United States Department of Agriculture

2013 WIC Vendor Management Study

Final Report

Nutrition Assistance Program Report **November 2013**

Food and Nutrition Service
Office of Policy Support

United States Department of Agriculture

Food and Nutrition Service, Office of Policy Support November 2013

2013 WIC Vendor Management Study Final Report

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This study was conducted under Contract number AG-3198-C-11-0009 with the Food and Nutrition Service, United States Department of Agriculture.

This report is available on the Food and Nutrition website: http://www.fns.usda.gov

Suggested Citation:
U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, "2013 WIC Vendor Management Study," by Stacy Gleason *et al*. Project Officer: Dr. Joseph F. Robare, Alexandria, VA: November 2013

Executive Summary

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Program provides supplemental nutrition assistance, nutrition education, breastfeeding promotion and support, and referrals to health and social services for low-income and nutritionally at-risk pregnant, breastfeeding, and postpartum women, as well as to infants and young children up to age 5. The Program, funded by the U.S. Department of Agriculture's Food and Nutrition Service (FNS), grants WIC State agencies the resources to provide nutrition services to eligible participants. In Federal Fiscal Year 2010, the total Federal expenditure for food benefits was $4.56 billion, after accounting for $1.69 billion in formula rebates. WIC serves more than half the infants born in the United States.

WIC participants receive food instruments (FI) to purchase nutritious supplemental foods. Ninety WIC State agencies administer the Program through more than 48,000 authorized retailers, known as vendors. WIC operates through 1,900 local agencies in 10,000 clinic sites in 50 State health departments, 34 Indian Tribal Organizations, the District of Columbia, and five Territories (the Northern Mariana Islands, American Samoa, Guam, Puerto Rico, and the U.S. Virgin Islands).

Administering this expansive Program requires a range of monitoring and evaluation strategies. These include an ongoing FNS effort to ensure WIC program integrity through a periodic vendor management study that examines the extent to which vendors adhere to WIC Program rules. In 2011, FNS contracted Altarum Institute and its partner, RTI International, to conduct this study.

Chief among the outcomes examined were the extents to which WIC vendors complete each transaction at checkout according to Program rules, allow participants to purchase only WIC authorized foods, and charge the WIC Program appropriately. Three prior studies indicate that the frequency and amount of overcharge and some administrative errors had been declining; however, major Program changes since the 2005 study may have had an effect on these trends. Of particular interest are Program changes aimed at containing food costs in the WIC Program, expanding the rollout of electronic benefit transfer (EBT) cards in additional States, and revising the content of WIC food packages. To capture the effect of these changes on the vendor management system, this 2013 study includes two complementary studies:

- A base study, comparable to the 1998 and 2005 WIC Vendor Management Studies (WVMS), which examines purchases made through compliance buys using the traditional WIC FIs or, in the case of EBT, to purchase traditional WIC foods; and
- A cash value voucher (CVV) study, which examines purchases made through compliance buys using the CVVs or, in the case of EBT, cash value benefits (CVBs) to purchase fruits and vegetables.

The results of this study suggest that some of the changes made to the WIC Program since the 2005 study have had a direct effect on and improvement in the rates of some Program violations. This progress is tempered, to some extent, by findings that suggest higher rates of some errors and violations, particularly in transactions that involve the CVV or CVB.

The study's key findings follow:

- The rate at which vendors allow buyers to substitute items for traditional WIC benefits has declined but is disproportionately high for benefits with a cash value.
- The use of EBT helps to mitigate substitutions, but rates of minor substitutions with the cash value benefit remain high.
- The use of EBT appears to have had little effect on the overall rate of overcharge, which has increased since 2005.
- Although the rate of undercharge remains the same, the average value of undercharge has increased and is greatest among vendors in EBT States.
- The two most common administrative errors—improper countersignature and failure to provide a receipt—are both associated with more serious vendor violations.
- Insufficient stock was more common among vendors in the 2013 study, compared to the 2005 study.

Methodology

The 2013 WVMS employed a nationally representative probability sample of 1,904 retail WIC vendors. The study's primary method of data collection was through more than 5,600 visits to WIC vendors, resulting in more than 7,900 WIC transactions over a 3-month period. The compliance buyers (CB) provided the sole source of data on the outcome variables of interest; these data are the basis for the national estimates of over-and undercharges, as well as the frequency of vendor violations (e.g., allowing a substitution, failing to provide a receipt). These buyers recorded multiple opportunities for violations and, whenever possible, recorded the shelf and receipt prices of WIC foods.

Additional data sources include FNS's WIC State Plan Guidance documents, which were used to examine differences in vendor compliance outcomes by common State agency administrative practices and to identify whether and which vendor management practices are associated with reduced incidence of vendor violations. The Integrity Profile Report 2010 was used as the basis for the development of sampling weights for the base and CVV studies. Finally, for each WIC State agency selected for the study, FI reconciliation files were acquired. These four data sources were merged to create an analytic data file.

Study Population

In general, vendor "type" is a classification based on a combination of factors, such as ownership, store size and variety of food items available. WIC uses type to differentiate among vendors for whom WIC business comprises more than half their total food sales, "above-50-percent vendors"; WIC terms as "regular vendors" those among whom WIC food sales represent less than half their total food sales. Nearly all vendors in this study (98.2 percent) were "regular vendors."

Other characteristics about vendors are worth noting, such as location and use of scanning equipment, number of registers, and geographic location. More than 40 percent of vendors in the study had eight or more registers (large); more than three-quarters (76.8 percent) were located in urban settings. Scanning equipment, which has the potential to reduce cashier error while ensuring proper transaction procedures, was present in 83 percent of the vendors.

Findings: WIC Vendor Administrative Errors

Specific violations of Program rules were studied; although breaking these rules does not necessarily result in improper payment (IP) to vendors, previous studies have found that failure to conform to some is associated with such violations. These rules include following proper countersigning procedures, providing a receipt, maintaining sufficient stock, ensuring that cashiers are familiar with WIC transactions, not requiring participants to pay cash in addition to the WIC benefit, allowing participants to purchase WIC authorized foods, and properly handling partial buys.

Among these administrative errors, an improper countersignature procedure (asked the participant to countersign the FI before the amount of the purchase was written on the check) occurred most frequently: More than 60 percent of vendors did not follow this procedure correctly. Failing to provide a receipt was the second most frequent administrative error, committed by more than one in five vendors. Fewer than 20 percent had a cashier who was unfamiliar with WIC transactions; fewer than 20 percent had insufficient stock. Nearly 16 percent of vendors did not handle an attempted partial buy according to their State agency's policies. Other administrative errors under study—not allowing buyers to purchase WIC items, or demanding cash—occurred infrequently.

Findings: Substitutions

Substitution of WIC authorized foods with unauthorized foods is a violation of Federal and State agency rules and regulations. Unlike the administrative errors described above, however, this violation requires that the WIC participant herself take some action by either bringing the item to the cash register or accepting a substitution suggested by the cashier. CBs attempted two types of substitutions: a minor substitution, in which the vendors allows the buyer to substitute an 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 something that is not within a WIC food category, such as soda or chips.The base study found that 18.4 percent of vendors allowed a minor substitution, such as allowing unauthorized brands of cereal or white instead of whole-grain bread. Only 5.6 percent of vendors allowed major substitutions. When CVVs or CVBs were used, these proportions were quite different: 42.4 percent of vendors allowed minor substitutions for fruits and vegetables, while 18.2 percent allowed major substitutions.

Findings: Improper Payments

As part of its effort to ensure WIC program integrity, FNS estimates IPs in programs of a certain size. In this study, overcharges, undercharges, and rainchecks were considered IPs; however, because rainchecks were seldom if ever offered, no further analysis was made of their use. IPs were examined through"safe buys" and "partial buys" (the former being purchases in which the buyer intends to purchase all foods listed on the FI in quantities and sizes indicated, the latter being purchases in which she intends to purchase some but not all of the items indicated).The national estimate of the dollar value of IPs is $68.2 million; IPs relative to benefits with a cash value account for 5.8 percent of this amount, while traditional WIC foods account for the remainder. Vendors authorized by State agencies with an EBT system in place account for a greater proportion of IPs (63 percent) compared to vendors authorized by State agencies with paper FIs. However, approximately 80 percent of the total national estimate is attributed to undercharges ($54.4 million). In general, vendors charge WIC less than they should for the foods that they distribute to Program participants.

Recommendations

This study's findings help to identify challenges that remain in administering the WIC Program, as well as others that have emerged in the wake of recent Program changes. These findings lead to the following recommendations:

- **Conduct further research to understand compliance issues in EBT and how to measure them.** FNS and its stakeholders should assess these issues and define IPs within this structure. FNS may want to consider revising information requested through annual WIC State plans to be more relevant to vendor management and retail food delivery practices and policies employed by State agencies with an EBT system in place.
- **Encourage vendors to use scanning equipment when making WIC transactions.** Vendors that do not use such equipment are significantly more likely to generate IPs and to allow substitutions.
- **State agencies should require vendors to provide a receipt.** Provision of a receipt is significantly related to the accuracy with which a vendor completes the WIC transaction. At the time of data collection, only 24 of the 40 State agencies included in the study made this requirement.
- **FNS should take a closer look at WIC EBT transactions that involve the use of a loyalty card.** In the course of analyzing transactions, researchers found that, when available, cashiers were scanning a store card that afforded CBs store discounts; these discounts, however, were not passed on to the WIC Program. Even when a discount was available, that price was not being offered to the WIC Program.

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Acknowledgements

Many individuals made important contributions to this report. The authors thank the Altarum Institute and RTI International Study Team, especially Diane Phillips, Ruth Morgan, Daniel Keever, Yuying Zhang, Gordon Brown, Michael Penne, Sheryl Cates, and Wanda Stephenson for their leadership on sampling and data collection tasks and acknowledge the hard work of the compliance buyers and field supervisors who ensured a quality data collection effort. We also thank Dr. Joseph Robare, Tony Hardy, Melissa Abelev, and Jay Hirschman of the U.S. Department of Agriculture's Food and Nutrition Service (FNS) for providing oversight, guidance, and critical Program information and the representatives from numerous Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) State agencies who contributed to the advisory panel discussions and helped to guide the study protocols, including communication with sampled State agencies and data requests.

Most importantly, we would like to thank the State WIC Directors, Vendor Managers, and other WIC staff members who worked behind the scenes to provide us with information regarding vendor management policies and procedures, WIC food instruments, and issuance and redemption files for the study. Without their contribution, this project could not have been conducted.

Acronym List

FNS: Food and Nutrition Service of the U.S. Department of Agriculture

WIC: Special Supplemental Nutrition Program for Women, Infants, and Children

IPIA: Improper Payments Information Act of 2002

ITO: Indian Tribal Organizations

FI: food instrument

FY: Fiscal Year

CVV: cash value voucher

CVB: cash value benefit

EBT: electronic benefit transfer

POS: point-of-sale

A50: above-50-percent

MAR: maximum allowable reimbursement

NTE: not-to-exceed

UPC: Universal Product Code

PLU: Product Lookup Code

APL: Authorized Product List

IOM: Institute of Medicine

WVMS: WIC Vendor Management Study

IP: improper payment

TIP: The Integrity Profile

CB: compliance buyer

PSU: primary sampling unit

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Chapter I: Introduction

In 2011, the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA) contracted with Altarum Institute (Altarum) and their partner, RTI International (RTI), to conduct a study to examine the management of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) retail food delivery system and determine the extent to which WIC authorized retail grocers (WIC vendors) adhere to Program rules. Foremost among the rules that were examined are the extent to which WIC vendors complete the WIC transaction at checkout in accordance with proper WIC Program procedures, allow only WIC authorized foods to be purchased by participants, and charge the WIC Program appropriately for the foods purchased. This study is part of a larger FNS effort to ensure WIC Program integrity and to comply with the Improper Payments Information Act of 2002 (IPIA), which requires FNS to estimate improper payments (IP) in programs of a certain size.

A. Background on WIC Program Retail Food Delivery Systems

The WIC Program provides supplemental nutrition assistance, nutrition education, breastfeeding promotion and support, and referrals to health and social services to low-income and nutritionally at-risk pregnant, breastfeeding, and postpartum women as well as infants and young children up to age 5. The Program is funded by FNS, which grants WIC State agencies, including those of States, U.S. Territories, and Indian Tribal Organizations (ITO), the resources to provide nutrition services to eligible Program participants, including food instruments (FI) that they can use to purchase nutritious, supplemental foods free of charge.

In Federal Fiscal Year (FY) 2010, the total Federal expenditure for food benefits in WIC was $4.56 billion after accounting for $1.69 billion in formula rebates. Most of this money was spent in retail food stores authorized by State agencies that provide supplemental foods through retail food delivery systems. In FY 2010, there were a total of 48,621 vendors nationally. WIC State agencies are responsible for providing the food benefits to eligible participants, developing and managing food delivery systems to supply participants with those benefits, and ensuring that funds provided for food benefits are properly spent on WIC authorized foods and that vendors follow Program rules and guidelines when transacting WIC benefits. These key aspects of WIC Program operations and management are described in the following sections.

1. Food benefit issuance

Most State agencies have developed retail food delivery systems that issue food benefits to participants in one of two ways:

- **Paper check or voucher.** Currently, the majority of WIC State agencies issue benefits through the use of FIs in the form of a check or a voucher, including the cash value voucher (CVV), which can be used to purchase WIC-eligible fruits and vegetables.
- **Electronic benefit transfer (EBT).** Since the 2005 WIC Vendor Management Study (WVMS), a number of State agencies have moved from a paper check system to EBT cards that contain information about the foods participants are prescribed as well as their cash value benefits (CVB). Additionally, many State agencies are currently in the process of planning,

piloting, or developing EBT systems, because all State agencies will be required to implement an EBT system by 2020.[1]

In State agencies that use a retail food delivery system, participants receive paper FIs or EBT cards at a WIC clinic.[2] WIC participants may use their FIs or EBT cards to purchase specific foods at grocery stores or other retail outlets that are WIC authorized vendors. Based on the guidelines and regulations established by FNS, each State agency develops a list of WIC authorized foods that serves as the basis for food benefit prescriptions. The exact types and quantities of food a participant may purchase are based on one of five WIC participant eligibility categories: pregnant women, postpartum women, breastfeeding women, infants, and children.

2. Vendor authorization

To become a WIC authorized vendor, an individual store must meet certain selection criteria established by the State agency (e.g., minimum stocking requirements, geographic need, history of compliance). When a grocery store applies to the State agency for WIC authorization, it is required to submit data describing the type and size of the store, as well as the price and availability of WIC foods. State agencies compare the data submitted by the store with their criteria to determine whether the store qualifies for authorization. Prior to approving the application, the State agency sends a representative from the State or a local WIC agency to visit the store and verify that the information contained in the application is correct, check the store's stock levels, and review Program rules and regulations with store management. After granting approval, the State agency requires vendor staff to participate in training on WIC Program rules and handling of WIC transactions. In some cases, retail store owners or managers are required to pass written examinations regarding Program rules.

If a store meets the State agency's criteria and participates in the required training, the vendor may enter into a vendor agreement with the WIC State agency. By signing the vendor agreement, the store agrees to comply with State agency rules and regulations.

3. Vendor management practices

State agencies face the ongoing challenge of managing their vendor populations and enforcing the requirements outlined in their vendor agreements. As mentioned earlier, State agencies are held accountable for the actions of their vendors, and any violation of Program rules is considered a serious matter. To address this, State agencies have developed vendor monitoring and compliance programs to ensure that vendors comply with the Program's rules and regulations. Because State agencies vary in size, demographics, and type of WIC service delivery, they adopt and customize vendor management practices to meet their specific needs. State agencies often use a combination of preventive efforts, such as vendor selection criteria and extensive vendor training programs; and activities aimed at examining compliance, such as extensive onsite monitoring visits, use of high-risk detection systems, WIC inventory audits, and aggressive compliance buy programs. Additionally, because EBT systems capture point-of-sale (POS) information about WIC transactions, these databases can serve as monitoring tools. However, the extent to which EBT States use their data for this purpose is currently unknown.

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[1] Public Law 111-296. December 13, 2010.

[2] Only three WIC State agencies do not operate any retail food delivery but instead operate only direct distribution systems: Mississippi; San Felipe, NM; and Santo Domingo, NM.

B. Regulatory Changes That Affected WIC Between 2004 and 2011

The prior three WVMSs indicate that the frequency and amount of overcharge and some administrative errors have been steadily declining. However, as previously described, the WIC Program has undergone substantial changes since the 2005 study took place; these may affect current vendor compliance issues. The three most critical changes to the Program are described in detail below.

- **Major Program Change 1: New Vendor Cost Containment Requirements**

New regulations aimed at containing food costs in the WIC Program were issued in response to the Child Nutrition and WIC Reauthorization Act of 2004.[3] These regulations require State agencies to ensure that all vendors are paid competitive prices for WIC supplemental foods. Specifically, the revised Vendor Cost Containment regulations issued in 2005 required State agencies to do the following:

- Establish a peer group system;
- Establish competitive pricing criteria and allowable reimbursement levels for each vendor peer group;
- Ensure that vendors applying to become authorized have shelf prices that are competitive with stores in the peer group they fit in; and
- If State agencies authorize above-50-percent (A50) vendors,[4] which include WIC-only stores, either (1) establish a separate peer group and ensure that this peer group has competitive pricing criteria and allowable reimbursement levels that do not result in higher food costs than from other regular retail vendors, or (2) include them in peer groups where they best fit and ensure that their prices are not used to calculate allowable reimbursement levels.

In response to these regulations, most State agencies have established maximum allowable reimbursement (MAR, also called "maximum allowable reimbursement levels" by some State agencies) and not-to-exceed (NTE) values that can be used in pre- and postpayment screening processes to identify overcharges by vendors and to ensure that the WIC Program does not pay exorbitant prices for supplemental foods. Among WIC State agencies that establish a MAR (n = 79), 83.5 percent establish reimbursement levels for each FI or food category, and 76.0 percent establish reimbursement levels for each peer group. EBT States set MARs at the food item level. Most State agencies for which data were available (n = 48) use a percentage over the average redemption amount to calculate the MAR (52.1 percent). Other WIC State agencies establish the MAR by using standard deviations over the average redemption amount (31.3 percent) or some other means, such as shelf prices collected from price surveys received across each peer group (22.9 percent). When paper FIs are processed and the price written on the FI exceeds the MAR amount, most WIC State agencies either reject the FI but allow the vendor to resubmit for payment or reimburse the vendor for amounts up to the maximum allowable amount.

In addition to revisions in vendor cost containment systems, State agencies are no longer allowed to issue vendor-specific FIs. These were instruments that were printed with the name and address of

[3] Public Law 108-265. June 30, 2004.
[4] Stores from which 50 percent or more of their food sales come from WIC transactions.

the authorized vendor selected by the WIC participant at the clinic site and could only be redeemed by the selected vendor. The new regulations specify that State agencies operating a retail food delivery system are required to allow WIC participants to shop at any authorized vendor and place restrictions on the provision of incentive items by A50 stores.[5] Incentives are items used by vendors to encourage solicitation by WIC customers and may include free or complimentary gifts, home delivery of foods, store memberships, lottery tickets, free or discounted services, etc. However, non-A50 vendors, also known as regular vendors, may offer incentive items to WIC participants as long as those vendors offer incentive items in the same manner to non-WIC customers, if applicable.

- **Major Program Change 2: Rollout of EBT in Additional States**

Currently, there are six State agencies and four ITOs providing WIC food benefits by EBT and many other State agencies in the design and development phase or planning stage of EBT. All State agencies will be required to implement EBT Statewide by October 1, 2020, per the Healthy, Hunger-Free Kids Act of 2010.[6]

EBT allows WIC food purchases to occur electronically at the grocery store (Cole, Jacobson, Nichols-Barrer, & Fox, 2011). An EBT transaction in WIC is more complex than a credit or debit transaction due to the specific food prescription that is the hallmark of the WIC food benefit. Two methods of WIC EBT are currently in use:

- **Offline EBT** uses a plastic card with an embedded computer chip (a smart card) that contains the WIC participant's current food benefits.
- **Online EBT** cards have a magnetic strip that assists in carrying out real-time communication through a card acceptor device in the checkout lane to an entity that has been approved to conduct the online EBT card processing. Upon swiping the card, a message is sent to the online EBT processor, which validates the card and personal identification number and sends the food prescription balance back to the vendor.

Despite the fundamental differences between the technology used for offline and online EBT systems, the details of the WIC transaction at the register are largely the same. At the checkout, the scanned Universal Product Codes (UPC) and Product Lookup Codes (PLU)[7] are assessed against an Authorized Product List (APL) created and updated by the WIC State agency and regularly downloaded by the vendor which are then assessed against the foods prescribed. If the scanned food items satisfy both the APL and the food prescription requirements, the purchases are authorized and the food prescription is updated on the smart card or with the EBT processor to reflect the use of the benefits.

- **Major Program Change 3: Contents of WIC Food Package**

In 2005, the National Academy of Sciences' Institute of Medicine (IOM) publicly released its report, *WIC Food Packages: Time for a Change*, with recommendations for revisions to the WIC food packages. An interim rule revising the WIC food packages was published in the *Federal Register* on December 6, 2007. The revisions in the interim rule align the WIC food packages with the Dietary

[5] Section 203 of Public Law 108-265. June 30, 2004.
[6] Public Law 111-296. December 13, 2010.
[7] This code is used to identify fresh fruit and vegetables, including related items such as nuts and herbs, that are sold in bulk.

Guidelines for Americans and the infant feeding practice guidelines of the American Academy of Pediatrics. The interim rule revisions largely reflect recommendations made by the IOM with certain cost containment and administrative modifications found necessary by the Department to ensure cost neutrality. All WIC State agencies were required to implement the revisions by October 1, 2009. As a result, WIC food packages better promote and support the establishment of successful, long-term breastfeeding, provide WIC participants with a wider variety of foods including fruits and vegetables and whole grains, and provide WIC State agencies greater flexibility in prescribing food packages to accommodate the cultural food preferences of WIC participants.

With the addition of fruits and vegetables to the WIC food benefit, all State agencies were required to add a new FI called a CVV, also known as a cash value benefit (CVB) in EBT States. As its name implies, the CVV has a cash value unlike traditional WIC food benefits and can be used only to purchase fruits and vegetables. In general, State agencies continue to have considerable flexibility in determining the amount and variety of foods to include in their authorized product lists, which resulted in some variance in policy choices across State agencies.

The food package changes noted above are the most dramatic changes that have been made to the WIC Program since its inception. This is the first WVMS that has been conducted since these changes were implemented.

C. Rationale and Purpose of the Study

The 2013 WVMS, the fourth of its kind, is critical in informing policy related to WIC vendor management at both the Federal and State agency levels. This study is of particular importance due to the numerous changes that have occurred since the last study was conducted by the Altarum/RTI Team, namely the addition of new foods to the WIC food packages, including fruits and vegetables that can be purchased with the CVV or CVB; changes in vendor management practices related to pricing for vendor authorization and reimbursement; and the expansion of EBT for food delivery. Therefore, this study not only provides an overall assessment of vendor management practices and vendor violations at the national level but will serve as a new baseline for future "bookend" studies.

With the addition of the CVV or CVB, WIC transactions are inherently different. It is critical to understand how this new benefit type affects national rates of vendor violations. For this reason, the 2013 WVMS comprises two complementary studies, the base study and the CVV study.

The base study. The base study seeks to examine purchases made through compliance buys using the traditional WIC FIs or, in the case of EBT, to purchase traditional WIC foods among a nationally representative sample of vendors. This study will be most comparable to the 1998 WVMS (Bell et al., 2001) and the 2005 WVMS (Bell et al., 2006) and aims to meet the following objectives:

- Develop a national profile of WIC vendor characteristics and State agency vendor management practices,
- Estimate the frequency of WIC vendor violations and proportions of vendors committing violations through conducting compliance purchases in a nationally representative sample of WIC vendors,
- Analyze vendor violations by store characteristics to determine the likelihood of a particular type of store violating Program regulations,

- Analyze vendor violations by State agency vendor management characteristics to determine differences in violations by various State agency-level policies and practices,
- Develop a national estimate of WIC vendor erroneous payments for the reporting compliance required by the IPIA, and
- Compare the results of the 2013 study with those of the two previous WVMSs (1998 and 2005) to examine changes in rates of Program violations.

The CVV study. The CVV study, an option which was executed concurrently with the base study, provides separate national estimates for vendor violations committed with this relatively new method of WIC payment and specifically aims to meet the following objective:

- Conduct CVV compliance buys, analyze CVV data to accomplish the same objectives described for the base study, and incorporate this information into the national estimates of IPs.

D. Organization of the Report

This report provides a detailed description of the type of violations committed and erroneous payments made by WIC vendors as well as the incidence of such violations and errors among a nationally representative sample of WIC vendors. Chapter II outlines the methods used to sample vendors, collect compliance buy data, and analyze data from available sources.

Chapter III comprises two sections, both of which provide detailed descriptions of the study population, including vendor characteristics and vendor management practices that are employed by vendors' authorizing State agencies.

Chapter IV presents detailed findings on seven specific administrative violations committed by WIC vendors and observed in this study, as well as a comparison to previous studies' findings.

Chapter V provides a detailed description of vendor response to compliance buyer (CB)-initiated substitutions, including associations between vendor response and any vendor characteristics, transaction characteristics, or vendor management practices.

Chapter VI describes findings related to IPs, including over- and undercharge. In addition to describing associations that exist between these particular violations and vendor characteristics, transaction characteristics, or vendor management practices, as is done in other key findings chapters, this chapter also examines the relationship between over- and undercharge and various administrative violations. Finally, this chapter presents the national estimate of IPs (total dollar value) made in the WIC Program overall, separately for the base study and the CVV study, and by benefit type (EBT versus paper FIs).

