U.S. DEPARTMENT OF AGRICULTURE
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Planning Future Data Collection Needs within the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

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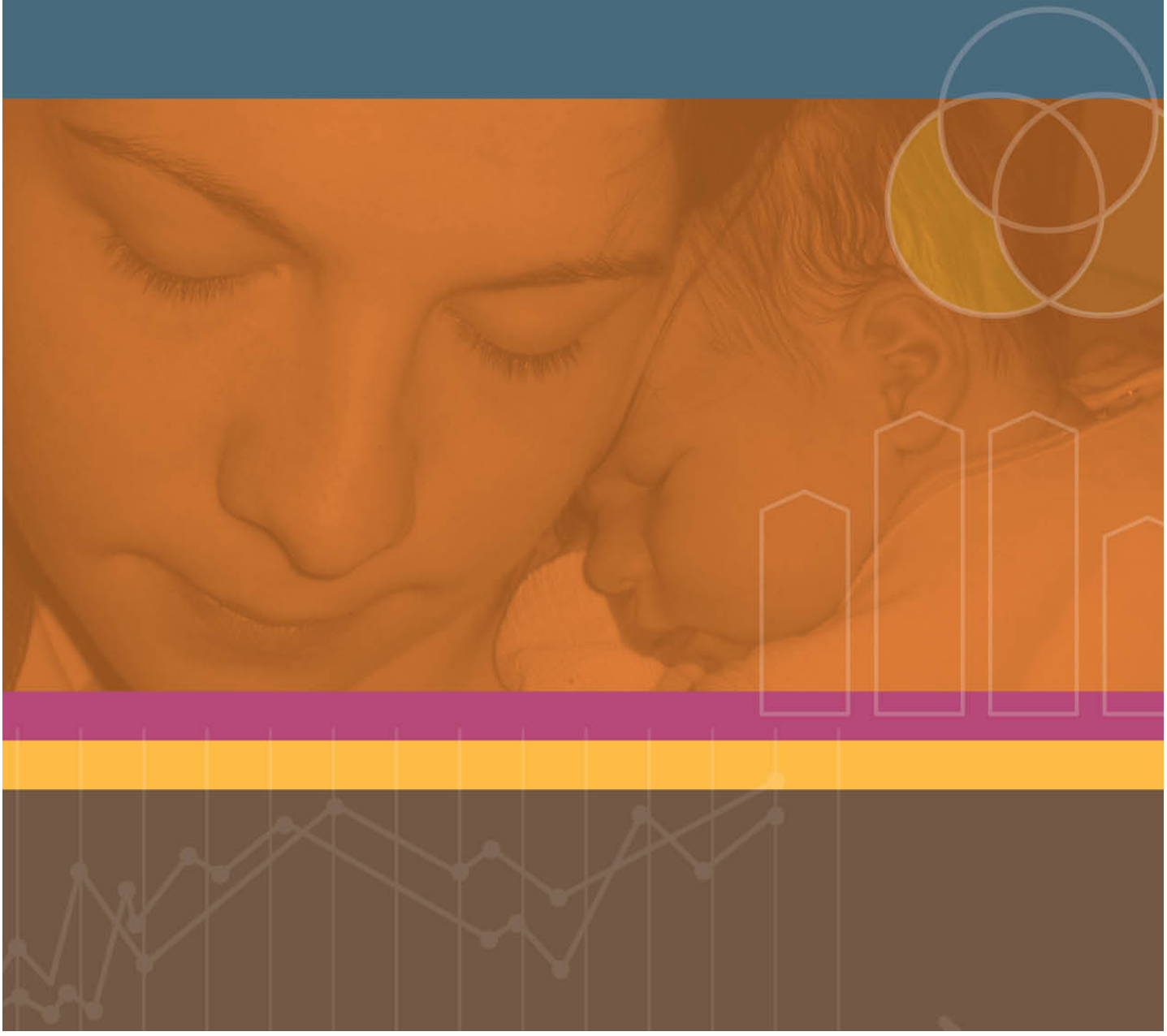

United States Department of Agriculture

Food and Nutrition Service

WIC Data Collection
Planning Future Data Collection Needs within the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

Final Report
June 2017

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GLOSSARY

Term	Description
Breastfeeding Duration	Breastfeeding duration is the length of time a mother fed breast milk to her child. Duration could be determined by start and stop dates, the amount of time reported in days, weeks, or months, or the amount of time an infant received a fully or partially breastfeeding food package from WIC.
Breastfeeding Exclusivity	Breastfeeding exclusivity is the length of time a mother feeds only breast milk to her child. Exclusivity could be determined by start and stop dates (for example, the introduction of water, formula, or foods), the amount of time reported in days, weeks, or months, or the amount of time an infant received a fully breastfeeding food package from WIC.
Breastfeeding Initiation	Breastfeeding initiation means a mother breastfed or fed her child breast milk at least once, or a child ever received a fully or partially breastfeeding food package.
Electronic Benefits Transfer (EBT)	Electronic Benefits Transfer (EBT) is an electronic system that allows a recipient to authorize transfer of their government benefits from a Federal account to a retailer account to pay for received products. EBT is used in all 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. EBT has been implemented in all States since June of 2004.
Food Instrument (FI)	A food instrument (FI) is an instrument issued by WIC programs that is used to buy authorized WIC foods at any authorized WIC vendor. FIs are sometimes called checks, vouchers, or coupons. FIs typically contain the following information: a unique serial number, the participant's WIC ID number and name, first and last days to use, type of food, amount of food, and a participant signature line.
Functional Requirements Document (FReD)	The Functional Requirements Document (FReD) for a Model WIC System provides a comprehensive description of functions that can be automated to support the WIC program.
Relational Database Management System (RDBMS)	A relational database management system (RDBMS) is a database engine or system that provides the ability to use tables for data storage while maintaining and enforcing certain data relationships. Most modern commercial and open-source database applications are relational in nature.
State Agency Model (SAM)	In 2002, the Food Nutrition Service FNS initiated the State Agency Model (SAM) at the request of the Office of Management and Budget

Term	Description
	(OMB) as a strategy to reduce costs through shared approaches. OMB's philosophy on WIC State agency system planning, development, and deployment is: "Build it once and replicate it many times." There are three SAM consortia: Crossroads, the Mountain Plains State Consortium (MPSC), and Successful Partners in Reaching Innovative Technology (SPIRIT).
User Group	A user group is a consortium of State agency representatives who share system capabilities and collaborate to maintain system integrity and manage system changes. A State agency may adopt a consortium's management system but not join the user group.
WIC-Authorized Foods	WIC-authorized foods are the foods that participants may buy with their WIC benefits. WIC staff sometimes call these foods "WIC allowed foods." Authorized foods are specific to each individual participant category. WIC authorized food categories include: milk, cheese, eggs, juice, beans or peanut butter, whole grains, and fruits and vegetables. Infant formula is authorized for infants who are not breastfed exclusively and infant foods are authorized for infants six months and older. State agencies may authorize substitutions for some food categories, e.g., soy beverage and tofu in place of milk. The U.S. Department of Agriculture (USDA) sets rules for the kinds and amounts of food the WIC program can offer. These foods contain the nutrients required in the diets of low-income women, infants, and children. WIC State agencies select the specific foods that participants in their State can buy with food benefits within the parameters of the Federal rules.
WIC Management Information System (MIS)	A WIC management information system (MIS) is the data system a WIC agency uses to conduct program functions, such as certification of participants and issuance of food benefits, and to record participant and program data for program management and reporting.
WIC Stakeholders	WIC stakeholders are WIC subject matter experts from outside the FNS who attended the WIC Stakeholder Workshop on January 28, 2016. These individuals represent WIC program administrators (WIC State and local agencies), WIC researchers (universities, the Centers for Disease Control and Prevention and the Health Resources and Services Administration of the U.S. Department of Health and Human Services, and the U.S. Census Bureau), and WIC advocates (e.g., National WIC Association, and the Center on Budget and Policy Priorities).
WIC State Agency	A WIC State agency is one of 90 State-level agencies that oversee administration of the WIC program in all 50 States, the District of Columbia, five territories, and 34 Indian Tribal Organizations (ITOs).

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EXECUTIVE SUMMARY

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), administered at the Federal level by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA), provides grants to WIC State agencies to deliver program services to eligible participants. WIC program services include supplemental foods, health care referrals, nutrition education, and breastfeeding support for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk. State agencies administer the WIC program according to Federal requirements and report program and participant data to FNS.

FNS awarded a contract to Manhattan Strategy Group (MSG) and its subcontractor, Altarum Institute (Altarum), to conduct a study of the WIC data collected by State agencies. This is an exploratory study that examines the broader uses of data for program management and policy research support.[1]

The goal of this study is to provide FNS and its partners with information on WIC necessary for:

1. Effective program management and performance assessment,
2. Describing program and participant characteristics,
3. Assessing program integrity,
4. Ongoing program monitoring,
5. Program outcome evaluation,
6. Addressing stakeholder concerns, and
7. Implementing a process for improving WIC data collection nationally.

This study examines the current status of WIC management information systems (MIS) and the challenges associated with modifying the State agencies' MIS to accommodate new data elements or to change the periodicity of data reporting to support FNS data needs. The study reviews data collected by State agencies, especially data that are not reported routinely to FNS. This study also examines the Electronic Benefits Transfer (EBT) data that are becoming available as State agency EBT implementation expands. It explores the State agencies' abilities to collect, store, retrieve, and report these and other data to meet policy and program management needs now and in the foreseeable future. Based on an analysis of that information, the study suggests additional data elements that could be considered for future data collection activities to support ongoing programmatic and research-related activities within the WIC program.[2] The study also considers the level of interest of WIC data users and stakeholders in WIC data improvements using a

[1] FNS has no current plans to request additional data elements or require changes to current management information system or other processes/systems in order to accommodate the addition of any data elements included in this report.

[2] Some State agencies operating EBT systems and more modern MIS systems have more detailed information on the food items, item prices, and purchase locations from EBT redemption information. These data could be reported to FNS and used to examine regional and national trends in pricing, food utilization, nutritional guidance, or program integrity initiatives. The periodicity of reporting these data would need to be determined. This reporting of data may require investment in a data repository and establishment of standards for compliance. Consequently, it is important to identify the need for the data elements and their use in supporting program goals.

workshop designed to elicit concerns and interest surrounding WIC data collection. Finally, this study provides recommendations for potential changes to how FNS requests and collects WIC data from State agencies.

Study Objectives

MSG and Altarum (the study team) addressed the following study objectives to examine the data collected by WIC State and local agencies and to provide FNS with information on future WIC-related data needs:

1. Describe the current state of WIC MIS used for collecting, storing, and retrieving data;
2. Describe State agency plans for upgrading the MIS and changing the data collected, periodicity of collection, or other revisions;
3. Identify participant and administrative data collected by WIC State and local agencies that are not reported routinely to FNS. Determine how these data are used for program management and performance assessment, describing program and participant characteristics, assessing program integrity, and monitoring;
4. Identify the cost drivers associated with data collection and changes to the WIC MIS;
5. Identify stakeholder data uses, concerns regarding challenges in data collection and use, and interest in WIC data collection improvements through a workshop discussion based on the results of the first four objectives; and
6. Provide recommendations to develop a process for improving WIC data collection.

Study Methodology

To meet these study objectives, the study team:

1. Reviewed existing MIS documentation (e.g., WIC State Plans) to establish a foundation for the study;
2. Performed a review of WIC-related literature completed from 2010 through 2014 to identify data items frequently used in WIC research;
3. Conducted interviews with all seven WIC regional offices to obtain an overview of each State agencies' MIS and upcoming system enhancement plans;[3]
4. Conducted interviews with eight WIC State agencies and one local agency to provide an in-depth look at the MIS capabilities and the types of data collected and stored within these systems;[4]
5. Facilitated a half-day workshop with WIC Stakeholders that are external to FNS. The workshop examined how WIC stakeholders use WIC data, how data are reported to FNS, and what new and future opportunities exist for WIC data collection; and
6. Facilitated three task force meetings with internal FNS staff members. The task force members served as study advisors, reviewed study results, and provided valuable content feedback.

[3] The study team conducted interviews with all seven regional offices: Mid-Atlantic (MARO), Midwest (MWRO), Mountain Plains (MPRO), Northeast (NERO), Southeast (SERO), Southwest (SWRO), and Western (WRO).
[4] The study team interviewed eight WIC State agencies: Arizona, Chickasaw Nation, Colorado, Kansas, Maryland, Missouri, New York, and North Carolina. An interview was conducted with one WIC local agency, the Public Health Foundation Enterprises (PHFE), located in California.

Summary of Findings

WIC is operated by 90 State agencies comprised of the 50 States, the District of Columbia, five U.S. territories, and 34 Indian Tribal Organizations (ITOs). State agencies develop their MIS to support the administration of the WIC program, which seeks *"to safeguard the health of low-income women, infants, and children up to age 5 who are at nutrition risk by providing nutritious foods to supplement diets, information on healthy eating, and referrals to health care."*[5] WIC State agencies collect a significant amount of data to support their WIC programs and other State health initiatives that they are not required to report to FNS. State efforts to enhance data collection cover a broad range of activities:

- ***Over half of the 88 WIC State agencies for which we were able to obtain data***[6] ***operate a modern MIS and another 41 percent are planning to replace their legacy MIS in the next two to three years.*** Based on the regional office survey conducted in February 2015, fifty-six percent of the State agencies (49) operate a modern WIC MIS based on a State Agency Model (SAM) or a non-SAM system. Many of these systems use modern Web technology that includes a Web-based Microsoft .NET system framework (v3.5 or v4.0) with a relational database management system (RDBMS). The majority of these State agencies belong to consortia ranging from 3 to 24 State agency members that share an MIS and are collectively responsible for system changes and the overall integrity of the system. Thirty-nine State agencies operate legacy MIS. Of these, thirty-six plan to replace their systems within the next two to three years. Three State agencies (Ohio, Oklahoma, and South Carolina) operating legacy WIC MIS do not have plans to upgrade or replace their system.[7]
- ***More than one-quarter (27%) of State agencies will complete the statewide rollout of EBT by December 2016.*** Many WIC State agencies are readying, upgrading, or replacing their MIS to interface with EBT and support EBT functions. EBT is an electronic delivery method that will replace paper food instruments with an electronic payment card for food benefit issuance and redemption at authorized WIC retailers. On December 13, 2010, President Obama signed into law the Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296) mandating each WIC State agency to implement an EBT-compatible WIC system by October 1, 2020. Based on the State Agency Detail EBT Status Report dated November 23, 2015, twenty-four State agencies (27%) are projected to complete the statewide rollout of EBT by the end of 2016. The EBT implementation will provide WIC with the opportunity to utilize additional data to support WIC program decisions, program integrity, vendor management, and provide detailed food product data for research and analytics.

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[5] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *Women, Infants and Children (WIC): About WIC-WIC's mission*. Retrieved from http://www.fns.usda.gov/wic/about-wic-wics-mission

[6] The study team received MIS status updates for 88 out of 90 WIC State agencies. Regional office surveys did not indicate the MIS status for eight ITOs: Cherokee Nation of Oklahoma, Citizen Potawatomi, Eastern Band of Cherokee Indians, Indian Township Passamaquoddy, Inter-tribal Council of Nevada, Pleasant Point Passamaquoddy, Pueblo of Isleta, and Seneca Nation. FNS subsequently provided an update for the remaining ITOs except for Cherokee Nation of Oklahoma and Seneca Nation.

[7] The regional office survey, conducted in February 2015, did not indicate upgrade plans for Illinois, Kentucky, Ohio, Oklahoma, Oregon, and South Carolina. Subsequently, FNS indicated via personal communication on January 22, 2016, that Illinois, Kentucky, and Oregon may be upgrading their technology systems in the next several years.

- ***All State agencies report the required Minimum Data Set (MDS) to FNS biennially, and 86 percent of all State agencies report the Supplemental Data Set (SDS).*** FNS collects the WIC Participant and Program Characteristics (WIC PC) data sets from State agencies biennially for FNS to report to Congress. State agencies must report the MDS to FNS; the SDS is optional. According to the WIC State Plans, all State agencies submit an MDS to FNS biennially, and 86 percent submit the SDS to FNS biennially. One of the outcomes of this reporting is a public-use file that FNS makes available for research.
- ***The study team identified potential data elements to consider for future FNS data collection efforts.*** The study team explored the data collected by WIC State and local agencies that are not reported routinely to FNS and identified 16 data elements that may be of interest to FNS. Interviews with FNS and State agencies repeatedly cited these data for improving WIC program management. The study team categorized these data elements into six topics.
    1. ***WIC Demographic Data:*** Demographic data (e.g., marital status and household language spoken) describe additional participant characteristics.
    2. ***WIC Health and Nutrition Data— Health Behaviors:*** Health behavior data (e.g., smoking and alcohol consumption) measure participant and program outcomes. WIC State agencies use health and nutrition data to identify needs and target services to participants. For example, addressing pregnancy risks through tailored nutrition education and referrals help to reduce complications and improve birth outcomes such as birth weight and gestational age.
    3. ***WIC Health and Nutrition Data— Breastfeeding:*** State agencies currently report breastfeeding initiation[8] and duration data to FNS. Adding a standardized exclusivity measure to the MDS may assist FNS in its ability to report on exclusivity rates among WIC participants. Exclusivity is a measure identified in the Healthy People 2020 goals[9] for the nation.
    4. ***WIC Health and Nutrition Data— Nutrition Education:*** Nutrition education data (e.g., topic and mode[10]) provide FNS with the opportunity to measure the effect of WIC services on participant behavior and outcomes. For example, when analyzed with EBT food purchasing data, WIC State agencies can evaluate the impact of nutrition education topics and modes of delivery on food purchasing patterns. State agencies may also evaluate the impact of nutrition education on birth outcomes.
    5. ***WIC Food Redemption Data:*** Data obtained from EBT transactions during participant redemptions of WIC food benefits issued[11] could provide FNS with

[8] See glossary for detailed definitions on page 1.
[9] Healthy People 2020 [Internet]. Washington, DC: U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion [cited 05/23/2016]. Available from: https://www.healthypeople.gov/2020/topics-objectives/objective/mich-215. The goal is to "Increase the proportion of infants who are breastfed exclusively through 6 months" to 25.5% of all infants born in 2020.
[10] Frequency of nutrition education participation would also be useful for measuring the impact of nutrition education on participant behavior. However, based on the data dictionaries provided by our sample, frequency appears to be difficult to extract from reported data.
[11] EBT redemption information is linked to an EBT card that is provided to the family or household rather than each participant. Consequently, individual participant redemption of foods is not available.

better access to timely data on participant household purchasing patterns, such as food types, brands, and quantities purchased with WIC benefits and the timing of WIC purchases in the benefit month.

6. ***WIC Vendor Management Data:*** Data pertinent to vendor practices obtained from EBT transactions (e.g., prices paid, discounts, adjustments to payments) will improve the timeliness and comparability of vendor management and program integrity analyses.

- ***Interviews with FNS and State and local agencies highlight opportunities to improve the MDS/SDS to provide better support for program management and monitoring. These opportunities include:***
  - ***Access to timely data.*** Timely data will help FNS and WIC State agencies make important decisions on policy and program activities related to food packages and WIC services. The MDS/SDS data sets are available on a biennial basis, and the lag time between agency data collection and its availability makes the information less useful.
  - ***Consistent, comparable data points across State agencies.*** Some respondents are concerned that although State agencies may report data fields with the same label/name, there may be differences in when and how the data are captured (e.g., weight and height measures) or in data definitions for potential MDS/SDS data elements (e.g., redemption date) that could result in inconsistencies.
- ***Adding new data elements to the WIC MIS is challenging even for State agencies operating a modern system.*** State agencies that have migrated to modern MIS have more flexibility to add new data elements yet continue to face difficulties accessing ad hoc data from their MIS to perform data analytics or build new reports. WIC program managers cite a lack of technology resources, staff, and tools to perform this function without support from their agency's technology department or technology vendor. Several State agencies, such as Ohio, Michigan, Texas, Kentucky, Missouri, and Arizona, have developed data warehouse functionalities, data cubes, dashboards, or specific reporting tools outside of their MIS that enhance their data analytic capabilities. Therefore, if additional elements are identified for the MDS/SDS or elsewhere, FNS must recognize the need to plan for the extra resources and time needed to build new elements into the various MIS or other data systems available to State agencies.
- ***State agencies that are part of a multi-State consortium or SAM have a complex change control process for coordinating enhancements to their MIS*.** The benefit of being part of a consortium or SAM is that group members share the costs associated with MIS development and management. The trade-off is that coordinating with other members of a user group can be cumbersome and time-consuming to reach consensus on requirements and reconcile competing priorities. State agencies would also like to obtain more unified guidance from FNS on policy directives to minimize differences in policy interpretation among State agencies using a common MIS. These differences are particularly challenging for SAMs that have State agencies supported by multiple FNS offices.

- ***Stakeholders, including WIC program administrators, WIC researchers and WIC advocates identified:***
  - ***Additional WIC data particularly useful to them, including:*** financial management, program integrity, cost containment management, food prescription redemption costs, administrative costs, caseload management, health outcomes, and nutrition services.
  - ***Similar data collection challenges to those identified by the State agency interviews, including:*** a burdensome change control process, lack of timeliness of data, and inconsistent data definitions and collection quality across localities and State agencies.
  - ***A set of principles they believe should guide future WIC data collection efforts, including the need to:*** strike a balance between data collection burden and benefit of data collection requirements, ensure that data are comparable across State agencies, coordinate national data collection efforts, and consider sampling for collecting some data elements.
  - ***Opportunities for future data collection efforts, including:*** improving data periodicity, consistency, and usefulness; using representative sampling; developing EBT analytics; and, creating a central WIC data repository.

Conclusion

Overall, the study identifies a significant potential for improvements to WIC data, while pointing out the challenges involved in making improvements. In addition, the study finds a sufficient level of interest among WIC stakeholders in improving WIC data collection to warrant further work on developing specific data improvement goals and a process for achieving those goals. Therefore, we recommend a three-phase strategy for ensuring that FNS and WIC stakeholders will succeed in producing meaningful improvements in data collection for program management, research, and advocacy. These phases are: (1) commitment development; (2) gauging data collection support and potential costs; and (3) establishing a shared FNS-stakeholder workgroup. During the commitment development phase, FNS would identify the level of commitment and resources the agency might apply to the WIC data collection improvement effort, as well as a mechanism for overseeing the process. During the gauging support and costs phase, FNS would convene stakeholder meetings to determine the level of support for various options and discuss potential costs with State MIS directors. Finally, during the FNS-stakeholder workgroup phase, FNS would identify workgroup partners to further develop plans and recommendations. The workgroup would then evaluate information gathered in phase 2 and develop more firm recommendations, priorities, and options for FNS decision makers to consider.

I. INTRODUCTION

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), administered at the Federal level by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA), provides grants to WIC State agencies[12] to deliver program services to eligible participants. WIC program services include supplemental foods, health care referrals, nutrition education, and breastfeeding support provided to eligible participants, including:

- Pregnant women;
- Breastfeeding women (up to the infant's first birthday);
- Non-breastfeeding postpartum women (up to six months after the birth of an infant or after pregnancy ends);
- Infants (up to their first birthday); and
- Children (up to their fifth birthday).

The U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) awarded a contract to Manhattan Strategy Group (MSG) and its subcontractor, Altarum Institute (Altarum), to conduct a study of the WIC data collected by State agencies. The study focuses on the broader uses of these data for policy and research support and the extent to which State agencies already collect additional data not reported to FNS, as well as State agencies' ability to collect, store, retrieve, and report these and other data to meet policy and research needs now and in the foreseeable future. This is an exploratory study and does not imply that FNS plans to request additional data elements or change current management information systems (MIS) or other processes/systems in order to accommodate the addition of any data elements included in this report.

A. BACKGROUND

WIC State agencies administer WIC on behalf of FNS, which relies on these State agencies to provide data on program operations and participants. These data are provided in periodic, required reports submitted to FNS:

- ***Monthly and Annual WIC Financial Management and Participation Report (FNS-798):*** Provides data on food and administrative grant expenditures and obligations, participation, rebates, program income, etc.
- ***Addendum to WIC Financial Management and Participation Report: Nutrition Services and Administration (NSA) Expenditures (FNS-798A):*** Provides data on NSA grant expenditures across four cost categories: program management, client services, nutrition education, and breastfeeding.
- ***The Integrity Profile (TIP) Report:*** The annual report provides an analysis of the WIC State agency vendor management activities. The report summarizes violations that occur among WIC-authorized vendors (e.g., retail, direct distribution, and home delivery systems).

[12] There are a total of 90 WIC State agencies: the 50 States, the District of Columbia, five U.S. territories, and 34 Indian Tribal Organizations (ITOs).

- ***Annual WIC State Plan:*** Describes the State agency's objectives and procedures for all aspects of WIC program administration for the fiscal year.
- ***Biennial WIC Participant and Program Characteristics (WIC PC) Report:*** Summarizes a set of demographic and health characteristics of WIC participants nationwide.
- ***WIC Breastfeeding Data Local Agency Report:*** Reports the results of the ongoing Breastfeeding Policy Inventory, a census of local and State Agency breastfeeding policies, practices, and data collection methods and reporting.

State and local agencies provide data for ad hoc reports or studies that are not part of routine reporting. These reports or studies cover a variety of topics such as food costs, rebates received, nutrition services, health outcomes, and administrative costs. State agencies also collect additional data to support their WIC program that they are not required to report to FNS. Some of these data, if reported to FNS, may contribute to better WIC program management, performance assessment, and monitoring. This study examines the WIC data collection process and potential enhancements to the Minimum Data Set (MDS) and Supplemental Data Set (SDS), which are the basis for the WIC PC report, including the addition of potential data elements.

WIC State agencies provide data on the demographics and characteristics of program participants for periodic WIC PC studies based on the required MDS and optional SDS data. FNS uses these data for program monitoring, research, and policy purposes. In 1984, FNS conducted its first WIC PC study on a nationally representative sample of WIC participants. FNS conducted WIC PC sample studies again in 1988 and 1990. Beginning in 1992, and biennially thereafter, WIC PC became a census-based study. The study provides a snapshot of WIC participants at a point in time, providing a census of all participants enrolled as of April of each reporting year.[13]

Since becoming a census-based study, the WIC PC report also includes a nationally representative public-use file on a sample of WIC participants. The WIC PC study includes aggregate summary data from the MDS and SDS. The MDS has required data items that WIC State agencies must collect and report to FNS (see Appendix A). The SDS has optional data items, which WIC State agencies voluntarily collect and report to FNS (see Appendix B). WIC PC is a point-in-time report that does not track the same participants over time or collect data on all of the services that the participants received.

[13] After the data are compiled, cleaned, and processed, they are available the following year.

B. STUDY GOAL AND OBJECTIVES

The goal of this study is to provide FNS and its partners with the information necessary for (a) effective program management and performance assessment, (b) describing program and participant characteristics, (c) assessing program integrity, (d) ongoing program monitoring (e) program outcome evaluation, (f) addressing stakeholder concerns; and, (g) implementing a process for improving WIC data collection nationally. This study explores data collected by FNS and WIC State or local agencies, examining data element collection frequency, retention length, validation procedures, and edit checks. The study also examines input from WIC data stakeholders to determine areas of concern and interest with respect to WIC data collection. The study objectives include:

1. Describing the current state of the WIC MIS used for collecting, storing, and retrieving data;
2. Describing State agency plans for upgrading the MIS and changing the data collected, periodicity of collection, or other revisions;
3. Identifying participant and administrative data collected by WIC State and local agencies that are not reported routinely to FNS and determining how these data are used for program management and performance assessment, describing program and participant characteristics, assessing program integrity, and monitoring;
4. Identifying WIC stakeholder data uses, challenges in data collection and usage, and interest in WIC data collection improvements through a half-day workshop discussion; and
5. Providing recommendations for developing a process for improving WIC data collection.

C. RESEARCH QUESTIONS

This study examines four key areas: the current state of WIC MIS and upgrade plans, data accessibility once collected, the data available to State and local agencies, and the impact of policy changes on WIC data collection. Exhibit 1 outlines the research questions for this study by these key areas.

Exhibit 1: WIC Data Collection Research Questions by Key Area

	Key Area	Research Questions
1.	MIS Capabilities and Upgrade Plans	▪ What are the MIS capabilities regarding data collection, storage, and retrieval? ▪ What are the State agency plans for upgrading the MIS or changing data elements collected, periodicity of data collected, or other revisions? ▪ What is the process for implementing major MIS upgrades, including cost and effort (time) for newer and older systems, including cost drivers?
2.	Data Accessibility	▪ What are the challenges and opportunities for improving the data collection process for data providers? ▪ What are the challenges and opportunities associated with improving data accessibility for FNS and WIC stakeholders? ▪ How burdensome is it for State and local agencies to make system changes to accommodate new variables?
3.	Data Availability	▪ Identify and describe data sets collected for program management, performance assessment, describing program and participant characteristics, assessing integrity, and monitoring beyond those reported to FNS. ▪ Identify the data fields that may potentially be added or eliminated from the MDS and SDS to enhance research efforts.
4.	Policy Impact	▪ What anticipated future policy changes will impact WIC data? ▪ How will data usage change as a result of the Electronic Benefits Transfer (EBT) implementation?

II. METHODOLOGY

The WIC Data Collection Study included a literature review of recent WIC research, interviews with each WIC regional office, interviews with a sample of State and local agencies, a WIC stakeholder workshop and task force meetings, and a review of each State agency's WIC State Plan and other system documentation.

1. ***Literature review of recent WIC research (December 2014 – July 2015):*** The study team performed a literature review of 120 WIC articles, published from 2010 through 2014, to produce a summary of data elements frequently used in recent WIC research. The study team used the summary of data elements to identify potential participant and administrative data that may be of interest to FNS. FNS reviewed and approved the list of documents for the literature review prior to execution. See Appendix 0 on page 141 for a bibliography of the WIC literature reviewed for this study.
2. ***Interviews with each WIC staff in each FNS regional office (January 2015 – March 2015):*** The study team conducted interviews with each of the seven WIC regional offices to obtain an overview of each region's MIS. These interviews are important because FNS only approved the study team to interview a total of nine State and local agencies.[14] The regional office overviews also provided context for the State and local agency interviews.
   - The study team distributed a pre-interview survey prior to each interview to collect data on each State agency's MIS and upcoming system upgrade or replacement plans. FNS reviewed and approved the interview protocol and pre-interview survey prior to execution.
3. ***Interviews with nine WIC State and local agencies (April 2015 – August 2015):*** The study team conducted interviews with eight State agencies and one local agency to obtain in-depth information regarding their MIS capabilities and the types of data collected and stored within these systems.[15] FNS reviewed and approved the State agency and local agency interview guides prior to execution.
   - The study team requested a copy of the data dictionary from each of the eight State agencies. A data dictionary is a system catalog that contains data about the data (i.e., the metadata) available in the MIS. It provides system users, designers, and programmers with the table name, the field name, field description, data type (e.g., alphanumeric), data size/length, data values, etc.
4. ***WIC stakeholder workshop and task force meetings (November 2015 – February 2016):*** The study team planned and facilitated one half-day workshop with WIC stakeholders that are external to FNS. The workshop examined how WIC stakeholders use WIC data, how data

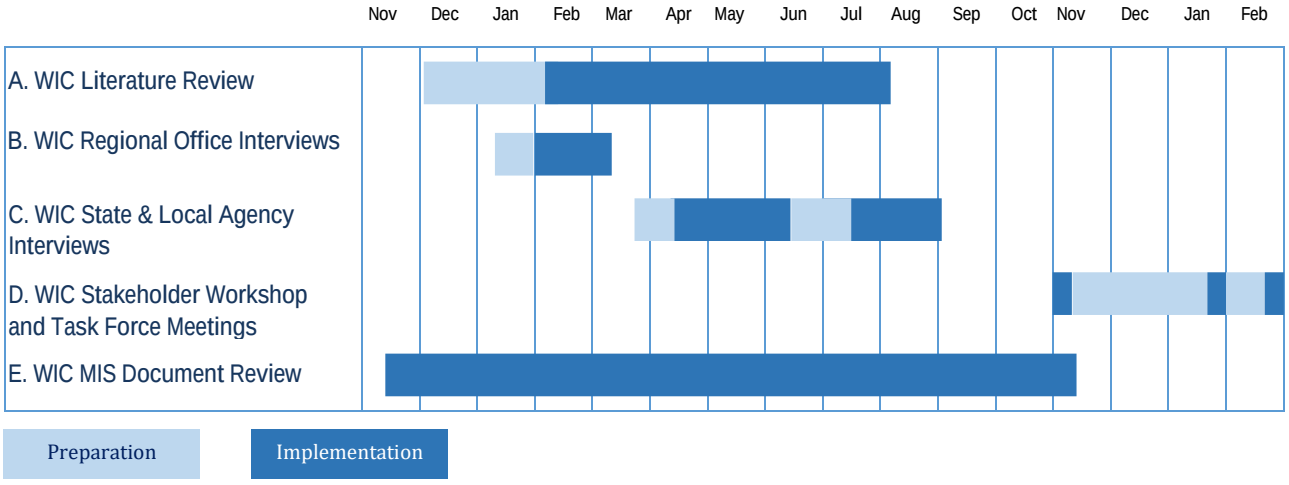
[14] The study team was limited to nine interviews with State and local agencies. Interviews with more than nine members of the public require the Office of Management and Budget's (OMB) approval.
[15] The intent of this study is to include a representation of State agencies across the nation in diverse geographic WIC regions operating different MIS systems (i.e., State Agency Model (SAM), other consortium, or legacy) and adhere to OMB guidelines (i.e., no more than nine entities interviewed without OMB clearance). The study team focused on obtaining information on the MIS used by a large number of State agencies located in different regions. This study did not analyze similarities in the regions in which the same MIS is used.

are reported to FNS, challenges to data collection and use and what new and future opportunities exist for WIC data collection. The study team also planned and facilitated three task force meetings with internal FNS staff members. The task force members served as study advisors, reviewed study results and provided content feedback.

5. ***Review WIC MIS documents (November 2014 – October 2015):*** The study team collected and reviewed existing WIC MIS documentation to establish a foundation for the study. These documents included each State agency's annual WIC State Plan (Part III—Information Systems), MIS data dictionaries and system documentation collected from State agency interviews, and additional documents and reports obtained from WIC conferences and Internet searches.

Exhibit 2 outlines the time frame for each major project activity. Based on this time frame, the information contained in this document is current as of October 2015 unless stated otherwise.

Exhibit 2: Research Time Frame (November 2014 through February 2016)



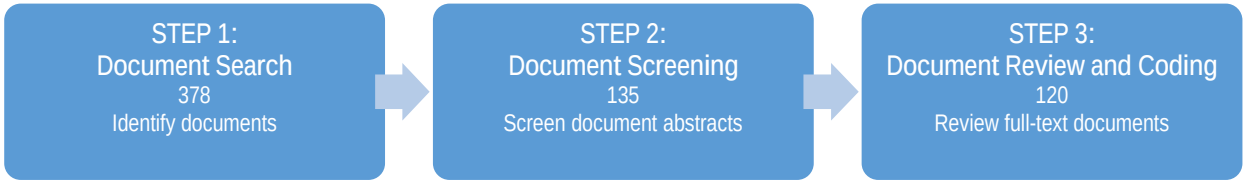
A. WIC LITERATURE REVIEW

This section describes the process used to search, screen, and review relevant documents for inclusion in the literature review, which focused on data and data sources. The literature review produced a summary of data elements frequently used in recent WIC research.

