# NATIONAL WIC ASSOCIATION

# 2022-2023 RESEARCH PRIORITIES

National WIC Association

Suggested Citation: National WIC Association 2022 Research Priorities. National WIC Association. Washington, DC. July 2022. Available at: https://thewichub.org/nwa-2022-2023-research-priorities/

# EXECUTIVE SUMMARY

## PURPOSE

The National WIC Association (NWA) views the cycle of research, practice, and policy to be reciprocal and encourages collaboration between researchers and practitioners to conduct high quality research that supports WIC and identifies innovative approaches to program improvement. The goal of the NWA Research Priorities is to identify research areas that support NWA and WIC programs nationwide. We aim to be responsive to emerging issues and continue to explore, demonstrate and integrate evidence-based practices that improve the health and well-being of WIC families. Researchers should use this document to guide the development of their research questions and design. A variety of research methods and designs from the social, nutritional and health sciences can be employed to understand various outcomes associated with WIC participation and to better understand the WIC participant experience. NWA encourages researchers to apply an equity lens to their work across all research questions and topic areas. We identify equity considerations for each area of identified research.

## RESEARCH PRIORITIES

### Breastfeeding Initiation, Duration, and Exclusivity of WIC Participants

More research is needed on WIC participants' experience with breastfeeding and identifying how WIC policies and breastfeeding education and support can close the gap between WIC participants and non-participants. Research across breastfeeding initiation, duration, and exclusivity are needed to understand the full spectrum of breastfeeding behaviors and benefits.

### Health Outcomes Associated with WIC Participation

During and beyond years of participation WIC influences health outcomes across life stages, including pregnancy, infancy, early childhood, the inter-pregnancy and post-partum period. Further, WIC participation in early childhood may benefit children at later life stages. While research in all of these life stages is helpful, there is a dearth of evidence around WIC's effects in maternal health and early and late childhood health.

### WIC Staff Recruitment, Retention, and Impact on Participant Experience

WIC participants interact with a variety of staff at WIC clinics and relationships with these staff members are central to the participant experience, yet little research explores how WIC staff impact participant experience. There is also dearth of data on the WIC workforce and how diverse WIC staff can be recruited and retained. Impact of COVID-19 on WIC Participant Experience and Outcomes States received several federal waivers to adapt program delivery during COVID-19, such as allowing

virtual enrollment and re-certification. Waivers also allowed flexible options for obtaining food benefits and nutrition education, counseling and referrals.[1] It is important to consider the impact that innovations have had on WIC service delivery and participants satisfaction throughout the pandemic, while also considering if the sudden shift in how WIC services were being delivered was a catalyst for new systems level innovations to be established. Research should build upon NWA's Multi-State WIC Participant Satisfaction Survey, which explored WIC participants experiences during the COVID-19 pandemic.[2]

## Dietary and Behavioral Changes Associated with Increase to Cash Value Benefit for Fruits and Vegetables (CVB)

The WIC CVB was increased from $9-11 per month to $35 per month as part of the American Rescue Plan Act, before being extended in October 2021 through the fiscal year 2022 appropriations process. Appropriators adjusted the CVB to $24 per month for children, $43-$47 per month for pregnant and postpartum participants.3 In March 2022, NWA, in partnership with researchers from the Nutrition Policy Institute (NPI), released a report that

**found an increase in child fruit and vegetable consumption among WIC participants after the benefit was enhanced in summer 2021.**

The report analyzed over 10,000 responses from WIC participants across 5 State WIC Agencies.[3] Further should assess the impact of a CVB increase over a longer period of time, as well as how the CVB bump impacted variety of fruit and vegetables consumption.

## WIC Participants Use of Technology and Barriers to Technology Access

Optimizing WIC service delivery requires a thorough understanding of the current skills, needs, experiences, and desires of the families served by the program. Research in this area should build upon NWA's Multi-State WIC Participant Satisfaction Survey, which explored participants' perceptions on technology use in WIC, such as the WIC shopper app.[1] NWA also co-convenes the WIC Technology Resource Group and has a variety of resources available on the WIC Hub.[4] Quantitative and qualitative studies should explore WIC participants' comfort with existing WIC technology, as well as interest and ideas for new technologies. Research should also assess WIC participants' use of online shopping platforms and digital literacy levels among participants.

## Economic Value of WIC Participation

Research is needed to explore and demonstrate the economic value and impact of WIC investments,

particularly related to Medicaid. Recent research by UCLA, PHFE WIC, and the City of Los Angeles determined that every dollar invested in WIC returns an average of $2.48 in medical, educational, and productivity costs.[5] However, the study's model was limited to cost savings associated with preterm birth. **Cost-savings related to children's health, such as childhood obesity prevention and increased food security would be particularly valuable.** Further, longitudinal studies should assess longer-term outcomes i.e., following children over a longer period than the 5 years of WIC eligibility.

## Systems Level Innovations and Cross Program Collaboration in WIC

Systems level innovations enable WIC programs to leverage other programs and services that support the population WIC serves. Policies and procedures that support system level innovation can enhance WIC program capacity to ensure families are receiving the support they need to access a range of services that promote health and wellbeing. Research related to automated referrals from health-care providers, along with data sharing with Medicaid and SNAP, are needed. Implementation science frameworks are particularly relevant for this research area.

## Food Package Redemption Patterns and Impact of Potential Changes to WIC Food Packages

The food package is one of the key benefits of WIC and aims to ensure that participants get the foods they need for their specific life stage. Research around the redemption of food package categories, as well as exploring the impact of potential food package changes, is critical to ensure that participants are benefitting from a nutrient dense, culturally relevant food package that they will enjoy redeeming and consuming. Further, many participants do not redeem the full value of their food package. Research is needed from both the health behavior perspective and epidemiology perspective to better understand these patterns.

## Changes to WIC Caseload

According to the latest data from USDA Food and Nutrition Services (FNS), in 2019, WIC served an estimated 57.4% of eligible participants.[6] Research is needed to understand the patterns in participation among different groups of eligible populations: those who are eligible but never enrolled, those who enrolled but stopped participating in the program before their eligibility expired, and those who enrolled and remained enrolled throughout their eligibility period. Research is particularly needed with populations eligible but not enrolled in the program to identify barriers to enrollment. Researchers should refer to the FNS WIC Eligibility and Coverage Rates report to understand national and state level trends around coverage rates of different demographic groups.

**Further questions? NWA is available as a resource to researchers interested in WIC; for questions or further information, please email NWA's Senior Manager of Research and Program Innovation, Christina Chauvenet, at cchauvenet@nwica.org.**

# BACKGROUND

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) has been an integral part of the nation's nutrition safety net for nearly 50 years, serving tens of millions of low-income and nutritionally at-risk women, infants and young children. WIC aims to improve the overall health and nutritional well-being of families by increasing the availability and the consumption of healthy foods and providing nutrition education targeted to address nutritional risks that are common in pregnant and postpartum women, as well as infants and young children. Each month, more than six million individuals benefit from WIC services -- nutrition education and counseling, breastfeeding education and support, nutritious foods and referrals to health care and other social and community services. One mother from Texas wrote:

***"WIC has been a crucial part in my success to exclusively breastfeed two of my three children. If it wasn't for such dedicated and wonderful staff, I am unsure that I would have breastfed this long with the breastfeeding challenges I have faced."***

Methodologically rigorous qualitative and quantitative research studies are essential in order to document the program's impact and identify areas for improvement. Anecdotes such as our Texas mother's story illustrate the positive impact that program participants feel that WIC has had on their lives. WIC has a strong history of rigorous program evaluation and using data to inform both policy and program management decisions.

NWA views the cycle of research, practice, and policy to be reciprocal and strongly encourages

collaboration between researchers and practitioners to conduct high quality research that supports WIC and identifies innovative approaches to program improvement.

**The goal of the NWA Research Priorities is to identify research areas that support NWA and WIC programs nationwide. We aim to be responsive to emerging issues and continue to explore, demonstrate and integrate evidence-based practices that improve the health and well-being of WIC families. Researchers should use this document to guide the development of their research questions and design.**

NWA is available as a resource to researchers interested in WIC; for questions or further information, please email NWA's Senior Manager of Research and Program Innovation, Christina Chauvenet, at cchauvenet@nwica.org.

## Embedding Health Equity Principles in Research

For the National WIC Association, health equity is the ability of all individuals and families to achieve optimal health, no matter their identity, race, ability, class, or location. This requires equitable access to nutritious foods, breastfeeding support, chronic disease prevention and management services, safe living environments, and good jobs with fair pay. It necessitates removing obstacles to families' short- and long-term health and wellbeing, including poverty, discrimination, and institutional racism and other forms of bias expressed through housing, healthcare, education, labor, and other public policies.

Rather than considering health equity as a single area of research, NWA encourages researchers to apply an equity lens to their work across all research questions and topic areas. Equity considerations include how participants within marginalized populations experience the program differently than those who are not part of marginalized populations. The application of an equity lens allows for exploration of how experiences and outcomes are impacted by race, ethnicity, disability status, gender identity, and other social identities. We identify equity considerations for each area of identified research.

## Research Design and Methodological Considerations for WIC Research

Because of the diverse nature of research topics within WIC, a variety of methods are appropriate, and the methodological approach should be carefully considered during project planning.

The following methods will support many of the research recommendations in this document. However, this list is not exhaustive. Further, mixed methods approaches that incorporate a variety of quantitative and qualitative methods can help address the multifaceted nature of WIC.