Chapter VII concludes the report with a discussion of study findings, including possible explanations for differences observed between this study and previous WVMS, as well as a series of recommendations. It also describes the limitations of the data that were available.

Chapter II: Study Methodology

This chapter describes the methods and procedures used to identify a nationally representative sample of WIC authorized vendors, collect and weight the data, and conduct data analysis. It also presents a comparison of the sampling approach and study design employed for the 2013 WVMS to those of the 1998 and 2005 studies.[8]

A. Data Sources

Although compliance buys served as the primary source of information, it was necessary to draw from four data sources in order to meet the objectives of the study:

- **FNS's WIC State Plan Guidance documents.** Information relevant to the WIC State agencies' vendor management practices, including vendor authorization and monitoring procedures, vendor training, and administrative review procedures, was abstracted from the State agency plans for each of the sampled State agencies. This State agency-level information was used to examine differences in vendor compliance outcomes by common State agency administrative practices and potentially identify whether and which vendor management practices are associated with reduced incidence of vendor violations. In some cases, this information was supplemented with information provided directly from the State agency.

Figure II-1 Example analytic variables pulled from TIP Report 2011

- Type of WIC vendor
- Volume of WIC sales
- Number of routine monitoring visits
- High-risk designation
- Geographic location

- **The Integrity Profile (TIP) Report 2010 and 2011.** TIP Report 2010 was used as the basis for the development of sampling weights for the base and CVV studies. Vendor-specific information on a number of factors relevant to the analyses were extracted from TIP Report 2011 (see figure II-1). TIP Report 2011 redemption data were also used for weighting purposes.
- **Compliance buys.** The compliance buy data collected during the course of the study form the basis for the national estimates of over- and undercharges, as well as the frequency of vendor violations (e.g., allowing a substitution, failing to provide a receipt). Specifically, the CBs recorded multiple opportunities for violations, as well as shelf and receipt prices of WIC foods whenever possible.

  In addition to providing the sole source of data on the outcome variables of interest, CB data included information about the vendors visited (e.g., presence of POS scanning equipment) and the checkout process (e.g., store clerk's familiarity with WIC transaction).
- **WIC State agency reconciliation files.** FI reconciliation files were acquired from each WIC State agency selected into the study. The reconciliation files contained information relevant to the FIs and food benefits used during the study. For paper FIs, the files included FI number,

[8] The first WIC Vendor Management Study was conducted in 1991. Comparisons between the 2013 study and 1991 study are not made in this report.

dollar amount submitted to the bank, dollar amount redeemed, and MAR (where possible). For EBT benefits, the files included detail about each food purchased with each EBT card, including the amount submitted and amount paid to the vendor.

More detail about the compliance buys, including the type of data collected and how they were conducted, is provided in the Compliance Buy Data Collection section that follows. Likewise, a detailed description of how these four sources were merged to create an analytic data file is provided in the Analytic Data File section. Appendix A includes a list of analytic variables that were included from each source.

B. Sampling Plan

The 2013 WVMS employed a nationally representative probability sample of WIC vendors. A two-stage cluster design, with primary sampling units (PSU) defined by geographic clusters of counties, was developed to meet the study needs. The following sections describe the basic steps involved in developing and implementing the sampling plan.

1. Target population and developing the sampling frame

The target population for this study includes all vendors authorized by State agencies with retail food delivery operations, and that had WIC sales or were a new vendor in 2010.[9] This includes chain grocery, independent grocery, convenience, general, and "WIC-only" (vendors that serve WIC participants only) or A50 stores (those with greater than 50 percent of sales from WIC). The following vendors were excluded from the study:

- Those classified as direct delivery, home delivery, or military commissaries, as they are different from other retailers and represent a small fraction of all WIC vendors;
- Those operating in Alaska, Hawaii, Puerto Rico, the U.S. Territories, and ITOs; and
- Pharmacies that provide special-order infant formula were also excluded from the target population due to cost restraints.

Mississippi and Vermont were excluded from the target population since they used a home delivery or direct distribution system. Overall, 47 State agencies, including that of the District of Columbia, were represented in the target population.

The 2010 TIP Report, which includes information on vendors that were authorized by the WIC Program in FY 2010, was used to construct a sampling frame consistent with the above described target population and to identify eligible vendors. In total, 40,634 WIC vendors were included in the final sampling frame. This study sample represents approximately 84 percent of all vendors that were authorized by the WIC Program and accounts for approximately 90 percent of all WIC food sales made through the WIC retail food delivery system in FY 2010.

2. Constructing Primary Sampling Units

PSUs were defined as either individual counties or groups of geographically contiguous counties within a single State. The county location of each vendor was determined by geocoding the vendor's

[9] The Integrity Profile from FY 2010, which was used to develop the sampling frame for the study, includes all vendors authorized at any point during FY 2010, even vendors who were later dropped from the Program because they did not have any WIC sales.

mailing address and ZIP code, which were readily available through TIP. The District of Columbia and each county within the eligible States were included in only one PSU. Counties with fewer than 80 WIC retail vendors were identified and combined with geographically adjacent counties to form PSUs that met or exceeded the minimum requirement of 80 vendors using ArcGIS 9.3 (Esri).

In one case, it was impossible to meet all PSU construction objectives. The vendor list from Washington, DC, contained only 20 vendors. To meet the target of at least 80 vendors in a PSU, Washington, DC was combined with an adjacent Maryland county to form a PSU with 86 total vendors. The final sampling frame contained 352 PSUs.

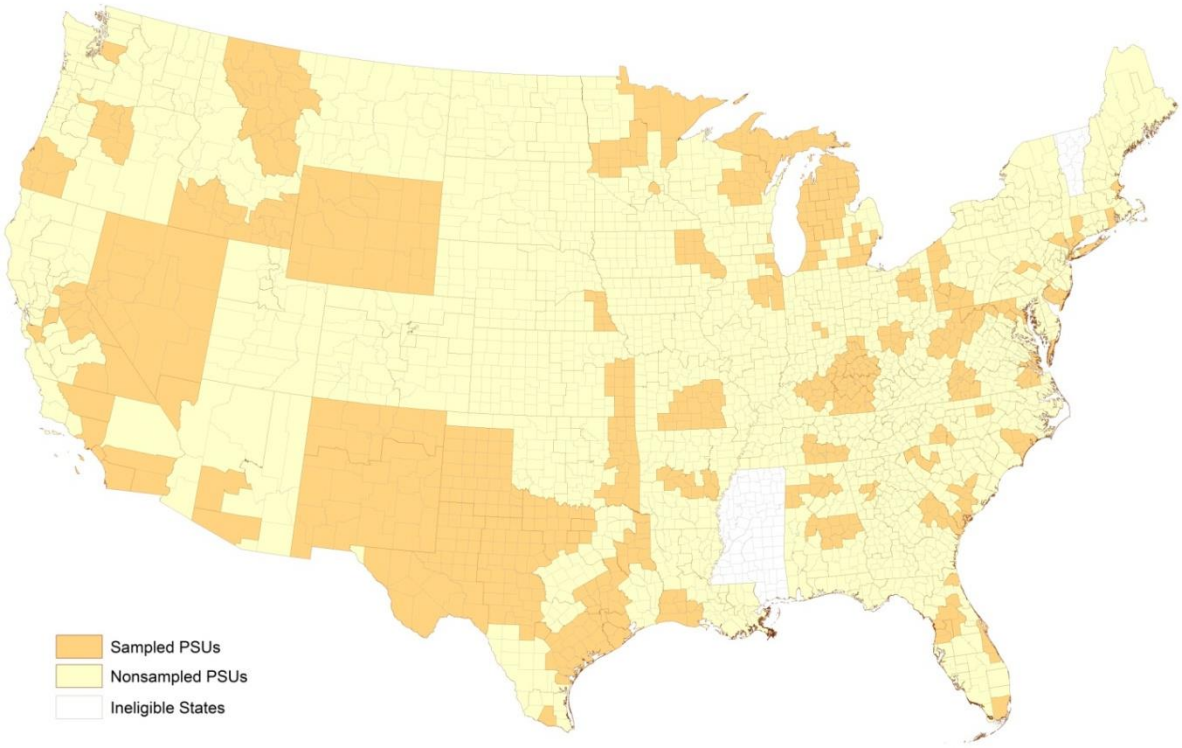
C. Sample Selection

A nationally representative sample of 1,904 WIC retail vendors was selected for the study. This sample size was designed to meet precision requirements for subgroup estimates of IPs for paper FI versus EBT (95 percent confidence interval (CI) and 5 percentage points) while maintaining the desired precision for the national estimates (95 percent CI and 3 percentage points). For the first stage of sampling, a total of 119 PSUs were selected from the 352 available PSUs, as depicted in figure II-2. PSUs were stratified based on a State agency's food benefit type (EBT or paper) and vendor-to-participant ratio to reduce sampling variability and to ensure adequate sample sizes for key analyses and comparisons, as described below.

- ***Food benefit type.*** The EBT States included Kentucky, Michigan, Nevada, New Mexico, Texas, and Wyoming. The paper-based States included the remaining 41 States that were part of the target population. Of the 119 PSUs, 40 were allocated to the 6 EBT States and 79 were allocated to the 41 paper-based States.
- ***Vendor-to-participant ratio.*** Vendor-to-participant ratios were calculated for each State agency using vendor information from TIP Report 2010 and State agency-level participation data reported on FNS's Web site[10] and then grouped into three categories: low, medium, and high. Within each level of the first stratification (food benefit type), a proportional number of PSUs were allocated to the three levels of the second stratification variable.

[10] FNS Program data accessed October 7, 2011, from: http://www.fns.usda.gov/pd/26wifypart.htm.

Figure II-2 Map of selected primary sampling units



After sorting each stratum by State to increase geographic diversity, PSUs were selected using a probability proportional to size with minimum replacement procedure developed by Chromy (Chromy, 1979). Of the 47 eligible States, PSUs were selected in 40.

For the second stage of sampling, vendors were sorted based on their WIC volume of business or monthly redemption amount, as given in TIP Report 2010, to facilitate the inclusion of vendors with both high and low redemption levels. A sample of 25 vendors, selected with equal probability and without replacement after sorting the vendors by redemption dollars, was drawn from each of the 119 PSUs. Sixteen of those vendors were selected for inclusion in the study; the remaining nine were selected as reserves and activated only when needed and according to protocol. Thus, a total of 1,904 primary vendors were selected into the study sample, including 640 EBT vendors and 1,264 paper FI vendors (see table II-1).

Table II-1 Vendor selection by stratum

	Stratum 1 EBT States	**Stratum 2** Paper-Based States
Vendor-to-participant ratio		
Low	208	400
Medium	112	432
High	320	432
TOTAL SAMPLE OF VENDORS	**640**	**1,264**

In summary, a total of 2,975 vendors were selected in 40 States: 1,904 vendors comprised the sample at study inception, and 1,071 vendors comprised the reserve pool. A total of 87 sample vendors were determined to be ineligible (e.g., out of business, no longer WIC authorized) and were replaced by reserve vendors prior to data collection.

D. Compliance Buy Data Collection

The primary method of data collection for this study was through more than 5,600 visits to WIC vendors, resulting in more than 7,900 WIC transactions over a 3-month period.

1. Procedures

Prior to data collection, each of the sampled vendors was randomly assigned to receive a woman, child, or infant food package. Vendors assigned to receive an infant food package were further randomized to either formula or infant food benefits. A total of three compliance buys were attempted at each sampled vendor between August and October 2012. To meet the objectives of the study, each compliance buy included both a traditional WIC FI and a CVV or CVB (except when assigned to an infant food package) or, in the case of EBT, included the purchase of food items from both benefit categories (traditional and cash value). The following is a description of the three types of compliance buys that were attempted by CBs at each vendor. Each type of buy is conducted to test the actions of the vendor when different scenarios present themselves:

- ***Safe buy.*** During a safe buy, the CB intends to complete her WIC purchase as any WIC participant would if she were to follow the correct procedures. CBs attempt to purchase all foods listed on the FI in the quantities and sizes indicated and to purchase enough fruits and vegetables to use the full dollar value of the CVV. For safe buys conducted in EBT States, the CB was instructed to purchase foods in quantities that mirror the benefits prescribed on a single paper FI, since purchasing all foods prescribed during a given month in their specified quantities would neither be practical nor represent a "typical" WIC transaction and could raise suspicion.
- ***Partial buy.*** During a partial buy, the CB intends to purchase some but not all of the items listed on the FI or, in the case of the CVV or CVB, less than the full value of the benefit. For infants, CBs purchased half the formula or half the quantity of jarred food listed on the FI. For women and children, CBs were instructed to omit one food item. For instance, if the FI listed milk, cereal, and juice, the CB might have purchased only the WIC authorized milk and juice in the quantities and sizes listed but omitted the cereal. Since all buys conducted in EBT States when purchasing traditional WIC foods, including the safe buy, omitted some WIC foods, there was no equivalent "partial buy" for the base study, and a "safe buy" was conducted twice. For the CVV or CVB in both paper-based and EBT States, the CB purchased fruits and vegetables up to $2 less than the full benefit amount.
- ***Subsitution buy.***There are two types of substitution buys—minor and major—to which vendors were randomly assigned. During a minor substitution buy, the CB attempts to substitute an unauthorized food item within an authorized food category (e.g., Hi-C for 100 percent fruit juice, white potatoes for WIC authorized vegetables). During a major substitution, the CB attempts to substitute an unauthorized food item that is clearly outside an authorized food category (e.g., soda, fruit snacks). The goal of the substitution buy is to test the vendor's reaction to the purchase of an unauthorized food item by using the WIC FI, CVV, or CVB. As a general rule, CBs attempted to purchase the unathorized item as if it were authorized. In other

words, CBs did not call attention to the item by asking the cashier whether it could be purchased with the FI.

Although the types of buys were executed similarly in paper-based and EBT States, there are fundamental differences in how the transactions are conducted in the two systems that warrant attention. In paper-based States, traditional FIs and CVVs are transacted separately. Therefore, during compliance buys in paper-based States, CBs were instructed to separate foods at the time of purchase, so it was clear to the cashier which foods the CB intended to purchase with each type of check. In EBT States, on the other hand, prescriptive food items and eligible fruits and vegetables can be purchased during a single transaction because both types of benefits are loaded onto the EBT card. Therefore, during compliance buys in EBT States, CBs completed both study buys (base and CVV) during a single transaction and were not instructed to separate foods at the time of purchase.

Buy types for the base and CVV studies were strategically paired to reduce the likelihood that multiple substitution attempts during one visit or purchase would affect the results of one or both studies. To illustrate this point, imagine that the base study substitution buy had been paired with the CVV study substitution buy. In this scenario, the cashier would have been presented with two unauthorized food items (one for each substitution buy) at the time of checkout. During previous WVMS, each compliance buy included the use of only one FI; therefore, during substitution buys, cashiers were presented with only one unauthorized food item at the time of checkout. It was hypothesized that cashiers might respond differently to the attempted substitution when presented with one versus multiple unauthorized food items. For this reason, and to ensure comparability to previous WVMS, the 2013 study strategically paired the base study safe buys with CVV substitution buys and base study substitution buys with CVV study safe buys (table II-2) so that cashiers were presented with only one unauthorized food item at the time of checkout.

Table II-2 Pairing of buy types for the base and CVV studies

Buy Number	Paper-Based States		EBT States	
	Base Study	CVV Study	Base Study	CVV Study
1	Safe Buy	Substitution Buy	Safe Buy	Substitution Buy
2	Partial Buy	Partial Buy	Safe Buy	Partial Buy
3	Substitution Buy	Safe Buy	Substitution Buy	Safe Buy

2. Instrumentation

A total of 117 CBs and 6 field supervisors were hired and trained to conduct field data collection. Given the covert nature of this data collection effort, all CBs were women of childbearing age and belonged to a racial or ethnic group that was predominant in the area to which they were assigned. All field staff members attended a 3-day training program and completed practice buys in their home areas prior to data collection.

CBs were instructed to use the data collection instrument, which was programmed into a smartphone application and comprised two main components:

- Data about each food item purchased (and attempted) were collected in **food item fields** and populated during the buy to the extent possible. These fields were used to record the item type, quantity, package size, and price (from the shelf and receipt if possible), as well as whether or

not the item was in stock, identified as a unauthorized item by the cashier or POS system, or purchased as an alternate item at the vendors' suggestion.

- **The questionnaire** captured contextual information about the vendor, checkout process, cashier response, and total purchase price.

The data collected via the food item fields and questionnaire largely mirrored the paper instrumentation used in previous studies. Using smartphones instead of paper-based forms, however, had many advantages, including streamlined data entry, readily available GPS and camera technology, and built-in quality control checks. Most importantly, this method allowed CBs to collect shelf price data covertly in most stores, instead of having to rely on memory as was done in previous studies. Appendix B provides detail on the specific questions and data fields included in the compliance buy data collection instrument.

3. Response rates

Overall, a total of 1,914 vendors were visited at least once during the course of the base study, resulting in a 99.3 percent response rate. The response rates for the CVV study were very similar or the same across the buy types for these two studies, because the buys for the two studies were conducted at the same time. Among the 1,899 vendors eligible for all three buys for the base study, buys were completed at 1,860 of these vendors for a response rate of 97.9 percent. Similarly, of the 1,246 vendors eligible for all three buys for the CVV study, buys were completed at 1,219 of these vendors for a response rate of 97.8 percent. Table II-3 reports the response rates for each specific buy type, as well as those completing all three buys.

Table II-3 Vendor eligibility and response rate by type of buy

Buys	Vendors Eligible for Buy	Vendors With Completed Buy	Response Rate	Weighted Number of Vendors
Base Study Compliance Buys				
At least one buy	1,927	1,914	99.3%	41,615
Buy 1 Safe	1,922	1,905	99.1%	41,615
Buy 2 Partial*	1,268	1,242	97.9%	36,146
Buy 2 Safe†	646	639	98.9%	5,469
Buy 2 Total	1,914	1,881	98.3%	41,615
Buy 3 Substitution	1,904	1,873	98.4%	41,615
All 3 buys	**1,899**	**1,860**	**97.9%**	**41,615**
CVV Study Compliance Buys				
At least one buy	1,267	1,258	99.3%	41,615
Buy 1 Substitution	1,264	1,251	99.0%	41,615
Buy 2 Partial	1,258	1,236	98.3%	41,615
Buy 3 Safe	1,249	1,229	98.4%	41,615
All 3 buys	**1,246**	**1,219**	**97.8%**	**41,615**

* Based on the results of the partial buys conducted in the paper-based States; partial buys were not conducted in EBT States.
† A second safe buy for the EBT States was conducted in place of the partial buy that was conducted in paper-based States.

Although nonresponse was low, it did exist for a number of reasons such as issues with signature cards, vendors being suspicious of the CB, and the vendor having no WIC foods in stock. When possible, the problematic vendor was replaced with a reserve vendor; however, this was not always

possible, or in some cases, it was more appropriate for the CB to return to the original store and attempt the buy again. Table II-4 provides additional information about the reasons for nonresponse.

Table II-4 Vendor eligibility and response rate by type of buy

Reason for Nonresponse	Base Study			CVV Study		
	Buy 1	Buy 2	Buy 3	Buy 1	Buy 2	Buy 3
Total number of nonresponding vendors	**17**	**33**	**31**	**13**	**22**	**20**
Unable to complete within data collection window	4	3	11	4	2	11
Signature or ID related issue	2	2	3	2	2	3
Vendor was suspicious of CB	6	6	6	2	2	2
Buy was conducted at the wrong store	2	2	1	2	2	1
Store was not at listed address*	2	2	2	2	2	2
No WIC foods in stock	0	0	1	0	0	0
WIC/POS system was down	1	17	7	1	11	1
Vouchers not available	0	1	0	0	1	0

*The same two vendors could not be identified across all three buys.

E. Analytic Data File

Upon completion of data collection, extensive quality control checks were performed on the compliance buy data, and information from the other three data sources (State plans, TIP Report 2011, and State agency reconciliation files) were merged on to the file. The final two steps of the file construction process—developing final sampling weights and developing key analytic variables—are detailed in the sections that follow.

1. Sampling weights for vendors

Weights were constructed and used for analyzing the data. These weights reflect the probabilities for selecting PSUs and vendors adjusted for nonresponse. Weights were necessary because of the unequal selection probabilities and differential nonresponse of vendors. The sampling process was the same across all the strata, thus the initial sampling weights for the selected vendors, based on the inverses of the PSU selection probabilities and the conditional vendor selection probabilities, were calculated in the same manner by stratum.

If complete study data were obtained for all of the sampled vendors, these unadjusted weights would have been appropriate for analyzing the study results. This was not the case, however, as some vendors were found to be ineligible for the study and it was not possible to complete all of the proposed data collection activities for others. The initial sampling weights were based on the 1,904 initially sampled vendors plus the 1,071 vendors in the reserve sample. The first adjustment made to the initial sampling weights was to adjust for the actual number of vendors included in the sample. As sampled vendors were identified as ineligible, reserve vendors were included in the study sample. Some vendors became ineligible after the first or second buy was completed (e.g., the vendor closed). When this occurred, a reserve vendor was activated, thus reserve vendors could enter the sample at any point during data collection. At the end of data collection, 1,996 vendors were either originally selected for inclusion in the study sample or added during the data collection period.

The second adjustment accounted for nonresponse and vendor ineligibility. Nonresponse and vendor eligibility changed as the three scheduled compliance buys at sampled vendors were completed, resulting in 12 different analysis weights:

- A separate weight was created for each base study buy type (safe, partial, and minor and major substitution buys), for vendors with at least one completed base study buy, and for vendors with three completed base study buys.

- A corresponding set of six analysis weights were developed for the CVV study: one for each CVV study buy type, one for vendors with at least one completed CVV study buy, and one for vendors with three completed CVV study buys.

The final adjustment was a post-stratification adjustment based on updated population totals from TIP Report 2011. TIP Report 2011 data had 41,615 vendors in the target population based on the eligibility criteria described earlier. Vendor totals from each of the six State agencies that comprise the EBT stratum, as well as the total number of vendors that comprise the paper-based State stratum, were used as control totals.

Three additional analysis weights were created for developing the national estimate of IPs:

- A weight to be used in the calculation of the base study national estimate of IPs (*Post-stratification Adjusted Base Safe IP Weight*). Only vendors with both the redeemed price amount and the best purchase price amount, or the amount that the vendor should have charged for the food items purchased by the CB (see description in Step 1 below), for the base study buy are included in this analysis. This weight adjusts for the additional item nonresponse occurring when both amounts are not present.
- A weight to be used in the calculation of the CVV study national estimate of IPs (*Post-stratification Adjusted CVV Safe IP Weight*). Only vendors with both the redeemed price amount and the best purchase price amount for the CVV study buy are included in this analysis. This weight adjusts for the additional item nonresponse occurring when both amounts are not present.
- A weight to be used in the calculation of the combined national estimate of IPs, including both traditional benefits and benefits with a cash values (*Post-stratification Adjusted Combined Safe IP Weight*). Only vendors with both the redeemed price amount and the best purchase price amount for both the CVV and base study buys are included in this analysis. This weight comes directly from the weights that were created from the vendors who are used in the IP calculations for the base and CVV studies.

2. Developing key analytic variables

The key analytic variables developed for analysis are based primarily on data collected during the compliance buys through the food item fields and questionnaire and sometimes through a combination of both. A description of analytic variables, including those related to IPs and those that indicate administrative errors made by vendors, are provided in this section.

i. Over- and undercharges

In order to estimate the total dollar amount of IPs, it was necessary to determine whether an over- or undercharge occurred, calculate the dollar amount of each over- and undercharge, and apply this amount to the IP calculation methodology (described elsewhere). For both safe and partial buys in which a purchase was transacted, the following steps were taken to achieve these objectives:

Step 1: Calculate best purchase price values. CBs collected price data from a number of sources for both the base and CVV studies, when the opportunity presented itself:

- Total receipt price—In States with paper FIs, these were two separate receipts for the base and CVV studies. In EBT States, there was one total receipt price for both buys, conducted in a single transaction.
- Total register price—In States with paper FIs, CBs recorded the total amount observed on the register for the base and CVV studies separately. In EBT States, a single price was recorded for both studies, as it was conducted as a single transaction.
- Calculated total food item shelf prices—Where the prices were displayed, CBs recorded the shelf prices listed for each food item purchased and these were summed to create a total price. For CVV buys, these prices were top coded to the maximum cash value of the benefit.
- Calculated total food item receipt prices—CBs also recorded the receipt prices for each food item purchased when a receipt was provided and the food items and prices were listed clearly and separately. These amounts were summed to create a total price and for CVV buys, these prices were top coded to the maximum cash value of the benefit.
- Amount entered on paper FIs—In States with paper FIs, CBs were asked to record the observed amount written on the paper FIs for both the base and CVV studies.

The best purchase price was calculated based on the hierarchy shown in figure II-3. For buys conducted with paper FIs, best purchase prices for the base and CVV studies were calculated separately by using data specific to each buy. For buys conducted with EBT cards, a total best purchase price was calculated using the same hierarchy. There were two other differences in calculations of the best purchase prices for buys using paper FIs and EBT. First, the amount written on the paper check was used as an absolute last resort, if no other information was collected; this was not applicable to EBT. Second, for the base study, three State agencies print a maximum value on the face of the check, so it was necessary to top-code these best purchase prices not to exceed the maximum value.

Figure II-3 Hierarchy used to determine best price

In general, the same hierarchy was used for the previous WVMS. In 1998, if the CB received a receipt, the receipt price was used; if not, register or shelf prices were used. If none of this information was available, the CB returned to the store at a later date and purchased the items with cash to determine the actual retail price. A similar approach was used in 2005, with one exception: Rather than returning to the store to purchase the items with cash, the CB used the amount written on the FI if a receipt was not provided and shelf prices and register amount were not available. The hierarchy used for the current study, though fairly consistent with the previous studies, necessarily includes additional pieces of information due to the increased complexity of the study design (the pairing of buys for the base and CVV studies).