The study team conducted a literature review of WIC research studies completed between 2010 and 2014. The literature review followed a review process where the study team identified research or evaluation projects exploring aspects of WIC policies, programs, or participants and then cataloged the resulting literature by study design, study findings, and study topic. Exhibit 3 outlines the literature review processing used by the study team.

Appendix C details the literature review search protocol and the decision model for document screening.

Exhibit 3: Process for Selecting the Documents for the Literature Review



Step 1: Document Search. Fox, Hamilton, and Lin (2004)[16] and Colman et al. (2012)[17] conducted literature reviews of WIC-related research focused on studies examining the impact of WIC policy or programs on WIC participants. These reviews, which were broader in scope than those conducted for this study, detailed study design, methodology, and outcomes. The study team used these earlier reviews to formulate an initial set of search criteria to identify WIC-related literature published after 2010. The study team included additional search criteria to identify literature examining WIC program management, administration, and related participant outcomes. This resulted in an iterative search string composed of a series of program and study identifiers connected by search operators. Exhibit 4 provides the final document search string that returned the largest number of WIC-related documents.

Exhibit 4: Document Search String

Criteria 1:	Criteria 2:	Search	Criteria 3: Study Identifier *(criteria used in previous research)*	Search Operator	Criteria 4: Study Identifier *(new)*
Published after 2010	WIC "Women, Infants, and Children" "Special Supplemental Food Program" "Special Supplemental Nutrition Program"	AND	Association Relationship Affect Effect Evaluation Impact Outcome Correlation	OR	Administration Management Operation System Cost Participation Caseload Program Integrity Food Packages

[16] Fox, M. K., Hamilton, W., & Lin. B.H. (2004). *Effects of food assistance and nutrition programs on nutrition and health: Volume 3, literature review* (Food Assistance and Nutrition Research Report No. FANRR19-3). Retrieved from http://www.ers.usda.gov/publications/fanrr-food-assistance-nutrition-research-program/fanrr19-3.aspx

[17] Colman, S., Nichols-Barrer, I. P., Redline, J. E., Devaney, B. L., Ansell, S. V., & Joyce, T. (2012). *Effects of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC): A review of recent research* (Special Nutrition Programs Report No. WIC-12-WM). Retrieved from http://www.fns.usda.gov/sites/default/files/WICMedicaidLitRev.pdf

Because the search interface for each database varies, the study team used multiple permutations of the above search string to ensure that returned documents contained at least one identifier from each of the four search criteria. For instance, because ERIC (Education Resources Information Center) allows users to define search parameters that cluster words around a similar topic field, the study team constructed the following search string:

> [(WIC OR "*Women, Infants, and Children*") AND "*Special Supplemental Nutrition Program*" NOT ("*SNAP*" OR "*Supplemental Nutrition Assistance Program*")] AND [Effect OR Affect OR Impact] OR [Administration OR Operation]

The study team reviewed the document citation returned in each search string, noted the number of items returned, and then refined the search strings to eliminate documents that fell outside the scope of the literature review. Thus, in the example search string above, the study team revised the initial search string to instruct the search engine to eliminate documents describing the Supplemental Nutrition Assistance Program (SNAP). Details of these search string permutations are detailed in Appendix C.

In addition, the study team applied "*wildcard*" and word boundary search parameters using bibliographic software, as appropriate, to study identifiers. Wildcard parameters ensure that all conjugates of a single word are included in a search string (e.g., "*correlate*" as well as "*correlation*"). Boundary search parameters ensure that compound nouns within a broad topical category are included in a search string (e.g., "*Information System*" and "*Management Information System*," or "*cost*" and "*cost containment*").

Initial search results returned 650 document citations. Using bibliographic software, the study team eliminated duplicate document citations and reviewed the remaining citations for false positive results, eliminating citations that included:

- General program descriptions;
- WIC program materials, brochures, and training manuals; and
- Comparative studies of nutrition programs including WIC or WIC participants.

The MSG study team checked these results against a bibliography of recent WIC literature that included unpublished working papers and soon-to-be-published reports provided by the evaluation committee of the National WIC Association, USDA's Economic Research Service, MSG study team members working on WIC research, the Robert Wood Johnson Foundation, and any relevant documents available from organizations that conduct WIC research (N=83). At the conclusion of the document search (Step I), a total of 378 document citations were identified.

Step 2: Screen Documents. The study team applied a screening decision model to the abstracts of the 378 documents, resulting in 135 documents selected for abstract review. Based on the review of the abstracts, the study team selected 120 documents for full review.

Step 3: Document Review and Coding. The study team developed a coding protocol to facilitate the systematic review of the 120 documents. The coding protocol incorporated a set of a priori categories covering broad topic areas within WIC-related research. The study team used a priori categories to sort the documents and identify the main categories emerging from WIC research. Exhibit 5 provides a breakdown of the categories and subcategories for the 120 documents included in the literature review.

Exhibit 5: Categories and Subcategories of WIC-Related Research Completed Since 2010

Category (N= 120)	Subcategories	
Breastfeeding (N=27)	▪ Counseling/Education/Support ▪ Economic Costs ▪ Equity and Culture Feeding Practices—Initiation/Duration	▪ Food Packages ▪ Health Outcomes ▪ Social Environment
Child Health and Socio-Emotional and Cognitive Development (N=8)	▪ Immunization ▪ Infant Mortality ▪ Utilization of Health Services	
Food Retail Environment (N=10)	▪ Food Packages ▪ Equity and Culture	
Nutrient and Food Behavior (N=38)	▪ Consumption Patterns/ Feeding Practices ▪ Education ▪ Equity and Culture ▪ Food Packages	▪ Food Retail Environment ▪ Food Security ▪ Fruit and Vegetable Purchases ▪ Prices, Vouchers, and Rebates
Nutrition Education/Nutrition Counseling (N=9)	▪ Breastfeeding ▪ Chronic Disease and Conditions (Diabetes, Obesity) ▪ Dietary Awareness and Information (Dietary Tools)	▪ Nutrient and Food Behavior ▪ Technology
Obesity (N=8)	▪ Breastfeeding ▪ Obesity Factors and Trends	
Pregnancy and Birth Outcomes (N=7)	▪ Infant Health and Mortality ▪ Maternal Health and Behavior	
WIC Administration (N=13)	▪ Food Packages ▪ Program Access and Participation	▪ Prices, Vouchers, and Rebates ▪ Program Operations (Caseload, Data Measures, and Collection)

B. WIC REGIONAL OFFICE INTERVIEWS

In February 2015, the study team interviewed each of the seven FNS WIC regional offices. The pre-interview survey is available in Appendix D and the WIC regional office interview guide is available in Appendix E.

Regional Office Interview Objectives

The objectives of the interviews with each of the seven WIC regional offices were to:

1. Update on the current status of State MIS and EBT projects underway within each region;
2. Gain an overview of the participant and administrative data that are not reported routinely to FNS that would be useful for program management performance assessment, describing program and participant characteristics, assessing integrity, and monitoring;

3. Discuss challenges and opportunities for data collection and management improvement; and
4. Learn about the guidance or assistance that WIC regional offices provide to State agencies regarding MIS and EBT projects or data collection and reporting for program management.

Regional Office MIS Survey

The study team sent a pre-interview survey (see Appendix D) to each of the regional offices to collect information on the MIS status of State agencies in their regions (i.e., MIS platform, system age, types of data collected, and system enhancement plans). Exhibit 6 lists the State agencies that appeared in the regional office survey results.

Exhibit 6: State Agency Input by Regional Office

Regional Office	Survey Results for State Agencies
1. Mid-Atlantic (MARO)	Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania, Puerto Rico, U.S. Virgin Islands, Virginia, West Virginia
2. Mid-West (MWRO)	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
3. Mountain Plains (MPRO)	Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, North Dakota, South Dakota, Utah, Wyoming, Cheyenne River Sioux Tribe (SD), Eastern Shoshone (WY), Northern Arapaho (WY), Omaha Nation (NE), Rosebud Sioux Tribe (SD), Santee Sioux Nation (NE), Standing Rock Sioux Tribe (ND), Three Affiliated Tribes (ND), Ute Mountain Ute Tribe (CO), Winnebago Tribe (NE)
4. Northeast (NERO)[18]	Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont
5. Southeast (SERO)[19]	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee
6. Southwest (SWRO)[20]	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
7. Western Regional Office (WRO) [21]	Alaska, American Samoa, Arizona, California, Guam, Hawaii, Idaho, Commonwealth of Northern Mariana Islands, Nevada Oregon, Washington

[18] The following ITOs did not appear in the NERO survey results: Indian Township Passamaquoddy Reservation (ME), Pleasant Point Passamaquoddy Reservation (ME), and Seneca Nation (NY).
[19] The following ITOs did not appear in the SERO survey results: Mississippi Band of Choctaw Indians (MS), Eastern Band of Cherokee Indians (NC).
[20] The following ITOs did not appear in the SWRO survey results: Chickasaw Nation; Oklahoma ITOs: Wichita Caddo and Delaware Tribes (OK), Citizen Potawatomi Nation (OK), Cherokee Nation of Oklahoma (OK), Muscogee Creek Nation (OK), Otoe-Missouria (OK), Inter-Tribal Council (ITC) of Oklahoma (OK), Osage Nation (OK), and Choctaw Nation (OK); New Mexico ITOs: Five Sandoval Pueblos (NM), Acoma Canoncito & Laguna (NM), Pueblo Of Isleta (NM), Zuni Pueblo (NM), Eight Northern Pueblos (NM), Santo Domingo Pueblo (NM), and San Felipe Pueblo (NM).
[21] The following ITOs but did not appear in the WRO regional office survey results: Inter-Tribal Council of Arizona (AZ), Navajo Nation (AZ), and the Inter-Tribal Council of Nevada (NV).

Elements of the Regional Office Interview Guide

- Duration: 60–90 minutes
- Format: Open-ended questions
- Interview Method: Telephone conference call
- Key Focus Areas: (based on the objectives described above)
  I. The Current State of WIC MIS
  II. Participant and Administrative Data
  III. Challenges and Opportunities for Improving Data Accessibility and Reporting
  IV. Regional Office Program Support

The study team sent a copy of the interview guide (see Appendix E) to each regional office before the scheduled interview. During the regional office interviews, staff provided details regarding the status of State MIS and EBT projects underway in their respective regions. They also provided an overview of the guidance they provide to State agencies regarding system enhancements, data collection, and reporting.

C. WIC STATE AND LOCAL AGENCY INTERVIEWS

Between April and July 2015, the study team conducted interviews with eight WIC State agencies and one local agency. The WIC State agency interview guide is available in Appendix F and the WIC local agency interview guide is available in Appendix G.

The study team selected these State agencies from six FNS regions to achieve geographic diversity and to learn about the MIS used by as many State agencies as possible. The study team focused on State agencies that share MIS with other State agencies as part of either a SAM consortium or a non-SAM consortium.[22] During the interviews, the State agencies were asked to share knowledge about other members within their consortium.

The study team interviewed one State agency from each SAM consortium: North Carolina from the Crossroads consortium, Colorado from the Mountain Plains State Consortium (MPSC), and Chickasaw Nation from the Successful Partners in Reaching Innovative Technology (SPIRIT).[23] The study team also interviewed State agencies from non-SAM consortia with three or more members: Arizona for the Health and Nutrition Delivery System (HANDS), Kansas for the Multi-State Consortium (MSC), and Maryland for the WIC on the Web (WOW).

Finally, the study team also interviewed Missouri and New York because these State agencies have creative ways of using WIC data or linking WIC data to other available data sets. New York is the only State agency interviewed that is not part of a consortium and operates a legacy system. The study team selected California's Public Health Foundation Enterprises (PHFE), the only local agency interviewed, for its large size and broad range of activities in WIC.

[22] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *MIS: State Agency Model (SAM) project fact sheet-WIC SAM project overview*. Retrieved from www.fns.usda.gov/wic/state-agency-model-sam-project-fact-sheet-wic-sam-project-overview

[23] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *Status of WIC SAM projects—as of 7/16/15*. Retrieved from http://origin.drupal.fns.usda.gov/sites/default/files/apd/SAM_Status_Chart.pdf

Exhibit 7 lists the WIC State agencies and the local agency that participated in the WIC data collection interviews, the agency's regional office, and the rationale for selection. The 8 State agencies interviewed represent systems that cover 42 of the 90 total WIC State agencies (47%); they include 20 States, 4 U.S. territories, and 18 ITOs. The WIC MIS used by each State agency within each WIC region varies. For example, the Mid-Atlantic Regional Office noted that Maryland, Delaware, and the U.S. Virgin Islands operate WOW, Virginia and West Virginia use Crossroads, and New Jersey, Pennsylvania, and the District of Columbia operate WIC Access, Quick WIC, and CARES, respectively. (Note that the materials that informed the rational for selection were obtained from public websites.)

Exhibit 7: Summary of WIC State Agencies and Local Agency Interviewed

Agency	Regional Office	Rationale for Selection
Arizona	Western (WRO)	▪ State agency in a consortium operating a modern MIS: HANDS ▪ Consortium members: Arizona, American Samoa, Guam, Commonwealth of the Northern Mariana Islands, Navajo Nation[24]
Chickasaw Nation	Southwest (SWRO)	▪ State agency in a SAM consortium operating a modern MIS: SPIRIT ▪ Implemented EBT in 2010 ▪ SPIRIT is the largest WIC MIS consortium with 23 members across five regional offices: Alaska, Arkansas, Chickasaw Nation, Maine, Minnesota, Mississippi, Missouri, Montana, two Maine ITOs, six New Mexico ITOs, and seven Oklahoma ITOs[25]
Colorado	Mountain Plains (MPRO)	▪ State agency in a SAM consortium operating a modern MIS: MPSC ▪ Consortium members: Colorado, North Dakota, Utah, Vermont, Wyoming[26]
Kansas	Mountain Plains (MPRO)	▪ State agency in a consortium operating a modern MIS: MSC ▪ Consortium members from two WIC regional offices: Inter-Tribal Council of Arizona, Kansas, New Hampshire[27]
Maryland	Mid-Atlantic (MARO)	▪ State agency in a consortium operating a modern MIS: WOW ▪ Consortium members: Delaware, Maryland, U.S. Virgin Islands[28]
Missouri	Mountain Plains (MPRO)	▪ State agency in a SAM consortium operating a modern MIS: SPIRIT ▪ Missouri is part of the SPIRIT consortium but it has not implemented EBT ▪ Uses data linkages with Medicaid and Vital Records to examine program outcomes

[24] CMA Consulting Services. (n.d.). Arizona WIC – HANDS. Retrieved from http://cma.com/success-stories/arizona-wic-hands

[25] Maine ITOs: Indian Township Passamaquoddy Reservation (ME) and Pleasant Point Passamaquoddy Reservation (ME). New Mexico ITOs: Acoma Canoncito & Laguna (NM), Eight Northern Pueblos (NM), Five Sandoval Pueblos (NM), San Felipe Pueblo (NM), Santo Domingo Pueblo (NM), and Zuni Pueblo (NM). Oklahoma ITOs: Choctaw Nation (OK), Citizen Potawatomi Nation (OK), Inter-Tribal Council of Oklahoma (OK), Muscogee Creek Nation (OK), Osage Nation (OK), Otoe-Missouria (OK), and Wichita, Caddo, and Delaware Tribes (OK). Source: U.S. Department of Agriculture, Food and Nutrition Service. (2015). Status of WIC SAM projects—as of 7/16/15. Retrieved from http://origin.drupal.fns.usda.gov/sites/default/files/apd/SAM_Status_Chart.pdf

[26] U.S. Department of Agriculture, Food and Nutrition Service. (2015). Status of WIC SAM projects—as of 7/16/15. Retrieved from http://origin.drupal.fns.usda.gov/sites/default/files/apd/SAM_Status_Chart.pdf

[27] Thomason, D., & Sadler. R. (n.d.). Common Ground: How States Take an Uncommon Approach to Common MIS Problems. Retrieved from https://s3.amazonaws.com/aws.upl/nwica.org/davethomason_ryansadler_commonground.pdf

[28] Ibid.

Agency	Regional Office	Rationale for Selection
New York	Northeast (NERO)	▪ State agency is operating a legacy MIS that was implemented in 2001: WIC Statewide Information System (WICSIS) ▪ New York is planning to replace its current MIS
North Carolina	Southeast (SERO)	▪ State agency in a SAM consortium operating a modern MIS: Crossroads ▪ Consortium members: Alabama, North Carolina, Virginia, West Virginia[29]
Public Health Foundation Enterprises (PHFE)	Western (WRO)	▪ WIC local agency based in California. ▪ Strong research unit with extensive use of data for program management ▪ Uses a local agency-designed reporting system—Raptor. Raptor receives data updates from the California State WIC System on the 4th of each month

As noted, the study team interviewed one local agency. The local agency interviewed is unusual for its large size and its mission beyond WIC as a nonprofit organization. Thus, the ways in which it uses data collected both for WIC and internal goals and purposes is valuable for this study.

Interview Objectives

The objectives of the interviews with WIC State agencies were to:

1. Determine the current status of the MIS and EBT projects underway in their State or consortium;
2. Understand how data are used for program management, performance monitoring, and measuring outcomes;
3. Determine challenges and opportunities for improvement; and
4. Explore the effects of policy changes (e.g., food package changes, nutrition risk codes) on WIC data collection and reporting.

Elements of the State Agency Interview Guide

The study team developed interview guides based on the overall research objectives, feedback from FNS, and information collected from documented WIC MIS data. See Appendix F for the State agency interview guide and Appendix G for the local agency interview guide. The study team refined the interview guides using information received from the regional office interviews.

The study team conducted initial interviews with Maryland, Kansas, Colorado, and North Carolina during April and May 2015. After the initial interviews, the study team assessed the interview questions, the format, and the interview method to see if revisions were required. In July 2015, the study team conducted the remaining State agency interviews with Arizona, Chickasaw Nation, Missouri, and New York and one local agency interview with California's PHFE.

The study team used an open-ended question format to give richness and depth to the data. This format allowed the study team to explore and probe for more detail when needed. The interview guides contain the following elements:

- Duration: 1 hour
- Format: Open-ended questions

[29] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *Status of WIC SAM projects—as of 7/16/15.* Retrieved from http://origin.drupal.fns.usda.gov/sites/default/files/apd/SAM_Status_Chart.pdf

- Interview Method: Telephone conference call for State agencies and a webinar for the local agency
- Key Focus Areas: (based on the objectives described above)
  I. The Current State of WIC MIS
  II. Participant and Administrative Data (Not applicable to the local agency interview guide)
  III. Challenges and Opportunities for Improving Data Accessibility and Reporting
  IV. Regional Office Program Support (Not applicable to the local agency interview guide)

Collect State Agency Data Dictionary and System Documentation

The study team requested an MIS data dictionary and available system documentation from each WIC State agency at the conclusion of each interview.

- The study team received six data dictionaries from the State agencies for the following MIS: Crossroads, HANDS, MPSC, MSC, SPIRIT, and WOW. Chickasaw Nation and Missouri use the SPIRIT system and share a similar data dictionary.
- The study team received user manuals for the following MIS: HANDS, Crossroads, and SPIRIT.

D. WIC STAKEHOLDER WORKSHOP AND TASK FORCE MEETINGS

This section summarizes the WIC Stakeholder Workshop and task force meetings facilitated for this study.

The study team planned and facilitated a half-day WIC Stakeholder Workshop on January 28, 2016, in Washington DC. The workshop convened sixteen WIC subject matter experts from outside the FNS. These individuals included WIC program administrators (from WIC State and local agencies), WIC researchers (universities, the Centers for Disease Control and Prevention and the Health Resources and Services Administration of the U.S. Department of Health and Human Services, and the U.S. Census Bureau), and WIC advocates (e.g., the National WIC Association, and Center on Budget and Policy Priorities). Eleven stakeholders attended the workshop in-person, and five stakeholders participated virtually. The workshop agenda is available in Appendix H.

The study team also planned and facilitated three task force meetings with internal FNS staff members. The task force members provided feedback and guidance on the WIC Data Collection Study.

1. November 16, 2015 – Review and discuss the results of the WIC Data Collection Study to date
2. November 18, 2015 – Review and discuss the agenda for the half-day WIC Stakeholder Workshop
3. February 24, 2016 – Review initial recommendations of the WIC Data Collection Study

E. WIC MIS DOCUMENT REVIEW

This section summarizes the WIC MIS documents reviewed for this study.

The study team collected and reviewed the WIC State Plans (Part III—Information Systems), State agency system documentation (e.g., MIS data dictionaries and system user guides), and additional documents and reports from WIC conferences and Internet searches. Exhibit 8 lists the types of documents reviewed, with a description and source information.

Exhibit 8: Summary of WIC Documents Reviewed

WIC Documents	Description	Source
WIC State Plans (Part III—Information Systems)	▪ The WIC State Plan describes the State agency's objectives and procedures for WIC program administration. The study team collected and reviewed 85 Fiscal Year (FY) 2015 WIC State Plans: Part III—Information System.[30]	FNS
MIS Documents Collected from WIC State Agency Interviews	▪ The study team reviewed six WIC MIS data dictionaries (Crossroads, HANDS, MPSC, MSC, SPIRIT, and WOW) to assess the data available on WIC MIS. ▪ The study team also collected user guides and other system documentation to provide a better understanding of the MIS.	State agency interview participants
Additional Documents and Reports	▪ The study team reviewed additional documents and reports obtained through WIC conferences and Internet searches. These documents are referenced throughout the study.	Web searches and WIC conference presentations

[30] The study team did not receive a FY 2015 WIC State Plan for one State agency (Mississippi) and four ITOs (Eastern Shoshone, Eastern Band of Cherokee Indians, Mississippi Band of Choctaw Indians, and Omaha Nation).

F. STUDY LIMITATIONS

There were several limitations that should be considered when reviewing this report:

- This study provides an overview of the current status of State agency MIS using secondary research and interviews with eight State agencies and one local agency. Although seven of the eight State agencies the study team interviewed share a common MIS with other States, feedback was nonetheless only obtained *directly* from eight of the 90 State agencies.
- Seven of the eight State agencies the study team interviewed use a modern MIS. Only one State agency uses a legacy system. Additional interviews with State agencies using legacy information systems would be helpful to validate this report's findings.
- The study team interviewed one local WIC agency, PHFE in California, as part of this report. PHFE is the largest local WIC agency in the country, and its operations, therefore, are not representative of other WIC local agencies nationwide.
- The study team collected data dictionaries for six MIS (Crossroads, HANDS, MPSC, MSC, SPIRIT, and WOW). The data dictionary catalogs the data elements stored within each WIC MIS. It includes the field name, field description, data type (e.g., alphanumeric), data size/length, data values, etc. Exhibit 9 summarizes the information available for each State agency's WIC MIS data dictionary. All the data dictionaries provided the field name and a basic field description. Not all State agencies that share the same data dictionary utilize the same data fields. For example, Missouri and Chickasaw Nation share the SPIRIT system and the same data dictionary, but only Chickasaw Nation utilizes EBT data elements. The data dictionaries do not indicate which data elements are used by which State agencies. The study team would need to interview each State agency sharing the same data dictionary to assess accurately the data available on their MIS.

Exhibit 9: Information Available from WIC MIS Data Dictionaries

WIC MIS	Field Name	Field Description	Data Type	Data Size	Data Values
Crossroads	✓	✓			
HANDS	✓	✓	✓	✓	
MPSC	✓	✓	✓	✓	
MSC	✓	✓	✓	✓	
SPIRIT	✓	✓	✓	✓	✓
WOW	✓	✓			✓

III. RESEARCH RESULTS—STATUS OF WIC INFORMATION SYSTEMS

State agency MIS address key functions that are designed to deliver participant services (e.g., ensure participants have access to nutritious foods) and manage program operations (e.g., ensure vendors are paid for food items purchased). The research results are divided into five sections:

1. ***Current Status of WIC Information Systems:*** This section provides a current status of the WIC State agency MIS regarding data collection, storage, and retrieval.
2. ***WIC Information System Enhancement Plans:*** This section summarizes the status of the WIC MIS modernization and EBT implementation efforts.
3. ***WIC Information System Capabilities:*** This section reviews the WIC State agencies' MIS capabilities, including the modules available within the MIS user interface, the functions/capabilities performed on State agencies' MIS based on the WIC Functional Requirements Document (FReD),[31] and the data reported to FNS.
4. ***WIC Information System Modifications:*** This section explores the effort involved in making changes to the WIC information system.
5. ***WIC Information System Challenges and Opportunities:*** This section highlights WIC MIS challenges and opportunities.

A. CURRENT STATUS OF WIC INFORMATION SYSTEMS

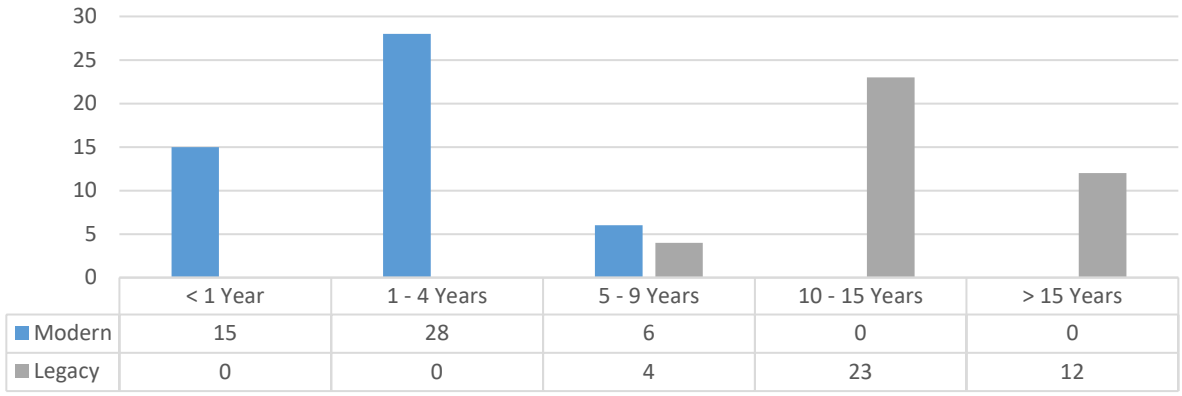
Section A summarizes the current status of the WIC State agency MIS regarding data collection, storage, and retrieval. (Appendix I lists the status of all State agency MIS)[32] Results compiled from the WIC regional office survey indicate that half of WIC State agencies use a modern WIC MIS based on a SAM or non-SAM system. Many of these systems use modern Web technology that includes a Web-based Microsoft .NET system framework (v3.5 or 4.0) with a relational database management system (RDBMS). The majority of these State agencies belong to consortia ranging from three to 24 State agency members. These consortia share an MIS and collectively are responsible for system changes and the overall integrity of the system.

1. Overview of WIC Systems

The study team compiled data collected from the FNS regional office survey conducted in February 2015. The study team validated the survey results during the eight State agency interviews and using information extracted from the WIC State Plans. Exhibit 10 provides an overview of the 90 WIC State agencies' MIS by the current system age as of February 2015. Overall, half of the WIC State agencies operate a modern MIS. Appendix I provides the MIS status and system enhancement plan by State agency.

[31] The Functional Requirements Document (FReD) for a Model WIC System provides a comprehensive description of functions that must be automated to support the WIC program.
[32] The status of State agency MIS was collected during the regional office interviews in February and March 2015.

Exhibit 10: Overview of WIC State Agency MIS by Age as of February 2015[33]



Source: Regional office MIS survey and data provided by FNS

Most of the State agencies operating a modern system implemented the MIS in the past five years. Many of these systems use modern Web technology that includes a Web-based Microsoft .NET system framework (v3.5 or 4.0) with a RDBMS.

Most of the State agencies operating a legacy system implemented the MIS more than nine years ago. Many of these legacy systems, although still functional, are operating within older design architectures that are inflexible and often costly to update or enhance. Exhibit 11 compares the features of the legacy and modern WIC information systems.

Exhibit 11: Comparison of Legacy and Modern WIC MIS

Features	Legacy MIS	Modern MIS
System Components	Older, Less Flexible Technology	Modular, Flexible, Scalable
Application	Custom Application	Open Source Application
Vendor	Vendor Dependent	Vendor Independent
User Interface	Static Screens	Dynamic Interactive Screens
Development Model	Independent	Consortium
Development Funds	Low Priority Grants	Higher Priority Grants
Maintenance Costs	Costs Remain Solely with the State Agency	Costs Distributed Across State Agencies Sharing an MIS

Source: State Agency Interviews

Below are two examples of State agencies that recently upgraded to a modern information system. North Carolina cited out-of-date design, dated technology, costly system enhancements, and changes in program requirements as their business case to replace their aging legacy system with

[33] Regional office surveys did not indicate the MIS status for eight ITOs: Cherokee Nation of Oklahoma, Citizen Potawatomi, Eastern Band of Cherokee Indians, Indian Township Passamaquoddy, Inter-tribal Council of Nevada, Pleasant Point Passamaquoddy, Pueblo of Isleta, and Seneca Nation. FNS subsequently provided an update for the remaining ITOs except Cherokee Nation of Oklahoma and Seneca Nation.

the Crossroads system.[34] Idaho's legacy system, since replaced with an update in 2012, was created in 1994 on an IBM mainframe system using the Natural programming language coupled to an Adabas database. The mainframe presented financial and technical problems and finding experienced and talented programmers who could program in Natural and work with Adabas was difficult and expensive.[35]

2. Summary of WIC Consortia

Nearly all State agencies operating a modern MIS are part of a consortium using a SAM or a non-SAM model. Several State agencies such as Ohio and Massachusetts have custom systems using more contemporary technology and are not part of a consortium.

In 2002, FNS initiated SAM at the request of the Office of Management and Budget (OMB) as a strategy to reduce costs through shared approaches. OMB's philosophy on WIC State agency system planning, development, and deployment is: "*Build it once and replicate it many times*."

In April 2004, FNS solicited applications from State agencies interested in participating in a SAM consortium. FNS selected three consortia to develop model systems: Crossroads, MPSC, and SPIRIT.[36]

The SAM consortia received priority funding to build a Web-based system incorporating standard WIC data elements, modular components, and an open-system architecture. To optimize its investment, FNS requires State agencies planning to replace their MIS to consider transferring to a SAM system. The benefits of a SAM are as follows:

- SAMs are fully functional and EBT-functional;
- State agencies may receive priority funding for model system transfer and implementation; and
- Future enhancements (e.g., a new regulation) are shared by all participating State agencies as a one-time cost.

Acquisition or transfer of a modern non-SAM system occurs when it is determined, through an alternatives analysis, that a SAM system is not viable. Potential reasons may include:

- The SAM is inconsistent with a State agency's mandated software/hardware requirements; or
- The SAM is not compatible with a State agency's needs for an integrated system.

Ultimately, State agencies interested in transferring a SAM or a modern non-SAM system as a member of a consortium[37] have two options:

[34] CMA Consulting Services. (n.d.). *Arizona WIC – HANDS*. Retrieved from http://cma.com/success-stories/arizona-wic-hands on October 1, 2015.
[35] Idaho Department of Health and Welfare. (2012). *WIC Information System Program: WISPr*. Retrieved from http://ita.idaho.gov/awards/2012/WISPr.pdf
[36] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *Status of WIC SAM projects—as of 7/16/15*. Retrieved from http://www.fns.usda.gov/sites/default/files/apd/SAM_Status_Chart.pdf
[37] Any SAM or non-SAM may be transferred by a State agency, but each State agency must pay for enhancements separately and national technology grants are limited to 75 percent of the cost.

1. Transfer the code and join the user group. (A user group is a consortium of State agency representatives who share system capabilities and collaborate to maintain system integrity and manage system changes.)
2. Transfer the code and make the desired changes as a "*stand-alone*" system without joining the user group.

State agencies that participate in a consortium and transfer or replicate an existing SAM or non-SAM system save on technology expenditures because the software enhancement costs typically are incurred once and distributed among all State agencies within the consortium's user group.

Many State agencies operating a modern MIS belong to a SAM or non-SAM consortium. Exhibit 12 provides an overview of the key WIC systems.

Exhibit 12: Overview of Key WIC MIS Systems

MIS Systems (Year Implemented)	Total	< 1 Year	1 – 4 Years	5 – 9 Years	10 – 15 Years	> 15 Years	No Data
State Agencies	*90*	*15*	*28*	*10*	*23*	*12*	*2*
Modern Systems	*49*	*15*	*28*	*6*	*0*	*0*	N/A
Crossroads (2014)	5	3	1	1	0	0	N/A
HANDS (2015)	5	5	0	0	0	0	N/A
MPSC (2011)	3	0	3	0	0	0	N/A
MSC (2011)	3	0	2	1	0	0	N/A
SPIRIT (2007)[38]	24	5	18	1	0	0	N/A
WOW (2007)	3	1	1	1	0	0	N/A
Other Modern Systems	6	1	3	2	0	0	N/A
Legacy Systems	*39*	*0*	*0*	*4*	*23*	*12*	N/A
WINDS (1996)	10	0	0	0	10	0	N/A
Other Legacy Systems	29	0	0	4	13	12	N/A
No Data[39]	2	N/A	N/A	N/A	N/A	N/A	N/A

Source: Regional office MIS survey and WIC State Plans

These consortia share MIS capabilities (e.g., user group, staff resources, and system costs). SPIRIT is the largest consortium with 24 State agency members across five WIC regions. Other consortia have between three and five members.

[38] SPIRIT is the oldest of the current SAM projects. The system is in the latter phase of its system life cycle, which has prompted the State agencies involved to examine future technological upgrades in architecture, hardware, and software.

[39] Regional office surveys did not indicate the MIS status for eight ITOs: Cherokee Nation of Oklahoma, Citizen Potawatomi, Eastern Band of Cherokee Indians, Indian Township Passamaquoddy, Inter-tribal Council of Nevada, Pleasant Point Passamaquoddy, Pueblo of Isleta, and Seneca Nation. FNS subsequently provided an update for the remaining ITOs except for Cherokee Nation of Oklahoma and Seneca Nation.

Five State agencies are operating a modern Web-based MIS and currently are not part of a consortium: Michigan operates the Michigan WIC system (MI-WIC),[40] Florida operates the WIC Information System and EBT (WiSE),[41] Idaho operates the WIC Information Systems Program (WISPr), Wisconsin operates the WIC Real-time On-line Statewide Information Environment (ROSIE), and Massachusetts operates the Eos. Several State agencies will transfer to the Florida WiSE system in 2016.

The Native American Technical Information Operating Networking System (NATIONS), comprised of 10 ITOs, is the only consortium that operates a legacy system, WIC Indian Networking Data Systems (WINDS).[42]

Exhibit 13 provides a summary of key WIC consortia, including the year that the first MIS was implemented in each consortium, a system description, and the State agency members. Note: some State agencies' MIS retain the same name as their consortium; others have branded their MIS with a new name. For example, the MSC system is known as "Kansas WIC (KWIC)" in Kansas, "StarLINC" in New Hampshire, and "STARS" in Inter-Tribal Council of Arizona.

