

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

Spillover Effect: Do Siblings Reap the Benefits?

by

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A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Science

Approved November 2018 by the
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ARIZONA STATE UNIVERSITY

May 2019

ABSTRACT

Objective: The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is a federally-funded program that provides supplemental food packages, nutrition education, and healthcare referrals to low-income women, infants, and children under 5, who are at the highest nutritional risk. This study explores if household WIC participation is associated with healthier dietary behaviors among age-ineligible children (5-18-years-old) in WIC households. Consumption frequency of fruits, vegetables, 100% juice, sugar-sweetened beverages (SSBs), and energy-dense snacks (sweet and salty snacks) among children from WIC and income-qualifying non-WIC households were compared.

Methods: Data were obtained from two cross-sectional panels (2009-10 and 2014) of the New Jersey Child Health Study conducted in four low-income New Jersey cities.

Questions from previously validated surveys assessed consumption frequency of fruits, vegetables, SSBs, and sweet and salty snacks. Analyses were confined to 570 children between 5-18 yrs; of which 365 (5-11 yrs: 237, 12-18 yrs: 128) resided in WIC participating households and 205 (5-11 yrs: 138, 12-18 yrs: 67) in income-qualifying non-WIC households. Over half of the sample was African American and 43% were Hispanic. Multivariable analyses were conducted to compute incidence rate ratios (IRRs) using negative binomial regression to compare the differences in eating behaviors of children in WIC vs. Non-WIC households

Results: Household WIC participation was associated with a slightly higher frequency of vegetable consumption among 12-18-year-old children (IRR= 1.25, $p=.05$); differences were significant among older males (12-18-years-old) ($p=.006$), and not in females.

Frequency of 100% juice consumption was significantly higher among younger females (5-11-years-old) in WIC households who consumed juice about 44% more frequently ($p=.02$) compared to similar age girls in non-WIC households. Hispanic children in WIC households reported a lower frequency of SSBs consumption ($p=.01$); this association was only true among males ($p=.02$).

Conclusions: Household WIC participation is associated with healthier dietary behaviors among age-ineligible children living in the households, suggesting a positive spillover effect of the program. Proposed changes to WIC packages are likely to have dietary implications not only for WIC participants but also for non-participating children residing in WIC households.

ACKNOWLEDGEMENTS

I want to thank Dr. Punam Ohri-Vachaspati for agreeing to create a mentoring partnership with me. I was honored to work with you and appreciated the opportunities you provided me with in the academic field. You helped carve my experience, knowledge and expertise in the world of research. I also want to extend appreciation to my committee members, Dr. Natasha Tasevska and Dr. Robin DeWeese for sharing their knowledge and craft to help make this project possible. My extended thanks to Dr. Francesco Acciai, for your critique, support and extensive set of skills both in and outside this field. You have been a great friend and mentor to me. I would like to acknowledge my dear colleagues who gave me an extensive amount of support throughout this process. To my mother, who helped push me to be diligent, passionate, and strong. Thank you for the support and the knowledge you bestowed upon me. And finally, thank you to those who supported and partnered with the New Jersey Child Health Study and Rutgers University.

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CHAPTER 1

INTRODUCTION

Dietary behaviors formulated in childhood have been found to set the basis for eating behaviors in adulthood (Craigie et al., 2011), and can influence future health and longevity (Neumark-Sztainer et al., 2011; Cutler et al., 2010). Among children, early exposures to food, parental modeling, family-eating behaviors, and the food environment can all influence child intake patterns (Zarnowiecki, Dollman & Parletta, 2014). Healthy eating behaviors are important for reducing undernutrition and nutrient-related deficiencies and promoting physical development. Current intake trends consistently show that children do not meet dietary recommendations for fruits, vegetables and whole grains (Kim et al., 2014; Banfield et al., 2016), and consumption of empty calories from saturated and trans fats (desserts) and added sugars (sugar sweetened beverages) is high (Banfield et al., 2016; Powell et al., 2016). Disparities in dietary quality and behaviors have also been observed by demographic characteristics, such as, sex, age, race and socioeconomic status (SES).

Total fruit and vegetable consumption tend to be higher among females (Kim et al., 2014), and males are found to consume a larger amounts of sugar-sweetened beverages (SSBs) and sweet and salty snacks (Powell et al., 2016; Dunford and Popkin, 2017). Distinctions by age groups demonstrate that younger children (4-8-years-old) tend to have a better dietary quality and higher consumption of fruit and 100% juice compared to adolescents (14-18-years-old) (Banfield et al., 2016; Gu and Tucker, 2017). When exploring age-related disparities, adolescents (12-18-years-old) consume more SSBs than their younger counterparts (2-6-years-old), which may be due to autonomy in purchasing behaviors (Vander Veur et al., 2013; Rosinger et al., 2017).

Disparate patterns in dietary intakes among racial/ethnic groups are also observed, especially among African American children who have consistently been shown to have poorer dietary quality (Gu and Tucker, 2017), and the highest intake of caloric snacks (sweet and salty snacks), SSBs and lower intakes of fruits and vegetables when compared to other racial/ethnic groups (Dunford and Popkin, 2017; Powell et al., 2014; Tasevska et al., 2017; Kim et al., 2014). Hispanic children have higher intakes of added sugars and fats compared to their non-Hispanic counterparts (Han and Powell, 2013; Rosginer et al., 2017).

Dietary inequalities are contingent on socioeconomic status (SES) (Drewnowski and Specter, 2004). Children from lower income households have lower dietary quality (Van Ansem et al., 2014), and are less likely to meet recommendations for fundamental Healthy Eating Index (HEI) components, such as whole grains, fruits, and vegetables when compared to those of a higher SES (Gu and Tucker, 2017; Kitzpatrick et al., 2013). In regards to food group consumption, children of lower SES have been observed to have higher intakes of SSBs, saturated fats, added sugars, 100% juice, and reduced consumption of fresh fruit and vegetables than their higher income counterparts (Van Ansem et al., 2014; Park et al., 2012; Valmorbidia and Vitolo, 2014; Drewnowski and Rehm, 2015), which is likely related to a variety of factors, such as food cost, access to grocery outlets or nutrition education (Thornton, Lamb & Ball, 2016; O'Malley et al., 2014; Adamo and Brett, 2014).

In response to inadequate consumption of healthy foods among young low-income children, the federal government established the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Participants are required to meet income guidelines, show proof of residency and be considered at “nutritional risk” (United States

Agricultural Department [USDA], 2017). WIC provides vouchers for specific foods, nutrition education, and health care referrals to low-income pregnant or post-partum women, infants and children up to the age of 5, who are considered at nutritional risk (USDA, 2017). Supplemental food packages include specific food items from food categories considered lacking in diets of targeted populations. They are prescribed based on the nutritional needs of the participants and include: whole grains, dairy, fruits, vegetables, 100% juice, fish, eggs, and infant formula and foods (USDA, 2017).

Research has consistently shown that participation in a WIC program improves the dietary quality of participants, specifically in relation to an increase in fruit, vegetable, whole grain and milk consumption and decrease in fat and added sugar content of diets (Siega-Riz et al., 2004; Wilde et al., 2000; Tester et al., 2016; Chiasson et al., 2013). Although available literature indicates a benefit of participating in WIC for children under 5 years of age, little has been done to explore how these benefits may influence the dietary behaviors of age-ineligible children (5-18-years-old) residing in WIC participating households.

Economists have made groundwork in exploring how WIC benefits may possibly spillover to age-ineligible children residing in WIC households. Using NHANES data, Ver Ploeg (2009) found that HEI scores for 5-17-year-old children from WIC participating households were higher compared to similar children who lived in non-WIC households. It was also found that the association of WIC and HEI scores were stronger for children who lived in families with two WIC participants, providing evidence that a larger dose of WIC benefits had a greater impact on the diets of age-ineligible children in the family (Ver Ploeg, 2009).

Robinson (2013) showed that 5-17-year-old children living in WIC participating households had higher physician rated health scores than similar-aged children living in income qualifying non-participating households. These differences were more pronounced among older male children (12-17-years-old). No differences were found for female children, which may be attributed to intra-household allocations, where male children may be allocated more household resources, such as food, nutrients, or education, thereby increasing the magnitude or likelihood of a health spillover (Robinson, 2013).

While some health benefits of household WIC participation have been identified among older children, research has yet to examine consumption behaviors associated with specific foods that are provided in WIC supplemental food packages among older (5-18-year-old) children living in WIC households compared to those living in income qualifying, but non-participating households. WIC participants have higher consumption patterns of products included in WIC packages and lower intakes of added sugars and fats (Oliveira, Gundersen & USDA, 2000; Tester et al., 2016). If package benefits “spilled over” to age-ineligible family members, similar dietary patterns would be assumed to be observed. Further, given that previous research showed disparate spillover benefits on health status among non-eligible children in WIC households (Robinson, 2013), it is important to examine potential disparities in WIC spillover effect on dietary consumption patterns in these children based on race, gender, and age groups (5-11 and 12-18-years-old).

Study Purpose

The primary objective of this study is to assess the association between household WIC participation and dietary intakes of age-ineligible children (5-18-years-old) residing

in WIC households, and to examine if these patterns vary by age, sex, and race. The six food categories examined include: fruits and vegetables, 100% juice, sugar-sweetened beverages (SSBs), fruit and vegetable as snacks, and energy-dense snacks.

Research and Hypotheses

The current study will address the following research question.

1. *How does fruit, vegetable, 100% juice, sugar-sweetened beverage (SSBs), and energy-dense snack (sweet and salty snack) consumption in 5-18-year-old children in WIC households compare with children of the same age from income qualifying non-WIC households? How does this compare by age groups [(5-11 years) and (12-18 years)], sex and race?*

Hypotheses:

- A. In WIC participating households, 5-18-year-old children will have a higher 100% juice consumption and lower SSBs consumption than 5-18-year old children in non-participating income qualifying WIC households.
- B. In WIC participating households, 5-18-year-old children will have higher intakes of fruit and vegetables and lower consumption of energy-dense snacks when compared to non-participating income qualifying WIC households.
- C. The above assessed behaviors will vary with demographic characteristics of children.

Definitions of Terms:

- Sugar- Sweetened Beverages: Drinks with added sugars (non-diet drinks, sports drinks, sweetened tea or energy drinks)
- Energy Density: Amount of energy (or calories) per gram of food

- National Health and Examination Survey (NHANES): A program of studies designed to assess the health and nutritional status of adults and children in the United States.
- Healthy Eating Index: A measure of diet quality that assesses conformance to The Dietary Guidelines for Americans

Delimitations and Limitations

- Data were obtained from two cross-sectional panels (2009-10 and 2014) from the longitudinal New Jersey Child Health Study
- Data were collected in four low-income cities in New Jersey: Camden, New Brunswick, Newark, and Trenton
- Demographic and frequency of food group consumption data were collected on the index child and adult relative
- Respondents were adults who were 18 years and older who made most of the household food purchasing decisions, and were included in the study if they were able to speak English or Spanish
- Six food items were examined: fruits, vegetables, fruits and vegetables as snacks, SSBs, 100% juice, and energy-dense snack consumption based on their association with WIC household participation
- Dietary consumption along with participation in government programs were all self-report and limited to the respondent
- Not all dietary behaviors were examined; thus, some potential effects may not have been captured.

- All data were cross-sectional and causal inferences in terms of dietary intake and health could not be determined.
- Data did not reveal if the mother or infant were the only WIC beneficiary, and was not available for children between the ages of 0 to 1 years old residing in the households.

CHAPTER 2

REVIEW OF THE LITERATURE

Dietary Behaviors

The early years of life among children play a critical role in the evolution of eating behaviors including, but not limited to, food exposures, parental feeding practices, and household food availability (Savage, Fisher and Birchheal, 2007; Nepper and Chai, 2015). Healthy dietary habits in childhood may be a preventive step in reducing risk of long-term chronic health problems (World Health Organization and Food and Agriculture Organization of the United Nations [WHO and FAO], 2003). Healthful eating habits would be those that are more closely aligned with the Dietary Guidelines for Americans (DGA), which recommend high fruit and vegetable intake with an emphasis on orange, red, and dark green vegetables, whole grains, low-fat dairy, legumes and nuts, oils, and lean protein (U.S. Department of Health and Human Services and U.S. Department of Agriculture {USDA}, 2015). The guidelines also suggest a limitation on added sugars and saturated fat to 10% of total calories each, and restricting sodium to 2,300 mg per day (USDA, 2015).

Current Trends in Children's Dietary Behaviors

Despite dietary recommendations, current trends in child dietary intake data demonstrate that children fail to meet these guidelines (Banfield et al., 2016). Current intake trends demonstrate poor intakes related to fundamental DGA components, such as fruits, vegetables, whole grains, and dairy (Gunenther et al., 2013; Acar Tek et al., 2011), and are found to exceed recommendations for calories related to added fats and sugars (Gunenther et al., 2013). Although a majority of children struggle to meet recommendations, research has demonstrated dietary quality is influenced by a number of

demographic factors. Individuals of lower SES and minority populations are observed to participate in more adverse dietary behaviors than those of higher income status (Patrick and Nicklas, 2005; Kant and Graubard, 2007; Park et al., 2012; Han and Powell, 2013; Rosginer et al., 2017; Ogden et al., 2011 Kim et al., 2014; Tasevska et al., 2017), which is likely related to associated food costs, nutrition education, and access to food outlets (Patrick and Nicklas, 2005; Keane et al., 2016). Sex-related differences in food choices demonstrate that males are more likely to participate in adverse dietary choices (Brener et al., 2011; Ogden, 2011; Nilufer Acar et al., 2011).

Research has observed that as a child progresses into adolescence, there is an observed shift in food choices, such as increased consumption of SSBs, nutrient-poor processed snacks (Nielsen et al., 2002; Nelson et al., 2009), and decreased consumption of fruits and vegetables (Larson et al., 2007), milk, and 100% juice (Nelson et al., 2009; Neilsen et al., 2002), which likely serves as an explanation for age-related differences in dietary quality.

Dietary quality and food choices in childhood become important factors when considering the high prevalence rates of child overweight and obesity in the United States, and its long-term impact on health and risk of chronic disease. Dietary quality is influenced by stable demographic factors, but is also influenced by modifiable factors, including nutrition education, beverage choices, and other lifestyle behaviors (LaRowe et al., 2007; Veugeler et al., 2005; Dixon et al., 2000). This review will explore the benefits, risks, and policies related to consumption of key food categories, specifically fruits and vegetables, SSBs, 100% juice, and energy-dense (sweet and salty snacks) that are a cause of concern amongst the diets of children.

Fruits and Vegetables

Fruits and vegetables are fundamental elements of DGA because they are natural sources of vitamins and minerals and fiber, which are considered essential to health and protective against major chronic disease (Liu, 2013). Further, there are a variety of benefits associated with fruit and vegetable intake in children, such as academic performance, digestive health, healthy weight status and immune health (Kim et al., 2016; Benton et al., 2010; Elkhayat et al., 2016; Mora, Iwata, & Von Andrian, 2008; Stephensen, 2001; Wintergerst, Maggini, & Hornig, 2007; Alpert, 2017).

Benefits of Fruit and Vegetable Consumption in Children

Research has demonstrated that dietary quality impacts cognitive thinking and behaviors, which are factors that have an effect on academic performance (Kim et al., 2016; Benton et al., 2010). Research has suggested that lower-fat diets incorporated with adequate fruit and vegetable intake improves students' academic performance (Florence, Asbrdidge & Veugelers, 2008; Maclellan, Taylor & Wood, 2008). The nutrient composition of fruits and vegetables can also indirectly influence academic performance by its effect on child health status, specifically quality of life and gastro-intestinal distress, which can be negatively impacted by poor digestive health (Elkhayat et al., 2016). Fruit and vegetables are good sources of dietary fiber, a nutrient that improves and maintains digestive health and functioning (Sibyulle et al., 2002). For children, dietary fiber is an important tool in reducing the prevalence of gastro-intestinal distress (Loening-Baucke, 1993), therefore potentially influencing scholarly performance. Dietary fiber has also been associated with reduced risk of developing chronic diseases, such as Type 2 Diabetes and Cardiovascular Disease, therefore further influencing adult health status (Lockyer, Spiro & Stanner, 2016).

Fruits and vegetables also have diverse antioxidant, mineral, and vitamin profiles that are directly linked to physiological functioning in regards to immunity and immune health (Meydani, Beharka, & Mayer, 2000; Mora, Iwata, & Von Andrian, 2008; Stephensen, 2001; Wintergerst, Maggini, & Hornig, 2007; Alpert, 2017). Proper nourishment and absence of deficiencies is crucial for both maturation and the defense response, and despite the number of biological and physiological benefits to adequate intakes of fruits and vegetables, children fail to meet dietary recommendations.

Current Guidelines and Levels of Consumption

For children, the DGA recommends 1-3 cups of vegetables and 1-2 cups of fruit per day (USDA, 2015). For children and adolescents, fruit and vegetable intakes are well below recommended levels (Kim et al., 2014). According to the State Indicator Report by the Center for Disease Control (CDC) 2013, the median intake of daily fruit and vegetable consumption amongst adolescence in United States averaged to approximately 1 serving of fruit and 1.3 for vegetables. Further, only 36% reported eating one serving of fruits or vegetables on a daily basis (CDC, 2013). Although national intake trends demonstrate that the majority of children are not meeting recommendations for fruits and vegetables, literature also demonstrates observed disparities in consumption patterns by demographic groups.

Factors Related to Fruit and Vegetable Consumption

Food choices are largely dictated by a variation of determinants, such as SES, race, sex, and age (Azagba and Sharaf, 2011), and research has demonstrated that these demographic characteristics influence children's fruit and vegetable consumption.

Socioeconomic status. Families and individuals of low SES have been found to be at the greatest deficit for fruit and vegetable consumption (Valmorbida et al., 2014;

Heron et al., 2008; Lorson et al., 2009; Sandvick et al., 2010), which is likely associated with cost, quality or variety of produce, lack of grocery outlets, or deficiencies in knowledge of dietary recommendations, or nutrition education.

Disparities by race. African American and Hispanic children are observed to consume less fruits and vegetables than their white peers (Kim et al., 2014). Diet- related disparities are likely due in part to area of residence, socioeconomic status or culture (health beliefs or dietary practices that are specific to that population (Satia, 2009).

Disparities by sex and age. A large majority of males are consistently insufficient in meeting recommended intakes and lag behind their female counterparts (Lorson et al., 2009; Gylln, Emmett & Rogers, 2005). Age-related differences have also been observed in fruit and vegetable consumption; research has demonstrated that younger children (2-5-years-old) consume significantly more fruits than older children (Lorson et al., 2009; Kim et al., 2014; Albani et al., 2017). For vegetable consumption, older children (12-18-years-old) consume higher mean intakes of total vegetables, but most commonly in the forms of white potatoes when compared to their younger counterparts (Lorson et al., 2009; Kim et al., 2014). There is also an observed dietary shift in the consumption of fruits and vegetables across childhood, where portions of intakes decrease when entering late childhood and early adolescence, which may be influenced by autonomy in food choices (Albani et al., 2017).

There are a variety of demographic characteristics that are predictors of fruit and vegetable intake among youth, and in acknowledgment of these factors the federal government and school-based programs have established policies and programs in an attempt to increase access and consumption of fruits and vegetables among children.

Policies and Guidelines to Promote Fruit and Vegetable Consumption

The school-setting presents an opportunity to influence child dietary behaviors due to its reach. It has established policies and programs in place to help increase fruit and vegetable consumption among students.

The National School Lunch Program. The National School Lunch Program (NSLP), a program that functions under the National School Lunch Act, is a lunch service operating in public and participating non-profit private schools that provides reduced or free lunch to students that are income-eligible through school subsidies (USDA, 2017). For schools to receive reimbursements and USDA graded food for meals served, they are required to meet federal nutrition meal guidelines (USDA, 2017). A significant change to the NSLP was the mandate under the Healthy Hunger-Free Kids Act of 2010 (HHFKA2010) that required changes to NSLP nutrition standards. The new standards increased portions of fruits and vegetables, whole grains, low fat/fat free milk, and a set target for sodium.

Fresh Fruit and Vegetable Program. The Fresh Fruit and Vegetable Program (FFVP) is a federally assisted program that provides free fruits and vegetables to children within eligible schools outside of standard meal times (USDA, 2016). There has been evidence indicating that consumption in participating schools has increased due to the prevalence of this program in eligible schools (Bartlett et al, 2013).

Salad Bars to Schools. Salad Bars to Schools functions with the purpose of increasing access and promoting consumption of fruits and vegetables within select United States schools through self-serve salad bars (United Fresh Start Foundation {UFSF}, 2017). A limited body of research has demonstrated that salad bars may have the potential to increase frequency of intake for both fruit and vegetable consumption in

students (Slusser, Cumberland, Browdy, Lange, & Neumann, 2007). Results have been mixed regarding the benefit of fruit and vegetable access and frequency of consumption due to salad bars, while others have shown no change in intake (Adams, Pelletier, Zive, & Sallis, 2005; Johnson et al., 2017).

WIC and Cash Value Voucher (CVV). The WIC program is designed to meet and address specific nutritional needs of low-income pregnant, postpartum non-breastfeeding and lactating women, infants and children up to 5, who may be susceptible to greater levels of nutritional risks than their counterparts (Institute of Medicine [IOM], 2006). This program provides 7 different supplemental food packages and other package benefits to those eligible, and participants can redeem these benefits in the form of food vouchers to obtain specific types of foods in participating food outlets.

In 2007-2009, the addition of the CVV for purchase of fruits and vegetables among other important revisions were a significant change to benefit packages. Cash allowances were \$11 for women and \$8 for children (6 months of age and older) that increased acquisition of a variety of fruit and vegetables within their supplemental food package (IOM, 2006). Due to the allowance of CVV vouchers there has been significant increases of fruit and vegetable consumption within the WIC population (Whaley et al., 2012; Ishdorj and Capps, 2013).

A study conducted by Whaley et al. (2012) aimed to explore the impact of the WIC package revisions on participant's consumption patterns of fruit and vegetables, whole grains, and low-fat milk. Results indicated that after package revisions approximately 46.2% of respondents reported consuming more vegetables, but fruit remained unchanged. Research by Odoms-Young et al. (2014) set out to study the impact of the 2009 WIC revisions on mother-child dyads in 273 Hispanic and African

American children ages 2-3.5-years-old. It was determined that 6 months after implementation, Hispanic mothers increased fruit consumption by 0.33 servings a day, but there was no change observed among children or African American mothers, and vegetable intake remained unchanged.

Research on WIC participating Native American children found a significant increase in reported consumption of 4 or more servings of fruits and vegetables daily (Ishdorj and Capps, 2013). Research by Chiasson et al. (2013) observed positive dietary changes in daily consumption of fruits and vegetables in children 1-4-years of age (5.3% and 3.5%), respectively. As demonstrated above, there have been a variety of studies indicating that there are positive associations between inclusion of the fruit and vegetable CVV and increased intake of fruits and vegetables amongst WIC participants.

Available literature indicates that fruit purchasing, and consumption have been positively impacted by the WIC revisions for CVV. A potential explanation for higher fruit intakes in WIC participants may be the preference for the purchase of fruit with CVV allowance rather than vegetables.

100% Fruit or Vegetable Juice

In the DGA, 100% juice has been retained as a fruit or vegetable category due to its vitamin and mineral profile and is considered as a supplemental way to reach daily fruit and vegetable target goals. However, the American Academy of Pediatrics (AAP) recommends that more than half of fruit and vegetable intake should be consumed as whole produce rather than 100% juice (Melvin et al., 2017). Despite this, it has been demonstrated that approximately 1/3 of fruit consumption consists of 100% juice in children (Herrick et al., 2015; Drewnowski & Rehm, 2015). It is important to note, 100% juice is not nutritionally equivalent to whole fruits and vegetables, and children may be

missing out on important nutrient components associated with whole produce by alternatively consuming 100% juice (Herrick et al., 2015; Drewnowski & Rehm, 2015).

Manufacturing Process of 100% Fruit or Vegetable Juice and Nutrient Quality

The manufacturing process of 100% juice results in increased losses of micronutrients when compared to whole fruit and vegetables. When extracting juice from the plant-based source, there is a loss of carotenoids and fibrous pulp, and when these nutrients are consumed regularly there has been an association with reductions in chronic disease risk (Knekt et al., 2001; Osganian, 2003; Holick et al., 2002; Baker et al., 2001).

Liquid forms of fruits and vegetables have somewhat of a similar nutrient and micronutrient profile when compared to whole fruit and vegetables. By USDA standards, 1 cup of 100% pure fruit or vegetable juice is equal to 1 cup of fruit or vegetables (USDA, 2015). In that respect, consumption of 100% juice may act as a compliment to whole fruits and vegetables, and a convenient way to meet dietary recommendations. However, the loss of nutrient components can also be a loss of potential benefits that are available in whole fruit and vegetables and are likely to result in disparate nutrition and health impacts when compared to whole fruits and vegetables.

Impacts of 100% Juice on Children's Health Status

The debate in favor of labeling 100% juice as a healthy beverage among consumers and select health professionals is based on the fact that 100% juice is considered a convenient and cheaper alternative in meeting whole fruit and vegetable requirements. Although 100% juice contains a variety of nutrients, the major concerns centralize around the potential adverse health impacts on child weight and oral status due to the high sugar and low fiber content of 100% juice.

Child weight status. Liquids such as juice could fail to signal cessation of intake, thus contributing to higher intakes of calories or overconsumption to bring about satiety (Wojcicki and Heyman, 2012; Almiron-Roig et al., 2003; DiMeglio and Mattes, 2000; Mourao et al., 2007). In that regard, frequent consumption of liquid calories may contribute to an increased weight status. A study by Sanigorski et al. (2006) measured consumption of key foods and beverages and their association with weight status. Children who consumed 2 or more servings (one serving = 250 ml) of fruit juice a day were more likely to be overweight/obese than children who drank fruit juice once or less per week (Sanigorski et al., 2006). Other research has also found that children consuming 8 fl oz or more of 100% juice per day are in a higher BMI percentile than children who do not (Sonneville et al., 2015; Shefferly et al., 2016; Faith et al., 2006).

Oral health. Fruit juices have also been implicated in dental erosion due to the sugar and natural acidic profile of these beverages. Research examining the association of 100% juice consumption and tooth decay in children (8-to-19-years old) has found that children who consume ≥ 1 servings/week (1 serving = 240 mL/day) were more likely to experience tooth decay [1.20 (95% CI: 1.02, 1.42)] than children consuming ≤ 1 serving/week (Salas et al., 2015). This suggests there is a positive association with 100% juice and tooth decay in children, but there is room for more research exploring 100% juice and oral health in children.

It has been demonstrated that there is limited research on the implications of 100% juice on child health and nutrition status and a need for further exploration. In an attempt to reduce potential health implications due to 100% juice consumption, guidelines have been put in place by the AAP.

Current Guidelines and Levels of Consumption

The AAP recommends avoidance of juice consumption for children under the age of 1 due to the lack of nutritional benefit (Melvin et al., 2017). For older children, specific allotments of juice recommendations are unique to age group subsets. Age subsets include: children 1-3, 4-6 and 7- 18 years old. Values are as follows: 4 fl oz/day, 4-6 fl oz/ day and 8 fl oz/day, respectively (Melvin et al., 2017).

In a further evaluation of consumption patterns, younger children (2-5-years-old) are typically the most frequent consumers of 100% juice, and are likely to exceed recommendations (O'Neil et al., 2011; Nicklas et al., 2008; Drewnowski and Rehm, 2015; Heyman and Abrams, 2017; Byrd-Bredbenner et al., 2017). WIC participation has also been associated with high and frequent consumption of 100% juice (Ponza et al., 2004; Deming et al., 2014; Watowicz and Taylor, 2014; Vercammen et al., 2018), presumably due to increased access related to package benefits. There also has been other demographic characteristics that have been identified as potential influences of 100% juice such as SES, race, and sex.

Factors Related to 100% Juice Consumption

Disparities by SES. Individuals of lower SES tend to be higher consumers of 100% juice when compared to their higher SES counterparts (Drewnowski and Rehm, 2015). One potential influencer of 100% juice purchase may be due to personal health beliefs (Bucher and Siegrist, 2015; McElligott et al., 2012). There has been some literature demonstrating that those who may purchase 100% juice believe it is a healthier option when compared to SSBs or as nutritionally equivalent to fresh fruits and vegetables (Bucher and Siegrist, 2015; McElligott et al., 2012; Duffet, 2018); thereby, increasing purchasing and consumption patterns may be associated with a nutrition knowledge

deficit. Typically, those who are at a lower SES status with lower levels of education have been found to consume and have increased home availability of 100% juice than those of a higher SES (Baranowski et al., 2008).

Disparities by race. African American and Hispanic children are observed to consume higher allotments of 100% juice and lower intakes of whole fruits and vegetables when compared to other racial groups (Drewnowski and Rehm, 2015; Herrick et al., 2015; Kim et al., 2014), an association likely strengthened by income and area of residence (Drewnowski and Rehm, 2015; Herrick et al., 2015).

Disparities by sex. There is limited data when evaluating 100% juice consumption by sex with most research focusing on adults, and the current data has not identified one sex to be the dominant consumer (O’Neil et al., 2011). For children, boys are typically found to more frequently consume a wider variety of beverages than females overall, including sugar-sweetened beverages such as soda or energy drinks (Brener et al., 2011; Ogden, 2011). There is a variety of demographic characteristics that may influence 100% juice consumption among youth, and current intake still well exceeds recommended levels, but has decreased by approximately 14% from 2004 and currently remains stagnant (Produce For Better Health Foundation, 2015). While the exact reason for this trend is unclear, consumption of 100% juice could be influenced by federal policies and guidelines put in place in an attempt to decrease consumption of 100% juice.

Policies, Guidelines and 100% Juice

Federal policies targeted at 100% juice provide a unique opportunity to influence food behaviors among American children due to their broad reach. However, there is a lack of policies that are specific to 100% juice.

WIC and 100% Juice Package Revisions. In 2009, the WIC program made significant revisions to supplemental food packages with the intent of aligning packages with the Dietary Guidelines for Americans, 2005 and contributed to the reduction of childhood obesity. A significant revision to packages was the reduction of 100% juice provisions as recommendations by the Institute of medicine (IOM) on the basis of increasing whole fruit and vegetable intake, aligning with the AAP guidelines and reduction of excess 100% juice consumption among WIC beneficiaries (IOM, 2006).

The following revisions were made: deletion of 100% juice for infants 4-11 months of age, and reduction of 100% juice allowance for children between the ages of 1-5-years-old (Special Supplemental Nutrition Program for Women, Infants and Children (WIC): Revisions in the WIC Food Packages, 2014). For children, new packages would allow 128 fluid oz of juice (4.3 fl oz/day) vs. 288 fl oz/day (Special Supplemental Nutrition Program for Women, Infants and Children (WIC): Revisions in the WIC Food Packages, 2014). Regarding this change, a limited body of literature has demonstrated that the revision of WIC packages has significantly reduced 100% juice consumption among participants (Andreyeva et al., 2013; Whaley et al., 2012). Another study had shown statistically insignificant reductions of 100% juice consumption in WIC participants (Morshed et al., 2015). Nonetheless, results are similar to studies that have shown significant changes in consumption patterns due to package revisions.

Sugar-Sweetened Beverages

The most popular sources of SSBs consumed in the American diet are carbonated soda, energy drinks, sweetened teas and coffees, sports drinks and fruit drinks (Miller et al., 2017). During 2011-2014, over 60% of youth consumed at least one SSBs on a given day (Rosinger et al., 2017), which significantly contributes to daily added energy and

sugar intake (Rosinger et al., 2017). Importantly, frequent consumption of SSBs can also have various implications on child health and nutrition status.