Table II-5 shows the number of buys with best purchase prices calculated for paper FIs and EBT cards. The total number missing is excluded from calculations of over- and undercharges.

Table II-5 Best purchase price source by type of buy*

Buy Type	Total receipt price		Total register price		Calculated shelf price		Calculated receipt price		Amount written on FI		Missing	
	n	%	n	%	n	%	n	%	n	%	n	%
Base Study (paper)												
Safe Buy	747	59.1	297	23.5	38	3.0	0	0	54	4.3	128	10.1
Partial Buy	733	59.0	312	25.1	30	2.4	0	0	52	4.2	115	9.3
CVV Study (paper)												
Safe Buy	481	58.9	228	27.9	79	9.7	0	0	5	0.6	24	2.9
Partial Buy	486	59.3	207	25.3	90	11.0	0	0	10	1.2	26	3.2
Base and CVV study (EBT)												
All Buys	1,339	91.1	24	1.6	5	0.3	5	0.3	--	--	97	6.6

*Since safe and partial buys were conducted in tandem, as well as with substitution buys across the two studies, all buys were included for EBT States. However, calculations of overcharges and undercharges still only apply to the safe and partial buys for the base and CVV studies, respectively.

Step 2: Identify potential over- and undercharges. WIC State agencies provided reconciliation information for all of the benefits used in the study. The dollar amount submitted for redemption, the dollar amount paid, and (where possible) the MAR or NTE amounts were included:

- **Dollar amount submitted:** The dollar amount submitted for processing. For paper FIs, the dollar amount submitted should match the best purchase price calculated above. For EBT States, the dollar amount submitted should reflect the prices rung up at the store.
- **Dollar amount paid:** In most paper-based States, pre- and post-edit screens were waived and FIs were processed as submitted, as is common practice for compliance investigations. In these cases, the dollar amount paid is the same as the dollar amount submitted. In all EBT States and some paper-based States, the MARs or NTEs were applied to the purchases and the dollar amount paid is lower than the amount submitted, reflecting these maximum prices.
- **MAR or NTE:** For State agencies that did not apply the MAR or NTE to the amount submitted, the maximum value of each FI was requested, since vendors in "the real world" would not have been paid at amounts higher than the MAR or NTE, thus potentially reducing the value of overcharges.

Potential over- and undercharges were identified if the dollar amount submitted for redemption did not match the best purchase price amount for each of the respective studies in paper-based States or the dollar amount submitted for redemption or paid amount did not match the total best purchase price amount in EBT States.

Step 3: Manually review each potential over- and undercharge. Every potential over- and undercharge was reviewed to determine whether an over- or undercharge occurred. First, data were checked for transposition errors (which could happen during bank processing or by the data collectors). If a transposition error was found, the buy was not coded as an over- or undercharge. Next, amounts submitted and paid were compared against every possible price.

If a match was found with any of the prices, all data, including CBs notes, food item notes, and outcomes of buys, were reviewed to determine whether the matching price was a better price than the best purchase price. If a match was not found with any price variable, the reviewer still scanned all data for the buy to determine whether the current best purchase price was the best dollar amount to

use. For most records using paper FIs, the original best purchase price was maintained. For most records using EBT, however, it was found that the total receipt and register prices included amounts paid in cash that were in excess of the CVB. In these cases, it was necessary to that subtract the excess amount resulted in a new best purchase price that matched the redemption amount, and so most of these were coded as not having been an over- or undercharge.

Based on the determinations above, a new or revised best purchase price variable was created to calculate amounts of over- and undercharges across all safe and partial buys.

Step 4: Develop analytic variables. Two types of analytic variables related to over- and undercharges were created for reporting purposes. Four dichotomous variables were created to determine the proportion of vendors committing over- and undercharges for the base and CVV studies. The actual dollar amount over- or undercharged was also calculated using price and redemption information. For each record in which an overcharge was identified, amounts paid were compared to the MAR or NTE values provided by the State agency. If the amount paid exceeded the MAR or NTE, then that lesser amount was used to calculate the overcharge. This was done to account for antifraud measures that have been put in place by State agencies to reduce the occurrence and dollar value of overcharges by vendors. Since most State agencies waived these screens for the purposes of the study, it was important to reflect these fraud reduction measures as much as possible in the national estimates. The IP amount was calculated as the MAR or NTE minus the revised best purchase price.

ii. Substitutions

Allowance of a substitution buy was coded as a dichotomous variable, indicating whether the CB was permitted to purchase an unauthorized item in place of a WIC item on their benefit list or paper FI. A substitution was considered allowed if the CB indicated in the questionnaire that the "cashier rang up the purchase and did not ask you to pay additional cash." Otherwise, the substitution was considered "not allowed" if the CB reported that the vendor refused to allow the item to be substituted or the cashier indicated that they would have to pay cash.

iii. Administrative errors

A total of seven dichotomous administrative error variables were developed. Each variable indicates whether the particular administrative error occurred. In most cases, these variables are based on the CBs' response to a single question on the compliance buy instrument. In a few cases, additional information gathered on each food item purchased (e.g., insufficient stock) was also used to develop the variable. For two of the administrative error variables, relevant State agency policies were also considered to determine whether a vendor responded to the buy erroneously. For example, WIC State agencies differ on whether partial buys are permitted, so this policy was considered when developing the variable related to vendors' response to a partial buy. Figure II-4 provides a list of the administrative error variables that were developed, and additional detail related to their development is provided in appendix A.

Figure II-4 Administrative error variables developed for the study

- Appropriate handling of partial buy
- Failed to provide a receipt
- Improper countersignature
- Insufficient stock
- Raincheck/cash or credit given
- Cashier unfamiliar with WIC transactions
- Buy asked to pay cash for WIC foods
- Cashier would not allow purchase of allowable WIC item

F. Data Analysis

1. Descriptive, bivariate, and multivariate

All data analysis was conducted using SAS version 9.3 (SAS Institute, Cary, NC) and SUDAAN 10.3 (RTI International). Univariate statistics were produced and used to describe the study population—a nationally representative sample of WIC vendors—including the State agency policies and practices to which they must adhere. Univariate statistics were also employed to estimate national rates of administrative errors and IPs. In most cases, overall rates of administrative errors and IPs were developed based on a vendor committing a particular administrative error at least once across all three buys. Rates of errors and violations were also produced for each buy type as appropriate.

Bivariate analyses were conducted to determine which vendor characteristics are associated with the occurrence of violations. The association between vendor violations and various aspects of the compliance buy (e.g., food package type, benefit type, transaction characteristics), as well as State agency-level policies and practices that are intended to reduce the likelihood of vendor violations and IPs, were also examined using bivariate analyses. Since the occurrence of a violation is dichotomous, bivariate statistics to test for association included the Pearson's chi-squared test statistic for dichotomous independent variables and the Mantel-Haenszel chi-squared test statistic for categorical variables. Significance tests yielding a *p*-value less than 0.05 were considered statistically significant for this study. Findings based on fewer than 20 cases or yielding a relative standard error greater than 30 percent are considered unreliable are indicated as such throughout the report and in the appendices.

Logistic regression models were developed separately for the base and CVV studies to identify vendor characteristics associated with a vendor's propensity to over- and undercharge the WIC Program. The results of the bivariate analyses were used to identify independent variables for inclusion in these models. The purpose of the models is to identify vendor characteristics or behaviors that are associated with IPs so that the WIC Program may better identify these vendors overall.

2. Developing national estimates of improper payments

National estimates of IPs were calculated overall and separately for the base and CVV studies using a series of steps designed to maximize precision. Estimates for EBT States (base and CVV) were also created. Results from the safe buys (buy 1 for the base study and buy 3 for the CVV study) were used to develop these estimates, and the following steps outline the process used:

Step 1. Develop national annual estimates of WIC redemptions. Annual vendor-level redemption amounts obtained from TIP Report 2011 were weighted and summed for all responding vendors in order to develop a national annual estimate of WIC redemptions for traditional FIs, a national annual estimate of WIC redemptions for CVVs and CVBs, and a total national annual estimate of WIC redemptions. Because TIP does not detail the proportion of redemptions that are attributed to traditional benefits versus benefits with a cash value, this information was obtained directly from WIC State agencies and applied to annual vendor-level redemption amounts prior to estimation.

Step 2. Limit analysis to vendors with complete price and redeemed amounts for the safe buy. To be included in the national estimate of IPs, a vendor had to have both a best purchase price amount and redeemed dollar amount for the safe buy. Nearly 90 percent of vendors for the base study (n = 1,697; 89.1 percent) and CVV study (n = 1,115; 88.8 percent) were included. For the base study, 71 vendors were missing both best purchase price and redemption dollar amount, 126 were missing best purchase

price, and 9 were missing the redemption dollar amount for the safe buy. For the CVV study, 50 vendors were missing both the best purchase price and the redemption dollar amount, 23 were missing the best purchase price, and 14 were missing the redemption dollar amount for the safe buy.

Step 3. Develop national annual estimates of over- and undercharge. National and EBT State subgroup-level annual estimates of over- and undercharge were developed for the base study, the CVV study, and overall. To estimate the annual WIC overcharge, the ratio of the best purchase price to the redeemed dollar amount was calculated for each vendor (*Vendor Overcharge Ratio*). If the ratio was less than 1, it implied an "overcharge" and the ratio was used in the overcharge estimation process. If the ratio was greater than or equal to 1, it was set to 1 for the purpose of the overcharge estimate.

A similar approach was employed to develop the annual estimates of WIC undercharge. However, in this case, if the ratio of best purchase price to the redeemed value (*Vendor Undercharge Ratio*) was greater than 1, it was used in the undercharge estimation process; otherwise the ratio was set to 1. Similarly, to estimate the net total of IPs, the ratio of best purchase price to redeemed value (*Vendor Charge Ratio*) was calculated and used in the estimation process; here the ratio was never set to 1.

Next, the following calculations were performed:

Overcharge

- *Sum A* = **Σ** [*VendorOvercharge Ratio* * post-stratification weight * vendor-level annual redemptions]
- *Sum B* = **Σ** [post-stratification weight * vendor-level annual redemptions]
- *National Overcharge Ratio = Sum A / Sum B*
- *National Annual Overcharge Amount = Total Annual WIC Redemption Dollars (see Step 1) – (National Overcharge Ratio * Total Annual Traditional WIC Redemption Dollars)*

Undercharge

- *Sum A* = **Σ** [*Vendor Undercharge Ratio* * post-stratification weight * vendor-level annual redemptions]
- *Sum B* = **Σ** [post-stratification weight * vendor-level annual redemptions]
- *National Undercharge Ratio = Sum A / Sum B*
- *National Annual Undercharge Amount = Total Annual WIC Redemption Dollars (see Step 1) – (National Undercharge Ratio * Total Annual Traditional WIC Redemption Dollars)*

National estimate of net value of over- and undercharges (sum of over- and undercharges)

- *Sum A* = **Σ** [*VendorCharge Ratio* * post-stratification weight * vendor-level annual redemptions]
- *Sum B* = **Σ** [post-stratification weight * vendor-level annual redemptions]
- *National Charge Ratio = Sum A / Sum B*
- *Total National Dollar Amount of IPs = Total Annual WIC Redemption Dollars (see Step 1) – (National Charge Ratio * Total Annual Traditional WIC Redemption Dollars)*

The process was repeated for the base study and the CVV study by substituting in the appropriate study variables (best purchase price, redeemed dollar amount, vendor-level annual redemptions, post-

stratification weights). To create the EBT State subgroup-level estimates, the data were subset to only include vendors from EBT States. To develop the total or combined estimates, estimates for the base study and CVV study were added together.

3. Conducting nonresponse bias analysis

Although very high response rates were obtained for the safe buys of 99.1 percent for the base study and 98.4 percent for the CVV study, it was not possible to include all the responding vendors in the national estimates of IPs due to missing price information (as described in Step 3 above). To better understand any potential bias in the national estimates of IPs, a nonresponse bias analysis was conducted. This analysis investigated unweighted differences in vendor type as well as weighted differences in the monthly vendor redemption amounts between the vendors included in the national estimates and those characterized as missing. Based on the results of the nonresponse bias analysis, the potential for bias in the estimates developed for the base study and the CVV study is minimal. A detailed description of the analysis that was conducted as well as any related results is provided in appendix C.

The response rate for the 2005 study safe buy was 97.6 percent and roughly 85 percent of responding vendors had complete best purchase price and redemption amount information, thus were included in the analysis. Results from the non-response bias analysis indicated that there was some potential for bias in the 2005 study. However, if there was bias, the national over- and undercharge estimates were probably biased low (the dollar amount for the over- and undercharge estimate is probably understated). The response rate for the 1998 study was similar at 97.6 percent. However, a nonresponse bias analysis was not conducted.

G. Comparison of Sampling Methods and Study Design From Current and Previous WVMSs

As mentioned previously, WVMSs were also conducted in 1991, 1998, and 2005. Since this report will compare results of the 2013 study with the two most recent prior studies (1998 and 2005), it is also necessary to compare their respective study populations and sampling techniques. Some similarities and differences exist in the way the study populations were selected. For example, all three studies used a nationally representative sample including only State agencies with retail food delivery systems and excluding Mississippi, Vermont, ITOs, and military commissaries, as well as Alaska, Hawaii, and U.S. Territories. All three studies also excluded pharmacies providing only special infant formula. The 1998 and 2005 studies excluded North Dakota and parts of Ohio and Illinois. Each study differed in what population was chosen for oversampling to test various hypotheses. In 1998, vendors in vendor-specific State agencies were oversampled; in 2005, WIC-only stores were oversampled; and in 2013, a stratum comprised of EBT States was created and enough sample was allocated to the stratum to provide EBT subgroup level estimates. Further similarities and differences in the characteristics of the three study samples are detailed in appendix D.

Chapter III: Study Population

A total sample of 1,914 authorized WIC vendors, representing the 41,615 authorized vendors nationally,were included in the base study and received at least one compliance buy. These same vendors were visited for both the base study and the CVV study. However, since infant food packages do not include a CVV or CVB, vendors randomized to receive an infant food package were excluded from the CVV study, thereby reducing its sample to 1,258 vendors. In this chapter, vendor characteristics, including the WIC State agency vendor management policies to which vendors must adhere, are described for the base study population only because the differences between the two samples are minimal. The results presented herein are weighted estimates of this nationally representative sample of vendors. Additional tables related to this chapter can be found in appendix E.

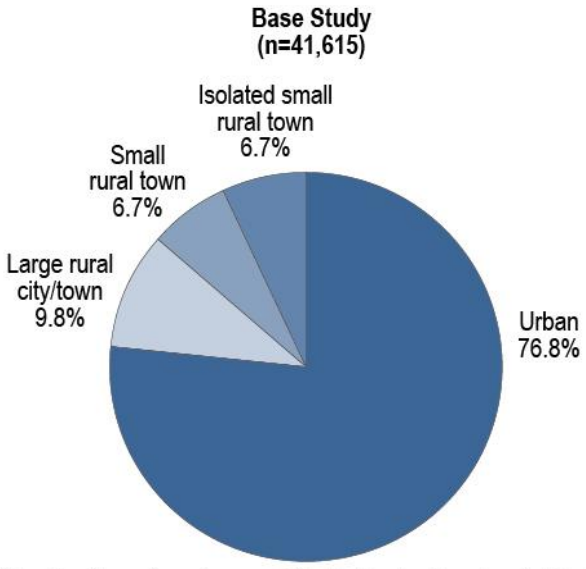
A. Vendor Characteristics

Typically, vendor "type" is a classification based on a combination of factors such as ownership (e.g, chain, independent) and variety of food items available (e.g., supermarket, convenience store). WIC, however, uses "type" to differentiate between A50s and vendors whose WIC business is less than 50 percent of total food sales (referred to simply as "regular vendors"). The vast majority of WIC vendors in the base study were regular vendors (98.2 percent). Vendor type, as defined in this study, provides limited information about a vendor—only whether its WIC business comprises more than 50 percent of its total food sales.

Because vendor type provides limited information about a vendor, other characteristics, such as store size and location and use of scanning equipment, are also important to consider. This study examined number of registers and volume of WIC sales, which serve as proxies for size, and vendor geographic location in relation to urban and rural settings. With regard to size, more than 40 percent of vendors in the base study had eight or more registers (large), 34.3 percent had three to seven (medium), and 25.4 percent had zero to two (small). Approximately 25 percent of sampled vendors had WIC sales in each of the following ranges: $0 to $2,774, $2,775 to $7,124, $7,125 to $15,879, and $15,880 or more.

Approximately three out of four stores were located in urban areas (76.8 percent). A smaller percentage were located in large rural cities or towns, small rural towns, and isolated rural towns—9.8, 6.7, and 6.7 percent, respectively (see figure III-1). Rural-Urban Commuting Area codes, based on the size of the city or town and the commuting pattern in the area, were used to determine vendor geographic location (http://depts.washington.edu/uwruca/index.php).

Figure III-1 Percentage of vendors by geographic location



Note: Results are based on a weighted estimate of vendors that had at least one completed buy.

Scanning equipment, which was present in 83.0 percent of vendors in the base study, is used to scan UPCs and has the potential to reduce cashier error and to ensure that WIC FIs are transacted correctly. When scanning equipment is used for a WIC transaction, the UPC are assessed against an APL created and updated by the WIC State agency and regularly downloaded by the vendor to determine whether a food item is authorized for purchase through WIC. Vendors in EBT States that do not have fully integrated POS systems instead use a stand-beside device to complete WIC transactions. Among vendors in EBT States in the base study, 24.4 percent had stand-beside devices that could be used for this purpose.

State agency vendor management policies and practices to which vendors must adhere are described in the next section. However, several related indicators, such as high-risk status and receipt of monitoring visits and training, were available at the vendor level through TIP and examined here as vendor characteristics. WIC State agencies are required to identify high-risk vendors at least once per year, and high-risk status must be used to decide which vendors receive compliance investigations over the course of the year. A high-risk vendor is defined by FNS as a vendor with a high probability of committing a violation based on specific, statistically based criteria determined by FNS and WIC agencies. Approximately one in six vendors in the base study sample were identified by their State agencies as high-risk (16.5 percent).

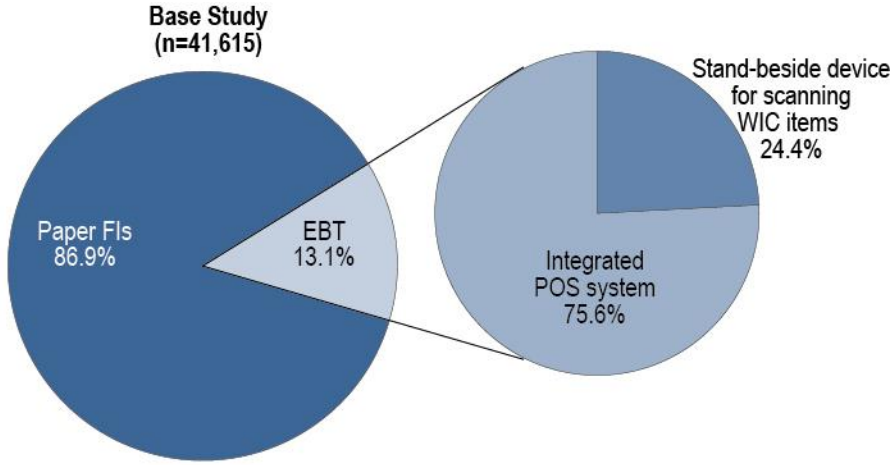
Routine monitoring of vendors involves overt, onsite visits during which the vendor is aware that a WIC representative is present. WIC State agencies are required by FNS to conduct routine monitoring visits for at least 5 percent of their authorized vendors annually. The purpose of such visits is to identify the types of errors and violations that take place among authorized vendors and to take corrective actions, if necessary. As such, vendor monitoring is a key component to ensuring program integrity, as well as cost containment for the WIC Program. More than 68 percent of vendors in the base study sample did not receive any routine monitoring visits during FY 2011. Nearly 21 percent of vendors in the sample received one visit, 7.9 percent received two visits and 2.7 percent received three or more.

In order to ensure that vendors transact and handle WIC benefits and treat WIC participants properly, each State agency is responsible for training and educating its authorized vendors with regard to current and new policies and procedures. Approximately, 62 percent of vendors in the base study sample received standard, annual training in the previous year whereas 37.6 percent received interactive training (e.g., in-store training meetings, offsite meetings, during routine monitoring visits). A very small percentage of vendors in the sample did not receive any training in the prior year (0.2 percent).

B. Vendor Management Practices

Because all State agencies must implement an EBT system by 2020, there is great interest in understanding vendor compliance in this environment. For this reason, vendors in EBT States were oversampled and account for 13.1 percent of all vendors. The remaining 86.9 percent of vendors are authorized by State agencies that use paper FIs (figure III-2).

Figure III-2 Percentage of vendors accepting EBT, and among them, the percentage of vendors with integrated POS systems versus stand-beside devices



Note: Results are based on a weighted estimate of vendors that had at least one completed buy.

Another important aspect of vendor management is the number of vendors authorized by WIC State agencies to serve their WIC population. State agencies with a high vendor-to-participant ratio have fewer vendors per participant compared to State agencies with a low vendor-to-participant ratio. From a vendor management perspective, vendor-to-participant ratios indicate the number of vendors a State agency must oversee and monitor per participant. It follows that, on average, vendors authorized by State agencies with a high vendor-to-participant ratio have higher WIC sales and more experience with WIC transactions than vendors authorized by State agencies with a low vendor-to-participant ratio. Exactly one-third of vendors in the base study sample had a low vendor-to-participant ratio (1:100 to <150), 28.3 percent had a moderate vendor-to-participant ratio (1:150 to <225), and 38.4 percent had a high vendor-to-participant ratio (1:225 or greater).

Three out of 40 WIC State agencies included in this study prohibit partial buys when purchasing traditional food items. As such, 87.8 percent of vendors in the base study sample are authorized by State agencies that permit partial buys, while 12.2 percent are not. Similarly, at the time of data collection, 24 of the 40 State agencies required vendors to provide a receipt, so 52.0 percent of vendors were authorized by State agencies that require vendors to provide a receipt to WIC participants.

Because of their relevance to vendor compliance, State agency policies related to the frequency of monitoring visits and conducting inventory audits are also important to consider. Slightly more than 50 percent of vendors are authorized by State agencies that conduct monitoring visits at least annually, and 76.7 percent of vendors are authorized by State agencies that conduct inventory audits.

C. Comparison of Study Populations from Current and Previous WVMSs

One key difference between the current WVMS and the two previous studies (1998 and 2005) is the presence of WIC-only stores. At the time of the 1998 study, WIC-only stores did not exist. By the time that the 2005 study was conducted, not only had WIC-only stores emerged, but they had already been identified as potentially driving up the costs of WIC foods. Because compliance issues related to WIC-only stores were new and unique at the time, FNS chose to oversample WIC-only stores in the 2005 study. As such, 2.2 percent of vendors in that sample were WIC-only. FNS has since

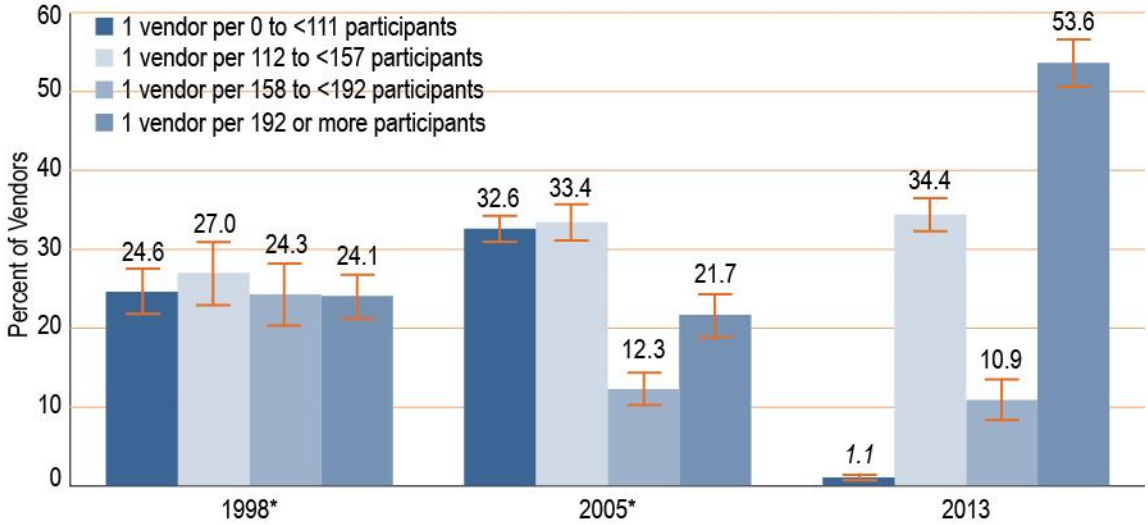
implemented regulations that place greater restrictions on these types of stores. Though it is anticipated that the number of WIC-only stores has declined since the 2005 study was conducted, it was not possible to estimate the proportion of WIC vendors that are WIC only because many State agencies now identify them as A50s for reporting purposes. As such, and because no pharmacies were included in the current study, significantly more vendors were categorized as retail or grocery stores (98.2 percent) in the 2013 study compared to the 2005 study (93.6 percent). Nearly 98 percent of vendors in the 1998 study were grocery stores, which is similar to the current study.

Vendor size is another characteristic that has changed over the years. Specifically, there was a significant increase between the 1998 and 2005 studies in the percentage of vendors that had eight or more registers (large): from 33.5 to 40.0 percent ($p < 0.05$). The percentage of large vendors in the sample remained consistent between 2005 and 2013.

Also noteworthy is the increase in the proportion of vendors with scanning equipment between study years. In 1998, 72.6 percent of vendors had scanning equipment. This increased in 2005, though not significantly, to 73.9 percent of vendors. Since 2005, however, there has been a 12 percent increase in the proportion of vendors with scanning equipment (83.0 percent; $p < 0.05$).