- Qualitative studies
- Ethnographic approaches
- Social network analysis
- Computer simulation modeling
- Research designs that explore commonalities across groups (e.g., latent class analysis, factor analysis)
- Implementation science methodologies and frameworks, such as Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) and Practical Implementation Sustainability Model (PRISM)
- Research designs that allow for exploration of trends over time
  - Longitudinal cohort studies (ideally prospective)
  - Pooled cross-sectional studies (e.g., using NHANES data across multiple waves)
- Research designs that reduce selection bias*
  - Regression discontinuity designs
  - Difference in differences or interrupted time series approaches
  - Instrumental variables approaches
  - Fixed effects approaches
  - Randomized controlled trials

NWA has provided sample research questions below each of the research priority areas. Note that these are only examples, and not an exclusive set of questions. NWA encourages researchers to consider research questions that best fit their dataset, methods, and are within the research priorities identified in this document.

# FEATURED RESEARCH METHOD

## Positive Deviance

Positive Deviance (PD) is based on the principle that in many communities, solutions for health-related problems already exist within the community and just need to be identified.[7] Because these solutions use accessible, existing resources, they are more sustainable than those brought to the community from the outside. Individuals who successfully discover ways to solve issues by engaging in uncommon but advantageous actions in the same high-risk environment as their peers are considered "positive deviants".[7] Identifying the unique, adaptive child feeding, child rearing, caregiver support, and other health behaviors that the positive deviant families engage in provides insight for the development of effective strategies and educational messages that are tailored to the needs of each community. These key adaptive, positive, local solutions are shared with other families as community-driven and proven intervention strategies.

**PD research developed through the study of communities experiencing high rates of malnutrition in low-income countries. The PD model has also been applied to many other areas of health care including understanding disparities in breastfeeding rates[8] and childhood obesity.[9]**

PD research could be applied to WIC as a tool to identify practices that PD individuals and families are using to reduce within WIC to improve health outcomes. These real world, community-developed and tested solutions can be shared by WIC as examples from other parents and caregivers in similar communities and circumstances. PD research is strengths-based and community-grown, which honors the lived experience of families served through WIC. Using PD research to complement existing nutrition education messaging by including behaviors and solutions identified through PD helps WIC translate and share approaches proven successful for other WIC families. New and innovative ways of delivering nutrition education using PD research will help identify the most effective methods such as one-on-one counseling, text, videos, etc. for reaching families in convenient and accessible ways.

**Recommended Reading** Marsh DR, Schroeder DG, Dearden KA, Sternin J, Sternin M. The power of positive deviance. BMJ. 2004;329(7475):1177-1179. doi:10.1136/bmj.329.7475.1177. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC527707/

## Collaboration with State Agencies and NWA in Research

NWA encourages researchers to be in consultation with their local and/or state WIC agencies during the development of their projects and to identify existing needs within agencies for data analysis and evaluation of existing agency data. Researchers can also get in touch with NWA's Senior Manager of Research and Program Innovation, Christina Chauvenet, at cchauvenet@nwica.org. For more information on planning WIC research projects, please visit NWA's Guidance for Planning, Conducting, & Communicating a WIC Research Project.[10]

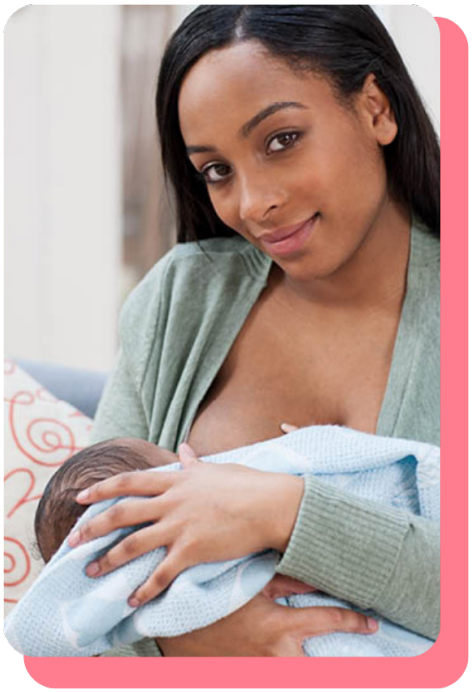
# NWA'S RESEARCH PRIORITIES

NWA's Senior Manager for Research and Program Innovation, alongside NWA's Evaluation Committee, identified ten priority areas for WIC.

1. Breastfeeding Initiation, Duration, and Exclusivity of WIC Participants
2. Health Outcomes Associated with WIC Participation During and Beyond Years of Participation
3. WIC Staff Recruitment, Retention, and Impact on Participant Experience
4. Impact of COVID-19 on WIC Participant Experience and Outcomes
5. Dietary and Behavioral Changes Associated with Increase to Cash Value Benefit for Fruits and Vegetables
6. WIC Participants Use of Technology and Barriers to Technology Access
7. Economic Value of WIC Participation
8. Systems Level Innovations and Cross Program Collaboration in WIC
9. Impact of Potential Changes to WIC Food Packages
10. Changes to WIC Caseload and Food Package Redemption Patterns

# PRIORITY AREA 1

## Breastfeeding Initiation, Duration, and Exclusivity of WIC Participants



Extensive research documents the benefits of breastfeeding to maternal and child health. Compared to infants who are not breastfed, breastfed infants have a lower risk of asthma, sudden infant death syndrome (SIDS), and type 1 diabetes, among other benefits.[11] For maternal health, breastfeeding reduces the risk of breast and ovarian cancer, type 2 diabetes, and high blood pressure.[12] **As the nation's leading breastfeeding promotion program, WIC provides individualized support, prenatal and postnatal education, and access to breast pumps to encourage and sustain WIC participants' choice to breastfeed.** Structural and societal barriers, such as a rapid return to work after delivery, lack of workplace support for breastfeeding, family and social pressures, and targeted marketing by the infant formula industry, create barriers for parents as they consider breastfeeding.[13]

WIC's commitment to breastfeeding, coupled with critical investments to nationalize WIC's Breastfeeding Peer Counselor Program[14], implemented in 2010, have resulted in a 30 percent increase in breastfeeding initiation rates among WIC participants since 1998.[15] WIC reinforces positive messages that encourage parents to breastfeed, with returning WIC participants demonstrating a significantly increased likelihood of sustained breastfeeding at one year postpartum. Despite this progress, in 2020, only 71.6 percent of WIC-enrolled infants were ever breastfed,[16] compared to 84.1 percent of all infants in the United States,[12] according to self-reported data from caregivers. Similarly, 22.1 percent of infant WIC participants were breastfed at 6 months[16] compared with 58.3 percent of infants in the general U.S. population.[12] Exclusive breastfeeding rates show a similar pattern, with WIC exclusive breastfeeding rates (at 6 months of age) at 12.1%[16] compared to 25.6%[12] nationally.

More research is needed on WIC participants' experience with breastfeeding and identifying how WIC policies and breastfeeding education and support can close the gap between WIC participants and non-participants. Research across breastfeeding initiation, duration, and exclusivity are needed to understand the full spectrum of breastfeeding behaviors and benefits.

## Potential areas of research include:

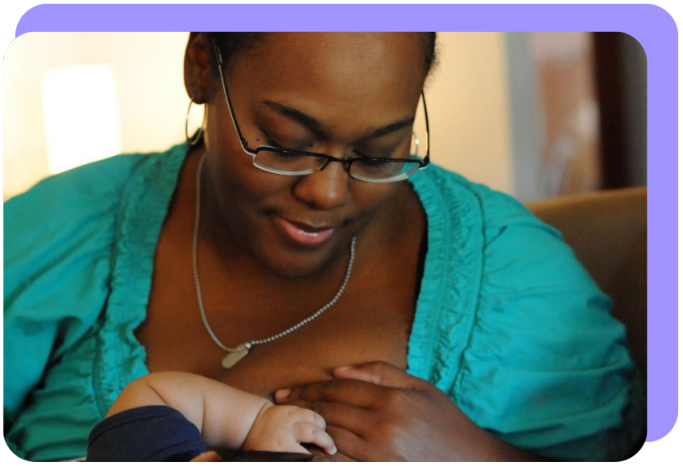
**Evaluation of WIC Breastfeeding Education and Support** One primary area for research is to assess the impact of tailored approaches to breastfeeding support in WIC. This work should be done in concert with State and Local WIC agencies. Evaluations could explore the effect of WIC breastfeeding education and support on breastfeeding outcomes. Little research has explored whether the breastfeeding outcomes vary based on attendance and engagement with WIC breastfeeding education. Research should explore whether there is a dose response to WIC participation on breastfeeding rather than using an intent-to-treat analysis when possible. More research is needed around the use of virtual technology in supporting breastfeeding among early postpartum and pregnant WIC participants (see Research Priority #6).

Researchers may also work with WIC agencies to enhance existing breastfeeding support and educational materials. However, it is critical that the development of these materials be some thing is cost-effective and that could be easily implemented at local agencies Interventions that are effective but require significant additional staff time and/or investment are unlikely to be successfully implemented in WIC agencies.

**Longitudinal Studies of Participants Who Initiated Breastfeeding** Though breastfeeding initiation is critical, research is also needed on breastfeeding duration and exclusivity. Longitudinal research is needed to explore why WIC participants who initiate breastfeeding either continue or cease to breastfeed. Research is needed in breastfeeding initiation, duration, and exclusivity. Longitudinal studies (ideally cohorts) would allow researchers to explore these patterns among participants and identify key factors in the decision to continue or cease breastfeeding.

## Enabling Factors and Barriers to Breastfeeding Among WIC Participants

A variety of individual and structural factors affect a participant's decision to breastfeed. A 2022 article by Borger et al identified that breastfeeding intentions and doctor's recommendation to breastfeed increased the likelihood of breastfeeding initiation.[17] Former WIC participation with another child also predicted breastfeeding at one year,[17] indicating that lessons learned through WIC participation can be carried on to other pregnancies.