Impacts of SSBs on Children's Health and Nutrition Status

Child weight status. Consumption patterns of SSBs aligned with obesogenic trends among children (Lee et al., 2010; Bremer et al., 2011; Hu, 2013; Bleich and Wolfson, 2015), which may suggest an associative relationship. Literature has demonstrated that frequent consumption of SSBs (≥ 3 servings/wk) have been associated with overweight and obesity status (Martin-Calvo et al., 2014; Gjammattei et al., 2003; Papandreou et al., 2013). Observational studies have also shown that with each additional portion of SSBs, there is an additional increase in BMI or weight (Ludwig et al., 2001), serving as an indication that the frequency of SSBs consumption likely influences weight status.

It is well-known that weight status is an etiologic factor in chronic disease risk and diagnosis (Rössner, 2002; Anderson and Konz, 2001). Recently, diseases typically regarded as adult onset have been found in higher prevalence amongst obese youth (Morisson et al., 2008; Franks et al., 2007; Ingelsson et al., 2007; Bibbins-Domingo et al., 2007). Obesity in childhood has been associated with higher risks of Type 2 Diabetes, hypertension, abnormal lipid profiles, and metabolic syndrome (De Ferranti et al., 2004; Weiss et al., 2004; Korsten-Reck et al., 2008; Sorof et al., 2002). In exploration of the etiological basis of obesity, it is perceived to be multifactorial and related to both genetic and non-genetic factors (Friedmen, 2004; Barsh et al., 2000; Zhao and Grant, 2011; Katzmarzyk et al., 2015), but can be highly reliant on lifestyle behaviors (Katzmaryrk et al., 2015; Hu et al., 2003) including sedentary behaviors and dietary choices (Katzmaryrk et al., 2015; Hu et al., 2003; Stettler et al., 2004; Trost et al., 2003).

Lifestyle behaviors. Research has demonstrated that habitual intake of SSBs is associated with higher intakes of fast-food, energy-dense snacks (chips or cookies), lower intakes of fruits and vegetables, and displacement of milk consumption (Ranjit et al., 2010; Park et al., 2012; Mathias et al., 2014). Sedentary behaviors have also been associated with regular SSBs consumption, such as prolonged television viewing (2 hours/day), and/or participation in videogames or computer games (Park et al., 2012; Ranjit et al., 2010; Lowry et al., 2015). Outside of dietary and sedentary behaviors consumption of SSBs can also have implications on oral health.

Oral Health. Research has demonstrated a positive association between SSBs consumption and prevalence of dental caries (Armfield et al., 2013; Declerck et al., 2008; Lee and Messer, 2010). A study conducted by Evans et al. (2013) found that consumption of ≥ 5 ounces/day of SSBs was related to 4.6 greater odds of dental caries compared to those with < 5 ounces/day of SSBs. In youth, consumption of SSBs has been found to be a potential contributing factor to risk of tooth decay and erosion, likely due to its nutrient composition and children's poor dental hygiene (Harding et al., 2003; Al-Majed et al., 2002; Marshall et al., 2003).

Frequent consumption of SSBs may contribute to a variety of health implications, and despite potential ramifications, consumption continues to be high amongst children. While there is not a recommendation specific to SSBs, there are guidelines specific to added sugar intake.

Current Guidelines and Levels of Consumption

The DGA recommends added sugars to be less than 10% of total calories (USDA, 2015). Yet, added sugars are typically a considerable proportion of the diet with children consuming over 17% of total calories from added sugars daily (Powell et al. 2016). The

greatest sources of added sugars are comprised of regular soda, sports drinks, and energy drinks, which account for approximately one-third of added sugar intake (Drewnowski and Rehm, 2014). It is approximated that six in ten children consume at least one SSBs on a given day which contributes 143 calories to their overall energy intake (Rosinger et al., 2017). The observed consumption of SSBs are not equally distributed; research has indicated disparities in the frequency of SSBs consumption related to demographic groups

Factors Related to SSBs Consumption

When exploring the profile of frequent SSBs users, the ubiquity of disparities becomes more discernible, and differences in consumption are observed by demographic characteristics.

Disparities by SES. Socioeconomic status is a predictor of SSBs consumption, and those of a lower SES are some of the most frequent SSBs consumers (Tasevska et al., 2017). Level of parental education is also associated with children consumption patterns (Hafekost et al., 2011; Han and Powell, 2013), which may impact nutrition knowledge thus resulting in unmonitored intake of sugar-laden beverages (Hafekost et al., 2011; Han and Powell, 2013).

Disparities by race. Literature has demonstrated African American children consume more SSBs than their white counterparts (Powell et al. 2016; Rosinger et al., 2017; Tasevska et al., 2017). A potential contributor to this disparity could be related to exposure of SSBs product marketing (Powell et al., 2014). African Americans are disproportionately targeted by SSBs marketing than youths of an alternative race/ethnicity (Powell et al., 2014).

Disparities by sex and age. There are also disparate patterns by sex and age (Park et al., 2012; Rosinger et al., 2017), where boys are more frequent consumers of SSBs than girls (Rosinger et al., 2017). For age distribution, adolescents typically consume SSBs more frequently than their younger counterparts (Han and Powell, 2013; Rosinger et al., 2017; Bleich et al., 2017). This trend could be due to increased access of SSBs products through beverage purchasing (Grummon et al., 2015; Borradaile et al., 2009; Vander Veur et al., 2013).

Potential Substitution Effect of SSBs and 100% Juice Consumption

When discussing factors in beverage consumption, there is an interesting pattern that has been shown in observational research. There appears to be an inverse relationship between SSBs and 100% juice. Frequent consumers of 100% juice have been observed to consume less SSBs (Oliveira, Chandran and USDA, 2005; Nicklas et al., 2008; Beck et al., 2013). When considering the subset of population that generally consumes high allotments of 100% juice, consumption of SSBs are typically lower in WIC participating children (Ponza et al., 2004; Deming et al., 2014). This may be due to nutrition education or absence of SSBs vouchers (Oliveira, Chandran and USDA, 2005; Newby et al., 2004). It is possible that 100% juice consumption displaces consumption of SSBs amongst this population. There are various demographic influences that can impact frequency of SSBs intake; in acknowledgment of these factors, the federal government and school-based programs have established variations of policies and programs in an attempt to decrease consumption of SSBs among children in the U.S.

Policies to Decrease SSBs Consumption

In response to the obesity epidemic and its association with added sugars and empty calories contributed by SSBs, one of the most sought-after options is the reduction of

consumption through taxes on SSB purchases through discouraging purchasing by consumers (Smith et al., 2010).

Exploring SSBs tax. There has been literature demonstrating that sales tax could potentially deter consumers from frequently purchasing SSBs (Fable et al., 2016; Cochero et al., 2017). More than half of the states in the U.S. have some form of sales tax on SSBs (1-7%) (Chriqui et al., 2014). Current sales taxes are found to be limited to food stores and vending machines, and often times, the sales tax is not significant enough to reduce statewide obesity rates or deter purchasing (Sturm, 2010), and is suggestive that higher tax (20%) may have greater influence on purchasing patterns (Finkelstein et al., 2013; Dharmasena and Capps, 2012; Smith et al., 2010).

School district policies and SSBs availability. Literature demonstrates that the prevalence of school policies related to the restriction of availability of SSBs can positively reduce or impact consumption amongst students (Jones et al., 2010; Taber et al., 2011; Miller et al., 2016). The school-setting can be highly impactful on student's dietary consumption patterns due to accessibility of various products through school-provided meals or other competitive foods available to the school environment (Fox et al., 2009; Story et al., 2006).

One federal initiative that worked to address the school health and nutrition environment was The Child Nutrition and WIC Reauthorization Act 2004 (P.L. 108-265, Section 204) which required schools participating in federally reimbursed nutrition programs to develop wellness policies by 2006 (IOM, 2007). To support this movement, a public health initiative formulated nutrition standards based on the Dietary Guidelines for Americans, 2005, and the American Heart Association's dietary guidelines for healthy children that established limitations on caloric content and portion sizes of competitive

foods and beverages sold within schools (Ohri-Vachaspati, Turner and Chaloupka, 2012; American Beverage Association, 2010; Alliance for a Healthier Generation, 2016). As a result of these guidelines, there were an 88% observed reduction of total beverage calories shipped to schools between 2004 and 2010 (American Beverage Association, 2010). In lieu of these successes, and under mandates by the HKHFA2010, the federal government established governmental regulations on nutritional standards of competitive foods sold within the environment of NSLP participating schools.

These guidelines are formally referred to as the Smart Snacks in Schools and applies to vending machines, a la carte, school stores or other points of access (National School Lunch Program and School Breakfast Program: Nutrition standards for all foods sold in school as required by the Healthy, Hunger-Free Kids Act of 2010 [NSLP], 2013).

Nutrition standards specific to beverages include plain water, 100% juices, and unflavored, low-fat milk or low-calorie options. The Smart Snacks in School policy has seen success improving beverage consumption patterns amongst school children (Miller et al., 2017; Miller et al., 2016).

Snacking: Definition and Types

Among children, frequency of snacking has steadily increased since the 1990's (Piernas and Popkin, 2010). For the purposes of this review, snacking is defined as eating between mealtimes (Wang et al., 2016).

Current Guidelines Related to Snacking

Although there are no guidelines currently in place that are specific to snacks, the AAP encourages the consumption of nutrient-dense snack foods to support nutrient needs among children. For toddlers, 1-2 servings of healthy foods (fruits, vegetables, and whole grains) would supplement nutrient needs (AAP, 2017). However, there is a lack of

standardized recommendations applicable to older children and no guidelines specific to energy-dense snacks.

Frequent Snacking and Impacts on Health Status

Child weight status. Increased portion sizes and eating frequency have been one hypothesized mechanism behind the high rates of obesity and overweight status among children (Sherry, 2005; Evans et al., 2015). On average, snacking contributes to over 25% of total caloric intake in children (Wang et al., 2016; Piernas and Popkin, 2010).

Snacking is an integral element of children's dietary intake and can be influential on various components of child's health status. Children may choose to snack with the intent of relieving hunger but eating with the absence of hunger can lead to consumption of unnecessary calories (Hess et al., 2016). In an evaluation of snacking choices, it has been found that the most popular types of snacks derive from energy-dense sources (Piernas and Popkins, 2010), such as sweets (cookies, chocolate, candy), SSBs or salty snacks (chips, pretzels or crackers) (Piernas and Popkin, 2010). Frequent consumption of these snack foods over time have the potential to contribute to eventual weight gain (Bellisle, 2014; Piernas and Popkins, 2010; Hess et al., 2016).

Oral health. Dietary sugars have been implicated in increasing incidences of dental caries amongst frequent consumers (Touger-Decker and Loveren, 2003; Tinanoff and Palmer, 2000). A study conducted by Kalsbeek and Verrips (1994) found that children who consumed 5 or more dessert snacks per day had higher incidences of caries than those who were less frequent consumers. Other literature has indicated that consumption of salty snacks (chips) clustered with frequent consumption of desserts amongst children increased prevalence of tooth decay at higher rates than those who did not consume these items as frequently (Johansson et al., 2010; Iftikhar et al., 2012). Poor

oral health care would likely exacerbate the impacts of sugars, salts, frequency of snacking and dental caries, but nonetheless, nutritive content of dietary choices play an important role in oral health status.

Consumption and access to foods of lower dietary quality are associated with numerous factors related to SES and extends to disparities in other demographic characteristics.

Factors Related to Snacking Consumption

SES. When examining determinants of eating and snacking behaviors, dietary inequalities are linked to household income status (Drewnowski and Specter, 2004). Poverty and food insecurity are associated with reduced food expenditures due to food costs and lack of disposable income (Drewnowski and Specter, 2004). Those of a lower SES tend to have increased purchasing and consumption patterns of refined grains and foods with higher compositions of added sugars and fats due to reduced monetary value (Darmon and Drewnowski, 2008; Thompson et al., 2009). When exploring snacking between low versus high SES, research has demonstrated that higher SES households tend to snack more frequently but noted differences in snacking quality (Jahns et al., 2001; Zizza et al., 2001; Liu et al., 2006). Literature has demonstrated that snacking choices of low SES individuals tend to be lower in nutrient quality than their higher income counterparts, and this is likely influenced by affordability and food access (Drewnowski and Darmon, 2008). When further exploring dietary disparities between SES, a small body of research has demonstrated that children residing in higher income households have stricter limitations on energy-dense snack consumption (Hupkens et al., 1998). In comparison, children of lower SES tend to have higher intakes of SSBs, saturated fats, added sugars and reduced consumption of fresh fruit and vegetables than

their higher income counterparts (van Ansem et al., 2014; Park et al., 2012; Valmorbidia et al., 2014; Heron et al., 2008; Patrick and Nicklas, 2005; Kant and Graubard, 2007).

Snacking choices among WIC participants. Children who participate in WIC are observed to have higher dietary quality and intakes of fruits, vegetables, whole-grains and lower consumption of added sugars and fats than those of a similar SES (Ponza et al., 2004; Deming et al., 2014; Siega- Ruiz et al., 2004; Tester et al., 2016). There is also some evidence that suggests WIC participants snack less frequently than their peers (Siega-Ruiz et al., 2004). In consideration of these differences and increased access to these food groups due to supplemental food packages, it is possible that WIC participating children may be consuming a larger variety of nutrient-dense snacks, such as fruits and vegetables during snacking events when compared to their SES counterparts.

Disparities by race. African American and Hispanic children are typically found to have higher intakes of added sugars and fats and decreased intake of fruits and vegetables than their non-Hispanic counterparts which may likely be due to access limitations (Park et al., 2012; Han and Powell, 2013; Rosginer et al., 2017; Ogden et al., 2011 Kim et al., 2014) Thereby, disparities in access and consumption of healthier snack options are demonstrated.

African American children have seen the highest increase in calories per person per day from snack foods since 1977 (180 kilocalories/day) (Dunford and Popkin, 2017). This population also has been found to have the highest consumption patterns of snacks revolving around energy intakes and snack frequency (Keast et al., 2010; Piernas and Popkins, 2010). It has also been demonstrated that African American individuals have the highest intakes from SSBs and salty snacks and lower intakes of fruits, vegetables, and

whole grains than their similar counterparts (Dunford and Popkin, 2017; Han and Powell, 2013; Rosginer et al., 2017; Kim et al., 2014).

Disparities by sex and age. Literature evaluating disparities in snacking choices by sex have not been consistent; some studies have demonstrated that males are the most frequent consumers of snacks (Dunford and Popkin, 2017; Wouters et al., 2010; Piernas and Popkins, 2010) while other have shown females as the dominant sex (Keast et al., 2010). For age related disparities, research also does not demonstrate a strong discrimination between specific age groups and snacking behaviors. However, there have been nutrient differences found between younger (2-6-years-old) versus older children (12-19-years-old). Younger children have been found to snack more frequently than their older counterparts (Jahns et al., 2001). In elementary-aged children, snacking has been associated with better HEI scores than their older peers likely reliant on snacking choices (Evans et al., 2015). Younger children are more likely to consume fruits and dairy products as snacks while older adolescents have been found to consume more SSBs and savory foods during snacking events (Evans et al., 2015; Wang et al., 2016; Duffey et al., 2014; Rosinger et al., 2017; Ogden et al., 2011). Differences in snack choices by age group may be due to increased autonomy in food choices and purchasing during the aging process (Grummon et al., 2015; Borradaile et al., 2009; Larson et al., 2015).

In an effort to curb the increased frequency of energy-dense snacking amongst children, federal policies and programs have been implemented in an attempt to encourage healthier snack consumption.

Policies and Guidelines to Decrease Energy-Dense Snack Consumption

There are a limited number of federal policies currently in place to curb consumption of energy-dense snacks and increase consumption of healthier snacks foods among children.

Fresh Fruit and Vegetable Program. The FFVP is available in select schools with the intent to promote consumption of fruits and vegetables as healthier snack alternatives in the elementary-setting (USDA, 2016). This program has been successful in increasing exposure to fresh fruit and vegetables and serves as a healthier snack access and exposure point (Bartlett et al., 2013).

School District Policies and Energy-Dense Snack Availability

Vending machines, a la carte, snack bars, and school stores serve as a point of access for a great variety of energy-dense snacks amongst students (Parks et al., 2010).

Literature has demonstrated that the consumption of energy-dense snacks among students increases with increased product availability within school-settings (Parks et al., 2010). In an attempt to influence snack food choices within school-settings, the Smart Snacks in Schools Rule extended to competitive food products sold within schools.

Smart Snacks in School. The federal government enacted nutrient composition stipulations of snack foods sold within the school-setting, referred to as Smart Snacks in School. Nutrition standards specific to snack variations are provided by the Council on School Health, Committee on Nutrition (2015): foods must be whole-grain product, first identified ingredient must be a fruit, vegetable, dairy product or protein food, combination foods must contain $\frac{1}{4}$ cup of fruit or vegetable. Competitive foods must also meet several nutrient requirements, which includes caloric, sodium, fat and added sugar restrictions.

Due to the relative newness of the Smart Snacks in School enactment in 2014, there is a lack of data available demonstrating the program's perceived role in decreasing consumption trends of energy-dense snacks amongst students. However, school-based

initiatives have demonstrated that changing product contents sold in vending machines has decreased purchasing patterns of energy-dense foods (Han-Markey et al., 2012).

Dietary Choices and Federal Assistance Programs

In terms of dietary quality and meeting the DGA among children there have been demonstrated challenges in children's ability to meet recommendations for healthy eating behaviors. Children do not meet DGA recommendations for key food categories and exceed recommendations for added sugars and fats. Foods of lower dietary quality can have obvious implications on child health and nutrition status. As demonstrated in this review, food-related behaviors are influenced by various mechanisms related to demographic characteristics. Socioeconomic status in particular can be a large determinant in what a child chooses to consume due to access and availability. In response to disparities in access and related implications on nutrient and health status, the federal government established the Supplemental Nutrition program for Women, Infants, and Children (WIC) in an attempt increase access and availability of nutrient-dense foods amongst a low-income subset that is considered particularly vulnerable to nutrient-related diseases.

WIC Program Overview

The WIC program is specific to low-income pregnant or postpartum women, infants and children under 5. This program provides federal grants to states for specific supplemental food packages, nutrition education, and referrals for healthcare (Institute of Medicine [IOM], 2006) for eligible participants. The federal government provides supplemental food assistance in order to address low-income disparities in access and consumption of foods as discussed throughout this review. The intent of this program is

to improve and support the health of the population that are the most vulnerable to nutrition disparities and health risks (IOM, 2006).

Program Delivery

The WIC program is governed and administered on the federal level under the USDA Food and Nutrition Service, and is operated by federal, state, and local agencies. Not all who qualify for eligibility are able to participate. Participants are required to meet income guidelines, show proof of residency and be considered at “nutritional risk” (USDA, 2017), meaning that the individual has a medical- or dietary-based condition that requires nutrition support as deemed by a health professional (USDA, 2017). For income eligibility, applicants must have an income at or below an income level or a standard determined by the state agency (at or below 185% of the federal poverty line), or be determined automatically income-eligible based on participation in certain programs, such as Medicaid or SNAP (USDA, 2017). Due to limitations of the federal budget, there are specific monetary allotments provided for program funding each year (USDA, 2015). Currently, WIC operates through 10,000 clinic sites in 50 state health departments and serves 53% of infants born in the U.S. (USDA, 2015). Participants are eligible for benefits during a 6-month period and must reapply when the certification terminates.

Program History

An amendment in the Child Nutrition Act of 1966 had put the WIC program into existence. The Child Nutrition Act of 1966 was enacted into law after the impacts of nutritious foods on child health and learning in the educational setting were demonstrated (an act to amend the National School Lunch Act, 1996). Due to public health concerns of malnutrition among low-income mothers and children, the WIC program was piloted as a supplemental nutrition assistance program to help reduce nutrition risks amongst those

considered most vulnerable (USDA, 2017). In 1975, the program was formally enacted and made permanent. Supplemental foods available in package benefits included foods that were considered most absent amongst populations at nutritional risk (USDA, 2017) – for example, foods high in quality protein, vitamin A, vitamin C, and iron. Revisions to packages have since been implemented and this will be discussed in further detail in a subsequent section.

Participant Benefits

Nutrition education. The nutrition education component of package benefits aims for two broad goals as explained in section 7 CFR 246.11(B) of the Federal WIC regulations: (1) emphasis of the relationships between nutrition, physical activity, and health with special emphasis on the nutritional needs of the focus population; (2) assistance to those at nutritional risk and guidance to achieve a positive change in both physical activity and nutrition habits. This would result in improved nutrition habits and avoidance of nutrition-related complications through maximum use of both WIC supplemental foods and other nutrient-dense foods. Agencies are required to provide two nutrition education courses to participants or the caretakers of both the infant or child participant during each 6-month certification period, but those who do not attend are not denied benefits.

Healthcare Referrals to Medical or Social Services. As a beneficence of the program, WIC provides screening and referrals to both private and public health care providers (USDA, 2015). This may include, but is not limited to: immunizations, drug or alcohol counseling, or prenatal care. The program also encourages oral health care and well-child visits.

Supplemental Foods. WIC agencies provide supplemental food vouchers, checks, or electronic benefits transfers system (EBT) for participant's exchange of foods at authorized vendors. There are 7 different variations of supplemental food packages based on category of the participant and nutrient need. Packages can be individualized by participant nutrient needs under the discretion of the WIC agency. The intent of supplemental food provisions is not to supplement the entire diet of the participant, but to enhance it by providing access to nutrients that are often found to be lacking amongst this population.

The variations of the packages are as follows: Infants 0-5 months (I and III), infants 6-11 months (II and III). These package variations are for infants who are fully formula fed or partially breastfed: fully breastfed infants between 0-5 months (I) and 6-11 months (II), children between 1-4 years old (IV), pregnant and partially breastfeeding up to 1 year postpartum (IV), postpartum- up to 6 months postpartum (VI), and fully breastfeeding- up to 1-year post-partum (VII) (USDA, 2016). Federal requirements for WIC-eligible foods can be located in 7 CFR Part 246.10. Package components often contain 100% juice for children over the age of 1 years old, eggs, milk (yogurt, tofu, cheese, soy beverages may be used as substitutes), breakfast cereal, whole wheat bread or alternative whole grains, fruits and vegetables (canned, fresh or frozen), canned fish, dry or canned legumes, and/or peanut butter. Packages specific to infants may contain iron fortified infant cereal, infant fruit and vegetables, formula, and baby food meat. The intent behind the various options in the updated WIC packages is to increase the variety and options to appeal to WIC's culturally diverse population (USDA, 2014). The provisions discussed above were created to align with the nutrient recommendations as described by the DGA, 2005 and the infant feeding practices recommended by the AAP

(USDA, 2014), along with providing more culturally diverse options and to serve those with qualifying medical conditions (USDA, 2014). These changes were the most significant alterations to packages since the 1980's (USDA, 2014; Ogden et al., 2002). In regard to WIC and children's health status, there have been various studies assessing the effect on health and dietary outcomes due to participation.

Health and Dietary Implications on WIC Participating Children

Available literature indicates that the WIC program has improved the dietary quality of participants, specifically in relation to increasing fruit, vegetable, whole grain, and milk consumption and decreasing fat and added sugar content (Siega-Riz et al., 2004; Wilde et al., 2000; Tester et al., 2016; Chiasson et al., 2013). It has been demonstrated that WIC participants consume higher intakes of WIC-approved foods, and various key vitamins and minerals when compared to non-participating children (Oliveira, Gundersen & USDA, 2000; Tester et al., 2016). These include: vitamin A, C, and B6, folate, and iron (Oliveira and Gundersen, 2000). Participation in WIC also has implications on health status. A study by Carlson and Senauer (2003) evaluated physician child health scores using NHANES data of WIC participating children. It was indicated that WIC participating children were more likely to be in excellent health than comparable non-participating children (Carlson and Senauer, 2003). This study concluded a positive association with WIC participation and child health status.

Although there have been many positive outcomes of WIC participation and dietary quality, the federal government is interested in the adequacy of package benefits and how they could be improved to further support positive health and dietary outcomes.

WIC Package Recommendations and Revisions

In 2003, IOM was awarded a contract through the Food and Nutrition Board to evaluate the sufficiency of WIC supplemental food benefits. The committee released a report on proposed criteria for WIC packaging and it consisted of various priority nutrients and food categories that the committee would consider when making its recommendations for specific foods with assurance of cost-neutrality (IOM, 2004).

Revisions. In 2014, the Final Rule: Revisions to WIC packages was published. Revisions that are discussed below are available in 7 CFR Part 246 of the Federal Registrar. Revisions to packages are as follows: the inclusion of fresh, dried, frozen, or canned fruit and vegetables with a CVV allowance of \$8.00 for children and \$11.00 that can be spent at approved vendors. Under the final rule there was also an addition of CVV for infants (\$4 and \$6) between the ages of 9-12 months as a substitution for the infant food jars in standard packaging. Allotments for 100% pure juice was also adjusted: infants 100% pure juice benefits were omitted under the age of 1 year's old, and packages specific to children decreased from 288 to 128 fluid ounces; 100% pure juice for women was also reduced by approximately half. The addition of mature legumes such as peas and dry beans as a quality protein were able to be purchased with both CVV and vouchers.

Whole milk for children over the age of 2 years old with a medical or nutritional need was excluded, and the availability of dairy substitutions (yogurt, soy-based beverages, and tofu), and whole-grain bread was increased. Information regarding further revisions of WIC packaging specific to infants and women is available in the (7 CFR Part 246) of the Federal Registrar. In order to assure that WIC packages continued to align

with DGA and remain a successful program, a review was mandated every 10 years (National Academies of Sciences, Engineering and Medicine [NASM], 2017).

Literature has demonstrated that revisions are creating positive impacts on participant's diets in regard to balance and increased consumption of target food categories.

Implications on Dietary Intake when WIC Packages Change

One of the most significant changes to WIC packaging was the omission of 100% juice amongst infants and lower allotment for children, and this appeared to decrease participant consumption. When evaluating store purchasing data, there has been some evidence that there was a decrease in purchasing patterns with partial compensation for juice products post-implementation. A study evaluating scanner data from loyalty cards of a supermarket chain in New England commonly frequented by WIC participants evaluated juice purchasing behaviors of 2137 WIC participants before and after revision implementations. It was found that prior to revisions, 100% juice had accounted for over one-third of purchasing and the household average volume decreased from 238 fl oz to 182 fl oz per household (Andreyeva et al., 2013). This volume reduction reflected new package allotments post-implementation (Andreyeva et al., 2013),

Dietary consumption of target foods has also been improved amongst participating children demonstrated by state locality data. After policy enactment, there have been pronounced increases in consumption of whole-grains, fruits and vegetables with a shift from whole dairy products to lower fat products (Whaley et al., 2012; Chiasson et al., 2013; Morshed et al., 2015 Odoms-Young et al., 2014; Ishdorj and Capps, 2013). Literature evaluating NHANES data on children aged 2-4-years-old from low-income households compared WIC participants to non-participants before and after

implementation of WIC revisions (2003-2008 and 2011-2012) using HEI scores. Among WIC participants, HEI scores had significantly increased post-implementation from a baseline of 50.0 to 58.3 amongst WIC participating children (Tester et al., 2016), which is suggestive that WIC revisions provided significant improvement to dietary quality amongst participating children.

There have been positive changes in dietary behaviors associated with WIC package revisions, but package acceptability is also important to investigate amongst participants to assure that participation rates do not decline.

Implications for Participation when Packages Change

There has been a nationwide decrease in WIC participation since its peak in 2010 (Oliveria, 2015). WIC participation rates have declined by approximately 10% and the greatest one-year decrease was seen in 2014, where participation had declined by at least 5% from the previous year (Oliveria, 2015). This trend is hypothesized to have little to do with revisions, but more so with the decline in birth rates, improvement of the US economy, decreased rates of unemployment and individuals in poverty (Oliveira, 2015), thereby, decreasing supplemental need and eligibility.

Nonetheless, due to revisions, it is of interest to understand the acceptability of revisions amongst participants in order to retain beneficiaries. Researchers and administrators are aware of participant dissatisfaction of supplemental foods when vouchers fail to be redeemed (Gleason, Pooler & Altarum Institute, 2011). A study conducted by the Altarum Institute (2011) explored WIC voucher redemption and acceptability of foods post-implementation amongst Wisconsin WIC participants. It was demonstrated that 18 months after implementation of WIC revisions, 90% of vouchers were redeemed (Gleason, Pooler & Altarum Institute, 2011), which would demonstrate

revision acceptability. However, 10% of vouchers failed to be redeemed and this could be due to a number of reasons, such as lack of acceptability of new food categories, challenges in redeeming due to limitations for purchasing at restricted WIC vendors, store availability, store clerk interactions, or lack of understanding in voucher redemption (Gleason, Pooler & Altarum Institute, 2011; Berttman et al., 2014). While there has been general satisfaction with revisions, there has also been negatively skewed voucher redemption amongst specific foods, such as infant food - jarred meats, fruits, vegetables, and whole grains (Phillips and Pooler, 2014), which may be associated with infant's dislike of foods, misunderstanding on how to redeem, or dislike of options eligible to infant's due to formula reduction (Phillips and Pooler, 2014). Nonetheless, when discussing food acceptability, due to the high satisfaction rates of the new foods allotted in packages amongst users, dissatisfaction may play a very small role in lack of voucher redemption or the reduction of WIC participants (Gleason, Pooler & Altarum Institute, 2011).

Although, more research must be done to fully understand the implications of package changes on WIC participation in order to maintain participation rates and continually improve dietary intakes among participants. Lack of redemption or decreased rates of participation may have implications on the future health status amongst this population. This would be important for policy makers to consider when making revisions for next review, and in this way adjustments to program delivery to address potential participant dissatisfaction.

Recommendations for WIC Package Changes

In 2014, the USDA FNS requested that the IOM now formally referred to as National Academies of Sciences, Engineering, and Medicine (NASM) committee to re-

evaluate the previous package changes to assure packages were consistent with the DGA and met unique cultural needs of participants. In 2017, the committee released, “Review of WIC Food Packages: Improving Balance and Choice: Final Report”, which contained a series of recommendations to decrease or increase components due to inadequate or excessive nutrient intakes in accordance with the DGA along with poor redemption of specific foods. If food components were in excessive amounts, they were decreased to add alternative components, improve balance and retain cost-neutrality (peanut butter and legumes). Proposed juice allotments were drastically reduced from 128 fl oz to 64 fl oz in children 1-4-years-old. For women, 100% juice was also reduced to 64 fl oz. The intent behind this change was to encourage a higher consumption of whole fruits rather than liquid forms, and this also enabled higher CVV allowances. The proposed CVV for children 1-4-years-old is \$12.00, and infant food (fruit and vegetables) can be substituted for increased CVV allowance averaging from \$10 to \$20 dollars. For women, allowances range from \$15-\$35 depending on pregnancy, post-partum, or lactating status.

Potential Implications on Dietary Behaviors with Package Revisions

Alternations in package benefits have improved dietary quality and balance among WIC participants, including increased whole grains, whole fruits and vegetables, and decreased consumption of saturated fats and 100% juice. Proposed recommendations are likely to have even more dramatic impacts on dietary quality for fruit and vegetable consumption due to increased CVV for fresh produce and decreased 100% juice allotments than what was shown in previous research (Andreyeva and Luedicke, 2014; Andreyeva et al., 2013; Tester et al., 2016). As alluded to previously, there appears to be an inverse relationship in SSBs and 100% juice consumption. In observational research, frequent consumption of 100% juice is associated with lower consumption of SSBs

(Oliveira, Chandran and USDA, 2005; Nicklas et al., 2008; Beck et al., 2013). There is some possibility that 100% juice displaces SSBs in the diet of the highest consumers. For WIC participants, there is a possibility that consumption of SSBs may increase due to decreased access to 100% juice. Due to increased availability and access, other package food components are also likely to increase nutrient intakes (Tester et al., 2016; Whaley et al., 2012), such as consumption of whole grains or fruits and vegetables, thereby influencing dietary consumption of food categories in a positive way. It is known that the WIC program is a benefit to targeted participants due to increased access to nutrient-dense food and nutrition education services; however, what is not as transparent is the potential impact that may extend to non-beneficiaries that live in a WIC household through household food availability.