Vendor-to-participant ratios have also changed dramatically between studies. For each study, State agency-level vendor-to-participant ratios are calculated and vendors are grouped into quartiles or tertiles based on their State agency's vendor-to-participant ratio. For comparison purposes, vendors are grouped into the quartile groups that were used in the 1998 study based on their State agency's current vendor-to-participant ratio. As depicted in figure III-3, the proportion of vendors that were authorized by a State agency with a lower vendor-to-participant ratio (less than 1:112) increased between 1998 and 2005 and then decreased dramatically between 2005 and 2013. Similarly, a marked increase in the percentage of vendors authorized by a State agency with a vendor-to-participant ratio greater than 1:192 occurred between 2005 and 2013, from 21.7 to 53.6 percent, respectively.

Figure III-3 Percentage of vendors by vendor-to-participant ratio in 1998, 2005, and 2013 WVMS



Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).
Note: Results are based on a weighted estimate of vendors that had at least one completed buy.
*Statistically significant difference when compared to 2013 base study at p <0.05.

Chapter IV: Findings on WIC Vendor Administrative Errors

In becoming authorized to accept WIC benefits, vendors must enter into an agreement with the State agency which clearly defines the vendor's responsibilities. While the Federal regulations governing the WIC Program set minimum standards, such as prohibiting vendors from charging participants cash in addition to the WIC benefit for WIC foods, State agencies have considerable flexibility in establishing additional vendor rules to mitigate fraud and error and ensure that participants are treated fairly. Once a State agency establishes its rules and the rules are approved by FNS via the State Plan, the State agency is then responsible for ensuring that all of its authorized vendors comply with them. These types of Program rules do not necessarily result in IPs to vendors, but failing to conform to some of these rules has been associated with such violations in previous studies.

The 2013 WVMS sought to examine six specific violations of Program rules, which are referred to as administrative errors throughout the report:

- **Not following proper countersignature procedures.** Vendors authorized by State agencies that use paper FIs to convey WIC food benefits should only ask participants to sign the FI after the purchase price is entered on the face of the check. This is intended to allow participants the opportunity to ensure that an accurate price is entered on the check.
- **Failure to provide a receipt.** Among those participating in the study, only 24 State agencies required vendors to provide a receipt to participants, while the remaining 16 had no such rule. The findings presented in this chapter focus on those State agencies in which failure to provide a receipt is, in fact, a violation of Program rules, whereas previous studies have presented findings that include all State agencies, regardless of their policy on receipt provision.
- **Insufficient stock.** Vendors are required by Federal regulations and WIC State agencies to stock a minimum amount of WIC foods to help ensure that a WIC participant will be able to take advantage of all of the benefits available. State agencies vary greatly in the quantities and types of foods that they require vendors to maintain; it was outside the scope of this study to determine whether each vendor met the State agency's minimum stocking requirements. Instead, for the purposes of this study, an error was recorded if any of the food items the buyer attempted to purchase was out of stock or if there was insufficient stock to make her purchase. As such, this may result in an underestimate of vendors with insufficient stock of WIC foods.
- **Not ensuring that cashiers are familiar with WIC transactions.** WIC vendors are responsible for ensuring that all cashiers are properly trained to conduct a WIC transaction. However, this is challenging given the high rate of turnover among cashiers. At each visit, buyers recorded whether a cashier seemed familiar with conducting a WIC transaction.
- **Requiring participants to pay cash in addition to the WIC benefit.** Vendors are prohibited from charging participants any extra cash for WIC foods that are included in their food prescriptions. However, some State agencies with paper FIs do permit vendors to use split tender when transacting the CVV which gives participants the option to use another form of payment (e.g., cash, the Supplemental Nutrition Assistance Program) when the cost of their fruits and vegetables exceeds the maximum value of their WIC benefit. Findings are

presented for the base study, which includes all WIC foods except for those purchased with the CVV.

- **Not allowing participants to purchase WIC foods.** WIC vendors are expected to permit the purchase of WIC authorized foods in accordance with the participants' prescribed benefits. In paper-based States, most vendors use POS systems that incorporate information from a UPC database and APL that is used to determine whether a food is WIC authorized; however, cashiers may and are expected to refer to WIC Program materials if a question arises. With EBT, there is perhaps a greater expectation that the UPC database and APL will be maintained and accurately identify foods as WIC authorized or not.
- **Improper handling of partial buys.** Paper FIs list the WIC foods that can be purchased with that check. Each State agency that issues paper FIs mandates whether participants must purchase all of those items listed, thus prohibiting a "partial buy." In 2012, at the time of data collection, 3 State agencies in the study prohibited all participants from purchasing less than what was listed on their paper FI, 2 State agencies prohibited partial buys of infant formula, and the remaining 29 had no such rule. For vendors authorized by State agencies that prohibit partial buys, an improper response to a partial buy meant that the vendor allowed the partial buy when they should not have. In the 29 State agencies that do not prohibit partial buys, a vendor was determined to handle the buy improperly if they refused to allow the partial buy.

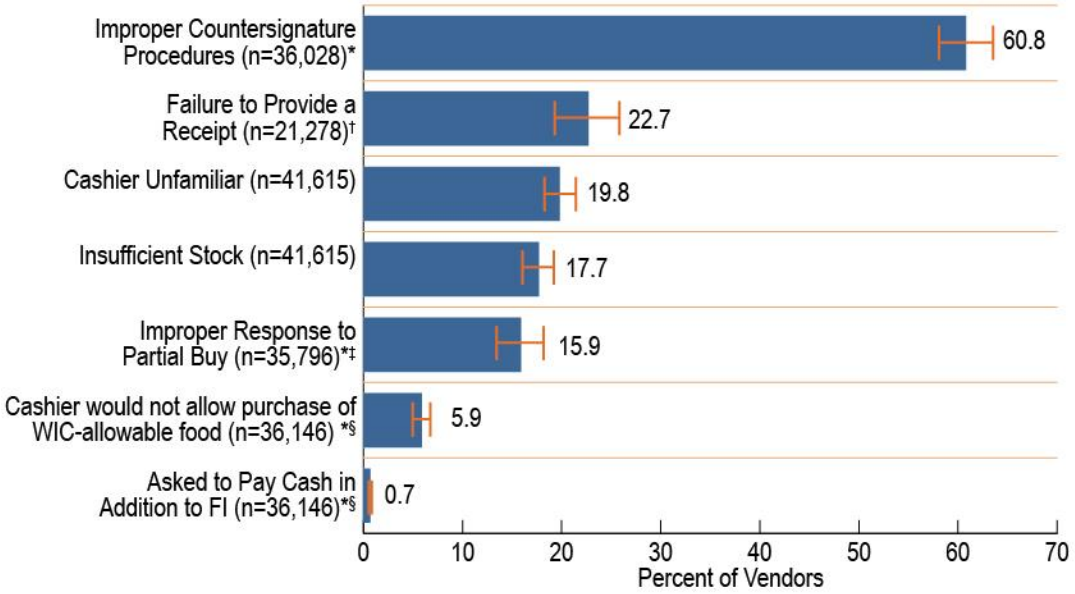
This chapter presents the findings on each of these administrative errors for both the base and CVV studies. Where the sample size allows, prevalence of administrative errors is also presented by vendor characteristics, transaction characteristics, and State agency vendor management policies and practices. Finally, this chapter presents comparisons between the current base study findings and the two previous WVMSs related to administrative errors.

A. Overall Findings

Vendors sampled for the study were presented with multiple opportunities to commit administrative errors. The overall findings for administrative errors are based on vendors that were visited three times and committed the specific error at least once, except in the case of partial buys, which were attempted during only one visit. Findings for the base study and CVV study are presented separately where appropriate.

An improper countersignature procedure was the most frequently occurring administrative error across vendors receiving all three base study buys. In total, more than 60 percent of vendors authorized by State agencies that use paper FIs did not follow the correct procedures by having a participant sign their FI after the purchase price was written on the check. The second most frequent administrative error was failure to provide a receipt, when required to do so by the State agency. More than one in five vendors committed this error at least once (22.7 percent). Fewer than 20 percent of vendors had a cashier that was unfamiliar with WIC transactions or had insufficient stock during one of the three buys (19.8 and 17.7 percent, respectively). Nearly 16 percent of vendors did not handle an attempted partial buy as specified by their State agency's policies. Fewer than 6 percent of vendors had cashiers who would not allow buyers to purchase WIC items, and 0.7 percent of vendors asked the buyer to pay cash in addition to the WIC benefit (figure IV-1).

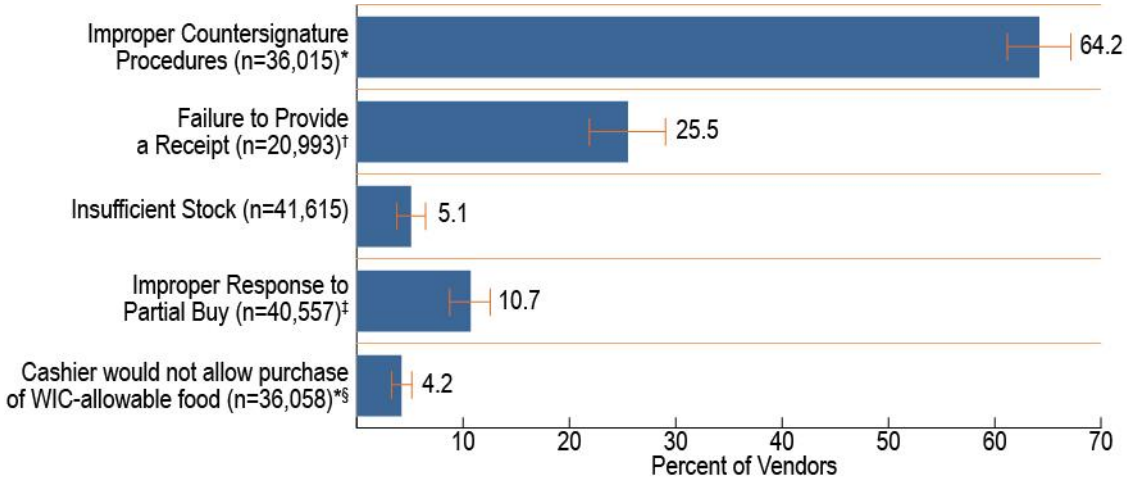
Figure IV-1 Percentage of vendors committing each administrative error at least once across all three buys, base study



Note: Results are based on a weighted estimate of vendors that had three completed buys.
*Includes vendors authorized by State agencies that have paper FIs. Not applicable to EBT States.
†Includes vendors authorized by State agencies that require provision of a receipt to participants.
‡Vendors were provided with only one opportunity across all three buys to commit this error: during the partial buy. For the base study, improper responses are dependent on State agency policy allowing or prohibiting partial buys.
§Vendors were provided with two opportunities across the three buys to commit this error: during the safe and partial buys.

As expected, the proportions of vendors committing errors related to improper countersignature procedures, providing a receipt, and not allowing the purchase of allowable foods were very similar across the base and CVV studies. The proportion of vendors with insufficient stock, however, was much lower in the CVV study, with 5.1 percent or 1 in 20 vendors committing this error. This may be due to the flexibility that vendors have to choose from a wide variety of fruits and vegetables versus having to maintain stock of a specific brand of formula or limited brands of whole-grain breads authorized by the State agency. In the CVV study, vendors also had slightly lower rates of improperly handling an attempted partial buy using the CVV or CVB (10.7 percent; figure IV-2).

Figure IV-2 Percentage of vendors committing each administrative error at least once across all three buys, CVV study



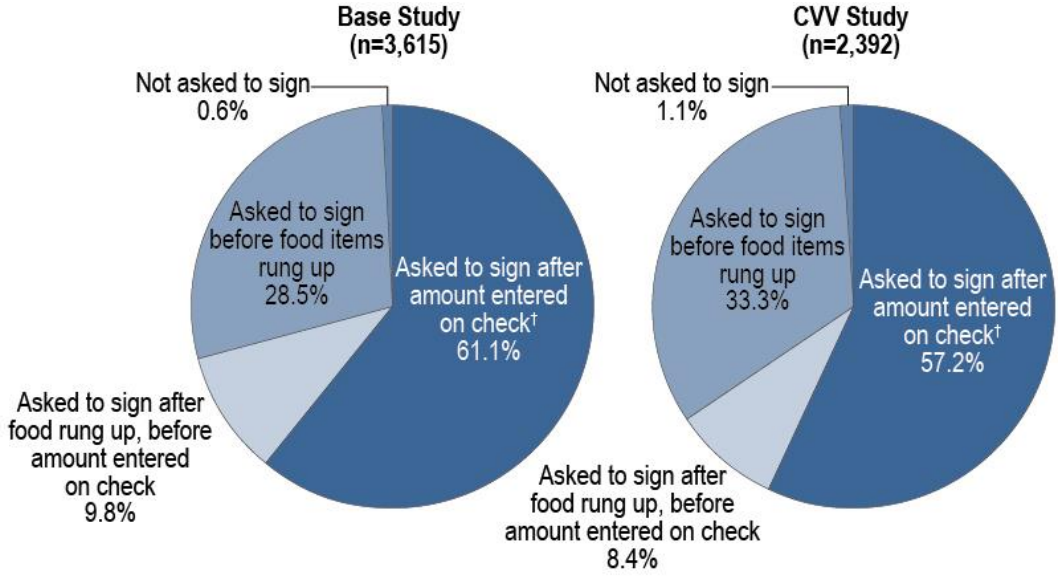
Note: Results are based on a weighted estimate of vendors that had three completed buys.
*Includes vendors authorized by State agencies that have paper FIs. Not applicable to EBT States.
†Includes vendors authorized by State agencies that require provision of a receipt to participants.
‡Vendors were provided with only one opportunity across all three buys to commit this error: during the partial buy. For the CVV study, failing to permit a partial buy was the improper response.
§Vendors were provided with two opportunities across the three buys to commit this error: during the safe and partial buys.

B. Findings by Type of Administrative Error

1. Failed to follow proper countersignature procedures

Participants should only be asked to countersign the WIC FI after the food items have been rung up and the amount of the purchase is written on the check. For the base study, 3,615 visits were made to vendors authorized by State agencies that use paper FIs and which resulted in the use of a WIC FI. Buyers followed the cashier's instructions on when to sign the FI, which resulted in 61.1 percent of FIs being signed properly—after the purchase price was entered. At almost 10 percent of visits, buyers were asked to sign the FI after the foods were rung up, but before the price was entered on the FI. In comparison, cashiers asked buyers to sign the check prior to ringing up the purchase at 28.5 percent of visits. The remaining 0.6 percent of FIs were not signed at all. Results for the CVV study were similar to the base study (see figure IV-3).

Figure IV-3 Percentage of visits employing various countersignature procedures across all three buys, base and CVV studies (unweighted estimates)*

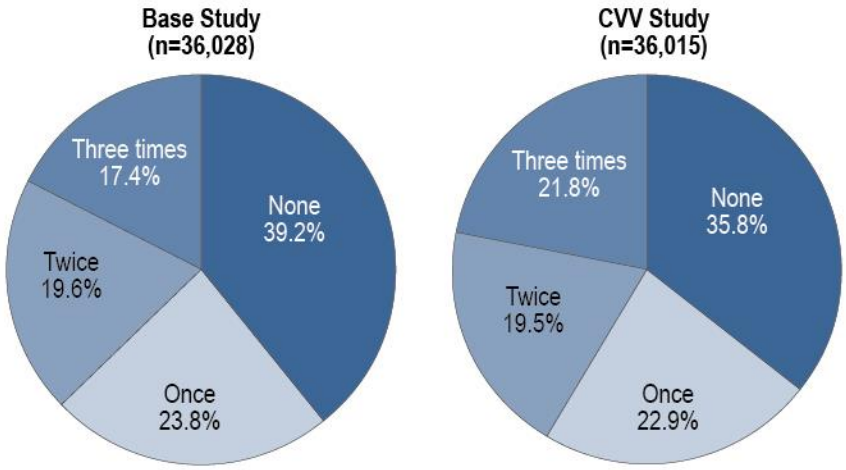


Note: Unweighted estimates are provided as these are representative only of the visits that occurred during data collection; the study was not designed to estimate the percentage of checks nationally that are properly signed.
*Includes vendors authorized by State agencies that have paper FIs. Not applicable to EBT States. †Correct procedure.

While the proportion of FIs that were not signed properly was roughly 40 percent in the two studies, more than 60 percent of vendors in both studies committed this error at least once across their three buys. This indicates that, while vendors may not neglect to properly handle countersignatures every time, very few vendors are diligent in ensuring that countersignatures are requested at the appropriate time every time.

Vendors had three opportunities for each study to commit this particular error, and the frequency with which this error occurred did not differ greatly across the two studies. About one-quarter of vendors in the base study (23.8 percent) and 22.9 percent in the CVV study committed the violation once, while fewer than 20 percent committed the error twice in both studies. Slightly more than 17 percent of vendors did not employ proper countersignatures at all during the base study, while 21.8 percent committed the error three times during the CVV study (see figure IV-4).

Figure IV-4 Number of occurrences of improper countersignature procedures across all three buys, base and CVV studies*



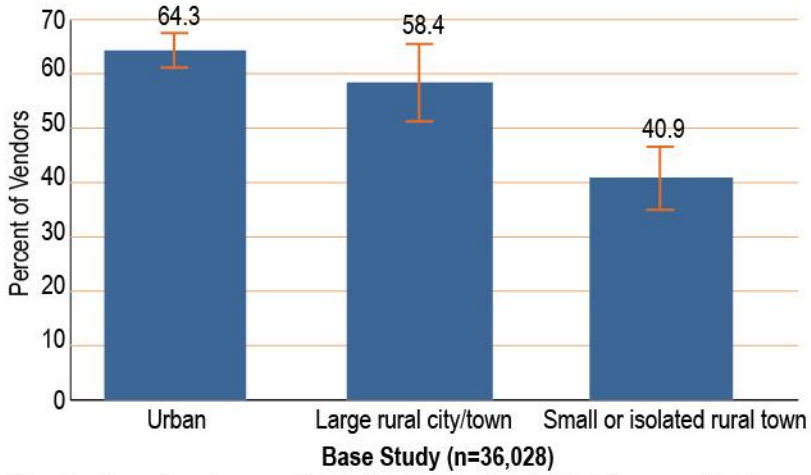
Note: Results are based on a weighted estimate of vendors that had three completed buys.
*Includes vendors authorized by States agencies that have paper FIs. Not applicable to EBT States.

i. Vendor characteristics

For the base study, there were a number of vendor characteristics that were significantly associated with having employed an improper countersignature at least once, including vendor size, geographic location, and the volume of WIC sales:

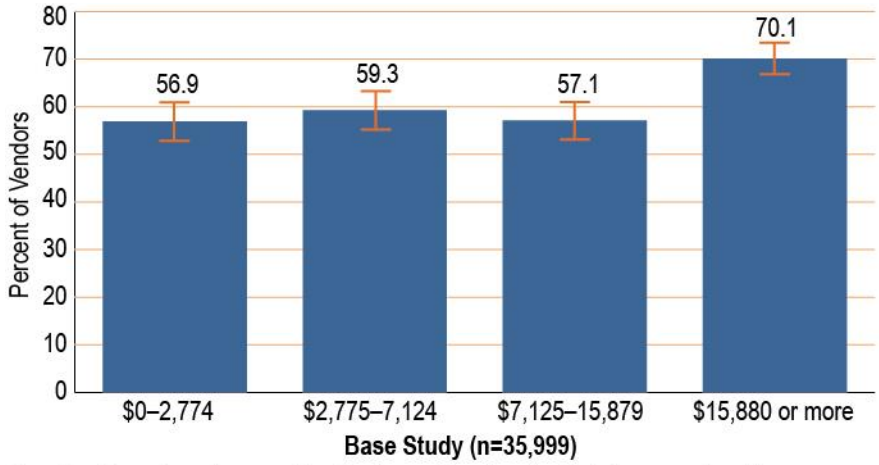
- **Number of registers.** Larger vendors, with eight or more registers, were most likely to have employed improper countersignature procedures at least once (66.7 percent), compared to 60.4 percent of vendors with fewer than three registers and 54.0 percent of vendors with 3-7 registers ($p < 0.001$).
- **Geographic location.** Vendors in urban areas were significantly more likely to commit this error than those in small or isolated rural towns (see figure IV-5; $p < 0.05$).
- **Volume of WIC sales.** The proportion of vendors committing this error increased as vendor's monthly volume of WIC sales increased: from 56.9 percent of vendors with less than $2,775 per month in WIC sales to about 70 percent of vendors with $15,880 or more in WIC sales per month (see figure IV-6; $p < 0.01$).

Figure IV-5 Percentage of vendors employing improper countersignatures at least once across all three buys, by geographic location, base study*



Note: Results are based on a weighted estimate of vendors that had three completed buys.
*Includes vendors authorized by States agencies that have paper FIs. Not applicable to EBT States.

Figure IV-6 Percentage of vendors employing improper countersignatures at least once, by volume of WIC sales, base study*



Note: Results are based on a weighted estimate of vendors that had three completed buys.
*Includes vendors authorized by States agencies that have paper FIs. Not applicable to EBT States.

While trends in the association between vendor characteristics and improper countersignatures were similar for the CVV study, the smaller sample size resulted in none of these characteristics being significantly associated with improper countersignature procedures.

ii. Transaction characteristics

The likelihood of employing improper countersignature procedures was also examined by characteristics that were specific to the transaction. Unlike other data presented in this section, however, these findings are limited to the safe buy, in which the vendors had one opportunity to commit this administrative error. During the safe buys, 37.0 percent of vendors employed improper countersignature procedures in the base study (n = 35,661), while 43.3 percent of vendors in the CVV

study did so (n = 35,706). In both studies, this varied significantly by whether or not the vendor had—and used—their scanning equipment:

- In the base study, 45.5 percent of vendors that did not have or use scanning equipment to ring up the purchase employed improper countersignature procedures, compared to 34.6 percent of those that did ($p < 0.01$).
- In the CVV study, 51.9 percent of vendors not using scanning equipment committed this error, compared to 41.1 percent who did ($p < 0.05$).

Interestingly, whether a cashier was familiar with conducting WIC transactions was not associated with the likelihood of this type of error in either study.

For the base study, 9.6 percent of cashiers entered the purchase amount on the check electronically, while 76.9 percent of cashiers entered the amount by hand. Improper countersignature procedures were more common among vendors whose cashiers entered the amount electronically (55.5 percent), compared to 24.7 percent of those who entered it by hand ($p < 0.01$).

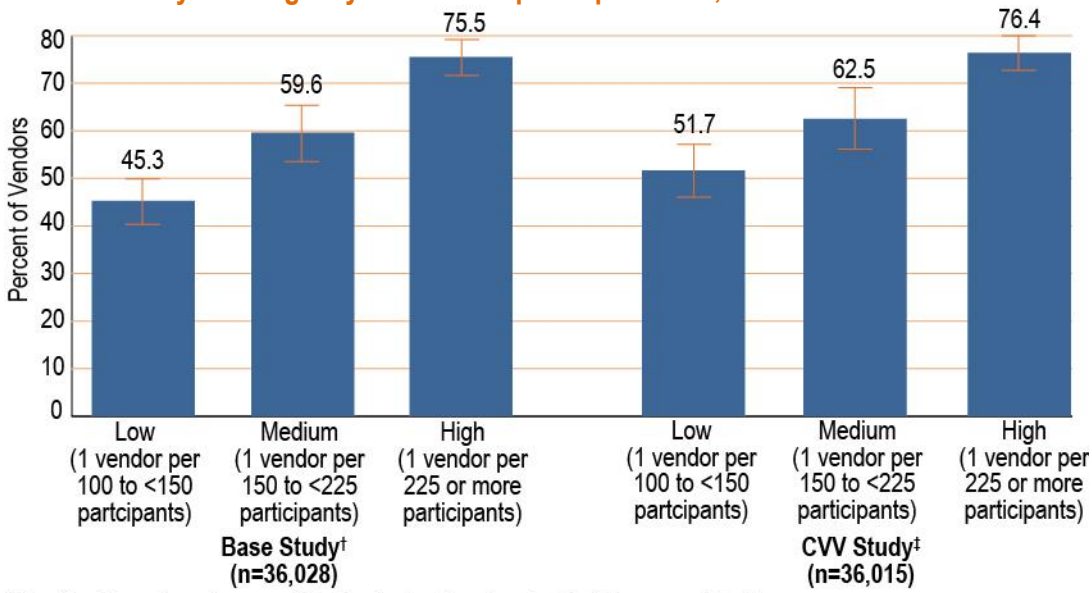
A considerably smaller proportion of cashiers in the CVV study entered the purchase amount electronically (3.1 percent), while 80.1 percent manually entered the amount on the FI. However, the small number of vendors overall that entered prices electronically and committed the error is too small to produce reliable estimates for the CVV study.

iii. Vendor management practices and policies

This study also sought to explore whether WIC State agencies' vendor management policies and practices are associated with rates of administrative errors. For both the base and CVV studies, higher vendor-to-participant ratios were significantly associated with higher rates of improper countersignature procedures.

A high vendor-to-participant ratio generally indicates that there are fewer vendors for State agencies to oversee and monitor per participant, while a low vendor-to-participant ratio means that State agencies must oversee more vendors per particpant. Despite theorizing that having fewer vendors to monitor would result in higher rates of compliance, more than three-quarters of vendors authorized by State agencies with high vendor to participant ratios employed improper countersignature procedures at least once across three buys. This was considerably higher than among vendors authorized by State agencies with low vendor-to-participant ratios: 45.3 percent in the base study and 51.7 percent in the CVV study (see figure IV-7).