Given that doctor's recommendation to breastfeed was associated with breastfeeding initiation, more research is related to hospital breastfeeding practices and their association with breastfeeding initiation. Additional partnerships with hospitals may help improve this relationship (see Research Priority #8).

Understanding the decision-making process around breastfeeding is also integral. More research is needed on WIC participants perceived benefits of breastfeeding. These perceived benefits may differ between breastfeeding and non-breastfeeding participants. There is a plethora of research around population level barriers to breastfeeding (lack of support, return to work, social norms, etc.), but more research is needed with WIC participants on barriers to breastfeeding, and what additional support is needed. Qualitative research could help elucidate this relationship.

## Equity Considerations

**Race and Ethnicity.** Nationally, Black and Indigenous infants have lower rates across all breastfeeding metrics than other racial and ethnic groups,[15] reflecting systemic disparities that are rooted in racism and intergenerational trauma,[18, 19] and targeted and deceptive infant formula marketing in commercial spaces[20] and hospital settings. Despite these structural barriers, Black infants enrolled in WIC are closer to the national breastfeeding initiation average than the general Black population and Indigenous infants enrolled in WIC are significantly outpacing the general Indigenous population.[12] More research is needed on how to further close the gaps in breastfeeding rates for Black participants compared to white participants. A 2022 American Journal of Public Health article by Roess et al documented a significant increase in WIC breastfeeding rates among African Americans, and also documented higher rates of breastfeeding initiation among Black immigrant participants and US-born African Americans in Washington, DC.[21]

This research highlights the need for research that demonstrates the importance of separating racial and ethnic subgroups to identify the most specific trends. More research in other states exploring the trends in disparities is critical to understand these patterns; research could also explore relevant racial and ethnic subgroups in their geographic area.

**Disability Status.** There is also a dearth of research of the experiences of WIC participants with disabilities. People with disabilities have unique challenges such as positioning and attachment issues which can be affected by mobility and chronic fatigue.[22] Identifying the prevalence of breastfeeding in this population and how to address barriers to breastfeeding in the WIC context is needed.

**Using Appropriate Control Groups to Estimate the Effect of WIC on Breastfeeding.** Many studies examining WIC participants' breastfeeding rates compare WIC participants to aggregate trends at the population level. However, because WIC participants have a lower household income than the average US household, this referent group may cause an underestimation in WIC's effect on breastfeeding. When conducting a quantitative analysis using a control group (such as difference in difference models), using a referent group of income eligible non-participants is recommended. Using income-eligible non-participants will reduce estimate bias and afford an appropriate comparison in breastfeeding rates.

## Sample Breastfeeding Research Questions:

- Is there a relationship between timing of prenatal enrollment in WIC and breastfeeding initiation, duration, and exclusivity?
- How do perceptions of breastfeeding benefits differ between breastfeeding and non-breastfeeding participants?
- Among participants who initiate breastfeeding, how are trajectories different in duration and exclusivity?
- Among participants who intend to breastfeed but do not initiate breastfeeding, what are the perceived barriers to breastfeeding?
- How effective is virtual technology (in comparison and/or in addition to) in-person lactation support?

# PRIORITY AREA 2

## Health and Behavioral Outcomes Associated with WIC Participation

WIC is the only USDA nutrition assistance program with legislative and regulatory requirements to provide nutrition education. WIC emphasizes changing health behaviors and influencing health outcomes through its individualized nutrition education, preventive health screenings, healthcare referrals and food packages targeted to supplement the nutritional needs of women, infants and children.

WIC influences health outcomes across life stages, including pregnancy, infancy, early childhood, the inter-pregnancy period, and the post-partum period.[23] Further, WIC participation in early childhood may benefit children at later life stages. While research in all of these life stages is helpful, there is a dearth of evidence around WIC's effects in maternal health and early and late childhood health. Below, we identify particular areas that need additional research.

### Early Childhood

The goals of child participation in WIC are to ensure that young children are guided in a positive health trajectory and are kindergarten ready. WIC nutrition services aim to impact the nutrient adequacy, and overall health of children. Research is needed to determine how the WIC food package and accompanying nutrition education impact participant and family behavior change and how these changes, in turn, influence health outcomes.

The transition from breastmilk and/or infant formula to complementary foods through the infant food package are building blocks to help an infant transition from being breastfed or formula-fed to consuming healthy meals. This transition is not always easy. WIC nutrition professionals provide education and support to help parents improve family health behaviors through food choices. **Research is needed to assess the effectiveness of WIC education and support optimal methods for WIC to support parents to successfully introduce complementary feeding and adapt healthy behaviors and nutritional health long-term.**

Multiple components of WIC directly address childhood obesity and must be carefully evaluated. WIC anthropometric data have the potential to continue to fill an important data gap in the evaluation of national, statewide and local obesity prevention efforts, especially those targeting low-income, high-risk communities. Further studies are needed to explore the associations between WIC participation, breastfeeding, healthy growth during early childhood, and childhood obesity prevention.

Program eligibility currently expires on the child's fifth birthday, regardless of whether the child has started full-day kindergarten and

receives support through school meals programs. The bipartisan Wise Investment in our Children Act (WIC Act) would remedy this gap by extending WIC's support until age six or the beginning of kindergarten.[24] A 2022 study by Seung Jin Cho in Health Economics using the Current Population Survey estimated that closing the gap in nutrition assistance would result in a 15 percent reduction in child food insecurity, reducing stressors as children enter school.[25] Replication studies of this work using different datasets would be valuable, as would qualitative work exploring how extending WIC eligibility would alleviate family food insecurity.

**Limited research has explored child mental health and behavioral outcomes related to WIC participation.** A 2020 study by Chorniy et al published in the American Journal of Health Economics found that participation in WIC was associated with a lower incidence of ADHD (attention-deficit/hyperactivity disorder) and other common childhood mental health conditions and a lower incidence of grade repetition among WIC participants in South Carolina.[20] Further research is needed in other geographic settings on these behavioral outcomes, ideally looking at data across states. Research is also needed on other behavioral outcomes that may be associated with WIC, such as academic preparedness. Collaboration between public health and child development researchers on this work is critical.

## Effects of WIC Participation at Later Life Stages

Due to the critical life stage of early childhood, WIC participation may confer benefits beyond the eligibility period. Wider research in maternal and child health has found positive effects in later childhood and adulthood of increased food security and diet quality in early childhood[27], but research has not explored WIC participation specifically. Because WIC participants often receive other public benefits (e.g., Medicaid, SNAP), studies that can isolate the effect of WIC participation are particularly helpful. Working in partnership with these programs for data sharing would facilitate such analysis (see Systems Level Innovations in WIC, Priority Area 7). Further, because WIC participation is recorded on birth certificate data in many states, this provides the opportunity to link birth certificate data with other publicly available datasets to examine long-term impacts of WIC.

## Maternal Health

WIC can serve as a crucial touchpoint for many mothers during pregnancy. There is a substantial body of evidence on the protective effects of WIC on infant health outcomes (e.g., preterm birth, infant mortality, etc)[28-30]. There is less evidence on the effects of WIC participation on maternal health outcomes, such as gestational diabetes and preeclampsia. Because these are leading causes of maternal mortality and morbidity, it is imperative that we examine the impacts of WIC participation on maternal and

infant health outcomes, such as gestational diabetes and preeclampsia. WIC may also improve other noncommunicable disease risks for pregnant and postpartum participants, such as reducing risk for heart disease and obesity. There is a dearth of evidence around WIC's relationship with these maternal outcomes. Preconception health factors, such as pre-pregnancy weight status, should also be considered as factors that may modify the effects of WIC on maternal health.

**WIC also has the unique opportunity to interact with women between pregnancies to help improve their own health as well as positively influence the outcomes of future births.** Designing, testing, and evaluating postpartum health messages or interventions tailored to a woman's health, nutritional, and breastfeeding status, as well as her future pregnancy plans, is an important area for research.

WIC participation may have effects on other aspects of participant health and health behaviors, such as smoking cessation, mental health, and substance use. Interdisciplinary partnerships with behavioral health researchers are needed to further explore this connection.

One of NWA's advocacy priorities is to extend the postpartum eligibility from 6 and 12 months (for non-breastfeeding and breastfeeding participants, respectively) to 24 months.[24] This extension would ensure that WIC's postpartum eligibility period is aligned with recommendations from the American College of Obstetricians and Gynecologists (ACOG) to counsel mothers for an interpregnancy interval of at least 18 months.[32] Simulation modeling and other types of estimation analysis that could explore the estimated health benefits of extending postpartum eligibility are needed to quantify the potential changes to postpartum health outcomes that could occur.

## Diet Quality

The WIC food package is specifically designed to meet the nutritional needs of eligible participants in their respective life stages. Across participant groups, diet quality is an important indicator of the health effects of the WIC food package. Consumption-related outcomes for each of the food package categories are important to explore. Nutritional epidemiological methods should be employed to estimate the effect of WIC on diet quality. Diet quality is important to capture both as a precedent for changes to body weight status and as an independent outcome, as improvements to diet quality confer many other benefits apart from contributing to healthy weight status.

When examining diet quality, examining redemption alongside diet quality is important. Because there is substantial variation in redemption, there may be a difference in effect size of WIC participation based on level of redemption of food package categories.

## Equity Considerations

In examining health and behavioral outcomes, it is critical to explore how these outcomes vary by race/ethnicity. For example, a 2021 publication in Annals of Epidemiology found that WIC participation reduced disparities between Black and Hispanic infants compared to white infants.[33]

Data can also be disaggregated at the race and ethnicity levels to look at trends within groups. Comparison groups of income-eligible non-WIC participants from the same racial/ethnic group can provide estimates of the effects of WIC among distinct racial and ethnic groups.