Exhibit 13: Summary of Key WIC MIS Consortia/MIS as of September 2015

MIS Consortium	System Description	State Agency Members
Crossroads[43] *(SAM consortium)*	▪ Implemented in 2014 ▪ Microsoft .NET v4 technology ▪ Microsoft Structured Query Language (SQL) Database ▪ Window Presentation Foundation (WPF)	Members: Alabama, North Carolina, Virginia, and West Virginia
HANDS	▪ Implemented in 2015 ▪ Microsoft .NET framework ▪ MVC architecture using an Oracle Database Server	Members: Arizona, American Samoa, Guam, Navajo Nation, and the Commonwealth of the Northern Mariana Islands
MPSC *(SAM consortium)*	▪ Implemented in 2011 ▪ Web-based application Microsoft's .NET ▪ Microsoft SQL Server ▪ Framework, open-system architecture	Members: Colorado, North Dakota, Utah, Vermont, and Wyoming

[40] Michigan updated the MD WOW system to adapt to EBT. This system is now being transferred or has been transferred to Indiana, Delaware, the Virgin Islands, and Connecticut. Connecticut has chosen to use a SQL database instead of Oracle.
[41] Florida's WiSE, implemented in 2014, is a transfer and modification of the MI-WIC system.
[42] NATIONS includes 10 ITOs: Cheyenne River Sioux Tribe (SD), Eastern Shoshone (WY), Northern Arapaho (WY), Omaha Nation (NE), Rosebud Sioux Tribe (SD), Santee Sioux Nation (NE), Standing Rock Sioux Tribe (ND), Three Affiliated Tribes (ND), Ute Mountain Ute Tribe (CO), and Winnebago Tribe (NE).
[43] Jackson, C. (2014). *Crossroads: Electronic Benefit Transfer (EBT) User Group Meeting – July 2014.* Retrieved from http://www.fns.usda.gov/sites/default/files/wic/2014-WICEBTUGM-SAMStatus-Crossroads-CJackson.pptx

MIS Consortium	System Description	State Agency Members
MSC	▪ Implemented in 2011 ▪ .NET system client-server based, distributed database with graphical user interface screens ▪ Microsoft SQL Server	Members: Kansas, Inter-Tribal Council of Arizona, and New Hampshire
SPIRIT *(SAM consortium)*	▪ Implemented in 2007 ▪ Microsoft .NET v3.5 framework ▪ Microsoft Windows Server 2008 ▪ Microsoft SQL Server 2008	Members: Alaska, Arkansas, Chickasaw Nation, Maine, Minnesota, Mississippi, Missouri, Montana, Maine ITOs, New Mexico ITOs, and Oklahoma ITOs44
WINDS	▪ Implemented in 1996 ▪ Legacy system	Native American Technical Information Operating Networking System (NATIONS) Members: Cheyenne River Sioux Tribe (SD), Eastern Shoshone (WY), Northern Arapaho (WY), Omaha Nation (NE), Rosebud Sioux Tribe (SD), Santee Sioux Nation (NE), Standing Rock Sioux Tribe (ND),Three Affiliated Tribes (ND), Ute Mountain Ute Tribe (CO), and Winnebago Tribe (NE)
WOW	▪ Implemented in 2007 ▪ Web-based Microsoft .NET system with an Oracle Database Server	Members: Maryland, Delaware, and U.S. Virgin Islands

Source: Compiled from the regional office MIS survey and WIC State Plans

B. WIC INFORMATION SYSTEM ENHANCEMENT PLANS

Section B summarizes the status of the WIC MIS modernization and EBT implementation efforts. Based on an analysis of the WIC State Plans, three priorities drive WIC MIS enhancements: replacing aging legacy MIS, enhancing the MIS to interface with EBT, and revising the MIS to support program directives (e.g., final food package rules). EBT implementation will provide WIC with additional data to support WIC programming decisions, program integrity, and vendor management and provide better research and analytics.

[44] Maine ITOs: Indian Township Passamaquoddy Reservation (ME) and Pleasant Point Passamaquoddy Reservation (ME). New Mexico ITOs: Acoma Canoncito & Laguna (NM), Zuni Pueblo (NM), Santo Domingo Pueblo (NM), Five Sandoval Pueblos (NM), Eight Northern Pueblos (NM), and San Felipe Pueblo (NM). Oklahoma ITOs: Citizen Potawatomi Nation (OK), Muscogee Creek Nation (OK), Wichita, Caddo, and Delaware Tribes (OK), Otoe-Missouria (OK), Inter-Tribal Council of Oklahoma (OK), Osage Nation (OK), and Choctaw Nation (OK).

Generally, the total project cost determines whether the activity is a major or minor enhancement. Major system enhancements (such as replacing or implementing a new system) typically require substantial investment dollars. These enhancements require the State agency to submit an Advance Planning Document (APD) to their FNS regional office for approval.[45]

Minor system enhancements typically involve changes to an existing system using funding from the operations or maintenance budget. These enhancements may include supporting program directives such as final food package rules or automating functionality required by FReD. Minor enhancements may or may not require FNS regional office approval depending on the total project cost.

1. WIC Information System Upgrade Status

The WIC regional office study collected each State agency's plans to upgrade or replace their current MIS within the next two or three years. Exhibit 14 summarizes State agencies' WIC MIS replacement plans by current MIS age.

Exhibit 14: WIC MIS Enhancement Plans for all State Agencies by MIS Age

Age of Current MIS	# State Agencies	Legacy System	System Replacement Plans
< 1 Year	15	0	No Major Plans
1–4 Years	28	0	No Major Plans
5–9 Years	10	4	3
10–15 Years	23	23	22
> 15 Years	12	12	11
No Data Available	2	NA	N/A
Total	90	39	36

Source: Regional office MIS survey

State agencies operating a modern MIS do not have plans to upgrade or replace their system. Thirty-six State agencies (90%) operating a legacy MIS plan to replace their MIS in the next two to three years. Appendix I provides details on major and minor system enhancement plans by State agency.

- Several State agencies are planning a transfer to the MPSC system, including Iowa, Nebraska, Nevada, North Dakota, Pennsylvania, South Dakota, and Vermont.
- Washington is planning a transfer to the Crossroads system.
- New York is planning to upgrade their MIS and may transfer to one of the systems.
- The NATIONS consortium is planning a transfer of the WIC on the Web/Michigan WIC (WOW/MI-WIC) system.

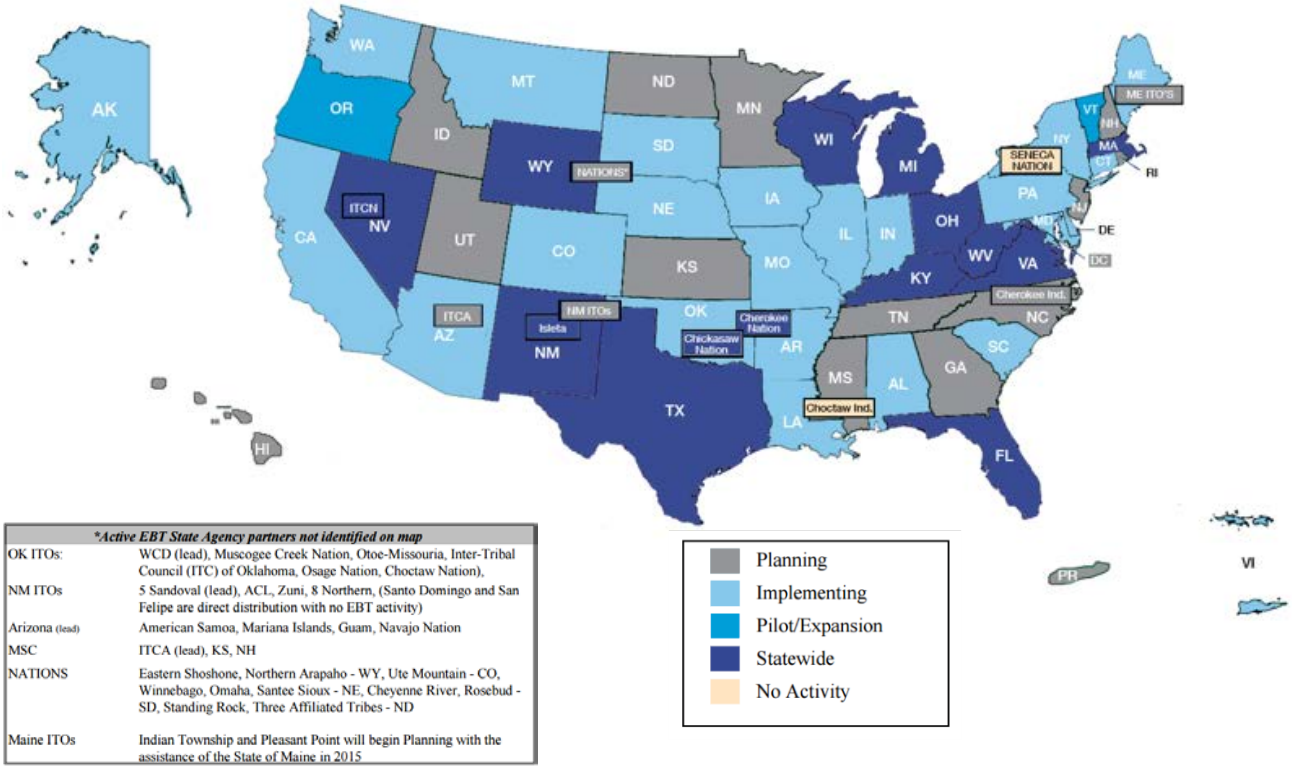
[45] Major system enhancements generally pertain to new technology investments that require special funding, resources, and business requirements documents (e.g., Replacing the WIC MIS, EBT Implementation). Minor enhancements generally pertain to changes or additions to system operations and maintenance utilizing existing resources.

2. WIC EBT Implementation Status

EBT is an electronic system that replaces paper food instruments with an electronic payment card for food benefit issuance and redemption at authorized WIC stores. On December 13, 2010, President Obama signed into law the Healthy, Hunger-Free Kids Act of 2010 mandating each WIC State agency to implement an EBT-compatible WIC system by October 1, 2020.[46]

Exhibit 15 provides an overview of the WIC EBT activity as of November 23, 2015. Appendix J details EBT implementation status by WIC State agency. Some State agencies refer to EBT as eWIC.

Exhibit 15: WIC EBT Activity Map as of November 23, 2015[47] See Appendix J for an Enlarged Image.



*Active EBT State Agency partners not identified on map	
OK ITOs:	WCD (lead), Muscogee Creek Nation, Otoe-Missouria, Inter-Tribal Council (ITC) of Oklahoma, Osage Nation, Choctaw Nation),
NM ITOs	5 Sandoval (lead), ACL, Zuni, 8 Northern, (Santo Domingo and San Felipe are direct distribution with no EBT activity)
Arizona (lead)	American Samoa, Mariana Islands, Guam, Navajo Nation
MSC	ITCA (lead), KS, NH
NATIONS	Eastern Shoshone, Northern Arapaho - WY, Ute Mountain - CO, Winnebago, Omaha, Santee Sioux - NE, Cheyenne River, Rosebud - SD, Standing Rock, Three Affiliated Tribes - ND
Maine ITOs	Indian Township and Pleasant Point will begin Planning with the assistance of the State of Maine in 2015

By the end of 2016, 24 State agencies (27%) will complete the statewide rollout of EBT. The progress of the State agencies in rolling out EBT statewide by year follows:

- ***EBT statewide rollout in 2015:*** Sixteen State agencies will have completed the statewide rollout of EBT by the end of 2015: Cherokee Nation of Oklahoma, Chickasaw Nation of Oklahoma, Florida, Kentucky, Inter-Tribal Council of Nevada, Massachusetts, Michigan, Nevada, New Mexico, Ohio, Pueblo of Isleta of New Mexico, Texas, Virginia, West Virginia, Wisconsin, and Wyoming.

[46] The Healthy, Hunger-Free Kids Act of 2010 states that no "later than October 1, 2020, each State agency shall be required to implement [EBT] systems throughout the State, unless the Secretary grants an exemption . . . for a State agency that is facing unusual barriers to implement an [EBT] system." Healthy, Hunger-Free Kids Act of 2010, Pub. L. No. 111–296. Retrieved from http://www.gpo.gov/fdsys/pkg/PLAW-111publ296/pdf/PLAW-111publ296.pdf

[47] U.S. Department of Agriculture, Food and Nutrition Service. (2016). *State agency detail EBT status report*. Retrieved from http://www.fns.usda.gov/wic/wic-ebt-activities

- ***EBT statewide rollout in 2016:*** Eight State agencies plan to complete the statewide rollout of EBT by the end of 2016: Colorado, Connecticut, Delaware, Indiana, Iowa, Oklahoma, Oregon, and Vermont.
- ***EBT statewide rollout in 2017 and beyond:*** Thirty State agencies will implement EBT after 2016 and another thirty-two State agencies are in the planning stages of EBT adoption. Four State agencies (ITOs) have no EBT activity. [48]

Some State agencies operating a legacy system are performing a combined MIS/EBT implementation. This means they will replace the MIS and implement EBT at the same time. The District of Columbia and Tennessee are examples of two State agencies that plan to replace their aging legacy systems as part of a combined MIS/EBT implementation.

Other State agencies that have already rolled out EBT statewide (e.g., Nevada, New Mexico, Texas) are now planning to replace their legacy information systems.

Of the eight State agencies interviewed, only Chickasaw Nation has rolled out EBT. Arizona, Colorado, Maryland, Missouri, New York, and California are in the implementation stage. Kansas and North Carolina are in the planning stage.

3. Impact of EBT on the WIC Information System

The study team asked regional offices and State and local agencies how data usage would change as a result of EBT implementation.

EBT Opportunities for WIC Program Management and Research

State and local agencies reported that they are looking forward to the potential opportunities for EBT data utilization. The transition to electronic processing will generate additional data for WIC program management. The study team summarized the benefits of EBT for data collection reported during the WIC State and local agency interviews:

- ***Programming decisions:*** Participant or household redemption data will be useful for programming decisions. State agencies noted that they will be able to make adjustments to their nutrition education campaigns based on participant food purchasing patterns they observe in EBT transaction data. State agencies also look forward to having the EBT data help guide the selection of allowable foods items (i.e., brands, package sizes) and substitutions (i.e., kefir for milk, etc.)
- ***Program integrity:*** EBT data will be useful for monitoring stores to ensure program integrity and compliance. EBT data will enable State agencies to monitor potential vendor fraud based on the EBT's ability to provide data to analyze and identify abnormal activities.
- ***Vendor management:*** EBT data will support vendor management by allowing State agencies to monitor vendor EBT file submissions and redemptions and react to vendor issues more quickly.

[48] Four ITOs (Mississippi Band of Choctaw Indians, Pueblo of San Felipe, Santo Domingo Tribe, and Seneca Nation) reported no EBT activity.

- ***Improving relationships:*** EBT data will improve the State agencies' relationships with WIC participants, local agencies, and vendors, as real-time information will allow State agency staff to be more responsive to stakeholder needs.
- ***Better research and analytics:*** EBT data will provide enhanced opportunities for research and evaluation. The State agencies see value in analyzing household characteristics using the participants' food purchase patterns and redemption patterns.

> *"This will allow State agencies to look at what participants buy, examine the nutrient content, examine the time of day participants redeem, and identify trends. Do participants shop for all products at one store? Did nutrition counseling work? Nutritionists could see these are what they are buying, are they purchasing the right foods, making sure participants are buying foods that are in season." (Regional office staff, February 6, 2015)*[49]

EBT Challenges for WIC Program Management and Research

- State agencies also noted that ITOs and smaller State agencies with limited staffing and tools will have a difficult time leveraging the full potential that EBT data utilization offers. Smaller State agencies that have already implemented EBT are looking to the larger State agencies for guidance.

C. WIC INFORMATION SYSTEM CAPABILITIES

Section C examines the capabilities performed by WIC MIS based on the WIC Functional Requirements Document (FReD), including the State agencies' ability to provide the MDS/SDS biennially to FNS. Some State agencies also developed electronic interfaces to third-party systems (e.g., State health systems) and devices (e.g., signature pads).

1. WIC MIS Functional Requirements

FReD provides guidance to State agencies on base functions FNS and State agencies agree should be incorporated into their MIS.[50] Appendix K provides a summary of the WIC functional requirements performed by State agencies using a modern or legacy MIS. There are approximately 30 base requirements that govern 12 WIC information system functional areas:

1. Certification
2. System Administration
3. Scheduling
4. Vendor Management
5. Operations Management
6. Caseload Management
7. Financial Management

[49] EBT redemption is linked to a specific EBT card number issued to a family or household. Benefits for each participant in the household often are combined on the card making it difficult to identify foods redeemed at the individual participant level.

[50] U.S. Department of Agriculture, Food and Nutrition Service. (2008). *Functional requirements document for a model WIC information system*. Retrieved from http://www.fns.usda.gov/sites/default/files/FReD%20v2.0%20Final.pdf

8. Food Benefit Redemption, Settlement, and Reconciliation
9. Food Benefit Issuance
10. Food Management
11. Nutrition Education and Health Surveillance and Referrals
12. Reporting

FNS regularly reviews system documentation to ensure that the base functions are included when systems are being planned and developed. State agencies operating a modern MIS designed their systems to support key WIC program operations and management functions, such as certifying applicants, monitoring food vendors, tracking participation and expenditures, and managing appointments. Many MIS WIC functions are organized within the following core modules:

- ***WIC Clinic Module:*** A WIC Clinic Module performs a sequence of events that occur when an individual applies for and receives WIC benefits. The system determines the eligibility of the applicant; captures demographic data; creates, assigns, and maintains benefit prescriptions; and issues and maintains WIC EBT cards for the WIC participant and WIC household.
- ***WIC Scheduler Module:*** A WIC Schedule Module schedules individual participant appointments and group classes. These modules track nutrition education, health surveillance, and referrals.
- ***WIC Vendor Management Module:*** A WIC Vendor Management Module performs the sequence of events that occurs when a retailer applies for and is approved to be a WIC vendor. This module may operate a separate system. This module captures demographic data and establishes data collection, payment, and adjustment processes with the WIC vendor.
- ***WIC Finance Module:*** A WIC Finance Module provides data to enable WIC State agencies to reconcile benefits.
- ***WIC Food Management Module:*** A WIC Food Management Module establishes and maintains the Authorized Product List (APL) of food items for WIC purchase in some WIC State agencies and has the capability to create food instrument-based food package data. The APL is used for EBT although a food list is used for other food delivery methods.
- ***WIC Reporting Module:*** A WIC Reporting Module generates standard reports. Some systems have the capability to produce ad hoc reports.

State agencies create additional functions to support specific needs that are unique to their State agency. Some of these functions include electronic interfaces to third-party systems and devices. These interfaces fall into four categories:

1. ***State*** (such as accounting systems, adjunctive eligibility systems);
2. ***Federal*** (such as the Food Programs Reporting System);
3. ***External Partners*** (such as wichealth.org); and
4. ***Peripherals*** (such as scales, hemoglobin/hematocrit measurement devices, signature pads).

Appendix L provides an overview of MIS capabilities for the State agencies the study team interviewed.

2. WIC MIS Data Available

Each of the WIC MIS contains various types of data. These data are used to administer the WIC program, support research initiatives, as well as other State agency reports outside of FNS. These data are also reported to FNS and included in reports such as WIC PC, FNS-798, etc. Exhibit 16 provides a summary of the data categories that are available in each of the major modern systems. MSG summarized the data categories across six major topics: WIC participant demographics, WIC health and nutrition data- health behaviors, WIC health and nutrition data- breastfeeding, WIC health and nutrition data- nutrition education, WIC food redemption data, and WIC vendor management data. A ✓ indicates that the system includes these data categories, an X indicates it does not.

Exhibit 16: Data Available on Modern MIS

Data Categories	Modern Information Systems						
	Crossroads	HANDS	MPSC	MSC	SPIRIT	WOW[51]	Total
WIC Demographic Data							
Applicant Data (name, contact info)	✓	✓	✓	✓	✓	✓	6
Certification Data (start date, end date, etc.)	✓	✓	✓	✓	✓	✓	6
Certification Termination Data (date, reason, etc.)	✓	✓	✓	✓	✓	✓	6
Clinic Hours	✓	✓	✓	X	✓	X	4
Disability Information	X	✓	X	X	✓	✓	3
Education Level	✓	✓	✓	✓	✓	✓	6
Homeless	✓	✓	✓	✓	✓	✓	6
Income Information	✓	✓	✓	✓	✓	✓	6
Internet Usage	X	X	X	X	X	✓	1
Language Spoken	✓	✓	✓	✓	✓	✓	6
Language Translator Required	X	✓	✓	✓	✓	✓	5
Marital Status	✓	✓	✓	✓	✓	✓	6
Migrant Status	✓	✓	✓	✓	✓	✓	6
Military Status	✓	✓	X	X	✓	✓	4
Race and Ethnicity	✓	✓	✓	✓	✓	✓	6
Voter Registration	✓	✓	✓	X	✓	✓	5
WIC Health and Nutrition Data— Health Behaviors							
Alcohol Consumption	✓	✓	✓	✓	✓	✓	6
Anemia	✓	X	X	X	✓	X	2
Anthropometric—Head Circumference	✓	✓	✓	✓	✓	✓	6
Anthropometric—Weight and Height	✓	✓	✓	✓	✓	✓	6
Bloodwork—Hemoglobin and Hematocrit	✓	✓	✓	✓	✓	✓	6
Body Mass Index (BMI)	✓	✓	X	✓	✓	✓	5
Breast Pump—Issuance	✓	✓	✓	✓	X	X	4

[51] The WOW System stores some of its data in separate systems outside of the MIS. These data do not appear in the WOW's MIS data dictionary.

Data Categories	Modern Information Systems						
	Crossroads	HANDS	MPSC	MSC	SPIRIT	WOW[51]	Total
Food Allergies	X	✓	X	X	✓	✓	3
Immunizations	✓	✓	✓	✓	✓	✓	6
Nutrition History—Mother (eating problems, etc.)	✓	✓	X	X	✓	✓	4
Nutrition History—Child (eating problems, etc.)	✓	✓	X	X	✓	✓	4
Smoking	✓	✓	✓	✓	✓	✓	6
TV Screen Viewing—Child	✓	✓	✓	✓	✓	✓	6
WIC Health and Nutrition Data— Breastfeeding							
Breastfeeding Duration (length of time in weeks, etc.)	✓	✓	✓	✓	✓	✓	6
Breastfeeding Behavior (fully, partially, etc.)	✓	✓	✓	✓	✓	✓	6
Breastfeeding Issues (no milk, etc.)	✓	✓	X	X	X	✓	3
Breast pump	✓	✓	X	✓	X	X	3
WIC Health and Nutrition Data— Nutrition Education							
Clinic Appointment	✓	✓	✓	X	✓	X	4
Nutrition Education Class Enrollment	✓	✓	✓	✓	✓	X	5
Nutrition Education Class Type or Category	✓	✓	✓	✓	✓	X	5
Client Referrals	✓	✓	✓	✓	✓	✓	6
Caseload	✓	✓	✓	✓	✓	X	5
WIC Food Redemption Data							
EBT Redemptions (transaction date, terminal code, vendor ID, purchased units, paid amount)	✓	X	✓	✓	✓	X	4
Farmers' Market	✓	✓	✓	✓	✓	X	5
Food Category	✓	✓	✓	✓	✓	X	5
Food Instrument	✓	✓	✓	✓	✓	X	5
Food Package	✓	✓	✓	✓	✓	✓	6
WIC Vendor Management Data							
Compliance Buys[52]	✓	✓	✓	X	✓	X	4
Vendor Contact Info	✓	✓	✓	✓	✓	X	5
Vendor Integrity Violations	✓	✓	✓	✓	✓	X	5
Vendor Peer Group	✓	✓	✓	✓	✓	X	5
Vendor Price	✓	✓	✓	✓	✓	X	5
Vendor Redemption Amount	✓	✓	✓	✓	✓	X	5
Vendor Risk	✓	✓	✓	✓	✓	X	5
Vendor Status	✓	✓	✓	✓	✓	X	5
Vendor Store Hours	X	✓	✓	✓	✓	X	4

[52] A compliance buy is when a contractor performs covert on-site investigations of vendors by posing as participants and redeeming FIs.

Data Categories	Modern Information Systems						
	Crossroads	HANDS	MPSC	MSC	SPIRIT	WOW[51]	Total
Vendor Store Type	✓	✓	✓	✓	✓	X	5
Vendor Training—Vendor Receives WIC Training	✓	✓	✓	✓	✓	X	5
Vendor Visit—Vendor Monitoring	✓	X	✓	✓	✓	X	4

Source: WIC MIS data dictionary for Crossroads, HANDS, MPSC, MSC, SPIRIT, WOW

Note: A data element that appears in the data dictionary does not necessitate that the data element exists for all State agencies within the consortium. Each State agency may turn data categories on or off depending on the data it decides to collect.

3. Data Accessibility and Reporting Capabilities

The majority of the interviewed State agencies use an RDBMS such as a Microsoft SQL Server or Oracle Database as part of their MIS technology architecture to store WIC data obtained through the WIC certification process or collected when services are provided to participants. Virtually all relational database systems use SQL programming language to retrieve and manipulate data from the database.

During the interviews, the study team asked each of the State agencies about their ability to access data stored on their MIS for reporting and analyses. State agencies responded that they access WIC participant data by producing existing standard reports or creating new ad hoc analyses.

- ***Existing standard reports:*** All MIS contain a set of predefined standard (i.e., canned or production) reports that provide data in a consistent format. Standard reports provide limited customization. State agencies typically have hundreds of standard reports that users easily can access based on their authentication level.
- ***New ad hoc analyses and reports:*** Ad hoc reports are created when specific data do not exist in a usable format in any standard report. The user can customize the report to the needs of the individual or organization at a specific point in time. Ad hoc reporting allows users to manipulate and explore their data and build reports quickly to answer business questions.

Typically, standard reports answer the question *"What is happening?"* and ad hoc reports may answer this question, as well as the question *"Why is it happening?"* The State agencies commented that they have easy access to existing standard reports but creating new reports can be difficult. Creating ad hoc reports either requires proficiency in SQL queries or the acquisition of an ad hoc reporting tool (e.g., Crystal Reports). Depending on the architecture, technical environment, and characteristics of the system, State agencies may use the ad hoc reporting tool either with the production database of the WIC transaction processing system or with a separate reporting database that presents an extract of the data in the transaction processing system.

State agencies noted they need better data extraction capabilities to develop custom reports and facilitate data analysis. Most State agencies using a modern MIS are satisfied with the amount and type of data being collected and stored in their system. However, State agencies do not have staff members proficient in SQL to extract the ad hoc reports from the relational database. As one respondent explained, "*I'm not concerned that this data doesn't exist. It's there. It's just a matter of getting access to it.*

Exhibit 17 summarizes the ability of State agencies to extract data stored on their current MIS to create new reports.

Exhibit 17: Level of Effort Required for Assessing Data to Create New Reports

MIS Consortia (Lead State Agency)	Easy	Moderate	Difficult
Modern Systems			
HANDS (Arizona)	✓		
MSC (Kansas)	✓		
WOW (Maryland)	✓		
MPSC (Colorado)		✓	
SPIRIT (Chickasaw Nation and Missouri)		✓	
Crossroads (North Carolina)			✓*
Legacy System			
WICSIS (New York)			✓

Source: Arizona, Chickasaw Nation, Colorado, Kansas, Maryland, Missouri, New York, and North Carolina State agency interviews

**Note: Crossroads is testing their new reporting system. Crossroads commented that data accessibility is difficult, but they anticipate that the reporting capabilities will become easier once the new system implementation is complete.*

Below are definitions of the classifications for Exhibit 17:

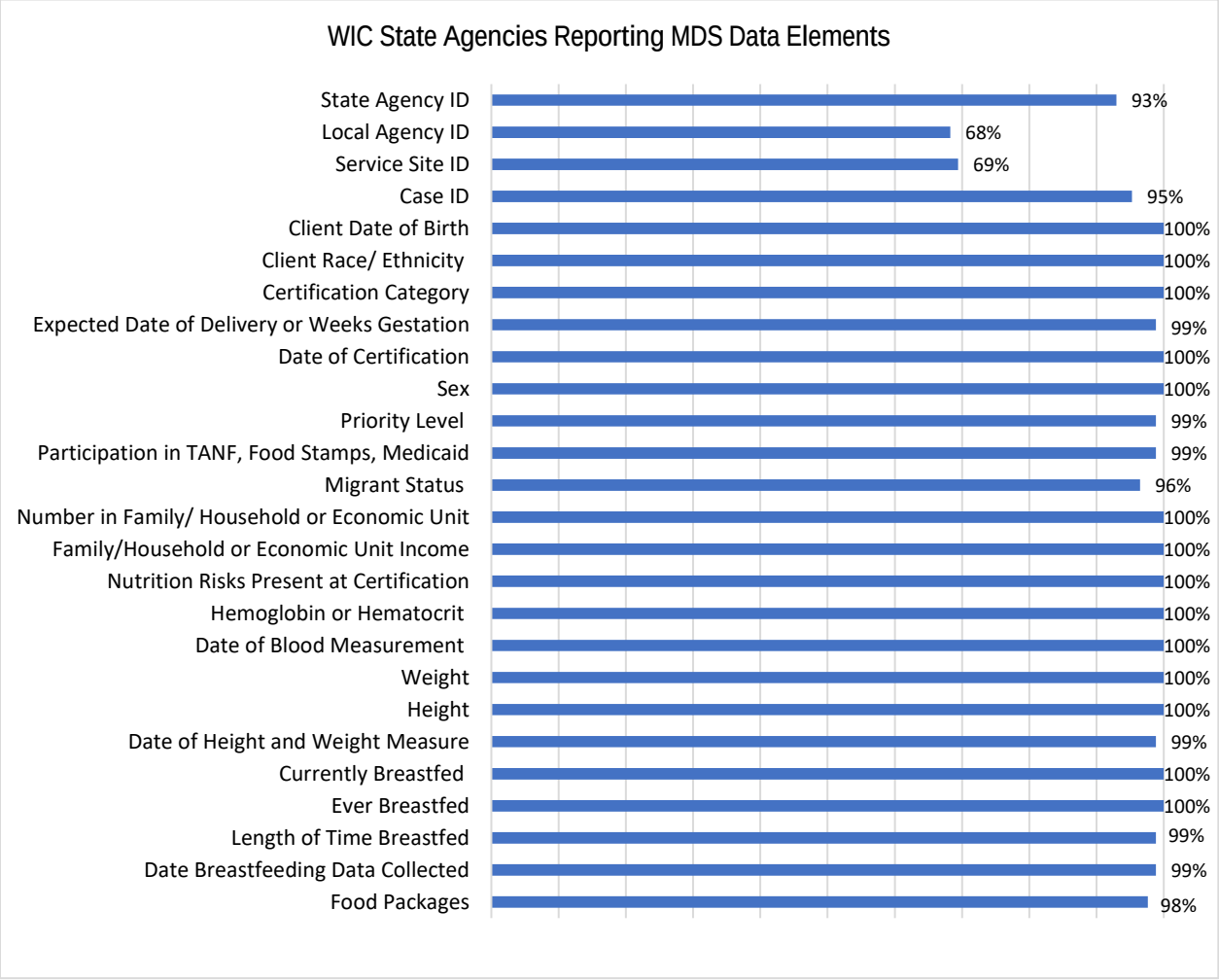
- ***Easy: Data are accessible by WIC program staff or dedicated IT staff.*** State agencies that say it is easy to produce new analyses and reports noted that they access data in one of two ways: (1) they have an immediate staff member or dedicated IT help desk that is proficient in SQL to produce the ad hoc reports or analysis, or (2) their IT department regularly (daily, weekly, monthly) extracts data from the database (e.g., data warehouse, data cube) into a data repository that is separate from the production system where nontechnical users can create ad hoc reports using a reporting tool (e.g., Crystal Reports). The biggest challenge for these State agencies is understanding the circumstances around which the data were captured and entered into the information system and ensuring data quality.
- **Moderate: Data are accessible using shared technical resources within the same *division (e.g., IT helpdesk), and the system documentation is updated.*** State agencies that say they can produce new analyses and reports with moderate effort noted that they rely heavily on contractors to write SQL to extract data from the database. Respondents noted that coordination with the database administrator to extract data could take several weeks.
- ***Difficult: Data are accessible using shared technical resources from a different division (e.g., resource sharing), and system documentation is outdated.*** State agencies that say it is difficult to produce new analyses and reports noted that they also rely heavily on contractors to write SQL queries necessary to extract data from the database. This process becomes more difficult if the system documentation is out-of-date, as is the case with many legacy systems, and the State agency must secure IT staff with departments outside of WIC.

It is especially difficult for ITOs to produce new analyses and reports because many are small and do not have the appropriate IT staff.

4. WIC Data Reported to FNS for WIC Minimum and Supplemental Data Sets

Based on an analysis of the FY 2015 WIC State Plans, all State agencies transmit an MDS file to FNS biennially. A few State agencies indicated that they do not report certain MDS data elements. For example, Montana does not report *Participation in TANF (Temporary Assistance for Needy Families), Food Stamps, and Medicaid* or the *Length of Time Breastfed*. American Samoa, U.S. Virgin Islands, and Northern Arapaho (WY) do not report *Migrant Status*. Connecticut indicated it does not report *Date of Breastfeeding Data Collected*. Exhibit 18 summarizes the percentage of State agencies reporting MDS by data element.

Exhibit 18: Percentage of State Agencies Reporting MDS by Data Element

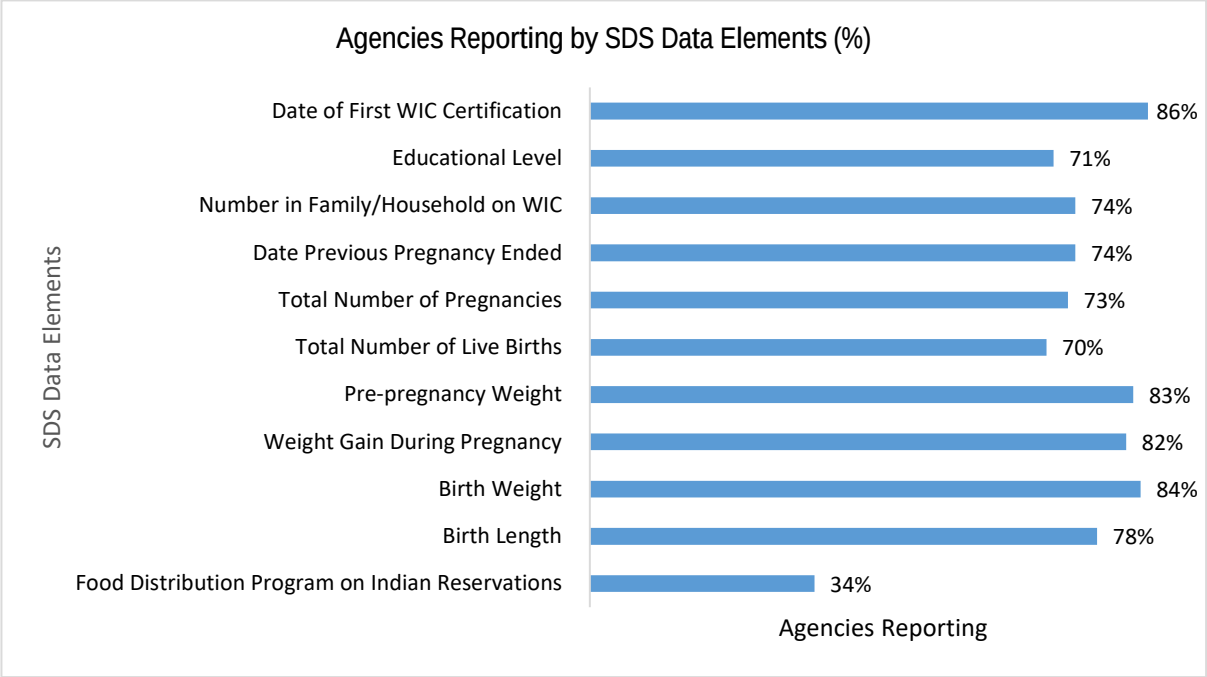


Source: 2015 WIC State Plans for which information was available (85 of the 90 State Plans)[53]

[53] The study team did not receive a FY 2015 WIC State Plan for one State agency (Mississippi) and four ITOs (Eastern Shoshone, Eastern Band of Cherokee Indians, Mississippi Band of Choctaw Indians, and Omaha Nation).

