WIC better serve participants like you.

Your individual privacy will be strictly maintained. We will refer to each other by first names during recorded discussions, and you will not be asked to provide any personal identifying information, such as your full name and address. Your WIC benefits will not be affected. You will receive a gift card for your participation in the focus group.

Your participation is completely voluntary, and you have the right to refuse, withdraw your consent, or discontinue participation from this study at any time without penalty or loss of benefits to which you are otherwise entitled. We ask that you provide only as much information as you feel comfortable sharing.

You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I consent to take part in this focus group discussion and understand that I am being recorded.

Your Signature ___________________________ Date ______________________

Your Name (printed) ________________________________________________
In addition to agreeing to participate, I also consent to having the focus group tape-recorded.

Your Signature ___________________________ Date ____________________

Signature of person obtaining consent ______________________ Date ____________________

Printed name of person obtaining consent ______________________ Date ____________________

Incentive Receipt

To show appreciation for the time that you spent talking with us today, we are offering you a gift card for your time. Please indicate that you agreed to participate in the interview and that you received the payment by signing below.

Printed Name of Participant

______________________________ Date ____________________

Signature of Participant Date ____________________
Appendix L:

WIC Focus Group: Intake Survey

1. What is your age? ___________

2. How would you describe your ethnicity?
   - Hispanic or Latino
   - Not Hispanic or Latino

3. How would you describe your race (Check all that apply)?
   - American Indian or Alaska Native
   - Asian
   - Black, or African American
   - Native Hawaiian or Other Pacific Islander
   - White
   - Other: __________________

4. Did you receive education about healthy eating?
   - Yes
   - No

5. Did you use the food benefits when you were enrolled in WIC?
   - Yes
   - No

6. How would you describe your satisfaction with the foods provided by WIC?
   - Very Satisfied
   - Satisfied
   - Neither Satisfied Nor Dissatisfied
   - Dissatisfied
   - Very Dissatisfied

7. If you had an infant on WIC receiving formula, did your infant continue on the program after he/she turned one year old?
   - Yes
   - No

8. While on WIC, did you have an experience at the health department that did not meet your expectations?
   - Yes
   - No
   
   If yes, please explain: ____________________________

9. Did you have any difficulties getting an appointment for WIC?
   - Yes
   - No

   If yes, please explain: ____________________________

10. Do you use any other resources to purchase food, such as SNAP?
☐ Yes  ☐ No

If yes, please explain: ________________________________
About the Author

Anthony Dominic Panzera was born in Suffern, New York in 1983 and grew up in New City, NY. Tony obtained his Bachelor of Science from Cornell University and his Master of Public Health from Brown University. He has worked in a multitude of settings that attest to his interdisciplinary thinking: from cellular science at the National Heart, Lung, and Blood Institute to private health policy firms in Washington, D.C. He has spent much of his public health career focused on examining the interaction between maternal and child health and local, state and federal services and programs. His professional mission is to leverage leadership, social marketing, epidemiology and data analysis to make America a healthier place for children and families.