For diet quality, cultural preferences should be taken into account when analyzing changes to diet quality. Qualitative methods in particular can explore how culturally appropriate foods in WIC packages affect diet quality.

## Sample Research Questions:

- What is the effect of participation in WIC on maternal risk for noncommunicable disease such as heart disease and obesity?
- What is the relationship between WIC participation and Healthy Eating Index (HEI) scores across participant categories?
- How do the relationships between health effects and diet quality vary based on redemption patterns among WIC households?

# PRIORITY AREA 3

## WIC Staff Recruitment, Retention, and Impact on Participant Experience

WIC staff play a large role in the WIC participant experience. WIC participants interact with a variety of staff at WIC clinics and relationships with these staff members are central to participants' experience with the program. Very limited research has explored how WIC staff impact participant experiences, and there is a dearth of data on the WIC workforce.

### Recruitment and Retention of WIC Staff

The recruitment and retention of highly trained, skilled staff is also critical to the WIC client experience. Little research has been conducted with WIC staff to determine what factors led them to join WIC and how best to retain them as staff. **Research around staff satisfaction and professional development is needed at all levels of WIC staff.** Similarly to research related to participant experiences, research is also needed on staff that leave WIC to identify common factors that could improve staff retention.

Efforts to diversify the WIC workforce– including credentialed staff such as Registered Dietitians (RDs) and International Board-Certified Lactation Consultants (IBCLCs) – are essential to building trust with the communities WIC serves. While some data exists within the individual professions related to demographic characteristics, there is little data on the composition of the national WIC workforce.

### WIC Staff Impact on Participant Experience

Qualitative data suggests that WIC participants are highly satisfied with WIC staff[34, 35], and the **National Survey of WIC Participants III found that WIC is seen as a trusted source for nutrition information.**[36] However, more research is needed on what factors are important to participants in WIC staff. One area for exploration is the importance of credentials among WIC staff. Nutrition and Dietetic Technicians, registered (NDTRs) and Certified Lactation Counselors and Educators (CLCs and CLEs) are highly trained staff that expand capacity at WIC clinics for RDs and IBCLCs. Research is needed with WIC participants to explore if there is a difference in perception based on different credentials.

Additional research is needed on how efforts to diversify the WIC workforce affects WIC participant experiences. Qualitative research is needed to explore how participants with

marginalized identities (e.g., immigrant populations) relate to WIC professionals from different backgrounds, and whether the diversification of the workforce to reflect the community WIC serves changes participants experiences, including retention.

Additional research is needed to explore how the implementation of health equity practices (such as equity, diversity, and inclusion (EDI) training for staff change staff capacity around working with diverse populations. NWA's Advancing Health Equity to Achieve Diversity and Inclusion (AHEAD) in WIC initiative, NWA has provided sub-grants to seven local WIC provider agencies that have implemented promising practices to advance racial equity and improve equitable service delivery.[18]

## Equity Considerations

Much of the above discusses equity considerations. It is important to consider how participants with marginalized identities have differen tial experiences with WIC compared to participants without marginalized identities. These experiences relate to both program satisfaction, effectiveness and potentially program retention.

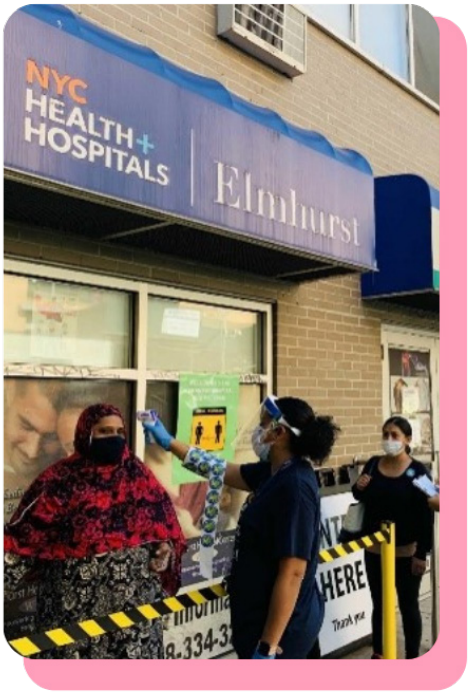
Language ability and cultural sensitivity and awareness are critical to a positive participant experience. NWA's Advancing Health Equity to Achieve Diversity & Inclusion (AHEAD) in WIC sought to systematically build capacity within the larger WIC community to incorporate a health equity framework into WIC research, policy, and practice.[18] The AHEAD in WIC Landscape Scan of WIC staff across the country found that most state and local directors surveyed (65%) indicated that they offer training related to cultural sensitivity/cultural humility annually. Fewer respondents indicated that they offer training on other topics with approximately 20%, 17%, and 27% indicated that they never offer training on trauma-informed care, implicit bias, and structural racism, respectively compared to slightly over 5% reporting for cultural sensitivity/cultural humility.[18]

## Sample Research Questions:

- How do staff EDI trainings affect the WIC participant experience, particularly among people of color and/or other identities focused on during EDI trainings?
- What are the current demographics of IBCLCs, RDs, and other WIC staff across the country? How do these demographics compare to participant demographics?
- What are the most important factors in a WIC participants satisfaction with staff? How aware are WIC participants of staff credentialing, and what is the perceived value of these credentials?

# PRIORITY AREA 4

## Impact of COVID-19 on WIC Participant Experience and Outcomes




The COVID-19 pandemic resulted in nationwide disruptions to in-person interactions beginning in March 2020. In spring 2020, the U.S. Department of Agriculture granted states waivers to adjust operations of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). States adapted WIC services by not requiring participants to be physically present to enroll and re-certify and by implementing flexible options for obtaining food benefits and nutrition education, counseling and referrals.[1] Concurrently, but unrelated to the pandemic, by the end of 2020 nearly all WIC participants had transitioned from using paper WIC checks to using a WIC Card to redeem WIC foods.[37]

These systems are the context within which many WIC programs have been operating throughout the COVID-19 pandemic. It is important to consider the impact that innovations have had on WIC service delivery throughout the pandemic, while also considering if the sudden shift in how WIC services were being delivered was a catalyst for new systems level innovations to be established.

There are two key umbrellas of research related to COVID-19: the effects of COVID-19 on WIC participant experiences and outcomes, and how lessons learned from WIC during the pandemic can help improve WIC services in the future. Related to participant outcomes and experience, research should take into account the unusual circumstances of the COVID-19 pandemic. Many other factors, including job loss, illness due to COVID-19, and stress can contribute both to an individual's overall health status and to dietary intake. Research should carefully control for as many of these external factors as possible when analyzing the participant experience in WIC.

NWA's Multi-State Participant Satisfaction Survey is a helpful resource to learn about how WIC services shifted during the pandemic.[2] **This survey, of over 26,000 WIC participants across 12 state agencies, found a high level of satisfaction with WIC services during the pandemic, including a high level of satisfaction with remote services.**[2] This survey can serve as a springboard for future research in this area. Because different states had different waivers in place during the pandemic, it can serve as a natural experiment to explore how participation rates varied based on waiver implementations (e.g., remote visits, expanded food package options, etc). The USDA-FNS report on the Impact of Federal Waivers provides important background context on these waivers and their implementation.[1]

One particular area of needed research is how remote certification may impact participant experience and/or participation rates. Remote certifications may reduce barriers to enrollment and retention, and remote certifications have been in place in many states since the onset of the COVID-19 pandemic.

## Equity Considerations

On a population level, Black, Indigenous, and people of color were affected more by COVID-19 than white people.[38] An individual or family member that was affected by COVID-19 may have also shaped the way that they interacted with WIC. For example, a participant that had COVID-19 (or had family members that were sick with COVID-19) may have inadvertently ceased participation in the program. Food insecurity also increased during the COVID-19 pandemic, as demonstrated by the documented use of other food assistance programs in the Multi-State Participant Satisfaction Survey.[2]

Participants with disabilities, and participants in in rural areas may particularly benefit from virtual options as barriers to visiting WIC clinics may be higher among these groups. Likewise, participants may face other barriers to in-person visitation, such as transportation and caregiving responsibilities. However, participants with limited access to the internet and limited digital literacy may face barriers to participating or fully benefiting from virtual visits. Deaf and hard of hearing participants would also need accommodations for virtual visits.

## Sample Research Questions:

- What, if any, differences are there in the health outcomes of those participating in virtual versus in person appointments?
- Using simulation models and/or natural experiment approaches, what effect would permanent remote certifications would have on participation rates?
- How were WIC caseloads affected by the COVID-19 pandemic?

# PRIORITY AREA 5

## Dietary and Behavioral Changes Associated with Increase to Cash Value Benefit for Fruits and Vegetables

WIC's fruit and vegetable benefit was increased from $9-11 per month to $35 per month as part of the American Rescue Plan Act,[39] before being extended in October 2021 through the fiscal year 2022 appropriations process.[40] Appropriators adjusted the WIC fruit and vegetable benefit to $24 per month for children, $43 per month for pregnant and postpartum participants, and $47 for breastfeeding participants.[40] In March 2022, NWA, in partnership with researchers from the Nutrition Policy Institute (NPI), released a report that found an increase in child fruit and vegetable consumption among participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) after the WIC benefit was enhanced in summer 2021. The report analyzed over 10,000 responses from WIC participants across 5 State WIC Agencies.[3]

While this research is promising for the effects of the CVB bump on fruit and vegetable consumption, further research is needed. Firstly, NWA's report assessed impacts of child fruit and vegetable intake after only a few months of a CVB increase.[3] It may take longer to incorporate more fruits and vegetables into a child's diet as much of the development of food acceptance occurs during childhood.[41-43] **Future studies should assess the impact of a CVB increase over a longer period of time as it may take more than a few months to achieve larger changes in fruit and vegetable intake by young children.** Future studies should also explore how the CVB bump affected children's fruit and vegetable intake beyond the period of eligibility.