WIC Spillover Effect

For WIC participants, the program has worked to address disparities in nutrition-related behaviors by increasing access to supplemental foods, nutrition education, and health services. While these benefits are specific to eligible participants, they may spillover to extended members of the family through various mechanisms, such as parental feeding practices or household food availability (Shloim et al., 2015; Ver Ploeg, 2009).

Influences of Child-Eating Behaviors

There are various factors that influence child-eating behaviors: parental feeding practices, observation, and parental modeling (Shloim et al., 2015). Studies have demonstrated that children who observe parents participating in healthy eating behaviors, such as the consumption of produce, are found to mimic these behaviors during meal times (Tibbs et al., 2001; Orlet Fisher et al., 2002; Fisk et al., 2011).

Other significant factors that will impact child's dietary intake are household food availability and intrahousehold allocations (Ver Ploeg, 2009), which include resources allocated to the child (Ver Ploeg, 2009). Intrahousehold allocations are reliant on family size, income, budget constraints, parental education, culture or race (Ver Ploeg, 2009). Food availability is likely to be influenced by numerous factors (Dennison et al., 2001; Patrick and Nicklas, 2005; Darmon and Drewnowski, 2008), such as culture, parental health beliefs, SES, food preferences, or nutrition education (Dennison et al., 2001; Patrick and Nicklas, 2005; Darmon and Drewnowski, 2008). The combination of factors largely determines in which dietary behaviors family members are likely to participate. Research has demonstrated that the WIC program has improved access and consumption of nutrient-dense foods among participants, but in consideration of factors that influence child-eating behaviors, it may be appropriate to assume that ineligible family members are also being influenced by the presence of WIC in the home, which is formally referred to as the WIC spillover.

WIC spillover mechanisms. According to Ver Ploeg (2009), the WIC spillover effect is hypothesized to impact ineligible family members in three ways: 1) the nutrition education and health counseling that participants receive may affect the diets and dietary behaviors of other family members if the participant uses what they have learned to prepare meals with other household members or influence what they purchase and make available in the household, or share the information with other members, which would influence their dietary intakes; 2) the supplemental foods acquired with WIC vouchers are shared with other household family members; 3) the advantages of participation may have an "income effect"- where money that would have been previously allocated to food

or infant formula could be spent on other foods that may affect the diets of nonparticipating family members.

In regard to household finances, participation in the WIC program could reduce budget constraints and increase financial ability in purchasing other foods (Ver Ploeg, 2009; Woodward and Ribar, 2012). These monetary values could significantly influence the diets of nonparticipating members due to a potentially increased household food availability (Ver Ploeg, 2009). The income effect can have significant impacts on dietary behaviors amongst family members residing in a WIC household due to increased food availability. However, food purchasing is often reliant on consumers' knowledge of nutrition outside of financial and access limitations.

Spillover Effect and Nutrition Education

The WIC program has capitalized on the nutrition education component as a tool to influence family dietary consumption patterns. A study conducted by Johnson et al. (2006) explored the impact of increasing knowledge and awareness surrounding the benefits of family meals amongst WIC participants. It was determined that for those who participated in the WIC family meals education module, they increased family meal participation (Johnson et al., 2006). Nutrition education can be influential in dietary behaviors amongst both participants and families which eludes to a potential spillover of WIC benefits to non-participants. However, package benefits are not limited to nutrition education. An unintended derivative of WIC is potentially increased household food availability through voucher beneficiaries. There are limited numbers of both indirect and direct studies that have examined the potential WIC spillover effect to non-beneficiaries.

Indirect Examination of the WIC Spillover Effect

Currently, there is a limited body of literature that has indirectly explored whether WIC benefits extend to nonparticipating household family members. Studies conducted by Oliveira and Gundersen. (2000) compared the nutrient intakes of WIC-participating children (1-4-years- old) to comparably-aged children who did not receive benefits but lived in a WIC household. WIC participants had significantly higher intakes of some WIC targeted nutrients (folate, vitamin B₆, and iron), but differences in other nutrients (vitamins A and C) were null. The result of this study supports the idea that WIC foods are indeed consumed by WIC participants. However, due to similarities amongst participants versus nonparticipants living in a WIC household in the consumption of other WIC-approved foods (eggs, peanut butter, or cheese), the quantity of food may be divvied with nonparticipating family members.

A study conducted by Basiotis et al. (1998) compared family-level eating behaviors or HEI scores between WIC households and non-WIC households. It was determined that family HEI scores for fruit, grain, dairy, meat, fat, cholesterol, and sodium were all greater in households with one WIC participant, indicating that package benefits may influence eating behaviors. However, HEI scores for each individual family member was not available. It is possible that there could be an unequal distribution in individual HEI scores which could influence the household HEI score; in other words, HEI scores could be higher for those who receive WIC benefits than other members of the family.

Direct Examination of the WIC Spillover Effect

A small body of literature has explored how WIC benefits may be extended to age-ineligible members of the family. A study conducted by Woodward and Ribar (2012) examined how food assistance programs may be shared amongst family members,

specifically older children (10-17-years-old, n=1582) through the evaluation of intake patterns of specific food items consumed at breakfast and over the presumed week. Children were asked what foods they usually have for breakfast on a weekday morning, how often they ate those foods over the previous week and how many days did they consume those types of foods in the last week. Possible answers ranged from 0 to 7 days. Foods of interest included, fruits, vegetables, coffee, cereal, toast, snack foods, dairy, sweets, meats and other proteins (eggs, peanut butter, beans and soy products. For children who resided in a household with one or more WIC participants, breakfast consumption of dairy products (milk), snack foods, and cereal were higher than non-WIC households. Dairy and cereals are supplemental food components available in WIC packaging. This may support the food sharing concept among families participating in supplemental food programs.

Another study by Ver Ploeg (2009) examined HEI data from the NHANES 1988-1994 survey among children who were between 5-17-years-old (n=5310). This study examined three separate models to assess if WIC participation influenced dietary consumption patterns among nonparticipating children residing in WIC households: 1) if WIC participation corresponds with better diet quality for nonparticipating children; 2) how the number of WIC participants in the household may increase any spillover effect of WIC; 3) distinguishing if spillover effects are due to household food sharing or the income effect. For the third model, if the income effect was responsible for the WIC spillover effect then it would be expected that children in infant-only WIC households would have better diet quality than those in alternative WIC household's due to the majority of foods in the infant packages not being shareable, although it has higher monetary value. It was concluded that children that lived in WIC families had

significantly higher HEI scores than children in non-WIC households. It was also demonstrated that as the number of household WIC participants increased, the total HEI score followed, and children residing in infant-only WIC households had lower HEI scores than families with either a woman or child participant (Ver Ploeg, 2009). Results demonstrated that nonparticipating children residing in WIC households have a higher diet quality than similar children in non-WIC households indicating some benefit from household WIC status, however the exact mechanism responsible for the spillover effect is unknown.

Another study conducted by Robinson (2013) used physician medical examination data from the 1988 and 1994 NHANES III. For the purposes of this study, in order to identify the presence of the WIC spillover effect, physician health scores of 3,434 children between the ages of 5-17-years-old who resided in a WIC household or had one person who was eligible for WIC participation were evaluated. This study also performed a race-sex analysis to evaluate differences in resource allocations amongst racial and sex categories. It was concluded that older males (12-17-years of age) who lived in a WIC participating household experienced a greater health benefit than children in nonparticipating households, and the extent of the spillover effect varied by race. White males were more likely to be reported as in excellent health than African American males. It was determined that African American males were more likely to be reported as in good or very good health than in excellent or poor health. Based on the results of this study, there is some indication that a spillover effect is present and may differ by demographic group.

WIC Selection Bias

It is important to note that while the spillover effect may be potentially responsible

for improved health and dietary outcomes of this population, there is a potential bias present. The self-selection bias is generally referred to as women who self-select themselves into the WIC program based on a number of potential reasons, such as being more health-conscious and more knowledgeable about nutrition than nonparticipants (Robinson, 2013). These women may actively choose to live a healthier lifestyle and those behaviors would trickle down to their family members regardless if WIC benefits were present (Ver Ploeg, 2009; Robinson, 2013). In this case, the benefits of the WIC program for older children may be overstated. On the other side of the spectrum, women who self-select into the WIC program may have knowledge that their child will be in poor health or at an increased nutrition risk and may seek benefits to improve health outcomes (Robinson, 2013). In these scenarios, results from these studies may underestimate the effect that WIC household status had on the older child (Ver Ploeg, 2009).

Gaps in the Literature

There is a limited body of research directly examining the possibility of the WIC spillover effect among age-ineligible children. Research has yet to explore specific dietary consumption behaviors available in WIC package benefits such as fruits, vegetables, and 100% juice of children between the ages of 5-18-years-old residing in a WIC household. Other dietary components that have yet to be explored include SSBs and energy-dense snack consumption among this population. For eligible participants, the WIC program provides greater access to fruits, vegetables, and 100% juice, and as it has been discussed throughout this review. WIC participants tend to have lower consumption of added sugars and saturated fat. If WIC benefits extend to nonparticipating children, similar eating behaviors would be expected to be observed amongst this population. In

order to observe the impact of the spillover effect, dietary intake of the items described above will be evaluated and compared to similar children residing in income qualifying non-participating households to assess differences in dietary intake due to the influence of household WIC benefit packages rather than income. Expanding on this idea, little research has been done to compare potential disparities and differences in dietary consumption patterns related to WIC household status between race, sex, and age groups (5-11 and 12-18) of age-ineligible children residing in WIC households versus income qualifying non-participating households. This study seeks to address the association between household WIC participation and dietary intakes of age-ineligible children (5-18-years-old) residing in WIC households, and to examine if these patterns vary by age, sex, and race through examination of fruits and vegetables, 100% juice, sugar-sweetened beverages (SSBs), fruit and vegetable as snacks, and energy-dense snacks intake.

CHAPTER 3

METHODS

Study Design

The study involved a secondary analysis of data collected for the New Jersey Child Health Study (NJCHS). The NJCHS examined the impact of changes in the food and physical activity environments on children's health behaviors and weight status in four low-income New Jersey cities: Camden, Newark, Trenton and New Brunswick.

Data Collection

Participant data. Data for the present study were collected using random-digit-dial household surveys from two independent cross-sectional panels in 2009-10 and 2014. Panel 1, round 1 data was collected from 1408 households between June 2009 and April 2010. Contact numbers for this round were chosen from a randomly generated telephone landline digit-dial sample based on the four geographic areas listed previously. Number of participating household data by city is as follows: Camden (n=400), Newark (n=400), Trenton (n=400) and New Brunswick (n=280) households. In Panel 1, round 1 households could partake in the study if they had at least one 3-to-18-year-old child and the adult survey respondent being 18 years or older. If a household contained more than one eligible child, a computer program was utilized to randomly select one child of focus. The adult most knowledgeable about household food shopping completed the interviewer-administered questionnaire over the telephone answering survey questions both for the child and themselves. Surveys were available in either Spanish or English. For qualifying households, up to 22 call efforts were made. Respondents that completed the survey were given a \$10 compensation. On average, the survey completion time was 36 minutes. The overall response rate for this round was 49%.

For Panel 2, round 1 participating household data was collected from April to August 2014. Contact numbers for this round were chosen from a randomly generated telephone landline digit-dial sample along with a random generated cell phone sample based on the four geographic areas listed previously. Panel 2, round 1 data was collected from a total of 803 households in the 4 New Jersey cities. Requirements for Panel 2, round 1 were similar to Panel 1, but with slight modifications. Qualifying households for this round had to have at least one child between the ages of 3 to 15 years old. Number of participating household data by city is as follows: Camden (n=199), Newark (n=382), Trenton (n=160), and New Brunswick (n=62) households. For survey collection, up to 23 call attempts were made. Respondents who successfully completed the survey were given \$25 for their time. On average, the survey took 30 minutes to finish. Participation from cellphone holders averaged 36% of the respondents. In total, the overall response rate was 36% for both landline and cellphone users.

The survey for both rounds included sections specific to adult and child-level demographics, perceived physical activity environment, child and adult health behaviors, self-reported height/weight status, perceived food environment, healthcare coverage, employment, and income. The survey items were tested prior to use and were adapted from previously validated surveys and research studies (Center for Disease Control {CDC}, 2014, Nelson et al., 2009; Murphy et al., 2001). The study protocol was approved by the Institutional Review Board of Rutgers University and Arizona State University and all respondents provided verbal consent over the telephone prior to the start of the survey.

Outcome Variables

In order to determine the selected child's dietary intake, adult respondents were asked frequency-based questions adapted from the Behavioral Risk Factor Surveillance System (BRFSS) and the 2009-2010 National Health Examination Survey (NHANES) (CDC, 2005, CDC, 2014).

Questions surrounding child's dietary behaviors were prepped with this verbalization, "The next few questions are about different kinds of foods the *index child* ate or drank during this past month. You can tell me number of times per day, week or month, and your best guess is fine."

To assess frequency of child's fruit consumption, respondents were asked, "Not counting juice, how often did the *index child* consume fruits: canned, fresh, or frozen?" Frequency of 100% juice consumption was determined by the question, "How often did the *index child* drink 100% PURE fruit juices such as, orange, apple, or grape juice? Do NOT include fruit-flavored drinks with added sugar like Hi-C, Gatorade, or fruit punch."

For overall frequency of vegetable consumption by the *index child*, a combination of three questions specific to salad, potato, and other vegetables were used. To assess frequency of salad consumption, respondents were asked, "How often did the *index child* eat a green leafy or lettuce salad, with or without other vegetables?" Frequency of consumption was then computed to assess daily intake used in analysis. For potato consumption, "Not including French fries or other fried potatoes, how often did *index child* eat any other kind of potatoes such as baked, boiled, mashed potatoes, or potato salad?" For vegetables, outside of the categories stated, respondents were asked, "Not including what you just told me about, how often *index child* ate other vegetables such as

tomatoes, green beans, carrots, corn, cooked greens, sweet potatoes, broccoli, or any other kinds of vegetables?”

Frequency of index child’s consumption of energy dense salty and sweet snacks were determined by the following questions, “How often did the *index child* eat salty snacks like, chips, Doritos, and Nachos?” For sweets, respondents were asked, “How often did *index child* eat sweet items like cookies, cakes, candy, or pies?”

Frequency of sugar-sweetened beverage consumption was calculated based on a combination of questions related to fruit-flavored drinks and regular soda consumption. Questions for frequency of consumption related to fruit-flavored drinks were stated as, “How often did *index child* drink fruit flavored drinks such as lemonade, Sunny Delight, Kool-Aid, Gatorade, or sweet iced teas? Do not include 100% fruit juice or diet drinks.” For regular soda or carbonated soft drinks, “How often did *index child* drink regular carbonated soda or soft drinks that are sweetened such as Coke, Pepsi, or 7-up? Do not include diet drinks.”

In addition to asking about frequency of index child’s consumption of fruits and vegetables as snacks with the question from the Food Behavior Checklist (1997) (Murphy et al., 2001; Townsend et al., 2003), “How often did *index child* eat fruits or vegetables as a snack at home or at school?”

Key Exposure Variables

WIC participation was determined by the inquiry, “Did anyone in your family living there receive WIC in 2008/2013?” If respondent was unclear and needed clarification, “WIC-Supplemental Nutrition Program for Women, Infants and Children.” Responses could be as follows: “don’t know”, “yes” or “no” a refusal to answer was also available.

Covariates. Age and sex of the index child was determined through survey questions to the respondent.

Race/ethnicity of the index child was reported by the respondent and categorized as, “Non-Hispanic White,” “Non-Hispanic Black,” “Hispanic”, and for races outside of these categories, they were put into an “Other” category.

Respondents were also asked to report on family household size, and if any females in the household were pregnant.

The education level of index child’s mother was determined by the following questions, “What is the highest grade or level of school that the mother of the index child has completed?” and categorized as less than high school, high school or equivalent, some college, 4-year degree (Bachelors), or Advanced degree (MS, MA, PHD). Reported household income was converted to the Federal Poverty Level (FPL) percent.

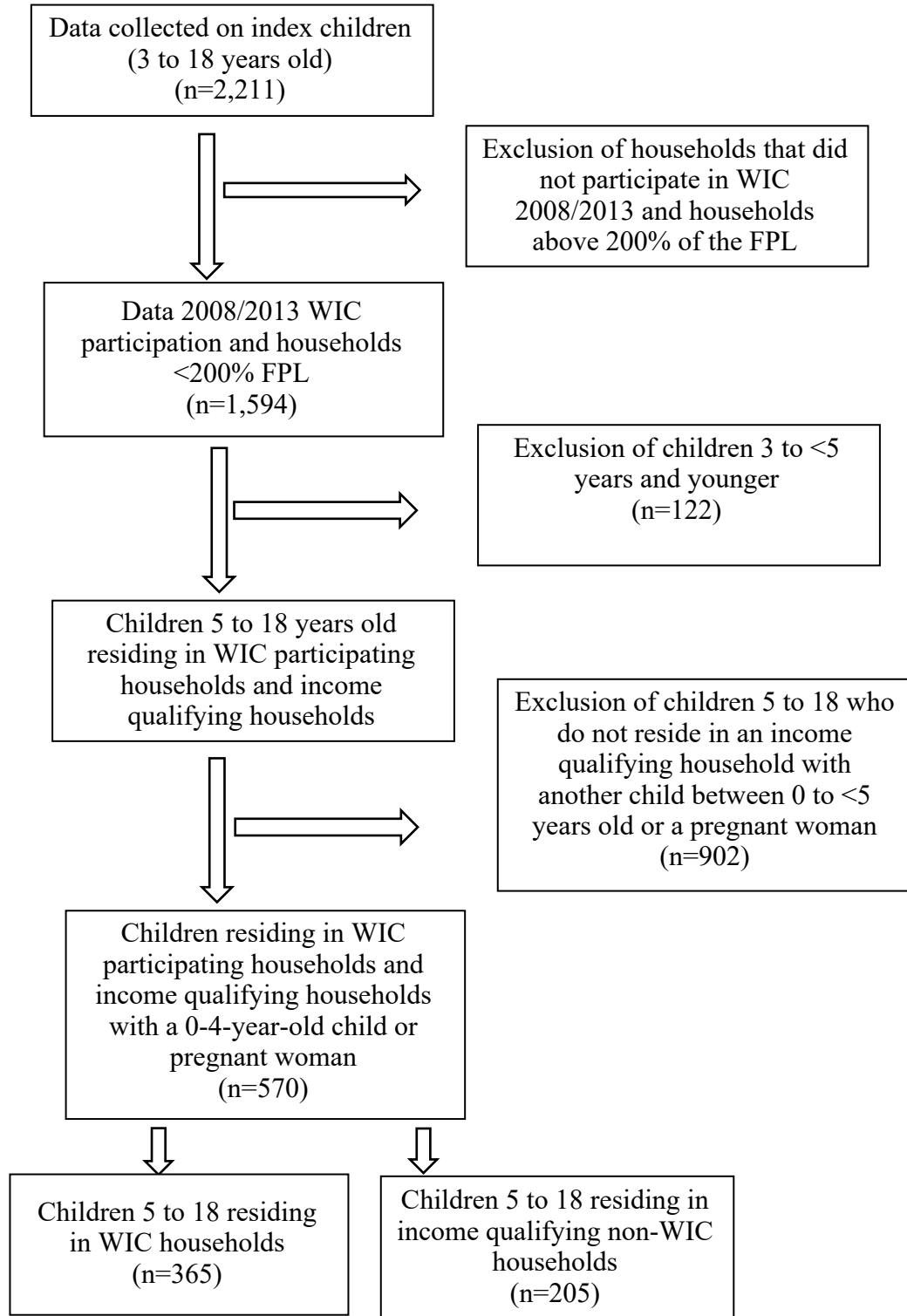
Statistical Analysis

All analyses were conducted using Stata 15. Independent t-tests were used to assess bivariate differences in frequency of consuming specific foods. Multivariate regression analyses estimated the association between household WIC participation status and daily mean frequency of consumption of the food categories of interest controlling for covariates. Incidence rate ratios (IRRs) and 95% confidence intervals were calculated for each dietary variable and demographic group. The incidence rate ratio is the number of events of one category compared to the number of events in the other category, which would be interpreted similar to a relative risk ratio. To estimate the WIC spillover effect (i.e. the difference in average frequency of consumption between WIC and non-WIC households) net of all covariates, the Stata “margins” command was used—a post-estimation procedure that is useful for group comparison. Margins return the predicted

mean of the outcome variable (frequency of food or beverage consumption) for the groups of interest (WIC vs non-WIC), while keeping all other predictors at their overall average value. The child's sex, age, race/ethnicity (non-Hispanic white, non-Hispanic Black, Hispanic, and other), mother's education (less than high school, high school, some college or college degree and more), household family size and city of residence were included in the model as covariates. Data were adjusted for survey panel (2009-10 and 2014) and complex survey design, including clustering at the city level and using the 'svy' prefix for commands in Stata. Analyses were also run to determine whether the results of the negative binomial regression models differ by the child's age and sex.

Data of households participating in WIC in 2008/2013 and those at or below 200% of the FPL were extracted from the full sample of 2,211 households (from both panels) with children between 5-18-years-old. The total analytical sample of 570 children included all 5-18-year-olds from WIC participating households (n=365), while children 5 to 18 from income qualifying non-participating households were included only if in the household there was a child between the ages of 0- <5 or a pregnant woman (n=205) (**Figure 1**).

Figure 1. Sampling plan for selecting analytical sample



CHAPTER 4
MANUSCRIPT

Research Snapshot

Research Question: Do dietary benefits from household WIC participation extend to age-ineligible children residing in the household?

Key Findings: In this cross-sectional study, adjusted incidence ratios indicated that 5-18-year-old children residing in WIC households had healthier dietary behaviors compared to similar age children living in income-eligible non-participating households.

Keywords: The Special Supplemental Nutrition Assistance Program for Women, Infants and Children (WIC); WIC Spillover effect; dietary consumption

Abstract

Background: Children under 5 years of age participating in the Special Supplemental Nutrition Assistance Program for Women, Infants and Children (WIC) consume healthier diets including higher amounts of fruits, vegetables, and whole grains and lower amounts of fat and added sugars. It is unclear if dietary behaviors of age-ineligible children (5-18-years-old) are influenced by household WIC participation.

Objective: To examine the association between household WIC participation and dietary behaviors of older age-ineligible children (5-18-years-old).

Design: This cross-sectional study utilized data from a telephone survey of 2,211 households in four cities in New Jersey. Data were analyzed from two independent cross-sectional panels (2009-10 and 2014). Questions from previously validated surveys assessed consumption frequency of specified food categories among 5-18-year-olds.

Participants/Setting: Analysis is limited to 570 children (365 WIC participants) with household incomes below 200% of the Federal Poverty Level.

Main outcome measures: Eating behaviors assessed as frequency of consumption of fruit, vegetables, 100% juice, sugar sweetened beverages (SSBs), fruits and vegetables as snacks, and sweet and salty snacks.

Statistical Analysis: Multivariable analyses were conducted to compute incidence rate ratios (IRRs) using negative binomial regression to compare the differences in eating behaviors of children in WIC vs. non-WIC households.

Results: Household WIC participation was associated with a slightly higher frequency of vegetable consumption among 12-18-year-old children (IRR= 1.25, $p=.056$) primarily driven by older males (12-18-years-old) ($p=.006$). Frequency of 100% juice consumption was primarily driven by sex of the child, with younger females (5-11-years-old) in WIC households consuming 100% juice about 44% more frequently ($p=.020$). Hispanic children in WIC households reported a lower frequency of SSBs consumption ($p=.015$), while this observation was stronger among males ($p=.024$).

Conclusions: This study shows that the benefits of household WIC participation may be extending to age-ineligible children, suggesting a possible WIC spillover effect. Among age-ineligible children, household WIC participation was associated with healthier behaviors including vegetable and 100% juice consumption, which are components of WIC packages. Revisions to WIC policies and package compositions should consider the possible dietary implications on all children in the household.

Introduction

The early years of life among children play a critical role in the evolution of eating behaviors through early exposures to food, parental modeling, socioeconomic status and the food environment (Zarnowiecki, Dollman & Parletta, 2014). Among children, healthy eating behaviors are important for reducing undernutrition and nutrient-related deficiencies and promoting physical development. Further, the effect of positive nutrition behaviors is not limited to benefiting child health status; research indicates that child nutrition and dietary habits persist through adulthood, affecting adult health status and longevity (Neumark-Sztainer et al., 2011; Cutler et al., 2010). Current intake trends consistently show that children do not meet dietary recommendations for fruits, vegetables and whole grains (Kim et al., 2014; Banfield et al., 2016), and consumption of empty calories from saturated and trans fats (desserts) and added sugars (sugar sweetened beverages) is high (Powell et al., 2016; Dunford and Popkin, 2017). Disparities in diet quality and behaviors have also been observed by demographic characteristics, such as, sex, race, age, and socioeconomic status (SES).

Total fruits and vegetables consumption tend to be higher among female children (Nilufer Acar et al., 2011; Kim et al., 2014), and males are found to consume a larger amounts of sugar-sweetened beverages (SSBs) and sweet and salty snacks (Brener et al., 2011; Powell et al., 2016; Bailey et al., 2018). Distinctions by age groups demonstrate that younger children (4-8-years-old) tend to have a better dietary quality and higher consumption of fruit and 100% juice compared to adolescents (14-18- years-old) (Banfield et al., 2016; Gu and Tucker, 2017). Among racial/ethnic groups, African American children have consistently been shown to have a poorer dietary quality (Gu and Tucker, 2017), and have the highest intake of caloric snacks compared to other

racial/ethnic groups (Dunford and Popkin, 2017). Hispanic children have higher intakes of added sugars and fats compared to their non-Hispanic counterparts (Powell et al., 2016; Rosginer et al., 2017). Children from lower income households have lower dietary quality (Van Ansem et al., 2014).

The United States Department of Agriculture (USDA) addresses the poor diet quality of young children through the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). WIC provides vouchers for specific foods, nutrition education, and health care referrals to low-income pregnant or post-partum women, infants, and children up to the age of 5, who are considered at nutritional risk (USDA, 2017). WIC supplemental food packages include items to bridge the gap between dietary recommendations and current diet of the US population. The items in the food package include: whole grains, dairy, fruits, vegetables, 100% juice, fish, eggs, and infant formula and foods (USDA, 2017).

Research has consistently shown that participation in a WIC program improves the dietary quality of participants, specifically in relation to increases in fruit, vegetable, whole grain and milk consumption and decreases in fat and added sugar content of diets (Tester et al., 2016; Chiasson et al., 2013; Morshed et al., 2015). Although available literature indicates a benefit of participating in WIC for children under 5 years of age, little research has been done to explore how these benefits may influence the dietary behaviors of age-ineligible children (5-18 years-old) residing in WIC participating households. For example, in a study using National Health and Nutrition Examination Survey (NHANES) data, Ver Ploeg (2009) observed higher Healthy Eating Index (HEI) scores among 5-17-year-old children residing in WIC households compared to children in non-participating households. They further reported that the association was stronger if

there were two WIC participants in the home (Ver Ploeg, 2009). Another study found consumption of milk and cereal, components of the WIC package, to be higher among 10-17-year-old children residing in a WIC participating household when compared to children in non-participating households (Woodward and Ribar, 2012). Research by Robinson (2009), found that residing in a WIC household was associated with a higher score on overall health status among older males (12-18 years-old), but this benefit was not observed among females or younger children (5-11-years-old)

Research has yet to examine specific food behaviors associated with a wider array of foods that are provided in WIC supplemental food packages and with energy-dense, nutrient poor foods among older (5-18-year-old) children living in a WIC household compared to those living in an income qualifying, but non-participating household.

WIC participants have higher consumption patterns of products included in WIC packages and lower intakes of added sugars and fats (Oliveira, Gundersen & USDA, 2000; Tester et al., 2016) when compared to children in non-participating households. If package benefits “spilled over” to age-ineligible children in participating households, similar dietary patterns would likely be observed. Further, given that previous research showed disparate spillover benefits on health status among non-eligible children in WIC households (Robinson, 2013), it is important to examine potential disparities in WIC spillover effect on dietary consumption patterns in these children based on race, gender, and age groups (5-11 and 12-18 years).

Materials & Methods

Participant Data

A random-digit dial survey of households was conducted as part of the New Jersey Health Study in four low-income New Jersey cities: Camden, Newark, Trenton

and New Brunswick. The respondent for the survey was an adult with at least one child between the ages of 3-18-years-old and responsible for food purchasing decisions in the household. The survey collected information on the respondent and one of their randomly selected children, referred to as index child. The adult respondent answered survey questions for the child and themselves. The household survey was administered to two different panels: panel 1 conducted in 2009-10 included a sample of 1,408 households and panel 2 conducted in 2014, included 803 households.

The questions from the survey included in these analyses were obtained from sections specific to adult and child-level demographics, child and adult dietary behaviors, respondent-reported height/weight status, employment status, and income. The survey was administered in either Spanish or English and took approximately 30 minutes to complete. Informed oral consent was obtained prior to the start of the phone survey. The Rutgers and Arizona State University Institutional Review Boards approved the study protocol.

Study Sample

Analysis was limited to households with household incomes at or below 200% of the Federal Poverty Level (FPL). The analytical sample included all 5-18-year-old children from WIC participating households (n=365), while children 5-18-year-old from income qualifying non-participating households were included only if in the household there was a child between the ages of 0 to 5 years old or a pregnant woman (n=205).

Outcome Variables

Six eating behaviors were chosen for this study based on their association with WIC supplemental packages, diet quality and health status. Fruits, vegetables, 100%

juice and FV snacks were selected as they are part of the WIC, while SSBs and sweet and salty snacks are likely to be substituted by foods available in WIC packages. Frequency of consumption was assessed for fruit, vegetables, sweet and salty snacks (chips or cookies), fruits and vegetables as snacks, 100% juice, fruit drinks, and regular soda. Fruit drinks and regular soda were combined into a total SSBs variable. Participants could report food and beverage consumption frequency by day, week, or month. Consumption frequency was calculated as number of times per day. Frequency of consumption of fruits and vegetables were derived using question adapted from the Behavior Risk Factor Surveillance Survey and 2009-10 National Health and Nutrition Examination Survey (Center for Disease Control [CDC], 2005; CDC, 2014). Frequency of 100% juice consumption was determined by the question, “How often did the *index child* drink 100% PURE fruit juices such as, orange, apple, or grape juice? Do NOT include fruit-flavored drinks with added sugar like Hi-C, Gatorade, or fruit punch.”

For fruit consumption, respondents were asked, “Not counting juice, how often did the *index child* eat fruit? Count fresh, frozen, or canned fruit.” Total vegetable consumption was a composite of four questions, similar to the one for fruit, asking participants to report on frequency of consumption of lettuce/salad, potato, beans, and other vegetables. SSBs consumptions was determined by two questions (Center for Disease Control [CDC], 2005; CDC, 2014), “How often did *index child* drink fruit flavored drink such as lemonade, Sunny Delight, Kool-Aid, Gatorade, or sweet iced teas? Do not include 100% fruit juice,” and “How often did *index child* drink regular carbonated soda or soft drinks such as coke, Pepsi, or 7-up? Do not include diet drinks.” Frequency of consumption of salty and sweet snacks were determined by the following questions, “How often did the *index child* eat salty snacks like, chips, Doritos and Nachos.” For sweets, respondents

were asked, “How often did *index child* eat sweet items like cookies, cakes, candy, or pies?” Participants were also asked about the frequency of index child’s consumption of fruits and vegetables as snacks with the question from the Food Behavior Checklist (1997) (Murphy et al., 2001; Townsend et al., 2003), “How often did *index child* eat fruits or vegetables as a snack at home or at school?”