Figure IV-7 Percentage of vendors employing improper countersignature procedures at least once, by State agency's vendor to participant ratio, base and CVV studies*



Note: Results are based on a weighted estimate of vendors that had three completed buys.
*Includes vendors authorized by States agencies that have paper FIs. Not applicable to EBT States. †p<0.001 ‡p<0.01

Interestingly, there were no differences in improper countersignature procedures among vendors authorized by State agencies that conduct monitoring visits annually versus less frequently.

2. Failure to provide a receipt

In 2012, at the time of data collection, 24 out of 40 WIC State agencies participating in the study required vendors to provide participants with a receipt. As such, 52.0 percent of the base study sample and 52.3 percent of the CVV study sample should have provided receipts during the study, and a failure to do so was recorded as an administrative error. In the base study, 22.7 percent of vendors that were required to do so, failed to provide a receipt at least one time across three buys, while 64.6 percent of vendors who were not required to provide a receipt did not provide one ($p < 0.0001$). Similar results were found with respect to the CVV study (see table IV-1). Despite more than one in five vendors failing to follow this Program rule at least once during the study, the State agency policy does appear to have a positive effect on the likelihood of a participant being provided with a receipt. This is particularly important since previous studies have shown that vendors failing to provide a receipt are at greater risk of overcharging the WIC Program, which will be explored further in chapter VI.

Table IV-1 Number and percentage of vendors failing to provide a receipt at least once across all buys, by State agency policy, base and CVV studies

	n	Weighted *n*	Weighted %	SE	*p*-Value
Base Study	5,559	41,471			
Receipt required	615	4,822	22.7	3.32	<0.0001
No receipt required	1,332	13,037	64.6	4.88	
CVV Study	3,570	41,113			
Receipt required	447	5,346	25.5	3.59	<0.0001
No receipt required	852	12,677	62.9	5.45	

Note: Results are based on a weighted estimate of vendors that had three completed buys.

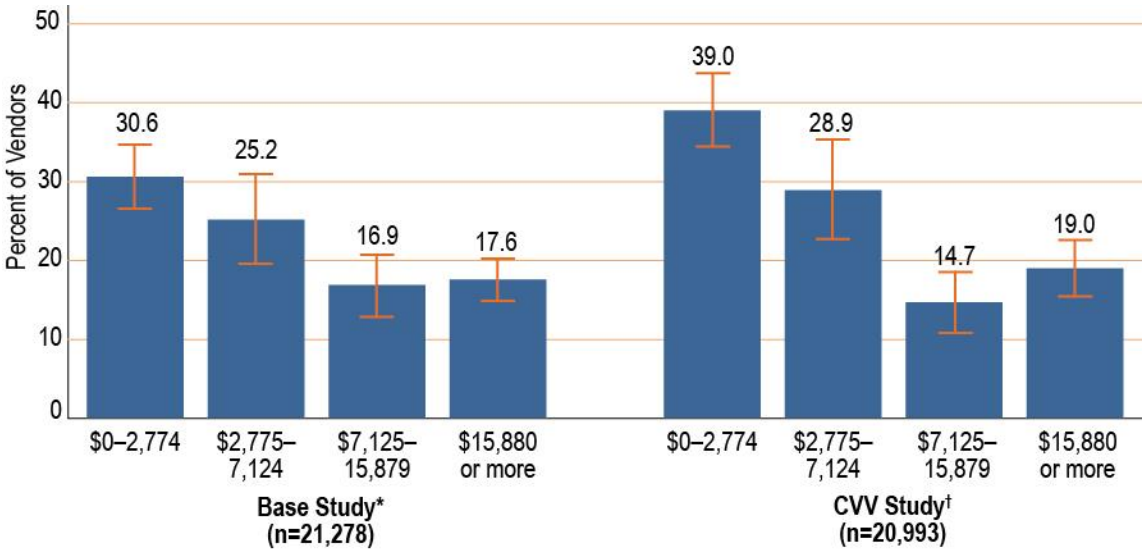
The remainder of this section will focus on the 21,278 vendors authorized by State agencies where failing to provide a receipt constitutes an administrative error and that had three completed buys.

i. Vendor characteristics

A number of vendor characteristics were significantly associated with failing to provide a receipt at least once across the three buys, including vendor size, geographic location, volume of WIC sales, and whether the store had POS scanning equipment.

- **Number of registers.** In the base study, vendors with fewer than two registers (small vendors) were significantly more likely than medium and large vendors to fail to provide a receipt (49.9 versus 18.5 and 14.5 percent, respectively; $p < 0.01$). This was more pronounced in the CVV study, with 61.7 percent of small vendors, 20.6 percent of medium vendors, and 15.8 percent of large vendors failing to provide a receipt at least once ($p < 0.01$).
- **Geographic location.** With regard to geographic location, vendors in small or isolated small rural towns were significantly more likely than vendors in other areas to commit this error in the base study (30.1 percent versus about 21 percent in urban and large rural areas; $p < 0.05$).
- **Volume of WIC sales.** In both studies, the proportion of vendors failing to provide a receipt generally decreased as average monthly WIC sales volume increased ($p < 0.05$; see figure IV-8).
- **Presence of scanning equipment.** In the base study, fewer than 18 percent of vendors with POS scanning equipment failed to provide a receipt, compared to 72.7 percent of vendors without such equipment ($p < 0.01$). Similar results were found with regard to the CVV study, 19.6 percent of vendors with scanning equipment failed to provide a receipt, while 81.2 percent of those without scanning equipment did so ($p < 0.01$).

Figure IV-8 Percentage of vendors failing to provide a receipt at least once when required to do so by the State agency, by volume of WIC sales, base and CVV studies



Note: Results are based on a weighted estimate of vendors that had three completed buys and which are required by the State agency to provide a receipt. *p<0.05 †p<0.01

ii. Transaction characteristics

Across safe buys conducted with vendors required to provide a receipt, the use of scanning equipment at the POS was associated with the likelihood of vendors failing to provide a receipt in both studies. In all, 65.5 percent of vendors that did not have or did not use scanning equipment failed to provide a receipt in the base study, compared to only 9.6 percent of vendors who did use scanning equipment ($p < 0.01$). Similarly, 68.6 percent of vendors not using scanning equipment in the CVV study failed to provide a receipt during the safe buy, compared to 10.9 percent that did use scanning equipment ($p < 0.01$).

Among vendors authorized by State agencies that use paper FIs ($n = 16{,}062$), there was also an association between cashiers providing receipts and whether the CB saw the purchase price entered on the check in the base study. When the CB reported that the purchase price was entered by the cashier, register, or themselves, this error occurred among only 16.3 percent of vendors. In comparison, among cases in which the purchase price was not entered or was entered out of view of the CB, 63.5 percent of vendors failed to provide a receipt ($p < 0.01$). Comparisons could not be made for the CVV study due to too few vendors in each category committing the error (see appendix F).

While receipt-related errors were expected to be higher when cashiers were unfamiliar with WIC transactions, the number of unfamiliar cashiers making this mistake was too small to create a reliable estimate for comparison.

iii. Vendor management practices and policies

With regard to vendor management policies and practices, some differences were apparent in the provision of receipts by vendors among those required to do so. The type of WIC benefit system, EBT or paper, was significantly associated with whether vendors failed to provide a receipt in both the base and CVV studies ($p < 0.001$). Vendors processing EBT benefits were far less likely to commit this error (9.2 percent for the base study and 10.8 percent for the CVV study) than those processing paper FIs (27.3 and 30.2 percent, respectively).

For the CVV study, failure to provide a receipt was also associated with the State agency's vendor-to-participant ratio: Vendors authorized by State agencies with high vendor-to-participant ratios were less likely to commit this error than vendors with medium and low vendor-to-participant ratios (14.5 versus 34.6 and 33.4 percent, respectively; $p < 0.05$). While a similar trend was seen with regard to the base study, these differences were not statistically significant.

3. Insufficient stock

Each WIC State agency has minimum stocking requirements that vendors must agree to in order to ensure that WIC participants will be able to take full advantage of the benefits offered to them. When CBs encountered instances in which there was not an adequate stock of foods to make their purchases, they noted this in the questionnaire and food item fields. In all, 17.7 percent of vendors in the base study and 5.1 percent of vendors in the CVV study had insufficient stock during at least one of their three visits. With regard to the frequency of having insufficient stock, 12.3 percent of vendors had insufficient stock during one base study buy, while 3.6 had insufficient stock during two of the buys, and 1.9 percent had insufficient stock during each of the three buys.

Due to the small number of sampled vendors across all three buys with insufficient stock of fruits and vegetables, reliable estimates of this error by vendor characteristics or State agency vendor

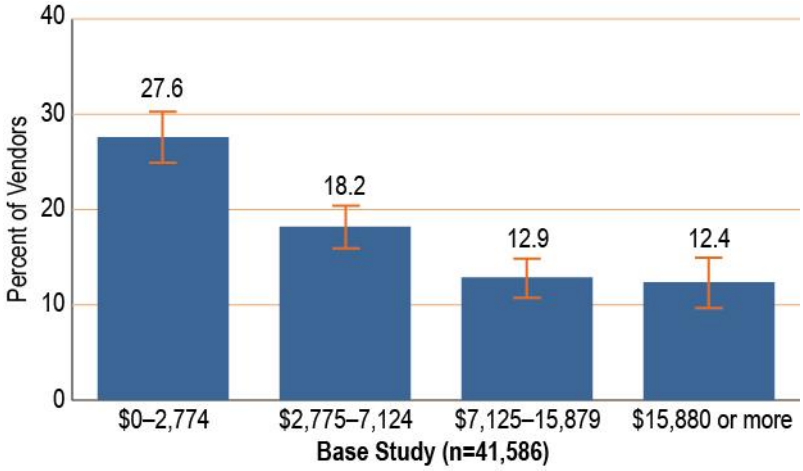
management practices and policies could not be produced for the CVV study. As such, the remainder of this section will focus exclusively on the base study findings.

i. Vendor characteristics

Occurrences of insufficient stock were associated with a number of vendor characteristics in the base study, many of which appear to be indicative of vendor size. Characteristics of vendors that were more likely to have had insufficient stock at least once across all three buys in the base study include:

- **Number of registers.** More than one-third of vendors with two or fewer registers had insufficient stock at least once (35.9 percent), compared to 14.5 percent of vendors with three to seven registers and 9.5 percent of vendors with eight or more registers ($p < 0.0001$).
- **Geographic location.** More than 19 percent of vendors in urban locations had insufficient stock, compared to 13.8 percent of those in large rural cities or towns and 12.8 percent of those in small or isolated rural towns ($p < 0.05$).
- **Presence of scanning equipment.** Vendors without scanning equipment were much more likely than vendors with scanning equipment to have had insufficient stock during the base study (38.9 versus 13.5 percent, respectively; $p < 0.0001$).
- **Volume of WIC sales.** The proportion of vendors with insufficient stock declined greatly as the volume of WIC sales increased: from 27.6 percent of vendors with less than $2,775 in monthly WIC sales to 12.4 percent of vendors with more than $15,880 in WIC sales ($p < 0.0001$).
- **Stand-beside devices in EBT States.** Among vendors processing EBT benefits, those that used a stand-beside devices to process WIC benefits were more likely to have had insufficient stock than those that did not (38.8 versus 19.4 percent, respectively; $p < 0.01$).
- **High-risk status.** Nearly one-quarter of vendors identified by WIC State agencies as high risk had insufficient stock (24.7 percent), compared to 16.4 percent of vendors who were not classified as high risk ($p < 0.05$).

Figure IV-9 Percentage of vendors with insufficient stock at least once, by volume of WIC sales, base study



Note: Results are based on a weighted estimate of vendors that had three completed buys.

There was no association between occurences of insufficient stock and whether vendors had received a routine monitoring visit or the type of training they received in FY 2011.

ii. Vendor management practices and policies

In examining the frequency with which vendors had insufficient stock, there were some associations with State agency-level vendor management practices, including the type of benefit system (paper FIs versus EBT) and the vendor-to-participant ratio. Base study findings indicate that vendors in EBT States were significantly more likely than those in paper-based States to have had insufficient stock (24.0 versus 16.8 percent, respectively; $p < 0.05$). Vendors authorized by State agencies with low vendor-to-participant ratios (i.e., those with a greater number of vendors per participant) were marginally more likely to have had insufficient stock (23.2 percent) than those with medium or high vendor-to-participant ratios (14.9 and 15.2 percent, respectively; $p = 0.06$).

Other practices and policies examined yielded no differences in vendors' likelihood of having had insufficient stock, including whether the State agency conducts inventory audits.

4. Cashier unfamiliar with conducting a WIC transaction

As noted in the introduction to this chapter, a cashier's familiarity with WIC transactions was captured by CBs once for each visit to the vendor and applies to both the base and CVV studies. As such, estimates were calculated only for the base study to maximize the larger sample size, since the CVV study does not include purchases for infant food packages. Overall, 19.8 percent of vendors had cashiers who expressed unfamiliarity with WIC at least once during the three buys. The majority of vendors committing this error, however, had only one instance of a cashier being unfamiliar (15.6 percent), while 3.5 percent had unfamiliar cashiers two out of three times and 0.7 percent had unfamiliar cashiers all three times.

The frequency of vendors having an unfamiliar cashier at least once differed slightly by the type of food package being used at the vendor: Vendors assigned infant food packages were least likely to have had a cashier perceived by the CB as unfamiliar with WIC (14.8 percent), compared to those assigned to receive women or child food packages (21.6 and 23.3 percent, respectively; $p < 0.01$). This could be due to the relative simplicity of transacting a purchase solely for infant formula or jarred food, versus having to be familiar with the many details of each WIC FI and authorized food items.

i. Vendor characteristics

Similar to other administrative errors encountered during the study, the proportion of vendors with unfamiliar cashiers differed with specific vendor characteristics, including the number of registers, volume of WIC sales, and presence of scanning equipment. The vendors most likely to commit an error, however, varied from the previous administrative errors with the following differences:

- **Number of registers.** Vendors with three to seven and eight or more registers were more likely than smaller vendors to have had an unfamiliar cashier (20.8 and 22.2 versus 14.5 percent, respectively; $p < 0.05$).
- **Presence of scanning equipment.** Vendors with scanning equipment were more likely to commit this error than those without scanning equipment (21.3 versus 13.1 percent, respectively; $p < 0.01$).
- **Volume of WIC sales.** Vendors with WIC sales below $2,775 per month in 2011 were most likely to have had an unfamiliar cashier, with nearly one-third committing this error (31.8

percent). In comparison, fewer than 20 percent of vendors with higher volume of sales had an unfamliar cashier ($p < 0.0001$). This is as expected, since one would expect greater WIC familiarity among vendors transacting a larger volume of purchases.

ii. Vendor management practices and policies

With regard to State agency vendor management practices and policies, the WIC benefit type and vendor-to-participant ratio were significantly associated with the proportion of vendors that had an unfamiliar cashier across the three buys. Specifically, 20.6 percent of vendors authorized by State agencies with paper FIs had an unfamiliar cashier at least once, compared to 14.3 percent of vendors authorized by State agencies with EBT ($p < 0.05$). While not explored explicitly in the study, transacting EBT benefits may be easier and more familiar to cashiers than paper benefits, which require a prior knowledge of allowable WIC foods and how to confirm the benefits on the check against the foods being purchased.

Vendors authorized by State agencies with high vendor-to-participant ratios, meaning that fewer vendors serve more participants across the State, were least likely to have had an unfamiliar cashier (14.9 percent). This is as expected, since one would expect these vendors in general to transact a greater volume of benefits. In comparison, more than a quarter of vendors authorized by State agencies with a medium vendor-to-participant ratio (25.2 percent), and one out of five vendors authorized by State agencies with low ratios did so (20.7 percent).

5. Improper response to partial buy

Partial buys were conducted for both the base and CVV studies during buy two at each vendor. As described in the methods (chapter II), EBT vendors were excluded from partial buys for the base study. This chapter presents the findings related to vendors committing an error when faced with a participant that tries to purchase less than their full benefit allocation.

Figure IV-10 Partial buy policies and percent of vendors in sample

- State agency allows partial buys for all benefits: 81.2%
- State agency does not allow partial buys for infant formula: 5.1%
- State agency does not allow partial buys for any traditional WIC foods: 13.7%

Overall, 15.9 percent of vendors in the base study failed to handle a partial buy of traditional WIC foods properly, by either allowing it when State agency regulations prohibit partial buys or disallowing a partial buy when State agency regulations permit them. Interestingly, the proportion of vendors commiting this error in the base study varied by food package type: 25.0 percent of vendors assigned child food package benefits committed this violation, compared to 12.2 percent of vendors assigned infant benefits, and 10.5 percent assigned a woman's benefit ($p < 0.001$). A little more than 10 percent of vendors in the CVV study failed to follow correct procedures by allowing participants to purchase less than the full value of the CVV.

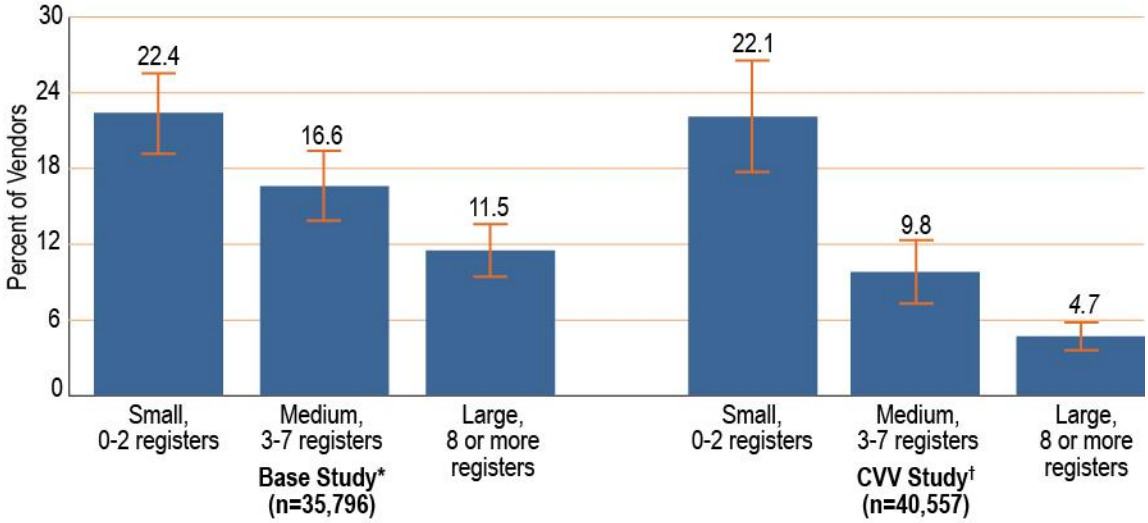
i. Vendor characteristics

A number of vendor characteristics were associated with improper responses to partial buys in both the base and CVV studies; however, there were some noteable differences in the characteristics associated with an error across the two studies:

- **Number of registers.** In the base study, vendors with two or fewer registers were more likely than larger vendors to have improperly responded to an attempted partial buy ($p < 0.01$; see figure IV-11).

- **Presence of scanning equipment.** Vendors with scanning equipment were significantly less likely to commit an error in transacting a partial buy for the base study (14.1 versus 23.8 percent, respectively; $p < 0.01$). This difference was more pronounced in the CVV study with 8.0 percent of those with scanning equipment commiting an error and 23.4 percent of vendors without scanning equipment improperly handling a partial buy ($p < 0.01$).
- **High-risk status.** With regard to only the CVV study, vendors designated by State agencies as high-risk were more likely than those not designated as such to have committed this error (23.3 versus 8.1 percent, respectively; $p < 0.01$). While the same trend was apparent for the base study, the difference lacked statistical significance.
- **Type of annual training received.** For the CVV study, vendors that received interactive training were more likely to have committed this error than those receiving annual training (16.1 versus 7.4 percent, respectively; $p < 0.05$).

Figure IV-11 Percentage of vendors improperly handling a partial buy, by number of registers, base and CVV studies



Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).
Note: Results are based on a weighted estimate of vendors that had three completed buys and which are required by the State agency to provide a receipt. *p<0.05 †p<0.01

ii. Vendor management practices and policies

The most critical vendor management policy related to this error is whether or not partial buys are prohibited for all traditional foods. While 36.0 percent of vendors that are prohibited from allowing a partial buy for all traditional foods did, in fact, allow the partial buy to happen, only 12.5 percent of vendors who should have allowed a partial buy did not allow it (p<0.05). (The number of vendors assigned infant formula buys that were not supposed to allow partial buys for that item was too small to calculate a reliable estimate for comparison.) With regard to the CVV study, all vendors should have permitted a purchase below the value of the voucher. However, there were still differences in allowance of partial buys by State agency policy on traditional WIC foods: 30.4 percent of vendors authorized by State agencies that prohibit partial buys for traditional foods failed to allow a partial CVV buy, compared to 8.2 percent of vendors authorized by State agencies with no restrictions on traditional foods ($p < 0.05$).

6. Cashier would not allow particpant to purchase an allowable item

Another administrative error resulting in inequitable treatment of WIC participants is not being allowed by a vendor to purchase a WIC food when prescribed. The frequency with which this occurred was estimated for vendors authorized by State agencies that use paper FIs. Overall, 5.9 percent of vendors in the base study and 4.2 percent of vendors in the CVV study did not allow the CB to purchase an authorized item at least once across two buys.

The small sample of vendors committing this violation in each study (base $n = 72$, CVV $n = 34$) prevented us from calculating reliable estimates by most vendor characteristics, transaction characteristics, and State agency vendor management practices and policies (see detailed tables in appendix F).

7. Buyer asked to pay cash in addition to FI

WIC participants should never be charged for purchasing the WIC foods specified in their benefit. Examining the frequency with which this occurred posed some challenges for the study, however, since vendors were correct to ask for additional cash when (1) the amount of fruits and vegetables purchased exceeded the benefit or (2) the CB was buying unauthorized foods. In the latter case, it was not always clear to the CB what they were asked to pay cash for, especially in EBT States when the base and CVV studies were conducted during a single transaction. As such, estimates for how frequently vendors asked for cash in addition to the food benefit are presented only for safe buys conducted with vendors transacting paper FIs during the base study. In total, nine vendors in the base study asked participants erroneously to pay cash in addition to their paper FI for WIC foods, accounting for 0.7 percent of all WIC vendors.

C. Comparisons to Previous Studies' Findings

This section presents comparable estimates of each of the administrative errors observed in the 2013 WVMS with those calculated in previous studies. The 2013 base study findings indicate little change between the current study and previous studies with regard to improper countersignature procedures and cashier familiarity with WIC. The proportion of vendors found to have insufficient stock, however, has increased to substantially more than both 1998 and 2005 estimates, while the proportion of vendors failing to provide a receipt in 2013 decreased signficantly compared to those in 2005. While the number of vendors in each study charging buyers cash in addition to the FI was extremely small, the 2013 study did reveal a significant increase in the proportion of vendors committing this error compared to the 1998 study; however, the 2013 rate did not differ from 2005.

Table IV-2 Percentage of vendors committing administrative errors at least once across all buys in the 1998, 2005, and 2013 WVMS

Administrative Error	1998 Study	2005 Study	2013 Base Study
	Percentage (SE)	Percentage (SE)	Percentage (SE)
Improper countersignature procedures	64.6 (2.60)	58.7 (2.80)	60.8 (2.93)
Failing to provide a receipt (all vendors)	51.1 (3.21)	61.1 (3.20) *	43.1 (3.50)
Insufficient stock	5.5 (0.60)*	11.5 (1.10) *	17.7 (1.68)
Unfamiliar cashier	--	20.9 (1.80)	19.8 (1.55)
Charged cash in addition to FI	0.08 (0.00)*	0.2 (0.10)	0.7 (0.26)

*Statistically significant difference when compared to 2013 base study at p <0.05.

Chapter V: Findings on Substitutions

This chapter presents the results of CBs' attempts to substitute unauthorized food items for those designated by the WIC FIs. Substitution of WIC authorized foods with unauthorized foods is a violation of Federal and State agency regulations. However, unlike under- and overcharges or administrative errors, which are solely dependent on the vendor's actions, substitutions require the WIC participant to take action, by either bringing the unauthorized food to the cash register for purchase or accepting a substitution initiated by the cashier. In States with paper FIs, WIC participants should only attempt to purchase WIC authorized foods with their WIC FIs, separating their WIC purchase at the POS and indicating to the cashier that they are paying with a WIC FI. If a participant inadvertently or purposefully attempts to purchase an unauthorized brand of cereal, for instance, it is the cashier's responsibility not to allow the substitution to take place, relying on either the POS scanning system, their knowledge of WIC, or the WIC authorized foods lists provided by the WIC State agency to identify an unauthorized item. If vendors do not have a scanner and their cashiers are unfamiliar with WIC, they might inadvertently allow a substitution. In other cases, vendors might initiate a substitution by suggesting that the WIC participant take an unauthorized item because they are out of stock of a WIC authorized food.

In theory, EBT reduces the possibility that the WIC Program will be charged for unauthorized food items because vendors in EBT States use a UPC database and APL to identify WIC authorized foods. These codes are checked against the WIC participant's benefit, and only those for which there is a match would result in the vendor receiving payment for those foods. As a purchase is transacted, the WIC authorized items are deducted from the participant's benefit balance and the participant is charged for any remaining items being purchased. In theory, most EBT vendors could not accidentally allow a substitution, because the POS scanning system would identify each item as WIC authorized or unauthorized. At the same time, this may increase cashiers' reliance on the POS system to the extent that they are less familiar with WIC authorized foods than cashiers in States with paper FIs. Additionally, if the APL is not up-to-date, this could result in substitutions being allowed inadvertently or even in a participant not being permitted to buy an authorized food. Vendors are responsible for downloading the APL on a regular (e.g., daily) basis, and most large vendors have automated this process. If vendors, particularly smaller vendors less likely to rely on automated programs, do not regularly download updated APLs, it is possible for these types of errors to occur.