Based on an analysis of the FY 2015 WIC State Plans, 92 percent of WIC State agencies collect and report some SDS data elements to FNS biennially. About half (55%) of the WIC State agencies report all SDS data elements to FNS biennially. Exhibit 19 summarizes the SDS data elements that State agencies report.

Exhibit 19: Percentage of State Agencies Reporting SDS by Data Element



Source: 2015 WIC State Plans

To date, FNS has relied on the WIC Medicaid studies (USDA, 1991; Devaney, 1992; and Devaney & Shirm, 1993)[54] or literature reviews of smaller and mostly local studies performed by outside researchers (Fox et al., 2004 and Colman et al., 2012)[55] for estimates of program outcomes. Although the MDS and SDS do not allow for comparison of WIC and non-WIC outcomes as does Medicaid data, with two significant adjustments, the data set could be made useful for estimating the impact of WIC dosage (i.e., the length of a pregnant woman's participation before birth) on birth

[54] U.S. Department of Agriculture/Food Nutrition Service. (1991). *The Savings in Medicaid Costs for Newborns and their Mothers Resulting from Prenatal Participation in the WIC Program.* Washington, DC: U.S. Department of Agriculture, October 1991.
Devaney, B. (1992). *Very Low Birthweight among Medicaid Newborns in Five States: The Effects of Prenatal WIC Participation*. Washington, DC: U.S. Department of Agriculture, March 1992. Retrieved from http://www.fns.usda.gov/sites/default/files/vlb.pdf
Devaney, B, Shirm, A. (1993). *Infant Mortality among Medicaid Newborns in Five States: The Effects of Prenatal WIC Participation*. Washington, DC: U.S. Department of Agriculture, May 1993. Retrieved from http://www.fns.usda.gov/sites/default/files/InfMort-Pt1.pdf
[55] Fox, Mary Kay, William Hamilton, and Biing-Hwan Lin. (2004). *Effects of Food Assistance and Nutrition Programs on Nutrition and Health: Volume 3, Literature Review.* Food Assistance and Nutrition Research Report No. (FANRR19-3), Washington, DC: U.S. Department of Agriculture, December 2004. Retrieved from http://www.ers.usda.gov/publications/fanrr-food-assistance-nutrition-research-program/fanrr19-3.aspx
Colman, S., Nichols-Barrer, I. P., Redline, J. E., Devaney, B. L., Ansell, S. V., & Joyce, T. (2012*). Effects of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC): A review of recent research* (Special Nutrition Programs Report No. WIC-12-WM). Retrieved from http://www.fns.usda.gov/sites/default/files/WICMedicaidLitRev.pdf

outcomes. First, mother's characteristics must be linked to their newborn infant's characteristics. Second, a set of independent or predictive variables must be reported consistently for every mother.

The MDS and SDS contain data reflecting pregnancy outcomes, such as birth weight and gestational age at birth desirable for evaluating the impact of aspects of a mother's WIC participation (e.g., length of WIC participation prior to giving birth, nutrition education participation) on birth outcomes. However, as currently collected, the MDS/SDS unique case identifiers do not link the mother's characteristics with her infant's characteristics. Should FNS desire to create a national database capable of estimating the impact of aspects of WIC participation to birth outcomes, linking of mother's and infant's records is necessary.

In addition, in order to produce reliable multivariate estimates of WIC's impact, a set of independent or predictive variables must also be collected for every mother. These include data elements such as existing health conditions, alcohol and drug use, parity, smoking, adequacy of prenatal care, Medicaid participation, income, race, marital status, age, obesity, and multiples. These data elements are found in the MDS, many of which are among the nutrition risks reported. However, State agencies are only required to report up to 10 of the highest priority risks per participant for the MDS. Although that list of risks should be sufficient to characterize each individual's risk, for the purposes of creating national estimates of WIC's impact on outcomes, values for all key predictive risks used for such an analysis would need to be collected for all participants. However, the way that nutrition risks are reported to FNS in the MDS limit the usefulness for producing multivariate outcome estimates. For example, a "no" or "not present" value for a particular key predictive risk associated with birth outcomes may not be reported to the MDS as one of the participants top 10 risks because the value is zero or null. However, in multivariate analysis, a no value is as important as a yes value. Reporting no or not present values as well as the yes values for a set of dependent, predictive risks is necessary to create a complete analytic data set capable of producing such outcome estimates. Should FNS desire to create a national data base capable of estimating WIC's contribution to birth outcomes, changes in how nutrition risks are reported in the MDS are necessary. Inclusion of a standard set of predictive variables for birth outcomes comprehensively collected for all participants, including "no" or "not present" values, would enable program outcome research using national WIC program data, which to date has been impossible.

Given the exponential increase in data storage capacity and computing speed, nutrition risks no longer need to be limited to the ten most prevalent risks identified. An FNS task force could be convened to determine a list of dependent or predictive variables to be taken from among the WIC's nutrition risks collected at certification for all participants for producing quality estimates of program outcomes. This list of predictive variables could then become the revised set of nutrition risks required to be reported to the MDS with both yes and no values for every participant. The risks reported to MDS need not be limited to that set of risks necessary for producing multivariate outcome estimates. FNS could retain the criteria of reporting the top 10 risks per participants as well as requiring comprehensive (yes and no values) of all of the risks, including those beyond the top 10, in the predictive variable set.

D. WIC INFORMATION SYSTEM MODIFICATIONS

Section D explores the effort involved in making changes to the WIC information systems. In the context of this exploratory study—as previously noted, FNS has no plans to add data elements or request MIS changes—this section examines the State agencies' ability to capture new data elements or change the periodicity of the data collected, investigates the Federal and State agencies' processes for implementing a change to the MIS, and assesses the cost drivers involved in performing system modifications. The results indicate that securing agreement from large consortia and limited technical resources needed to implement new changes increase the time and cost for performing system modifications.

1. Modifications to Data Elements and Periodicity of Data Captured Within WIC MIS

During State agency interviews, the study team asked State agencies to describe the perceived difficulty of making modifications within their MIS. Exhibit 20 summarizes State agencies' responses regarding the ease in making modifications to their data structures or changing the periodicity of data collection.

Exhibit 20: WIC MIS Data Field Modifications

MIS	Add a New Value to an Existing Data Element	Add a New Data Element	Change Periodicity of Data Collection
Modern Systems			
WOW	Easy	Manageable	Easy
Crossroads	Easy	Difficult	Manageable
HANDS	Easy	Difficult	Difficult
MSC	Manageable	Manageable	Manageable
SPIRIT	Difficult	Difficult	Manageable
MPSC	Difficult	Difficult	Difficult
Legacy System			
WICSIS	Difficult	Difficult	Difficult

Source: State agency interviews: Arizona (HANDS), Chickasaw Nation (SPIRIT), Colorado (MPSC), Kansas (MSC), Maryland (WOW), New York (WICSIS), and North Carolina (Crossroads)

Easy: *Modifications do not require a formal process to facilitate a change to the MIS (change control process). Modifications can be performed by WIC program staff or dedicated technology resources.*

Manageable: *Modifications do not require a change control process, but technology resources must be scheduled to perform the modification.*

Difficult: *Modification requires a change control process, and technology resources must be scheduled to perform the modification.*

State agencies reported that modifications to the data structure involve either updating the values of existing data elements or adding new data elements.

- ***New data values:*** MIS with built-in user tables for frequently modified data fields (e.g., food packages, health risk codes) make updating values easy. Otherwise, data modifications that are performed with existing resources and do not require approval or a change control process can be performed with moderate effort.

- ***New data elements:*** State agencies reported that even when using a modern MIS it is difficult to perform MIS modifications to add a new data element. Adding a new data element requires technology support. Data modifications that are performed with existing resources and do not require approval or a change control process can be implemented with moderate effort. State agencies reported that data modifications that require approval or a change control process increase the difficulty level. The difficulty is attributed to time and resources. Consortia must obtain approval from the change control board and the system's user group. Large consortia typically require more time to obtain the required approvals from all member State agencies. Additionally, State agencies without dedicated technology staff will need to secure technology resources to perform the modification.
- ***Periodicity:*** Changing the periodicity of data collection involves changing the time period of the data extract. This requires technology resources to extract the proper data elements and manipulate the data into the required data format.

2. Funding for MIS Enhancements

WIC State agencies obtain funding for MIS development and operations from a variety of governmental (Federal, State, and local) and nongovernmental sources. The majority of funding comes from the Federal Government. Current funding sources for technology projects include: [56]

- ***Nutrition Services and Administration (NSA) Funds:*** Annual federal fiscal year (FFY) USDA NSA grant used for State and local-level program operations including client services, nutrition education, breastfeeding promotion and support, and program management. NSA funds may be used for technology operations and maintenance to support these program operations and technology capital investments upon FNS approval.
- ***Operational Adjustment (OA) Funds:*** Up to 10 percent of each State agency's final NSA grant is aggregated for allocation by FNS regional offices to the State agencies within their region. The regional offices distribute OA funds according to State agency need and national guidelines for projects that support and improve services provided by WIC.
- ***Multi-Purpose Grants:*** Grants allocated for special State agency projects, national infrastructure initiatives such as EBT and SAM projects, and breastfeeding promotion and support.
- ***National Technology Grants:*** Grants authorized for MIS and EBT planning, transfer, design, development, and implementation.
- ***Other funding sources:*** Other Federal agencies (e.g., CDC), State-appropriated funds, nongovernmental funds, etc.

WIC State agencies must obtain prior written approval from FNS for acquisitions with a total project cost of $100,000 or greater from all funding sources. An FNS-approved Planning Advance Planning Document (PAPD) or Implementation Advance Planning Document (IAPD) is required for all MIS projects when the estimated acquisition cost exceeds $500,000. State agencies handle system updates through an IAPD update to the approved IAPD when they meet certain thresholds.

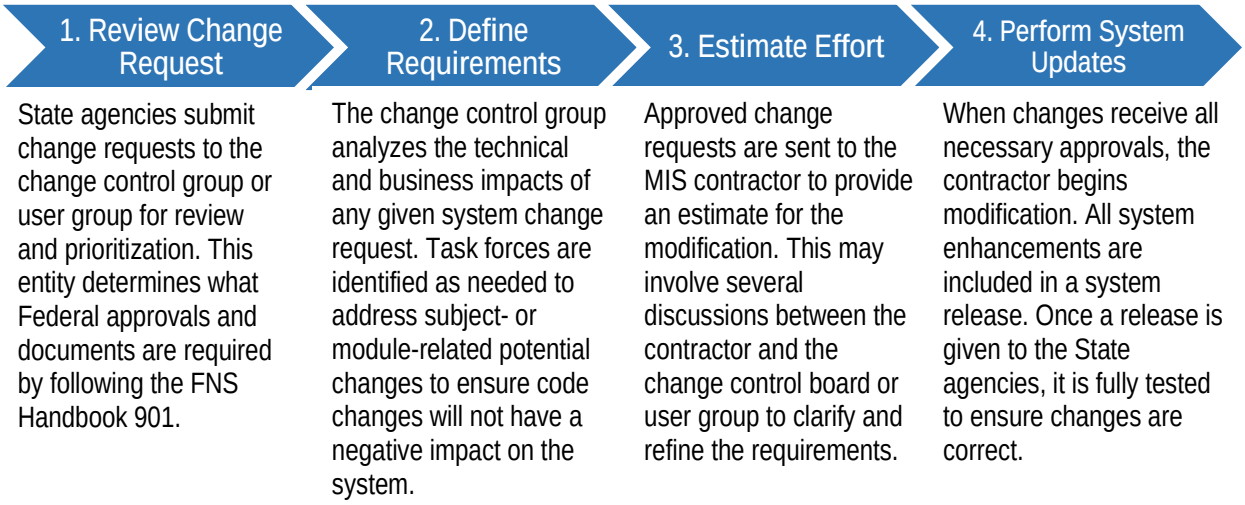
[56] U.S. Department of Agriculture, Food and Nutrition Service. (2001). *Attachment B: Management Information System (MIS) funding sources*. Retrieved from http://www.fns.usda.gov/sites/default/files/AttachmentB.pdf

State agency MIS updates therefore may need to include an updated IAPD within their management of any change requests. See Appendix M for technology requirements by project cost.

Consortium Requirements for Managing Change Requests

The user group defines the system requirements for each consortium. WIC State agencies that are part of a consortium describe an official user group or change control board that has established specific processes for prioritizing, approving, and coordinating planned changes to the MIS regardless of MIS enhancement cost thresholds. The overall change control process is highlighted in Exhibit 21.

Exhibit 21: WIC MIS Change Control Process for a Consortium



Note: Smaller State agency user groups have a less complicated process, although coordination and consensus among members are still required. The change control process is similar for non-consortia MIS.

For consortia with large user groups, planned enhancements take six to eight months to complete and incorporate into a system release. Consortia establish consensus on enhancement priorities, before making decisions on which State agencies will receive funding. This process can take longer if there are multiple iterations of the requirements. Consequently, making a change to a State agency's MIS can be a lengthy process for State agencies that are part of SAM or a large consortium. This is true even when the modification is simple (e.g., addition of a new value to an existing data element). New Federal policies that require MIS modifications are challenging for these State agencies.

- MIS enhancements need to comply with State and local agency requirements, obtain approval through the necessary and established consortium or SAM processes, and coordinate with the maintenance and enhancement contractor or other vendors. Any change has to be implemented to ensure it meets the requirements and has no negative impacts on existing functions.
- The MIS change control process involves coordination with the other user group members, which can be lengthy and cumbersome. WIC policies can be general, allowing room for interpretation or options for implementation. Each State agency may interpret these policies differently. For example, the SPIRIT system has users in 24 State agencies across five FNS regions, so reaching consensus takes time.

- FNS review periods for updated IAPDs may involve multiple discussions between FNS and the State agencies, requiring additional time to reach agreement. State agencies further noted that the contracting process is arduous.

3. Cost Drivers for MIS Modifications

Several factors drive the level of effort involved in adding or changing the existing data structure or the periodicity of the data collection efforts:

- ***Change control process:*** This is presented in Exhibit 21 above. Even when the addition of a data element is not technically difficult, the process of working within a SAM or a large consortium can be lengthy and complex in order to ensure there is no negative impact.
- ***System flexibility:*** Some newer systems, such as the MSC, can accommodate minor changes quickly and easily (e.g., table updates). However, older systems have less flexibility to make modifications to the database architecture or lack the software to accommodate changes.
- ***Scope or type of change:*** In some newer systems, adding a new value to an existing data element can be achieved by adding the value to a drop-down menu or updating a user table (e.g., add "*white potatoes*" as a value for the data element "*vegetables*"). However, other data elements may require more extensive programming and database modifications. For modern and legacy systems, adding a new data element to the MIS may require the State agency to follow the change control process (e.g., add "*vegetables*" as a new data element to the database).
- ***System impact:*** Although adding new values to existing data elements may be easy, State agencies must perform an evaluation to assess the impact in the MIS logic, including the system's data history and any associated processes or reports utilizing the new values. In contrast, adding data elements or extending a database and associated data queries for reports or other functions can require extensive analysis, reprogramming, and testing.
- ***Staffing capacity:*** Even when system modification is simple, enhancements can be delayed by a lack of WIC IT staff or contractor availability.

> "*Other than funding availability, the biggest challenge States face in revising or replacing their WIC systems is lack of technical expertise in terms of internal WIC resources and IT contractors." (Regional office staff, July 2015)*

As a result, necessary external support may be hard to find and expensive, especially for legacy systems that rely on older system architecture and software.

E. WIC INFORMATION SYSTEM CHALLENGES AND OPPORTUNITIES

Section E explores the challenges and opportunities for improving data collection, taking into consideration improvements that would address needs both for FNS and for each State agency.

State agencies and regional office staff suggested the following items for improving data collection and accessibility.

- ***Consistent, comparable data points across State agencies:*** Some respondents cited that although State agencies may collect the data fields with the same label/name, there may be differences in when and how data are captured (e.g., weight and height measures) or in data definitions (e.g., for non-MDS/SDS data elements such as *rebate, participation, banking date, issuance date, redemption date*) that could result in inconsistencies.

  > *"Even if the definition of the data field seems straightforward or standardized across State agencies, there can be differences to how that data was obtained from the client and how it was entered into the system."* (State agency interview)

  Greater data uniformity for new data elements added to the MDS or SDS would allow State agencies to benchmark themselves against their peers. State agencies would be able to gain best practices from other State agencies that are performing well in certain areas. Comparable data would help FNS prioritize resources and provide support where it is needed. One respondent commented, however, that getting State agencies to agree on a single definition for certain data fields may be a difficult task. Clinics that report to the same WIC local agency typically have more consistency in their data.

- ***Timely data:*** Nearly all respondents agreed that although FNS collects other program data more frequently, the data collection and reporting for MDS and SDS every two years is not sufficient for program management and performance assessment, integrity, or monitoring. Although State agencies maintain these and other data for internal management and other purposes, and thus are not affected by the time lag, FNS's ability to use these data most effectively is limited. Several State agencies interviewed for this study indicated that changing the periodicity of data submission would not be an additional burden. Some State agencies indicated that once the data set is created, a report can be generated when needed.

- ***Staffing constraints:*** State agencies mentioned that limited time and resources constrain their data collection and analysis capabilities. Challenges that some State agencies face include older MIS with limitations in terms of accessing data, and/or either limited staff available to devote to data analysis or limited depth of knowledge necessary to perform optimal data analysis.

- ***EBT redemption is linked to a specific EBT card number issued to a family or household:*** EBT cards combine benefits for each participant in the household, making it difficult to identify foods redeemed at the individual participant level. This may present some difficulties, and because food purchased may be shared across individuals in the household, other challenges remain.

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IV. RESEARCH RESULTS— DATA ELEMENTS OF KEY INTEREST

The study team explored the data collected by WIC State and local agencies that are not reported routinely to FNS, as well as data elements becoming available through EBT as EBT is implemented nationally. The study team identified potential data elements for inclusion in a future national WIC data set, such as a revised MDS or another data set explicitly designed for analytic purposes. These potential data elements are divided into six topics and include items that have clear management or descriptive uses at the national level. These items would enable FNS to better understand program management needs and costs and describe the participant population in more detail.

A. Data Selection Process and Criteria

WIC State agencies collect many data elements that are not reported routinely to FNS or, as in the case of nutrition risks that are reported in a manner that limits their use. To determine if a data element falls within the area of interest, the following must hold true:

- The data element appeared repeatedly in the recent WIC literature reviewed (See Appendix N), was cited frequently during FNS regional office or State agency interviews, or can be used by FNS at the national level for program management, describing key participant characteristics, or program assessment and evaluation.
- Multiple WIC State agencies (based on reports from system/consortia members interviewed) collect the data element or the data element (e.g., EBT) will soon be collected by all State agencies.
- Currently, the data element is not reported to FNS as part of the MDS or SDS.

B. Program Management and Descriptive Data

The data elements of key interest that have clear uses for program management, describing participant characteristics, or program evaluation are categorized into the following topics:

1. WIC Demographic Data
2. WIC Health and Nutrition Data—Health Behaviors
3. WIC Health and Nutrition Data—Breastfeeding
4. WIC Health and Nutrition Data—Nutrition Education
5. WIC Food Redemption Data
6. WIC Vendor Management Data

Exhibits 22 through 26, are in the same format and depict data elements of key interest that the interviewed State agencies collect. The data elements are categorized into the six topics noted above, and numbered consecutively across the similarly formatted exhibits. Thus, these exhibits could be combined into one exhibit, with key data elements listed in the six categories.

1. WIC Demographic Information Data

FNS and State agencies use WIC demographic data to describe participant characteristics. In addition to providing a snapshot of who is accessing WIC services, these data inform program outreach and program integrity related to income eligibility and help tailor nutrition education and food package substitution choices. Exhibit 22 presents information on which of the interviewed State and local agencies collect two additional participant data elements of key interest—marital status of the pregnant or postpartum participant and the language spoken at home—that are not reported to FNS in the MDS or the SDS, but that may be useful for outreach and management purposes.

Exhibit 22: WIC Demographic Data Cited during State and Local Agency Interviews

Demographic Information	Definition	AZ	CN	CO	KS	MD	MO	NC	NY	PHFE
1. Marital Status	This field indicates a person's state of being single, married, separated, divorced, or widowed. Data are collected once during the woman's initial WIC visit.	Y	Y							
2. Household Language Spoken	This field indicates the language spoken in the home. Data are collected once during the woman's initial WIC visit.	Y								Y

CN= Chickasaw Nation; PHFE= Public Health Foundation Enterprises

Researchers have long known that marital status is a significant factor affecting birth outcomes.[57] Married women are more likely to have fewer low-birth weight babies, fewer preterm births, and fewer babies that are small for gestational age. Therefore, for purely descriptive purposes, marital status would enhance the risk profile of the WIC population described in the WIC PC studies and reports to Congress.

Knowing the language spoken in the home enables State and local agencies to target nutrition education materials, informs administrative needs for translators, and informs cultural tailoring of food package substitutions. A data measure for household language in a national database, along with measures of nutrition education modes and intensity and food redemption patterns, would allow FNS to evaluate how well nutrition education and food substitution allowances are working for non-English speaking households at a national level. In addition, information on efficacy of nutrition education and acceptance of food substitutions to these households could help identify best practices that could be shared among State and local agencies. Finally, such a measure would enable FNS to evaluate more fully the administrative funding needs of WIC agencies serving relatively high proportions of non-English speaking households or a relatively large number of language groups, or both.

[57] Shah, P.S., Zao, J., & Ali, S. (2011). Maternal marital status and birth outcomes: A systematic review and meta-analyses. *Maternal and Child Health Journal, 15*(7), 1097–1109.

2. WIC Health and Nutrition Data—Health Behaviors

Personal health behaviors such as smoking and alcohol consumption affect the health of the mother and her children, contributing to low birth weight, developmental issues, and obesity.[58] WIC State agencies use health and nutrition data to identify potential pregnancy and birth complications, tailor nutrition education, and identify health referrals for the participants. Exhibit 23 summarizes the health behavior data elements of key interest that are not reported to FNS via the MDS/SDS and may be considered for future data collection efforts.

Exhibit 23: WIC Health and Nutrition—Health Behaviors Data Cited during State and Local Agency Interviews

Health Behaviors	Definition	AZ	CN	CO	KS	MD	MO	NC	NY	PHFE
3. Maternal Smoking (prepregnancy)	This field indicates the average number of cigarettes the woman smoked per day during the three months before she became pregnant. Data are collected when the woman returns for her prenatal visit.	Y			Y					
4. Maternal Smoking (during pregnancy)	This field indicates the average number of cigarettes the woman currently smoked per day at her prenatal visit. Data are collected when the woman returns for her prenatal visit.	Y			Y					
5. Maternal Smoking (postpartum)	This field indicates the average number of cigarettes the woman currently smokes per day at the postpartum visit. Data are collected when the woman returns for her postpartum visit.	Y			Y					
6. Maternal Alcohol Use (prepregnancy)	This field indicates the average number of drinks per week of beer, wine, or liquor the woman consumed prepregnancy (three months prior to pregnancy). Data are collected during the woman's prenatal visit.	Y								

[58] Agrawal, A., Scherrer, J. P., Grant, J. D., Sartor, C. E., Pergadia, M. L., Duncan, A. E., . . . Xian, H. (2010). The effects of maternal smoking during pregnancy on offspring outcomes. *Preventive Medicine, 50*(1–2), 13–18.

Health Behaviors	Definition	AZ	CN	CO	KS	MD	MO	NC	NY	PHFE
7. Maternal Alcohol Use (during pregnancy)	This field indicates the average number of drinks per week of beer, wine, or liquor consumed during the last three months of pregnancy and is reported at the postpartum visit only. Data are collected when the woman returns for her postpartum visit.	Y								

CN= Chickasaw Nation; PHFE= Public Health Foundation Enterprises

Maternal and household smoking and maternal alcohol consumption are key pregnancy risks identified by researchers and authorities such as the National Institute of Child Health and Human Development.[59] State agencies provide data on nutrition risks identified at intake by local WIC staff. However, as State agencies only report the top 10 risks to the MDS, these measures may not be comprehensively available for every participant. Local WIC staff may not flag all nutritional risks exhibited by each participant once they have identified a qualifying risk. At the national level, inclusion of smoking and alcohol consumption measures as separate, well-defined measures would enhance the risk profile of the WIC population described in the WIC PC studies and reports to Congress.

3. WIC Health and Nutrition Data—Breastfeeding

As part of its mission to improve the health of its target audience, the WIC program has long provided breastfeeding promotion and support services for pregnant and postpartum participants. Benefits and services include:

- Accurate breastfeeding information through anticipatory guidance, counseling, and breastfeeding educational materials.
- One-to-one breastfeeding support from peer counselors.
- Breastfeeding mothers are eligible to participate in WIC longer than non-breastfeeding mothers.
- An enhanced food package with greater variety and quantity of food available to mothers who are fully or mostly breastfeeding.
- Breast pumps and other breastfeeding aids (e.g., nipple shields, nursing supplementers) to help support the initiation and continuation of breastfeeding.

The revised WIC Food Packages, the expansion of the WIC Peer Counselor Program, and the Healthy, Hunger-Free Kids Act of 2010 increased emphasis on breastfeeding promotion and support and strengthened WIC's efforts to promote and support breastfeeding among WIC participants. In addition, other Federal guidance stresses the importance of breastfeeding. For

[59] National Institute of Child Health and Human Development. (2013). *what are the factors that put a pregnancy at risk?* Retrieved from https://www.nichd.nih.gov/health/topics/high-risk/conditioninfo/Pages/factors.aspx

example, Healthy People 2020 includes multiple objectives to increase the proportion of infants who are breastfed.[60]

Determining measures of breastfeeding success across State agencies requires a consistent collection of data and the inclusion of necessary data elements. Evaluating the relationship between the program's breastfeeding promotion and support efforts and participants' breastfeeding practices is essential to targeting services and funds. In addition, the MDS requires State agencies to collect the following data items: "currently breastfed," "ever breastfed," and "length of time breastfed." WIC State and local agencies also collect many more measures concerning breastfeeding that would help present a comprehensive picture of breastfeeding. Measures such as breastfeeding exclusivity (i.e., infant receiving human milk only, which is not currently included in the MDS) and date of solid food introduction are essential to targeting services and funds. The Healthy, Hunger-Free Kids Act of 2010 requires the USDA to compile and publish breastfeeding performance measurements annually.[61] FNS currently compiles State and local agency data on infants reported as "fully breastfed" (i.e., the breastfed infant does not receive any infant formula from WIC) and "partially breastfed" infants (i.e., the breastfed infant receives some infant formula from WIC) for its annual *WIC Breastfeeding Data Local Agency Report.* FNS estimates a proxy of these measures from the food package prescriptions, assignment of breast pumps, involvement in peer counseling, etc.[62]

Breastfeeding exclusivity is of particular interest to State agencies. A review of breastfeeding data across data dictionaries received from State agencies found that each MIS may define and label breastfeeding measures differently. In Exhibit 24, exclusive breastfeeding appears in the data dictionaries of three State agencies: Arizona defines the field as number of weeks breastfeeding was the sole source of nutrition; Colorado defines the field as infants who were exclusively breastfed by participating women; and Kansas defines the field as a description of the type of breastfeeding.

Exhibit 24: WIC Health and Nutrition—Breastfeeding Data Cited during State and Local Agency Interviews

Breastfeeding	Definition	AZ	CN	CO	KS	MD	MO	NC	NY	PHFE
8. Exclusive Breastfeeding	Breastfeeding was the sole source of nutrition for an infant.	Y[63]		Y[64]	Y[65]					

CN= Chickasaw Nation; PHFE= Public Health Foundation Enterprises

Standardizing definitions and data labels for items such as "fully breastfed" and "exclusively breastfed" across State agency data collections would provide a basis for FNS and State agencies to compare their program's efficacy in breastfeeding promotion. State agencies indicate a desire to

[60] Office of Disease Prevention and Health Promotion, Healthy People 2020. (n.d.). *Maternal, infant, and child health*. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives

[61] U.S. Department of Agriculture, Food and Nutrition Service, Supplemental Food Programs Division. (n.d.). *WIC breastfeeding data local agency report, FY 2013*. Retrieved from http://www.fns.usda.gov/sites/default/files/wic/FY-2013-Breastfeeding-Data-Local-Agency-Report.pdf

[62] These measures are not used as annual performance measures, but for helping State agencies to tailor breastfeeding counseling, promotion, and support services.

[63] Length of time (weeks) breastfeeding was the sole source of nutrition.

[64] Infants who were exclusively breastfed by participating women.

[65] Description of the type of breastfeeding.

separate these two related but distinct data items for the purpose of analyzing how successful their efforts are in reaching the goal of achieving exclusive breastfeeding for as many infants as possible.

There are two limitations associated with reporting breastfeeding data.

- Inconsistent collection and storage methods: USDA's WIC Breastfeeding Policy Inventory[66] finds that the collection and storage methods for breastfeeding measures are inconsistent across WIC agencies. The study indicates that more than one-third of agencies maintain breastfeeding data on systems other than their WIC MIS, making the linking of breastfeeding data to administrative data uncommon except for those items in the MDS. This study found that State agencies are interested in improving the consistency in breastfeeding measures to more accurately gauge their breastfeeding promotion and support success.
- Infrequent breastfeeding data capture: WIC mothers do not visit a WIC clinic frequently enough to capture breastfeeding data beyond a single point in time. A mother's breastfeeding intent or behavior may change over time, and breastfeeding patterns may change outside of the times where data is collected by WIC. It also may be difficult for a mother to recall accurately how many weeks the child was breastfed and at what intensity. To meet needs for more detailed information on breastfeeding patterns, FNS would need a mechanism to capture breastfeeding data regularly and accurately outside of the point-in-time constraints of MDS and SDS. Even so, there are intrinsic challenges in capturing data on breastfeeding regardless of the time constraints of MDS and SDS because the behaviors are subject to change.

4. WIC Health and Nutrition Data—Nutrition Education Services

Nutrition education is a key service provided by WIC agencies that directly impacts the nutrition and health of WIC families. Nutrition education plays a critical role in the WIC program and is intended to influence participants' nutrition and health-related knowledge, attitudes, and behaviors. These data provide FNS with the opportunity to measure the impact of WIC services on participant behavior. Currently, State agencies use these data to track the number of nutrition education contacts by State agency staff members. Exhibit 25 summarizes the nutrition education data elements of key interest that are not reported to FNS and may be considered for future data collection efforts.

[66] Forrestal, S., Briefel, R., & Mabli, J. (2015). *WIC breastfeeding policy inventory*. Retrieved from http://www.fns.usda.gov/sites/default/files/ops/WICBPI.pdf

Exhibit 25: WIC Health and Nutrition—Nutrition Education Data Cited during State and Local Agency Interviews

Nutrition Education	Definition	AZ	CN	CO	KS	MD	MO	NC	NY	PHFE
9. Nutrition Education Topic	This field indicates the type of information covered during the nutrition education session (e.g., breastfeeding, nutritional guidelines, and food preparation). Data are collected each time the woman attends a nutrition education session.	Y	Y	Y	Y	Y		Y		Y
10. Nutrition Education Mode	This field indicates how a participant received WIC nutrition education (e.g., attended a WIC class in the clinic, referrals, received one-on-one education, completed an Internet class at home, and took a packet of information home). Data are collected each time the woman attends a nutrition education session.	Y	Y	Y						Y

CN= Chickasaw Nation; PHFE= Public Health Foundation Enterprises

The WIC State Plans include a checklist for FReD, which is provided as guidance to State agencies on functions they should consider incorporating into their MIS. The majority of State agencies (89%) reported that their State agency system currently captures or documents the nutrition education provided to each participant as well as the covered topics. With the advent of WIC EBT, data will soon become available that will open up new avenues for the evaluation of nutrition education effectiveness. In combination with specific data on participant food purchases using WIC EBT, for the first time FNS will be able to connect nutrition education parameters such as topic and mode with redemption patterns. Some State agencies, such as Arizona, are working on methods using price look-up (PLU) data to identify particular fruits and vegetables purchased using WIC EBT. Heretofore this information has been unavailable, so WIC has only been able to identify the amount of money spent on fruits and vegetables rather than the content of the foods. Information garnered by such analysis will help FNS nationally and at the State and local agency level to better target nutrition education and identify best practices that can be shared among all WIC agencies.

5. WIC Food Redemption Data

State agencies use participant redemption data for making payments to vendors, reporting costs to FNS in the WIC Financial Management and Participation Report (FNS-798), estimating food package costs locally, and identifying patterns in food costs. FNS, in turn, compiles these data to provide a broader national overview of food costs. However, as EBT replaces paper food instruments nationally, much new data are becoming available. As WIC EBT systems begin to adhere to the

universal standard set forth in the *WIC Universal MIS—EBT Interface,*[67] data items will become consistent across the nation. This standardization will enable the creation of a national EBT database that can be linked to participant administrative data. A universal data platform will improve the efficiency of EBT data analysis, encourage sharing of analytic tools among State agencies, and enable comparisons across State and local agencies. The State agencies interviewed for this study expressed hopeful anticipation that the usefulness of the data will be available through EBT. Exhibit 26 summarizes a selection of data elements that are becoming available through EBT transactions that are not reported to FNS and may be considered for future data collection efforts. Many more elements that will provide context for analysis such as vendor, State agency, and local agency ID can be found in the MIS-EBT universal interface data dictionary. Because of significant overlap, this exhibit also contains data elements for the next topic, "Vendor Management Data."