Explanatory Variables

Child and parent demographic information was reported by the respondent. Child’s race/ethnicity was categorized as, “Non-Hispanic White,” “Non-Hispanic Black,” “Hispanic,” and “Other” and children were categorized into younger (5-11-years-old) and older (12-18-years-old) age group. Mothers’ education was categorized into, “less than high school,” “high school or equivalent,” “some college,” or “college graduate.” Household income was calculated as a percentage of the Federal Poverty Level and accounted for household size according to the year of data collection. Participation in Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) was determined by the question, “Did anyone in your family living there receive WIC in 2008/2013?” Respondents were also asked to report on family household size, and if any females in the household were pregnant.

Statistical Analysis

All analyses were conducted using Stata 15. T-test were used to assess differences in eating behaviors. Multivariate regression analyses estimated the association between household WIC participation status and daily mean frequency of consumption of the food categories of interest controlling for covariates. Incidence rate ratios (IRRs) and 95% confidence intervals were calculated for each dietary variable and demographic group. The incidence rate ratio is the number of events of one category to the number of events

in the other category, which is interpreted similarly to a relative risk ratio. To estimate the WIC spillover effect (i.e. the difference in average frequency of consumption between WIC and non-WIC households) net of all covariates, we used the Stata “margins” command—a post-estimation procedure that is useful for group comparison. Margins returns the predicted mean of the outcome variable (frequency of food or beverage consumption) for the groups of interest (WIC vs non-WIC), while keeping all other predictors at their overall average value. Child’s sex, age, race/ethnicity (non-Hispanic white, non-Hispanic Black, Hispanic, and other), mother’s education (less than high school, high school, some college, college degree or more, household family size and city of residence were included in the model as covariates. Data were adjusted for survey panel (2009-10 and 2014) and complex survey design, including clustering at the city level, using the ‘svy’ prefix for commands in Stata. Analyses were also run to determine whether the results of the negative binomial regression models differ by child’s age, sex or racial/ethnic group.

Table 1. Demographic and dietary outcome variables by household WIC participation status among age ineligible 5-18-year-olds (N=570)

Demographic Variables	WIC (N=365)	%	Non- WIC^a (N=205)	%	p-value
Sex^b					0.198
Male	195	53	98	48	
Female	170	47	107	52	
Age^b					0.565
5-11 years old	237	65	138	67	
12-18 years old	128	35	67	33	
Race/Ethnicity^b					0.058
Non-Hispanic white	10	3	7	3	
Non-Hispanic black	173	47	120	59	
Hispanic	170	47	72	35	
Other	12	3	6	3	
Mother's Education^b					0.237
Less than high school	96	26	43	21	
High School	161	44	94	46	
Some College	86	24	51	25	
College degree or more	21	6	16	8	
Residence^b					0.385
Newark	110	30	75	37	
Camden	113	31	62	30	
Trenton	94	26	47	23	
New Brunswick	48	13	21	10	
	Mean	SD	Mean	SD	
Household Family Size					0.503
	5.0	1.7	5.2	1.7	
Food categories(times/day)^c					
Vegetables	1.9	1.6	1.8	1.3	0.617
Fruits	1.3	1.3	1.3	1.2	0.804
100% juice	1.6	1.6	1.5	1.5	0.296
FV Snacks	1.0	1.1	1.2	1.2	0.160
SSBs	1.2	1.6	1.2	1.4	0.835
Sweet and salty snacks	1.0	1.3	1.1	1.2	0.771

^a included income-qualifying (200% FPL) non-WIC households

^b Chi-square analyses

^c Independent two tailed t-tests

RESULTS

Table 1 presents demographic and dietary outcome variables by household WIC participation status among all children in the sample (n=570). Three hundred and sixty-five children resided in WIC households and 205 in income-qualifying non-WIC households. Approximately 51% of the children in the sample were males and 66% consisted of children between the ages of 5-11 years old. On average household family size was 5 members, and roughly 47% of mothers obtained a high school degree or equivalent. In the bivariate analyses, there were no significant differences observed in the mean frequency of consumption of vegetables, fruits, 100% juice, SSBs, and sweet and salty snacks of children in WIC versus non-WIC household (Table 1).

To examine differences in association between household WIC status and outcome variables by demographic factors, subgroup analyses were conducted for age, sex, race/ethnicity, and further by age by sex, age by race, and race by sex in exploratory analysis.

Bivariate Analyses of mean frequency of intake and WIC household participation status by age, sex and race

Vegetables and Fruits Consumption

Tables 2-4 shows results of the bivariate analyses with mean frequency of intake (times per day) by age, sex and race by WIC household participation status. Differences in the frequency of vegetable consumption were marginally significant for older children (12-18-years-old) with those residing in WIC households consuming vegetables about 0.42 times more often than their counterparts in non-WIC households (p=.087) (**Table 2**). Additional exploratory analysis showed that this finding was mostly driven by 12-18-

year-old boys (**Table 2a**). No significant differences in the frequency of vegetable and fruit consumption were observed for other demographic groups.

Table 2. Mean frequency (SD) of dietary outcome variables among age-ineligible children by age and WIC household participation status (N=570)

Food Items	5-11-year-olds (N=375)			12-18-year-olds (N=195)		
	WIC (N=237)	Non-WIC (N=138)	p-value	WIC (N=128)	Non-WIC (N=67)	p-value
100% Juice	1.7 (1.7)	1.5 (1.4)	0.290	1.5 (1.6)	1.4 (1.6)	0.725
Fruit	1.4 (1.4)	1.3 (1.1)	0.821	1.1 (1.1)	1.1 (1.2)	0.801
Vegetables	1.8 (1.5)	1.9 (1.4)	0.473	1.9 (1.9)	1.5 (0.9)	0.087
FV Snacks	1.1 (1.2)	1.2 (1.2)	0.344	0.8 (1.0)	1.0 (1.1)	0.318
SSBs	1.1 (1.6)	1.1 (1.5)	0.917	1.4 (1.7)	1.5 (1.4)	0.743
Sweet and salty snacks	1.0 (1.4)	0.9 (0.9)	0.653	0.9 (1.2)	1.2 (1.6)	0.283

Table 2a. Mean frequency (SD) of dietary outcome variables among age-ineligible male children by age and WIC household participation status (N=293)

Food Items	5-11-year-olds (N=202)			12-18-year-olds (N=91)		
	WIC (N=133)	Non-WIC (N=69)	p-value	WIC (N=62)	Non-WIC (N=29)	p-value
100% Juice	1.7 (1.6)	1.9 (1.7)	0.415	1.7 (1.8)	1.5 (1.8)	0.530
Fruit	1.4 (1.3)	1.4 (1.2)	0.764	1.2 (1.2)	0.7 (0.9)	0.056
Vegetables	1.8 (1.4)	1.9 (1.3)	0.515	2.1 (1.5)	1.3 (.88)	0.008
FV Snacks	1.1 (1.2)	1.2 (1.2)	0.588	0.9 (1.2)	0.7 (0.7)	0.298
SSBs	1.1 (1.5)	1.1 (1.6)	0.974	1.5 (1.6)	1.9 (1.7)	0.294
Sweet and salty snacks	0.9 (1.4)	1.0 (1.1)	0.740	0.9 (1.2)	1.5 (2.0)	0.142

Beverage Consumption

Significant differences were observed in mean frequency of SSBs consumption by race, with Hispanic children in WIC households consuming SSBs about 0.38 times less frequently than Hispanic children in non-WIC households ($p=.028$) (**Table 3**). Among Hispanic boys, WIC household participation was associated with less frequent SSBs consumption when compared to their peers ($p=.028$), but not among Hispanic girls (**Table 3a**). No significant differences in beverage consumption were found for other age, sex or racial subgroups.

Table 3. Mean frequency (SD) of dietary outcome variables among age-ineligible children by race and WIC household participation status (N=535)

Food Items	African American (N=293)			Hispanic (N=242)		
	WIC (N=173)	Non-WIC (N=120)	p-value	WIC (N=170)	Non-WIC (N=72)	p-value
100% Juice	1.7 (1.8)	1.6 (1.7)	0.591	1.5 (1.5)	1.3 (1.2)	0.472
Fruit	1.3 (1.4)	1.4 (1.3)	0.776	1.3 (1.3)	1.1 (0.9)	0.273
Vegetables	2.0 (1.9)	1.8 (1.3)	0.377	1.8 (1.4)	1.7 (1.2)	0.722
FV Snacks	1.2 (1.2)	1.3 (1.2)	0.470	0.8 (0.9)	0.9 (1.1)	0.439
SSBs	1.5 (1.9)	1.2 (1.4)	0.295	0.9 (1.0)	1.3(1.6)	0.028
Sweet and salty snacks	1.2 (1.2)	1.2 (1.3)	0.679	0.9 (1.4)	0.8 (1.0)	0.501

Table 3a. Mean frequency (SD) of dietary outcome variables among age ineligible Hispanic children by sex and WIC household participation status (N=535)

Food Items	Female (N=106)			Males (N=136)		
	WIC (N=72)	Non-WIC (N=34)	p-value	WIC (N=98)	Non-WIC (N=38)	p-value
100% Juice	2.0 (1.3)	1.3 (1.2)	0.666	1.7 (1.6)	1.4 (1.2)	0.271
Fruit	1.1 (.99)	1.2 (.94)	0.452	1.5 (1.4)	1.0 (0.9)	0.078
Vegetables	1.7 (1.3)	1.7 (.93)	0.948	1.8 (1.5)	1.7 (1.4)	0.705
FV Snacks	0.7 (0.8)	1.0 (1.3)	0.250	0.9 (0.9)	0.8 (0.8)	0.945
SSBs	0.8 (1.1)	1.0 (1.1)	0.398	0.9 (0.9)	1.5 (1.9)	0.028
Sweet and salty snacks	0.7 (1.1)	0.8 (0.8)	0.987	1.0 (1.6)	0.8 (1.2)	0.470

Snack Consumption

Variations in snack consumption were observed among children residing in WIC versus non-WIC households. Differences in frequency of fruits and vegetables as snacks (FV snacks) were observed by sex; girls residing in WIC households consumed FV snacks less often than girls in non-WIC households ($p=.051$) (**Table 4**). In particular, older girls in WIC households consumed FV snacks about 0.51 times less often than older girls in non-WIC households ($p=0.019$) (**Appendix A for Table 1a.**). No other differences in FV or sweet and salty snacks were observed by other race, age or sex categories.

Table 4. Mean frequency (SD) of dietary outcome variables among age-ineligible children by sex and WIC household participation status (N=570)

Food Items	Females (N=277)			Males (N=293)		
	WIC (N=170)	Non-WIC (N=107)	p- value	WIC (N=195)	Non-WIC (N=98)	p-value
100% Juice	1.5 (1.8)	1.2 (1.2)	0.103	1.7 (1.7)	1.8 (1.8)	0.749
Fruit	1.3 (1.4)	1.4 (1.2)	0.487	1.3 (1.2)	1.2 (1.1)	0.263
Vegetables	1.9 (1.6)	1.9 (1.3)	0.926	1.9 (1.4)	1.7 (1.3)	0.349
FV Snacks	1.0 (1.0)	1.3 (1.3)	0.051	1.0 (1.2)	1.0 (1.0)	0.991
SSBs	1.2 (1.7)	1.1 (1.2)	0.902	1.2 (1.6)	1.3 (1.7)	0.647
Sweet and salty snacks	1.1 (1.3)	0.9 (0.9)	0.382	0.9 (1.3)	1.2 (1.4)	0.258

Multivariate Analyses of mean frequency of intake and WIC household participation status by age, sex and race.

Table 5 shows results from the negative binomial regression model that compared daily mean frequency of consumption between age ineligible children in WIC vs. Non-WIC households after controlling for covariates. In the full analytical sample, consumption frequency of various foods included in the analysis did not vary by WIC participation status. To examine the hypotheses related to potential disparities in association between household WIC participation and consumption by age, sex, and race of age-ineligible children, analysis was run stratified by these demographic variables and are presented in Appendix C, D, E, and FIGURES 1-4. Further exploratory analysis also assessed two-way interactions between age and sex, race/ethnicity and age, and race/ethnicity and sex.

Table 5. Adjusted incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items among age-ineligible children by WIC household participation status (N=570)

Food Items ^a	IRR ^c	95% CI	p-value
100% Juice	1.15	0.96, 1.35	0.111
Fruit	1.05	0.89, 1.23	0.600
Vegetables	1.06	0.93, 1.21	0.400
FV Snacks	0.93	0.77, 1.10	0.414
SSBs	0.94	0.76, 1.16	0.600
Sweet and salty snacks	1.01	0.82, 1.23	0.920

^a all frequencies are per day

^b adjusted for city of residence, panel, sex, age, mothers education, race, household family size

^c IRR incidence rate ratios for negative binomial regression

Vegetables and Fruits Consumption

For vegetable consumption, significant differences were observed in analysis stratified by age. Older children (12-18-years-old) in WIC households consumed vegetables about 25% more frequently than similarly-aged children in non-WIC households (p=.056) (**Appendix C and Figure 2**). In particular, older males in WIC households were observed to consume vegetables approximately 58% more frequently than their peers in non-WIC households (p=.006) (**Figure 2a**). Also, older African American children from WIC households consumed vegetables about 40% more often than their counterparts who did not reside in WIC households (p=.049) (**Figure 2b**). No associations were observed for fruit for any of the analyses stratified by demographic variables.

Figure 2. Adjusted mean and SE for vegetable consumption by WIC participation status stratified by age (N=570)

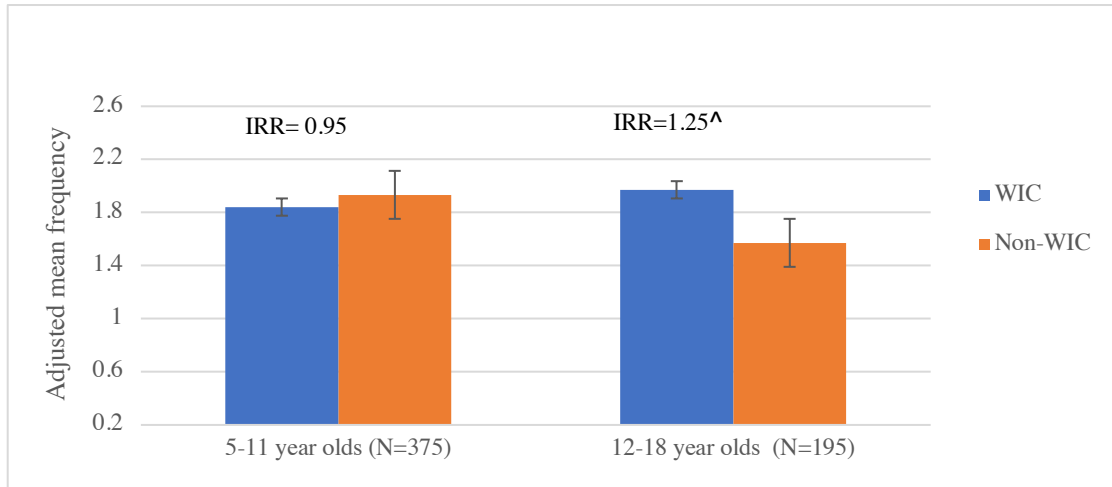


Figure 2a. Adjusted mean and SE for vegetable consumption by WIC participation status stratified by sex (N=195)

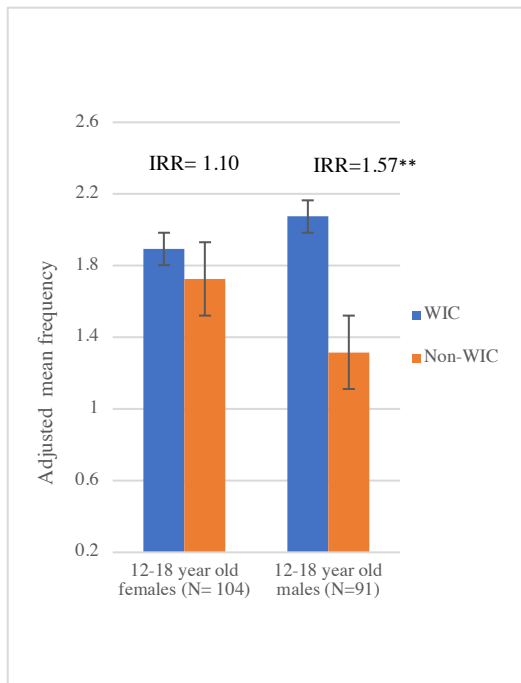
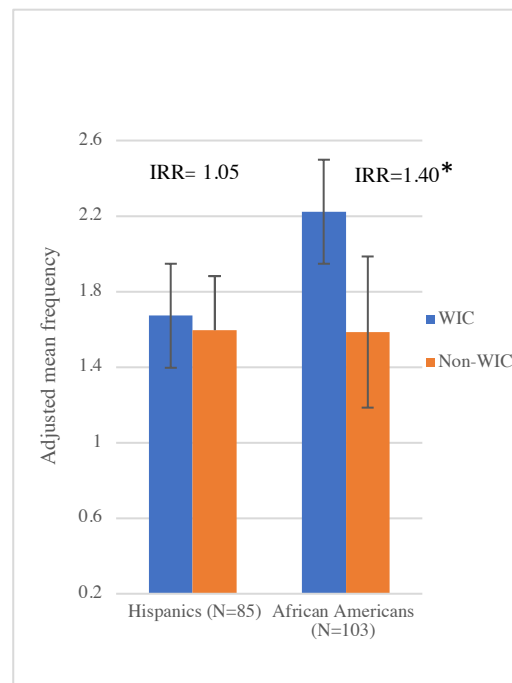


Figure 2b. Adjusted mean and SE for vegetable consumption by WIC participation status stratified by race (N=188)



Analysis adjusted for city of residence, sex, panel, race, household family size and mother's education
[^]p<.10; * p < 0.05; **p< 0.01; *** p < 0.001

Beverage Consumption

In stratified analyses, significant differences were observed in beverage consumption between children from WIC and non-WIC households by sex (**Table 6**). Differences in frequency of 100% juice consumption were primarily driven by sex of the child, with younger girls (5-11-years-old) in WIC households consuming 100% juice about 44% more frequently ($p=.020$) (**Figure 2c**). On the other hand, older boys from WIC household consumed 100% juice about 57% more frequently than their counterparts, and this difference was marginally significant ($p=.06$). When exploring by race, African American girls in WIC households consumed 100% juice approximately 36% more frequently than girls in non-WIC households ($p=.054$) (**Figure 2d**).

Table 6. Adjusted incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items among age-ineligible children by sex and WIC household participation status (N=570)

Food Items	Females ^b (N=277)			Males ^b (N=293)		
	IRR ^c	95% CI	p-value	IRR ^c	95% CI	p-value
100% Juice	1.32	1.01, 1.71	0.040	1.07	0.86, 1.33	0.538
Fruit	0.98	0.76, 1.23	0.834	1.18	0.94, 1.46	0.135
Vegetables	1.04	0.85, 1.28	0.650	1.10	0.93, 1.31	0.240
FV Snacks	0.86	0.67, 1.08	0.203	1.03	0.78, 1.34	0.839
SSBs	0.98	0.74, 1.29	0.893	0.93	0.69, 1.25	0.637
Sweet and salty snacks	1.18	0.90, 1.53	0.213	0.92	0.67, 1.24	0.579

^a all frequencies are per day

^b adjusted for city of residence, panel, age, mother's education, race, household family size

^c IRR incidence rate ratios for negative binomial regression

Figure 2c. Adjusted mean and SE for 100% juice consumption by WIC participation status among females stratified by age (N=277)

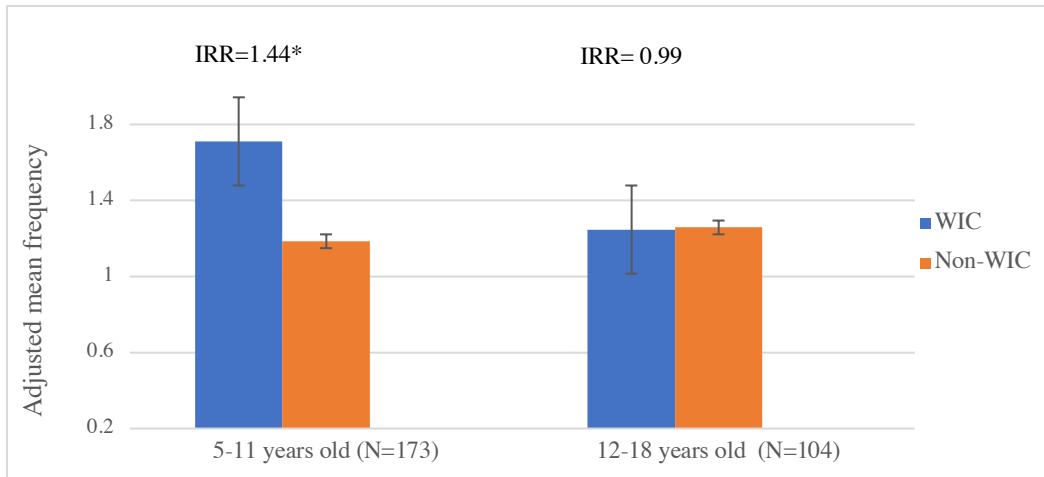
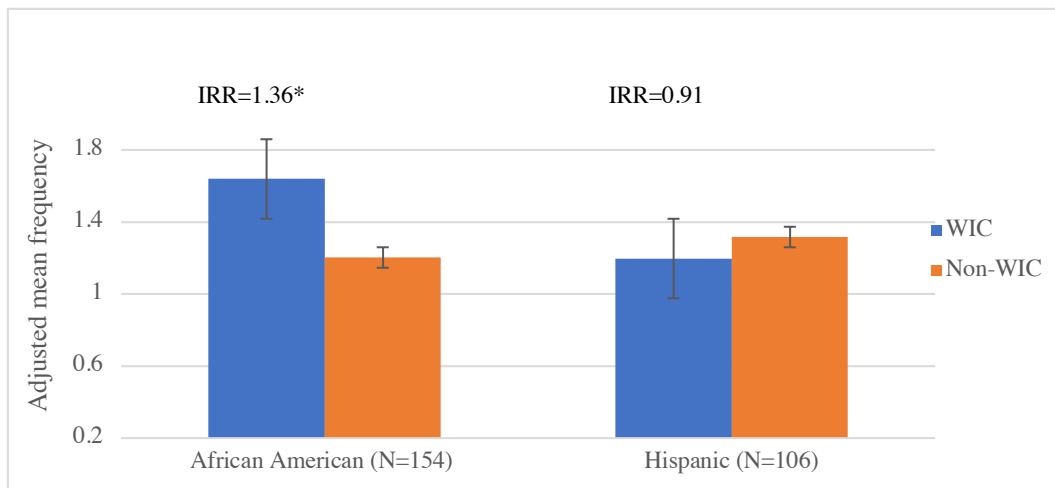


Figure 2d. Adjusted mean and SE for 100% juice consumption by WIC participation status among females stratified by race (N=260)



^p<.10; * p < 0.05; **p< 0.01; *** p < 0.001

A relationship was also observed for SSBs consumption by WIC household status and race; WIC household participation was associated with 33% lower frequency of SSBs consumption among Hispanic children (p=.015) (**Table 7**). This association was stronger among Hispanic boys, where those who resided in WIC households consumed SSBs approximately 36% less frequently (p=.024) (**Figure 2e**). This relationship was also detected among Hispanic girls, but only with a marginal significance (p=.065).

Table 7. Adjusted incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items among age-ineligible children by race and WIC household participation status (N=535)

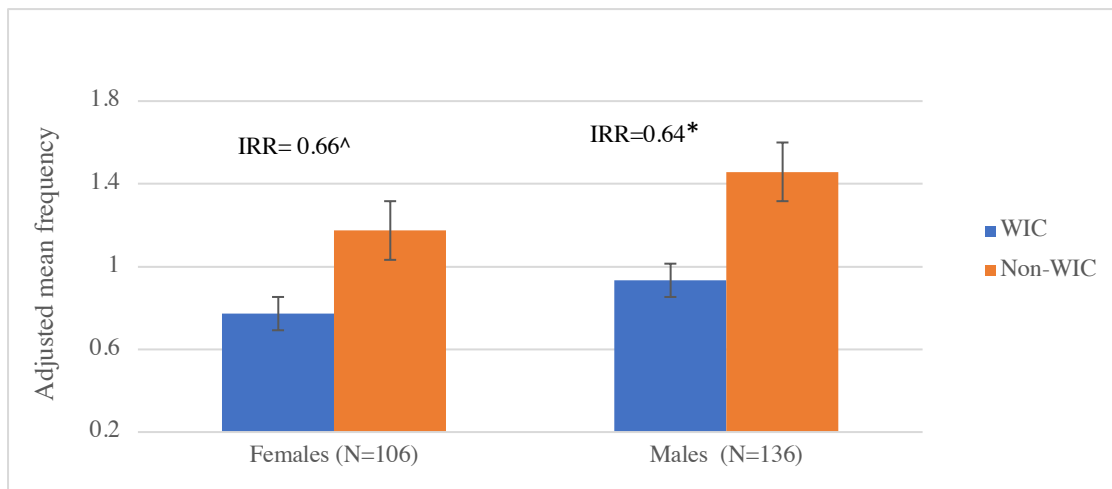
Food Items	African American ^b (N=293)			Hispanic ^b (N=242)		
	IRR ^c	95% CI	p-value	IRR ^c	95% CI	p-value
100% Juice	1.13	0.89, 1.41	0.313	1.07	0.82, 1.37	0.619
Fruit	1.02	0.80, 1.27	0.890	1.12	0.87, 1.44	0.364
Vegetables	1.10	0.91, 1.32	0.307	1.03	0.83, 1.25	0.800
FV Snacks	1.00	0.81, 1.23	0.993	0.83	0.61, 1.13	0.250
SSBs	1.10	0.83, 1.44	0.482	0.68	0.49, 0.92	0.015
Sweet and salty snacks	0.96	0.74, 1.22	0.727	1.17	0.81, 1.66	0.387

^a all frequencies are per day

^b adjusted for city of residence, panel, age, mother’s education, sex, household family size

^c IRR incidence rate ratios for negative binomial regression

Figure 2e. Adjusted mean and SE of SSBs consumption by WIC household participation status among Hispanic children stratified by sex (N=242)



Analysis adjusted for city of residence, panel, race, household family size and mother’s education
[^]p<.10; * p < 0.05; **p<0.01; *** p < 0.001

Snack consumption

No significant associations were observed for FV snacks or sweet and salty snacks in stratified analyses.

DISCUSSION

In this sample of 5-18-year-old children from four low-income cities in New Jersey, living in WIC participating households was associated with healthier dietary behaviors when compared to similar age children in non-participating households, suggesting a

spillover effect of household WIC participation on age-ineligible children. Further, the WIC spillover effect varied across demographic groups.

Among older children (12-18-years-old), specifically boys, living in WIC households was associated with a marginally higher frequency of consuming vegetables. WIC food packages include Cash Value Vouchers (CVV), \$8.00 for children and \$11.00 for women for produce purchase and has been associated with increased consumption among participants (Morshed et al., 2015). Interestingly, results from this study did not reveal differences in fruit consumption among any group. Prior to package revisions, WIC participants were observed to have higher intakes of fruits (Siega-Riz et al., 2004; Wilde et al., 2000). However, there is currently a lack of literature exploring differences in fruit intake between WIC and non-WIC participants post-implementation of package changes, research by Vercammen et al. (2018), observed WIC participants to have higher total fruit intake, which included 100% juice, but not whole fruit when compared to non-participating children. In this study, children in both WIC and non-WIC households consumed an adjusted mean of 1.5 and 1.3 servings of total fruit, respectively and 0.7 servings of total vegetables per day (Vercammen et al., 2018). Our results indicated that children in WIC and non-WIC households consumed fruits and vegetables 1.3 and 1.9 times per day, respectively. Results indicate that children are not currently meeting total fruit and vegetable recommendations, and differences in vegetable consumption may signify that over-reporting was present in our sample.

Marginally significant higher consumption for 100% juice was also observed among older males living in WIC households. Typically, consumption of 100% juice has been shown to decrease with age (Drewnowski and Rehm, 2015). However, among older boys, residence in a WIC household was associated with more frequent consumption of 100%

juice. This could indicate that higher availability of juice at home may have influenced consumption choices among this group.

Higher consumption of foods from WIC packages among older males may be an indication of differences in how household resources are allocated among family members (Robinson, 2013), where sex composition of siblings may present competition for resources (Zheng, 2015). Literature has identified differences in food allocations and education resources by sex, where females were more likely to be at a disadvantage when compared to their male siblings (Chen et al., 1981; Wibowo et al., 2015; Zheng, 2015). Age-based differences observed in this study also aligns with research in household decision making. Older adolescents may exert more influence in household purchasing decisions (Dauphin et al., 2011), and may use this power to distribute more resources to themselves, which would increase their likelihood of experiencing a benefit (Ver Ploeg, 2009).

Among younger children (5-11-years-old), females had significantly higher intakes of 100% juice if they resided in a WIC household. Available literature demonstrates that WIC participants consume higher intakes of 100% juice (Vercammen et al., 2018), which may potentially displace sugar-laden beverages. Interestingly, our results indicated significant differences in SSBs consumption among Hispanic children where consumption of SSBs tended to be lower if they resided in a WIC household, but this association was more significant among boys. The observed lower frequency of consumption of SSBs among Hispanic youth is important because Hispanic youth in general are likely to consume more (Bleich and Wolfson, 2015), and experience higher rates of obesity than non-Hispanic white children (Ogden et al., 2015). The fact that Hispanic children were found to consume less SSBs if they lived in a WIC household

demonstrates a potential positive influence on dietary choices. A similar behavior was observed among WIC participating children, where SSBs consumption was lower, and likely due to these beverages being substituted by 100% juice (Deming et al., 2014).

When comparing substitution patterns among males and females and in subgroup comparisons by age, race and sex, although not statistically significant in all cases, multivariable analyses suggest substitution effect trends, whereby age-ineligible children in WIC households consumed SSB's less frequently compared to their non-WIC counterparts, and consumed 100% juice more frequently.

The positive association with household WIC participation and spillover of benefits to age-ineligible children also aligns with previous research. These children may benefit from WIC household participation in three ways as suggested by Ver Ploeg (2009): 1. the nutrition education provided through WIC may affect the diets and dietary behaviors of other family members if the adult recipient uses what they learned to purchase and prepare healthier foods and meals; 2. the supplemental foods from the WIC package are shared with other family members; 3. an "income effect"- where money that would have been previously allocated to food or infant formula could be spent on other foods that may improve household availability (Ver Ploeg, 2009). A study evaluating the spillover effect found HEI scores to be higher among children who resided in a WIC household, and that association was stronger if there were two WIC participants in the home when compared to non-WIC households (Ver Ploeg, 2009). Another study found consumption of milk and cereal to be higher among children residing in a WIC participating household when compared to non-participating WIC households (Woodward and Ribar, 2012). These are significant findings because the foods investigated are components of the WIC food package. The results of this current study

suggest that components of supplemental food packages may be shared among ineligible family members due to observations of increased vegetable and 100% juice consumption, which may provide evidence of the potential for food sharing. However, it is important to note that this study does not attempt to distinguish the mechanism of the spillover effect, but rather how dietary choices of age eligible children may be influenced by the presence of WIC in the household.

Strengths and limitations

A major strength of this study was the large and comparable sample of children from WIC and income-qualifying non-WIC households from four low-income communities. This study is not without limitations. Given the cross-sectional design, causality cannot be inferred. Further, it is likely that there is higher degree of underreporting for foods considered unhealthy (Bornhorst et al., 2013), which may have contributed to lower frequency of consumption of unhealthy foods in the sample. Additionally, data does not identify the WIC beneficiary within the household. Package composition and monetary value differs with each package, which would be influential in how the presence of WIC would influence dietary behaviors of ineligible children. In addition, self-selection into the WIC program due to increased health consciousness or other motivators presents a potential bias.