Further, NWA's report looked only at children and not at pregnant or postpartum participants' fruit and vegetable intake.[3] It is important to assess the changes to fruit and vegetable consumption across participant categories. Research that explores fruit and vegetable consumption, rather than (or in addition to) purchasing patterns is preferable to research only exploring purchasing patterns.

Finally, anecdotal reports from WIC participants and agencies indicate that a greater variety of fruit and vegetables were purchased due to the CVB bump. Because of the importance of introducing fruits and vegetables to create taste preferences for them, and because of the importance of variety in diet quality, more research is needed to elucidate this relationship.

## Equity Considerations

It is critical to consider how the CVB bump differentially impacted racial and ethnic groups. Nutrition epidemiology research should be stratified by race and ethnicity. Stratifying within racial and ethnic groups when possible allows for further analytic precision. For example, recent Latin American immigrants may have different fruit and vegetable consumption patterns compared to Latinos who have been in the United States for a longer period of time.

Access to retailers that sell fruits and vegetables is paramount to redemption of CVB. Majority Black and Hispanic neighborhoods have fewer supermarkets and more smaller retail outlets compared to majority-white neighborhoods. On average, smaller retail outlets lack variety, have limited fresh produce availability, and have higher prices compared to supermarkets. There are many public health efforts to address these food access issues, which are important to consider in the context of WIC. In areas with A50 authorized retailers (WIC-only stores), participants may have fewer barriers to food access. Thus, GIS methods are critical to understanding how access interacts with consumption.

## Sample Research Questions:

- To what extent did the variety of fruits and vegetables purchased and consumed change among WIC participants during the CVB bump?
- How, if at all, did the CVB bump change children's taste preference development for fruits and vegetables?
- Using longitudinal or repeated cross-sectional analysis, how did the CVB bump change trajectories of children's fruit and vegetable consumption in later childhood?
- How does access to health retail environments (including A50 stores) affect WIC purchases and consumption?

# PRIORITY AREA 6

## WIC Participants Use of Technology and Barriers to Technology Access

Frontline WIC staff report that WIC participants are eager to use technology to access different aspects of the program. COVID-19 presented a challenge and opportunity for WIC services to pivot to remote services quickly and implement new technologies. However, a comprehensive assessment of the digital skill levels of WIC participants is needed. Optimizing WIC service delivery requires a thorough understanding of the current skills, needs, experiences, and desires of the families served by the program. Research in this area should build upon NWA's Multi-State Participant Satisfaction Survey, which explored participants' perceptions on technology use in WIC, such as the WIC shopper app.[2]

Research to better understand the digital literacy of WIC participants would be valuable. Quantitative and qualitative studies should explore WIC participants' comfort with existing WIC technology, as well as interest and ideas for new technologies. Research should also assess WIC participants' use of online shopping platforms. As USDA is currently piloting online shopping with WIC across several states, online shopping may be more widely available to WIC participants in the coming years.[44] **The desire for online shopping has already been well documented[45], but evaluations of participant experiences with online shopping platforms as they become available is critical to identify how online shopping impacts redemption and purchasing patterns.** Further, reported challenges in the retail environment, such as issues identifying eligible items and perceived stigma, are likely lessened in the online environment.[46,47] If these challenges are reduced, redemption of the WIC food package may increase. Research will be needed with participants as online shopping

mechanisms become available. NWA encourages research in real-world environments, through collaboration with retailers and WIC agencies. Controlled research environments are less desirable because of the unique nature of the WIC food package and the lack of external validity in these settings.

### Equity Considerations for Technology

Research should explore barriers to technology access alongside participant comfort with technology use. Barriers to technology may include limited digital literacy, but may also include limited internet access, particularly in rural areas. Research should also consider how accessible technology is to non-native English speakers, and those who are hard of hearing or low vision.

Online shopping platforms should also amplify and reflect WIC's core nutrition mission. Thoughtful consumer protections should be established to prevent shopping mechanisms or advertising that encourages unhealthy purchases and to maintain the privacy of WIC participant data.

## Sample Research Questions:

- Among those not currently using WIC technologies such as the WIC Shopper app, what are the key reasons for non-use?
- In what ways could WIC staff further facilitate use and comfort of new technologies among participants?
- How does the WIC shopping experience change in the online environment (with regards to satisfaction, redemption, stigma, and other factors)?
- To what extent are advertisements for unhealthy foods affecting WIC customer purchases?

# PRIORITY AREA 7

## Economic Value of WIC Participation

Research is needed to explore and demonstrate the economic value and impact of WIC investments. Research relating to cost-savings related to Medicaid costs is particularly important. 2019 research by UCLA, PHFE WIC, and the City of Los Angeles determined that every dollar invested in WIC returns an average of $2.48 in medical, educational, and productivity costs.[48] However, the study's model was limited to cost savings associated with preterm birth, suggesting that the program's total cost savings are actually higher. Studies of the cost-saving impacts on children have yet to be explored. Cost-savings related to childhood obesity prevention associated with WIC participation would be particularly valuable, alongside estimates of cost saving associated with increased food security. Studies that look at multiple geographic locations would build this evidence base.

Further, early investments in WIC may not show immediate savings due to the time-limited nature of the program**.** Longitudinal studies demonstrating the impact of WIC on cost-savings need to be explored i.e., following children over a longer period than the 5 years of WIC eligibility.

**A 2021 study by the University of California San Francisco estimated the annual change in economic impact if the cash value benefit for fruits and vegetables were increased to $35 permanently. The researchers found that the total national economic contribution was $2.81 billion.[49]**

As the value of the fruit and vegetable benefit changes, particularly if the current amounts of $24 per child and $43-$47 per woman participating becomes permanent, additional estimations of the economic impact will be needed (see priority area 5 for background on CVB). These estimates should also include economic impacts when WIC is spent at farmers markets and matching funds are distributed to spend. Quantitative modeling and/or qualitative research can also explore how participation in WIC changes family spending in other areas shifts when household members participate in WIC.

### Equity Considerations for Economic Value of WIC Participation

It is critical to explore the economic value both at the population level and as it differs for race and ethnicity. To our knowledge, previous economic estimations have not examined racial and ethnic differences in cost-savings. However, because WIC participation has been demonstrated to have a greater impact on rates of infant mortality and preterm births among Black and Native American participants compared to white participants, it is likely that cost savings equivalencies may be higher for these and other non-white racial groups.

Incorporating GIS methods into economic estimations would also be helpful. Economic impacts of WIC are likely different due to urbanicity, neighborhood economic activity, and other factors. For example, though economic impacts of WIC in rural areas may be smaller in dollar amount compared to urban areas, the impact as a relative portion of economic activity may be higher.

## Sample Research Questions:

- What are the cost savings associated with WIC and childhood obesity prevention in later childhood and adolescence?
- What is the total cost saving associated with WIC across maternal and child health outcomes?
- What would be the economic impact of making the $24, $43, and $47 CVB amounts permanent? How do these economic impacts vary by geography?

# PRIORITY AREA 8

## Systems Level Innovations and Cross Program Collaboration in WIC

Systems level innovations enable WIC programs to leverage other programs and services that support the population WIC serves. Policies and procedures that support system level innovation can enhance WIC program capacity to ensure families are receiving the support they need to access a range of services that promote health and wellbeing.

### Automated Referrals

Referrals are one of the cornerstones of the WIC program, yet communication between WIC and health, early learning, and social service providers relies largely on the WIC participant to follow through with referral information and communicate their referral experience or outcome back to WIC staff. Through policy initiatives, state WIC programs can create standardized workflow systems for WIC staff when a participant's health, developmental, or social need is identified. Key to the success of these workflows will be the establishment of ongoing, two-way communication between WIC and the referral organizations to ensure continuity of care. The placement of patient guides - individuals paid by health care systems to help patients with health and social needs to navigate service systems - in WIC would assure a warm hand-off for WIC participants when WIC staff identify an issue that is outside of their scope of practice or requires more intensive case management.

Automated data sharing systems similar to those currently in use by health systems to track Emergency Room visits within and outside of their own health networks could help support continuity of care. Existing technologies, such as Data Bridge, facilitate the automatic extraction and communication of designated risk codes from one organization to another. For example, a WIC risk code, indicating failure to thrive, would automatically initiate a data transfer to the WIC participant's primary care provider, thus

spurring follow-up by a case manager. Likewise, a hospital or OB-GYN office could send an automated notification to WIC staff if a woman were diagnosed with gestational diabetes after her initial WIC visit or has certain complications with labor and delivery. This would lead to more tailored prenatal or postpartum WIC services.

Clinical health care systems use the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) and Current Procedural Terminology (CPT) codes to document diagnoses, and encounter type, and level of complexity. WIC has a series of numerical risk codes created by USDA that are unique to the program. WIC is a public health nutrition program, and therefore does not provide diagnoses nor bill Medicaid for services, it may seem unnecessary to connect WIC codes to medical coding systems. However, in order to facilitate communication and continuity of care

between WIC and health care providers, particularly through automated data sharing procedures, a crosswalk between WIC and ICD and CPT codes would be beneficial.

During COVID-19, 65 percent of WIC participants used measurements from a recent doctor's visit to inform WIC's nutrition education efforts. **Especially as statutory and regulatory changes create more flexibility, the ability to communicate electronic health information between WIC agencies and healthcare providers will be essential to future program operations.** Innovative pilot studies to test standardized workflows, automated data sharing, and connection of patient navigators to WIC are a promising area for future research.