Exhibit 26: WIC EBT Data Soon to Be Available from MIS-EBT Universal Interface

WIC Food Redemption	Definition
11. Dollar Amount, (ACH payment, discount, item discount, Not-to-Exceed (NTE) adjustment, recoupment adjustment, paid, total food sales, total adjustments, transaction)	Amount to be debited or credited to the WIC vendor; total discounts;[68] item discounts; adjustment applied to item price due to price being in excess of NTE for the WIC peer group; price adjustments made by WIC State agency; amount paid to vendor less discounts and accounting for NTE and recoupment adjustments; volume of food sales by WIC vendor; sum of all adjustments made to item price; amount requested by cardholder, including surcharges.
12. Benefit Month	Period benefits are in effect.
13. Benefit Quantity (hold, available, expired, issued, redeemed, voided)	Quantity of a food item for item allowed with the following sub-items: on hold for manual authorization; available for purchase; expired; issued in the food prescription; redeemed by the participant; and voided by WIC MIS.
14. Category/Subcategory (code, long description, short description)	Codes identifying the type and subtype of product defined in the Universal Product Code (UPC) database; long description provided by WIC; short description for reports.
15. Date and Time, Host	Date and time transaction occurred in store.
16. Item Purchased (description, price, NTE price, package size, purchase quantity, units)	Name for WIC food item; purchase price assigned to one unit of food item; maximum allowed price for a food item established by WIC State agency; size of the contents of a food package in standard benefit units of measure; number of food items or quantity of food item being purchased; number of benefit units being reported).

As EBT data become available, some of the measures that State agencies collect for each transaction will enhance FNS's ability to analyze participant access to WIC foods, shopping behaviors, and food

[67] A comprehensive list of data items available to WIC MIS through EBT transactions, some of which will be necessary for context in analyzing the included data items, can be found on pages 83–96 of the following document: U.S. Department of Agriculture, Food and Nutrition Service. (2015). *WIC Universal MIS - EBT Interface*. Retrieved from http://www.fns.usda.gov/sites/default/files/wic/WIC%20Universal%20MIS%20%20EBT%20Interface%20Specification%20March%202015.pdf

[68] Discounts may be due to coupons or other reductions in amount.

redemption patterns. For households including more than one participant, the EBT transaction data will reflect benefits issued to and redeemed for all participants in the household. This limitation of the data prevents assessments of participant-level redemption patterns in households with multiple participants. However, as with paper food instruments, most foods that participants purchase through WIC become available for use by any household member. The only method of determining whether specific foods are utilized by specific participants would be intrusive household audits, which WIC has never undertaken.

Many possible analyses have the potential to inform policies relevant to participant access to WIC stores, food packages, and nutrition education. These include:

- Analysis of the timing of benefit issuance, redemption, and expiration can help FNS understand when during the benefit month participants tend to shop, whether they tend to purchase WIC foods all at once or in several shopping trips, and whether they tend to allow certain portions of their food prescriptions to expire without being redeemed.
- Analysis of the specific items and quantities, including package size and number of units of a given food purchased will reveal participant food choices, leading to better targeted nutrition education and food substitution policies. In addition, FNS can use this information in conjunction with nutrition education topic and mode in an analysis of the impact of nutrition education on participant shopping habits.
- Analysis of item price and discounts utilized by participants will allow FNS to determine whether and how much WIC participants take advantage of sales and coupons in their WIC purchases.

Some State agencies also expressed the hope of being able to identify specific fruit and vegetable purchases, which are marked with a PLU code. The PLU code found in EBT transactions generally only looks up a price associated with the PLU without reporting a description of associated items unlike items marked with a UPC, which carries more information. In order to collect data on specific fruit and vegetable purchases, individual States, such as Arizona, must work with their EBT vendor and grocery vendors to include vendor PLU lexicons that will also show item descriptions. Should State agencies successfully solve the problem of collecting item descriptions for foods marked only with PLU codes, FNS could use these data to inform participant purchasing patterns of fruit and vegetables. In turn, FNS could use information on fruit and vegetable purchasing patterns to tailor nutrition education, identify best practices, and evaluate the effectiveness of nutrition education.

6. WIC Vendor Management Data

Currently, FNS receives most of its vendor management and integrity information through forms FNS-698 and FNS-699, which form the basis for the TIP report. State agencies have noted that the definitions of the data elements included in the TIP report are not standardized across State agencies. The TIP report collects data on State policies and practices pertaining to vendor management and food benefit transactions; in completing a TIP report, State agencies may interpret questions and response options in different ways. In addition, the TIP report is published well after the fiscal year for which it annually reports. Several State agencies commented that the lack of timeliness and the lack of comparability of the TIP measures across State agencies make TIP less useful than it could be. FNS also periodically conducts a WIC Vendor Study that delves into

details concerning vendor activities and infractions such as substitutions of unallowable foods for allowable foods, overcharges, undercharges, and improper payments. The last WIC Vendor Management Study[69] was published in 2013 and before that in 2005. Currently, FNS produces an erroneous payments report[70] utilizing data collected in the latest WIC Vendor Study to estimate current erroneous payments.

With the advent of universal standard EBT data, FNS could evaluate some vendor practices in a timelier manner. With EBT data, some of the analyses conducted in the WIC Vendor Management Study could be conducted more readily, and other analyses not yet done may be possible. With the standardization of transaction data, State agencies and FNS would be able to compare transaction and integrity patterns across State agencies. Exhibit 26, above, also summarizes the elements of key interest to State agencies that are not reported to FNS but that could be used for improved vendor management and may be considered for future data collection efforts.

Analyses that can be done using the data found in Exhibit 26 include:

- Infractions of NTE prices.
- Patterns of over and undercharges in which WIC shoppers are charged different prices at the same vendor for the same items during a specific time period. Follow-up compliance buys at such vendors could further reveal the circumstances of the over and undercharges.
- Frequency and amounts of adjustments to payments to vendors.
- Frequency and amounts of discounts such as coupons or rebates.
- Patterns of insufficient stock in which vendors not recording transactions, including certain WIC foods during a particular time period, reveal a vendor's tendency to understock. Compliance investigations would be needed to follow up with this.

Although the introduction of EBT has somewhat mitigated substitutions, a vendor still could allow the substitution of unallowable items for those recorded on the transaction.[71] Thus, compliance buys must continue to identify the frequency with which vendors allow participants to circumvent the benefit issuance allowed on the EBT card.

[69] Gleason, S., Pooler, J., Bell, L., Erickson L., Eicheldinger C., Porter, J., & Hedershott, A. (2013). *2013 WIC vendor management study* (FNS Contract No. AG-3198-C-11-0009). Retrieved from http://www.fns.usda.gov/sites/default/files/2013WICVendor.pdf

[70] U.S. Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis. (2012). *Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) erroneous payments to vendors: Annual estimates for fiscal year 2011* (FNS Contract No. AG-3198-D-11-0060). Retrieved from http://www.fns.usda.gov/sites/default/files/WICErroneousPayment_2011.pdf

[71] The ongoing WIC Vendor Management Study (Gleason et al., 2013) identifies two types of substitutions: "a minor substitution, in which the vendor allows the buyer to substitute an unallowable item that is in the same category as the WIC authorized food; and a major substitution, in which a vendor allows a buyer to purchase an unallowable item that is not within a WIC food category, such as soda or chips."

V. RESEARCH RESULTS— STAKEHOLDER WORKSHOP SUMMARY

The WIC Data Collection Stakeholder Workshop was held on January 28, 2016 in Washington D.C. The workshop convened sixteen WIC subject matter experts from outside FNS. Eleven participants attended the workshop in-person, and five participants attended the workshop virtually. The participants are grouped into the following three stakeholder groups:

1. WIC program administrators (WIC State and local agencies),
2. Researchers (universities, the USDA Economic Research Service, the Centers for Disease Control and Prevention and the Health Resources and Service Administration of the U.S. Department of Health and Human Services, and the U.S. Census Bureau), and
3. WIC advocates (e.g., the National WIC Association, and the Center on Budget and Policy Priorities).

A detailed workshop agenda is available in Appendix H. The workshop addressed the following goals:

- Review preliminary results of the WIC Data Collection Study,
- Understand how stakeholders use WIC data for program management,
- Discuss the current WIC data collection efforts and challenges within the stakeholder's respective area of expertise, and
- Discuss future opportunities available for WIC data.

A. DATA UTILIZATION BY STAKEHOLDER GROUPS

The section examines WIC data collection and utilization across the three stakeholder groups.

1. WIC Program Administrators

WIC program administrators collect data that are necessary to efficiently and effectively run the program and/or that are required by regulations to be reported to FNS. Program administrators attending the workshop reported uses for data in several significant areas, including: financial management, program integrity, cost containment, food expenditures, administrative costs, caseload management, health outcomes, and nutrition services (i.e., nutrition education and breastfeeding promotion.)

- ***Financial management*** functions depend upon quality data to ensure efficient use of food and Nutrition Services Administration grants; application for and oversight of operational adjustment funds and multipurpose grants, and for financial reporting to FNS and their State government. The data used for these purposes mainly include grant and expenditure data.
  Program integrity is central to maintaining public trust in the administration of the WIC program and therefore is a high priority to State administrators. Program integrity includes the accuracy of eligibility decisions, participant benefits issuance, and vendor and food instrument redemption integrity, which overlap with cost containment efforts. Accuracy of

eligibility depends on reported income (pay stubs or other sources of information), adjunctive program participation, family size, and nutrition risk. If the participant makes any misrepresentation at the WIC intake interview or at intake of any of the adjunctive eligibility programs (e.g., SNAP, Medicaid, TANF), fraud has been committed. Data in support of eligibility integrity include all of the information reported by participants concerning income, adjunct program participation, family size, and nutrition risks.

Issues surrounding vendor integrity and the integrity of food instrument redemptions include maintaining NTE price requirements and preventing administrative errors, improper payments, and substitutions. State agencies typically collect data that support the integrity of redemptions during routine shelf price surveys, in-store monitoring, and through food redemption cost data, as well as during occasional undercover compliance buys. During price surveys, State agencies collect prices for WIC foods from vendors' shelves. State agencies use these data to determine whether vendors are maintaining requirements to be cost-competitive with other vendors in their peer group. Some State agencies use shelf price data to set maximum allowable reimbursement rates, which are used to assess prices that vendors request for payment for foods sold to WIC participants and to contain costs. State agencies operating EBT may obtain FNS approval to use shelf price information obtained from daily redemption data in lieu of conducting six-month price surveys. During compliance buys, State agencies compare prices paid to shelf prices to render calculated data elements showing under- and overcharges. Also, compliance buys may identify inappropriate substitutions allowed by vendors (i.e., when vendors allow non-WIC foods to be purchased in place of WIC foods).

Finally, for the TIP report, WIC State agencies collect and report routine indicators such as annual redemptions, redemption months covered, data reflecting the results of routine monitoring visits and compliance investigations, and high-risk (for fraud) indicators in these categories: redemption, volume, participant, and other (e.g., excessive errors, history of violations, associations with known violators).[72]

- ***Cost containment*** management is required by law and regulations and is an essential aspect of the conscientious use of WIC allocations. Cost containment practices include product rebates[73] and vendor management policies aimed at controlling costs.[74] State agencies carefully manage their allocations and grants to serve as many eligible women, infants, and children as possible. Data in support of product rebates include features of cost containment contracts with food manufacturers, original costs of rebated foods, and the amount of rebates earned. Data supporting vendor management include maximum allowable prices and reimbursement levels, and vendor peer group criteria.[75]

[72] Source: FNS-700, TIP Data Entry Form (www.reginfo.gov/public/do/downloaddocument?objectID=11597501)
[73] For example, infant formula rebates.
[74] For example, establishment of vendor peer groups, competitive price criteria, allowable reimbursement levels, and a requirement that vendors for whom "above-50-percent" of their clientele are WIC clients are paid no more than regular vendors.
[75] Vendor peer group criteria include a variety of vendor characteristics including population density, number of cash registers, type of ownership, store size, WIC sales volume, and the A50 indicator, which indicates whether above 50% of a store's sales are WIC sales.

- ***Food expenditures*** comprise the vast majority ($4.2 billion or 68% in 2015[76]) of the WIC program's budget. Therefore, the quality of the data reflecting food prescriptions, food instrument redemptions, and the costs associated with each food item and food package is critical to managing and projecting the WIC budget. Currently, State agencies have data on each individual participant's food prescription. FNS uses these data to derive aggregate national cost estimates associated with each food package. However, data on the costs of each food item and individual participant's WIC food expenditures do not exist except where EBT data are available for State agency analyses.
- ***Administrative cost*** data allow State and local agencies to manage functions that contribute to WIC service delivery and to forecast administrative needs and costs. State agencies collect cost data on items such as facilities and maintenance, salary and benefits, communications, utilities, insurance, computer/data processing, printing, supplies, vehicles, travel, and contracts (e.g., transportation, and banking and translation services). Local agencies collect much of the same data needed to manage their local operations and report expenditures to the State agency.
- ***Caseload management*** refers to the management required to maximize the number of eligible women, infants and children that can be served with the WIC grant funds allocated to the State agency while not overspending the grant. State agencies use food and NSA expenditure data, participation counts, and eligibility projections to understand actual costs and project future costs. These data also facilitate decision making on conducting outreach to eligible individuals or strategies to promote WIC participant retention.
- ***Health outcomes dat***a help State administrators determine the impact of WIC services on some of the key indicators of overall health and well-being of WIC participants. Data such as anthropometric measures (e.g., height, weight, and body mass index), birth outcomes (e.g., birth weight and gestational age), and breastfeeding duration and exclusivity when linked with data reflecting participant utilization of nutrition services and food benefits, help administrators understand how well WIC services are helping participants.
- ***Nutrition services*** data identify whether participants are utilizing nutrition education and breastfeeding promotion services. When linked with outcomes such as breastfeeding duration and exclusivity, and attainment of goals for healthy eating and other behaviors, these data help administrators determine how well their nutrition and breastfeeding education services are working and enable better targeting of services. State agencies also expressed a desire for data supporting integration of services with other organizations in order to more actively refer clients for services that will improve their health and wellness, such as smoking cessation programs and dental services.

2. WIC Researchers

Researchers evaluating the WIC program are primarily interested in determining how WIC program interventions affect participant behavior, outcomes, and program costs. Researchers attending the workshop highlighted multiple interests, including the determinants of obesity, the impact of peer counseling on breastfeeding rates, the effect of nutrition education on food

[76] U.S. Department of Agriculture, Food and Nutrition Service. (2016). *Women, Infants and Children (WIC): WIC funding and program data*. Retrieved from http://www.fns.usda.gov/wic/wic-funding-and-program-data

redemption, and the effect of WIC participation on health outcomes. In addition to outcome studies, researchers such as the Economic Research Service have used WIC data to evaluate the impact of WIC cost containment policies on average WIC food costs and infant formula wholesale prices and rebates. However, to date, studies such as Gleason and Pooler (2011),[77] which evaluated the impact of food package changes on actual food redemptions, required researchers to obtain point-of-sale data from vendors rather than from WIC EBT databases since EBT data have not been widely available.

Researchers also noted that they use the MDS/SDS analytic file for developing sampling frames and identifying specific study sites; link WIC data to other data sources such as the now decommissioned PNSS/PedNSS, the Child and Adolescent Health Survey, and State health data where linkages are possible; and use WIC data in geographical information systems and longitudinal data sets.

Other government agencies also employ WIC administrative data for research purposes. For example, the U.S. Census Bureau enhances the decennial census by using WIC administrative records to estimate undercounted populations. The Maternal and Child Health division of the U.S. Department of Health and Human Services uses WIC data to study overweight, obesity and smoking behaviors.

3. WIC Advocates

Advocates of the WIC program represent the interests of WIC participants and eligible persons, as well as State and local WIC agencies to legislators and other decision makers. They use data presented in the WIC PC studies, the TIP reports, WIC administrative data (i.e., participation and costs), and official estimates of the eligible population to develop fact sheets and reports for their audiences. Their areas of interest cover a wide range of issues including, but not limited to, administrative costs, outreach, caseload dynamics, adjunctive and income eligibility, and program integrity.

B. DATA COLLECTION CHALLENGES REPORTED BY WIC STAKEHOLDERS

The challenges in current data collection efforts reported by stakeholders at the workshop are similar to those reported by State agencies and regional office staff in their interviews. The stakeholders identified three areas of challenge: (1) a burdensome change control process, (2) the lack of data reporting timeliness, and (3) inconsistent data quality and definitions.

1. *The **change control process*** is particularly burdensome in a consortium environment. When a member of a consortium wishes to include or change a data element, that member must obtain the agreement of all members of the consortium. Stakeholders also found that FNS policy changes that require modifications to MIS or otherwise redirect IT staff efforts often force other data collection and analysis priorities to the back burner. These conflicts increase the complexity and burden of the change process.
2. ***Timeliness*** of data reporting is critical when State agencies wish to compare their program data to that of other agencies. State administrators found that WIC PC data do not serve their needs

[77] Gleason, S., & Pooler J. (2011). *The effects of changes in WIC food packages on redemptions* (FANRP Report 69). Washington, DC: Altarum Institute/Economic Research Service.

because of the delays in reporting. Researchers and advocates at the workshop also found that the two-year lag of WIC PC limited its' usefulness for research and advocacy.

3. ***Data definitions and data collection quality*** across State agencies must be consistent in order to be useful for comparison. The inconsistencies of concern include specific data definitions, data collection quality, and measurement methods. Stakeholders, especially State administrators, remarked that they do not have confidence that States and localities are using the same measurement methods for anthropometric measures (e.g., BMI, height, and weight). Stakeholders also do not have confidence that the measurement methods regarding breastfeeding, financial reporting, and vendor integrity are always defined to ensure comparability or implemented consistently. State agencies expressed concern that multiple changes to TIP requirements over the years have resulted in varying State agency perceptions of data definitions, which have impacted data standardization negatively. While breastfeeding measures might be more easily standardized through national definitions and training, financial reporting measures for WIC NSA grant funds may vary due to differing State accounting practices and may not be standardized readily. Vendor integrity measures may not be comparable due to varying cost containment policies, such as peer group criteria, that differ across States.

C. PRINCIPLES OF DATA COLLECTION EFFORTS DEFINED BY WIC STAKEHOLDERS

Stakeholders expressed that they hoped for certain principles to guide future data collection efforts. These fall into areas of burden, comparability, coordination, and sampling.

- ***Burden*** of data collection is a serious concern for stakeholders as they struggle to maintain their MIS and other reporting systems, in addition to planned improvements to these systems to meet their State's management needs. Stakeholders, especially State administrators, agreed that any changes to data collection requirements must strike a satisfactory balance between the perceived benefit of the additional data collected and the burden placed on State and local agencies and WIC participants for the data collection. In addition, researchers often find that their data collection requests are viewed as extra burdens on already overburdened MIS and clinic staff.
- ***Comparability*** of data collection would enable State agencies, researchers, and advocates to have confidence in analyzing and reporting comparisons among State agencies of information including State WIC policies and procedures, participant characteristics, and health outcomes. State agencies particularly desire data comparability in studies and reports, such as TIP, that compare their performance or outcomes to those of other States. They report that if the data are not comparable then the reports can do more harm than good. In addition, they report that comparable national data would be more useful for development of best practices recommendations.
- ***Coordination of national data collection efforts*** is critical to stakeholder buy-in. State agencies reported a desire to have agreements to the terms of use of data collected by FNS. They recommend that any data collection efforts have discrete uses agreed upon by stakeholders. They also suggest that a strong leader for the data collection process is necessary for the success of any new effort. Without high-level dedication to ensuring success, stakeholders fear wasting their time, energy, and money on a new data collection effort.
- ***Sampling*** arose as a possible method of managing the enormous quantity of data collected by State and local agencies and provided to State agencies via food benefit transactions. Stakeholders agree that not all data necessarily needs to be collected from all States. For some purposes, sampling would serve FNS' and stakeholders' needs. As mentioned above, when discrete purposes for data collection are defined and agreed upon, the scope (i.e., census v. sampling) of the data collection can be defined with efficiency in mind.

D. DATA AREAS OF INTEREST REPORTED BY WIC STAKEHOLDERS

Stakeholders identified a number of areas of interest for which data collection could be improved. These areas include:

- *Health outcome* measures, such as anthropometric measurements and birth outcomes, that are collected, cleaned, and recorded using consistent methods;
- Vendor and participant *integrity* data that are comparable across State agencies;
- *Food purchasing data,* such as prices and quantities purchased at the food item level for WIC-approved foods, and detail on fruits and vegetables available through EBT;

- *Breastfeeding* practices measures that are defined the same in every State and local WIC clinic;
- *Nutrition education* practices and participation;
- *Income and adjunctive eligibility* measures;
- Accessible *State plan* data such as authorized foods and allowed substitutions, cost containment policies, and breastfeeding and peer counseling practices; and
- *Linkage* between participant certification databases, which include nutrition services information, and EBT food benefits and redemption databases. Since EBT aggregates benefits to a household, connecting the participant food package to food redeemed may be possible only when there is one participant in a household or when a food item is unique to a food package for one participant category (e.g., infant food or formula).

E. OPPORTUNITIES FOR FUTURE DATA COLLECTION EFFORTS

Although the stakeholders were interested in accessing EBT data, they were more interested in improvements to the data that are currently collected and reported to FNS. Opportunities to improve the usefulness of WIC data abound. The level of effort needed to accomplish potential modifications ranges widely.

1. ***Periodicity:*** As mentioned previously, the two-year lag between the publishing of the WIC PC reports and the time of data collection makes WIC PC irrelevant to many users. Since processes for State reporting of the MDS/SDS for WIC PC are fairly routine, more frequent collection may not require much additional effort among State agencies with more advanced analytical and reporting capabilities. However, among States with less advanced analytical and reporting capabilities more frequent submittal may increase the cost to clean the data and conduct the analysis now done every other year.
2. ***Data consistency:*** Stakeholders are concerned about the consistency and comparability of some of the WIC data commonly used in the administration of the program. For example, not all data definitions (e.g., obesity, breastfeeding practices), collection (e.g., measurement of height and weight, questions regarding health conditions) and cleaning methods are standardized nationally. To standardize data definitions, collection and cleaning methods, a comprehensive review of nationally collected data must be undertaken to identify areas of concern. Once the problem areas are identified, standards must be agreed upon by stakeholders, data collection systems may need to be updated, instructions may need to be revised or created, and staff may need to be trained in new methods and definitions.
3. ***Data usefulness:*** Stakeholders feel that some of the current data collection and reporting activities are not useful in helping to manage operations. Specifically, some stakeholders mentioned that although they submit data for the TIP report, they do not understand how the data are used. State administrators noted that, in the case of TIP, peer group criteria and other aspects of their vendor populations differ across WIC State agencies, and as such, the TIP data are not comparable across State agencies, making the data less useful to them. Any effort to improve the data collections and reports could start with a concerted effort to identify and investigate how FNS and stakeholders use the data that State agencies report to them, the reasons why stakeholders do not find value in these data or reports and what type of data and

reports would be useful to them. Making changes necessary to improve data collections such as TIP would require national coordination, agreement, revisions of data collection forms, training and recoding MIS dedicated to collecting the data. Quite possibly, the current data sets and reports may need to be completely replaced with more useful alternatives.

4. ***Representative sampling***: Given the vast quantity of data available today, especially through sources such as EBT, stakeholders suggest that nationally representative sampling of a subset of data elements rather than a census of all items could reduce burden while being equally useful. Again, the process would start with identifying possible data elements, agreement upon those items and a schedule for data collection, development of sampling frames, and planning new ways to publish or otherwise share the samples.

5. ***EBT analytics***: WIC EBT is scheduled to be rolled out nationally by October 1, 2020. The WIC MIS-EBT universal interface sets standard protocols for linking participant data from WIC MIS and EBT data on EBT transactions. These include data items, such as food prescriptions authorized by food category, subcategory, and quantity;[78] types and quantities of food items purchased; prescription items expired without being purchased; prices paid; NTE prices; discounts applied; rebates applied; vendor peer group; addresses of vendors and participants, which can be used to calculate distance to the store; and participant, clinic, and vendor identifiers. Much could be learned from EBT data linked to WIC participant databases, which could reveal food purchasing behaviors that many stakeholders have long wished to understand. Since EBT data may become more standardized in an upcoming update to the MIS-EBT universal interface, nationally comparable analytics are potentially possible using EBT data once the interface is adopted by State agencies. Several routes could be taken to develop EBT analytic data sets and standard analyses. Data for several State agencies could be aggregated and analyzed within the MIS storing their data, or data from several MIS could be regionally or nationally aggregated and analyzed.

6. ***Centralized repository***: Currently, WIC data reside in multiple unlinked databases and MIS throughout the country. This dispersal of WIC data makes national analyses very difficult, costly and time-consuming because of the need to aggregate data housed in different databases and systems. Now that EBT systems are operable in an increasing number of States, the consolidation of EBT data is quite possible. For example, some EBT processors that serve multiple State EBT systems are able to take advantage of technological compatibility to consolidate EBT data across the State agencies they serve. This opportunity to aggregate EBT data makes the aggregation of WIC MIS data into a central data system also timely. Consolidation of WIC's great wealth of data would provide excellent opportunities for improving program management, research, and advocacy. For example, linking program participant or household[79] demographic data to EBT data could reveal much about WIC participants' food purchasing behaviors. Linking such data nationally, if the data are consistently collected, would make way for the development of powerful analytical tools for improving program management and the development of best practices. EBT data are already moving toward greater standardization through the EBT-MIS universal interface, making their

[78] EBT benefit prescriptions are organized into a common structure following the National Category Subcategory Table, although the specifics vary from State agency to State agency.
[79] EBT data are aggregated at the household level so that purchases pertaining to all WIC participants in a single household are associated with a single EBT card.

use potentially more feasible. Should FNS decide to pursue developing a central repository for EBT and MIS data, planning should begin soon, before multiple EBT databases become entrenched, differentiated, and more difficult to incorporate into a central database for analysis. Clearly, creation of a central repository would require exceptional planning, coordination, and labor and capital investments. Such a planning effort would need to clearly define the data elements, consider any sensitive data, and define stakeholder accessibility to the database.

Exhibit 27: WIC Data Improvement Opportunities shows several opportunities for improving WIC data collection and a description of the investment that might be needed.

Exhibit 27: WIC Data Improvement Opportunities

Improvement Opportunities	Investment Needed
Periodicity	Time and labor from FNS and SA staff.
Consistency	Time and labor from FNS and SA staff; training.
Data Usefulness	Time and labor from FNS and SA staff to assess data needs and to implement changes; training.
Representative Sampling	Time and labor from FNS and SA staff; training.
EBT Analytics	Time and labor from FNS and SA MIS staff; training; expenditures for servers and code developers.
Central Repository	Time and labor from FNS and SA MIS staff, including additional training; expenditures for data management vendors and servers.

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VI. RECOMMENDATIONS

Given the concern among WIC stakeholders on the challenges highlighted above in WIC's current national data collections, improvements are essential in order to promote widespread use of WIC data among WIC administrators, researchers, and advocates. The ability of FNS and WIC State and local agencies to improve data collections relies greatly upon strong leadership from FNS and the full engagement of stakeholders. Stakeholder buy-in depends upon FNS' ability to demonstrate that stakeholders' perspectives and input on principles for data collections will be incorporated into a planning process. Determining FNS' commitment to improving WIC data collection and assessing the level of willingness of stakeholders to participate in revisions are the first steps to success. Conducting additional workshops, regionally or at a national conference, or a survey of all 90 State agencies and ITOs could give FNS a sense of their interest and potential level of commitment to a national data collection project. Once a broader sense of State agency interest is obtained, FNS can move forward by instituting an FNS stakeholder workgroup tasked with developing detailed objectives and actionable plans.

Based on the information collected in the study, we recommend that FNS investigate the feasibility of the following areas for improvement:

- Increasing the *periodicity* of the WIC PC MDS/SDS collections;
- Improving the *quality* and *consistency* of data currently collected by standardizing data definitions and data collection and data cleaning methods;
- Enhancing the *usability* of data collected by FNS, with the objective of reviewing and modifying the data items collected as needed;
- Considering *representative sampling* in the place of the census for some data collection efforts;
- Assessing the feasibility of developing a national analytic database of *EBT data* that can be linked to participant data; and
- Assessing the feasibility of a national *central repository* for a defined set of WIC data.

A. NEXT STEPS

Expanding and revising WIC's national data collections efforts will require considerable coordination between FNS and stakeholders. We recommend continuing this work in three phases to ensure that FNS and stakeholders will succeed in producing meaningful data collections for program management, research and advocacy.

1. Commitment Development
   - FNS determines its level of commitment and resource dedication to planning and conducting a WIC data collection improvement project.
   - FNS identifies an administrative officer who will oversee and advocate for the project throughout the effort.
   - FNS determines the oversight mechanism to manage the project.

2. Gauging Data Collection Improvement Support and Potential Costs
    - FNS schedules a national or multiple regional WIC data collection conference(s) with interested stakeholders to determine the level of support for various options, such as those mentioned in the key recommendations section above.
    - FNS conducts meetings with State MIS and EBT managers to assess how each data collection option would affect MIS and EBT costs and level of effort.
3. FNS-Stakeholder Workgroup
    - FNS identifies State and local agency members for a workgroup that represents all FNS regions, reflects the diversity in program operations and size, and includes prominent research and advocacy stakeholders that will further develop plans for modifications and recommendations for data access and use policies.
    - Workgroup evaluates information gathered from the input in phase 2 above, gauging data collection improvement support and potential costs.
    - Workgroup develops recommendations, prioritization, and options for FNS decision-making on which data collection improvements will be pursued.

VII. CONCLUSION

The WIC Data Collection Study provides a current status of WIC MIS and identifies the opportunities and challenges associated with modifying the State agencies' MIS to accommodate new data elements or other changes to support FNS data needs. The study also identifies data collected by State agencies that are not reported routinely to FNS and EBT data that are becoming available as State agency EBT implementation expands. It explores the State agencies' ability to collect, store, retrieve, and report these and other data to meet policy and program management needs now and in the foreseeable future. Based on an analysis of that information, the study suggests additional data elements that could be considered for future data collection activities to support ongoing programmatic and research-related activities within the WIC program. Also, it examines the level of interest of WIC data users and stakeholders in WIC data improvements through an analysis of a workshop designed to elicit concerns and interest surrounding WIC data collection. Finally, it provides recommendations for potential changes to how FNS requests and collects WIC data from State agencies.

Status of *WIC MIS and EBT*

Over half of the WIC State agencies (49) operate a modern MIS, while the rest operate legacy systems. The majority of these State agencies belong to consortia that share an MIS and collectively are responsible for changes to and the integrity of the system. Thirty-six of the State agencies operating a legacy MIS indicated that they plan to replace their system within the next two to three years. Many of the legacy systems, although still functional, are operating within older design architectures that are inflexible and often costly to update or enhance.

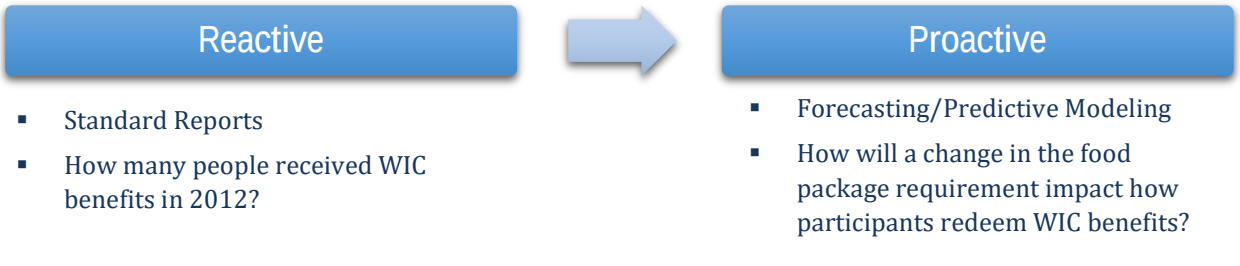
Many WIC State agencies are readying, upgrading, or replacing their MIS to adopt EBT. Twenty-four State agencies (27%) will complete the statewide rollout of EBT by the end of 2016 while another 62 are in the planning or implementation stages.

Data Collection Challenges and Opportunities

FNS and State agencies want access to timely data to evaluate the impact of WIC services (e.g., nutrition education) on critical issues, such as breastfeeding status and reducing obesity. In addition, FNS and State agencies are interested in using comparable data points to identify areas for improvement and leverage best practices across State agencies.

WIC State and local agencies are interested in moving from reactive standard reports to proactive data analytics (Exhibit 28).

Exhibit 28: Transitioning from Reactive Reporting to Proactive Data Analytics



State agencies that have migrated to a modern information system continue to face difficulties accessing data from their MIS to perform ad hoc data analyses or build new reports.

- WIC program managers cite a lack of technology resources and tools to perform this function without support from their technology departments. Several State agencies, such as Ohio, Michigan, Texas, Kentucky, Missouri, and Arizona, have developed data warehouse functionalities, data cubes, dashboards, or specific reporting tools outside of their MIS to enhance their data analytic capabilities.
- Better user documentation will help FNS and State agencies understand the data that reside in the WIC MIS. This information may include how data are captured (e.g., clinic, client application), when the data are collected, and when the MIS receives the data.

Based on the interviews and reviews conducted for this study, MIS modernization and the implementation of EBT are changing the ability of State agencies to gather information relevant to WIC program management and policy. State and local agencies are excited about the opportunity to analyze EBT data as the data become available and analytic tools are developed. Meanwhile, State agencies already collect much additional data not reported to FNS that they use for program management. Some of these data are of potential use to FNS for program management, policy development, and integrity oversight at the Federal level. Although State agencies have or readily can collect these data, challenges remain. Specifically, State agencies, including those with modern systems, often lack the staff resources needed to extract and report these data. They also find that changing data collection parameters within an MIS consortium environment involves additional challenges associated with coordinating the change control process with multiple partners.

Data Elements of Key Interest

The study team explored the data collected by WIC State and local agencies that are not reported routinely to FNS and identified 16 data elements that may be of interest to FNS. Interviews with FNS and State agencies repeatedly cited these data for improving WIC program planning and management, as well as monitoring integrity. The study team categorized these data elements into six topics.

1. WIC Demographic Data (e.g., marital status and household language spoken) describes additional participant characteristics.
2. WIC Health and Nutrition Data—Health Behaviors (e.g., maternal smoking and maternal alcohol consumption) measure participant and program outcomes. WIC State agencies use health and nutrition data to reduce complications during pregnancy and reduce the number of low-birthweight and premature infants. State and local agencies use these data to tailor nutrition education and identify referrals needed for the participants.
3. WIC Health and Nutrition Data—Nutrition Education Services (e.g., topic and mode) provides FNS with the opportunity to measure the impact of WIC services on participant behavior.
4. WIC Health and Nutrition Data—Breastfeeding (e.g., exclusivity) provides FNS with the ability to differentiate fully breastfed infants from exclusively breastfed infants and to establish standardization of the meaning of exclusive breastfeeding in WIC MIS data collections.

5. WIC Food Redemption Data (e.g., quantity of WIC food benefits redeemed and WIC food items issued, redeemed, and expired) provide FNS with better access to timely data on participant purchasing patterns, including food types, brands, and quantities purchased with WIC benefits.
6. WIC Vendor Management Data (e.g., prices paid and discounts) allow FNS to analyze nearly real-time and standardized data to improve the timeliness and comparability of vendor management analyses.