Conclusion

This study shows that for age-ineligible children residing in WIC participating household was associated with healthier dietary behaviors, suggesting a possible spillover effect. The magnitude of the spillover effect varied by age, sex, and race. Estimations indicated that household WIC participation was associated with a higher frequency of vegetables and 100% juice consumption and a lower frequency of consumption of SSBs

among children 5-18 years-old. Vegetables and 100% juice are components of supplemental food packages and results suggest that the benefits of this program may extend to older children. Revisions to WIC policies and package compositions should consider the possible dietary implications on age-ineligible children in the household.

Policy Implications

This study found that food consumption patterns among age-ineligible children varied by household WIC participation status, with children from WIC households consuming some healthier foods more frequently and consuming some unhealthy foods less frequently. These findings would be important to consider when the USDA redesigns WIC food packages. Policy revisions should consider the possible implications of package composition on age-ineligible children in WIC households in addition to WIC participants. Current recommendations by the National Academies of Sciences, Engineering and Medicine (NASM) advocates for a series of package revisions that are more consistent with the DGA. Available literature demonstrates that changing package composition has implications on what participants consume (Andreyeva and Luedicke, 2014; Andreyeva et al., 2013; Tester et al., 2016). If package benefits “spilled over” to age-ineligible children, similar dietary implications could be observed among that age group.

Among the key findings of the study is higher 100% juice consumption and lower SSBs consumption in subgroups of age-ineligible children. If the WIC package is changed to reduce the amount of 100% juice, the nutrition education component of the program should specifically address beverage consumption among all household members, so the families substitute 100% juice with a healthier option like water and not

SSBs. Such efforts are necessary to overcome a potential of increased SSBs consumption due to the substitution effect observed in available literature (Nicklas et al., 2008; Beck et al., 2013). Due to interest in bolstering the effectiveness of the WIC program, intrahousehold allocations related to the family structure should be recognized as playing an influential role in the effectiveness of the WIC program and should be considered when revising policies (Robinson, 2013). Future research should seek to identify the mechanisms for the spillover effect and design nutrition and health-related education programs that encourage and improve diet-related behaviors for all members of the household.

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APPENDIX A
RESULTS FROM BIVARIATE ANALYSES

Table 1a. Mean frequency (SD) of dietary outcome variables among age ineligible 12-18-year-old children by sex and WIC household participation status (N=195)

Food Items	Females (N=104)			Males (N=91)		
	WIC (N=66)	Non- WIC (N=38)	p-value	WIC (N=62)	Non-WIC (N=29)	p-value
100% Juice	1.2 (1.2)	1.3 (1.5)	0.657	1.7 (1.8)	1.5 (1.8)	0.530
Fruit	1.0 (.92)	1.3 (1.4)	0.189	1.2 (1.2)	0.7 (0.9)	0.056
Vegetables	1.9 (2.2)	1.8 (1.0)	0.812	2.1 (1.5)	1.3 (0.8)	0.008
FV Snacks	0.7 (0.8)	1.3 (1.3)	0.019	0.9 (1.2)	0.7 (0.7)	0.298
SSBs	1.3 (1.9)	1.2 (1.0)	0.707	1.5 (1.6)	1.9 (1.7)	0.294
Sweet and salty snacks	0.9 (1.1)	0.9 (1.2)	0.988	0.9 (1.2)	1.5 (2.0)	0.142

Table 1b. Mean frequency (SD) of dietary outcome variables among age ineligible females by age and WIC household participation status (N=277)

Food Items	5-11-year-olds (N=173)			12-18-year-olds (N=104)		
	WIC (N=104)	Non-WIC (N=69)	p-value	WIC (N=66)	Non-WIC (N=38)	p-value
100% Juice	1.7 (1.9)	1.2 (1.0)	0.028	1.2 (1.2)	1.3 (1.5)	0.657
Fruit	1.4 (1.5)	1.4 (1.1)	0.976	1.0 (.92)	1.3 (1.4)	0.189
Vegetables	1.9 (1.6)	1.9 (1.4)	0.751	1.9 (2.2)	1.8 (1.0)	0.812
FV Snacks	1.2 (1.1)	1.3 (1.2)	0.464	0.7 (0.8)	1.3 (1.3)	0.019
SSB	1.1 (1.6)	1.1 (1.3)	0.862	1.3 (1.9)	1.2 (1.0)	0.707
Sweet and salty snacks	1.1 (1.3)	0.9 (0.7)	0.268	0.9 (1.1)	0.9 (1.2)	0.988

Table 1c. Mean frequency (SD) of dietary outcome variables among age ineligible 5-11-year-olds by race and WIC household participation status (N=347)

Food Items	African American (N=190)			Hispanic (N=157)		
	WIC (N=110)	Non-WIC (N=80)	p-value	WIC (N=111)	Non-WIC (N=46)	p-value
100% Juice	1.7 (1.8)	1.7 (1.7)	0.886	1.6 (1.6)	1.4 (1.1)	0.412
Fruit	1.4 (1.5)	1.5 (1.2)	0.924	1.4 (1.3)	1.2 (1.0)	0.368
Vegetables	1.9 (1.5)	2.0 (1.4)	0.493	1.8 (1.5)	1.8 (1.4)	0.838
FV Snacks	1.3 (1.3)	1.3 (1.1)	0.790	0.9 (1.0)	0.9 (1.2)	0.762
SSBs	1.3 (1.9)	1.1 (1.3)	0.515	0.8 (1.1)	1.2 (1.8)	0.124
Sweet and salty snacks	1.1 (1.1)	1.1 (.93)	0.843	0.9 (1.6)	0.8 (1.1)	0.458

APPENDIX B
RESULTS FROM BIVARIATE ANALYSES

Table 1d. Mean frequency (SD) of dietary outcome variables among age ineligible 12-18-year-olds by race and WIC household participation status (N=188)

Food Items	African American (N=103)			Hispanic (N=85)		
	WIC (N=63)	Non-WIC (N=40)	p-value	WIC (N=59)	Non-WIC (N=26)	p-value
100% Juice	1.8 (1.9)	1.5 (1.9)	0.488	1.2 (1.1)	1.2 (1.3)	0.996
Fruit	1.1 (1.0)	1.1 (1.4)	0.804	1.1 (1.1)	0.9 (0.9)	0.568
Vegetables	2.3 (2.4)	1.5 (1.1)	0.053	1.7 (1.1)	1.6 (.90)	0.727
FV Snacks	1.0 (1.0)	1.2 (1.3)	0.429	0.6 (0.7)	0.8 (0.9)	0.026
SSBs	1.8 (2.1)	1.5 (1.4)	0.459	0.9 (0.9)	1.4 (1.4)	0.101
Sweet and salty snacks	1.2 (1.4)	1.5 (1.9)	0.418	0.8 (0.9)	0.8 (0.9)	0.954

Table 1e. Mean frequency (SD) of dietary outcome variables among age ineligible African American children by sex and WIC household participation status (N=293)

Food Items	Females (N=154)			Males (N=139)		
	WIC (N=87)	Non-WIC (N=67)	p-value	WIC (N=86)	Non-WIC (N=53)	p-value
100% Juice	1.7 (1.9)	1.2 (1.2)	0.079	1.8 (1.8)	2.2 (2.1)	0.255
Fruit	1.4 (1.6)	1.4 (1.3)	0.920	1.2 (1.1)	1.3 (1.2)	0.829
Vegetables	2.0 (2.2)	2.0 (1.5)	0.796	2.0 (1.5)	1.7 (1.1)	0.200
FV Snacks	1.2 (1.1)	1.5 (1.3)	0.192	1.2 (1.3)	1.1 (0.9)	0.710
SSBs	1.5 (2.1)	1.2 (1.3)	0.299	1.4 (1.8)	1.3 (1.5)	0.678
Sweet and salty snacks	1.4 (1.4)	1.0 (1.1)	0.144	0.9 (1.0)	1.5 (1.6)	0.032

APPENDIX C
RESULTS FROM MULTIVARIATE ANALYSES

Table 1f. Adjusted incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items among age-ineligible children by age and WIC household participation status (N=570)

Food Items ^a	5-11-year-olds ^b (N=375)			12-18-year-olds ^b (N=195)		
	IRR ^c	95% CI	p-value	IRR ^c	95% CI	p-value
100% Juice	1.14	0.93, 1.39	0.193	1.15	0.83, 1.58	0.395
Fruit	1.03	0.85, 1.24	0.738	1.05	0.76, 1.44	0.764
Vegetables	0.95	0.81, 1.11	0.541	1.25	0.99, 1.58	0.056
FV Snacks	0.94	0.76, 1.16	0.569	0.81	0.61, 1.06	0.130
SSBs	1.02	0.76, 1.35	0.914	0.86	0.63, 1.17	0.349
Sweet and salty snacks	1.10	0.87, 1.38	0.401	0.84	0.60, 1.16	0.284

^a all frequencies are per day

^b adjusted for city of residence, panel, sex, mother's education, race, household family size

^c IRR incidence rate ratios for negative binomial regression

Table 1g. Adjusted incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items among age-ineligible females by age and WIC household participation status (N=277)

Food Items ^a	5-11-year-olds ^b (N=173)			12-18-year-olds ^b (N=104)		
	IRR ^c	95% CI	p-value	IRR ^c	95% CI	p-value
100% Juice	1.44	1.05, 1.96	0.020	0.99	0.61, 1.59	0.970
Fruit	1.05	0.79, 1.38	0.724	0.83	0.54, 1.27	0.393
Vegetables	1.00	0.78, 1.27	0.985	1.10	0.77, 1.55	0.602
FV Snacks	0.92	0.66, 1.26	0.608	0.77	0.53, 1.11	0.169
SSB	0.97	0.66, 1.42	0.889	1.16	0.77, 1.74	0.467
Sweet and salty snacks	1.29	0.95, 1.74	0.095	0.99	0.60, 1.63	0.968

^a all frequencies are per day

^b adjusted for city of residence, panel, mother's education, race, household family size

^c IRR incidence rate ratios for negative binomial regression

APPENDIX D
RESULTS FROM MULTIVARIATE ANALYSES

Table 1h. Adjusted Incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items by among African American children by sex and WIC household participation status (N=293)

Food Items ^a	Females ^b (N=154)			Males ^b (N=139)		
	IRR ^c	95% CI	p-value	IRR ^c	95% CI	p-value
100% Juice	1.36	0.99, 1.86	0.054	0.95	0.69, 1.28	0.720
Fruit	1.01	0.71, 1.43	0.936	1.03	0.75, 1.41	0.844
Vegetables	1.05	0.79, 1.39	0.714	1.18	0.93, 1.50	0.165
FV Snacks	0.88	0.69, 1.11	0.283	1.18	0.82, 1.67	0.363
SSBs	0.96	0.68, 1.35	0.830	1.18	0.78, 1.77	0.421
Sweet and salty snacks	1.25	0.87, 1.78	0.216	0.74	0.53, 1.02	0.070

^a all frequencies are per day

^b adjusted for city of residence, panel, mother's education, household family size

^c IRR incidence rate ratios for negative binomial regression

Table 1i. Adjusted Incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items by among African American children by age and WIC household participation status (N=293)

Food Item ^a	5-11-year-olds ^b (N=190)			12-18-year-olds ^b (N=103)		
	IRR ^c	95% CI	p-value	IRR ^c	95% CI	p-value
100% Juice	1.03	0.78, 1.35	0.816	1.30	0.85, 1.98	0.219
Fruit	1.01	0.77, 1.31	0.939	1.00	0.63, 1.58	0.997
Vegetables	0.92	0.73, 1.14	0.451	1.40	1.0, 1.96	0.049
FV Snacks	1.00	0.76, 1.29	0.984	0.90	0.66, 1.21	0.478
SSBs	1.16	0.79, 1.68	0.434	1.05	0.71, 1.55	0.793
Sweet and salty snacks	1.02	0.78, 1.32	0.862	0.81	0.52, 1.24	0.328

^a all frequencies are per day

^b adjusted for city of residence, sex, mother's education, household family size, panel

^c IRR incidence rate ratios for negative binomial regression

APPENDIX E
RESULTS FROM MULTIVARIATE ANALYSES

Table 1k. Adjusted Incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items by among Hispanic children by age and WIC household participation status (N=242)

Food Item ^a	5-11-year-olds ^b (N=157)			12-18-year-olds ^b (N=85)		
	IRR ^c	95% CI	p-value	IRR ^c	95% CI	p-value
100% Juice	1.07	0.79,1.43	0.664	1.05	0.63,1.71	0.857
Fruit	1.12	0.82, 1.53	0.453	1.10	0.72, 1.66	0.650
Vegetables	1.00	0.76, 1.30	0.996	1.05	0.82, 1.32	0.695
FV Snacks	0.89	0.60, 1.31	0.554	0.71	0.43, 1.16	0.178
SSBs	0.69	0.44, 1.07	0.099	0.69	0.44, 1.05	0.089
Sweet and salty snacks	1.24	0.78, 1.95	0.358	0.95	0.61, 1.46	0.819

^a all frequencies are per day

^b adjusted for city of residence, panel, sex, mother's education, household family size

^c IRR incidence rate ratios for negative binomial regression

Table 1L. Adjusted Incidence rate ratios (IRRs) of mean frequency of consumption of food and beverage items by among Hispanic children by sex and WIC household participation status (N=242)

Food Items ^a	Females ^b (N=106)			Males ^b (N=136)		
	IRR ^c	95% CI	p-value	IRR ^c	95% CI	p-value
100% Juice	0.91	0.61, 1.34	0.631	1.22	0.88, 1.67	0.218
Fruit	0.87	0.62, 1.21	0.426	1.37	0.95, 1.95	0.091
Vegetables	0.94	0.74, 1.19	0.616	1.04	0.79, 1.38	0.757
FV Snacks	0.72	0.46, 1.13	0.154	0.93	0.64, 1.35	0.722
SSBs	0.66	0.42, 1.02	0.065	0.64	0.43, 0.94	0.024
Sweet and salty snacks	0.90	0.57, 1.40	0.636	1.24	0.74, 2.04	0.402

^a all frequencies are per day

^b adjusted for city of residence, sex, mother's education, household family size, panel

^c IRR incidence rate ratios for negative binomial regression

APPENDIX F
NJCHS IRB

APPROVAL: MODIFICATION

Punam Ohri-
 Vachaspati SNHP:
 Nutrition 602/827-
 2270
 Punam.Ohri-

Vachaspati@asu.edu Dear

Punam Ohri-Vachaspati:

On 8/28/2017 the ASU IRB reviewed the following protocol:

Type of Review:	Modification
Title:	Impact of Environmental Changes on Children's BMI and Behaviors: A Panel Study
Investigator:	Punam Ohri-Vachaspati
IRB ID:	1107006669
Funding:	Name: HHS: National Institutes of Health (NIH), Funding Source ID: HHS-NIH-National Institutes of Health; Name: Robert Wood Johnson Foundation
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • ASU Subcontract with The Food Trust on RWJF funded project, Category: Sponsor Attachment; • NJCHS Panel 2.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • phone survey panel 1 time 2, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Revised Consent Language, Category: Recruitment materials/advertisements /verbal scripts/phonescripts; • Translation Certification Form, Category: Translations; • Rutgers IRB approval amend 9-22-14, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc); • Farmer's Market survey - Back-translated from Spanish, Category: Measures (Survey

- questions/Interview questions /interview guides/focus group questions);
- NJCHS store audit, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);
 - Parent measurement reminder letter, Category: Recruitment materials/advertisements /verbal scripts/phone scripts;
 - Parent measurement invitation letter, Category: Recruitment materials/advertisements /verbal scripts/phone scripts;
 - Rutgers IRB amendment.pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);
 - instructions for weight measurement, Category: Participant materials (specific directions for them);
 - non-contact letter panel 1 time 2, Category: Recruitment materials/advertisements /verbal scripts/phonescripts ASU_July_2011_SocialBehavioralapplication_july_2 2.docx, Category: IRB Protocol;
 - NJCH_NursesPaperBaseCopy.pdf, Category: Measures (Survey questions/Interview questions/interview guides/focus group questions);
 - IRB-amendment-form-2014a 5-20-14_worksheet cover letter-corner store checklist (1).pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);
 - corner store intro letter, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);
 - Rutgers approval.pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);
 - instruction for height measurements, Category: Participant materials (specific directions for them);
- guides/focus group questions);
- Rutgers_IRB approval - Amend 5 28 14_worksheet Cover-letter (1).pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);
 - Rutgers_IRB approval - amend 4 16 14_worksheet (1).pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);
 - Farmer's Market survey - Spanish, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);
 - Supermarket survey - Back-translated from Spanish, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);
 - ASU Subcontract with The Food Trust on RWJF funded project, Category: Sponsor Attachment;

- Supermarket survey - English, Category: Measures (Survey questions/Interview questions /interview

The IRB approved the modification.

When consent is appropriate, you must use final, watermarked versions available under the “Documents” tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

APPENDIX G
NJCHS SURVEY

4462 - Childhood Obesity Questionnaire
5-28-09 FINAL

Introductory script

Hello, this is _____ and I am calling for Rutgers University. We are conducting a survey of New Jersey families in order to understand and improve the health of their children. I need to speak with an adult, 18 years or older, who lives here and makes most decisions about food shopping for this household.

IF ROOMMATES /NO FAMILY MEMBERS, SAY: In that case I can continue with you if you are 18 years of age or older.

IF NO ONE 18 YEARS OF AGE OR OLDER EVER: Is this a dormitory, a medical institution or hospital, some other type of institution, a place of business, or is this your home?

IF HOME: What is the age of the oldest person living in this home? (AS LONG AS THE OLDEST HOUSEHOLD MEMBER IS AT LEAST 18 YEARS OF AGE, WE CAN INTERVIEW THEM.)

**IF DORMITORY, INSTITUTION, ETC. RECORD
APPROPRIATELY AND END
CONVERSATION.**

(INT: IF NO ONE IN HH IS 18 YEARS OF AGE OR OLDER ENTER DISPO AS “NO ONE IN
HH IS 18 YEARS OF AGE OR OLDER”)

IF NEW RESPONDENT COMES TO PHONE SAY:

Hello, this is _____ and I am calling from Rutgers University. We are conducting a survey of New Jersey families in order to understand and improve the health of their children. I need to speak with an adult, 18 years or older, who lives here and makes most decisions about food shopping for this household.

(IF EXPRESSES CONCERN ABOUT CONFIDENTIALITY READ:)

You as an individual will not be linked to any reports using the data. Only information for groups of people will be reported.

(IF ASKED LENGTH OF INTERVIEW READ:) The first part of the conversation will last only a few minutes. If the computer selects you to continue with a longer interview I'll explain at that time.

(IF RESPONDENT HAS OTHER QUESTIONS ABOUT THE SURVEY...WHETHER THEY AGREE TO CONTINUE OR NOT...READ:) If you have additional questions, you can contact someone at our firm by either calling a toll-free number during normal business hours, or e-mailing us anytime of the day. Would you like the toll free number and/or the e-mail address? Do you have something to write this down? The number is 1-800-772-9287. Ask to speak to Mr. Munjack. The e-mail address is: njhealth@srbi.com. Would you like me to repeat that/either of them? [IF RESPONDENT WANTS TO MAKE THIS CALL BEFORE CONTINUING...ARRANGE CALLBACK DATE AND TIME.] If you still have questions about this survey, please contact Susan Brownlee at the Center for State Health Policy at Rutgers University, 55 Commercial Avenue, New Brunswick, NJ, 08901-1340, or by telephone at 732-932-4666. If you have any questions about your rights as a research subject, you may contact the IRB Administrator at Rutgers University at:

Rutgers University, the State University of New Jersey
Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 732-932-0150, ext. 2104
Email: humansubjects@orsp.rutgers.edu

INTRO2. (IF SC1a=1 OR SC1baa=1:) Hello, this is _____ and I am calling for Rutgers University. We are conducting a survey of New Jersey families in order to understand and improve the health of their children.

(SHOW FOR ALL:) The survey is confidential and its findings will help shape policies and programs that impact children's health in New Jersey. You have been randomly selected to participate in this study.

Robert We are not selling anything or asking for donations. This study is sponsored by the Wood Johnson Foundation, a non-profit organization. Our goal is to understand and improve the health of New Jersey children. Your participation in the study is voluntary and confidential.

as a If you are eligible to participate in the full interview we will send you a check for \$10.00 token of our appreciation for your time and cooperation.

1 = CONTINUE

SC1. First let me just verify that you are 18 years of age or older? (NASF,SINTRO_1)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF SC1=1, GO TO SC1ba. ELSE GO TO SC1a.)

SC1a. I need to speak to an adult 18 years of age or older, who lives in this household and makes most decisions about food shopping for this household.

- 1 = Qualified respondent came to phone
- 2 = Qualified respondent not available
- 3 = Qualified respondent Refused

(IF SC1a=1, GO BACK TO INTRO2. IF SC1a=2, schedule CB. IF SC1a=3, dispo as Refusal.)

SC1ba. And I just want to verify that you make most decisions about food shopping for this household.

(IF THEY ARE AS KNOWLEGEABLE AS ANYONE ELSE OR EQUALLY AS KNOWLEDGEABLE RECORD AS "YES")

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF SC1ba=1, GO TO SC2a. ELSE GO TO SC1baa.)

SC1baa. I need to speak to an adult 18 years of age or older, who lives in this household and makes most decisions about food shopping for this household.

- 1 = Qualified respondent came to phone
- 2 = Qualified respondent not available
- 3 = Qualified respondent Refused

(IF SC1baa=1, GO BACK TO INTRO2. IF SC1baa=2, schedule CB. IF SC1baa=3, dispo as Refusal.)

SC2a. In what city do you currently live? (DO NOT READ LIST)

- 1 = Camden
- 2 = Newark
- 3 = New Brunswick
- 4 = Trenton
- 5 = Vineland
- 6 = Other (Do NOT Specify)
- 9 = (VOL) Refused

(Programmer: If SC2a=6, TERMINATE (“S/O SC2a – Not in 1 of 5 cities). If SC2a=7, dispo as Refusal. Else go to SC2a1.)

SC2a1. Do you live within the city limits of *(insert from SC2a)*, or do you live outside the city limits?

- 1 = Inside the city limits
- 2 = Outside the city limits
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(Programmer: If SC2a1=2 TERMINATE (“S/O SC2a1 – Not in 1 of 5 cities). If SC2a1=3 or 4, dispo as Refusal. Else go to SC2c.)

(IF (V4=2 or 3), read: “I must have entered some of your previous answers incorrectly. I need to re-ask about the number of family members living in your household.”)

Display: Please tell me how many people are currently living in your household that are in the following age groups.

SC2ca. How many people in your household are currently...Under 3 years of age?

(RANGE = 0 to 10; 10=10 or more; 11=DK; 12=REF)

(IF SC2ca=1 through 10, ASK SC2ca1. ELSE GO TO SC2cb.)

SC2ca1. ***(IF SC2ca=1, read:)*** Is this child related to you by blood, through marriage or living as married? (INTERVIEWER: If “Yes,” enter “1.” If “No,” enter “0.”)

(IF SC2ca=2 through 10, read:) How many of them are related to you by blood, through marriage or living as married?

(RANGE = 0 to 10; 10=10 or more; 11=DK; 12=REF)

(Programmer: Answer to SC2ca1 can NOT exceed answer to SC2ca.)

SC2cb. How many people in your household are currently...3 to 18 years of age? Please INCLUDE yourself if you happen to be 18 years of age.

(RANGE = 0 to 10; 10=10 or more; 11=DK; 12=REF)

(Programmer: If ((SC2cb=0 or 11 or 12), TERMINATE (“S/O SC2cb - No 3 to 18 children in HH”). ELSE GO TO SC2b1.)

SC2cb1. ***(IF SC2cb=1, read:)*** Is this child related to you by blood, through marriage or living as married? (INTERVIEWER: If “Yes,” enter “1.” If “No,” enter “0.”)

(IF SC2cb=2 through 10, read:) How many of them are related to you by blood, through marriage or living as married?

Please COUNT YOURSELF, if applicable.

(RANGE = 0 to 10; 10=10 or more; 11=DK; 12=REF)

(Programmer: Answer to SC2cb1 can NOT exceed answer to SC2cb.)

SC2cc. How many people in your household are currently...OVER the age of 18? Be sure to INCLUDE yourself, if applicable.

(RANGE = 0 to 10; 10=10 or more; 11=DK; 12=REF)

(IF SC2cc=1 through 10, ASK SC2cc1. ELSE GO TO INSTRUCTS BEFORE SC2d1.)

SC2cc1. ***(IF SC2cc=1, read:)*** Is this person related to you by blood, through marriage or living as married? (INTERVIEWER: If “Yes,” enter “1.” If “No,” enter “0.”)

(IF SC2cc=2 through 10, read:) How many of them are related to you by blood, through marriage or living as married?

Please COUNT YOURSELF, if applicable.

(RANGE = 0 to 10; 10=10 or more; 11=DK; 12=REF)

(Programmer: Answer to SC2cc1 can NOT exceed answer to SC2cc.)

(IF (SC2cb1=1) AND (SC2cc=0 or SC2cc1=0), TERMINATE (“S/O SC2c – No Adults/Only 1 Child”).

(IF (SC2ca1=11 or 12) OR (SC2cb1=11 or 12) OR (SC2cc1=11 or 12), dispo as Refusal.)

(IF SC2cb1=0, ASK SC2d1. ELSE GO TO SC4b.)

SC2d1. Being that you are NOT related to *(the 3 to 18 year old child / any of the 3 to 18 year old children)*, I am unable to conduct the interview with you. Instead, I will need to speak with

the adult in your household who IS related to *(that child / those children)* and makes most decisions about food shopping for the *child / children)*. Is that person available?

1 = Came to Phone/Brought to Phone

2 = Not Available

3 = Refused to Come to Phone / Refused to Bring to Phone

(IF SC2d1=1, ask SC2e. IF SC2d1=2, Schedule CB. IF SC2d1=3, dispo as Refusal.)

SC2e. Hello, this is _____ and I am calling for Rutgers University. We are conducting

a survey of New Jersey families in order to understand and improve the health of their children. I have already spoken with one of the other adults in your household and they indicated that you are related to *(if sum from SC2cb > 1, insert: "at least 1 of the 3 to 18 year old children" / if sum from SC2cb =1, insert: "the 3 to 18 year old child")* in this household. Is that correct?

1 = Yes

2 = No

9 = (VOL) Refused

(IF (SC2e=1), go back to SC2ca. IF SC2e=2, go back to SC2d1. If SC2e=9, dispo as Refusal.)

SC4b. Let me verify that there is a total of *(INSERT SUM FROM SC2ca/SC2cb/SC2cc)* people, INCLUDING YOURSELF, in your household. Is that correct?

1 = Yes

2 = No

8 = (VOL) Don't Know

9 = (VOL) Refused

(IF SC4b=1, GO TO SC5. IF SC4b=2, go back and re-ask SC2ca through SC2cc. ELSE dispo as Refusal.)

(Programmer: Create the following variables:

➤ *"TOTHH" = Sum of SC2ca/SC2cb/SC2cc.*

➤ *"TOTFAM" = Sum of SC2ca1/SC2cb1/SC2cc1.*

➤ *"TOTNFAM" = "TOTHH" minus "TOTFAM"*

➤ *"NONFAMAD" = "SC2cc" minus "SC2cc1"*

➤ *"NONFAMCH" = "SC2cb" minus "SC2cb1"*

To complete this section, I just need to have YOUR first name or initials.

SC5. First you...what is YOUR first name or initials?

____ Record Verbatim

SC5a. (INTERVIEWER: RECORD GENDER BY OBSERVATION)

1 = Male

2 = Female

SC5b. What is your age?

(RANGE = 18 to 99; 98 = DK; 99 = REF)

(IF SC5b=98 or 99, ASK SC5b1. ELSE GO TO INSTRUCTS BEFORE SC6.)

SC5b1. Can you please tell me if your age is...(READ LIST)?

(ONLY SHOW CODES 5 through 11)

- 1 = 3 to 4,
- 2 = 5 to 9,
- 3 = 10 to 13,
- 4 = 14 to 16,
- 5 = 17 to 18,
- 6 = 19 to 30,
- 7 = 31 to 49,
- 8 = 50 to 61, or
- 9 = 62 or older?
- 10 = (VOL) Don't Know
- 11 = (VOL) Refused

(IF SC5b=18 or SC5b1=5, THEN THE # OF TIMES TO ASK THE SC6/SC7/SC7a/SC7a1 LOOP WILL BE EQUAL TO THE TOTAL FROM SC2cb1.

IF SC5b<>18 AND SC5b1<>5, THEN THE # OF TIMES TO ASK THE SC6/SC7/SC7a/SC7a1 LOOP WILL BE EQUAL TO THE TOTAL FROM SC2cb1 PLUS 1.)

**(AUTOPUNCH THE ANSWER FROM SC5 INTO ITERATION #1 OF SC6 (i.e. – the RESP).
AUTOPUNCH THE ANSWER FROM SC5a INTO ITERATION #1 OF SC7 (i.e. – the RESP).
AUTOPUNCH THE ANSWER FROM SC5b INTO ITERATION #1 OF SC7a (i.e. – the RESP).
AUTOPUNCH THE ANSWER FROM SC5b1 (if applicable) INTO ITERATION #1 of SC7a1 (i.e. – the RESP).)**

SC6. **[READ FOR REMAINING ITERATIONS]**

And what is the first name or initials of the oldest child age 3 to 18 that is related to you? And the next oldest child age 3 to 18 that is related to you?

(ASK SC6 UNTIL WE HAVE CAPTURED THE SUM FROM (SC2cb1) or (SC2cb1 PLUS Resp)...whichever is applicable.

(Read if necessary: The goal of this survey is to understand and improve children's health. All information is confidential.)

(ASK SC7 to SC7a1 CONSECUTIVELY FOR RESPONDENT AND EACH PERSON FROM SC6.)

SC7. **(Is name or initials)** a male or female?

- 1 = male
- 2 = female

SC7a. What is **(name or initials)**'s age?

(RANGE for RESP = 18 to 99; 98 = DK; 99 = REF)
(RANGE for Children = 3 to 18; 98 = DK; 99 = REF)

(ASK IF SC7a IS DK OR REF... OTHERS TO FR1.)

SC7a1. Can you please tell me if *(name or initials)* age is (READ LIST)

(ONLY SHOW CODES 1 through 5, and 10 and 11)

- 1 = 3 to 4,
- 2 = 5 to 9,
- 3 = 10 to 13,
- 4 = 14 to 16,
- 5 = 17 to 18,
- 6 = 19 to 30,
- 7 = 31 to 49,
- 8 = 50 to 61, or
- 9 = 62 or older?
- 10 = (VOL) Don't Know
- 11 = (VOL) Refused

SECTION FR1 (HOUSEHOLD/FAMILY ROSTER)

(ASK FR1a FOR EACH CHILD MENTIONED AT SC6 SERIES. IF NO OTHERS GO TO BOX A.)

FR1a. What relation is *(name/initials)* to you?

(NOTE: YOU ARE ALWAYS RECORDING WHAT RELATIONSHIP THE CHILD HAS TO THE RESPONDENT.)

[IF CHILD MENTIONED: "Is that your natural or legally adopted child, your stepchild, your foster child, or a child for whom you are the legal guardian?"]

- 1 = my spouse/husband/wife
- 2 = my unmarried partner/boyfriend/girlfriend/domestic partner
- 3 = my natural or legally adopted child/son/daughter
- 4 = my stepdaughter/son
- 5 = my foster child
- 6 = my grandchild/grandson/granddaughter
- 7 = my child for whom I am the legal guardian
- 8 = partner's natural or legally adopted child/son/daughter
- 9 = partner's stepdaughter/son
- 10 = partner's foster child
- 11 = partner's grandchild/grandson/granddaughter
- 12 = partner's child for whom I am the legal guardian
- 13 = my brother/sister/sibling
- 14 = my sister/brother-in-law
- 15 = my daughter/son-in-law
- 16 = my niece/nephew
- 17 = my cousin
- 18 = my great grandchild
- 19 = my other relative, specify: _____
- 20 = other, specify: _____

(NOW GO BACK AND ASK FR1 FOR THE NEXT PERSON. IF NO OTHERS GO TO BOX A.)