## Data Sharing with SNAP and Medicaid

State WIC Agencies have increasingly partnered with their Medicaid and SNAP agencies to cross-promote programs, refer to WIC, and explore unified program applications. States are also building new partnerships with Head Start, recognizing that partnerships can streamline health assessments across the two programs while reaching a target population of three- to four-year-old children. For tribal populations, partnerships with Indian Health Service, Urban Indian Health Programs, and other tribal health offices can similarly identify eligible families and direct new participants to WIC. To ensure families receive their full benefits of support, referral practices require the integrated commitment of all agencies to the referral process.

The Center on Budget and Policy Priorities has some tools that may help with this research; a 2021 report assessed state-level coordination with Medicaid and SNAP.[51] In 2022, they released a toolkit with Benefits Data Trust. This toolkit includes all stages of integration projects, from planning to evaluations. Researchers should work with WIC agencies in evaluating these integration projects. It is particularly important to quantify both the number of participants referred as well as enrolled.

## Equity Considerations for Systems Level Innovations

Transportation is a commonly cited barrier to attending WIC appointments. This issue may particularly affect participants with disabilities and participants in rural areas. Non-emergency medical transportation (NEMT) is a benefit for Medicaid participants who need to get to and from medical services. Federal law requires states to ensure that eligible, qualified Medicaid beneficiaries are afforded this benefit. As the vast majority of WIC participants are also Medicaid patients, expanding NEMT to include rides to WIC could lessen the transportation barrier. In some areas, NEMT already authorizes WIC ad an add-on trip when participants are going to Medicaid visits. Research is needed to determine whether this could be implemented in all states and territories given the varied implementation of NEMT. In addition, WIC services need to be mapped to correspond to existing Medicaid billing codes in order to determine which WIC appointment types (e.g., certification, follow-up with registered dietitian, group class, etc.) align with Medicaid services.

Special considerations should be taken to ensure that when data is sharing, participants privacy is protected. This issue is particularly relevant to people who are part of a small racial group or other demographic factor that could make the identification of the individual through data possible even without personal identifying information.

## Sample Research Questions:

- If NEMT were to include WIC appointments as qualified medical visits, what would be the impact on Accountable Care Organization service costs?
- For WIC clinics that are partnering with Medicaid, physicians, and other relevant partners, how many referrals are enrolled in WIC?
- Using an implementation science framework such as Practical Implementation Sustainability Model (PRISM), what is the optimal way to create efficient referral systems?

# PRIORITY AREA 9

## Food Package Redemption Patterns and Impact of Potential Changes to WIC Food Packages

The food package is one of the key benefits of WIC and aims to ensure that participants get the foods they need for their specific lifestage. Research around the redemption of food package categories, as well as exploring the impact of potential food package changes, is critical to ensure that participants are benefitting from a nutrient dense, culturally relevant food package that they will enjoy redeeming and consuming.

In order to maximize the benefits of WIC participation, the full amount of food package benefits need to be redeemed. However, many participants do not redeem the full value of their food package. Research is needed from both the health behavior perspective and epidemiology perspective to better understand these patterns.

### Food Package Redemption Patterns

Working with WIC agencies to better understand these redemption patterns across different locations is critical. Examining why participants underuse their benefits is also valuable, with particular attention to what would help participants fully maximize their benefits. Again here, there are several groups of WIC clients to consider: those who redeem 100% of their benefits, those who redeem some of their benefits, and those who redeem little to no benefits. Partnerships with WIC agencies to share data around redemptions is key to this research.

This research area can also be explored alongside Priority Area #1, health outcomes research. Because the WIC food packages are designed to meet the special nutritional needs of each participant category, underredemption of the food package could result in less effective health outcomes for participants. Research in this area should consider redemption across each of the food package categories (e.g., grains, fruits and vegetables, dairy) and within package categories (e.g., for grains, bread, pasta, etc) to capture variation in redemption patterns.

Qualitative research has identified a number of reasons for underredemption of benefits, including stigma and challenges identifying eligible products in-store.[52,53] Less quantitative research has explored patterns of redemption, though **Zhang et al found that non-Hispanic Black and white participants redeemed a higher percent of the CVB benefit compared to Hispanic participants in Virginia.[54] Li et al explored food redemption patters in Oklahoma and found that 18% of food package benefits went unredeemed.[55]** More mixed methods and quantitative research is needed to explore patterns of redemption, ideally across multiple states. Methods that identify groups with common characteristics, such as latent class analysis, may be helpful in identifying demographic groups that may need additional support to redeem benefits. Qualitative research could build on quantitative research to do targeted interviews and focus groups with participants who are underredeeming benefits.

Finally, if online shopping becomes more widely available for WIC participants, research should explore how redemption patterns change in online environments compared to physical retail environments.

## Impact of Potential Changes to WIC Food Packages

In 2009, the first revisions to the WIC food packages in nearly three decades introduced fruits, vegetables, and whole grains – resulting in improved dietary quality and reducing childhood obesity among WIC-enrolled toddlers.[14] The 2009 revision were so effective in expanding WIC's public health impact that Congress codified the independent scientific review process, requiring that the WIC food packages be reviewed every decade to assure alignment with nutrition science. In 2017, the National Academies of Sciences, Engineering, and Medicine (NASEM) issued a final report that detailed several recommendations to improve the WIC food packages. The 2017 NASEM Report's comprehensive analysis recognized that several core food groups fell short of even half of intake recommended by the Dietary Guidelines for Americans (DGAs).[56] In June 2021, the National WIC Association issued a report that assessed the impacts of the 2017 NASEM Report, the 2020-2025 DGAs, and the WIC benefit bump.[57]

A proposed WIC package rule is expected to be released in Spring/Summer 2022. Upon the release of the food package rule, there will be a time for public comment before the rule is finalized. When the proposed rule is released, research should explore how the proposed changes to the food package align with the NASEM recommendations. Research could also explore NWA's proposed changes to the food package and how that compares with the proposed rule.

Once the food package rule is finalized, research will be needed on a variety of aspects of the food package changes. Following the 2009 WIC food package changes, a plethora of research explored changes to purchasing patterns, dietary intake, and other health outcomes associated with the food package change.[58-60] Research also found that the food package changes were associated with healthier retail environments in neighborhoods with high levels of WIC participation.[61-63] Similar research will be needed after the 2022 food package rule. Nutritional epidemiology methods will be needed to explore changes to consumption and diet quality, while qualitative research should explore participant satisfaction with the new food package. GIS methods and partnerships with retailers should also be used to explore changes to retail environments.

## Equity Considerations for Redemption Patterns and Food Package Rule

The WIC Program uses the Dietary Guidelines for Americans (DGA) as a baseline for WIC food packages. In the 2020-2025 DGA, one recommendation is for dietary patterns to align with personal and cultural preferences.[64] The 2017 NASEM Report encouraged a greater range of options to account for cultural preferences, including new grain options like corn masa flour.[56] The food packages should also account for the diversity of diet patterns, including vegetarians and vegans, food sensitivities and allergies, and religious-based food preferences. Accounting for diversity among WIC participants may increase equity and retention in WIC. Research should include how states can include more traditional food choices and how WIC staff educate participants using WIC foods to create cultural and traditional meals.

Research related to participant satisfaction with the food package should explore how the cultural appropriateness of the food package contributes to redemption and satisfaction. Caregivers value the ability to choose preferred foods and view restrictions on food choices less positively.[65] Increasing choice and providing more variety of foods that meet dietary guidelines may improve retention, increase redemption, and provide marketing value to drive caseload increase. Using quantitative methods to identifying groups of WIC participants that under redeem benefits will help WIC practitioners target outreach and education. Qualitative research may help elucidate reasons for underredemption from the participant perspective and may help identify potential changes to the WIC package that may increase redemption.

## Sample Research Questions:

- To what extent do participants, particularly immigrant groups, find the food package to be culturally relevant? How do these preferences affect redemption rates?
- To what extent do redemption patterns vary based on demographic factors including race, ethnicity, language preferences, rurality, and disability status?
- Upon release of the food package rule, and using simulation and quantitative modeling, how would proposed food package rule would change consumption patterns among WIC recipients?
- How, if at all, does online shopping access for WIC change redemption patterns and/or participant experience?

# PRIORITY AREA 10

## Changes to WIC Caseload

Prior to COVID-19, WIC had been experiencing a decrease in participation. Research prior to COVID-19 explored the barriers to WIC participation and found numerous factors that impact WIC participants' ability and desire to participate in WIC. Examples of commonly noted barriers included transportation, lack of referrals from other health providers and misconceptions about WIC and eligibility. According to the latest data from USDA Food and Nutrition Services (FNS), in 2019, WIC served an estimates 57.4% of eligible participants.[6]

However, changes in services due to COVID-19 may have helped retain participants. After years of declining caseload, WIC recorded a 10 percent increase in child participation (ages 1-4) during the first year of the pandemic nationwide.[66] This increased retention may be because of ease of logistical barriers to participating in WIC (e.g., remote appointments), increase in value due to the CVB benefit bump (see research priority #10), and increased efforts around recruitment and retention. Additional research is needed on changes to participant retention since COVID-19, with particular attention to how changes to WIC service delivery have impacted retention. Research is needed among different groups of eligible populations: those who are eligible but never enrolled, those who enrolled but stopped participating in the program before their eligibility expired, and those who enrolled and remained enrolled throughout their eligibility period. Research is particularly needed with populations eligible but not enrolled in the program to identify barriers to enrollment. Researchers should refer to the FNS WIC Eligibility and Coverage Rates report to understand national and state level trends around coverage rates of different demographic groups.[6]

Both quantitative and qualitative approaches can help better understand reasons for not enrolling in WIC and program cessation. Limited research has explored reasons for program cessation. A 2022 article published in Pediatrics used qualitative methods to explore reasons for program cessation among WIC participants in Massachusetts and found that though participants who stopped participating were satisfied with WIC services, logistical barriers and confusion around eligibility caused them to stop participating.[33] Further, participants were concerned that if they participated in WIC, they would be taking away benefits from other potential participants.[33] Further research is needed on how to engage adult WIC participants and caregivers.