Stakeholder Workshop Summary

Stakeholders, including WIC program administrators, WIC researchers and WIC advocates demonstrated considerable enthusiasm for using WIC data and improving its collection. They identified:

- ***Several types of WIC data particularly useful to them, including:*** financial management, program integrity, cost containment management, food prescription redemption costs, administrative costs, caseload management, health outcomes, and nutrition services data;
- ***Similar data collection challenges to those identified by the State agency interviews, including:*** a burdensome change control process, lack of timeliness of data, and inconsistent data definitions and collection quality across localities and State agencies;
- ***A set of principles they believe should guide future WIC data collection efforts, including the need to:*** strike a balance between data collection burden and benefit of data collection requirements, ensure that data are comparable across State agencies, coordinate national data collection efforts, and consider sampling for collecting some data elements; and
- ***Opportunities for future data collection efforts, including:*** improving data periodicity, consistency, and usefulness; using representative sampling; developing EBT analytics; and creating a central WIC data repository.

Recommendations

Overall, the study identifies a significant potential for improvements to WIC data, while pointing out the challenges involved in making improvements. In addition, the study finds a sufficient level of interest among WIC stakeholders in improving WIC data collection to warrant further work on developing specific data improvement goals and a process for achieving those goals. Therefore, we recommend a three-phase strategy for ensuring that FNS and WIC stakeholders will succeed in producing meaningful improvements in data collection for program management, research, and advocacy. These phases are: (1) commitment development; (2) gauging data collection support and potential costs; and (3) establishing a shared FNS-stakeholder workgroup. During the commitment development phase, FNS would identify the level of commitment and resources the agency might apply to the WIC data collection improvement effort, as well as a mechanism for overseeing the process. During the gauging support and costs phase, FNS would convene stakeholder meetings to determine the level of support for various options and discuss potential costs with State MIS directors. Finally, during the FNS-stakeholder workgroup phase, FNS would identify workgroup partners to further develop plans and recommendations. The workgroup would then evaluate information gathered in phase 2 and develop more firm recommendations, priorities, and options for FNS decision makers to consider.

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VIII. REFERENCES

Appendix A: Participant Characteristics—Minimum Data Set

The Minimum Data Set (MDS) contains participant and program characteristic data items that WIC State agencies must collect and report to FNS. State agencies report these data biennially in the WIC Participant and Program Characteristics (WIC PC) Report.

- ***Collection Frequency:*** State agencies have reported the data to FNS biennially since 1992 in even-numbered years. Prior to 1992, WIC PC was a sample-based survey of WIC participants.
- ***Population:*** The MDS is a census of WIC participants in State agencies, territories, and ITOs. The term WIC participant means a person on the WIC master lists or person listed in WIC operating files who is certified to receive WIC benefits.

Exhibit 29: MDS Field Descriptions, Data Characteristics, and Values and Validations

Item #	Data Field	Field Description	Start & End Column	Field Length	Data Type	Values & Validations
1	State Agency ID	A unique number that permits linkage to the WIC State agency where the participant was certified. First 7 digits of the 10-digit Local Agency code maintained by FNS in the WIC Local Agency Directory (WIC LAD).	1 7	7	Numeric	
2a	Local Agency ID	A unique number that permits linkage to the local agency where the participant was certified as eligible for WIC benefits. Last 3 digits of the 10-digit Local Agency Code maintained by FNS in WIC LAD.	8 10	3	Numeric	
2b	Service Site ID	A unique number that permits linkage to the service site where the participant was certified. For State agencies that submitted service site or clinic-level data for WIC LAD, service site IDs appear in WIC LAD as the 3-digit codes under Administering Agency.	11 13	3	Numeric	

Item #	Data Field	Field Description	Start & End Column	Field Length	Data Type	Values & Validations
3	Case ID	A unique record number for each participant that maintains individual privacy at the national level. (Note: State agencies should not use as the case ID the case number of the participant as listed in State agency-held files. Participant or case IDs for each participant should continue to maintain individual privacy at the national level.)	14 24	11	Alphanumeric	
4	Client Date of Birth	Month, day, and year of participant's birth.	25 32	8	Date	MMDDYYYY
5	Client Race/ Ethnicity	This categorization requires classification of participants based on ethnicity as well as race. The two ethnic categories are Hispanic/Latino or Not Hispanic/Latino. The five racial categories, as required by OMB, are (1) American Indian or Alaskan Native; (2) Asian; (3) Black or African American; (4) Native Hawaiian or Other Pacific Islander; or (5) White. One or more racial categories may be selected.	33 38	6	Numeric	State agencies may report race/ethnicity using one of two formats: (1) yes/no for each of the categories resulting in a 6-digit code (1=yes; 2=no), or Three digits to represent key combinations of racial selections with the first digit representing ethnicity and the last two representing race combinations.
6a	Certification Category	The category—one of five possible categories—under which a person is certified as eligible for WIC benefits.	39 39	1	Numeric	Pregnant woman Breastfeeding woman Postpartum woman (not breastfeeding) Infant (under 12 months) Child (12–59 months)
6b	Expected Date of Delivery	For pregnant women, the projected date of delivery or the number of weeks since the last menstrual period as determined at WIC program certification.	40 47	8	Date	MMDDYYYY
6c	Number of Weeks Gestation		48 49	2	Numeric	# of weeks

Item #	Data Field	Field Description	Start & End Column	Field Length	Data Type	Values & Validations
7	Date of Certification	The date the person was declared eligible for the most current WIC program certification.	50 57	8	Date	MMDDYYYY
8	Sex	For infants and children, male or female.	58 58	1	Numeric	Male Female
9	Risk Priority Level	Participant priority level for WIC program certification at the time of the most recent WIC program certification as of April of study year.	59 59	1	Numeric	
10a	Participation in TANF	The participant's reported participation in Temporary Assistance for Needy Families (TANF), Supplemental Nutrition Assistance Program (SNAP), and Medicaid programs at the time of the most recent WIC program certification as of April of study year.	60 60	1	Numeric	Yes No
10b	Participation in SNAP		61 61	1	Numeric	Yes No
10c	Participation in Medicaid		62 62	1	Numeric	Yes No
11	Migrant Status	Participant migrant status according to the Federal WIC program definition of a migrant farmworker (currently counted in the FNS-498 report).	63 63	1	Numeric	Yes No

Item #	Data Field	Field Description	Start & End Column	Field Length	Data Type	Values & Validations
12	Number in Family/ Economic Unit	The number of persons in the family/household or economic unit upon which WIC income eligibility was based. States may report a self-declared number in the family or economic unit for participants whose income was not required to be determined as part of the WIC certification process. These participants include adjunctively income-eligible participants (due to TANF, SNAP, or Medicaid participation) and those participants deemed income-eligible under optional procedures available to the State agency in Federal WIC Regulations, Section 246.7(d) (2) (vi-viii) (means tested programs identified by the State for automatic WIC program income eligibility, income eligibility of pregnant women, and income eligibility of Indian and instream migrant farmworker applicants).	64 64	2	Numeric	1 – 20 Zero is not a valid value for this item.
13a	Family/Economic Unit Income	For a person whose income is determined during the certification process, enter the income amount that was used to qualify the individual for WIC benefits. Amounts may be reported for various periods of time (weekly, monthly, biweekly—every 2 weeks, or annually) as specified in 13b. For a participant whose income was not required to be determined for WIC certification, enter a self-declared income for descriptive purposes only. Self-declared incomes for these participants may be entered in dollar amounts in MDS Items 13a and 13b or by income categories in MDS Item 13c.	66 70	6	Numeric	Dollars ($) expressed in annual amounts States may enter income for adjunctively income eligible participants either in 13a or 13c. Zero should not be used to indicate income values that are missing or not available. Zero should indicate only an actual value of zero.

Item #	Data Field	Field Description	Start & End Column	Field Length	Data Type	Values & Validations
13b	Income Period	The period covered by the amount described in Family Income (item 13a). Income period should be present for every record containing a dollar value for income. FNS will convert income expressed in different measures to annual amounts.	71 71	1	Numeric	1 = Weekly 2 = Monthly 3 = Biweekly (every 2 weeks) 4 = Annually Zero is not a valid value for this item.
13c	Income Ranges for Participants with Adjunct Eligibility	Self-declared income for the family/economic unit expressed in a dollar range for any participant whose income was not required to be determined as part of the WIC certification process. Participants whose incomes are not required to be determined during WIC certification include adjunctively income-eligible participants and those persons deemed income eligible under optional procedures available to the State agency in Federal WIC Regulations, Section 246.7(d) (2) (vi-vii).	72 73	2	Numeric	1 – 63 See footnote below[80] Zero is not a valid value for this item
14a	Nutrition Risk #1	Up to 10 highest-priority nutrition risks present at the WIC program certification current in April of study year. Uniform coding is required in submissions from all States, according to WIC Policy Memorandum 98-9. (All data is left justified.)	74 79	6	Alphanumeric	
14b	Nutrition Risk #2		80 85	6	Alphanumeric	
14c	Nutrition Risk #3		86 91	6	Alphanumeric	
14d	Nutrition Risk #4		92 97	6	Alphanumeric	
14e	Nutrition Risk #5		98 103	6	Alphanumeric	
14f	Nutrition Risk #6		104 109	6	Alphanumeric	

[80] For some applicants, States agencies reported "actual" income—that is, the dollar amounts provided by WIC applicants. For many applicants who are adjunctively income eligible, States agencies reported income ranges rather than dollar amounts. For analytic purposes, the midpoints of the ranges were assigned as household income. Both types of data have been combined to compute average annualized income and to calculate percent of poverty. Income ranges were reported in $100-per-month increments up to a top category of $6,200 and greater per month. Retrieved from https://origin.drupal.fns.usda.gov/sites/default/files/wic/PC2012Guidance.pdf

Item #	Data Field	Field Description	Start & End Column	Field Length	Data Type	Values & Validations
14g	Nutrition Risk #7		109 115	6	Alphanumeric	
14h	Nutrition Risk #8		116 121	6	Alphanumeric	
14i	Nutrition Risk #9		122 137	6	Alphanumeric	
14j	Nutrition Risk #10		128 133	6	Alphanumeric	
15a	Hemoglobin	Value for the measure of iron status that applies to the WIC program certification current in April of study year. It is assumed that the measure was collected at the time of certification or within 90 days of the certification date. This item is not required for infant participants who are less than 9 months old.	134 136	3	Numeric	
15b	Hematocrit		137 139	3	Numeric	Reported in grams/dl (XX.Y) with a single implied decimal place For example, 14.9 is coded as 149
15c	Date of Blood Test	The date of the blood measurement that was used during the most recent WIC program certification current in April of study year.	140 147	8	Date	MMDDYYYY
16a (I)	Participant Weight in Pounds	The participant's weight measured according to the CDC nutrition surveillance program standards (nearest one-quarter (1/4) pound). If weight is not collected in pounds and 1/4 pounds, weight may be reported in grams.	148 150	3	Numeric	
16a(ii)	Weight—Nearest Quarter Pound		151 151	1	Numeric	
16b	Participant Weight in Grams		152 157	6	Numeric	
17a (i)	Participant Height in Inches	The participant's height (or length) measured according to the CDC nutrition surveillance program standards (nearest one-eighth (1/8) inch). If height is not collected in inches and 1/8 inches, height may be reported in centimeters.	158 159	2	Numeric	
17a(ii)	Height—Nearest Eighth		160 160	1	Numeric	
17b	Participant Height in Centimeters		161 164	4	Numeric	

Item #	Data Field	Field Description	Start & End Column	Field Length	Data Type	Values & Validations
18	Date of Height & Weight Measure	The date of the height and weight measures that were used during the most recent WIC program certification current in April of study year.	165 172	8	Date	MMDDYYYY
19a	Currently Breastfed	Information is needed for all infant participants ages 6 through 13 months, whether or not the infant is currently receiving breast milk.	173 173	1	Numeric	Yes No
19b	Ever Breastfed	Information is needed for all infant participants ages 6 through 13 months, whether or not the infant ever received breast milk.	174 174	1	Numeric	Yes No
19c	Length of Time Breastfed	For infants ages 6 through 13 months, the number of weeks the infant received breast milk.	175 176	2	Numeric	0–72
19d	Date Breastfeeding Data Collected	For infants ages 6 through 13 months, the date on which breastfeeding status was reported.	177 184	8	Date	MMDDYYYY
20a	Food Code #1	State agencies have the option of providing food data in a food package format or in an item-quantity format. The item-quantity format is preferable. States should provide the food package codes or item codes and quantities for all food prescribed for the participant during the month requested. The food package code(s) for the WIC food package or for all food instruments prescribed for the participant during the month.	185 194	10	Alphanumeric	
20b	Food Code #2		195 204	10	Alphanumeric	
20c	Food Code #3		205 214	10	Alphanumeric	
20d	Food Code #4		215 224	10	Alphanumeric	
20e	Food Code #5		225 234	10	Alphanumeric	
20f	Food Code #6		235 244	10	Alphanumeric	
20g	Food Code #7		245 254	10	Alphanumeric	
20h	Food Code #8		255 264	10	Alphanumeric	
20i	Food Code #9		265 274	10	Alphanumeric	
20j	Food Code #10		275 284	10	Alphanumeric	

Item #	Data Field	Field Description	Start & End Column	Field Length	Data Type	Values & Validations
20k	Food Code #11		285 294	10	Alphanumeric	
20l	Food Code #12		295 304	10	Alphanumeric	
20m	Food Code #13		305 314	10	Alphanumeric	
20n	Food Code #14		315 324	10	Alphanumeric	
20o	Food Package Type	A code representing the interim rule food package descriptor. This descriptor uniquely represents the FNS food package number (I through VII), participant type, breastfeeding status, and (for infants and children only) age, associated with the reported food code(s) for that participant.	325 326	2	Numeric	1–28

Note: Adapted from U.S. Department of Agriculture, Food and Nutrition Service. (2011). *Guidance for state agencies providing participant data: WIC participant and program characteristics 2012*. Retrieved from http://origin.www.fns.usda.gov/wic/PC2012Guidance.pdf

Appendix B: Participant Characteristics—Supplemental Data Set

The Supplemental Data Set (SDS) contains participant and program characteristic data items that are optional for WIC State agencies to collect and report to FNS. State agencies report these data biennially in the WIC Participant and Program Characteristics (WIC PC) Report.

- ***Collection Frequency:*** State agencies have reported the data to FNS biennially since 1992 in even-numbered years. Prior to 1992, WIC PC was a sample-based survey of WIC participants.
- ***Population:*** The SDS is a census of WIC participants in State agencies, territories, and ITOs. The term WIC participant means a person on the WIC master lists or person listed in WIC operating files who is certified to receive WIC benefits.

Exhibit 30: SDS Field Description, Data Characteristics, and Values and Validations

Item #	Data Field	Field Description	Begin & End Column	Field Length	Data Type	Values & Validations
21	Date of First WIC Certification	Date the participant was first certified for the WIC program. For pregnant, breastfeeding, and postpartum women, this applies to the current/most recent pregnancy and not to prior pregnancies.	327 334	8	Numeric	MMDDYYYY
22	Educational Level	For pregnant, breastfeeding, and postpartum women, the highest grade or year of school completed. For infants and children, the highest grade or year of school completed by mother or primary caretaker.	335 356	2	Numeric	0–18 Zero is a valid entry for this item and should be used for any WIC participant who has completed less than 1 year of school.
23	Number in Family/ Household on WIC	The number of people in the participant's family/household receiving WIC benefits.	337 338	2	Numeric	1–20 The value is no greater than the number in the economic unit entered in item 12 of the Minimum Data Set.
24	Date Previous Pregnancy Ended	For pregnant women, the date previous pregnancy ended.	339 346	8	Date	MMDDYYYY

Item #	Data Field	Field Description	Begin & End Column	Field Length	Data Type	Values & Validations
25	Total Number of Pregnancies	For pregnant women, the total number of times the woman has been pregnant, including this pregnancy, all live births, and any pregnancies resulting in miscarriage, abortion, or stillbirth.	347 348	2	Numeric	1–20
26	Total Number of Live Births	For pregnant women, the total number of babies born alive to this woman, including those who may have died shortly after birth.	349 350	2	Numeric	1–20
27a (i)	Prepregnancy Weight in Pounds	For pregnant women only, the participant's weight immediately prior to pregnancy. Prepregnancy weight may be reported either in pounds and ounces or in grams.	351 353	3	Numeric	
27a (ii)	Prepregnancy Weight—Nearest Quarter Pound		354 354	1	Numeric	0–3
27b	Prepregnancy Weight in Grams		355 360	6	Numeric	
28a (i)	Weight Gain During Pregnancy–Pounds	For breastfeeding and postpartum women, the participant's weight gain during pregnancy as taken immediately at or prior to delivery. Weight gain during pregnancy may be reported in pounds and quarter pounds or in grams.	361 363	3	Numeric	-20–50
28a (ii)	Weight Gain During Pregnancy—Nearest Quarter Pound		364 364	1	Numeric	0–3
28b	Weight Gain During Pregnancy—Grams		365 370	6	Numeric	-10000–25000
29a (i)	Baby's Birth Weight—in Pounds	For infants and children, the participant's weight at birth measured according to the CDC nutrition surveillance program standards (pounds/ounces). Birth weight may be reported in either pounds or ounces, or in grams.	371 372	2	Numeric	0–15
29a (ii)	Baby's Birth Weight—in Ounces		373 374	2	Numeric	0–15
29b	Baby's Birth Weight—in Grams		375 378	4	Numeric	

Item #	Data Field	Field Description	Begin & End Column	Field Length	Data Type	Values & Validations
30a (i)	Baby's Birth Length –in Inches	For infants and children, the participant's length measured according to the CDC nutrition surveillance program standards (eighth inches). Birth length may be reported in inches and eighth inches or in centimeters.	379 380	2	Numeric	
30a (ii)	Baby's Birth Length –Nearest Eighth of an Inch		381 381	1	Numeric	0–7
30b	Baby's Birth Length –Nearest Eighth of an Inch		382 384	3	Numeric	
31	Participation in the Food Distribution Program on Indian Reservations	The participant's reported participation in this program at the time of most recent WIC program certification as of April of study year.	385 385	1	Numeric	1 = Yes 2 = No

Note: Adapted from U.S. Department of Agriculture, Food and Nutrition Service. (2011). *Guidance for state agencies providing participant data: WIC participant and program characteristics 2012*. Retrieved from http://origin.www.fns.usda.gov/wic/PC2012Guidance.pdf

Appendix C: Literature Review Search Protocol and Decision Model for Document Screening

Search String Permutations

The study team used bibliographic software to generate all possible permutations of the keywords identified in Exhibit 4.

In most search engines the study team used in this search, including Google Scholar and Wiley Online Library, the exact order of keywords is not important; the search algorithms within these databases generate search string permutations automatically. For the other search engines the study team used in this search, such as PubMed and POPLINE, search permutations must be entered manually. To make the search process more efficient, the study team relied on bibliographic software to automatically generate these permutations and apply them in the PubMed and POPLINE databases. Thus, the study team inputted the following initial search string and commanded the bibliographic software to generate all possible permutations:

> [WIC or "*Women, Infants and Children*" or "*Special Supplemental Food Program*" or "*Special Supplemental Nutrition Program*" or "*Food Packages*"] AND [Association or Relationship or Affect or Effect or Evaluation or Impact or Outcome or Correlation] OR [Administration or Management or Operation or System or Cost or Program]

The software generated 23 unique search string permutations. The study team refined these search strings for precision using two bibliometric techniques: wildcard searches and word boundary searches. As we discussed in this report, wildcard searches command the bibliographic software to include all possible conjugates of a keyword. Word boundary searches use positional operators to search for words within the "*neighborhood*" of a keyword (i.e., within *n* words of a keyword). These techniques help to limit the number of false positive results within a multi-engine search query while ensuring that any similar keywords not included within an initial search string are captured. We used the percent symbol (%) in search string formulas, although positional operator and numeric value (e.g., *"ADJn"*) are used for boundary searches.

The study team applied wildcard parameters to a number of the search keywords and set a word boundary of two for keywords where compound nouns were likely (e.g., system or management). As in the previous search string, the study team commanded the bibliographic software to run all possible permutations and apply them to all search engines used in this literature review. The study team used the following search string:

> [{adj2<WIC>adj2} or "*Women, Infants and Children*" or "*Special Supplemental Food Program*" or "*Special Supplemental Nutrition Program*" or "*Food Packages*"] AND [Associa% or Relation% or Affect or Effect or Evaluation or Impact or Outcome or Correlat%] OR [{adj2<Administration>adj2} or {adj 2<Manage%>adj2} or Operation or {adj2<System>adj2} or {adj2<Cost>adj2} or {adj2<Program>adj2}]

The study team reviewed the output of this search string, which returned 977 unique document citations published after 2010. The bibliographic software ranked these citations depending on the number of keywords found in both the document abstract and full text. The study team used this ranking to refine the search string and its permutations in order to narrow the number of returned document citations. For instance, many document citations with lower rankings consisted of

reports on other nutrition assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP), the Temporary Assistance for Needy Families program (TANF), the National School Lunch Program (NSLP), and the School Breakfast Program (SBP), where WIC was mentioned somewhere in the report (often in a footnote) but was not the main topic of the document. The study team also adjusted the word boundaries in an attempt to reduce erroneous returns. As a result, the study team used the following search string:

> *[[{adj2<WIC>adj2} or "Women, Infants and Children" or "Special Supplemental Food Program" or "Special Supplemental Nutrition Program" or "Food Packages"] NOT [SNAP or "Supplemental Nutrition Assistance Program" or "National School Lunch Program" or NSLP or "School Breakfast Program" or SBP or "Temporary Assistance for Needy Families" or TANF]] AND [Associa% or Relation% or Affect or Effect or Evaluation or Impact or Outcome or Correlat%] OR [{adj2<Administration>adj2} or {adj 2<Manage%>adj2} or Operation or {adj1<System>adj1} or {adj1<Cost>adj1} or {adj2<Program>adj2}]*

The literature review search protocol and search results are outlined in Exhibit 31. The search returned 650 document citations that, when accompanied by 87 documents obtained from research contacts, comprised 378 documents. These 378 documents were screened using the decision model detailed in Exhibit 32 below.

Exhibit 31: Literature Review Search Protocol and Search Results

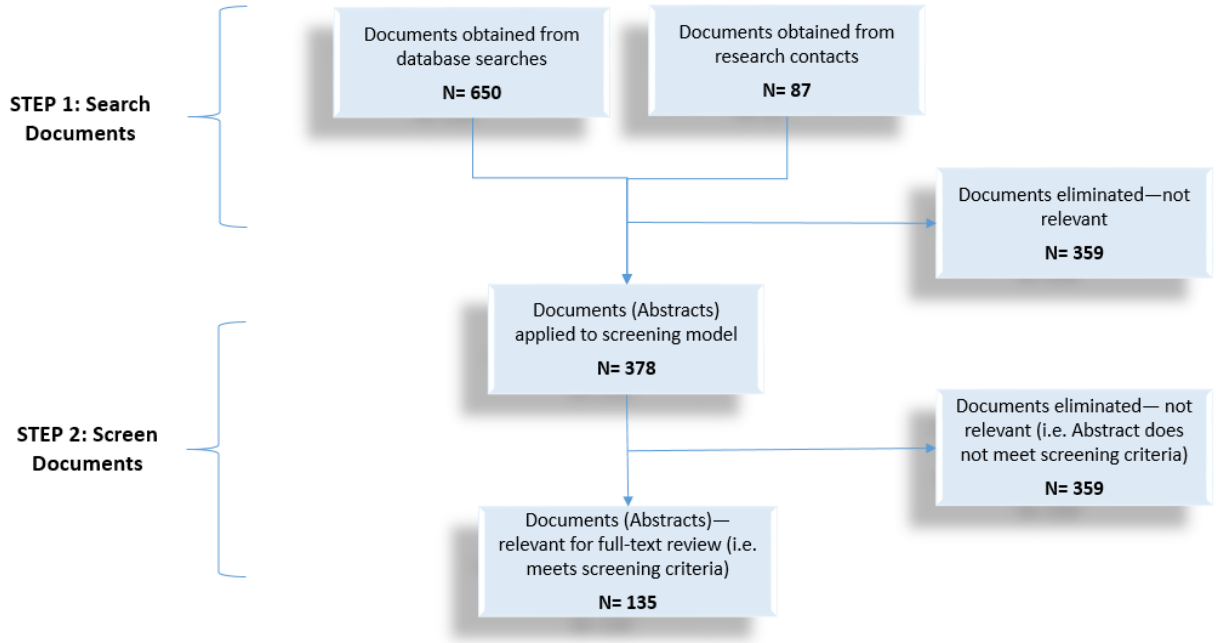
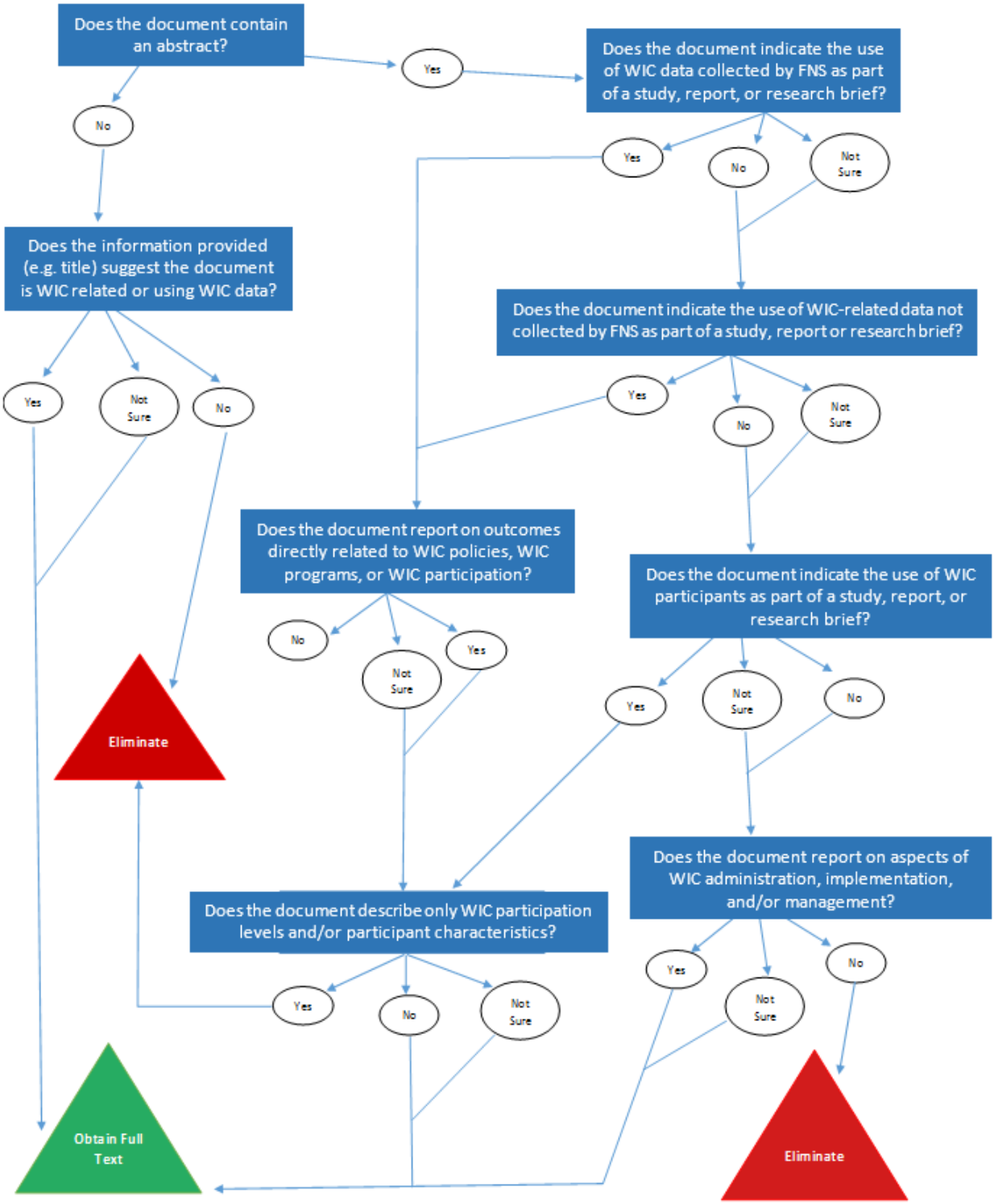


Exhibit 32: Screening Decision Model



Note: "Not sure" means it is not clear from the title of the document or the abstract if the answer is "yes" or "no."

Appendix D: Regional Office Pre-Interview Survey

WIC Data Collection Study
USDA Food and Nutrition Service (FNS)
Pre-Interview Guide for FNS Regional Offices

Regional Office:

Respondent Name and Title:

Respondent Email:

INTRODUCTION

Thank you for agreeing to participate in this interview for the **WIC Data Collection Study**. As you know, the Food and Nutrition Service (FNS) has contracted with Manhattan Strategy Group (MSG) and its partner, Altarum Institute, to conduct a study to provide information that will allow FNS to update WIC data collection efforts. The goal of the updated data collection will be to provide information to support more in-depth analyses of program management and performance assessment, describe program and participant characteristics, and ensure program integrity. The study requires an assessment of WIC data systems and the data that are collected by State and/or local agencies.

We have populated the table below with information available from other sources. Please review and validate the populated information and complete the missing information on this pre-interview sheet prior to your scheduled interview. Return this completed sheet to wic@manhattanstrategy.com.

State Agency	Current MIS System Used*	Age of Current System	Plans to Upgrade/Replace System in Next 2 or 3 Years (Y or N)	Collects Data beyond Minimum and Supplemental Data Sets (Y or N)
1.				
2.				
3.				
4.				

** Successful Partners in Reaching Innovative Technology (SPIRIT), Crossroads, Mountain Plains State Consortium (MPSC), Multi-State Consortium (MSC), Transfer of [insert system name], State agency-developed, and other [insert name].*

1. For State agencies that collect data beyond the Minimum and Supplemental Data Sets, is there a document that summarizes the additional data collected by these States? If not, how would you suggest we obtain this information?

_____

_____

_____

2. For State agencies that plan to upgrade or replace their system in the next two years, is there an approved Planning Advance Planning Document (PAPD) or Implementation Advance Planning Document (IAPD)?

_____

_____

_____

Appendix E: Regional Office Interview Guide

WIC Data Collection Study
USDA Food and Nutrition Service (FNS)
FNS Regional Office Interview Guide

Regional Office:

Respondent Name and Title:

Respondent Email:

Interviewers:

Date of Interview:

INTRODUCTION

Thank you for agreeing to participate in this interview for the **WIC Data Collection Study**. As you know, the Food and Nutrition Service (FNS) has contracted with Manhattan Strategy Group (MSG) and its partner, Altarum Institute, to conduct a study to provide information that will allow FNS to update WIC data collection efforts. The goal of the updated data collection will be to provide information to support more in-depth analyses of program management and performance assessment, describe program and participant characteristics, and ensure program integrity. The study requires an assessment of WIC data systems and the data that are collected by State and/or local agencies.

As a starting point for this assessment, we are interviewing regional office staff. We appreciate having the opportunity to interview you regarding these topics.

INTERVIEW PROCEDURES

This interview will consist of a series of open-ended questions organized by various topics focused on the current status of WIC data systems, technology projects underway in States, State agency data collection and reporting capabilities, and guidance and assistance provided by the regional office to State agencies.

The interview will take approximately 60–90 minutes. We will be recording the interview in order to ensure that your responses are captured accurately. We will maintain the recording securely, with access limited to a small number of authorized study team members for data entry and quality control purposes.

Do you have any questions before we begin? Let's get started.

I. The Current State of WIC Management Information Systems

There is a wide range of WIC data systems in use, and State agencies are in various stages of planning and implementing new systems and transitioning to EBT. My first questions are focused on WIC information systems currently used by States in your region and plans for upgrading or replacing the systems and implementing EBT.

1. According to the FNS WIC State Agency EBT Status Report dated November 2014, X States in your region [names of State agencies] have fully implemented EBT statewide and Y States are in various stages of EBT planning or implementation.
    a. For the State agencies in the EBT planning stage, do you anticipate any of these State agencies moving forward into the implementation stage during fiscal year 2015? If so, which State agencies?
    b. Over the past few years, what funds have States received/used for EBT projects? Do you anticipate that availability of funds will have an impact on State EBT projects?
2. Over the past few years, what funds have States received/used for projects to replace or enhance WIC information systems?
    a. For projects that begin in FFY 2015 or future years, do you anticipate that these same funding sources will be used or will there be changes in the availability of funds?
    b. Do you anticipate that availability of funds will have an impact on State projects? For example, will funding availability have an impact on the project timeline or decisions regarding whether to transfer to a State Agency Model system or develop a new system?
3. Other than availability of funding, what are the biggest challenges States face in revising or replacing their WIC systems?

II. Participant and Administrative Data Available

The purpose of the next set of questions is to gain an understanding of the data other than the Minimum and Supplemental Data Sets collected by State agencies in your region and of data elements that you feel would be beneficial for State agencies to collect.

1. Are there data elements not currently collected by States, or collected by only a few States, that would be helpful to the regional office staff in performing your oversight, monitoring, or technical assistance role? If so what are these data elements and how would they be helpful to regional offices?
2. From your regional office perspective, how easy or difficult is it for States to add new data elements to their information systems? What are the biggest challenges that States face in adding new data elements to existing systems?

III. Current Challenges and/or Opportunities for Improving Data Accessibility and Reporting

The next several questions relate to State agency data analysis and reporting capabilities and ways data are used by your regional office and State agencies for program management, monitoring, and research.

1. What challenges does your regional office or the States experience in data analysis and reporting capabilities that should be addressed to improve program management, performance monitoring, and/or integrity?
2. How easy or difficult is it for State agencies in your region to provide the WIC Participant and Program Characteristics (PC) data set, The Integrity Profile (TIP) report, and other federally required reports?
3. Are there any best practices related to using WIC data that you think would be beneficial for State agencies in your region? If so, what are these and what ideas do you have to encourage States to adopt them?
    a. For example, using data to monitor/evaluate WIC program outcomes (breastfeeding, obesity).
    b. For example, merging WIC data with other data such as Vital Records or Medicaid data to evaluate outcomes.
4. How often do States in your region work with universities or other institutions to conduct research using WIC data? Please describe examples of any recent research efforts.
5. Are there any other unique features in ways the regional office or State agencies in your region use data?

IV. Regional Office Program Support

The last questions pertain to the role of regional offices in working with State agencies to plan and implement information systems and EBT projects and in monitoring information systems operations.

1. Please describe how your regional office works with State agencies to:
    a. Plan and implement new information systems or EBT;
    b. Prepare and submit required Federal reports and data sets; and
    c. Use data for managing or monitoring program operations.
2. For State agencies in your region that have implemented EBT, do the EBT data provide them with new opportunities for managing their programs? If yes, what are some examples?
3. Is the FNS process and requirements for approving EBT projects helping to achieve the mandate for nationwide implementation by 2020? If not, what changes would improve the process?
4. Do you believe that the current FNS process and requirements for approval of new information systems or upgrades to existing systems are effective? For example, do you

believe the priority of transferring SAM systems is the best approach? If not, what improvements or changes can you suggest?