BOX A:

Please compile 2 separate Rosters:

3. **Family Roster:** - Show the name/initials, gender and age of the Respondent, AND each HH member listed at the SC6 series that is related to the Respondent (i.e. – FR1=1).
4. **3-18 Family Roster:** - Show the name/initials, gender and age of each 3 to 18 year old HH member listed at the SC6 series that is related to the Respondent (i.e. – FR1=1). Do NOT include Respondent if he/she is 18.

(PROGRAMMER NOTE: When creating ALL sub-lists for use throughout the survey, make sure that each HH member always occupies the SAME iteration # on ALL sub-lists. The order in which the HH members are inventoried at the SC6 series can be used as the key for determining to which iteration each HH member is to be assigned.)

BOX B:

- > IF “3-18 Family Roster” IS EMPTY, GO TO V4.
- > IF ALL OF THE PEOPLE IN THE “3-18 Family Roster” ARE EITHER (FR1a=1 or 2,) TERMINATE (“S/O BOX B – Spouse/Partner of Resp.”).
- > ELSE GO TO INSTRUCTS BEFORE SC9a.

- V4. The answers that I recorded previously indicate that there is/are (*insert # from SC2cb1*) children in your household between the ages of 3 to 18 years old who are related to you. However, based upon your subsequent answers, it appears that none of these 3 to 18 year old children in your household are related to you. So, I need to know which of the

following

most accurately describes your household situation? (READ LIST)

- 1 = There are NO 3 to 18 year old children living in this household AT ALL,
- 2 = YOU are over the age of 18 AND there is at least one 3 to 18 year old child living in this household who is RELATED to YOU,
- 3 = YOU are currently 18, but there is also at least one other 3 to 18 year old child living in this household who is RELATED to YOU, or
- 4 = YOU are currently 18 years old, and there are NO other 3 to 18 year olds living in this household who are RELATED to YOU?
- 9 = (VOL) Refused

(IF V4=1 or 4, TERMINATE (“S/O V4 – NO 3 to 18 IN HH”). IF V4=2 or 3, GO BACK TO SC2c. IF

V4=3, dispo as Refusal.)

(IF “NONFAMAD” > 0 AND “NONFAMCH” > 0, ask SC9a. ELSE GO TO SC8a.)

- SC9a. Do any of the other UNRELATED ADULTS currently living there use the same land line phone as you?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don’t Know3
- 9 = (VOL) Refused

(IF SC9a=1, ASK SC9b. ELSE GO TO SC8a.)

SC9b. Do they have any children ages 3-18 who are RELATED TO THEM, but are NOT related TO YOU living in this household? (INTERVIEWER: If "Yes," probe with, "How many?" If "No," record as "0.")

(RANGE=0 to 14; 14=14 or more; 15=DK; 6=REF)

:

Record #
(IF SC9b=0 or 15 or 16, go to SC8a. Else go to SC9c.)

SC9c. What is the name of the adult who makes the food shopping decisions for *(this 3-18 year old child / those 3-18 year old children)*?

1 = Gave Response
9 = (VOL) Refused

SC8a. Do you have more than one landline telephone number in your household?

[IF "NO" ENTER "1"...IF YES ASK: How many different landline telephone numbers do you or anyone else in the household have at this residence at which you NORMALLY receive incoming phone calls? Do NOT include modem or fax lines, beepers, pagers or cell phones.]

(RANGE=1 to 12; 10=10 or more; 11=DK; 12=REF)

Record #

SC8b. At any time during the past twelve months has your household been without any telephone service (working telephone number) for a week or longer?

1 = Yes
2 = No
8 = (VOL) Don't Know
9 = (VOL) Refused

(IF SC9=1, GO BOX C. IF SC9=2, SCHEDULE CB. IF SC9=3, DISPO AS REFUSAL.)

(INSERT TIME STAMP)

BOX C:

> RANDOMLY SELECT ONE INDEX CHILD FROM THE "3-18 FAMILY ROSTER" (see Box A) ACCORDING TO THE FOLLOWING RULES:

1 -- RANDOMLY SELECT ONE OF RESPONDENT'S CHILDREN AGES 3-18 (i.e. - FR1a=3 or 4 or 5 or 7 or 8 or 9 or 10 or 12).
2 -- IF RESPONDENT DOES NOT HAVE ANY CHILDREN (i.e. - (FR1a<3 AND FR1a<4 AND FR1a<5 AND FR1a<7 AND FR1a<8 AND FR1a<9 AND FR1a<10 AND FR1a<12) FOR ALL CHILDREN IN "3-18 Family Roster"), RANDOMLY SELECT ANY CHILD FROM THE "3-18 Family Roster."
3 -- IF A CHILD IN THE "3-18 FAMILY ROSTER" IS THE SPOUSE OR PARTNER OF THE

BE **RESPONDENT (i.e. – FR1a=1 OR 2), THEN THAT CHILD IS NOT ELIGIBLE TO
SELECTED AS THE INDEX CHILD.**

**(AA12 through AA16 IS ASKED ONLY OF EACH CHILD FROM THE “3-18 Family Roster.”
ALWAYS START WITH THE INDEX CHILD.)**

**(IF (SC7=2 for Resp) AND (FR1a=3), AUTOPUNCH “1” TO AA12 AND GO TO INSTRUCTS
BEFORE
AA14. ELSE ASK AA12.)**

AA12. Does (**CHILD**)'s mother live in the household? (NSAF D7A)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

**(IF (SC7=1 for Resp) AND (FR1a=3), AUTOPUNCH “1” TO AA14 AND GO TO INSTRUCTS
BEFORE
AA16. ELSE ASK AA14.)**

AA14. Does (**CHILD**)'s father live in the household? (NSAF D7C)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF AA12=2 and AA14=2, ASK AA15. ELSE GO TO INSTRUCTS BEFORE AA16.)

AA15. Does (**CHILD**)'s legal guardian live in the household?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

**(IF MORE THAN ONE CHILD AGES 3-18 IN HOUSEHOLD, ASK AA16. Else go back to AA12 and
ask
for next child. If no others, go to Section A.)**

AA16. Do all the remaining children AGES 3 to 18 THAT ARE RELATED TO YOU in the household
have the same (**parents/legal guardians**)?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(If AA16=1, go Section A. Else go back to AA10 and ask for next child. If no others, go to Section A.)

SECTION A - HEALTH STATUS

(ASK A1, A2 & A3 CONSECUTIVELY...FIRST FOR RESPONDENT, THEN FOR INDEX CHILD.)

(Read only if "Entire 3-18 Roster" contains MORE THAN 1 individual: "Most of the remaining questions are for you and (INDEX CHILD)." This child was selected randomly from the children in your household.)

The first questions are about health.

A1. Would you say (*your/INDEX CHILD'S*) health is (READ LIST): (CTSpG78, e401; NSAFpgF-1, F1)

- 1 = Excellent,
- 2 = Very good,
- 3 = Good,
- 4 = Fair, or
- 5 = Poor?
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

A2. Would you say (*your/INDEX CHILD'S*) DENTAL health is (READ LIST):

- 1 = Excellent,
- 2 = Very good,
- 3 = Good,
- 4 = Fair, or
- 5 = Poor?
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

A3. Would you say (*your/INDEX CHILD'S*) MENTAL health is (READ LIST):

- 1 = Excellent,
- 2 = Very good,
- 3 = Good,
- 4 = Fair, or
- 5 = Poor?
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(NOW GO BACK AND RE-ASK A1-A3 SERIES FOR INDEX CHILD. IF RESP and INDEX CHILD ALREADY ASKED A1-A3, continue to A4.)

A4. Has a doctor or other health professional ever said that you had asthma? (modified BRFSSpg9, 3.1)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

A5. What about (**INDEX CHILD**)? (modified BRFSSpg9, 3.1)

(IF NEEDED: “Has a doctor or other health professional ever said that (**INDEX CHILD**) had asthma?)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

A6. Has a doctor or other health professional ever said that you had diabetes? (modified BRFSSpg10, 4.1)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

A7. What about (**INDEX CHILD**)? (modified BRFSSpg10, 4.1)

(IF NEEDED: “Has a doctor or other health professional ever said that (**INDEX CHILD**) had diabetes?)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

(ASK A8 IF ANY FEMALES AGE 14-49 IN “Family Roster.” ELSE GO TO INSTRUCTS BEFORE A9.)

A8. *(If Resp. female & 14 to 49, insert: “Are you or”)* I/is anyone in your family pregnant?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

(IF A8=1, ASK A8b. ELSE GO TO INSTRUCTS BEFORE A9.)

A8b. Who? Anyone else?

INSERT ALL FEMALE, 14 to 49 YEAR OLDS FROM FAMILY ROSTER
Add the following codes: “19 = Other Related HH member”
“20 = Other non-related HH member”

(IF INDEX CHILD UNDER 5 YEARS OF AGE ASK A9...ELSE GO TO A10.)

A9. Is (**INDEX CHILD**) limited in any way in activities, including play activities, because of an impairment or a physical or mental health problem?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

A10. Are you limited in any way in your ability to care for yourself, to work at a job, do housework, school work, or go to school because of an impairment or a physical or mental health problem?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(ASK A11 IF INDEX CHILD AGE 5-18...ELSE GO TO SECTION B.)

A11. What about ***(INDEX CHILD)***?

(IF NEEDED: "Is (INDEX CHILD) limited in any way in his/her ability to care for him/herself, do housework, do school work, or go to school because of an impairment or a physical or mental health problem?)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(INSERT TIME STAMP)

SECTION B: HEIGHT/WEIGHT – All children AGED 3-18)

(B1-B12a ARE ASKED ONLY OF CHILDREN FROM THE "3-18 Family Roster." FIRST START WITH THE INDEX CHILD, THEN GO BACK AND ASK B1-B12a FOR REMAINING CHILDREN FROM THE "3-18 Family Roster," IF ANY. B6-B12a ARE TO BE ASKED ONLY OF THE INDEX CHILD.)

B1. How tall is ***(INDEX CHILD/CHILD NAME)*** now without shoes?

(ONLY IF NEEDED SAY: "Your best guess is fine")

- 1 = Answer in feet/inches (INTERVIEWER: RECORD WHOLE NUMBER ONLY)
- 2 = Answer in meters/centimeters (INTERVIEWER: RECORD 2 DECIMAL PLACES IF NEEDED)
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

(IF B1=8 or 9, SKIP TO B3. ELSE CONTINUE.)

B2. When was the last time ***(INDEX CHILD/CHILD NAME)***'s height was measured?

(IF NECESSARY: Your best estimate is fine.)

- 1 = 1 month or less ago
- 2 = 2 months ago
- 3 = 3 months ago
- 4 = 4-6 months ago
- 5 = over 6 months to 1 year ago
- 6 = More than a year ago
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

B3. How much does (*INDEX CHILD/CHILD NAME*) weigh now without shoes?

(ONLY IF NEEDED SAY: "Your best guess is fine")

- 1 = Answer in pounds (INTERVIEWER: RECORD 1 DECIMAL PLACE IF NEEDED)
- 2 = Answer in kilograms (INTERVIEWER: RECORD 1 DECIMAL PLACE IF NEEDED)
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

(IF B3=8 or 9, SKIP TO B5. ELSE CONTINUE.)

B4. When was the last time (*INDEX CHILD/CHILD NAME*)'s weight was measured?
(IF NECESSARY: Your best estimate is fine.)

- 1 = 1 month or less ago
- 2 = 2 months ago
- 3 = 3 months ago
- 4 = 4-6 months ago
- 5 = over 6 months to 1 year ago
- 6 = More than a year ago
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

B5. What is the year and month of birth of (*INDEX CHILD/CHILD NAME*)?

- 1 = Gave Response
- 9 = (VOL) Refused

(IF B5=1, ASK B5a and B5b. ELSE GO TO INSTRUCTS BEFORE B6.)

B5a. (INTERVIEWER: ENTER YEAR OF BIRTH) (RANGE = 1990 to 2006)

_____ Enter Year

B5b. (INTERVIEWER: SELECT MONTH OF BIRTH)

- | | |
|--------------|---------------|
| 1 = January | 7 = July |
| 2 = February | 8 = August |
| 3 = March | 9 = September |
| 4 = April | 10 = October |
| 5 = May | 11 = November |
| 6 = June | 12 = December |

(IF INDEX CHILD, CONTINUE TO B6.

IF NOT INDEX CHILD, DISPLAY THE FOLLOWING: "Now I need to get the heights and weights of your

other children" ...**THEN GO BACK TO B1 FOR REMAINING CHILDREN BEGINNING WITH THE**

OLDEST CHILD WHO IS NOT INDEX CHILD.
IF NO MORE CHILDREN, GO TO INSTRUCTS BEFORE B13.)

B6. Compared to what you would like (*him/her*) to be, would you say (*INDEX CHILD*) is very underweight, slightly underweight, about the right weight, slightly overweight, or very overweight? (Modified from CHIS adolescent survey)

- 1 = Very underweight
- 2 = Slightly underweight
- 3 = About the right weight
- 4 = Slightly overweight
- 5 = Very overweight
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF B6=1 or 2 or 3, GO TO B11. ELSE ASK B7.)

B7. Are you trying to have (*INDEX CHILD*) lose weight?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF CHILD > 10 Yrs, ASK B8. ELSE GO TO INSTRUCTS BEFORE B9.)

B8. Is (*INDEX CHILD*) doing anything to lose weight?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(If B7 = Yes or B8 = Yes Go to B9 else go to B11.)

B9. Is (*INDEX CHILD*) eating differently to lose weight?

(IF NEEDED: For example, is (*INDEX CHILD*) eating less fat, less calories, or eating more fruits and vegetables, etc.?)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know / Not sure
- 9 = (VOL) Refused

B10. Is (*INDEX CHILD*) using any form of physical activity to lose weight?

(IF NEEDED: For example is (*INDEX CHILD*) playing more actively, running, biking, etc.?)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know / Not sure
- 9 = (VOL) Refused

B11. In the past 12 months, has a doctor, nurse or other health professional given you advice about **(INDEX CHILD)**'s weight? (IF YES: "Did they suggest **(INDEX CHILD)** lose weight, gain weight, or maintain current weight?")

- 1 = Yes, lose weight
- 2 = Yes, gain weight
- 3 = Yes, maintain current weight
- 4 = No, no advice given about weight
- 8 = (VOL) Don't Know/Not sure
- 9 = (VOL) Refused

(IF B11=1 or 2 or 3, ASK B12. ELSE GO BACK TO B1 FOR REMAINING CHILDREN BEGINNING WITH THE OLDEST CHILD WHO IS NOT THE INDEX CHILD; IF NO MORE CHILDREN, GO TO INSTRUCTS BEFORE B13.)

B12. Did they help you develop a plan to follow the advice about **(INDEX CHILD)** (if B11=1, read: "losing" / if B11=2, read: "gaining" / if B11=3, read: "maintaining") weight?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF B12=1, ASK B12a. ELSE GO TO INSTRUCTS BEFORE B13.)

B12a. Did the doctor, nurse or other health professional follow up with you at subsequent visits to see how **(INDEX CHILD)** was doing with the plan to (if B11=1, read: "lose" / if B11=2, read: "gain" / if B11=3, read: "maintain") weight?

- 1 = Yes
- 2 = No
- 8 = Don't know / Not sure
- 9 = Refused

(GO BACK TO B1 FOR REMAINING CHILDREN BEGINNING WITH THE OLDEST CHILD WHO IS NOT THE INDEX CHILD; IF NO MORE CHILDREN, GO TO INSTRUCTS BEFORE B13.)

HEIGHT/WEIGHT – RESPONDENT

(ASK FOR RESPONDENT ONLY)

B13. How tall are you without shoes?

(IF NEEDED SAY: "Your best guess is fine")

- 1 = Answer in feet/inches (INTERVIEWER: RECORD WHOLE NUMBER ONLY)
- 2 = Answer in meters/centimeters (INTERVIEWER: RECORD 2 DECIMAL PLACES IF NEEDED)
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

B14. How much do you weigh now without shoes?

(IF NEEDED SAY: "Your best guess is fine")

- 1 = Answer in pounds (INTERVIEWER: RECORD 1 DECIMAL PLACE IF NEEDED)
- 2 = Answer in kilograms (INTERVIEWER: RECORD 1 DECIMAL PLACE IF NEEDED)
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

B15. Compared to what you would like to be, would you say you are very underweight, slightly underweight, about the right weight, slightly overweight, or very overweight?

- 1 = Very underweight
- 2 = Slightly underweight
- 3 = About the right weight
- 4 = Slightly overweight
- 5 = Very overweight
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF B15=1 or 2 or 3, go to B19. ELSE ASK B16.)

B16. Are you doing anything to lose weight?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF B16=2, GO TO B19. ELSE ASK B17.)

B17. Are you trying to eat differently to lose weight?

(IF NEEDED: For example, are you eating less fat, less calories, or eating more fruits and vegetables, etc.)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

B18. Are you using any form of physical activity to lose weight?

(IF NEEDED: For example, are you walking, running, going to the gym etc.?)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

B19. In the past 12 months, has a doctor, nurse or other health professional given you advice about your weight? *(IF RESP IS FEMALE (SC7=2) AND LESS THAN 50 YEARS OF AGE (SC7a<50)*

OR

SC7a1=5, 6, OR 7) AND NOT CURRENTLY PREGNANT (A8=2 or A8b<1), READ:

“Exclude any advice given if you were pregnant in the past year.”)

(IF YES: “Did they suggest you lose weight, gain weight, or maintain current weight?”)

- 1 = Yes, lose weight
- 2 = Yes, gain weight
- 3 = Yes, maintain current weight
- 4 = No, no advice given about weight
- 8 = (VOL) Don’t Know/Not sure
- 9 = (VOL) Refused

(IF B19=1 or 2 or 3, ASK B20. ELSE GO TO SECTION C.)

B20. Did they help you develop a plan to follow the advice about *(if B19=1, read: “losing” / if B19=2, read: “gaining” / if B19=3, read: “maintaining”)* weight?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

(IF B20=2, GO TO SECTION C. ELSE ASK B21.)

B21. Did the doctor, nurse or other health professional follow up with you at subsequent visits to see how you were doing with the plan to *(if B19=1, read: “lose” / if B19=2, read: “gain” / if B19=3, read: “maintain”)* weight?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

(INSERT TIME STAMP)

SECTION C: Food Environment Questions – Respondent only

READ SLOWLY: Okay, in the next section, please think of your neighborhood as the area within a 20 minute walk, a 5 minute drive, or about 1 mile in all directions around your home.

C1. How long have you lived in this neighborhood?

- 1 = Less than a year
- 2 = 1 to less than 2 Years
- 3 = 2 to less than 5 years
- 4 = 5 to less than 10 years
- 5 = 10 years or more
- 8 = (VOL) Don’t know / Not sure
- 9 = (VOL) Refused

C2. Who does most of the food shopping for your family?

- 1 = respondent
- 2 = someone else
- 3 = respondent and someone else
- 8 = (VOL) Don't know / Not sure
- 9 = (VOL) Refused

C3. *(If C2=1 or 3, read: "Do you" / If C2=2 or 8 or 9, read: "Does your family shopper")* usually do most of the food shopping in YOUR neighborhood?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF C3=2, ASK C4. ELSE GO TO INSTRUCTS BEFORE C5.)

C4. What would you say is the main reason that *(you do/your family shopper does)* not shop for most of your food in your neighborhood? (READ LIST)

- 1 = No food stores in the neighborhood
- 2 = Not convenient
- 3 = Higher cost
- 4 = Poor Quality
- 5 = Lack of variety
- 6 = Lack of healthy choices
- 7 = (VOL) OTHER (Specify): _____
- 8 = (VOL) Don't know / Not sure
- 9 = (VOL) Refused

(If C3=2 or 8 or 9, say: In the next set of questions, I will ask you about the store where (you do/your family shopper does) MOST of your food shopping.

C5. Is this store a...(READ LIST)?

(Note: If Resp. says they shop at 2 or more stores equally, ask about the one that is easiest to get to.)

(Note: Target, K-Mart, Costco, Price Club and BJ's are considered "Superstores")

- 1 = Supermarket (like Shop Rite, Pathmark),
- 2 = Superstore like Wal-Mart or Sam's Club,
- 3 = Small grocery store,
- 4 = Ethnic store or bodega,
- 5 = Corner store or convenience stores like 7-11,
- 6 = or some other type of store (Specify): _____
- 8 = (VOL) Don't know / Not sure
- 9 = (VOL) Refused

C6. What would you say is the main reason that *(you shop/your family shopper shops)* for most of your food at this *(INSERT C5 RESPONSE / if C5=DK/REF, insert "store")*? Is it...(READ LIST)?

- 1 = Convenience,
- 2 = Better prices,
- 3 = Better quality, or
- 4 = A larger selection?
- 5 = (VOL) Other (SPECIFY): _____
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

C7. How easy is it for *(you/your food shopper)* to get to this store? Would you say it is very easy, somewhat easy, somewhat difficult, or very difficult?

- 1 = Very easy
- 2 = Somewhat easy
- 3 = Somewhat difficult
- 4 = Very difficult
- 8 = Don't know
- 9 = Refused

C8. How available are fresh fruits and vegetables at this store? Would you say very available, somewhat available, somewhat unavailable, or very unavailable?

- 1 = Very Available
- 2 = Somewhat Available
- 3 = Somewhat Unavailable
- 4 = Very Unavailable
- 5 = (VOL) Store does NOT sell fresh fruits and vegetables
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF C8=5, SKIP TO C12. ELSE CONTINUE.)

C9. Is there a large selection of good quality fresh fruits and vegetables at this store? Would you say a very large selection, somewhat large selection, somewhat limited selection, or very limited selection?

- 1 = Very large selection
- 2 = Somewhat large selection
- 3 = Somewhat limited selection
- 4 = Very limited selection
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

C10. How expensive are fresh fruits and vegetables at this store? Would you say very expensive, somewhat expensive, somewhat inexpensive, or very inexpensive?

- 1 = Very Expensive
- 2 = Somewhat Expensive
- 3 = Somewhat Inexpensive
- 4 = Very Inexpensive
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF C10=1 or 2, ASK C11. ELSE GO TO C12.)

C11. How often does the cost of fresh fruits and vegetables at this store keep *(you/your food shopper)* from buying them? (READ LIST)

- 1 = Always,
- 2 = Often,
- 3 = Sometimes,
- 4 = Rarely, or
- 5 = Never?
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

C12. How available are low-fat foods such as low fat milk and lean cuts of meat at this store? Would you say very available, somewhat available, somewhat unavailable, or very unavailable?

- 1 = Very Available
- 2 = Somewhat Available
- 3 = Somewhat Unavailable
- 4 = Very Unavailable
- 8 = (VOL) Don't know / Not sure
- 9 = (VOL) Refused

C13. Is there a large selection of good quality low-fat foods at this store? Would you say a very large selection, somewhat large selection, somewhat limited selection, or very limited selection?

- 1 = Very large selection
- 2 = Somewhat large selection
- 3 = Somewhat limited selection
- 4 = Very limited selection
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

C14. How expensive are low-fat foods at this store? Would you say very expensive, somewhat expensive, somewhat inexpensive, or very inexpensive?

- 1 = Very Expensive
- 2 = Somewhat Expensive
- 3 = Somewhat Inexpensive
- 4 = Very Inexpensive
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF C14=1 or 2, ASK C15 ELSE GO TO C16.)

C15. How often does the cost of low-fat foods at this store keep *(you/your food shopper)* from buying them? **(READ LIST)**

- 1 = Always
- 2 = Often
- 3 = Sometimes
- 4 = Rarely
- 5 = Never
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C16. How *(do you/does your family shopper)* usually travel to this **(INSERT C5 RESPONSE / if C5=DK/REF, insert "store")**? **(DO NOT READ LIST)**

- 1 = Drive a car
- 2 = Get a ride
- 3 = Take the bus
- 4 = Take the train
- 5 = Take a taxi
- 6 = Walk
- 7 = Bike
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C17. How long does it usually take *(you/your food shopper)* to get there when *(you/they)* **(INSERT C16 RESPONSE / if C16=DK/REF, insert "go to this store")**?

(RANGE = 1 to 120; 1=Less than 1 minute; 120= 120 minutes or more; 121=DK; 122=REF)

_____ minutes

(IF C16<1 and C16<2, ASK C18. ELSE GO TO C20.)

C18. Is there ever a car available for your family's food shopping?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

(IF C18=1, ASK C19. ELSE GO TO C20.)

C19. Is it usually or only sometimes available?

- 1 = Usually
- 2 = Sometimes
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

(IF C8=5, SKIP TO INSTRUCTS BEFORE C21. ELSE ASK C20.)

C20. In the past month, did *(you/your family shopper)* usually buy most of your fruits and vegetables at the same store where *(you/they)* do most of your shopping?

(IF NEEDED, STATE THAT WE MEAN ALL KINDS of fruits and Vegetables -- fresh, canned, frozen)

- 1 = Yes, same store
- 2 = Somewhere Else
- 3 = (VOL) Buy 50/50 from same store and Somewhere Else
- 4 = (VOL) Don't buy fruits and vegetables
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF (C8=5) or (C20=2 or 3), ASK C21. ELSE GO TO C24.)

C21. ***(If C20=2 or 3, read:*** Other than your usual food shopping store, what kind of place is that?)

(IF C8=5, read: In the past month, where did you usually buy fruits and vegetables, or did you not buy any?)

(IF NEEDED, SAY:) Would you say at a supermarket, a superstore like Wal-Mart or Sam's Club, small grocery store, market, bodega, ethnic store (like an Asian market); or a convenience store such as a gas station, a corner store; or a farmer's market or fruit and vegetable store?

(Note: Target, K-Mart, Costco, Price Club and BJ's are considered "Superstores")

- 1 = Supermarket (like Shop Rite, Pathmark),
- 2 = Superstore like Wal-Mart or Sam's Club,
- 3 = Small grocery store,
- 4 = Ethnic store or bodega,
- 5 = Corner store or convenience stores like 7-11,
- 6 = Farmer's market or fruit and vegetable store/produce store
- 7 = or some other type of store (Specify): _____
- 8 – (VOL) Did NOT buy fruits and vegetables
- 9 = (VOL) Don't know / Not sure
- 10 = (VOL) Refused

C22. How often *(do you/does your family shopper)* shop at this store for fruits and vegetables?

- 1 = Gave times per week (RANGE 1-7)
- 2 = Gave times per month (RANGE 1-31)
- 3 = Gave times per year (RANGE 1-365)
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

C23. What is the main reason (*you shop/your family shopper shops*) at this store? Is it...(READ LIST)?

- 1 = Convenience,
- 2 = Better prices,
- 3 = Better quality, or
- 4 = A larger selection?
- 17 = (VOL) Other (SPECIFY) _____
- 18 = (VOL) Don't Know
- 19 = (VOL) Refused

C24. Still thinking about your neighborhood, that is the area within a 20 minute walk, a 5 minute drive, or

about 1 mile in all directions around your home, are there any fast-food restaurants, delis, pizza, burger, taco or chicken places where you pay before you eat in your neighborhood?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C26. Are there any full-service restaurants in your neighborhood?

(ONLY IF NEEDED: "Examples include a diner, Denny's, or Friendly's")

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

I will now ask you a few questions about food items available in your home. Please answer yes or no for each of the questions. In the last week, did you have...

(RANDOMIZE ORDER OF C28a-C28e; ALWAYS ASK C28f LAST)

C28a. Fresh, frozen, or canned vegetables available in your home?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C28b. 1% or skim milk available in your home?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C28c. Whole grain bread or whole grain pasta available in your home?

(IF NEEDED: "Include any whole grain, whole wheat, rye, etc. bread or pasta.")

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C28d. Cookies, cakes, or candy that were available in your home?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C28e. Chips or Nachos or Doritos available in your home?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C28f. Fresh, canned or dried fruit on the kitchen counter or somewhere easy for your child to get to?

(IF NEEDED, PROBE WITH: "In your home?")

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

Please tell me if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each of the following statements.

C29a. In general, I eat healthy. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C29b. In general, (*INDEX CHILD*) eats healthy. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

C30. Which one of the following statements best describes the food eaten by your family? Do you have...(READ LIST)?

- 1 = Enough food to eat,
- 2 = Sometimes NOT enough to eat, or
- 3 = Often NOT enough to eat?
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(INSERT TIME STAMP)

SECTION D: PHYSICAL ENVIRONMENT FOR ACTIVITY – Respondent only unless otherwise noted

For the next few agree/disagree statements, as before, please think of your neighborhood as the area within a 20 minute walk, a 5 minute drive, or about 1 mile in all directions around your home.

(RANDOMIZE ORDER OF D1a-D1f...do NOT rotate D1g or D1h)

D1a. My neighborhood offers many opportunities to be physically active. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

D1b. My neighborhood is a close-knit or unified neighborhood. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

D1c. People around here are willing to help their neighbors. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

D1d. People in this neighborhood generally don't get along with each other. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

D1e. I trust people in this neighborhood. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

D1f. People in this neighborhood do not share the same values. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

D1g. On the whole, I get enough exercise or physical activity. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

D1h. On the whole, (**INDEX CHILD**) gets enough exercise or physical activity. Do you Agree or Disagree? Strongly or Somewhat?

- 1 = Strongly agree
- 2 = Somewhat agree
- 3 = Somewhat disagree
- 4 = Strongly disagree
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

D3. Thinking about TRAFFIC, how safe is it to walk, run, bike, or play in your neighborhood? Would you say very safe, somewhat safe, somewhat unsafe, or very unsafe?

- 1 = Very Safe
- 2 = Somewhat Safe
- 3 = Somewhat Unsafe
- 4 = Very Unsafe
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D2. Thinking about CRIMINAL ACTIVITY, how safe is it to walk, run, bike, or play in your neighborhood? Would you say very safe, somewhat safe, somewhat unsafe, or very unsafe?

(NOTE: If ask whether we mean "at night" or "during the day," probe..."We simply mean in general or overall.")

- 1 = Very Safe
- 2 = Somewhat Safe
- 3 = Somewhat Unsafe
- 4 = Very Unsafe
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D4. How pleasant is it to walk, run, bike, or play in your neighborhood? For example, are there trees and proper lighting, no graffiti, or abandoned buildings? Would you say very pleasant, somewhat pleasant, somewhat unpleasant, or very unpleasant?

- 1 = Very Pleasant
- 2 = Somewhat Pleasant
- 3 = Somewhat Unpleasant
- 4 = Very Unpleasant
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D5. For walking after dark, are there working street lights on most streets in your neighborhood?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D6. Are there sidewalks in most areas of your neighborhood?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF D6=2, GO TO D10. ELSE ASK D7.)

D7. Are the sidewalks generally in good, fair, or poor condition?

- 1 = Good
- 2 = Fair
- 3 = Poor
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D8. How often does (**INDEX CHILD**) use sidewalks in your neighborhood to walk, run, bike, or play? Often, sometimes, rarely, or never?

- 1 = Often
- 2 = Sometimes
- 3 = Rarely
- 4 = Never
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D9. How often do you use sidewalks in your neighborhood to walk, run, or bike? Often, sometimes, rarely, or never?

- 1 = Often
- 2 = Sometimes
- 3 = Rarely
- 4 = Never
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D10. Are there parks in your neighborhood where children can walk, run, bike, or play?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF D10=2, GO TO D15. ELSE ASK D11.)

D11. Thinking about CRIMINAL ACTIVITY, how safe are these parks? Would you say very safe, somewhat safe, somewhat unsafe, or very unsafe?