While the study does not attempt to quantify the overall frequency of participant-initiated substitutions, the frequency with which participants attempt to substitute items is largely unknown. The movement toward EBT benefit delivery across all WIC State agencies will result in this same type of purchase (a mixed basket of WIC authorized and unauthorized foods) occurring regularly during WIC transactions, at least in States that employ an online EBT system.

As described in chapter II, CBs attempted a minor or major substitution for the base study during the third buy and during the first visit for the CVV study. This chapter will present the findings on the two types of substitutions attempted during the two studies:

- A **minor subsitution** occurs when a vendor allows the buyer to substitute an item that is of the same category as the WIC authorized food (e.g., cereal, juice, white potatoes) but not on the WIC authorized list.
- A **major substitution** occurs when a vendor allows a CB to purchase an item that does not fall within one of the WIC food categories (e.g., soda instead of juice, fruit snacks instead of fruit).

To ensure that vendors were given the benefit of the doubt with regard to substitutions and not coerced into acting in a manner they might not have otherwise, CBs were instructed to present the substitution item at the time of purchase along with their other WIC authorized foods and attempt to pay for it by using their WIC benefit. If the cashier told them that they could not get the item with WIC, the buyer was to accept this response and proceed with the purchase without the unauthorized item. If the cashier asked the buyer whether the food was allowable, the buyer was to respond that they did not know and let the cashier make the decision to allow or not allow the purchase. Under no circumstances was the buyer to try to persuade the cashier to allow the substitution.

A. Overall Findings

Using a weighted sample of vendors, national rates of vendor acceptance of buyer-initiatied substitutions were developed. With regard to the base study, during which traditional WIC foods were purchased, 18.4 percent of vendors allowed a minor substitution (e.g., allowing unauthorized brands of cereal or white instead of whole-grain bread), while 5.6 percent allowed a major substitution, which might include soda or chips. The proportion of vendors allowing substitutions on the CVV or CVB used to purchase fruits and vegetables, however, was much higher for both types of substitutions: 42.4 percent of vendors allowed minor substitutions for fruits and vegetables (e.g., white potatoes, canned fruit in syrup), while 18.2 percent allowed major substitutions (see table V-1).

Table V-1 Number and percentage of vendors allowing minor and major substitutions, base and CVV studies

	Base Study		CVV Study	
	Weighted N	% (SE)	Weighted N	% (SE)
Minor Substitution				
Accepted	7,500	18.4 (1.88)	16,584	42.4 (3.00)
Rejected	33,156	81.6 (1.88)	22,544	57.6 (3.00)
Major Substitution				
Accepted	2,297	5.6 (1.10)	7,223	18.2 (2.64)
Rejected	39,067	94.4 (1.10)	32,507	81.8 (2.64)

Note: Results are based on a weighted estimate of vendors that had a completed substitution buy.

The remainder of this chapter will focus on the characteristics of vendors, vendor management policies and practices, transaction characteristics that are associated with each type of substitution, and how they differ across the two studies. Detailed tables relative to substitutions can be found in appendix G.

B. Findings by Type of Substitution

1. Minor substitutions

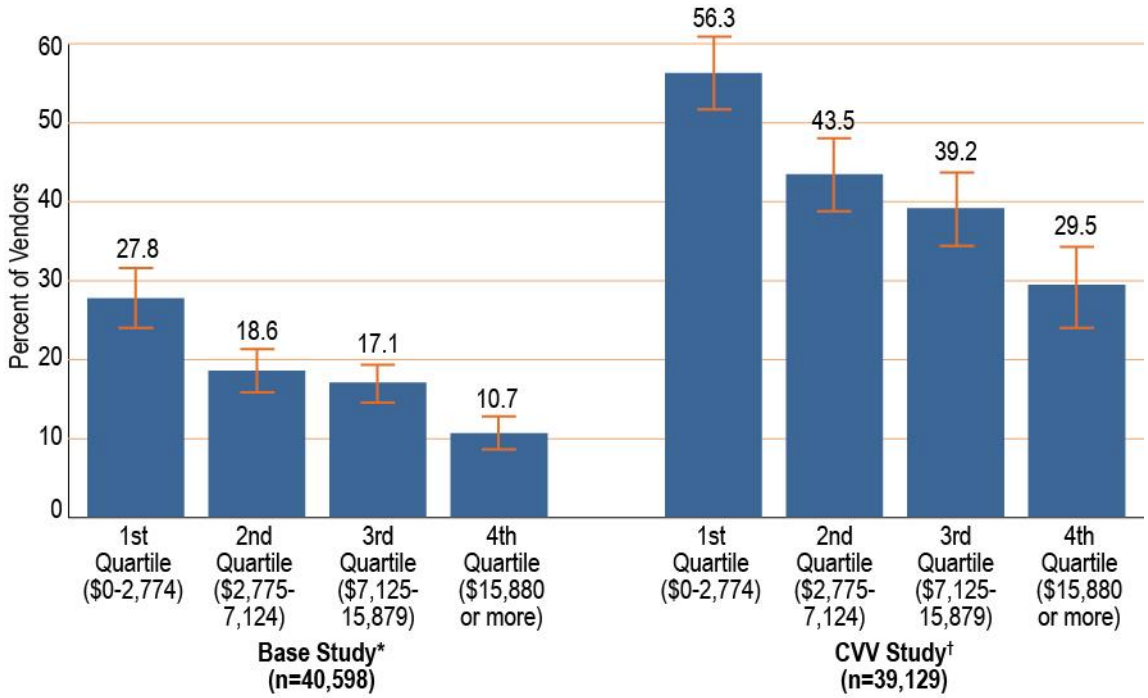
With regard to vendor characteristics, only the volume of WIC sales was associated with allowing a minor substitution in the base study. Vendors falling in the lowest quartile of monthly WIC sales

(less than $2,775 per month) were most likely to have allowed a minor substitution (27.8 percent), compared to 17–18 percent of those falling into the middle quartiles. Vendors with the highest volume of WIC sales were least likely to have allowed a minor substution (10.7 percent; $p < 0.001$; see figure V-1).

The findings of the CVV study tell a vastly different story, however, with a multitude of vendor characteristics showing strong associations with the proclivity to allow a minor substitution:

- **Volume of WIC sales.** Similar to the base study, the proportion of vendors allowing minor substitutions decreased as the monthly volume of WIC sales increased. More than 56 percent of vendors with WIC sales in the lowest quartile did so, compared to 29.5 percent of vendors with the highest volume of WIC sales ($p < 0.01$; see figure V-1).
- **Number of registers.** Vendors with two or fewer registers were most likely to have allowed a minor substitution (64.1 percent), compared to vendors with three to seven and eight or more registers (33.9 and 37.3 percent, respectively; $p < 0.001$).
- **Geographic location.** Vendors in urban areas were significantly more likely than those in small or isolated rural towns to have allowed a minor substitution (46.1 versus 32.5 percent, respectively; $p < 0.05$).
- **Scanning equipment.** Vendors with scanning equipment were less likely than those without to have allowed a minor substitution (37.4 versus 65.4 percent, respectively; $p < 0.01$).

Figure V-1 Percentage of vendors allowing minor substitutions, by monthly volume of WIC sales, base and CVV studies



Note: Results are based on a weighted estimate of vendors that had a completed substitution buy. *p<0.001 †p<0.01

With regard to vendor management practices and policies, the use of EBT for benefit delivery appears to dramatically decrease a vendors' likelihood to allow substitutions, both in the base and CVV studies. More than 20 percent of vendors in paper-based States allowed a minor substitution during the base study, compared to only 7.3 percent of vendors in EBT States ($p < 0.001$). Similarly, 45.7 percent of vendors in paper-based States allowed a minor substitution during the CVV study, compared to only 19.0 percent of vendors in EBT States. There are some variations across stores transacting EBT benefits that warrant further consideration, such as whether a separate stand-beside device is used to enter the purchase information from which vendors are paid, as well as whether a generic PLU code is used for all fresh fruits and vegetables that must be entered manually, instead of using the PLU codes assigned to each item. Unfortunately, the small number of EBT vendors in the sample allowing minor substitutions on the base ($n = 23$) and CVV ($n = 35$) studies limits the ability to perform further analyses for this subgroup.

For the CVV study, 54.3 percent of vendors authorized by State agencies with low vendor-to-participant ratios (or few participants per vendor) allowed a substitution, compared to 41.2 percent of vendors authorized by State agencies with high vendor-to-participant ratios, and 30.2 percent of those authorized by State agencies with medium vendor-to-participant ratios.

2. Major substitutions

The small number of vendors in the sample allowing a major substitution in the base study ($n = 44$) prevented us from exploring associations between vendor characteristics and the likelihood of allowing a major substitution for this study. The CVV study yielded a slightly larger number of vendors in the sample that allowed a major substitution ($n = 95$), permitting us to perform some additional analyses to identify characteristics of vendors associated with a greater likelihood of committing this Program violation. Interestingly, no differences were seen with regard to the monthly volume of WIC sales or presence of scanning equipment. Stratification by other characteristics yielded unreliable estimates, preventing us from drawing inference to the entire population. It is noteworthy, however, that in both the base and CVV studies, major substitutions occurred less frequently among vendors transacting EBT benefits.

C. Comparisons to Previous Studies' Findings

The 2013 study findings vary somewhat from previous studies with regard to minor substitutions. Vendors are significantly less likely to allow minor substitutions for traditional WIC foods than in both of the previous studies ($p < 0.05$); however, no changes were seen with regard to the proportion of vendors allowing major substitutions of WIC foods. The decline in minor substitutions, though, is tempered by the high rate of both minor and major substitutions that are allowed with the CVV or CVB, which became part of the Program after the 2005 study.

Table V-2 Percentage of vendors allowing major and minor substitutions in the 1998, 2005, and 2013 WVMS

	1998 Study	2005 Study	2013 Base Study	2013 CVV Study
	Percentage (SE)	Percentage (SE)	Percentage (SE)	Percentage (SE)
Minor substitutions	34.7 (2.65)*	27.8 (2.20)*	18.4 (1.88)	42.4 (3.00)
Major substitutions	3.7 (0.75)	6.5 (1.30)	5.6 (1.10)	18.2 (2.64)

*Statistically significant difference when compared to 2013 base study at $p < 0.05$.

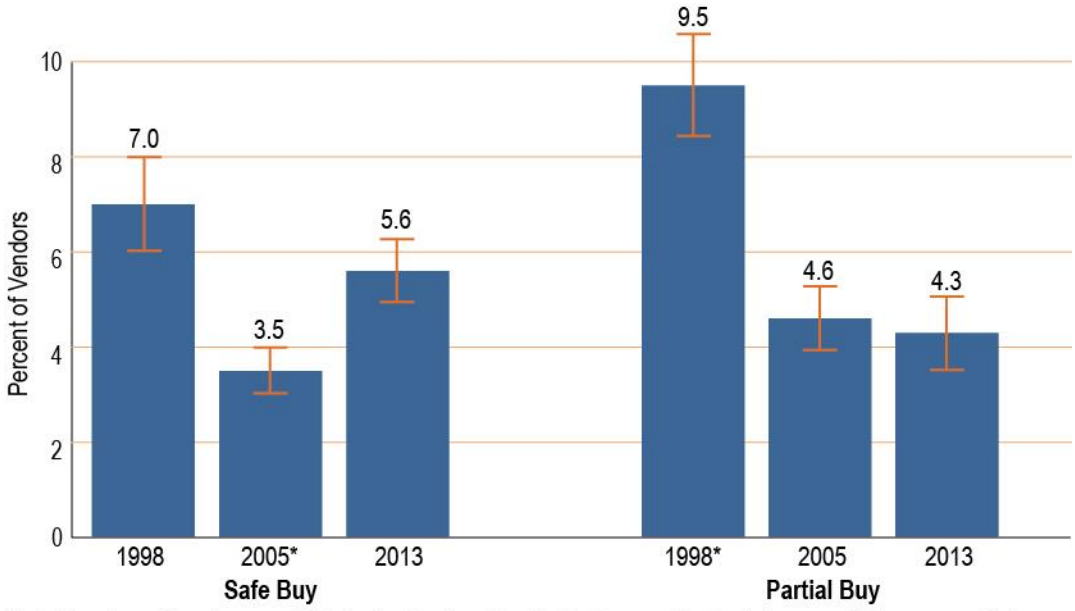
As described in chapter I, this study is part of a larger FNS effort to ensure WIC Program integrity and to comply with the IPIA, which requires FNS to estimate IPs in programs of a certain size. Vendors sampled for the study were provided with multiple opportunities to commit an IP. For purposes of this study, overcharges, undercharges, and rainchecks were considered IPs and examined exclusively for the safe and partial buys. Both the rate of improper payments and the national estimate of IPs are presented in this chapter. Findings relative to IPs are based primarily on results of the safe buy (similar to the 2005 report), although overall rates are presented for the partial buy as well.

Additionally, because only one vendor offered a raincheck during the base study and no vendors offered rainchecks during the CVV study, no further analysis of rainchecks was conducted. Moreover, the value of the raincheck that was offered could not be determined based on the food item data that was collected during this buy, so it is not accounted for in the national estimates of IPs presented in section C.

A. Overcharge

Overall, 5.6 percent of vendors overcharged during the base study safe buy. This respresents a significant increase since 2005, when only 3.5 percent of vendors committed this violation ($p < 0.05$). For partial buys, however, the rate of overcharge was unchanged: 4.3 percent compared to 4.6 percent for the 2005 study (figure VI-1). For the CVV study, 5.2 percent of vendors overcharged during the safe buy and 7.4 percent of vendors overcharged during the partial buy.

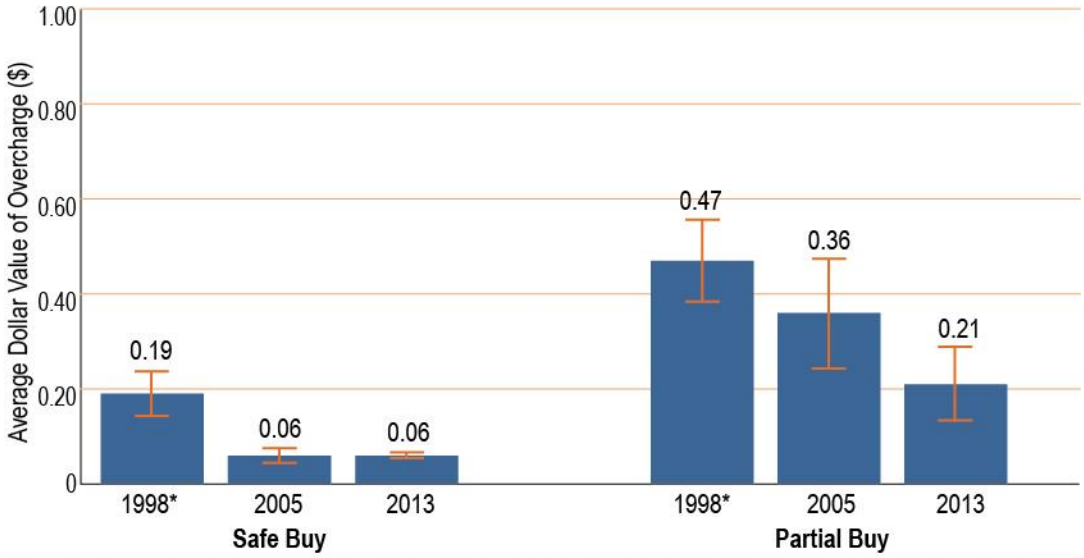
Figure VI-1 Percentage of vendors overcharging in the 1998, 2005, and 2013 WVMS



Note: Results are based on a weighted estimate of vendors that had a completed safe buy or partial buy, respectively.
*Statistically significant difference when compared to 2013 base study at p <0.05.

For the base study, which is most comparable to previous studies, the average dollar values of overcharge were $0.06 (safe buy) and $0.21 (partial buy) across all vendors for the safe and partial buys, respectively. As depicted in figure VI-2, these findings indicate no change in the average value of overcharge for the safe buy and a decrease in this value for the partial buy compared the 2005 study. The average value of overcharge for the CVV study was even more modest at $0.03. It is important to note that during the CVV study safe buy, CBs were instructed to purchase as close to the maximum value of the CVV or CVB as possible, leaving vendors limited opportunity to overcharge by an exorbitant amount; this is directly reflected in the modest average value of overcharge for the CVV study safe buy ($0.03). The average value of overcharge during the CVV study partial buy was $0.11, which is also modest compared to the base study.

Figure VI-2 Average dollar value of overcharge in the 1998, 2005, and 2013 WVMS



Note: Results are based on a weighted estimate of vendors that had a completed safe buy or partial buy, respectively.
*Statistically significant difference when compared to 2013 base study at p <0.05.

When limited to vendors that overcharged, the average dollar value of overcharge was $1.08 and $0.61 during the safe buy and $4.88 and $1.46 during the partial for the base study and the CVV study, respectively.

1. Vendor and transaction characteristics associated with overcharge

For the base study, reliable point estimates were produced for and compared by vendor size, volume of WIC sales, receipt of a routine monitoring visit in the previous year, use of scanning equipment, and whether the CB saw the cashier enter the purchase price on the FI. Several of these were significantly associated with vendors overcharging during the safe buy, including vendor size, volume of WIC sales, and use of scanning equipment—the same three characteristics that were associated with overcharge in the 2005 study:

- **Number of registers.** Smaller vendors, with two or fewer registers, were most likely to have overcharged the WIC Program (14.4 percent), compared to 4.2 percent of vendors with three to seven registers and 2.8 percent of vendors with eight or more registers ($p < 0.001$).

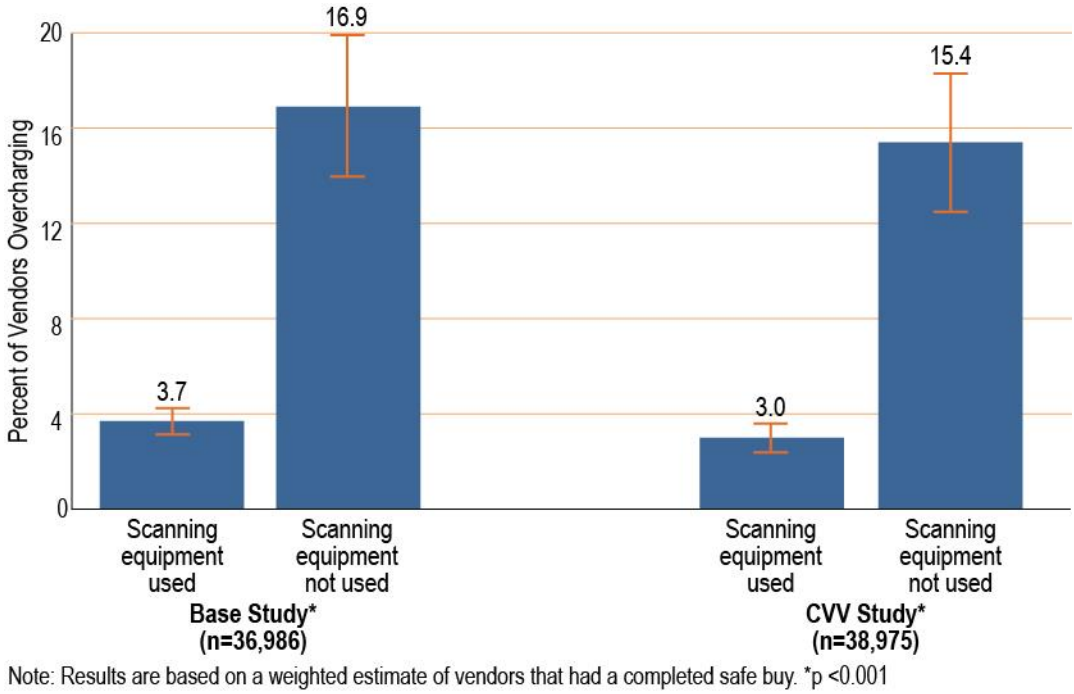
- **Volume of WIC sales.** The proportion of vendors committing this violation decreased as vendors' monthly volume of WIC sales increased: from 9.9 percent of vendors with less than $2,775 per month in WIC sales to 3.6 percent of vendors with $15,880 or more in WIC sales per month ($p < 0.01$).
- **Scanning equipment.** Vendors that did not have or did not use scanning equipment were significantly more likely to overcharge (16.9 percent) than vendors that did (3.7 percent; $p < 0.001$; see figure VI-2).

Although similar trends relative to vendor size and volume of WIC sales were observed for the CVV study, due to the relatively small number of overcharges that occurred, these estimates are not considered reliable. Associations between overcharge and two transaction characteristics, however, were highly significant:

- **Scanning equipment.** Similar to the base study, vendors that did not have or did not use scanning equipment during the CVV study safe buy were significantly more likely to overcharge (15.4 percent) than vendors who did (3.0 percent; $p < 0.001$; see figure VI-3).
- **Purchase price entered.** Likewise, 20.3 percent of vendors who did not enter the purchase price on the CVV (or did without the CB seeing it) overcharged the WIC Program, compared to only 2.9 percent of vendors that either entered the purchase price in front of the CB or had the CB enter the purchase price ($p < 0.001$).

The latter association was limited to vendors in paper-based States since vendors in EBT States are not required to enter the purchase price.

Figure VI-3 Percentage of vendors overcharging during the safe buy, by use of scanning equipment, base and CVV studies



Note: Results are based on a weighted estimate of vendors that had a completed safe buy. *p <0.001

2. Vendor management practices associated with overcharge

Because all State agencies will be required to implement an EBT system by 2020, it is important to understand the influence that this shift could have on vendor compliance. To this end, overcharge rates were compared by benefit type (EBT versus paper FIs). For the base study safe buy, 5.7 percent of vendors authorized by State agencies with paper FIs overcharged the WIC Program, compared to 4.7 percent of vendors in EBT States. This difference is not statistically significant. Benefit type was significantly related to overcharge, however, for the CVV study. Vendors authorized by State agencies with paper FIs were more likely to overcharge WIC (5.5 percent) than vendors authorized by States with EBT systems in place (2.7 percent; $p = 0.05$). Despite its influence on the rate of overcharge for the CVV study, benefit type did not influence the average dollar value of overcharge for either study.

Vendor-to-participant ratio was also examined but was not significantly related to overcharge for either study.

3. Odds of vendors overcharging when also committing an administrative violation

Similar to the 2005 study, provision of a receipt was associated with overcharge. Vendors that failed to provide a receipt during the base study safe buy were 13.9 times more likely to overcharge the WIC Program than vendors that did provide a receipt (95 percent CI: 8.5 to 22.9) and 8.2 times more likely during the CVV study safe buy.

Although improper countersignature procedures were not associated with overcharge for the base study safe buy, similarly to the 2005 study, they were associated with overcharge during the CVV study. Vendors that employed improper countersignature procedures during the CVV study safe buy were 3.8 times more likely than vendors that had the CB sign the FI after the purchase price was entered (95 percent CI: 1.7 to 8.2). Cashier familiarity was also examined but not significantly related to overcharge for either study.

4. Multivariate models used to examine vendors' proclivity to overcharge

In order to more fully understand the types of vendors that are more likely to commit an overcharge, a variable was created to identify vendors who committed an overcharge on either the safe or partial buys, among those who received three visits, and logistic regression models were developed to identify vendor and State agency-level characteristics that are strong predictors of overcharging. In all, 7.9 percent of vendors in the base study overcharged the WIC Program during at least one of the buys, while 10.9 percent did so during the CVV study. These proportions are higher than reported in the previous section on overcharges for the individual buy types (safe and partial), because very few vendors overcharged on both buys (5.6 and 4.3 percent, respectively). As such, given more opportunity (two chances), more vendors committed an overcharge.

Bivariate associations between overcharging at least once and vendor characteristics, as well as State agency policies, were similar to those reported in the previous sections (see tables in appendix H). For this analysis, however, highly correlated characteristics were regrouped to simplify the models and provide a more robust representation of the types of vendors committing overcharges. As such, the number of registers and presence of scanning equipment were regrouped into a three-category indicator (zero to two registers and no scanning equipment, zero to two registers and scanning equipment, and three or more registers), and the benefit delivery method was grouped with State

agency policies requiring provision of receipts to produce a three-category State agency-level characteristic (paper FIs and no receipt required, paper FIs and receipt required, and EBT).

For the base study, four characteristics were found to significantly increase the odds of committing an overcharge, as shown in table VI-1 below.Vendors with zero to two registers and no scanning equipment were nearly 7 times more likely to have committed an overcharge than vendors with three or more registers, while those with zero to two registers and scanning equipment were 3.7 times more likely. Vendors authorized by State agencies using paper FIs that do not require a receipt were three times more likely than vendors in EBT States to have committed an overcharge. Interestingly, vendors transacting paper FIs that were required to provide a receipt were no more likely to have committed an overcharge than vendors in EBT States (odds ratio (OR) 1.16; 95 percent CI: 0.62 to 2.14). Additionally, vendors identified as high risk were 2.3 times more likely to have committed an overcharge than those that were non-high-risk vendors, and vendors in the lower half of WIC sales volume (<$7,125 per month) were almost twice as likely as vendors with higher volumes of sales to have done so.

Table VI-1 Unadjusted and adjusted odds of vendors overcharging at least once, logistic regression model findings, base study

Base Study	OR	95% CI	*p*-Value (t-test)	AOR*	95% CI	*p*-Value (t-test)
Registers and scanning equipment						
0-2 registers, NO scanning equipment	7.0	4.41,11.01	<0.0001	5.0	3.04,8.31	<0.0001
0-2 registers, YES scanning equipment	3.7	2.03,6.88	<0.0001	3.8	2.09,7.06	<0.0001
3 or more registers	REF	--	--	REF	--	--
Volume of WIC sales in FY 2011 (monthly average)						
Low (<$7,125)	1.9	1.31,2.85	0.0010	1.4	0.96,2.14	0.0761
High ($7,125 or more)	REF	--	--	REF	--	--
Identified as high risk by WIC State agency						
Yes	2.3	1.35,3.98	0.0027	1.2	0.65,2.05	0.6170
No	REF	--	--	REF	--	--
Benefit delivery and receipt requirement						
Paper FIs / NO receipt required	3.0	1.73,5.32	0.0002	2.7	1.35,5.50	0.0057
Paper FIs / YES receipt required	1.2	0.62,2.14	0.6421	1.2	0.60,2.49	0.5752
EBT / receipt required (true for all EBT states)	REF	--	--	REF	--	--

*Model includes all significant predictors.