5. To what extent do State-level requirements and approval processes for information systems and EBT projects come in conflict with FNS requirements? If this is a problem, do you believe that this contributes to delays in implementing these projects?
6. Over the past few years, which State agencies in your region have had a State Technical Assistance Review of their information system or participated in an MIS Integrity Review?
    a. What are some of the key findings from those reviews?
    b. Is the completed MIS Integrity Review Tool available from any of those reviews?

That ends my formal interview questions. Is there anything that we haven't discussed on the topic of information systems, EBT, data collection, or analysis and reporting that you would like to share?

Thank you so much for spending the time with us in this interview.

Appendix F: State Agency Interview Guide

WIC Data Collection Study
USDA Food and Nutrition Service (FNS)
State Agency Interview Guide

INTRODUCTION

Thank you for agreeing to participate in this interview for the **WIC Data Collection Study**. The Food and Nutrition Service (FNS) has contracted with Manhattan Strategy Group (MSG) and its partner, Altarum Institute, to conduct a study to provide information that will allow FNS to update WIC data collection efforts. The goal of the updated data collection will be to provide information to support more in-depth analyses for program management and performance assessment; describe program and participant characteristics; and ensure program integrity. The study requires an assessment of WIC data systems and the data that are collected by State and/or local agencies. As part of the assessment, we are interviewing staff in a small number of States. We appreciate the opportunity to interview you regarding this topic.

INTERVIEW PROCEDURES

This interview will consist of a series of open-ended questions organized by topics focused on describing your current WIC information system; understanding the process and impact of system modifications; discussing your data analysis and reporting capabilities; and your experience with guidance or assistance provided by the regional office.

The interview will take approximately one hour. We will be recording the interview in order to ensure that your responses are captured accurately. We will maintain the recording securely, with access limited to a small number of authorized study team members for data entry and quality control purposes. Your answers will be private. We may follow up with you if we have questions about information you share with us when we prepare the report for FNS.

I. The Current State of WIC Management Information Systems

Our first questions are focused on the WIC information system your State agency currently uses. Your State agency was selected for an interview because of your role in a State Agency Model system or consortium system. As we discuss the information system, please share how other State agencies that use the system have modified it, if you are aware of differences.

1. Our understanding is that your State uses the [insert name of MIS system] system. According to the [insert name of MIS system] regional office, this system is [insert age of current MIS system] years old and there are [insert system/upgrade replacement plans in the next two years]. Is this description accurate? If not, what is different from the description I shared?
2. Do you operate WIC-related data systems that are separate from the WIC information system; for example, a vendor portal or financial management system? If so, please describe what data these systems contain and how the data are used.
3. Are you planning to make any changes or modifications to the current WIC system in the next year? If so, what are the planned changes? [If applicable] Are other State agencies that use the system planning to make these or other changes or modifications? If so, please describe.
4. How easy or difficult is it for you to add new data elements, change the periodicity of data collection, or make other similar changes to your information system?
    a. What makes it easy or difficult?
    b. [If applicable] How do you think other State agencies that use the system would respond to this question?
5. What is your process for making changes or upgrades to your system?
    a. Please describe both the State and Federal processes and approvals that are needed.
    b. Describe the process for working with IT services or vendor to make the changes.
    c. [If applicable] What is the process for working with the other States in your consortium to make changes to the system?
6. Over the past couple of years, what changes have you needed to make in your information system to implement changes in WIC polices such as the Final Food Package Rule or vendor cost containment requirements?
    a. What challenges have you experienced in making these changes?
    b. Have the costs of these changes required a large amount of Nutrition Services and Administration (NSA) funds or extra funds from your regional office?

The next questions pertain to EBT data. [Ask questions based on State agency EBT status.]

1. [For States that use EBT statewide or are currently implementing it]
    a. What changes did you need to make in your WIC information system to implement EBT?

b. When you planned your EBT system, did you plan for any special data sets or analytic files that allow you or others to conduct analyses of EBT data? If so, please describe these.

2. [For States that use EBT statewide]
    a. How are you using your EBT data; for example, what reports are you producing and using for program management, monitoring, or evaluation?
    b. What other ways have you thought about using the EBT data?
    c. What, if any, barriers do you experience with analyzing/using EBT data?
    d. Does the EBT data provide new opportunities for managing your programs? If yes, what are some examples?
3. [For States that are currently planning EBT]
    a. As you plan for EBT, have you identified ways that you will use EBT data for program management, compliance, or monitoring? If so, what new opportunities have you identified?
    b. What, if any, challenges do you anticipate to using EBT data in these ways?
4. To what extent do State-level requirements and approval processes for information system and EBT projects come in conflict with FNS requirements?
    a. If this is a problem, do you believe that this contributes to delays in implementing these projects?
    b. If applicable, what suggestions do you have for resolving this situation?

II. Participant and Administrative Data Available

Next, we have some questions about data you collect in your information system.

1. Does your information system collect data elements or have features that exceed the Federal Minimum and Supplemental Data Sets or other Federal requirements for documentation or reporting?
    a. If so, what were these data elements or system features particularly as they pertain to the following topics?
        - WIC and EBT
        - Program Management
        - Vendor Management
        - Client Redemption Patterns
        - Program Integrity
    b. How do you use these data or system features?

   c. [If applicable] If you've discussed these features with other States that use this system, have they included these or other additional data collection or features? If so, please describe.

2. Are there data elements or features not included in the current system(s) that would be useful for program management or monitoring, or that would provide you with outcome data for evaluating the program? If so, please describe the data and how you would use it.
3. Do you collect any data that are used by other programs in your State agency or are linked with other data such as birth records, immunization data, Medicaid data, or other program data?
   a. If so, please describe these data and how they are used.
   b. Are you able to use data from other programs or systems (e.g., birth records) to measure outcomes for WIC participants? If yes, please describe.

III. Challenges and/or Opportunities for Improving Data Accessibility and Reporting

The next questions relate to data analysis and reporting capabilities and ways you use data for program management, monitoring, and research.

1. How easy or difficult is it to access data from your information system for analysis or reporting?
   a. Have you experienced any challenges with data storage or access as your system has matured? If yes, please describe.
   b. [If using EBT statewide] Is accessing EBT data any easier or more difficult than accessing other data? Why or why not?
2. What reports do you routinely produce for managing or monitoring program operations?
   a. How are the reports used; for example, what program decisions do you make using the data from these reports?
   b. Are there changes or additions you would like to make to these reports, or the data collection, to make them more useful? If yes, please explain.
3. Over the past two years, has your State agency conducted research on WIC program outcomes either internally or with a researcher at a university or other institution? If yes, please describe the research.
4. What is the process or protocol for sharing data with external researchers?
5. On a scale of 1 to 5, with 1 being very dissatisfied and 5 being very satisfied, how satisfied are you with the WIC data you have available?
   a. Why did you choose that number?
   b. [If applicable (less than a score of 5)] What would make you more satisfied with the data?

c. If applicable, what are the challenges to accomplishing this?

6. What staff resources do you have available, either within your WIC program or within your health department or agency, for analyzing WIC data, e.g., epidemiologist, statistical analyst? Do you feel you have access to enough staff or that staff have the skills needed? If not, what would be desirable?
7. Are there any best practices related to using WIC data that you would suggest for other States? If so, what are these and what ideas do you have to encourage States to adopt them?

IV. Regional Office Program Support

The last questions pertain to the role of regional offices in working with State agencies to plan and implement information system and EBT projects and in monitoring information systems operations.

1. What assistance or support do you receive from your regional office for developing or operating information systems or using data from your system for program management and evaluation?
2. Is there additional support that you would like to receive from the regional office staff?

That ends the interview questions. Is there anything that we haven't discussed on the topic of information systems, EBT, data collection, or analysis and reporting that you would like to share?

Thank you for spending the time with us for this interview.

Appendix G: Local Agency Interview Guide

WIC Data Collection Study
USDA Food and Nutrition Service (FNS)
Local Agency Interview Guide

INTRODUCTION

Thank you for agreeing to participate in this interview for the **WIC Data Collection Study.** The Food and Nutrition Service (FNS) has contracted with Manhattan Strategy Group (MSG) and its partner, Altarum Institute, to conduct a study to provide information that will allow FNS to update WIC data collection efforts. The goal of the updated data collection will be to provide information to support more in-depth analyses for program management and performance assessment, better describe program and participant characteristics, and ensure program integrity. The study requires an assessment of WIC data systems and the data that are collected by State and/or local agencies. As part of the assessment, we are interviewing staff in a small number of State and local agencies. We appreciate having the opportunity to interview you regarding this topic.

INTERVIEW PROCEDURES

This interview will consist of a series of open-ended questions organized by topics focused on participant and administrative data collected by your local agency that are not reported routinely to your State agency or FNS and how these data are used for program management and assessment.

The interview will take approximately one hour. We will be recording the interview to ensure that your responses are captured accurately. We will maintain the recording securely, with access limited to a small number of authorized study team members for data entry and quality control purposes. Your answers will be private. We may follow up with you if we have questions about information you share with us when we prepare the report for FNS.

I. The Current State of WIC Management Information Systems

The first questions relate to the types of participant and administrative data your local agency collects and how you use it.

1. To what extent do you feel that the State's information system meets your needs for data to administer the program at the local level? If there are gaps in data collection or access, what are they?
2. What types of participant and/or administrative data do you collect that are not routinely reported to your State agency?
    a. How do you use the additional data?
    b. What challenges have there been with collecting and using the additional data?
    c. What benefits have been realized?
3. What local reports do you routinely produce for managing or monitoring program operations?
    a. How much of the data for these reports is accessed from the State information system and how much is additional data collected by your local agency?
    b. How are the reports used; for example, what program decisions do you make using the data from these reports and what activities do you monitor with the reports?
    c. Are there changes or additions you would like to make to these reports, or the quality of data collection, to make them more useful? If yes, please explain.
4. Are you able to compare WIC program data from your local agency with other local agencies in your State?
    a. If so, please describe how you do this and what you learn from the comparisons?
    b. Are there other comparisons you would like to make? If so, please describe.
5. Do you link WIC data with other data collected by your local agency or other programs?
    a. If so, please describe these data and how they are used.
    b. Are you able to use data from other programs or systems to measure outcomes for WIC participants? If yes, please describe.
6. Over the past two years, has your local agency conducted research on WIC program outcomes either internally or with a researcher at a university or other institution? If yes, please describe the research.
7. Are there any research topics would you be interested in addressing using WIC data?

II. Current Challenges and/or Opportunities for Improving Data Accessibility

The next questions relate to your satisfaction with available data and your feedback on best practices for using WIC data.

1. On a scale of 1 to 5, with 1 being very dissatisfied and 5 being very satisfied, how satisfied are you the WIC data you have available?
    a. Why did you choose that number?
    b. [If applicable (less than a score of 5)] What would make you more satisfied with the data?
    c. [If applicable] What are the challenges to accomplishing this?
2. Is there additional data you would like to access from the State information system for local program management?
    a. If yes, what data and how would you use the data?
    b. Do you anticipate that implementation of EBT will provide your local agency with additional data? If yes, what EBT data would be useful at the local level?
3. What challenges have there been with collecting and using the additional data? What benefits have been realized?
4. Are there any best practices related to using WIC data that could be applied across local agencies? If so, what are these and what ideas do you have to encourage local agencies to adopt them?
5. What staff resources do you have available for analyzing WIC data? Do you feel you have enough staff or that staff have the skills needed? If not, what would be desirable?
6. Are there any other features related to how you use data for program management, evaluation or other purposes, or any suggestions for future data collection and analysis that you would like to share?

That ends my formal interview questions. Thank you for spending the time with us for this interview.

Appendix H: January 28, 2016 WIC Stakeholder Workshop Agenda

A. 1:00 – 1:40 p.m. (40 minutes)
   - Introduction, Overview, Background
   - Discuss initial themes
   - Stakeholder Perspectives on Data Collection and Utilization
     - *Question: How do stakeholder use WIC data?*

B. 1:40 – 2:20 p.m. (40 minutes)
   - Current WIC Data Collection Efforts
     - *Question 1: What challenges do WIC State agencies experience in collecting or submitting data to FNS?*
     - *Question 2: What improvements can be made to address the challenges?*
     - *Question 3: What data are WIC State or local agencies collecting and using to manage their programs in areas such as financial management; caseload management; program integrity/quality; vendor management; or evaluation of participant health outcomes?*
     - *Question 4: What data collected by WIC State or local agencies may be useful from a national perspective?*

- 2:20 – 2:30 p.m. Break

C. 2:30 – 3:45 p.m.(75 minutes)
   - Future Opportunities for WIC Data Collection
     - *Question 1: What changes to participant data collection—e.g., Minimum Data Set elements, periodicity, access—would improve the usefulness of this data?*
     - *Question 2: WIC State agencies collect and use data to set reimbursement rates for food benefits, establish vendor peer groups, and manage vendor activities. What, if any, benefits might be realized through standardizing and collecting vendor data beyond what is currently contained in The Integrity Report (TIP)?*
     - *Question 3: With a nationwide implementation of electronic benefits transfer (EBT) in WIC, what value may FNS, WIC State agencies and others realize from a national EBT data set?*
     - *Question 4: What challenges exist in collecting and using a national EBT data set?*

- 3:45 – 4:00 p.m. Break

D. 4:00 – 5:00 p.m. (60 minutes)
   - Summary and Next Steps

Appendix I: MIS Status and System Enhancement Plans by WIC State Agency

The table below summarizes the MIS status by WIC State agency. Information includes the name of the WIC consortia or MIS, the age of the current MIS, MIS enhancement plans, EBT implementation status, and whether the State agency collects data on their MIS beyond MDS and SDS. The study team compiled this information from the regional office survey conducted in February 2015. This information was supplemented by information extracted from the 2015 WIC State Plans and from regional office and State agency interviews.

WIC manages 90 State agencies comprised of 50 States, the District of Columbia, five U.S. territories, and 34 ITOs. Forty-nine State agencies operate a modern MIS and are not planning any major system enhancements. Thirty-six State agencies operate a legacy MIS and have indicated that they plan to replace their MIS within two to three years. Three State agencies operate a legacy MIS and did not indicate any upgrade plans.[81] Two ITOs, Cherokee Nation of Oklahoma and Seneca Nation, did not provide data for this study.

Exhibit 33: WIC MIS Status by WIC State Agency

States

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
ALABAMA	Southeast	Crossroads	<1 year	No [a]	▪ Implement WICHealth.org as the provider of online nutrition education lessons for Alabama WIC participants. ▪ Implement a Crossroads interface to verify Medicaid enrollment via VPN connection.	Y	Implementing
ALASKA	Western	SPIRIT (Successful Partners in Reaching Innovative Technology)	<1 year	No [a]	▪ Implement enhancements to support final food package rule.	N	Implementing

[81] Illinois, Kentucky, Ohio, Oklahoma, Oregon, and South Carolina did not indicate MIS upgrade plans on the regional office survey conducted in February 2015. Subsequently, FNS indicated via personal communication on January 22, 2016, that Illinois, Kentucky, and Oregon may be upgrading their technology systems in the next several years.

[82] U.S. Department of Agriculture, Food and Nutrition Service. (2016). *State agency detail EBT status report*. Retrieved from http://www.fns.usda.gov/wic/wic-ebt-activities on November 23, 2015

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
ARIZONA	Western	HANDS (Health and Nutrition Delivery Service System)	<1 year	No	▪ Implement EBT by the end of 2016. ▪ Develop a reporting and surveillance data warehouse.	Y	Implementing
ARKANSAS	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ Minor enhancements to the MIS that will include the ability to directly distribute special formula and issue benefits using offline EBT. ▪ Implement changes to allow the MIS to issue a larger amount of CVB to children and issue CVBs to infants and pregnant women who are breastfeeding to comply with the new food rule. ▪ Add "Participation in the Food Distribution Program on Indian Reservations."	Y	Implementing
CALIFORNIA	Western	WIC System (Integrated Statewide Information System; State Developed)	Over 15 years	Yes	▪ e-WIC Data cleansing and conversion, readiness for new MIS.[83] ▪ Increase read access to reporting data to 7 years.	N	Implementing
COLORADO	Mountain Plains	MPSC (Mountain Plains State Consortium)	1–4 years	No [a]	▪ Roll out EBT statewide in 2017; the rollout will integrate an online e-WIC EBT interface system.	Y	Implementing
CONNECTICUT	Northeast	SWIS (State Developed)	Over 15 years	Yes	▪ Planning a new MIS project.	No Data	Implementing
DELAWARE	Mid-Atlantic	WOW (WIC on the Web)	1–4 years	No	▪ Minor enhancements, fix defects and errors.	Y (some)	Implementing

[83] The goal of the eWIC MIS project is to transfer, modify, and implement an MIS system for California's WIC program. The MIS system will be integrated with an online, out-sourced EBT system. California Department of Public Health. (2014, November 20). *eWIC MIS project: Request for Offer #14-CFH-0877*. Retrieved from http://www.cdph.ca.gov/programs/wicworks/Documents/JobAnnouncements/14-CFH-0877%20WIC%20RFO%20IVV%20(2).pdf

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
DISTRICT OF COLUMBIA	Mid-Atlantic	CARES (Connect, Access, Respond, Empower, Support)	10–15 years	Yes	▪ Perform a full replacement of CARES as part of a combined MIS/eWIC implementation. ▪ Implement the Infant Formula Warehouse once the Formula Exchange has been successfully transferred from the State to the local level. ▪ Capture BMI/percentiles in the database.	Y (all)	Planning
FLORIDA	Southeast	FL-WiSE (Florida WIC Information System and EBT)	<1 year	No	▪ Minor enhancements to the FL-WiSE system implemented in 2014 (transfer and modification of the Michigan MIS).	Y	Statewide-Online (2014)
GEORGIA	Southeast	AEGIS, Mitchell and McCormick, Netsmart, and HealthNet2	10–15 years	Yes	▪ VMARS Phase II enhancements. ▪ Automation of SMR/ETAD Change/Work Order Web site. ▪ Automate clinic forms—paperless environment. ▪ Automate growth charts, PARS updates, VIPS enhancements.	Y	Planning
HAWAII	Western	SWICH (Serving Women Infants and Children in Hawaii; Maine transfer)	Over 15 years	Yes	▪ Continue efforts to refresh the client PCs and printers statewide. ▪ Conduct EBT planning activities throughout FFY 2015.	Y (in process)	Planning
IDAHO[84]	Western	WISPr (WIC Information Systems Program; State Developed)	1-4 years	No	▪ One-year certification and Health Screen. ▪ Implement enhancements to support final food package rule. ▪ Add batch process to delete Voucher/Archive files.	N	Planning

[84] WISPr, the Idaho MIS system implemented in 2011, is a Web-based thin client application using the Microsoft .Net development framework, a high-end business rules engine, SQL databases, and several internally developed and off-the-shelf software components. WISPr replaced the original WIC MIS built in 1994 on an IBM mainframe system using the Natural programming language coupled to an Adabas database. Idaho Department of Health and Welfare. (2012). *WIC Information System Program: WISPr*. Retrieved from http://ita.idaho.gov/awards/2012/WISPr.pdf

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
					▪ Add new risk codes. ▪ Enhancements for Vendor and Alert tab functionality.		
ILLINOIS	Midwest	Cornerstone	10–15 years	Possibly	▪ FNS indicated on 1/22/2016 that Illinois may be upgrading their MIS in the next several years. Plans are not formalized yet. ▪ Convert the current food package-based system to an item-based system to allow individual tailoring. ▪ Implement enhancements to support final food package rule. ▪ Base date assignment and family grouping processes to be changed to synchronize family benefits issuance for EBT implementation. ▪ Evaluating trying to capture WIC Health information and looking to add capacity to text from Cornerstone directly to consenting participants.	Y	Implementing
INDIANA	Midwest	WISE (WIC Information System and EBT)	10–15 years	Yes	▪ Migrating to Three Sigma MIS. ▪ Implement enhancements to support final food package rule.	Y	Implementing
IOWA	Mountain Plains	IWIN (Iowa WIC Information Network)	10–15 years	Yes [a]	▪ Converting to new MPSC SAM system.	N (but will)	Implementing
KANSAS	Mountain Plains	MSC MIS (Multi State Consortium MIS is known as "KWIC" in Kansas)	1–4 years	No	▪ Transition from CY base to SQL Server. ▪ Move hosting from Kansas to CQUEST facility in Springfield, Illinois. ▪ Planning for EBT implementation project.	Y	Planning
KENTUCKY	Southeast	KCMS (Kentucky Clinic Management	Over 15 years	Possibly	▪ FNS indicated on 1/22/2016 that Kentucky may be upgrading their MIS in the next several years. Plans are not formalized yet.	Y	Statewide-Online (2011)

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
		System- CDP Designed System)					
LOUISIANA	Southwest	PHAME (WIC Public Health Automated Management Enabler)	5–9 years	Yes [a]	▪ Converting to the MPSC SAM system but will not join the user group ▪ Minor enhancements to fix defects and errors in the Vendor Portal. ▪ Implement ad hoc reporting (BMI)	Y	Implementing
MAINE	Northeast	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ Implement e-WIC. ▪ Assess State and local agency needs for ad hoc reports to expand reports module.	No Data	Implementing
MARYLAND	Mid-Atlantic	WOW (WIC on the Web)	5–9 years	No	▪ Roll out EBT by the end of 2016. Enhancements to the WOW system will be made to support EBT as needed. ▪ Implement e-WIC in Maryland and Virgin Islands.	Y (some)	Implementing
MASSACHUSETTS	Northeast	Eos (CIBER Transfer)	1–4 years	No	▪ Make changes to Vendor Management System.	No Data	Statewide-Online (2014)
MICHIGAN	Midwest	MI-WIC (Michigan WIC developed by 3 Sigma)	5–9 years	No	▪ Minor enhancements to fix defects and errors in the MI-WIC. ▪ Improvements in MI-WIC to meet FNS policies or industry standards (e.g., enhanced fraud prevention measures, additional reports).	Y	Statewide-Online (2009)
MINNESOTA	Midwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ In Minnesota, the SPIRIT system is known as HuBERT (Health Benefits Real Time).	N	Planning
MISSISSIPPI	Southeast	SPIRIT (Successful Partners in	1–4 years	No [a]	▪ Minor enhancements to fix defects and errors.	Y	Planning

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
		Reaching Innovative Technology)					
MISSOURI	Mountain Plains	SPIRIT (known as "MOWINS" in Missouri)	1-4 years	No [a]	▪ Implement enhancements to support final food package rule. ▪ Add the universal interface to enable both online and smart card EBT. ▪ Plans to roll out EBT by the end of 2017. Enhancements to the SPIRIT system will be made to support EBT as needed.	Y	Implementing
MONTANA	Mountain Plains	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	Y	Implementing
NEBRASKA	Mountain Plains	Legacy System	Over 15 years	Yes [a]	▪ Migrate to the MPSC SAM system.	N (but will)	Implementing
NEVADA	Western	NV MIS (State developed)	Over 15 years	Yes [a]	▪ Migrate to the MPSC SAM system in 2015.	N	Stateside-Online (2009)
NEW HAMPSHIRE	Northeast	MSC MIS (Multi State Consortium MIS is known StarLINC" in New Hampshire)	5–9 years	No	▪ Additional automated risk factors. ▪ Implement enhancements to support final food package rule.	No Data	Planning
NEW JERSEY[85]	Mid-Atlantic	WIC Access	10–15 years	Yes	▪ Migrate to a new MIS system. ▪ WIC Access is approaching the end of its useful product life cycle. NJ WIC issued a contract for the modification and implementation of Maryland's Web-based Electronic Data Processing system.	Y	Planning

[85] New Jersey Department of Health. (n.d.). *FFY final 2015 State strategic plan*. Retrieved from http://www.state.nj.us/health/fhs/wic/documents/2015_state_strategic_plan.pdf

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
NEW MEXICO	Southwest	NM Legacy System	10–15 years	Yes [a]	▪ Converting to the MPSC SAM system but will not join the user group ▪ Implement the Settlement Financial System into a clustered environment. Upgrade the Settlement database to 2008 or higher. ▪ Implement a history reporting server. ▪ Upgrade the WIC application database from SQL 2008 R1 to SQL 2008 R2 or higher. ▪ Implement enhancements to support final food package rule. ▪ Begin work on adding communication at Satellite sites to eliminate the use of mobile laptops and connect directly to the new database cluster environment.	Y	Statewide-Offline (2007)
NEW YORK	Northeast	WICSIS (WIC Statewide Information System)	10–15 years	Yes	▪ Migrate to the MI-WIC System by 2019. ▪ Implement enhancements to support final food package rule.	No Data	Implementing
NORTH CAROLINA	Southeast	Crossroads	<1 year	No [a]	▪ Continue transition from WIC ADP to WIC Crossroads; maintaining both systems in parallel during transition. ▪ Roll out the new system's vendor and participant portals. ▪ Modify Crossroads to allow local agencies to issue benefits via EBT.	Y	Planning
NORTH DAKOTA	Mountain Plains	SA WIC	5–9 years	Yes [a]	▪ Migrate to the MPSC MIS in 2015. Working on a streamlined IAPD with Iowa.	N (but will)	Planning
OHIO	Midwest	State Developed MIS	Over 15 years	No	▪ Pilot smartcard EBT before rolling out EBT statewide. ▪ Implement enhancements to support final food package rule. ▪ Integration of category/subcategory and food items and food subcategories tables.	Y	Statewide-Offline (2015)

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
					▪ Automated calculation and update of NTE prices in price bands. ▪ Create a participant portal to access information. ▪ Data Mart enhancements to improve EBT data reporting. ▪ Improvements to the WIC UPC user interface.		
OKLAHOMA	Southwest	PHOCIS (Public Health Oklahoma Client Information System)	10–15 years	No	▪ Update PHOCIS to prepare for EBT implementation.	Y	Implementing
OREGON	Western	TWIST (The WIC Information System Tracker)	10–15 years	Possibly	▪ FNS indicated on 1/22/2016 that Oregon may be upgrading their MIS in the next several years. Plans are not formalized yet.	Y	Implementing
PENNSYLVANIA	Mid-Atlantic	Quick WIC	10–15 years	Yes [a]	▪ Migrate to MPSC MIS in 2016 but will not join the user group	Y (some)	Implementing
RHODE ISLAND	Northeast	RIWEBS (Rhode Island Web-Enabled Benefits System; CSC MIS transfer)	5–9 years	Yes	▪ Implement a transferrable MIS system. ▪ Implement enhancements to support final food package rule.	No Data	Planning
SOUTH CAROLINA	Southeast	CARES (Connect, Access, Respond, Empower, Support)	5–9 years	No	▪ Expand current risk code field to allow health issues associated with risk codes to be documented more accurately.	Y	Implementing
SOUTH DAKOTA	Mountain Plains	SD-eWIC (State Agency Developed MI-MD System)	1–4 years	No	▪ NA	Y	Implementing

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[82]
TENNESSEE[86]	Southeast	PTBMIS (Patient Tracking Billing Management Information System)	Over 15 years	Yes	▪ Replace aging WIC MIS with an existing transferrable modern WIC MIS that meets all current WIC program system functional requirements and that includes an EBT component.	Y	Planning
TEXAS	Southwest	TX WIN (Texas WIC Information Network)	Over 15 years	Yes [a]	▪ Converting to the MPSC SAM system but will not join the user group ▪ MIS/EBT System Replacement Oversite (design and development). ▪ Implement enhancements to support final food package rule. ▪ Convert incremental income (weekly, monthly) to an annual figure.	Y	Statewide-Offline (2009)
UTAH	Mountain Plains	MPSC (Mountain Plains State Consortium)	1–4 years	No [a]	▪ Reconfigure the MP-EBT interface to support HIPAA security compliant file and data transfers between the State-hosted Wyoming MIS (HORIZONS) operations and the contractor-hosted WIC EBT Settlement Service (WESS).	Y	Planning
VERMONT	Northeast	Legacy (State Developed)	Over 15 years	Yes	▪ Migrate to the MPSC SAM MIS in 2016.	No Data	Implementing
VIRGINIA	Mid-Atlantic	Crossroads	5–9 years	No [a]	▪ Crossroads bug fixes and change requests.	Y (some)	Statewide-Online (2014)
WASHINGTON[87]	Western	CIMS	Over 15 years	Yes	▪ Migrate to the Crossroads SAM MIS. In Washington, the system will be known as Cascades.	N	Implementing

[86] WIC Technology Partners. (n.d.). *Solicitation overview: Tennessee request for proposals for professional planning services for the implementation of a modern WIC management information system*. Retrieved From http://www.wictechnologypartners.com/solicitations/tennessee-request-proposals-professional-planning-services-implementation-modern-wic

[87] The legacy WIC system, Client Information Management System (CIMS), was built 1996 – 1999. The client server approach and PowerBuilder technology is out-of-date and costly to maintain. WIC Technology Partners. (n.d.). *Solicitation overview: WA WIC Cascades project*. Retrieved from http://wictechnologypartners.com/solicitations/wa-wic-cascades-project#sthash.z9xIAybQ.dpuf

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		(Client Information Management System)			▪ Begin online EBT project implementation. ▪ Interface to the State's Medicaid system. ▪ Interface to the WIC online vendor application portal.		
WEST VIRGINIA	Mid-Atlantic	Crossroads	< 1 year	No [a]	▪ Minor enhancements to fix defects and errors.	Y	Statewide-Online (2013)
WISCONSIN	Midwest	ROSIE (CIBER Transfer)	5–9 years	No	▪ EBT implementation; included changes to the benefits issuance area, associated reports, implement UPC functionality, and ICD interface implementation, etc. ▪ Develop a smartphone downloadable app for collecting UPC data.	N	Stateside-Online (2015)
WYOMING	Mountain Plains	MPSC (Mountain Plains State Consortium)	1–4 years	No [a]	▪ Install version 3.10 of the Wyoming Horizons system.	Y	Statewide-Offline (2002)

U.S. Territories

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[88]
AMERICAN SAMOA	Western	HANDS (Health and Nutrition Delivery Service System)	<1 year	No	▪ NA	Y	Implementing
COMMONWEALTH OF THE	Western	HANDS	<1 year	No	▪ Change over from copper landline system to VIOP/Copper hybrid system to reduce cost and increase security.	Y	Implementing

[88] U.S. Department of Agriculture, Food and Nutrition Service. (2016). *State agency detail EBT status report*. Retrieved from http://www.fns.usda.gov/wic/wic-ebt-activities on November 23, 2015

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NORTHERN MARIANA ISLANDS		(Health and Nutrition Delivery Service System)			▪ Installation of emergency generators for both the Administrative and Clinic.		
GUAM	Western	HANDS (Health and Nutrition Delivery Service System)	<1 year	No	▪ NA	Y	Implementing
PUERTO RICO	Mid-Atlantic	No formal name (originally the Washington State system)	10–15 years	Yes	▪ Develop additional reconciliation exception reports. ▪ Modify the Client Services Module to verify the presence of the participant. ▪ Modify the Vendor Investigations Module to comply with approved Vendor regulations.	Y	Implementing
U.S. VIRGIN ISLANDS	Mid-Atlantic	WOW (WIC on the Web)	< 1 year	No	▪ Minor enhancements to collect additional data elements: education level, number in family/household on WIC, date previous pregnancy ended, total number of live births, participant's weight gain during pregnancy.	Y	Implementing

Source: WIC State Plans and regional office MIS survey

[a] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *Status of WIC SAM projects—as of 7/16/15*. Retrieved from http://origin.drupal.fns.usda.gov/sites/default/files/apd/SAM_Status_Chart.pdf

[b] FNS indicated updates via personal communication on December 14, 2015

ITOs

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[89]
ACL - ACOMA CANONCITO AND LAGUNA (NM)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	Planning
EASTERN BAND OF CHEROKEE INDIANS (NC)	Southeast	Crossroads	1–4 years	No [a]	▪ NA	No Data	Planning
CHEROKEE NATION OF OKLAHOMA (OK)	Southwest	CNWIC (Cherokee Nation WIC)	Not reported	Not reported	▪ NA	No Data	Statewide-Offline (2009)
CHEYENNE RIVER SIOUX TRIBE (SD)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs. ▪ Update risk factors and income eligibility guidelines.	N (but will)	Planning
CHICKASAW NATION (OK)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	5–9 years	No [a]	▪ Implement enhancements to support final food package rule. ▪ Implement an EBT universal interface release and subsequent release for State-specific enhancement requests. ▪ Perform enhancements to the EBT interface to accept Smart Cards. ▪ Perform upgrades to the SQL server.	No Data	Statewide-Offline (2010)
MISSISSIPPI BAND OF CHOCTAW INDIANS (MS)	Southeast	SPIRIT (Successful Partners in Reaching Innovative Technology)	<1 year	No [a]	▪ Mississippi Band of Choctaw Indians is transitioning to SPIRIT	No Data	No EBT Activity

[89] U.S. Department of Agriculture, Food and Nutrition Service. (2016). *State agency detail EBT status report*. Retrieved from http://www.fns.usda.gov/wic/wic-ebt-activities on November 23, 2015

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[89]
CHOCTAW NATION OF OKLAHOMA (OK)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	< 1 year	No [a]	▪ Implement enhancements to support final food package rule. ▪ Universal interface.	No Data	Implementing
CITIZEN POTAWATOMI NATION (OK)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	Implementing
EASTERN SHOSHONE (WY)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning
EIGHT NORTHERN INDIAN PUEBLOS (NM)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No	▪ Minor enhancements to fix defects and errors. ▪ Technology upgrades within the system for effectiveness and efficiency.	No Data	Planning
FIVE SANDOVAL INDIAN PUEBLOS (NM)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	Planning
INDIAN TOWNSHIP PASSAMAQUODDY RESERVATION (ME)	Northeast	SPIRIT (Successful Partners in Reaching Innovative Technology)	<1 year	No [a]	▪ India Township Passamaquoddy recently began using SPIRIT [b]	No Data	Planning
INTER-TRIBAL COUNCIL OF ARIZONA (AZ)	Western	MSC MIS (Multi State Consortium MIS is known as “STARS” in ITCA)	1 – 4 years	No	▪ Minor enhancement to automate additional risk factors; consolidate some screens into family screens.	No Data	Planning

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[89]
INTER-TRIBAL COUNCIL OF NEVADA (NV)	Western	NV Legacy System	Over 15 years	Yes [a]	▪ Converting to a new MPSC SAM System. [b]	No Data	Statewide-Online (2009)
INTER-TRIBAL COUNCIL OF OKLAHOMA (OK)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	Implementing
MUSCOGEE CREEK NATION (OK)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	Implementing
NAVAJO NATION (AZ)	Western	HANDS (Health and Nutrition Delivery Service)	<1 year	No	▪ NA	No Data	Implementing
NORTHERN ARAPAHO (WY)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning
OMAHA NATION (NE)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning
OSAGE NATION (OK)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	Implementing
OTOE-MISSOURIA TRIBE (OK)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	Implementing