- 1 = Very Safe
- 2 = Somewhat Safe
- 3 = Somewhat Unsafe
- 4 = Very Unsafe
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D12. How pleasant are the parks in your neighborhood? For example, are there trees, proper lighting, no graffiti or trash. Would you say very pleasant, somewhat pleasant, somewhat unpleasant, or very unpleasant?

- 1 = Very Pleasant
- 2 = Somewhat Pleasant
- 3 = Somewhat Unpleasant
- 4 = Very Unpleasant
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D13. How often does (*INDEX CHILD*) use parks in your neighborhood to walk, run, bike, or play?
Often,
sometimes, rarely, or never?

- 1 = Often
- 2 = Sometimes
- 3 = Rarely
- 4 = Never
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D14. How often do you use parks in your neighborhood to walk, run, or bike? Often, sometimes, rarely, or never?

- 1 = Often
- 2 = Sometimes
- 3 = Rarely
- 4 = Never
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D15. Are there indoor or outdoor exercise facilities such as walking or running tracks, basketball or tennis courts, swimming pool, or school gym in the parks or elsewhere in your neighborhood?

(IF NEEDED: Include public or private facilities)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF D15=2, GO TO D22. ELSE ASK D16.)

D16. How convenient are the hours during which these exercise facilities are available for use? Would you say very convenient, somewhat convenient, somewhat inconvenient, or very inconvenient?

(NOTE: If asked "convenient for ME, or for the KIDS, say, "Just in general.")

- 1 = Very Convenient
- 2 = Somewhat Convenient
- 3 = Somewhat Inconvenient
- 4 = Very Inconvenient
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D17. Thinking about CRIMINAL ACTIVITY, how safe are these facilities? Would you say very safe, somewhat safe, somewhat unsafe, or very unsafe?

- 1 = Very Safe
- 2 = Somewhat Safe
- 3 = Somewhat Unsafe
- 4 = Very Unsafe
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D18. In what kind of condition are these facilities (clean, well-maintained, proper lighting, etc)? Would you say very good condition, somewhat good condition, somewhat poor condition, or very poor condition?

- 1 = Very Good Condition
- 2 = Somewhat Good Condition
- 3 = Somewhat Poor Condition
- 4 = Very Poor Condition.
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D19a. Do these facilities charge a fee?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF D19a=1, ASK D19. ELSE GO TO D20.)

D19. How affordable are these exercise facilities? Would you say very affordable, somewhat affordable, somewhat unaffordable, very unaffordable?

- 1 = Very affordable
- 2 = Somewhat affordable
- 3 = Somewhat unaffordable
- 4 = Very unaffordable
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D20. Other than during regular school hours, how often does (**INDEX CHILD**) use these indoor or outdoor exercise facilities in your neighborhood? Often, sometimes, rarely, or never?

- 1 = Often
- 2 = Sometimes
- 3 = Rarely
- 4 = Never
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D21. How often do you use these indoor or outdoor exercise facilities in your neighborhood? Often, sometimes, rarely, or never?

- 1 = Often
- 2 = Sometimes
- 3 = Rarely
- 4 = Never
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

D22. How often does (**INDEX CHILD**) walk to stores, libraries, or recreational facilities in your neighborhood? Often, sometimes, rarely, or never, or are there no such places to walk in the neighborhood? (IF NEEDED: "This can be either alone or with someone else.")

- 1 = Often
- 2 = Sometimes
- 3 = Rarely
- 4 = Never
- 5 = No such places in the neighborhood
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF D22=5, GO TO SECTION E. ELSE ASK D23.

D23. How often do you walk to stores, libraries, or recreational facilities in your neighborhood? Often, sometimes, rarely, or never, or are there no such places to walk in the neighborhood?

- 1 = Often
- 2 = Sometimes
- 3 = Rarely
- 4 = Never
- 5 = No such places in the neighborhood
- 8 = (VOL) Don't Know / Not sure

9 = (VOL) Refused

SECTION E: BEHAVIOR – CHILD - FOOD

E1. What grade in school is (**INDEX CHILD**)?

- 1 = 1st Grade
- 2 = 2nd Grade
- 3 = 3rd Grade
- 4 = 4th Grade
- 5 = 5th Grade
- 6 = 6th Grade
- 7 = 7th Grade
- 8 = 8th Grade
- 9 = 9th Grade
- 10 = 10th Grade
- 11 = 11th Grade
- 12 = 12th Grade
- 13 = Pre-school
- 14 = Kindergarten
- 15 = Graduated HS/Entering College or Tech/Trade/Nursing School
- 16 = (VOL) Not in school
- 17 = (VOL) Home Schooled
- 18 = Other, (SPECIFY)
- 19 = (VOL) Don't Know
- 20 = (VOL) Refused

(IF E1=15 or 16 or 17 or 19 or 20, GO TO E4. ELSE GO TO INSTRUCTS BEFORE E1a.)

(IF SC2a=1 (CAMDEN), ASK E1a. ELSE GO TO INSTRUCTS BEFORE E1b.)

E1a. What is the name of the school that (**INDEX CHILD**) currently attends?

(IF CHILD HAS CLASSES AT MULTIPLE LOCATIONS, PROBE: “At which one does (**INDEX CHILD**) have MOST of his/her classes?”)

(ENTER APPROPRIATE CODE FROM BLUE “TACK UP” SHEET)

- 1 = BONSALL
- 2 = BRIMM MEDICAL ARTS HIGH SCHOOL
- 3 = CAMDEN ACADEMY CHARTER HIGH SCHOOL
- 4 = CAMDEN CAP
- 5 = CAMDEN FORWARD SCHOOL
- 6 = CAMDEN HIGH SCHOOL
- 7 = CAMDEN HOUSE
- 8 = CAMDEN SIP
- 9 = CAMDEN VIRTUA KIDS IN TRANSITION
- 10 = CAMDEN'S PROMISE CS

- 12 = COOPERS POYNT
- 13 = CRAMER
- 14 = CREATIVE & PRFRMG ARTS HIGH SCHOOL
- 15 = D.U.E. SEASON CS

16 = DAVIS ELEMENTARY
17 = DUDLEY
18 = EARLY CHILDHOOD DEVEL CENTER
19 = EAST CAMDEN MIDDLE SCHOOL
20 = ENVIRONMENT COMMUNITY CS
21 = FOREST HILL
22 = FREEDOM ACADEMY CS
23 = HATCH MIDDLE SCHOOL
24 = HOLY NAME SCHOOL
25 = JRC ALTERNATIVE SCHOOL
26 = LANNING SQUARE
27 = LEAP ACADEMY UNIVERSITY CS
28 = THE LEARNING TREE
29 = MCGRAW
30 = MET EAST HIGH SCHOOL
31 = MORGAN VILLAGE MIDDLE SCHOOL
32 = MT OLIVET SEVENTH-DAY ADV SCHOOL
33 = OLD CATTO ELEMENTARY
34 = PARKSIDE
35 = POWELL
36 = PYNE POYNT FAMILY SCHOOL
37 = R C MOLINA ELEM SCHOOL
38 = RILETTA CREAM ELEM SCHOOL
39 = RIVERFRONT STATE PRISON
40 = SACRED HEART GRADE SCHOOL
41 = THE SAN MIGUEL SCHOOL
42 = SHARP
43 = SO CAMDEN ALTERNATIVE SCHOOL
44 = ST ANTHONY OF PADUA SCHOOL
45 = ST JOSEPH PRO-CATHEDRAL SCHOOL
46 = SUMNER
47 = U. S. WIGGINS
48 = URBAN PROMISE ACADEMY
49 = VETERANS MEMORIAL MIDDLE SCHOOL
50 = WASHINGTON
51 = WHITTIER
52 = WILSON
53 = WOODROW WILSON HIGH SCHOOL

- 197 = OTHER (SPECIFY)
- 198 = (VOL) DON'T KNOW
- 199 = (VOL) REFUSED

(NOW GO TO E2.)

(IF SC2a=2 (NEWARK), ASK E1b. ELSE GO TO INSTRUCTS BEFORE E1c.)

E1b. What is the name of the school that **(INDEX CHILD)** currently attends?

(IF CHILD HAS CLASSES AT MULTIPLE LOCATIONS, PROBE: "At which one does **(INDEX CHILD)** have MOST of his/her classes?")

(ENTER APPROPRIATE CODE FROM GREEN "TACK UP" SHEET)

- 1 = ABINGTON AVE
- 2 = ACADEMY OF ST. BENEDICT
- 3 = ACADEMY OF VOC CAREERS
- 4 = ALEXANDER ST
- 5 = AMERICAN HISTORY HIGH
- 6 = ANN ST
- 7 = ARTS
- 8 = AVON AVE
- 9 = BARRINGER
- 10 = BELMONT RUNYON
- 11 = BETHANY CHRISTIAN ACADEMY
- 12 = BETHEL CHRISTIAN ACADEMY
- 13 = BLESSED SACRAMENT SCHOOL
- 14 = BOYLAN EARLY CHILDHOOD CT
- 15 = BRAGAW AVE
- 16 = BRANCH BROOK SCHOOL
- 17 = BROADWAY
- 18 = BRUCE ST
- 19 = BURNET ST
- 20 = CALVARY CHRISTIAN SCHOOL
- 21 = CAMDEN MIDDLE
- 22 = CAMDEN ST
- 23 = CENTRAL
- 24 = THE CHAD SCHOOL/THE BLACK YOUT
- 25 = CHAD SCIENCE ACADEMY
- 26 = CHANCELLOR AVE
- 27 = CHANCELLOR AVE ANNEX
- 28 = CHEN SCHOOL

29 = THE CHILDRENS ACADEMY
30 = CLEVELAND

32 = DAYTON ST
33 = DELIVERANCE CHRISTIAN SCHOOL
34 = DISCOVERY CS
35 = DR E ALMA FLAGG
36 = DR WILLIAM H HORTON
37 = EARLY CHILDHOOD PROGRAM
38 = EAST NEWARK PUBLIC
39 = EAST SIDE
40 = EIGHTEENTH AVE
41 = ELLIOTT ST
42 = ESSEX CO. YOUTH HOUSE
43 = ESSEX CTY V N 13TH ST NWK
44 = ESSEX REGIONAL SCHOOL
45 = ESSEX RGC
46 = FIFTEENTH AVE
47 = FIRST AVENUE
48 = FOURTEENTH AVENUE
49 = FRANKLIN
50 = FULL GOSPEL CHRISTIAN ACADEMY
51 = GEORGE WASHINGTON CARVER
52 = GRAY CS
53 = GREATER NEWARK ACADEMY CS
54 = GROWING GARDEN PRE-SCH & KNG
55 = HARRIET TUBMAN
56 = HAWKINS ST
57 = HAWTHORNE AVE
58 = JERSEY PREPARATORY SCHOOL
59 = JOHN F KENNEDY
60 = JUST US KIDS DAY CARE CENTER
61 = LADY LIBERTY ACADEMY CS
62 = LAFAYETTE ST
63 = LINCOLN
64 = LINK COMMUNITY SCHOOL
65 = LOUISE A. SPENCER
66 = LOVE CENTER DAY CARE CENTER
67 = LUIS MUNOZ MARIN MIDDLE
68 = MADISON ELEM.

69 = MALCOLM X SHABAZZ HIGH
70 = MAPLE AVE SCHOOL
71 = MARIA L. VARISCO-ROGERS CS
72 = MARION P. THOMAS CS
73 = MARTIN LUTHER KING JR

75 = MILLER ST
76 = MIRACLE TEMPLE DAY CARE CENTER
77 = MORTON ST
78 = MT VERNON
79 = NJ REGIONAL DAY SCH-NEWARK
80 = NEW HORIZONS COMM. CS
81 = NEW LIFE CHILD CARE LEARNING CENTER
82 = NEWARK BOYS CHORUS SCHOOL
83 = NEWARK CHRISTIAN SCHOOL
84 = NEWARK DAY CENTER
85 = NEWARK VOCATIONAL H S
86 = NEWTON ST
87 = NORTH STAR ACAD. CS OF NEWARK
88 = NORTH WARD CHILD DEVELOPMENT CENTER
89 = NORTHERN STATE PRISON
90 = OLIVER ST
91 = OUR LADY-GOOD COUNSEL SCHOOL
92 = OUR LADY OF GOOD COUNSEL HIGH SCHOOL
93 = PESHINE AVE
94 = PROVISION OF PROMISE ACADEMY
95 = QUEEN OF ANGELS
96 = QUITMAN COMMUNITY SCHOOL
97 = RAFAEL HERNANDEZ SCHOOL
98 = RENAISSANCE ACADEMY
99 = RIDGE ST
100 = RISING STAR LEARNING CENTER
101 = ROBERT TREAT ACADEMY CS
102 = ROBERTO CLEMENTE
103 = ROSEVILLE AVE SCHOOL
104 = REFUGE OF HOPE
105 = SACRED HEART ELEMENTARY SCHOOL
106 = SAMUEL L BERLINER
107 = SCIENCE HIGH
108 = SHILOH RAINBOW ACADEMY INC.
109 = SOUTH SEVENTEENTH ST
110 = SOUTH ST

111 = SPEEDWAY AVE
112 = ST BENEDICT'S PREP SCHOOL
113 = ST CASIMIE ACADEMY
114 = ST FRANCIS XAVIER
115 = ST JAMES PREPARATORY SCHOOL
116 = ST JOHN THE BAPTIST UKRAINI
117 = ST LUCY FILIPPINI ACADEMY

119 = ST MARY ELEMENTARY SCHOOL
120 = ST MICHAEL SCHOOL
121 = ST PATRICK'S SCHOOL
122 = ST PHILIPS ACADEMY
123 = ST ROCCO SCHOOL
124 = ST ROSE OF LIMA SCHOOL
125 = ST VINCENT ACADEMY
126 = SUSSEX AVE
127 = TEAM ACADEMY CHARTER SCHOOL
128 = TECHNOLOGY HIGH
129 = TENDER CARE
130 = THIRTEENTH AVE
131 = UNITED ACADEMY
132 = UNIVERSITY HEIGHTS CS
133 = UNIVERSITY HIGH
134 = VAILSBURG CHRISTIAN ACADEMY
135 = VAILSBURG MIDDLE SCHOOL
136 = WEEQUAHIC
137 = WEEQUAHIC DAY NURSERY & SCHOOL
138 = WEST MARKET STREET CENTER
139 = WEST SIDE HIGH
140 = WILLIAM H BROWN ACADEMY
141 = WILSON AVE
142 = ZION LEARNING CENTER
197 = OTHER (SPECIFY)
198 = (VOL) DON'T KNOW
199 = (VOL) REFUSED

(NOW GO TO E2.)

(IF SC2a=3 (NEW BRUNSWICK), ASK E1c. ELSE GO TO INSTRUCTS BEFORE E1d.)

E1c. What is the name of the school that **(INDEX CHILD)** currently attends?

(IF CHILD HAS CLASSES AT MULTIPLE LOCATIONS, PROBE: “At which one does **(INDEX CHILD)** have MOST of his/her classes?”)

(ENTER APPROPRIATE CODE FROM PINK “TACK UP” SHEET)

- 1 = A CHESTER REDSHAW
- 2 = ALTERNATIVE SCHOOL
- 3 = THE CHILDREN'S CENTER
- 4 = GREATER BRUNSWICK CS
- 5 = GREATER NEW BRUNSWICK DAY CARE

- 6 = JOHNSON & JOHNSON CHILD DEVELOPMENT
- 7 = LINCOLN
- 8 = LIVINGSTON
- 9 = LIVINGSTON AVE CHILD DEVELOPMENT CENTER
- 10= LORD STIRLING
- 11 = MAE J STRONG CHILD DEVELOPMENT CENTER
- 12 = MCKINLEY COMM
- 13 = MIDDLESEX CO. YOUTH CTR.
- 14 = N.B HEALTH AND TECHNOLOGY
- 15 = N.B. MIDDLE SCHOOL
- 16 = NEW BRUNSWICK HIGH
- 17 = PAUL ROBESON COMM
- 18 = REDSHAW
- 19 = ROOSEVELT ELEM
- 20 = ST MARY OF MT VIRGIN SCHOOL
- 21 = ST PETER HIGH SCHOOL
- 22 = ST PETER THE APOSTLE ELEMENTARY
- 23 = WOODROW WILSON
- 197 = OTHER (SPECIFY)
- 198 = (VOL) DON'T KNOW
- 199 = (VOL) REFUSED

(NOW GO TO E2.)

(IF SC2a=4 (TRENTON), ASK E1d. ELSE GO TO INSTRUCTS BEFORE E1e.)

E1d. What is the name of the school that **(INDEX CHILD)** currently attends?

(IF CHILD HAS CLASSES AT MULTIPLE LOCATIONS, PROBE: “At which one does **(INDEX CHILD)** have MOST of his/her classes?”)

(ENTER APPROPRIATE CODE FROM YELLOW “TACK UP” SHEET)

- 1 = AFRIKAN PEOPLES ACTION SCHOOL
- 2 = ALBERT E GRICE MIDDLE

3 = ANNE KLIEN FORENSIC CENTER
4 = CADWALADER
5 = CENTRAL RECEPTION AND ADJUSTMENT FACILITY
6 = COLUMBUS
7 = DAYLIGHT/TWILIGHT H S
8 = EDISON PREP
9 = EMILY C REYNOLDS MIDDLE
10 = EMILY FISHER CS OF ADV. STUDIE
11 = EWING RESIDENTIAL TREATMENT CENTER
12 = FAMILY GUIDANCE CENTER-CHILDREN
13 = FRANKLIN

14 = GEORGE E. WILSON
15 = GRACE A DUNN MIDDLE SCH
16 = GRANT
17 = GREENWOOD
18 = GREGORY
19 = HAMILTON EAST-STEINERT
20 = HAMILTON NORTH-NOTTINGHAM
21 = HARRISON
22 = HEDGEPEETH-WILLIAMS SCH
23 = HOLY ANGELS SCHOOL
24 = HOLY CROSS SCHOOL
25 = IMMACULATE CONCEPTION SCHOOL
26 = INCARNATION ELEMENTARY SCHOOL
27 = INTERNATIONAL CS OF TRENTON
28 = JEFFERSON
29 = JOSEPH F CAPPELLO SCHOOL
30 = JOYCE KILMER
31 = KISTHARDT
32 = KLOCKNER
33 = KUSER
34 = LALOR
35 = LANGTREE
36 = LUIS MUNOZ-RIVERA ELEM
37 = MCGALLIARD
38 = MCVS ASSUNPINK CENT
39 = MCVS PERFORMING ARTS
40 = MEADOW VIEW JUNIOR ACADEMY
41 = MERCER CO. YOUTH DET. CTR.
42 = MERCER JR/SR HIGH SCHOOL

43 = MERCER REGIONAL SCHOOL
44 = MERCERVILLE
45 = MONUMENT
46 = MORGAN
47 = MOTT
48 = MT SINAI SEVENTH-DAY ADVENTIST SCHOOL
49 = N J REG DAY-HAMILTON
50 = NEW JERSEY STATE PRISON
51 = OFFICE OF EDUCATION ADMINISTRATIVE OFFICE
52 = OFFICE SYSTEMS
53 = OUR LADY OF SORROWS SCHOOL
54 = P.J. HILL
55 = PARKER

56 = PERKINS CHRISTIAN INSTITUTE
57 = RICHARD C CROCKETT MIDDLE

58 = RING KINDERGARTEN
59 = ROBBINS
60 = ROBINSON
61 = SACRED HEART SCHOOL-TRENTON
62 = SAYEN
63 = SR GEORGINE SCHOOL
64 = ST GREGORY THE GREAT
65 = ST RAPHAEL SCHOOL
66 = STOKES
67 = SUNNYBRAE
68 = TRENTON CENTRAL HIGH
69 = TRENTON COMMUNITY CS
70 = TRENTON PSYCHIATRIC HOSPITAL
71 = TRINITY EPISCOPAL ACADEMY
72 = UNI HTS/HOWARD D MORRISON
73 = VILLA VICTORIA ACADEMY
74 = VILLAGE CS
75 = WASHINGTON
76 = WILSON
77 = YARDVILLE
197 = OTHER (SPECIFY)
198 = (VOL) DON'T KNOW
199 = (VOL) REFUSED

(NOW GO TO E2.)

(IF SC2a=5 (VINELAND), ASK E1e. ELSE GO TO E2.)

E1e. What is the name of the school that **(INDEX CHILD)** currently attends?

(IF CHILD HAS CLASSES AT MULTIPLE LOCATIONS, PROBE: "At which one does **(INDEX CHILD)** have MOST of his/her classes?")

(ENTER APPROPRIATE CODE FROM WHITE "TACK UP" SHEET)

- 1 = ANTHONY ROSSI INTER. SCH
- 2 = CAA GRAPE ST PROGRAM
- 3 = CAA WOOD STREET PROGRAM
- 4 = CREATIVE ACHIEVEMENT ACD#1
- 5 = CREATIVE ACHIEVEMENT ACADEMY #3
- 6 = CUMBERLAND CHRISTIAN SCHOOL
- 7 = CUMBERLAND REGIONAL SCHOOL

- 8 = CUNNINGHAM
- 9 = DANE BARSE
- 10 = D'IPPOLITO INTERMEDIATE
- 11 = DR. WILLIAM MENNIES
- 12 = EARLY LEARNING CENTER
- 13 = EAST VINELAND
- 14 = THE ELLISON SCHOOL
- 15 = EMMANUEL DAY SCHOOL
- 16 = JOHN H WINSLOW
- 17 = JOHNSTONE
- 18 = LANDIS INTERMEDIATE SCH
- 19 = LITTLE ACRES LEARNING CENTER
- 20 = MARIE DURAND
- 21 = MAURICE FELS
- 22 = NASH EDUCATION CENTER
- 23 = OAK AND MAIN
- 24 = PAULINE J. PETWAY
- 25 = SACRED HEART HIGH SCHOOL
- 26 = SACRED HEART REGIONAL GRAMMAR
- 27 = SOUTH VINELAND
- 28 = ST. FRANCIS OF ASSISI
- 29 = ST MARY'S REGIONAL SCHOOL
- 30 = T.W. WALLACE MIDDLE SCH
- 31 = VETERANS MEMORIAL INT SCH

- 32 = VINELAND CHILDREN'S RESIDENTIAL CENTER
- 33 = VINELAND MENNONITE SCHOOL
- 34 = VINELAND SR HIGH-NORTH/SOUTH
- 197 = OTHER (SPECIFY)
- 198 = (VOL) DON'T KNOW
- 199 = (VOL) REFUSED

E2. Regardless of whether or not (**INDEX CHILD**) eats food provided by his/her school, how would you rate the nutritional quality of foods offered at (**INDEX CHILD**)'s school? Would you say very unhealthy, somewhat unhealthy, somewhat healthy, or very healthy?

- 1 = Very Unhealthy
- 2 = Somewhat Unhealthy
- 3 = Somewhat Healthy
- 4 = Very Healthy
- 5 = (VOL) School does not provide food
- 8 = (VOL) Don't Know / Not sure
- 9 = (VOL) Refused

(IF E2 > 5, ASK E3a. ELSE GO TO INSTRUCTS BEFORE E3.)

E3a. On most school days, does (**INDEX CHILD**) have a lunch served by the school?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF E3a=1, GO TO E4. ELSE ASK E3.)

E3. On most school days, does (**INDEX CHILD**) bring lunch from home, buy lunch at an outside restaurant or store, or buy it at a vending machine?

(IF NEEDED: Which of these ways does (**he/she**) get lunch at school most often?)

- 1 = Brings lunch from home
- 3 = Buys at an outside restaurant or store (whether before school or at lunch time)
- 4 = Buys at vending machine (whether on or off campus)
- 5 = (VOL) Does not eat lunch
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

The next few questions are about different kinds of foods (**INDEX CHILD**) ate or drank during the past month. Your best guess is fine. You can tell me number of times per day, per week, or per month.

E4. How often did (**INDEX CHILD**) drink 100% PURE fruit juices such as orange, apple, or grape juice? Do NOT include fruit-flavored drinks with added sugar like Hi-C, Gatorade, or fruit punch. You can tell me number of times per day, per week or per month.

(IF NEEDED: This is IN THE PAST MONTH.)

(INTERVIEWER: If answer is "every day" or "7 days a week", probe with "How many times a day?")

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E5. Not counting juice, how often did (*INDEX CHILD*) eat fruit? Count fresh, frozen, or canned fruit.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: “Your best guess is fine. Include apples, bananas, applesauce, oranges, fruit salad, watermelon, cantaloupe or musk melon, papaya, mangos, grapes, and berries such as blueberries and strawberries.”)

(IF NEEDED, SAY: You can tell me number of times per day, per week or per month.)
 (INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E6. How often did (*INDEX CHILD*) eat a green leafy or lettuce SALAD, with or without other vegetables?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED: “Such as American or Western-type RAW salads with leaf lettuce, romaine, mixed-greens, and spinach.”)

(IF NEEDED, SAY: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E7. NOT INCLUDING FRENCH FRIES OR OTHER FRIED POTATOES, how often did (*INDEX CHILD*) eat any other kind of POTATOES such as baked, boiled, mashed potatoes, or potato salad? You can tell me number of times per day, per week or per month.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: Fried potatoes include French fries, potato chips, tater tots, home fries, and hash brown potatoes. This includes potatoes prepared in any fashion such as baked, boiled, mashed, au-gratin, or scalloped. It includes potatoes prepared in other dishes such as potato salad. Include white, yellow, red-skinned, yams, and sweet potatoes.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

E8. How often did (**INDEX CHILD**) eat cooked or canned DRIED beans, such as refried beans, baked beans, bean soup, tofu, or lentils?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: Include round or oval beans such as navy, Northern, kidney, black, pinto, soy beans, split peas, cow peas, garbanzo beans, or lentils cooked this way. Do NOT include long green beans such as string beans or pole beans.)

(IF NEEDED, SAY: You can tell me number of times per day, per week or per month.

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

E9. Still thinking about the past month...Not including what you just told me about, how often did (**INDEX CHILD**) eat OTHER vegetables such as tomatoes, green beans, carrots, corn, cooked greens, sweet potatoes, broccoli, or any other kinds of vegetables?

(IF ASKED: Do not count any of the following as vegetables: lettuce salads, potatoes, beans, or anything you have already counted.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

E13. How often did (**INDEX CHILD**) eat at a fast food restaurant, deli, pizza, burger, taco or chicken place where you pay before you eat?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: You can tell me number of times per day, per week, or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 - 3)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF E13=1 or 2 or 3, ASK E13a. IF E13=4, ASK E13b. ELSE GO TO E14.)

E13a. How many of these (*insert from E13*) times per (*day/week/month*) did (**INDEX CHILD**) eat healthy choices, such as low-calorie or low-fat items or salads at these places?

- 1 = Gave Response (RANGE=0 to 30) (*can not exceed answer from E13*)
- 2 = (VOL) No such option available
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(NOW GO TO E14.)

E13b. Did (**INDEX CHILD**) eat healthy choices, such as low-calorie or low-fat items or salads at these places?

- 1 = Yes
- 2 = No
- 3 = (VOL) No such option available
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E14. How often did (**INDEX CHILD**) eat out at a full service restaurant?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: You can tell me number of times per day, per week, or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 - 3)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF E14=1 or 2 or 3, ASK E14a. IF E14=4, ASK E14b. ELSE GO TO E12.)

E14a. How many of these (*insert from E14*) times per (*day/week/month*) did (*INDEX CHILD*) eat healthy choices, such as low-calorie or low-fat items or salads at these places?

(IF RESP SAYS, "A salad comes with the meal," then this counts as a healthy choice.)

- 1 = Gave Response (RANGE=0 to 30) (*can not exceed answer from E14*)
- 2 = (VOL) No such option available
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(NOW GO TO E12.)

E14b. Did (*INDEX CHILD*) eat healthy choices, such as low-calorie or low-fat items or salads at these places?

(IF RESP SAYS, "A salad comes with the meal," then this counts as a healthy choice.)

- 1 = Yes
- 2 = No
- 3 = (VOL) No such option available

- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

[ROTATE ORDER OF E12, E15, E16, E17, E19...E10, E11 and E18 WERE MOVED AFTER E19.]

E12. How often did (*INDEX CHILD*) eat fruits and vegetables as a snack at home or at school? You can tell me number of times per day, per week or per month.

(INTERVIEWER NOTE: It doesn't matter if it is fruits or vegetables)

(INTERVIEWER: If answer is "every day" or "7 days a week", probe with "How many times a day?")

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E15. How often did (*INDEX CHILD*) drink fruit flavored drinks such as lemonade, Sunny Delight, Kool-aid, Gatorade, or sweet iced teas? Do not include 100% fruit juice.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: You can tell me number of times per day, per week, or per month.)

(INTERVIEWER: If answer is "every day" or "7 days a week", probe with "How many times a day?")

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E16. How often did (**INDEX CHILD**) drink regular carbonated soda or soft drinks that are sweetened such as coke, pepsi, or 7-up? Do not include diet drinks. You can tell me number of times per day, per week or per month.

(IF NEEDED: This is IN THE PAST MONTH.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E17. How often did (**INDEX CHILD**) eat salty snacks like chips, Doritos, and Nachos?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E19. How often did (**INDEX CHILD**) eat sweet items like cookies, cakes, candy, or pies?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E18. In a usual week in the past month, how many days a week did (**INDEX CHILD**) eat breakfast?
(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

_____ # DAYS

E10. How often did (**INDEX CHILD**) eat at least two different kinds of fruits IN A DAY, including 100% fruit juice? DO NOT include fruit flavored drinks like lemonade, Hi-C, or fruit punch.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED: For example, a banana at lunch and an apple for a snack.)

[IF NEEDED, SAY: You can tell me number of days per week or per month.]

- 1 = Gave answer times per week (RANGE 1 - 7)
- 2 = Gave answer times per month (RANGE 1 - 30)
- 3 = Less than once a month
- 4 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

E11. How often did (**INDEX CHILD**) eat at least two different kinds of vegetables IN A DAY, including 100% vegetable juice?. DO NOT include fried potatoes.

(IF NEEDED: This is IN THE PAST MONTH.)

[IF NEEDED, SAY: You can tell me number of days per week or per month.]

- 1 = Gave answer times per week (RANGE 1 - 7)
- 2 = Gave answer times per month (RANGE 1 - 30)
- 3 = Less than once a month
- 4 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

PHYSICAL ACTIVITY

E20. Now think of all (**INDEX CHILD**)'s physical activity in the past 7 days. Adding up all the time (**he/she**) spent in any kind of physical activity that increased (**his/her**) heart rate and made (**him/her**) breathe hard, on how many days was (**he/she**) physically active for a total of AT LEAST 30 MINUTES PER DAY?

(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

_____ # DAYS

(IF E20=0, SKIP TO INSTRUCTS BEFORE E22. ELSE ASK E21.)

E21. **(IF E20=1, read:** Was **(INDEX CHILD)** physically active for a total of AT LEAST 60 MINUTES on that day? (If "Yes," enter "1." If "No," enter "0.")

(IF E20>1, read: On how many of these (# from E20) days was **(INDEX CHILD)** physically active for a total of AT LEAST 60 MINUTES PER DAY?

(READ ONLY IF NEEDED: Add up all the time **(INDEX CHILD)** spent in any kind of physical activity that increases heart rate and makes (him/her) breathe hard some of the time.)

(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

_____ # DAYS **(Answer to E21 can NOT exceed answer from E20.)**

(IF E1= 16 or 17, GO TO E24. ELSE ASK E22.)

E22. Now thinking about the school year, on how many days during a typical week does **(INDEX CHILD)** walk, bicycle, or skateboard to or from school? (Do not include motor scooters)

(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

_____ # DAYS

E23. During the school year, how often does **(INDEX CHILD)** get any type of physical activity or exercise at school (for example, PE class, recess)? You can tell me number of days per week or per month.