Each of these four characteristics associated with a vendor's proclivity to overcharge were included in a multivariate logistic regression model. The results of this model are also shown in table VI-2, which shows the adjusted odds ratios for each characteristic in the model. The odds of overcharging was tempered somewhat for vendors with zero to two registers and no scanning equipment (adjusted odds ratio (AOR) 5.0, 95 percent CI: 3.04 to 8.31) and vendors authorized by State agencies with paper FIs and no receipt required (AOR 2.7, 95 percent CI: 1.35 to 5.50); however, these two vendor characteristics remained the strongest predictors of overcharging. Volume of WIC sales and high-risk status were no longer significant predictors of overcharging. It is worth noting, however, that variables included in the model may be correlated, and this collinearity may have an impact on the stability of the parameter estimates for those predictors. Multicollinearity occurs when two or more variables in a logistic regression model are highly correlated. The presence of multicollinearity does not reduce the predictive power of the overall model but can affect individual predictors and not produce valid results for a specific predictor variable, such as high-risk status.

Similar findings were found with regard to the CVV study, though the strength of association was much greater between specific vendor characteristics and the likelihood of overcharging. Vendors with zero to two registers and no scanning equipment were 12.5 times more likely to overcharge than vendors with three or more registers, while those with fewer registers and scanning equipment were 4 times more likely. Vendors with lower volumes of WIC sales, as well as those identified as high-risk, were more than twice as likely to have overcharged at least once, compared to those with higher volumes of WIC sales and non-high-risk vendors, respectively. Vendors in urban areas were three times more likely than those in small and isolated rural towns to have overcharged. State agencies with paper FIs that do not require a receipt also saw a significantly higher odds of overcharging among vendors (OR 4.6; 95 percent CI: 2.37, 8.93).

Table VI-2 Unadjusted and adjusted odds of vendors overcharging at least once, logistic regression model findings, CVV study

CVV Study	OR	95% CI	*p*-Value (t-test)	AOR	95% CI	*p*-Value (t-test)
Registers and scanning equipment						
0–2 registers, NO scanning equipment	12.5	7.34,21.45	0.0000	10.0	5.51,18.19	0.0000
0–2 registers, YES scanning equipment	4.2	1.81,9.64	0.0010	5.3	2.17,12.88	0.0003
3 or more registers	REF	--	--	REF	--	--
Volume of WIC sales in FY 2011 (monthly average)						
Low (<$7,125)	2.5	1.43,4.25	0.0013	1.6	0.86,2.77	0.1413
High ($7,125 or more)	REF	--	--	REF	--	--
Identified as high risk by WIC State agency						
Yes	2.1	1.19,3.57	0.0101	0.7	0.37,1.34	0.2771
No	REF	--	--	REF	--	--
Geographic location						
Urban	3.1	1.35,7.22	0.0084	**2.9**	**1.11,7.37**	**0.0299**
Large rural city/town	1.1	0.27,4.54	0.8841	1.5	0.33,7.07	0.5909
Small or isolated rural town	REF	--	--	REF	--	--
Benefit delivery and receipt requirement						
Paper FIs / NO receipt required	4.6	2.37,8.93	0.0000	2.5	1.15,5.57	0.0219
Paper FIs / YES receipt required	2.0	0.84,4.59	0.1164	1.5	0.66,3.59	0.3154
EBT / receipt required (true for all EBT States)	REF	--	--	REF	--	--

*Model includes all significant predictors.

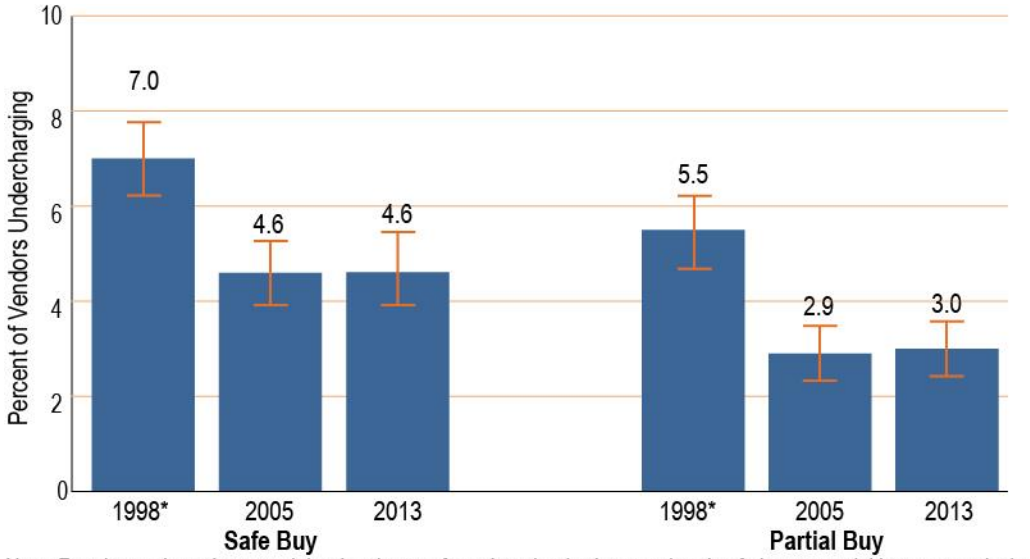
Three vendor characteristics remained significant after adjusting for all significant predictors of overcharging in the final model. While the odds of overcharging were somewhat lower than in the unadjusted model, vendors with zero to two registers and no scanning equipment were 10 times more likely than those with three or more registers to have overcharged (95 percent CI: 5.51 to 18.19). Vendors with zero to two registers and scanning equipment were also more likely than those with more registers to have overcharged (AOR 5.3; 95 percent CI: 2.17 to 12.88). Urban geography also remained a significant predictor of overcharging (AOR 2.9; 95 percent CI: 1.11 to 7.37), as did being authorized by a State agency that issued paper FIs and did not require a receipt (AOR 2.5; 95 percent CI: 1.15 to 5.57). Volume of WIC sales and high-risk status were no longer predictive of vendors' proclivity to overcharge in the adjusted models.

B. Undercharge

Overall, 4.6 percent of vendors undercharged during the base study safe buy—the same percentage that undercharged in the 2005 study. The rate of undercharge was lower during partial buys. Only 3.0 percent of vendors undercharged during the base study partial buy, compared to 2.9 percent during

the 2005 study (see figure VI-4). A slightly larger percent of vendors undercharged during the CVV study safe buy (5.0 percent) compared to the base study safe buy. However, only 2.4 percent of vendors undercharged during the CVV study partial buy, which is 50 percent lower than the rate for CVV safe buys.

Figure VI-4 Percentage of vendors undercharging in the 1998, 2005, and 2013 WVMS

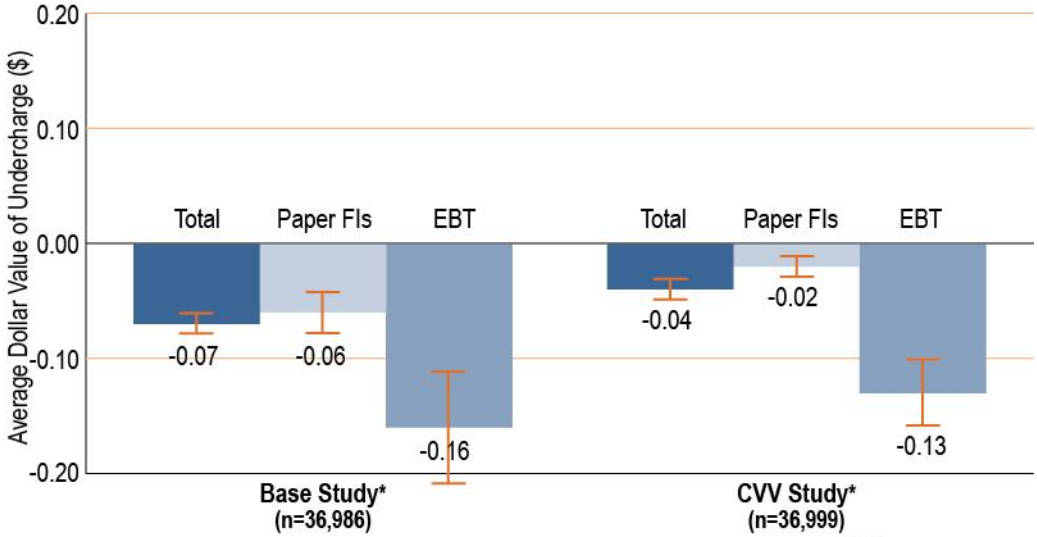


Note: Results are based on a weighted estimate of vendors that had a completed safe buy or partial buy, respectively.
*Statistically significant difference when compared to 2013 base study at p <0.05.

Overall, the average dollar value of undercharge was $0.07 and $0.04 across all vendors during the base study and CVV study safe buys, respectively. When limited to only those vendors that undercharged, the average dollar value of undercharge was $1.53 and $0.69 for the base and CVV studies, respectively.

Unlike overcharges, the average dollar value of undercharge was statistically significantly different for paper FIs and EBT during the base study safe buy—$0.06 and $0.16, respectively ($p < 0.05$). A similar difference was observed for the CVV study (see figure VI-5). The average dollar value of undercharge was also statistically significantly different by food package type during the base study safe buy. The average value was $0.11 for an infant package and only $0.03 for a child package.

Figure VI-5 Average dollar value of undercharge by benefit type



Note: Results are based on a weighted estimate of vendors that had a completed safe buy. *p <0.05.

Because undercharges are not favorable toward vendors, when they occur, they most likely occur inadvertently. Interestingly, there are several factors associated with undercharge for the base study safe buy, including vendor size, use of scanning equipment, and provision of a receipt, and the findings are similar to those for overcharge:

- **Number of registers.** Smaller vendors were most likely to have undercharged the WIC Program (12.3 percent), compared to 3.4 percent of vendors with three to seven registers and 2.0 percent of vendors with eight or more registers ($p < 0.01$).
- **Scanning equipment.** Vendors who did not use scanning equipment were significantly more likely to undercharge (18.3 percent) than vendors who did (2.7 percent; $p < 0.01$).
- **Receipt provision.** Vendors who failed to provide a receipt were 5.7 times more likely to undercharge the WIC Program than vendors who did provide a receipt (95 percent CI: 3.3 to 9.7) and 6.1 times more likely during the CVV study safe buy (95 percent CI: 3.1 to 11.8).

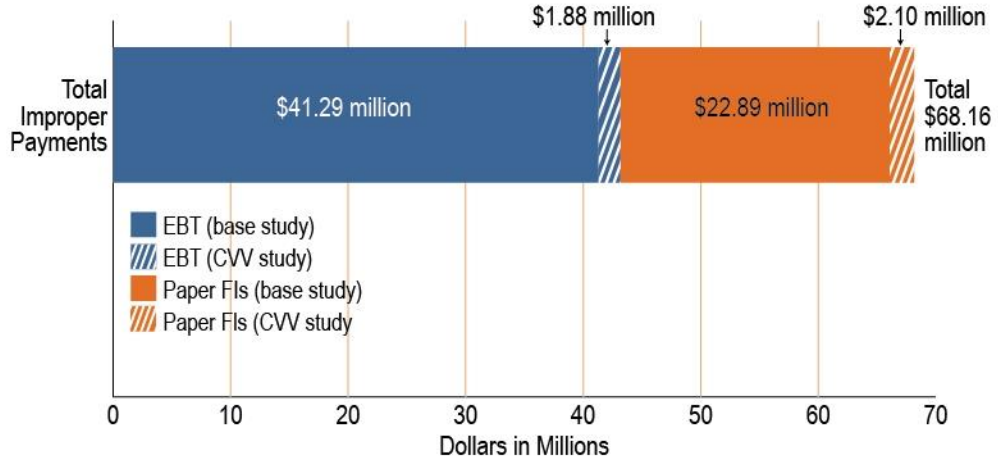
Similar trends were observed for the CVV study with regard to vendors size and use of scanning equipment. However, valid comparisons could not be made due to too few vendors in each cateogry committing this violation (see appendix H).

C. National Dollar Estimate of Improper Payments

National estimates of IPs were developed overall and separately for the base and CVV study as well as benefit type (EBT versus paper FIs) using the approach described in chapter II. The total amount of IPs was determined by summing the absolute value of the national estimate of overcharge and the national estimate of undercharge. Again, these estimates are based on results of the safe buy only. The total national dollar estimate of IPs is $68.2 million (95 percent CI: $39.8 to 96.5 million). IPs relative to CVVs and CVBs account for only 5.8 percent ($4.0 million) of the national dollar estimate, while traditional WIC foods (base study) account for the remaining $64.1 million of this total. This difference is a direct reflection of the relative value of these benefits. Participants receive $10 in benefits with a cash value at most each month, compared to food packages for fully formula fed infants that are worth in excess of $100, for example. As depicted in figure VI-6, vendors in EBT

States account for a greater proportion of IPs (approximately 63 percent overall) compared to vendors authorized by State agencies with paper FIs.

Figure VI-6 National dollar estimate of improper payments

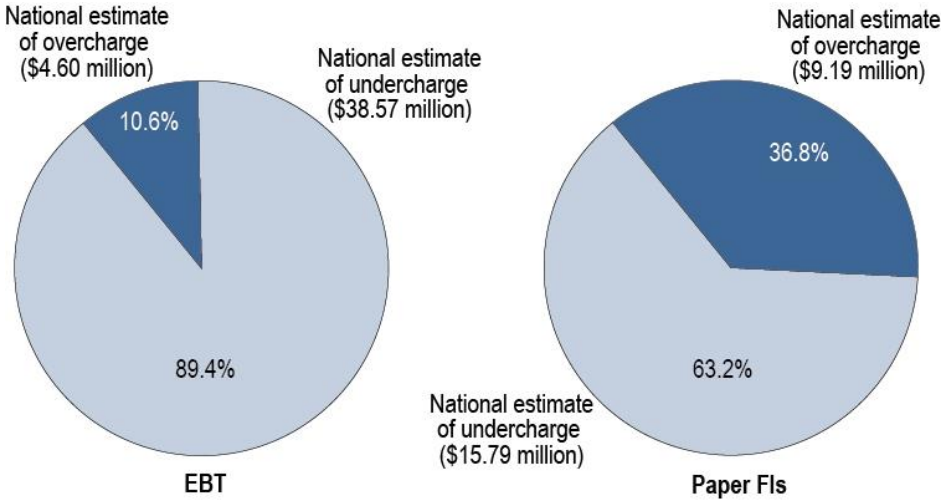


Although the national dollar estimate of IP for the current study is not directly comparable to those from previous studies, it is interesting to note two important similar trends. First, similar to 2005, undercharges account for the majority of IPs that are made in the WIC Program. Approximately 80 percent ($54.4 million) of the total national estimate of IP is attributed to undercharges, while 20 percent ($13.8 million) can be attributed to overcharges.

Second, because the national estimate of undercharge far exceeds the national estimate of overcharge, the net value of these two violations is negative (-$40.6 million). In other words, overall, vendors charge WIC less than they should for the foods that they distribute to Program participants.

These trends hold true regardless of benefit type. However, as depicted in figure VI-7, the national estimate of overcharge accounts for a much smaller proportion of the total national estimate of IP in EBT than it does for paper FIs—10.6 percent compared to 36.8 percent, respectively.

Figure VI-7 Proportion of total national estimate of IPs attributed to over- and undercharge



Chapter VII: Conclusions and Recommendations

The evidence presented in this study suggests that some of the changes made to the WIC Program since the 2005 study directly affect and improve the rate and dollar value of IPs. While some significant improvements were observed relative to previous studies, these positive findings are tempered to some extent by the higher rates of some errors and violations that were observed when vendors transacted the CVV or CVB. This chapter provides a summary and discussion of the key findings, study limitations, and a set of recommendations.

A. Conclusions and Discussion

Vendor allowance of buyer-initiated substitutions has declined for traditional WIC benefits but is disproportionately high for benefits with a cash value.

Unlike under- and overcharges or administrative errors, substitutions require the WIC participant to initiate the action or, in some cases, respond to an offer made by store employees. Substitutions can happen by the participant either bringing the unauthorized food to the cash register for purchase or accepting a substitution initiated by the cashier. As previously described, it is the cashier's responsibility not to allow the substitution to take place. It is not known how many participants try to substitute unauthorized foods for WIC authorized foods, but presentation of unauthorized foods could happen on purpose or by accident. Typically, the cashier can rely on the POS system to identify the item as WIC allowable or not or simply allow the substitution to go through by using an override key. However, in some cases, cashiers might need to rely on their knowledge of the WIC Program or refer to the State agency's allowable food list. This is especially true for the CVV or CVB. Since variable weight produce is not scanned but rather identified by using a PLU code and then weighed, it is up to the cashier to determine whether the item is allowable. White potatoes, which were the unauthorized item that CBs most frequently attempted to purchase during the minor substitution buy, have long been suspected as a "problem" food item. Not only do the findings from this study indicate that substitutions are a chief concern with the relatively new CVV or CVB, but they also help support the hypothesis that white potatoes in particular are problematic.

Findings suggest that EBT helps to mitigate substitutions, but the rate of minor substitutions with the cash value benefit are still high.

The study findings indicate that EBT significantly reduces the rate with which vendors allow minor substitutions—less than half the rates observed in paper-based States for both the base and CVV studies. However, the rate of minor substitutions among vendors in EBT States was much higher for the CVV study compared to the base study, which helps to substantiate the conclusion that cashier discretion relative to variable-weight produce items most likely influences the allowance of minor substitutions. Also, despite a limited ability to draw inference, the findings suggest that EBT may reduce the incidence of major substitutions as well.

EBT appears to have a limited impact on the overall rate of overcharge which has increased since 2005.

The increase in the rate of overcharge is somewhat perplexing due to the fact that, until this study was conducted, it has steadily declined since 1991. Several factors were found to be associated with overcharge, including small vendor size, lower volume of WIC sales, not scanning WIC items, and

failing to provide a receipt. However, none of these associations help to explain the significant increase in the rate of overcharge, because overall the proportion of WIC vendors exhibiting these characteristics has declined since 2005.

Interestingly, many stakeholders assume that because WIC transactions are even more automated in EBT compared to paper FIs, overcharges will occur less frequently. As evidenced by this study, EBT does not significantly reduce the rate of overcharge during traditional WIC buys, and clearly there are numerous ways in which an overcharge can occur even in EBT. For example, overcharges can occur when a food item is swiped twice, either intentionally or inadvertently, and deducted from the participant's benefit even though they only purchased one of that particular item. Overcharges can also occur if an item is on sale but WIC is charged the full price, not the sale price for the item. There may be additional ways in which an overcharge can occur in WIC EBT; determining the mechanism of overcharge was outside the scope of the study.

It is important to note that revisions to the current study's design relative to the 2005 study, namely the pairing of buys for the base and CVV study, might have influenced the rate of overcharge. Buy types for the base and CVV studies were strategically paired to allow us to differentiate between substitutions permitted during the separate studies and to reduce the likelihood that multiple substitution attempts during one visit or purchase would affect the results of one or both studies. As such, safe buys were paired with substitution buys. While the impact that this pairing of buys had on the outcome of the transaction(s) cannot be measured, most likely the impact was minimal among vendors authorized by State agencies with paper FIs, because the traditional FI and CVV were transacted separately. This is not the case for EBT, however. As previously described, in EBT States, the base and CVV study buys were completed during a single transaction. Although this might seem like a flaw in the study's design, arguably, this type of transaction, where traditional and cash value WIC benefits are used during the same transaction, is the norm in WIC EBT. Thus, any resulting increase in the rate of overcharge is real and should be considered valid and comparable to previous studies.

While the rate of undercharge remains the same, the average value of undercharge has increased and is greatest among vendors in EBT States.

Overall, the rate of undercharge remained unchanged between 2005 and 2013. Although this finding is not too surprising, one might expect the rate of this presumably unintentional IP to have declined with the increased automation of WIC transactions (e.g., use of scanning equipment, EBT). However, as with overcharge, there are still opportunities for a vendor to undercharge the WIC Program, even with EBT. For example, similar to the examples provided relative to overcharge, undercharges can occur when two or more of the same food item is purchased but the item is only scanned and deducted from the benefit once. Interestingly, even though EBT does not appear to influence the rate of undercharge, it does influence the average dollar value of the undercharge. Again, the reasons for this are unclear but may warrant further examination.

The two most common administrative errors—improper countersignature and failure to provide a receipt—are both associated with more serious vendor violations.

Improper countersignature procedures and failure to provide a receipt are the two most common administrative errors committed by vendors. Compared to the 2005 study, rates of improper countersignature remained unchanged, and rates of failure to provide a receipt decreased significantly. However, because both errors are related to a vendor's likelihood to commit an IP, the frequency with

which they still occur is concerning. Because improper countersignature procedures are not relevant in EBT, this administrative error will phase out as more State agencies make the transition from paper FIs. Moreover, because vendors in EBT States are significantly more likely than vendors authorized by State agencies with paper FIs to provide a receipt, the rate with which this error occurs is also likely to decrease as more State agencies transition to EBT.

There was a significant increase in the percentage of vendors with insufficient stock.

Insufficient stock was more common among vendors in the 2013 study compared to vendors in the 2005 study. This is most likely attributed to the large number and variety of foods that vendors have been required to carry since the new Program rules were implemented in 2009. Again, these rules incorporated the issuance of additional foods, including whole grains and fruits and vegetables, as well as a greater variety of some foods (e.g., low- or reduced-fat milk instead of just whole milk). As such, vendors authorized by the WIC Program are required to carry these items in accordance with their State agency's minimum stocking requirements. These criteria are typically designed to be easy for most vendors of all sizes to meet but also help to ensure that a WIC participant will be able to purchase the items issued to them through the Program. Findings from this study suggest that WIC vendors are having some trouble meeting these requirements. This is particularly true of smaller vendors, as evidenced by their higher rates of insufficient stock.

B. Study Limitations

There are five primary limitations of this study that warrant attention. First, with regard to both traditional benefits and benefits with a cash value, there is no way of knowing the frequency with which participants attempt each type of buy: safe, partial, and substitution. As part of this study, each vendor was presented with one opportunity to demonstrate how they would act in each scenario, and the estimates presented in this report are based their responses. Without knowing how frequently each type of scenario presents itself, it was best to use a conservative approach in calculating the national estimate of IPs by using only the results of the safe buys. This may, however, underestimate the total amount of IP, as partial and substitution buys may offer vendors additional opportunities to overcharge the Program.

The second limitation is similar in scope, but specific to the estimate of IPs for the CVV study. Based on information from other previous WIC studies, it is common knowledge that many participants, at least in paper-based States, do not use the full amount of their CVV, either by choice or because vendors are not permitted by the State agency to allow split tender. For this reason, CBs were instructed to purchase at or near the full amount of their voucher during the CVV "safe buy." Again, this may result in a more conservative estimate of IPs, since the study cannot account for the number of opportunities that vendors are given to overcharge or the dollar amounts of those opportunities, which could vary depending how much of the cash value was used legitimately.

Third, the estimates do not take into account many of the pre- and post-edit screens that State agencies have put in place to reduce the likelihood of administrative errors and IPs. In addition to the MAR and NTE values, which could be accounted for in most cases, WIC agencies screen for purchase amounts exceeding a percentage above the average FI redemption, redemptions attempted after the last date to use, missing signatures (paper-based States), missing vendor IDs, altered purchase prices, and altered signatures. In most State agencies participating in this study, FIs created for the compliance buys were created through the State agencies' vendor compliance sections, so these types of screens were waived. For this reason, it cannot be known, for instance, how many altered purchase prices would

have resulted in payments to vendors being rejected. Additionally, participants in EBT States who are erroneously debited for items that they did not purchase have the ability to contest a purchase and regain those benefits. Subsequently, the State agency is able to retroactively reduce their payment to a vendor in the event that it erroneously debited a participant for items that she did not purchase. This could happen if a vendor accidentally scans two cans of formula twice, charging the WIC Program for four cans. If the participant notices that she was debited more than she should have been, she can contact the WIC Program to correct the error. The study could not take this into account when developing estimates of IPs, because the frequency with which these types of postpayment corrections are made is unknown.

As mentioned above, the frequency with which substitutions are attempted by participants is unknown, thus this study can only present the frequency with which vendors allowed a substitution when presented with the opportunity, not how frequently vendors do so in the real world. In fact, it is assumed that for most participants, presenting vendors an opportunity to allow a substitution is not the norm. However, this may change as WIC moves to EBT and vendors are increasingly presented with mixed-basket purchases, at least in an online EBT environment.Still the use of UPC databases and APLs should eliminate or decrease the need for cashier discretion in these situations.

A fourth limitation is inherent in the study design, as the sample was not drawn to conduct subgroup analyses by each type of vendor characteristic. This, combined with the small number of vendors committing errors and IPs, in many cases limited the study's ability to explore the vast array of vendor and State agency-level characteristics that might be associated with these violations.

Finally, while compliance buys were conducted covertly, the study cannot account for how vendors might behave differently when transacting purchases for familiar or frequent WIC participants who might even be family members or friends. This could ultimately result in underestimates of violations.

C. Recommendations

Despite some positive findings, this study helps to identify the challenges that remain or that have emerged in the wake of several major Program changes. Because the findings are based on a nationally representative sample of vendors, the recommendations provided in this section are relevant for all State agencies and at the Federal level as appropriate.

Conduct further research to understand compliance issues in EBT and how they can be measured.