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[89]
PLEASANT POINT PASSAMAQUODDY RESERVATION (ME)	Northeast	SPIRIT (Successful Partners in Reaching Innovative Technology)	<1 year	No [a]	▪ Point Pleasant Passamaquoddy recently began using SPIRIT [b]	No Data	Planning
PUEBLO OF ISLETA (NM)	Southwest	NM Legacy System	10–15 years	Yes	▪ Pueblo of Isleta uses the NM Legacy System. New Mexico is planning on converting to the MPSC SAM system. [b]	No Data	Statewide-Offline (2009)
PUEBLO OF SAN FELIPE (NM)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	No EBT Activity
PUEBLO OF ZUNI (NM)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	Planning
ROSEBUD SIOUX TRIBE (SD)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning
SANTEE SIOUX NATION (NE)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning
SANTO DOMINGO TRIBE (NM)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ NA	No Data	No EBT Activity
SENECA NATION (NY)	Northeast	Not Reported	Not reported	Not reported	▪ NA	No Data	No EBT Activity

WIC State Agency	Region	WIC Consortia or MIS	Age of MIS	MIS Upgrade Plans 2–3 Years? (Source: Regional Office Survey)	MIS Enhancement Plans (Source: FY 2015 State Plans and Regional Office Survey)	Data beyond MDS/SDS? (Source: Regional Office Survey)	EBT Status[89]
STANDING ROCK SIOUX TRIBE (ND)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning
THREE AFFILIATED TRIBES (ND)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning
UTE MOUNTAIN UTE TRIBE (CO)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning
WICHITA, CADDO, & DELAWARE TRIBES (OK)	Southwest	SPIRIT (Successful Partners in Reaching Innovative Technology)	1–4 years	No [a]	▪ Minor enhancements to fix defects and errors.	No Data	Implementing
WINNEBAGO TRIBE (NE)	Mountain Plains	WINDS (WIC Indian Networking Data Systems)	10–15 years	Yes	▪ Implement a transfer of the WOW/MI-WIC system. Part of the NATIONS consortium with the other 9 ITOs.	N (but will)	Planning

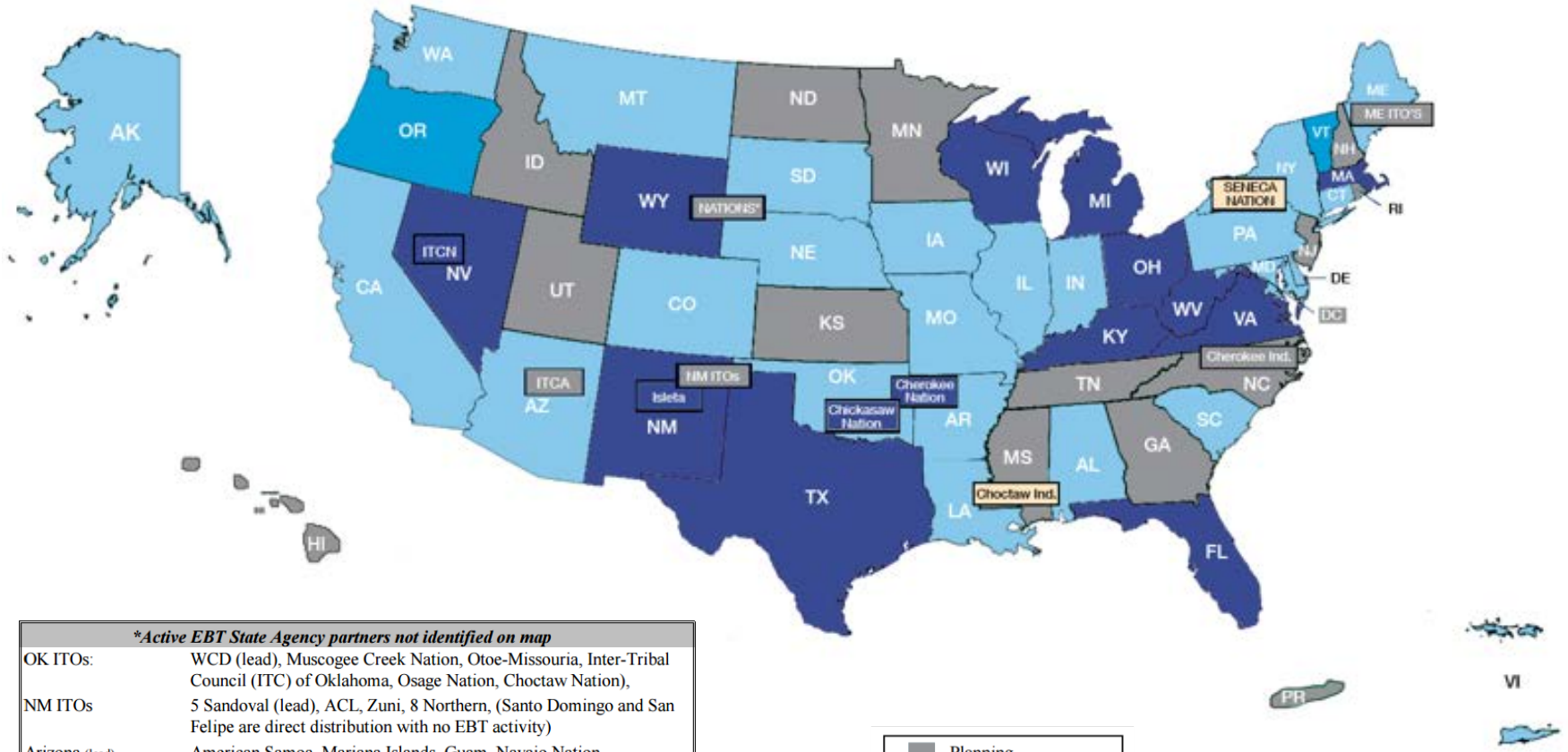
Source: WIC State Plans and regional office MIS survey

[a] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *Status of WIC SAM projects—as of 7/16/15*. Retrieved from http://origin.drupal.fns.usda.gov/sites/default/files/apd/SAM_Status_Chart.pdf

[b] FNS indicated updates via personal communication on December 14, 2015

Appendix J: WIC EBT Activity Map as of November 23, 2015

This is an enlarged image of Exhibit 15 on page 37.



Active EBT State Agency partners not identified on map	
OK ITOs:	WCD (lead), Muscogee Creek Nation, Otoe-Missouria, Inter-Tribal Council (ITC) of Oklahoma, Osage Nation, Choctaw Nation),
NM ITOs	5 Sandoval (lead), ACL, Zuni, 8 Northern, (Santo Domingo and San Felipe are direct distribution with no EBT activity)
Arizona (lead)	American Samoa, Mariana Islands, Guam, Navajo Nation
MSC	ITCA (lead), KS, NH
NATIONS	Eastern Shoshone, Northern Arapaho - WY, Ute Mountain - CO, Winnebago, Omaha, Santee Sioux - NE, Cheyenne River, Rosebud - SD, Standing Rock, Three Affiliated Tribes - ND
Maine ITOs	Indian Township and Pleasant Point will begin Planning with the assistance of the State of Maine in 2015

Appendix K: WIC MIS Functional Requirements

Exhibit 34: MIS Functional Requirements Performed by State Agencies Using Modern vs Legacy Systems

#	Function	Description	Functional Area(s)
1	Calculates the date certification is due to expire.	The system automatically calculates the date the certification is due to expire for each participant.	Certification
2	Assigns the participant a nutritional risk code and assigns a priority level. (CPA confirms the code is correct).	Based on the nutrition and health information entered into the system by the CPA and the priority system established by Program regulations, the system assigns the participant a nutrition risk code and assigns a priority level. Where multiple risk factors exist, the system stores risk factors for each participant and assigns the highest applicable priority. At the State agency's discretion, the CPA may override the code generated by the system.	Certification
3	Calculates the applicant's household income and flags individuals whose income exceeds program standards.	Based on information provided by applicants and established income eligibility guidelines, the system calculates the applicant's income and flags individuals whose income exceeds program standards. For those determined to be eligible, the system automatically stores the information in the participant's certification record. Where the applicant is determined eligible based on adjunctive income eligibility, this information is also stored in the system.	Certification
4	Associates family members.	Clinic staff enters information that applies to all family members into the system only once. The system automatically updates or modifies the participant records of all associated family members by linking the common family ID. The statewide family ID is used to facilitate coordination of certification periods for family members, transferring families within the system, and food package tailoring when several family members are eligible to receive the full package.	Certification
5	Maintain statewide data to facilitate families transferring within the State.	The system enables local staff to easily transfer the participant from one agency to another. To facilitate transfers within the State, the system maintains statewide data on all certified participants. The staff at the participant's new location is able to access the participant's file via the statewide family identification number to find out what foods were issued at the former local agency and when they were last issued, as well as other information useful in providing continued health and nutrition-related services.	Certification
6	Transfers certification data to the central computer facility electronically either in real time or batch mode.	Participant certification data are sent to the central computer facility electronically either in real time or batched mode. Paper forms are not sent through the mail.	Certification
7	Captures or documents the nutrition education provided to each participant as well as the topics covered.	The system captures the nutrition education provided to each program participant throughout the certification period as well as nutrition education topics covered during nutrition education training. Uses table-driven food packages.	Nutrition Education, Health Surveillance, & Referrals

#	Function	Description	Functional Area(s)
8	Uses standard table-driven food packages.	The system allows the CPA to select a food package for issuance to a participant from a table of standard, predefined packages.	Certification & Food Management
9	Uses standard predefined food packages.	The system allows the CPA to select a food package for issuance to a participant from a table of standard, predefined packages.	Certification & Food Management
10	Enables easy food package tailoring.	The certifying official has the flexibility to tailor a standard package or develop a new package from scratch by quickly selecting food items from a table to construct the package.	Certification & Food Management
11	Performs edits to prevent over-issuance during food package creation.	The system is programmed with edits that prevent the user from issuing foods that are disallowed or quantities of food that exceed the regulatory limit based on participant category.	Certification & Food Management
12	Enables food instruments to be printed when the participant is present for pick-up, i.e., on demand.	Printing is done for each participant at the time the participant is present to pick up the food instruments. With this system there is no need to fill out a food instrument by hand or to print any food instruments in advance. The printing of food instruments on demand reflects the most recent food package prescribed for the participant and may include adjustments to the food package recorded in the system before printing to reflect late pickup of the instruments, as well as other anticipated changes such as category change (i.e., infant to child). The system also retains internal records of all food instruments issued to support subsequent food instrument reconciliation and provides a complete audit trail.	Food Benefit Issuance
13	Captures or documents the name of the programs to which the participant was referred.	The system captures the name of the programs to which the participant was referred.	Nutrition Education, Health Surveillance, & Referrals
14	Performs food instrument reconciliation.	Issuance information includes the name of the participant, the participant's ID, the food instrument serial number, the food package prescribed, the date the food instrument was issued, the date the food instrument expires, and the estimated value of the food instrument. Redeemed food instruments are processed through regular banking channels or through the State payment system for payment to the vendor's account. Each food instrument redeemed is matched with the issuance data maintained in the system, and a monthly report is produced that shows a summary of the disposition of food instruments and expenditures. The summary shows the number of food instrument redeemed, voided because they expired, were never issued, or because they were replaced; unclaimed because the participant failed to pick up the food instrument at the clinic, issued but unredeemed because the participant failed to redeem the food instrument they received, or unmatched because the serial number did not match with the serial number of the food instrument issued. The unmatched food instruments appear in an exception file, and the State agency must follow up on each one to ensure it was properly issued. With the use of on-demand food instrument printing, these unclaimed, voided, and unmatched food instruments are significantly reduced. On-demand benefit issuance enables greater food instrument	Food Benefit Issuance & Food Benefit Redemption, Settlement & Reconciliation

#	Function	Description	Functional Area(s)
		control and accountability. With this system nearly all food instruments redeemed can be reconciled with issuance information.	
15	Produces standard Dual Participation Report.	The local worker has access to statewide data to determine whether a duplicate record exists on an individual who is newly certified for WIC. In an online system, the information is available immediately. In a distributed system, preliminary demographic data is recorded in the system. The information is matched against the database periodically to identify clinics where the applicant may already be participating.	Certification & Reporting
16	Produces standard Integrity Profile (TIP) Report.	The WIC information system produces report data in accordance with the existing specifications and produces other vendor management reports deemed necessary by the State agency.	Vendor Management & Reporting
17	Produces standard Rebate Billing Report.	Based on redemption data, the system produces a report that shows the number of cans of formula purchased by brand name and by type, and the month the food instrument was valid for participant use. In addition, the number of full versus partial infant formula packages can be identified. The system also provides rebate billing reports for rebated foods other than infant formula.	Financial Management & Reporting
18	Produces standard Participation Report.	The system produces reports that summarize the number of participants served during a specified time period (e.g., month) and for a specified area (e.g., statewide, agency, clinic). This information is used for caseload management and funds management.	Caseload Management & Reporting
19	Produces Participant Characteristics data sets.	The system produces data tapes for use in the biennial report to Congress on WIC Participant and Program Characteristics.	Reporting
20	Captures basic transaction data by vendor.	The system is designed to accept basic transaction information pertaining to each authorized retailer either at the time of issuance (i.e., vendor-specific food instruments) or at the time of payment. Transactions are related to the vendor performing the redemption.	Food Benefit Redemption, Settlement, & Reconciliation
21	Flags high-risk vendors through peer group analysis redemption data.	The system flags high-risk vendors based on suspicious redemption patterns.	Vendor Management
22	Identifies vendors with high average food instrument redemptions.	The system flags high-risk vendors based on suspicious redemption patterns.	Vendor Management
23	Identifies vendors with a narrow variation in redemptions.	The system flags high-risk vendors based on suspicious redemption patterns.	Vendor Management
24	Assigns a maximum value for each food instrument type.	The system assigns a maximum value for each food instrument type. Once the food instrument is redeemed, the system automatically checks the redeemed price against the maximum value and rejects any food instrument exceeding the maximum amount.	Food Management & Food Benefit Redemption, Settlement & Reconciliation
25	Checks redeemed price against maximum	The system assigns a maximum value for each food instrument type. Once the food instrument is redeemed, the system	Food Management

#	Function	Description	Functional Area(s)
	and rejects any food instruments exceeding the maximum amount.	automatically checks the redeemed price against the maximum value and rejects any food instrument exceeding the maximum amount.	& Food Benefit Redemption, Settlement & Reconciliation
26	Captures source of income.	The system is used to document the source of income information (e.g., pay stubs, letter from Medicaid).	Certification
27	Has the capability of annualizing household income occurring at more than one frequency.	Based on information provided by applicants and established income eligibility guidelines, the system calculates the applicant's income and flags individuals whose income exceeds program standards.	Certification
28	Performs automated dietary assessment.	The system performs an automated dietary assessment.	Nutrition Education, Health Surveillance
29	Has automated growth charts.	Height, weight, and head circumference (for infants) are entered into the system, and the system graphically plots the individual's growth and/or provides the nutritionist with the calculated percentiles.	Certification
30	Has point of certification data entry, i.e., a personal computer at each "station" within the clinic.	The information that makes up the participant's certification record is entered directly onto the computer. Optimally, no information is handwritten on paper for data entry onto the computer at a later time, except for when information is collected off-site (i.e., in a nonpermanent location such as a mobile van or other temporary clinic location) where a computer may not be available. A computer is readily available to all staff that has a need to enter information into a participant's certification record.	Certification
31	Allows for ad hoc reporting.	The system is designed so data can be easily accessed. State agencies archive static information that does not need to be stored on the WIC information system but will be needed for future program management. Data systems are designed to store, retrieve, and analyze data along a number of dimensions, including but not limited to: caseload management, budget forecasting, employee and participant fraud detection, and nutrition monitoring.	Reporting

Appendix L: Modern WIC MIS Capabilities

Exhibit 35: Modern WIC MIS Capabilities

Consortium	System Modules	Additional System Capabilities
Crossroads	▪ Clinic ▪ Appointment scheduling (list appointment types, pending list, waiting list) ▪ Vendor services (new application, vendor price survey search, manage vendor portal users, vendor peer group (re)evaluation) ▪ Operations management (State family workflow dashboard, maintain customer service issue, clinic search, search product inventor, maintain local agencies, maintain clinics) ▪ Finance ▪ Food maintenance ▪ Caseload management (monitor caseload, manage caseload eligibility data) ▪ Food instrument redemption	▪ Integrated vendor and participant portal ▪ Integrated financial management system ▪ Interfaces to third-party systems—State accounting system, Federal Foods Programs Reporting System (FPRS)
HANDS	▪ WIC services ▪ Appointment scheduling ▪ Vendor ▪ Operations management ▪ Finance ▪ Commodity Supplemental Food Program services ▪ Farmers' market ▪ Program integrity ▪ System administration ▪ Reports	▪ Integrated vendor portal ▪ Local agency portal ▪ Separate financial management system ▪ PedNSS and PNSS data tracking
MPSC	▪ Clinic services (intake, assessment, certification, education/care, food benefit issuance, transfers) ▪ Scheduler (appointments, nutrition education classes) ▪ Vendor management (application, price survey, vendor oversight, investigations, training) ▪ Operations (interface, outreach) ▪ Finance (caseload, food instrument redemptions, grant tracking, local agency budget) ▪ Food management (categories/subcategories/ Universal Product Code, participant profiles, food rules, model food packages) ▪ System administration ▪ Reports (clinic services, scheduler, vendor management, operations, finance, system administration)	▪ Separate financial management system ▪

Consortium	System Modules	Additional System Capabilities
MSC	▪ WIC services (e.g., breast pump issuance) ▪ Clinic administration (class management and no-show management) ▪ Client management ▪ Check issuance ▪ Reports (automated)	▪ Integrated vendor portal ▪ Integrated participant portal ▪ Separate financial management system ▪ PedNSS and PNSS data tracking
SPIRIT	▪ Scheduler ▪ Online vendor management ▪ Breastfeeding peer counselor ▪ Food package ▪ Reporting (ad hoc and standard)	▪ Integrated vendor portal (vendor application, price trackers) ▪ Separate financial management system ▪ Ad hoc reporting available through Crystal Reports[90]
WOW	▪ Clinic (schedule appointments, demographic intake, income validation, nutrition risk assessment) ▪ Certification tracker ▪ Nutrition (maintain food package description) ▪ Finance (track caseload, food instrument issuance and redemption) ▪ Training (Web-based training for WOW and nutrition topics) ▪ Reports (Oracle)	▪ Integrated vendor portal (application process, training, price monitoring, track peer group averages) ▪ Integrated participant portal ▪ Separate financial management system ▪ PedNSS and PNSS data tracking

Source: Compiled from State agency interviews, WIC State Plans, MIS system documentation

[90] Crystal Reports is a report generation program that allows a programmer to create reports by extracting data from various sources such as RDBMS. Users build the reports once and then a user can run the reports many times, getting the latest results with each successive run.

Appendix M: State Agency Technology Requirements by Project Cost

According to the FNS Handbook 901,[91] FNS authorizes WIC State agencies to make MIS acquisitions with a total project cost of up to $4,999 without prior FNS review. For acquisitions with a total project cost between $5,000 and $99,999, WIC State agencies must notify the FNS regional office in writing within 60 days of the expenditure or contract execution. Systems acquisitions with a total project cost of $100,000 to $499,999 require a written request for prior approval from FNS, including an explanation of the purchase(s), description of needs, and other information appropriate to the proposed acquisition (e.g., cost allocation plan, procurement documents). For total anticipated project costs that are $500,000 or greater, State agencies must submit a PAPD and an IAPD before the appropriate phase begins and receive prior approval from FNS before incurring any project costs.[92] Exhibit 36 provides a summary of the State agency requirements for MIS and EBT projects by acquisition cost.

Exhibit 36: State Agency Technology Requirements for MIS and EBT Projects by Acquisition Cost[93]

Total Project Cost	State Agency Requirements: MIS Projects	State Agency Requirements: EBT Project
< $5,000	▪ No Federal review or approval is required.	▪ PAPD required for all projects utilizing Federal funding.
$5,000 to $99,999	▪ No FNS approval is required. ▪ State agency provides a written notification to the WIC regional office within 60 days of the expenditure or contract execution. Applies to all funding sources.	
> $100,000 Acquisition Costs (noncompetitive procurement)	▪ Written FNS approval required for all funding sources. ▪ State agency provides a sole source justification submitted to FNS prior to the acquisition.	
$100,000 to $499,999 Acquisition Costs (competitive procurement)	▪ Written FNS approval required for all funding sources. ▪ State agency submits a document citing the description of needs, budget, procurement method, and cost allocation proposal.	
≥ $500,000 Project Cost	▪ Written FNS approval required for all funding sources. State agency submits PAPD for all projects utilizing Federal funding.	

[91] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *FNS Handbook 901* (Chapter 4). Retrieved from http://www.fns.usda.gov/apd/fns-handbook-901-advance-planning-documents

[92] The APD process was established by regulation in 7 CFR 277.18 of the Supplemental Nutrition Assistance Program (SNAP) and adapted by WIC through subsequent policy memorandums.

[93] U.S. Department of Agriculture, Food and Nutrition Service. (2015). *Preparing and submitting a Planning APD (PAPD)*. Retrieved from http://www.fns.usda.gov/sites/default/files/apd/2014-12-01-PAPD.pdf

Appendix N: Data Elements of Key Interest— Literature Review

This section summarizes the data used in WIC research completed between 2010 and the end of 2014. The study team reviewed 120 research studies obtained through online search databases, the National WIC Association, USDA's Economic Research Service, MSG team members working on other WIC-related research, the Robert Wood Johnson Foundation, and any relevant documents available from organizations that conduct WIC research. The study team used frequency analyses to identify the most common data elements used by WIC researchers and the sources of these data elements.

Exhibit 37 presents the results of the data element frequency analyses. The frequency analyses identified the data elements—or element groups—that are most common to a particular WIC research category. The table provides a count of the number of studies using each type of data element, with many studies using more than one data source. For instance, two studies contain data elements related to the academic achievement of the child. Of these two studies, one study obtained these data from the Early Childhood Longitudinal Study (ECLS-B), although the other study collected these data using an interview survey (Primary). Finally, the table provides an indication of whether a data element is collected in the State agency MIS. This is represented using the symbols below.

● Data collected by most State agencies and reported to FNS (MDS/SDS).

◔ Evidence of data collected by many State agencies, but not reported to FNS (MDS/SDS). Additional State agencies outside the entities interviewed for this study also collect these data on their State WIC MIS.

◐ Evidence of data collected by some State agencies, but not reported to FNS (MDS/SDS). Many State agencies interviewed for this study collect these data on their State WIC MIS.

◔ Evidence of data collected by a small number of State or local agencies, but not reported to FNS (MDS/SDS).

◉ No evidence of data collected by State agencies. May be calculated from existing MDS/SDS or future data sources (e.g., EBT).

○ No evidence of data collected by State agencies.

Exhibit 37: Summary of Data Used in WIC Research since 2010

Data Element	Data Collected WIC MIS	# Used in Research Reports	Primary Research	WIC Source		CDC Source		Other Sources	
			Interviews/ Surveys	MDS/ SDS	State WIC	PedNSS/ PNSS	Other	Transaction Data	Other
Academic Achievement (child)	○	2	1						ECLS-B (1)
Average Consumption (fruit, vegetables, juice, etc.)	○	34	24					POS (8) TEXFAN (2)	
Average Consumption (other foods)	○	23	13					POS (8) TEXFAN (2)	

Data Element	Data Collected WIC MIS	# Used in Research Reports	Primary Research	WIC Source		CDC Source		Other Sources	
			Interviews/ Surveys	MDS/ SDS	State WIC	PedNSS/ PNSS	Other	Transaction Data	Other
Average Food Expenditure (daily and monthly)	○	6	6						
Breastfeeding Duration	●	25	10	MDS (5)		PNSS (2)	BRC (1) PRAMS (7)		
Breastfeeding Education	◐	7	7						
Breastfeeding Exclusivity	◔	6	3		1		BRC (1) PRAMS (1)		
Breastfeeding Initiation	●	11	4	MDS (3)		PNSS (2)	BRC (1) PRAMS (1)		
Cognitive Development	○	3							CDS (1) ECLS-B (2)
Consumption Patterns (fruit, vegetables, juice, diary)	○	15	15						
Counseling Location (in-home, in-clinic, peer counseling)	◔	5	5						
Counseling/ Education Topics (breastfeeding, nutritional guidelines, food preparation)	◐	9	9						
Food Preferences (cultural/regional)	◉	16	6					EBT (2) POS (8)	
Density of Fast Food Stores	○	1	1						
Distance to WIC Facility	○	1	1						
Distance to WIC Retailer	○	2	2						
Eating Frequency	○	3	3						
Eating Patterns (eating out, with family, in front of television/ computer)	○	2	2						
Entitlement Program Enrollment (TANF, SNAP, Medicaid)	●	69	44	MDS (11)	2	PedNSS (9)	NIS (1)		CDS (2)

Data Element	Data Collected WIC MIS	# Used in Research Reports	Primary Research	WIC Source		CDC Source		Other Sources	
			Interviews/ Surveys	MDS/ SDS	State WIC	PedNSS/ PNSS	Other	Transaction Data	Other
Food Package Cost	◉	3	1		2				
Food Package Redemption and Utilization	◐	4	1		3				
Food Perceptions/ Beliefs	○	22	22						
Food Price	◉	5	5						
Food Purchases (Personal Funds)	◉	6	4					EBT (2)	
Food Purchases (WIC/non-WIC or SNAP benefits)	◉	7	2					EBT (3) POS (2)	
Food Security	○	8	7				NIHANES (1)		
Retailer Food Variety	○	2	2						
Retailer Fruit Availability	◉	7	7						
Geographic Location	○	1					NHIS (1)		
Gravidity	●	5	4	SDS (1)					
Health Insurance	○	1	1						
Household (HH) Characteristics (HH size and income)	●	90	62	MDS (7)	2	PedNSS (6) PNSS (8)	NHIS (1) NIS (1)	TEXFAN (2)	CHS (1)
Household Language Spoken	◉	16	16						
Immunization (Child)	◐	2	1				NIS (1)		
Infant Birth Length	●	7	3	SDS (1)			PRAMS (3)		
Infant Birth Weight	●	32	11	MDS (2) SDS (7)		PedNSS (3) PNSS (3)	PRAMS (5)	VS (1)	
Infant Delivery Characteristics (vaginal, vacuum, cesarean, complications)	○	3					PRAMS (3)		
Infant Health Status	○	2					NHIS (1)		CHS (1)
Infant/Child Characteristics (age, gender, race/ethnicity)	●	59	27	MDS (4)		PedNSS (7)	NHANES (1) NHIS (3)	VS (1)	CDS (2) ECLS-B (7)

Data Element	Data Collected WIC MIS	# Used in Research Reports	Primary Research	WIC Source		CDC Source		Other Sources	
			Interviews/ Surveys	MDS/ SDS	State WIC	PedNSS/ PNSS	Other	Transaction Data	Other
							NIS (2) PRAMS (5)		
Infant/Child Food Intake	○	2	2						
Infant/Child Health (obesity, physical activity)	◐	30	25	MDS (2)		PNSS (2)	NHANES (1)		
Interpregnancy Interval	⊙	4	4						
Least Expensive Brand (LEB)	○	3	3						
Marital Status	◐	28	22				NHIS (3) PRAMS (3)		
Maternal Characteristics (age, race/ethnicity)	●	49	13	MDS (12)	2	PNSS- 6	NHIS (3) NIS (2) PRAMS (6)		ECLS-B (5)
Maternal Education	●	39	21	SDS (8)	2	PNSS- 2	NHIS (3) PRAMS (3)		
Maternal Employment	○	18	18						
Maternal Health (BMI, gestational diabetes and hypertension, anemia)	◐	21	9			PNSS- 8	PRAMS (4)		
Maternal Prepregnancy, Pregnant, Postpartum Characteristics (BMI, weight)	◐	7	4				PRAMS (3)		
Maternal Smoking or Drinking (pregnant, postpartum)	◐	15	3			PedNSS (3) PNSS (1)	PRAMS (8)		
Maternal Social Media/Internet Usage	◔	1	1						
Maternal/Paternal Characteristics (age, race/ethnicity)	●	26	20	MDS (2)		PNSS (3)	NHANES (1)		

Data Element	Data Collected WIC MIS	# Used in Research Reports	Primary Research	WIC Source		CDC Source		Other Sources	
			Interviews/ Surveys	MDS/ SDS	State WIC	PedNSS/ PNSS	Other	Transaction Data	Other
Maternal/Paternal Education	●	2	21	MDS (2)					
Maternal/Paternal Employment Status	○	4	4						
Maternal/Paternal Health (obesity, hypertension, physical activity, smoking)	◐	18	16			PNSS (2)			
Nutritional Counseling	◐	4	4						
Other Food Availability	◔	7	7						
Parity	●	9	3			PedNSS (3) PNSS (3)			
Product Visibility	○	3	3						
Program Satisfaction	◔	2	2						
Quality of Fresh Produce	○	1	1						
Vegetable Availability	○	7	7						
WIC Caseloads	◐	2			2				
WIC Eligibility	●	6	1				NHIS (2)		CDS (3)
WIC Eligibility Category	●	21	7			PedNSS (3) PNSS- (2)	PRAMS (9)		
WIC Food Label	○	1	1						
WIC Participation	●	9	5	MDS (1)			PRAMS (3)		

Exhibit 38 accompanies the table above. It provides additional details on the existing data sets used in WIC research.

Exhibit 38: Existing Data Sets Used in WIC Research

Data Source (Sponsor)	Acronym	Level of Data	Data Collected (Examples)	Population or Sample	Periodicity
Breastfeeding Report Card (DNPAO/CDC)	BRC	National, State	Breastfeeding rates, types of support in key community settings	Estimates from various sources	Annual

Data Source (Sponsor)	Acronym	Level of Data	Data Collected (Examples)	Population or Sample	Periodicity
Children's HealthWatch Survey (Children's HealthWatch)	CHS	Children's HealthWatch medical centers	Demographics, child health and development, parental health, housing, household food security, Federal assistance program utilization, employment, income, financial literacy, dental care, utilities, and childcare	Children (0–4 years of age) and their families accessing emergency services and primary and acute care clinics in the U.S. (N=Approx. 4,800)	Ongoing
Child Development Supplement of the Panel Study of Income Dynamics (PSID)	CDS	National	Maternal employment; family structure; marital status; economic status; parenting style; child cognitive, emotional, and behavioral development	Children (0–12 years of age); Subsample of the Panel Study of Income Dynamics (PSID) (N=Approx. 2,000)	1997, 2002
Early Childhood Longitudinal Study (Birth Cohort) (NCES/ED)	ECLS-B	National	Children's health, development, care, and education	Sample of children born in 2001 and followed from birth through kindergarten entry (N= 14,000)	2000, 2002, 2004, 2006, 2007
Electronic Benefits Transfer Data	EBT	10 States and 4 tribal governments	WIC Account Balance, WIC Transaction History	U.S. adults with an EBT card	Ongoing
National Health and Nutrition Examination Survey (NCHS/CDC)	NHANES	National	Demographic; socioeconomic; dietary and health-related questions; medical and dental examination; physiological measurements and laboratory tests	U.S. adults and children (N=Approx. 27,000)	Annual
National Immunization Survey (DCIRD/CDC and NCHS)	NIS	National, State, select urban areas	Childhood immunization coverage	U.S. children (19–35 months) (N=Approx. 30,000)	Annual since 1994; Breastfeeding since 2001
National Health Interview Survey (NCHS/CDC)	NHIS	National	Health status, insurance coverage, use of health services, immunizations, health behaviors, injuries, occupational health, cancer screening, asthma, diabetes, mental health	Sample of U.S. adults and children by household (N= Approx. 35,000).	Annual since 1957

Data Source (Sponsor)	Acronym	Level of Data	Data Collected (Examples)	Population or Sample	Periodicity
National Survey of Children's Health (HRSA and MCHB/DHHS)	NSCH	National, State, regional	Physical and emotional health, family interactions, parental health, school and afterschool experiences	Infants and children (<8 years of age) (N=Approx. 90,000)	Every 4 years (may be annual in the future)
Pediatric Nutrition Surveillance System (DNPAO/CDC)	PedNSS	44 States, the District of Columbia, 2 U.S. Territories, and 7 tribal governments	Birth weight, short stature, underweight, overweight, anemia, breastfeeding, smoking in household, TV viewing	Infants and children (<5 years of age) participating in the WIC program (N=Approx. 8 million)	Annual since 1973 Decommissioned 2012
Point-of-Sale Data	POS	Store specific	Various data: transaction date, items purchased, purchase price	All shoppers	Ongoing
Pregnancy Nutrition Surveillance System (DNPAO/CDC)	PNSS	27 States, the District of Columbia, Puerto Rico, and 4 tribal governments	Prepregnancy weight status, maternal weight gain, parity, anemia, diabetes, and hypertension during pregnancy, as well as data on maternal behavioral such as alcohol consumption	Pregnant and postpartum women enrolled in federally funded public health programs (N=Approx. 1.3 million)	Annual since 1979[94] Decommissioned 2012
Pregnancy Risk Assessment Monitoring System (DHHS/CDC)	PRAMS	Participating States (40) and New York City	Maternal attitudes and experiences before, during, and shortly after pregnancy	Random sample of birth certificates; women with a recent live birth and their infants	Annual
Primary Data Collection (Various)	Primary	Various	Original data collected by researchers using questionnaires, interviews, or direct observations	Various	Various
State-level WIC Administrative Database	State WIC	State	Various	Various	Various

[94] Similar to PedNSS, PNSS data was collected from a handful of States beginning in 1979 (Arizona, California, Kentucky, Louisiana, and Oregon) and later included 27 States, the District of Columbia, Puerto Rico, and 4 tribal governments.

Data Source (Sponsor)	Acronym	Level of Data	Data Collected (Examples)	Population or Sample	Periodicity
WIC Minimum Data Set (USDA/FNS)	MDS	National, State, regional	Required data: date of birth, sex, race/ethnicity, certification category, expected date of delivery, certification date, migrant status, weight, height, currently breastfed, food packages, etc. See Appendix A for full list of data elements.	Census of WIC participants in States, territories, and ITOs	Biennial since 1992[95]
WIC Supplemental Data Set (USDA/FNS)	SDS	National, State, regional	Optional data: date of first WIC certification, educational level, parity, prepregnancy weight, weight gain during pregnancy, birth weight, etc. See Appendix B for full list of data elements.	Census of WIC participants in States, territories, and ITOs	Biennial since 1992
Texas Food and Nutrition Questionnaire (Texas A&M)	TEXFAN	Texas only	WIC food package impact on food preferences, food purchases, and food consumption with focus on fruits and vegetables; whole grain foods; lower-fat milk; adult, infant, and child eating practices; cultural preferences	Mothers, infants, and children at WIC clinics throughout Texas	Prepackage change: 2009 Post-package change: 2010
State Vital Statistics (U.S. Government)	VS	State	Date of birth (infant), State of birth, time of birth, sex, date of birth (mother), residence of mother	All women with a live birth	Ongoing; updated annually as a public-use file

DNPAO = Division of Nutrition, Physical Activity, and Obesity; PSID = Panel Study of Income Dynamics; NCES = National Center of Education Statistics; ED = Department of Education; NCHS = National Center of Health Statistics; NCIRD = National Center for Immunizations and Respiratory Diseases; HRSA = Health Resources and Services Administration; MCHB = Maternal and Child Health Bureau; DHHS = U.S. Department of Health and Human Services

[95] Prior to 1992, WIC PC was a sample-based survey of WIC participants.

Appendix O: Bibliography of Current WIC Literature (2010 – 2014)

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