Research is also needed on wider population trends and WIC participation. For example, little is known about the impact of fertility rates and participation among pregnant and postpartum people, alongside infant participation. Though WIC Eligibility and Coverage Rates report provide coverage rates of eligible populations,[6] they are only published on a biennial basis. In the interim, USDA publishes caseload numbers monthly.[66] Quantitative research is needed to explore how caseload numbers oscillate with fertility rates, and if there is an association between the two.

## Equity Considerations for WIC Caseload Trends

While Hispanic participants participate at a higher rate than non-Hispanics, most research does not delineate between English language speakers and non-English speakers. Understanding if there are differences in Hispanic participation by language status can help identify gaps to coverage of this population. Language ability should similarly be explored in other immigrant populations as a potential barrier to enrollment.

Though Black and Hispanic populations participate in WIC at higher rates than the white population, little research explores how dropout rates are different among these groups. Prospective studies with a diverse WIC participant may identify barriers to retention among particular racial and ethnic groups. The extent to which WIC staff is reflective of the population being served, alongside WIC staff's implicit bias and cultural competency, may affect WIC caseload. This research should be considered alongside Priority Area 6, WIC Staff Recruitment, Retention, and Impact on Participant Experience.

Disability status of caregivers and/or participants may differentially affect enrollment in retention. People with disabilities may face additional barriers with transportation to appointments and accessibility of WIC sites. No research has explored disability and WIC enrollment and retention, and research could elucidate how, if at all, participants with disabilities participation differs from able-bodied participants.

Rural participants may likewise have greater barriers to enrollment and retention, and access to transportation and location of WIC clinics should also be explored.

## Sample Research Questions:

- How have birth rates affected WIC participation over the past 10 years?
- How have changes to WIC service delivery during the pandemic (e.g., remote appointments) affected participation rates?

### For those eligible but not participting in WIC:

- How, if at all, do reasons for program cessation (dropping out of WIC after enrolling) differ from reasons for program enrollment?
- What is the level of awareness around eligibility and perception of benefit of enrollment?
- What changes to WIC would increase interest in participation (e.g., changes to food package, increased benefit amount, virtual visit options)?

### For those participating in WIC:

- What are enabling factors that allow WIC participants to continue participating in WIC?
- What is the intended duration of participants during pregnancy and infant enrollment?
- What latent factors are different among those participating in WIC compared to those eligible but not participating?

# Works Cited


1. Bush A, Lee H. Changes in WIC Operations During the COVID-19 Pandemic: A First Look at the Impact of Federal Waivers. U.S. Department of Agriculture, Food and Nutrition Service. https://www.fns.usda.gov/wic/operations-impact-federal-waivers-during-covid-19-pandemic. Published 2021. Accessed June 29, 2022

2. Ritchie L, Lee D, Sallack L, Chauvenet C, Machel G, Kim L, Song L, and Whaley SE. Multi-State WIC Participant Satisfaction Survey: Learning from Program Adaptations during COVID. The National WIC Association and Nutrition Policy Institute, University of California Division of Agriculture and Natural Resources. Published 2021. https://s3.amazonaws.com/aws.upl/nwica.org/nwamulti-state-wic-participant-satisfaction-surveynationalreportfinal.pdf. Accessed June 29, 2022.

3. Ritchie L, Lee D, Felix C, Sallack L, Chauvenet C, Machel G, Whaley SE. Multi-State WIC Participant Survey: Cash Value Benefit Increase During COVID. The National WIC Association and Nutrition Policy Institute, University of California Division of Agriculture and Natural Resources. Published 2022. https://s3.amazonaws.com/aws.upl/nwica.org/nwa-multi-state-cvb-report-march-2022.pdf. Accessed June 29, 2022.

4. National WIC Association. Power Your Mission: Human-Centered Technology and WIC. https://thewichub.org/learn-about-the-newly-formed-wic-technology-resource-group/. Published 2021. Accessed June 29, 2022.

5. Nianogo RA, Wang MC, Basurto-Davila R, et al. Economic evaluation of California prenatal participation in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) to prevent preterm birth. Preventive Medicine. 2019;124:42-49. doi:10.1016/J.YPMED.2019.04.011

6. National and State Level Estimates of WIC Eligibility and Program Reach in 2019. U.S. Department of Agriculture, Food and Nutrition Service. https://www.fns.usda.gov/wic/national-state-level-estimates-eligibility-program-reach-2019

7. Marsh DR, Schroeder DG, Dearden KA, Sternin J, Sternin M. The power of positive deviance. BMJ : British Medical Journal. 2004;329(7475):1177. doi:10.1136/BMJ.329.7475.1177

8. Spencer B. Examining Racial Disparities in Breastfeeding from a Positive Deviance Lens: A Commentary. Journal of Human Lactation. 2017;33(2):379-382. doi:10.1177/0890334417698690

9. Foster BA, Aquino CA, Mejia S, Turner BJ, Singhal A. Identification and Characterization of Families That Are Positively Deviant for Childhood Obesity in a Latino Population: A Case-Control Study. Journal of Obesity. 2018;2018. doi:10.1155/2018/9285164

10. National WIC Association. Guidance for Planning, Conducting, & Communicating a WIC Research Project. https://www.nwica.org/guidance-for-planning-conducting-and-communicating-a-wic-research-project. Accessed June 29, 2022.

11. Victora CG, Bahl R, Barros AJD, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. The Lancet. 2016;387(10017):475-490. doi:10.1016/S0140-6736(15)01024-7

12. Centers for Disease Control and Prevention. Breastfeeding Report Card. https://www.cdc.gov/breastfeeding/data/reportcard.htm. Published 2020. Accessed June 29, 2022.

13. Sayres S, Visentin L. Breastfeeding: uncovering barriers and offering solutions. Curr Opin Pediatr. 2018;30(4):591-596. doi:10.1097/MOP.0000000000000647

14. Healthy, Hunger-Free Kids Act, Pub. L. No. 111-296 §232 (Dec. 13, 2010)

15. Kline N, Thorn B, Bellows D, Wroblewska K, Wilcox-Cook E. WIC Participant and Program Characteristics 2018 Final Report. 2020. https://fns-prod.azureedge.net/sites/default/files/resource-files/WICPC2018.pdf

16. U.S. Department of Agriculture, Food and Nutrition Service. Fiscal Year 2020 WIC Breastfeeding Data Local Agency Report. https://fns-prod.azureedge.us/sites/default/files/resource-files/FY2020-BFDLA-Report.pdf. Published 2021. Accessed June 29, 2022.

17. Borger C, Weinfield NS, Paolicelli C, Sun B, May L. Prenatal and Postnatal Experiences Predict Breastfeeding Patterns in the WIC Infant and Toddler Feeding Practices Study-2. https://home.liebertpub.com/bfm. 2021;16(11):869-877. doi:10.1089/BFM.2021.0054

18. National WIC Association. Advancing Health Equity to Achieve Diversity and Inclusion (AHEAD) in WIC: Results from the National Landscape Scan. https://thewichub.org/advancing-health-equity-to-achieve-diversity-and-inclusion-ahead-in-wic-results-from-the-national-landscape-scan/. Published 2022. Accessed June 29, 2022.

19. DeVane-Johnson S, Giscombe CW, Williams R, Fogel C, Thoyre S (2018) A Qualitative Study of Social, Cultural, and Historical Influences on African American Women's Infant-Feeding Practices. Journal of Perinatal Education 27(2):71-85. https://doi.org/10.1891/1058-1243.27.2.71.

20. Freeman A (2018) Unmothering Black Women: Formula Feeding as an Incident of Slavery. Hastings Law Journal 69(6):1545-1606. https://repository.uchastings.edu/cgi/viewcontent.cgi?article=3831&context=hastings_law_journal.

21. Roess AA, Robert RC, Kuehn D, et al. Disparities in Breastfeeding Initiation Among African American and Black Immigrant WIC Recipients in the District of Columbia, 2007-2019. Am J Public Health. 2022;112(4):671-674. doi:10.2105/AJPH.2021.306652

22. Andrews EE, Powell RM, Ayers KB. Experiences of Breastfeeding among Disabled Women. Women's Health Issues. 2021;31(1):82-89. doi:10.1016/J.WHI.2020.09.001

23. National WIC Association. Proven Outcomes: Recent Research Adds to WIC's Public Health Record. https://s3.amazonaws.com/aws.upl/nwica.org/proven-outcomes.pdf. Published 2022. Accessed June 29, 2022.