1 = Gave answer times per week (RANGE 1 - 5)

2 = Gave answer times per month (RANGE 1 – 20; 20=20 OR MORE)

3 = Less than once a month

4 = Never

8 = (VOL) Don't Know

9 = (VOL) Refused

E24. **(IF E1 <> 16 or 17, READ:)** During the school year, on an average school day, how many hours does **(INDEX CHILD)** watch TV, play video games, or use a computer outside of school? This does not include using the computer for school work.

(IF E1=16 or 17, READ:) On an average weekday, how many hours does **(INDEX CHILD)** watch TV, play video games, or use a computer

1 = Gave answer in minutes (RANGE 1-59)

2 = Gave answer in hours (RANGE 1-10)

3 = (VOL) Does not watch TV/Use computer/Play video games

8 = (VOL) Don't Know

9 = (VOL) Refused

E25. **(IF E1 < 16 or 17, READ:)** During the school year, on a typical weekend DAY, how many hours does **(INDEX CHILD)** watch TV, play video games, or use a computer? This does not include using the computer for school work.

(IF E1=16 or 17,, READ:) On a typical weekend DAY, how many hours does **(INDEX CHILD)** watch TV, play video games, or use a computer?

day out (INTERVIEWER: ALWAYS PROBE WITH: "Is that for the whole weekend, or just 1 of the weekend?" If resp says "whole weekend", re-ask about hours for just ONE DAY)

- 1 = Gave answer in minutes (RANGE 1-59)
- 2 = Gave answer in hours (RANGE 1-10)
- 3 = (VOL) Does not watch TV/Use computer/Play video games
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

SECTION F: BEHAVIOR - ADULT

(QUESTIONS FOR RESPONDENT ONLY)

F1. How many days a week do you usually sit down with your whole family for the dinner meal?

(RANGE 0-7, LESS THAN ONCE/WEEK = 8; DK=9, REF=10)

The next few questions are about different kinds of foods you ate or drank during the past month. Your best guess is fine. You can tell me number of times per day, per week, or per month.

F2. How often did you drink 100% PURE fruit juices such as orange, apple, or grape juice? Do NOT include fruit-flavored drinks with added sugar like Hi-C, Gatorade, or fruit punch. You can tell me number of times per day, per week or per month.

(IF NEEDED: This is IN THE PAST MONTH.)

day?") (INTERVIEWER: If answer is "every day" or "7 days a week", probe with "How many times a

- 1 = Gave answer times per day (RANGE 1 - 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F3. Not counting juice, how often did you eat fruit? Count fresh, frozen, or canned fruit.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: Your best guess is fine. Include apples, bananas, applesauce, oranges, fruit salad, watermelon, cantaloupe or musk melon, papaya, mangos, grapes, and berries such as blueberries and strawberries.)

(IF NEEDED, SAY: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F4. How often did you eat a green leafy or lettuce SALAD, with or without other vegetables

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: Such as American or Western-type RAW salads with leaf lettuce, romaine, mixed-greens, and spinach.)

(IF NEEDED, SAY: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F5. NOT INCLUDING FRENCH FRIES OR OTHER FRIED POTATOES, how often did you eat any other kind of POTATOES such as baked, boiled, mashed potatoes, or potato salad? You can tell me number of times per day, per week or per month.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: Fried potatoes include French fries, potato chips, tater tots, home fries, and hash brown potatoes. This includes potatoes prepared in any fashion such as baked, boiled, mashed, au-gratin, or scalloped. It includes potatoes prepared in other dishes such as potato salad. Include white, yellow, red-skinned, yams, and sweet potatoes.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F6. How often did you eat cooked or canned DRIED beans, such as refried beans, baked beans, bean soup, tofu, or lentils?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: Include round or oval beans such as navy, Northern, kidney, black, pinto, soy beans, split peas, cow peas, garbanzo beans, or lentils cooked this way. Do NOT include long green beans such as string beans or pole beans.)

(IF NEEDED, SAY: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)

2 = Gave answer times per week (RANGE 1 - 7)

3 = Gave answer times per month (RANGE 1 - 30)

4 = Less than once a month

5 = Never

8 = (VOL) Don't Know

9 = (VOL) Refused

F7. Not including what you just told me about, how often did you eat OTHER vegetables such as tomatoes, green beans, carrots, corn, cooked greens, sweet potatoes, broccoli, or any other kinds of vegetables?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF ASKED: Do not count any of the following as vegetables: lettuce salads, potatoes, beans, or anything you have already counted.)

(IF NEEDED, SAY: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)

2 = Gave answer times per week (RANGE 1 - 7)

3 = Gave answer times per month (RANGE 1 - 30)

4 = Less than once a month

5 = Never

8 = (VOL) Don't Know

9 = (VOL) Refused

F11. How often did you eat at a fast food restaurant, deli, pizza, burger, taco or chicken place where you pay before you eat?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED: You can tell me number of times per day, per week, or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 - 4)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF F11=1 or 2 or 3, ASK F11b. IF F11=4, ASK F11c. ELSE GO TO F12.)

F11b. How many of these (*insert from F11*) times per (*day/week/month*) did you eat healthy choices, such as low-calorie or low-fat items or salads at these places?

- 1 = Gave Response (RANGE=0 to 30) (*can not exceed answer from F11*)
- 2 = (VOL) No such option available
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(NOW GO TO F12.)

F11c. Did you eat healthy choices, such as low-calorie or low-fat items or salads at these places?

- 1 = Yes
- 2 = No
- 3 = (VOL) No such option available
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F12. How often did you eat at a full service restaurant?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED: You can tell me number of times per day, per week, or per month.)

(INTERVIEWER: If answer is "every day" or "7 days a week", probe with "How many times a day?")

- 1 = Gave answer times per day (RANGE 1 - 3)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF F12=1 or 2 or 3, ASK F12a. IF F12=4, ASK F12b. ELSE GO TO F10.)

F12a. How many of these (*insert from F12*) times per (*day/week/month*) did you eat healthy choices, such as low-calorie or low-fat items or salads at these places?

(IF RESP SAYS, "A salad comes with my meal," then this counts as a healthy choice.)

- 1 = Gave Response (RANGE=0 to 30) (*can not exceed answer from F12*)
- 2 = (VOL) No such option available
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(NOW GO TO F10.)

F12b. Did you eat healthy choices, such as low-calorie or low-fat items or salads at these places?

(IF RESP SAYS, “A salad comes with my meal,” then this counts as a healthy choice.)

- 1 = Yes
- 2 = No
- 3 = (VOL) No such option available
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

[ROTATE ORDER OF F10, F13, F14, F15, F17...F8, F9 and F16 WERE MOVED AFTER F17.]

F10. How often did you eat fruits and vegetables as a snack? You can tell me number of times per day, per week or per month.

(IF NEEDED: This is IN THE PAST MONTH.)

(INTERVIEWER NOTE: It doesn’t matter if it is fruits or vegetables)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refused

F13. How often did you drink fruit flavored drinks such as lemonade, Sunny Delight, Kool-aid, Gatorade, or sweet iced teas? Do not include 100% fruit juice.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: You can tell me number of times per day, per week, or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don’t Know
- 9 = (VOL) Refuse

F14. How often did you drink regular carbonated soda or soft drinks such as coke, pepsi, or 7-up? Do not include diet drinks. You can tell me number of times per day, per week or per month.

(IF NEEDED: This is IN THE PAST MONTH.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F15. How often did you eat salty snacks like chips, Doritos, and Nachos?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F17. How often did you eat sweet items like cookies, cakes, candy, or pies?

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED: You can tell me number of times per day, per week or per month.)

(INTERVIEWER: If answer is “every day” or “7 days a week”, probe with “How many times a day?”)

- 1 = Gave answer times per day (RANGE 1 – 10: 10=10 OR MORE)
- 2 = Gave answer times per week (RANGE 1 - 7)
- 3 = Gave answer times per month (RANGE 1 - 30)
- 4 = Less than once a month
- 5 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F16. In a usual week in the past month, how many days a week did you eat breakfast?

(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

_____ # DAYS

F8. How often do you eat at least two different kinds of fruits IN A DAY, including 100% fruit juice NOT include fruit flavored drinks like lemonade, Hi-C, or fruit punch.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED: For example, a banana at lunch and an apple for a snack.)

(IF NEEDED, SAY: You can tell me number of days per week or per month.)

- 1 = Gave answer times per week (RANGE 1 - 7)
- 2 = Gave answer times per month (RANGE 1 - 30)
- 3 = Less than once a month
- 4 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F9. How often did you eat at least two different kinds of vegetables IN A DAY, including 100% vegetable juice? DO NOT include fried potatoes.

(IF NEEDED: This is IN THE PAST MONTH.)

(IF NEEDED, SAY: You can tell me number of days per week or per month.)

- 1 = Gave answer times per week (RANGE 1 - 7)
- 2 = Gave answer times per month (RANGE 1 - 30)
- 3 = Less than once a month
- 4 = Never
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

F19a. Now think about your physical activity both at work and at home in the past 7 days. Adding up all the time you spent in any kind of physical activity that increased your heart rate and made you breath hard, on how many days were you physically active for a total of AT LEAST 15 MINUTES PER DAY?

(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

_____ DAYS

(IF F19a>0, ASK F19. ELSE GO TO F20.)

F19. **(IF F19a=1, read:** Were you physically active for a total of AT LEAST 30 MINUTES PER DAY on _____ that day? (If "Yes," enter "1." If "No," enter "0.")

(IF F19a>1, read: On how many of these (# from F19a) days were you physically active for a total of AT LEAST 30 MINUTES PER DAY?

(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

_____ DAYS

(Answer to F19 can NOT exceed answer from F19a.)

F20. Now think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any walking that you might do for exercise, or leisure.

During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

(IF F20=0, SKIP TO F22a; ELSE ASK F21)

F21. **(IF F20=2 through 7, read:)** “On average, how much time did you usually spend walking on one of those *(insert from F20)* days?”

(IF F20=1, read:) “How much time did you spend walking on that day?”

(IF F20=8 or 9, read:) “On average, how much time did you usually spend walking on a typical day?”

- 1 = Gave hours per day
- 2 = Gave minutes per day
- 3 = Time Varies Widely
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF F21=1 or 2, GO TO F22a. ELSE ASK F21a.)

F21a. What is the total amount of time you spent walking over THE LAST 7 DAYS?

- 1 = Gave hours per week [Range = 0 - 112]
- 2 = Gave minutes per week [Range = 0 - 6720]
- 8 = (VOL) Don't Know/Not Sure
- 9 = (VOL) Refused

F22a. Have you ridden a bicycle in the past week?

(INTERVIEWER: Does NOT include using a stationary bike.)

- 1 = Yes
- 2 = No
- 3 = (VOL) Don't Know
- 4 = (VOL) Refused

(IF F22a=2, SKIP TO G1. ELSE CONTINUE.)

F22. Now think only about the BICYCLING you did to travel to and from work, to go from place to place, or solely for exercise, or leisure. Do NOT include time spent on a stationary bike.

During the last 7 days, on how many days did you bicycle for at least 10 minutes at a time?

(RANGE 0-7; 8=(VOL) DON'T KNOW; 9=(VOL) REFUSED)

_____ DAYS

(IF F22=9, GO TO SECTION G. ELSE ASK F23.)

F23. How much time did you usually spend bicycling on a typical day?

(INTERVIEWER: An average time for one of the days on which you bicycle is being sought)

- 1 = Gave hours per day
- 2 = Gave minutes per day
- 3 = Time Varies Widely
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF F23=1 or 2, GO TO SECTION G. ELSE ASK F23a.)

F23a. What is the total amount of time you spent bicycling over the last 7 days?

- 1 = Gave hours per week [Range = 0 - 112]
- 2 = Gave minutes per week [Range = 0 - 6720]
- 8 = (VOL) Don't Know/Not Sure
- 9 = (VOL) Refused

(INSERT TIME STAMP)

SECTION G – HEALTH CARE COVERAGE

Display: Now, we're going to talk about health insurance.

G1. Do you have some form of health insurance or health care coverage, or not? (ABC, #7)

- 1 = Yes, have insurance
- 2 = No insurance
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(If G1=1, ask G2. Else go to G4.)

G2. Are you mainly covered by Medicare, Medicaid, NJ FamilyCare, insurance through a current or former job or other private insurance, or do you have coverage from some other source? (ABC, #8)

(IF NEEDED: Medicare is the government health insurance program for people 65 and over and some younger people with disabilities. Medicaid and NJ FamilyCare are government health

insurance programs for low-income families.)

- 1 = Medicare
- 2 = Medicaid
- 3 = NJ Family Care
- 4 = Insurance through a current or former job
- 5 = Other private insurance
- 6 = Coverage from some other source
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF G2=2 through 6, ASK G2a. ELSE GO TO INSTRUCTS BEFORE G4.)

G2a. Is **(INDEX CHILD)** covered by your health insurance?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(If G2=5 or 6, ask G3. Else go to G4.)

G3. Is that coverage part of a program such as NJ FamilyCare or Medicaid?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF G2a=1, SKIP TO SECTION H. ELSE ASK G4.)

G4. Does **(INDEX CHILD)** currently have some form of health insurance or health care coverage?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF G4=1, ASK G5. ELSE GO TO SECTION H.)

G5. Is **(INDEX CHILD)** covered by health insurance through the current or former employer of a parent or guardian or some other private insurance, is **(he/she)** covered by a program such as Medicare, Medicaid, or NJ FamilyCare, or does **(he/she)** have some other kind of health insurance?

(IF NEEDED: Medicare sometimes covers younger people who have certain disabilities).

(IF NEEDED: Medicaid and NJ FamilyCare are government health insurance programs for low-income families)

- 1 = insurance through current or former employer of parent/guardian
- 2 = Other private insurance
- 3 = Medicare
- 4 = Medicaid
- 5 = NJ FamilyCare
- 6 = other coverage
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(If G5= 2 or 6, ask G6. Else go to SECTION H.)

G6. Is that coverage part of a program such as NJ FamilyCare or Medicaid?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

SECTION H - EMPLOYMENT AND EARNINGS

The next section is about employment.

(IF (((SC5b=18 or SC5b1=5) and (SC2cc=0)) or ((SC5b>18 or SC5b1>5) and (SC2cc=1))) and ((SC7a_2 through SC7a_14 are ALL NOT 18) and (SC7a1_2 through SC7a1_14 are ALL NOT punch 5)), ASK H1. ELSE GO TO INSTRUCTS BEFORE H2.)

H1. Are you working for pay?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF (((SC5b=18 or SC5b1=5) and (SC2cc>0)) or ((SC5b>18 or SC5b1>5) and (SC2cc>1))) or ((SC7a_2 through SC7a_14 are ALL > 17) or (SC7a1_2 through SC7a1_14 are ALL > punch 4)), ASK H2. ELSE GO TO H3.)

H2. How many people in your household age 18 and over are working for pay? Please be sure to include yourself, if applicable.

(RANGE: 0 to 16; 15=DK; 16=REF)

H3. The next questions are about income that your family received during 2008. Again, by family, include all family members living there related by blood, marriage, living as married, and any children of those people.

During 2008, what was your family's total income from all sources, before taxes and other deductions? Include job wages, public assistance, social security, child support, and any other sources of income. (FHIS 7.1)

- 1 = Gave Annual Salary
- 2 = Gave Weekly Salary
- 3 = Gave Bi-Weekly Salary
- 4 = Gave Monthly Salary
- 5 = Gave Bi-Monthly Salary
- 6 = (VOL) No income whatsoever in 2008 ***(GO TO H9)***
- 8 = (VOL) Don't Know ***(GO TO H5)***
- 9 = (VOL) Refused ***(GO TO H5)***

(IF H3=8 or 9, GO TO H5. IF H3=6, GO TO H9. ELSE ASK H4.)

H4. ENTER INCOME: (DO NOT READ:)

(RANGE = 0-999999; 999999 = 999,999 OR MORE)

_____ Record #

(ALL ASKED H4 GO TO H9)

H5. Was your family's 2008 total income from all sources, before taxes: (READ LIST)

(READ PROBES ONLY IF RESPONDENT REFUSES TO ANSWER)

(a) Answers to questions on earnings are important to our survey because they help explain whether people can afford the health care they need. Also, the information you provide will be kept confidential and will only be used in statistical summaries).

(b) Total income includes wages and salaries from jobs, net income from farms or businesses, interest or dividends, pensions or social security, income from rental property, estates or trusts, public assistance or welfare, social security, child support, other sources.

(c) Your best estimate would be fine.

- 1 = Under \$20,000,
- 2 = \$20,000 to \$49,999, or
- 3 = \$50,000 or greater?
- 8 = (VOL) Don't know
- 9 = (VOL) Refused

(IF H5=1, ASK H6. IF H5=8 or 9, GO TO H9. ELSE GO TO INSTRUCTS BEFORE H7.)

H6. Is it...(READ LIST)?

- 1 = Under \$10,000, or
- 2 = \$10,000 - \$19,999?
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(ALL ASKED H6, GO TO H9)

(IF H5=2, ASK H7. ELSE GO TO INSTRUCTS BEFORE H8.)

H7. Is it...(READ LIST)?

- 1 = Between \$20,000 and \$29,999,
- 2 = Between \$30,000 and \$39,999 or
- 3 = Between \$40,000 and \$49,999?
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(ALL ASKED H7, GO TO H9)

(IF H5=3, ASK H8. ELSE GO TO H9.)

H8. Is it...(READ LIST)?

- 1 = Between \$50,000 and \$74,999,
- 2 = Between \$75,000 and \$99,999,
- 3 = Between \$100,000 and 149,999, or
- 4 = \$150,000 or more?
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

H9. During the year 2008, did anyone in your family living there receive government assistance such as SSI, SSDI, or TANF (TANIF)?

(IF NEEDED: “SSI=Supplemental Security Income”
“SSDI=Social Security Disability Insurance”
“TANF=Temporary Assistance for Needy Families”)

1 = Yes
2 = No
8 = (VOL) Don't Know
9 = (VOL) Refused

H10. Did anyone in your family living there receive food stamps in 2008? (FHIS 7.13)

(IF NEEDED: “Food Stamps” are also referred to as SNAP (Supplemental Nutrition Assistance Program) or as having an EBT card (Electronic Benefits Transfer.)

1 = Yes
2 = No
8 = (VOL) Don't Know
9 = (VOL) Refused

H11. Did anyone in your family living there receive WIC in 2008?

and (IF NEEDED: “WIC=Special Supplemental Nutrition Program for Woman, Infants and Children.)

1 = Yes
2 = No
8 = (VOL) Don't Know
9 = (VOL) Refused

H12. Does (*INDEX CHILD*) receive free or reduced-cost breakfast or lunch at school/daycare?

1 = Yes
2 = No
3 = (VOL) Not in school/daycare
8 = (VOL) Don't know
9 = (VOL) Refused

H14. Do you own or rent your home? (DO NOT READ UNLESS NECESSARY) (NSAF M-1)

1 = Owned or being bought by you/someone in your household
2 = Rented for cash, or
3 = Occupied without payment of cash rent?
8 = (VOL) Don't know
9 = (VOL) Refused

(INSERT TIME STAMP)

SECTION I - DEMOGRAPHICS

- i1. Are you of Spanish, Hispanic, or Latino origin or descent?

[PROBE FOR REFUSALS: "I understand that these questions may be sensitive. We are asking these questions to help understand different health care problems and needs people have."]
(Probe used in CTS, not NASF) (NASF O1, CTS p106)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

- i2. Is (**INDEX CHILD**) of Spanish, Hispanic or Latino origin or descent?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(ASK i3 IF i1=1. ELSE GO TO INSTRUCTS BEFORE i4.)

- i3. What group are you? Would you say you are Mexican, Mexican-American, Puerto Rican, Central or South American, Cuban or some other group?

- 1 = Mexican/ Mexican-American
- 2 = Puerto Rican
- 3 = Cuban
- 4 = Central or South American
- 5 = Dominican
- 6 = Haitian
- 10 = Other (SPECIFY)
- 11 = (VOL) Don't Know
- 12 = (VOL) Refused

(IF (i3=1 through 10) and (i2<>2), ask i4. ELSE GO TO INSTRUCTS BEFORE i5.)

- i4. Is (**INDEX CHILD**) also (*insert response to i3*)?

- 1 = Yes, we are the same
- 2 = No, we are not the same
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF (i4=2) or (i1<>1 and i2<>2) or ((i3=11 or 12) and (i2<>2)), ASK i5. ELSE GO TO i6.)

- i5. What group is (**INDEX CHILD**)? Would you say (**INDEX CHILD**) is Mexican, Mexican-American, Puerto Rican, Central or South American, Cuban or some other group?

[NOTE: If anyone is a combination put the answer as “other” and list the combination – i.e., Mexican and South American]

- 1 = Mexican/ Mexican-American
- 2 = Puerto Rican
- 3 = Cuban
- 4 = Central or South American
- 5 = Dominican
- 6 = Haitian
- 10 = Other (SPECIFY)
- 11 = (VOL) Don't know
- 12 = (VOL) Refused

i6. What is your race? (DO NOT READ LIST)

(IF “HISPANIC”, PROBE: Are you Hispanic and black, or Hispanic and white?) (NASF, O3)

- 1 = Black/African American
- 2 = White
- 3 = American Indian/Native American/Aleutian or Eskimo
- 4 = Asian/Pacific Islander
- 5 = (VOL) Hispanic (ACCEPT ONLY AFTER PROBE)
- 9 = Other (SPECIFY)
- 10 = (VOL) Don't Know
- 11 = (VOL) Refused

i7. What is (*INDEX CHILD*)'s race?

- 1 = Black/African American
- 2 = White
- 3 = American Indian/Native American/Aleutian or Eskimo
- 4 = Asian/Pacific Islander
- 5 = (VOL) Hispanic (ACCEPT ONLY AFTER PROBE)
- 9 = Other (SPECIFY)
- 10 = (VOL) Don't Know
- 11 = (VOL) Refused

i8. Were you or (*INDEX CHILD*) born outside of the United States, Puerto Rico, or other U.S. territories?

[IF NECESSARY: Puerto Rico and other U.S. territories (Guam, U.S. Virgin Islands, American Samoa, Northern Marianas Islands, or Marshall Islands) are considered inside the United States. If born in a U.S. military family, that is considered born in the U.S. regardless of

the

country.] (NASF O4)

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF i8=1, GO TO i9. ELSE GO TO i12.)

i9. Who was born outside of the United States? (MULTIPLE RECORD) (PROBE: Anyone else?) (NASF, O5)

- 1 = respondent (*read-in Resp name/initials*)
- 2 = index child (*read-in Index Child name/initials*)
- 3 = Other HH member(s)
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF i9=1 and/or 2, ASK i10 THROUGH i11NYR CONSECUTIVELY FOR EACH. DO NOT ASK FOR CODE 3 FROM i9. IF i9= 4 or 5, GO to i12.)

i10. (*Are you / Is INDEX CHILD*) a citizen of the United States? (NASF, O7)

- 1 =Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

i11. When did (*you/INDEX CHILD*) come to live in the United States? (NASF, O9)

- 1 = Gave SPECIFIC Year
- 2 = Gave Number of Years
- 8 = (VOL) DON'T KNOW
- 9 = (VOL) REFUSED

(IF i11=1, ASK i11syr. ELSE GO TO INSTRUCTS BEFORE i11nyr.)

i11syr. [INTERVIEWER: ENTER SPECIFIC YEAR; ENTER AS 4 DIGITS, EX: 1970]

“When did (*he/she*) come to live in the United States?”

(RANGE = 1900 – 2009)

(NOW GO BACK TO i10 FOR THE NEXT PERSON. IF NO ONE ELSE, GO TO i12.)

(IF i11=2, ASK i11nyr. ELSE GO BACK TO i10 FOR THE NEXT PERSON. IF NO ONE ELSE,

GO TO i12.)

i11nyr. [INTERVIEWER: ENTER NUMBER OF YEARS]

“When did (*he/she*) come to live in the United States?”

(RANGE = 1 TO 100)

(NOW GO BACK TO i10 FOR THE NEXT PERSON. IF NO ONE ELSE, GO TO i12.)

i12. What is the primary language spoken in your home?

- 1 = English
- 2 = Spanish
- 11 = Other (Specify)
- 12 = (VOL) Don't Know
- 13 = (VOL) Refused

i13. What is the highest grade or level of school that you have completed?

- 1 = 8th GRADE OR LESS
- 2 = 9th TO 11TH
- 3 = 12TH GRADE, GED OR HIGH SCHOOL DIPLOMA
- 4 = Some voc//tech/business/trade school
- 5 = Some voc.tech/business/trade school certificate or diploma
- 6 = Some college/no degree
- 7 = Associate's degree
- 8 =Bachelor's degree
- 9 = Some graduate/professional school/no degree
- 10 = Graduate/professional degree (MA;MS;PHD;EDD;MD;DDS;JJ/LLB, ETC)
- 16 = (VOL) Don't Know
- 17 = (VOL) Refused

(If I13=4 OR 5, ASK i14. ELSE GO TO INSTRUCTS BEFORE i13a.)

i14. Do you have a high school diploma or GED?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(If Resp is the Mother of the Index Child (i.e. – (SC7=2 for Resp) AND (FR1a=3 or 4 or 5 or 7 or 8 or 9 or 10 or 12 for Index Child), then go to i15. Else ask i13a.)

i13a. What is the highest grade or level of school that (***INDEX CHILD***)'s mother has completed?

- 1 = 8th GRADE OR LESS
- 2 = 9th TO 11TH
- 3 = 12TH GRADE, GED OR HIGH SCHOOL DIPLOMA
- 4 = Some voc//tech/business/trade school
- 5 = Some voc.tech/business/trade school certificate or diploma
- 6 = Some college/no degree
- 7 = Associate's degree
- 8 =Bachelor's degree
- 9 = Some graduate/professional school/no degree
- 10 = Graduate/professional degree (MA;MS;PHD;EDD;MD;DDS;JJ/LLB, ETC)
- 16 = (VOL) Don't Know
- 17 = (VOL) Refused

(If I13a=4 OR 5, ASK i14a. ELSE GO TO i15.)

i14a. Does (***INDEX CHILD***)'s mother have a high school diploma or GED?

- 1 = Yes
- 2 = No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF (Sc2cc=1), GO TO CLOSING. ELSE ASK i15.)

i15. Are you the Head of the Household?

(IF NEEDED: This would be the person in your household who provides 50% or more of the financial support and maintenance to 1 or more other people in that household who are closely related to him/her by blood, marriage or adoption.)

(INTERVIEWER: THIS INCLUDES SINGLE PERSON HHs.)

- 1 = Yes
- 2 = No
- 3 = (VOL) Respondent shares joint head of household
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

(IF i15=1 or 3, GO TO CLOSING. ELSE ASK i16.)

i16. How is the head of the household related to **(INDEX CHILD)**?

- 1 = his/her father
- 2 = his/her mother
- 3 = his/her step-father
- 4 = his/her step-mother
- 5 = his/her foster father
- 6 = his/her foster mother
- 7 = his/her grandfather
- 8 = his/her grandmother
- 9 = his/her legal guardian (male)
- 10 = his/her legal guardian (female)
- 11 = his/her legally adopted father
- 12 = his/her legally adopted mother
- 13 = partner of respondent
- 14 = partner of other household member
- 15 = his/her uncle
- 16 = his/her aunt
- 17 = his/her brother
- 18 = his/her sister
- 19 = his/her cousin
- 20 = his/her father-in-law
- 21 = his/her mother-in-law
- 22 = his/her great grandfather
- 23 = his/her great grandmother
- 24 = his/her other relative, specify: _____
- 25 = other, specify: _____
- 26 = Don't Know
- 27 = Refused

(INSERT TIME STAMP)

CLOSING. Thank you very much for your time. I want to get your name and your mailing address so I can send you the check as a token of our appreciation.

(INTERVIEWER: IF RESP. REFUSES, FIRST PROBE WITH..."Please know that this information will be held in strictest confidence and will NOT be shared beyond the research team.")

1 = Gave Response
9 = (VOL) Refused

(IF CLOSING=1, GO TO MYGETA. IF CLOSING=2, GO TO CS1.)

(PROGRAMMER: SHOW CONTACT INFO AS A GRID ON 1 SCREEN. UPDATE GRID AS INFORMATION IS BEING ENTERED FROM "MYGETA.")

RESPONDENT NAME -:
STREET -:
APT NUMBER -:
CITY *:
STATE -:
ZIPCODE -:

MYGETA. INTERVIEWER: RECORD RESPONDENT NAME

1 = Gave RESPONDENT NAME
3 = (VOL) DON'T KNOW
4 = (VOL) REFUSED

MYGETA. INTERVIEWER: RECORD STREET

1 = Gave STREET
3 = (VOL) DON'T KNOW
4 = (VOL) REFUSED

MYGETA. INTERVIEWER: RECORD APT NUMBER

1 = Gave APT NUMBER
2 = No Apartment Number
3 = (VOL) DON'T KNOW
4 = (VOL) REFUSED

MYGETA. INTERVIEWER: RECORD CITY

1 = Gave CITY
3 = (VOL) DON'T KNOW
4 = (VOL) REFUSED

MYGETA. INTERVIEWER: RECORD STATE

1 = Gave STATE
3 = (VOL) DON'T KNOW
4 = (VOL) REFUSED

MYGETA. INTERVIEWER: RECORD ZIPCODE

1 = Gave ZIPCODE
3 = (VOL) DON'T KNOW
4 = (VOL) REFUSED

(NOW GO TO W1.)

(IF CLOSING=9, ASK CS1. ELSE GO TO INSTRUCTS BEFORE W1.)

CS1. Would you at least be able to provide us with the cross streets that are nearest to your home?

1 = Yes / Gave Response (Record Verbatim): _____
2 = No / Refused

WORKSHEET INSTRUCTIONS

(IF CLOSING=1, ASK W1. ELSE GO TO R2.)

W1. In addition to the \$10 we will be sending you, we will also be sending you a tape measure and worksheet to record you and your children's height and weight. If you complete and send back the worksheet, we will send you an additional \$10 as a token of our appreciation.

1 = CONTINUE

RE-CONTACT INFO

R2. Thank you for your cooperation and for taking the time to participate in this important study. In the future, we may be contacting you again to collect some follow-up information on health care issues and concerns. Like the interview today, your participation to a follow-up interview will be voluntary and your responses will remain confidential.

Would you be willing to provide us with the name or initials and phone number of 2 friends or family members who would know how to contact you in the event that we would be unable to reach you at this phone number?

1 = Yes, willing to provide names/numbers
2 = No, refuses to provide names/numbers

(IF R2=1, GO TO R2a. ELSE GO TO W2.)

R2a. What is the name or initials of the 1st family member or friend?

1 = Gave Response
9 = (VOL) Refused

(IF R2a=9, GO TO W2. ELSE GO TO R2b.)

R2b. And what is the phone number for the 1st family member or friend?

1 = Gave Response
9 = (VOL) Refused

(IF R2b=9, GO TO W2. ELSE GO TO R3a.)

R3a. What is the name or initials of the 2nd family member or friend?

1 = Gave Response
9 = (VOL) Refused

(IF R3a=9, GO TO W2. ELSE GO TO R3b.)

R3b. And what is the phone number for the 2nd family member or friend?

1 = Gave Response
9 = (VOL) Refused

W2. Finally, before we say good-bye if you would like to have more information about Medicaid, NJ Family Care or NJ Ease I can give you the phone numbers.

(PROVIDE NUMBERS REQUESTED: Medicaid: 1-800-356-1561; NJ Ease: 1-877-222-3737;
NJ FamilyCare: 1-800-701-0710) (MULTIPLE RECORD)

1 = Didn't want numbers
2 = Gave Medicaid
3 = Gave KidCare/FamilyCare
4 = Gave NJ Ease

CLOSING 2 Thank you for your cooperation and for taking the time to participate in this important study.

LANG. INTERVIEWER PLEASE ENTER THE LANGUAGE OF INTERVIEW

1 = ENGLISH
2 = SPANISH

(INSERT TIME STAMP