24. Wise Investment in our Children Act (WIC Act), H.R. 2011/S. 853 (2021).

25. Cho SJ. The effect of aging out of the Women, Infants, and Children (WIC) program on food insecurity. Health Economics. 2022;31(4):664-685. doi:10.1002/HEC.4470

26. Chorniy A, Currie J, Sonchak L. Does Prenatal WIC Participation Improve Child Outcomes? American Journal of Health Economics. 2020;6(2):169-198. doi:10.1086/707832/SUPPL_FILE/634APPENDIX.PDF

27. Woo JG, Reynolds K, Summer S, Khoury PR, Daniels SR, Kalkwarf HJ. Longitudinal Diet Quality Trajectories Suggest Targets for Diet Improvement in Early Childhood. J Acad Nutr Diet. 2021;121(7):1273-1283. doi:10.1016/J.JAND.2020.08.084

28. Sonchak L. The Impact of WIC on Birth Outcomes: New Evidence from South Carolina. Maternal and Child Health Journal. 2016;20(7):1518-1525. doi:10.1007/S10995-016-1951-Y/TABLES/4

29. Soneji S, Beltrán-Sánchez H. Association of Special Supplemental Nutrition Program for Women, Infants, and Children With Preterm Birth and Infant Mortality. JAMA Network Open. 2019;2(12):e1916722-e1916722. doi:10.1001/JAMANETWORKOPEN.2019.16722

30. Blakeney EL, Herting JR, Zierler BK, Bekemeier B. The effect of women, infant, and children (WIC) services on birth weight before and during the 2007-2009 great recession in Washington state and Florida: A pooled cross-sectional time series analysis. BMC Pregnancy and Childbirth. 2020;20(1):1-13. doi:10.1186/S12884-020-02937-5/TABLES/4

31. Caulfield LE, Bennett WL, Gross SM, et al. Maternal and Child Outcomes Associated With the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Published online April 20, 2022. doi:10.23970/AHRQEPCCER253

32. American College of Obstetricians and Gynecologists (2019) Obstetric Care Consensus: Interpregnancy Care. https://www. acog.org/clinical/clinical-guidance/obstetric-care-consensus/ articles/2019/01/interpregnancy-care.

33. Testa A, Jackson DB. Race, ethnicity, WIC participation, and infant health disparities in the United States. Annals of Epidemiology. 2021;58:22-28. doi:10.1016/J.ANNEPIDEM.2021.02.005

34. Gago CM, Wynne JO, Moore MJ, et al. Caregiver Perspectives on Underutilization of WIC: A Qualitative Study. Pediatrics. 2022;149(2):2021053889. doi:10.1542/PEDS.2021-053889/1233064/PEDS_2021053889.PDF

35. Barnes C, Petry S. "It Was Actually Pretty Easy": COVID-19 Compliance Cost Reductions in the WIC Program. Public Administration Review. 2021;81(6):1147-1156. doi:10.1111/PUAR.13423

36. U.S. Department of Agriculture, Food and Nutrition Service. Third National Survey of WIC Participants. https://www.fns.usda.gov/wic/third-national-survey-wic-participants. Published 2021. Accessed June 29, 2022.

37. U.S. Department of Agriculture, Food and Nutrition Service. WIC - Electronic Benefits Transfer (EBT) and Management Information Systems (MIS). https://www.fns.usda.gov/wic/wic-electronic-benefits-transfer-ebt. Published 2020. Accessed June 29, 2022.

38. Centers for Disease Control and Prevention. Risk for COVID-19 Infection, Hospitalization, and Death By Race/Ethnicity. https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html. Published 2022. Accessed June 29, 2022.

39. American Rescue Plan Act, Pub. L. No. 117-2 §1105 (Mar. 11, 2021).

40. U.S. Department of Agriculture, Food and Nutrition Service. Implementation of PL 117-103 - Extending the Temporary Increase in the Cash-Value Voucher/Benefit for Fruit. https://www.fns.usda.gov/wic/wpm-2022-3. Published 2022. Accessed June 29, 2022.

41. Podzimek, Dušková M, Broukal Z, Rácz B, Stárka L, Dušková J. The evolution of taste and perinatal programming of taste preferences. Physiol Res. 2018;67(Suppl 3):S421-S429. doi:10.33549/PHYSIOLRES.934026

42. Çınar Ç, Karinen AK, Tybur JM. The multidimensional nature of food neophobia. Appetite. 2021;162. doi:10.1016/J.APPET.2021.105177

43. Ventura AK, Worobey J. Early influences on the development of food preferences. Curr Biol. 2013;23(9). doi:10.1016/J.CUB.2013.02.037

44. National WIC Association. Building a Modern WIC: Steps to Advance Online Shopping Options. https://s3.amazonaws.com/aws.upl/nwica.org/online-shopping.pdf. Published 2021. Accessed June 29, 2022.

45. Zimmer M, McElrone M, Anderson Steeves ET. Feasibility and Acceptability of a "Click & Collect" WIC Online Ordering Pilot. J Acad Nutr Diet. 2021;121(12):2464-2474.e1. doi:10.1016/J.JAND.2021.05.015

46. Zimmer MC, Beaird J, Steeves EA. WIC Participants' Perspectives of Facilitators and Barriers to Shopping With eWIC Compared With Paper Vouchers. Journal of Nutrition Education and Behavior. 2021;53(3):195-203. doi:10.1016/J.JNEB.2020.09.007

47. Chauvenet C, de Marco M, Barnes C, Ammerman AS. WIC Recipients in the Retail Environment: A Qualitative Study Assessing Customer Experience and Satisfaction. J Acad Nutr Diet. 2019;119(3):416-424.e2. doi:10.1016/J.JAND.2018.09.003

48. Nianogo RA, Wang MC, Basurto-Davila R, et al. Economic Evaluation of California Prenatal Participation in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) to Prevent Preterm Birth. Prev Med (Baltim). 2019;124:42. doi:10.1016/J.YPMED.2019.04.011

49. Bauman A, Thilmany D. The Economic Impact of Increasing the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Fruit & Vegetable Cash-Value Benefit. https://eatsfvoucher.org/wp-content/uploads/2021/08/wic-economic-impact-report_final.pdf. Published 2021. Accessed June 29, 2022.

50. Hall L, Neuberger Z. Eligible Low-Income Children Missing Out on Crucial WIC Benefits During Pandemic. http://www.cbpp.org/wicpandemicparticipation. Published 2021. Accessed June 29, 2022.

51. Center on Budget and Policy Priorities and Benefits Data Trust. Toolkit: Increasing WIC Coverage Through Cross-Program Data Matching and Targeted Outreach. https://www.cbpp.org/research/food-assistance/increasing-wic-coverage-through-cross-program-data-matching-and-targeted#introduction. Published 2022. Accessed June 29, 2022.

52. Liu CH, Liu H. Concerns and Structural Barriers Associated with WIC Participation among WIC-Eligible Women. Public Health Nurs. 2016;33(5):395. doi:10.1111/PHN.12259

53. Office of the State Auditor. Audit of the Executive Office of Health and Human Services—Barriers to Access to Public Benefits. https://www.mass.gov/audit/audit-of-the-executive-office-of-health-and-human-services-barriers-to-access-to-public-benefits. Published 2019. Accessed June 29, 2022.

54. Zhang Q, Zhang J, Park K, Tang C, McLaughlin PW, Stacy B. Women, Infants, and Children Cash Value Benefit Redemption Choices in the Electronic Benefit Transfer Era. American Journal of Health Promotion. 2022;36(2):310-313. doi:10.1177/08901171211045804

55. Li X, McLaughlin PW, Saitone TL, Sexton RJ. The Magnitude and Determinants of Partial Redemptions of Food Benefits in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). American Journal of Health Promotion. 2021;35(6):775-783. doi:10.1177/0890117121992307

56. National Academies Press. Review of WIC Food Packages: Improving Balance and Choice: Final Report. https://nap.nationalacademies.org/catalog/23655/review-of-wic-food-packages-improving-balance-and-choice-final. Published 2017. Accessed June 29, 2022.

57. Enhancing the WIC Food Package: Impacts and Recommendations to Advance Nutrition Security. National WIC Association. Published June 2021. https://thewichub.org/enhancing-the-wic-food-package-impacts-and-recommendations-to-advance-nutrition-security/

58. Tester JM, Leung CW, Crawford PB. Revised WIC Food Package and Children's Diet Quality. Pediatrics. 2016;137(5). doi:10.1542/PEDS.2015-3557

59. Daepp MIG, Gortmaker SL, Claire Wang Y, Long MW, Kenney EL. WIC Food Package Changes: Trends in Childhood Obesity Prevalence. Pediatrics. 2019;143(5). doi:10.1542/PEDS.2018-2841

60. Zhang Q, Alsuliman MA, Wright M, Wang Y, Cheng X. Fruit and Vegetable Purchases and Consumption among WIC Participants after the 2009 WIC Food Package Revision: A Systematic Review. Adv Nutr. 2020;11(6):1646-1662. doi:10.1093/ADVANCES/NMAA060

61. Rose D, O'Malley K, Dunaway LF, Bodor JN. The influence of the WIC food package changes on the retail food environment in New Orleans. J Nutr Educ Behav. 2014;46(3 Suppl). doi:10.1016/J.JNEB.2014.01.008

62. Chaparro MP, Whaley SE, Anderson CE, Wang MC, Crespi CM. The role of income and neighbourhood poverty in the association between the 2009 Special Supplemental Nutrition Program for Women, Infants and Children (WIC) food package change and child obesity among WIC-participating children in Los Angeles County, 2003-2016. Public Health Nutr. 2021;24(13):4212-4219. doi:10.1017/S1368980020005200

63. Lu W, McKyer ELJ, Dowdy D, et al. Evaluating the Influence of the Revised Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Food Allocation Package on Healthy Food Availability, Accessibility, and Affordability in Texas. J Acad Nutr Diet. 2016;116(2):292-301. doi:10.1016/J.JAND.2015.10.021

64. U.S. Department of Agriculture & U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025. https://www.dietaryguidelines.gov/sites/default/ files/2021-03/Dietary_Guidelines_for_Americans-2020-2025.pdf. Published 2020. Accessed June 29, 2022.

65. Weber S, Uesugi K, Greene H, Bess S, Reese LS, Odoms-Young A. Preferences and Perceived Value of WIC Foods Among WIC Caregivers. Journal of Nutrition Education and Behavior. 2018;50(7):695-704. doi:10.1016/J.JNEB.2018.04.280

66. U.S. Department of Agriculture, Food and Nutrition Service. WIC Data Tables, Monthly Data—State Level Participation by Category and Program Costs, FY 2021 (preliminary). https://www.fns.usda.gov/pd/wic-program. Accessed June 29, 2022.