It was anticipated that the current study would serve as the new baseline to which all future WVMSs would be compared. After conducting the study, however, it is clear that some additional revisions to the study design that address issues related to EBT will enhance FNS's ability to measure compliance in an EBT environment. FNS and key stakeholders should come together to discuss compliance relative to EBT and confer on what constitutes an IP. FNS should also consider revising the information requested through annual WIC State Plans to be more relevant to the vendor management and retail food delivery practices and policies employed by States with EBT. Additionally, a feasibility study aimed at testing a streamlined compliance buy data collection instrument designed explicitly for use in EBT States should be conducted. This issue is paramount since all WIC State agencies will have transitioned to EBT by the time that the next WVMS is conducted.

Strongly encourage vendors to use scanning equipment when conducting WIC transactions.

Currently, the WIC Program does not require its vendors to have or to use scanning equipment when completing WIC transactions. Most likely, this is because small stores, which are least likely to have scanning equipment, are critical to ensuring that Program participants have access to WIC foods in some areas. However, because vendors that do not use scanning equipment are significantly more likely to overcharge or undercharge the WIC Program or to allow a substitution, State agencies should consider using scanning equipment as a selection criteria when participant access is not a factor. Also relevant is the fact that one out of four vendors in EBT States uses a stand-beside device to complete WIC transactions. Although it was not possible to examine the rate of IPs among EBT vendors by this characteristic, the limitations of this technology may lead to higher rates of Program violations among vendors that use a stand-beside device compared to vendors that use fully integrated POS systems. As such, this characteristic should be examined more closely as State agencies transition to EBT and, if warranted, used by State agencies as a selection criteria in the future.

State agencies should require vendors to provide a receipt.

At the time of data collection, only 24 of the 40 State agencies included in the study required vendors to provide a receipt; yet, similarly to the 2005 study, provision of a receipt is significantly related to the accuracy with which a vendor completes a WIC transaction. All six EBT States in the study require vendors to provide a receipt perhaps because receipts provided by vendors in EBT States convey information about the benefits remaining on an EBT card to the participant. Most likely, more State agencies will adopt this policy as they transition to EBT. Nevertheless, State agencies, particularly those issuing paper FIs, should be reminded of the importance of this policy because of its relevance to ensuring payment accuracy.

FNS should take a closer look at WIC EBT transactions that involve the use of a loyalty card.

With the adoption of EBT, WIC has gained access to detailed information on the foods participants purchase with their benefits. This information proved to be extremely useful in the examination of IPs. Since food item-level price data, including the price submitted by the vendor and the price paid by the State agency, were included in the reconciliation files obtained from EBT States, it was possible to identify a type of overcharge that might not otherwise have been detected. Through a thorough review of each EBT transaction that potentially included an IP, a number of cases were identified where CBs were asked to scan their store discount card; if they did not have one, the cashier scanned a store card for them. In these cases, the receipt reflected the discounted food item price, but the vendor still submitted or requested the full price for those items from the WIC Program. Clearly, the cashiers were doing the right thing by offering the WIC participant the discounted price. However, during the reconciliation process, that discounted price was not passed on to the WIC Program. It is possible that vendors are not clear on the rules surrounding these circumstances or that they have intentionally designed the POS system to charge WIC the full price even when a discount is available. Either way, State agencies need to be aware of this issue, provide clear instructions to vendors regarding their expectations, and enforce any relevant policies.

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Appendices A-D

Appendix A: Key Analytic Variables and Data Sources

WIC Vendor Management Study Key Analysis Variables	DATA SOURCES			
	State plan abstraction	TIP	CB	State agency reconciliation data
Vendor characteristics				
Type of WIC vendor		x		
Geographic location (RUCA)		x	x	
Number of registers			x	
Volume of WIC sales		x		
High-risk status		x		
Specific high-risk indicators		x		
Number of routine monitoring visits in previous year		x		
Type of training received in previous year		x		
Transaction characteristics				
Use of scanning equipment			x	
For EBT: Stand-aside kiosk used to scan WIC items			x	
FI Characteristics				
Food package type (Woman, Child, Infant)			x	
Buy type (Safe, partial, substitution)			x	
Vendor management characteristics and State policies				
Benefit type (paper/EBT)			x	
Vendor-to-participant ratio	x	x		
Allowance of partial buys	x			
Requires store to provide receipt with WIC transaction	x			
Frequency of trainings	x			
Frequency of monitoring and compliance visits	x			
Whether inventory audits are conducted	x	x		
For CVV/CVB: Requires or allows vendors to accept split tender	x			
For CVV/CVB: Requires PLU codes to be used versus having generic WIC produce code	x			
Administrative errors (see *Administrative Error Variable Development* section below)				
For non-EBT: Improper countersignature procedures			x	

WIC Vendor Management Study Key Analysis Variables	DATA SOURCES			
	State plan abstraction	TIP	CB	State agency reconciliation data
Provision of receipt			x	
Insufficient stock of WIC foods			x	
Cashier familiarity with WIC transactions			x	
Provision of credit or rain check for WIC foods			x	
For base study: Requiring participant to pay cash in addition to WIC FI			x	
Cashier would not allow CB to purchase an allowable item			x	
Cashier would not allow partial buy (when permitted by state)			x	
Violations resulting in improper payments				
CB offered cash or store credit for FI balance			x	
Major substitution allowed			x	
Minor substitution allowed			x	
Vendor undercharge			x	x
Vendor overcharge			x	x

Administrative Error Variable Development

Partial buy. Allowance of a partial buy was coded as a dichotomous variable, indicating whether or not the CB was permitted to purchase only a portion of their WIC foods, based on CB responses to the questionnaire. State WIC agencies differ on whether or not partial buys are permitted for traditional food items and infant formula. As such, we also created a dichotomous variable indicating whether a partial buy was improperly handled based on 1) whether or not the State allows partial buys and 2) whether the vendor allowed or did not allow the partial buy in accordance with that State's policy.

Failed to provide a receipt. CBs documented in the questionnaire whether a receipt was provided for each purchase transacted. Failure to provide a receipt is coded as a dichotomous variable (receipt provided, receipt not provided). In States that do not require a receipt to be provided, failure to provide a receipt is not considered a vendor violation and therefore these vendors are excluded from estimates of vendor violations related to providing a receipt. Failure to provide a receipt is, however, included for all vendors in modeling predictors of improper payments.

Improper countersignature. In States that use paper food instruments, improper countersignature was coded as a dichotomous variable based on CB responses to the questionnaire. The CB being asked to sign the food instrument after the cashier rang up the items, but before the price was entered on it; before the cashier rang up the items; or not being asked at all to sign, were all was coded as an improper countersignature procedures. Cases in which a transaction was not completed were coded to missing.

Insufficient stock. Insufficient stock was coded as a dichotomous variable, indicating whether or not sufficient stock was available to complete the buy as planned, based on CB responses to the questionnaire. CBs were asked to indicate whether or not there was sufficient stock of all items on their shopping list as well as of each specific item. A negative response to any of these was coded as insufficient stock.

Rain check/cash or credit given. Receipt of a rain check or cash or credit in exchange for any portion of the WIC food benefit was coded as a dichotomous variable based on CBs responses to the questionnaire or information entered about each specific food item purchased (e.g., CB indicated accepting a rain check for a specific food item at vendor's suggestion).

In States using paper checks, an additional question was asked specific to the CVV purchase, again to ascertain whether the CB "received cash or credit in exchange for any portion" of the CVV benefit. CBs also indicated whether the cashier gave them change for any amount of the CVV not used. A positive response to either of these questions resulted in an initial indication of having provided cash, credit, or rain check.

Cashier unfamiliar with WIC transactions. Cashier's familiarity with WIC transactions was determined for both the base and CVV studies from one single question asked of the CB during each buy: "Did the cashier indicate that he/she was unfamiliar with how to conduct a WIC transaction?" As such, estimates are only calculated for base study purchases and apply to all types of food instruments.

Buyer asked to pay cash for WIC foods. For the base study, CBs were asked to indicate whether they were asked by the cashier to pay cash in addition to the WIC food instrument for WIC foods. An affirmative response indicated that the vendor erroneously requested cash for WIC foods. Since vendors were correct to ask for cash on substitution (unallowable) items, this is only reported for safe and partial buys, which only contained allowable WIC foods. In addition, buys made with EBT cards were excluded from these estimates, since the base and CVV buys were conducted in tandem and therefore all purchases contained a CVV buy, for which the vendor may have legitimately asked for cash to cover amounts in excess of the cash value.

Cashier would not allow purchase of allowable WIC item. CBs were asked in multiple places in the data collection instrument to indicate whether a food item was not allowed to be purchased. A dichotomous variable was created for safe and partial buys to indicate whether or not vendors refused to allow the purchase of a WIC item. This variable was not created for substitution buys since vendors were correct to disallow substitution it

Appendix B: Compliance Buy Data Collection Instrument

PART II: DESCRIPTION OF COMPLIANCE BUY

(Complete This Section Immediately After Leaving the Store.)

Please think about your paper food instrument/EBT purchase for the following questions.

Food Instrument (FI)/EBT- Substitution Buy (EXAMPLE)

(Choose one number for each question)

1. Were all items on your list available in the required quantities and sizes?

   Yes 01
   No 02

2. Were you asked to accept another item in substitution for the WIC foods you attempted to purchase?

   Yes ..... 01 ➔ *Go to 2a*
   No 02

   2a. Please explain:

   _____

   _____

   _____

   _____

   _____

3. Do you recall the total amount rung up on the cash register?

   Yes ..... 01 ➔ *Go to 3a*
   No 02

   3a. Enter amount on register:.....*$*_____._____

4. Were you provided with a register receipt for the WIC purchase?

   Yes ..... 01 ➔ *Go to 4a*
   No 02

   4a. Enter amount on receipt: *$*_____._____

   [IF EBT, GOTO Q7]

5. How was the purchase price entered on the WIC food instrument?

Cashier entered price electronically.....01 ➔ *Go to 5a*
Cashier entered price by hand .....02 ➔ *Go to 5a*
I was asked to enter price .....03 ➔ *Go to 5a*
Price was not entered.....*04*
Don't know.....05

5a. Amount *entered:* .....*$*_____.____

6. When were you asked to countersign the WIC food instrument?

After the purchase price was entered on the food instrument 01
After the cashier rang up the WIC food items, but before the price was entered on the food instrument 02
Before the cashier rang up the WIC food items.....03
I was not asked to countersign the WIC food instrument 04

7. Were you asked to pay cash in addition to the purchase price for WIC food?

Yes ..... 01 ➔ *Go to 7a*
No 02

7a. Enter amount paid in cash*:* .....*$*_____.____

8. Were you offered cash or credit in exchange for any portion of the WIC food benefit?

Yes ..... 01 ➔ *Go to 8a*
No 02

8a. Enter amount of cash or credit offered*:* .....*$*_____.____

9. Were there any allowable food items that you were not allowed to purchase?

Yes ..... 01 ➔ *Go to 9a*
No 02

9a. For what reason were you not allowed to purchase the item?

- ☐ Cashier identified the item as unallowable (01)
- ☐ System identified the item as unallowable when scanned (02)
- ☐ Other, explain: (03) _____
- ☐ Don't know (04)

10. Some stores have a small "store-within-a-store" for WIC customers where WIC foods are displayed together on the shelves, separate from the rest of the regular food items. Did you have to go to a separate section or aisle within the store to shop for some or all of your WIC foods?

    Yes 01
    No 02

11. Please describe the reaction of the cashier to your (attempted) FI substitution:

    - ☐ Cashier indicated you would have to pay cash and asked if you still want the item (01)
    - ☐ Cashier rang up the purchase and did not ask you to pay additional cash (02)
    - ☐ Other, explain: (03) _____

Cash Value Voucher/Cash Value Benefit (CVV/CVB) – Safe Buy (EXAMPLE)

Please think about your CVV/CVB purchase for the following questions.

(Choose one number for each question)

1. Were fruits and vegetables available for purchase during this buy?

    Yes 01
    No ..... 02 [GOTO Q21]

    N/A – This was an infant buy…03 [GOTO Q21]

2. Were you asked to accept another item in substitution for the WIC foods you attempted to purchase?

    Yes ..... 01 ➔ *Go to 13a*
    No 02

    13a. I was asked to accept another item in substitution for:

    - ☐ The unallowable item that I was attempting to substitute (01)
    - ☐ An allowable fruit or vegetable that I was attempting to purchase (02)
    - ☐ An allowable food item that I was attempting to purchase (other than fruits or vegetables) (03)
    - ☐ Other, explain: (04) _____
    - ☐ Don't know (05)

    [IF EBT, GOTO Q21]

3. Do you recall the total amount rung up on the cash register?

Yes ..... 01 ➔ *Go to 14a*
No 02

14a. Enter amount on register:.....*$*_____._____

4. Were you provided with a register receipt for the WIC purchase?

Yes ..... 01 ➔ *Go to 15a*
No 02

15a. Enter amount on receipt:.....*$*_____._____

5. How was the purchase price entered on the WIC CVV?

Cashier entered price electronically.....01 ➔ *Go to 16a*
Cashier entered price by hand .....02 ➔ *Go to 16a*
I was asked to enter price .....03 ➔ *Go to 16a*
Price was not entered.....*04*
Don't know.....05

16a. Amount *entered:* .....*$*_____._____

6. When were you asked to countersign the WIC CVV?

After the purchase price was entered on the CVV.....01
After the cashier rang up the WIC food items, but before the price was entered on the CVV 02
Before the cashier rang up the WIC food items.....03
I was not asked to countersign the WIC CVV.....04

7. Were you allowed to pay cash in addition to the CVV purchase price for WIC food?

Yes ..... 01 ➔ *Go to 18a*
No 02

7a. Enter amount paid in cash*:* .....*$*_____._____

8. Were you offered cash or credit in exchange for any portion of the WIC food benefit?

Yes ..... 01 ➔ *Go to 19a*
No 02

8a. Enter amount of cash or credit offered: .....*$*_____._____

8b. Did the cashier give you change for any amount of the CVV not used?

Yes 01
No 02

N/A – Entire amount of CVV was used…03

9. Were there any allowable food items that you were not allowed to purchase?

Yes ..... 01 ➔ *Go to20a*
No 02

20a. For what reason were you not allowed to purchase the item?

- ☐ Cashier identified the item as unallowable (01)
- ☐ System identified the item as unallowable when scanned (02)
- ☐ Other, explain: (03) _____
- ☐ Don't know (04)

Please think about your overall compliance buy (both FI/EBT and CVV/CVB) for the following questions.

10. How many registers did this store have? ☐☐

11. Did the store have scanning equipment?

Yes ..... 01➔ *Go to 22a*
No 02

22a. Were your items scanned?

Yes, all items were scanned……...01
Yes, some items were scanned……..02
No, none of the items were scanned……..03

12. Were you asked to take your purchase to a register specifically for WIC participants?

Yes 01
No 02

13. Did the cashier enter the transaction in a stand-beside device?

Yes 01
No 02

14. Did the cashier indicate that he/she was unfamiliar with how to conduct a WIC transaction?

Yes ..... 01 ➔ *Go to 25a*
No ..... 02 ➔ *Go to 26*

1. 25a. How was this communicated? *(Choose all that apply.)*

Cashier indicated that he/she was a new employee 01
Cashier indicated that he/she had never completed a WIC transaction 02
Cashier received assistance from a co-worker or supervisor in completing the WIC transaction..... 03
[FOR EBT ONLY] Cashier indicated that he/she had never completed an EBT transaction..... 04
Other ..... 05 ➔ *Explain:*

15. Were any incentives offered to encourage initial or continued use of this store?

Yes ..... 01➔ *Go to 26a*
No 02

26a. What type of incentive was offered/provided?

_____

_____

_____

_____

_____

PLEASE PROCEED TO PART III

PART III: WIC PURCHASE INFORMATION

(Complete Immediately After Leaving the Store.)

Food Instrument (FI)/EBT- Substitution Buy

1. Were you able to complete a FI/EBT substitution buy?

   Yes .....01 ➔ *Complete columns A-F for all items purchased. Indicate substituted item(s) in column B.*

   No.....02 ➔ *Complete columns A-F for all items purchased*

ITEM CODES	**PRICE CODES**
*(*In column B, enter **all codes that apply**.)*	*(In Column F, enter all codes that apply.)*
01 – Not in stock	01 – Price marked on item
02 – Total quantity/Required size not in stock	02 – Price observed in store
03 – Purchased alternate item at vendor suggestion	03 – Price obtained through other method *(explain in notes section)*
04 – Purchased additional item at vendor suggestion	04 – Item was on sale/special offer *(explain in notes section)*
05 – Accepted rain check at vendor suggestion	
08 – This approved item was replaced for substitution buy	
09 – This item purchased as a substitute for allowable WIC item	
10 – Vendor refused to allow substitution buy	
11 - This item was identified as unallowable by the POS scanner system	
12 -This item was identified as unallowable by the cashier	

A			B	C	D	E	F[2]	G
					SHELF PRICE DISPLAYED ON SHELF OR FOOD ITEM?	SHELF PRICE (if column D = yes)	RECEIPT PRICE	
Item Type	Qty	Size	Item Code	Brand/Flavor	(Yes/No/Not Sure)	Unit Price		Price Code
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						$	$	
						Total Receipt Price	$	

[2] If receipt was provided, enter amount of each item from receipt, and enter total from receipt. If no receipt provided, do not enter any amount in Column F.

Refer to Item Codes and Price Codes on previous page to complete columns B & G.

2. Were you able to complete a CVV/CVB safe buy?

   Yes .....01 ➔ *Complete columns A-F for all items purchased.*

   No.....02 ➔ *Complete columns A-F for all items purchased*

ITEM CODES	**PRICE CODES**
*(*In column B, enter **all codes that apply**.)*	*(In Column F, enter all codes that apply.)*
01 – Not in stock	01 – Price marked on item
02 – Total quantity/Required size not in stock	02 – Price observed in store
03 – Purchased alternate item at vendor suggestion	03 – Price obtained through other method *(explain in notes section)*
04 – Purchased additional item at vendor suggestion	04 – Item was on sale/special offer *(explain in notes section)*
05 – Accepted rain check at vendor suggestion	
11 - This item was identified as unallowable by the POS scanner system	
12 -This item was identified as unallowable by the cashier	

A			B	C SHELF PRICE DISPLAYED ON SHELF OR FOOD ITEM?	D SHELF PRICE (if column C = yes)	E[2] RECEIPT PRICE	F
Item Type	Qty	Unit	Item Code	(Yes/No/Not Sure)	Unit Price		Price Code
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
						Total Receipt Price	$

[2] If receipt was provided, enter amount of each item from receipt, and enter total from receipt. If no receipt provided, do not enter any amount in Column E.

Refer to Item Codes and Price Codes on previous page to complete columns B & F.

Appendix C: Nonresponse Bias Analysis

Nonresponse bias analysis

In estimating the national Improper Payments (IP) dollar amount for the 2013 WIC Vendor Management Study we compared, for each safe buy, the best price amount and the redeemed amount. Only safe buys with both a best price and redeemed amount were included in the study estimates. Roughly 11 percent of the completed base study safe buys and 9 percent of the completed CVV study safe buys did not meet these criteria and thus were not included in the study estimates; we refer to these safe buys as missing for the national IP estimates. A nonresponse analysis, investigating differences in benefit type (EBT versus paper FIs) and vendor to participant ratio (VPR), both of which were stratification variables, between the vendors included in the IP estimates and vendors not included in the IP estimates, is described below. Since our response rates for the base and CVV studies were extremely high (99.1% of the sample had a completed safe buy for the base study and 98.4% for the CVV study) we did not consider nonresponse due to compliance buys not being conducted in this nonresponse bias analysis.

Nonresponse versus Frame Distributions by Benefit Type and VPR

The first step in investigating potential nonresponse bias was to better understand the distribution of vendor characteristics by whether or not a vendor was included in the IP estimates. Frequency and percentage distributions for benefit type and VPR by whether or not a vendor was included in the IP estimates. Of the vendors missing from the national IP estimates for the base study safe buy (208 vendors out of 1,905 possible compliance buys) a higher proportion of vendors in States with a low VPR were missing in the IP estimates (46% missing compared to 33% included) as well as a lower proportion of vendors in States with a medium VPR missing from the IP estimates (17% missing compared to 26% included). For the CVV study the differences are more dramatic: 30% of the vendors included in the IP estimates were from EBT States, but 68% of those not included in the IP estimates were from EBT States. Similar to the base study, a higher proportion of vendors in States with low VPRs (41% missing compared to 33% included) were missing from the IP estimates as well as a lower proportion of vendors in States with a medium VPR missing from the IP estimates (15% missing compared to 27% included).

Table 1. Unweighted frequency distributions for the WIC sample for vendors included in the IP estimates.

	Base Study		CVV Study	
	Unweighted Frequency Distributions			
Vendor Characteristics	Included in the IP Estimates	Nonresponse[1] for IP Estimates	Included in the IP Estimates	Nonresponse[1] for IP Estimates
Benefit type				
EBT States	576 (34%)	65 (31%)	334 (30%)	78 (68%)
Paper FI States	1,121 (66%)	143 (69%)	781 (70%)	36 (32%)
Vendor to participant ratio				
Low (1: 100 to <150)	557 (33%)	95 (46%)	367 (33%)	47 (41%)
Medium (1: 150 to <225)	441 (26%)	35 (17%)	298 (27%)	17 (15%)
High (1: 225 to <752)	699 (41%)	78 (37%)	450 (40%)	50 (44%)
Overall	1,697 (100%)	208 (100%)	1,115 (100%)	114 (100%)

[1]Includes nonresponse due to missing price information.

Next, we compared the weighted percentages for the set of vendors included in the IP estimates to the set of vendors with completed safe buys by benefit type and VPR. Weights were adjusted for nonresponse and post-stratified to the specific benefit type stratum totals. As seen in Table 2, the weighted percentages across the two studies within each stratum (13.14% for EBT and 86.86% for Paper FIs) are identical. The distributions across the VPR for both studies and across the percentage of vendors included in the IP estimates compared to the percentage of vendors with a conducted safe buy but not included in the IP estimates are extremely similar. This suggests that the disproportion nonresponse found in Table 1 is compensated for by the post-stratified, nonresponse adjusted weights.

Table 2. Weighted percentage distributions for the WIC sampling frame, those with a completed safe buy and vendors included in the IP estimate by vendor characteristics

	Base Study		CVV Study	
	Weighted Percentage Distributions			
Vendor Characteristics	Weighted Percentage of Vendors Included in the IP Estimates	Weighted Percentage of Vendors with a conducted Safe buy	Weighted Percentage of Vendors Included in the IP Estimates	Weighted Percentage of Vendors with a conducted Safe buy
Benefit type				
EBT States	13.14	13.14	13.14	13.14
Non-EBT States	86.86	86.86	86.86	86.86
Vendor to participant ratio				
Low (1: 100 to <150)	30.60	33.27	32.07	32.74
Medium (1: 150 to <225)	30.12	28.35	29.48	28.92
High (1: 225 to <752)	39.28	38.38	38.45	38.34
Overall	100.00	100.00	100.00	100.00

Nonresponse for Vendor Weighted Monthly Redemption Amount by Benefit type

After investigating the nonresponse frequency and percentage distributions by benefit type and VPR, we expanded the analysis to explore nonresponse differences in the weighted vendor redemption amounts. We used the weighted monthly vendor redemption amount because it indicates the effect each vendor will have on the national IP estimates. The IP estimates are weighted by each vendor's analysis weight and each vendor's redemption amount. Thus, a vendor with a large analysis weight and a large redemption amount will have more effect on the final estimate than a vendor with a small weight and a smaller redemption amount. Similar to the analysis in the previous section, we compared vendors that were included in the analysis to vendors that were not included in the analysis but had a conducted safe buy.

Listed in Table 3 are the weighted mean monthly vendor redemption amounts by benefit type and VPR for the base study for vendors included in the IP estimate and vendors excluded from the IP estimates. Also shown in Table 3 are the differences and the accompanying p-values testing the hypothesis that the differences between the weighted mean monthly vendor redemption amounts are significantly different from zero.

For benefit type, the weighted mean monthly vendor redemption amounts for the paper FI States were significantly higher for vendors included in IP estimates compared to vendors not included in the IP estimates ($11,651 vs. $8,384; p=0.0126). For EBT States the difference was not significant. The weighted mean monthly vendor redemption amounts for vendors in States with low and medium VPRs were significantly higher for vendors included in the IP estimates compared to vendors not included in the IP estimates. The overall difference was marginally higher for vendors included in the IP estimates compared to those vendors not included in the IP estimates ($11,852 vs. $9,240; p=0.0503).

Table 3. Weighted Mean Monthly Redemption Amounts by Vendor Type and Benefit type for the Base Study

	Base Study			
	Weighted Mean Monthly Redemption Amounts			
Vendor Characteristics	Included in the IP Estimates ($)	Missing from the IP Estimates ($)	Difference between the Weighted Means of those Included and those not included in the IP Estimates ($)	P-values for the Difference
Benefit type				
EBT States	13,162	15,478	-2,316	0.6236

Paper FI States	11,651	8,384	3,267	0.0126
Vendor to participant ratio				
Low (1: 100 to <150)	9,002	6,152	2,850	0.0277
Medium (1: 150 to <225)	11,354	6,547	4,807	0.0041
High (1: 225 to <752)	14,476	15,618	-1,142	0.7321
Overall	11,852	9,240	2,612	0.0503

Table 4 shows the same results for the CVV Study. For the CVV study, the weighted mean monthly vendor redemption amounts for the EBT States were marginally higher for vendors included in the IP estimates compared to those vendors not included in the IP estimates. The difference among paper FI States was not significant either. Significant differences were found for the low and medium levels for the VPR ($p<0.0001$). Again, the weighted mean monthly vendor redemption amount was significantly higher for vendors included in the IP estimates ($694 for States in vendors with a low VPR and $809 for States in vendors with a medium VPR) compared to vendors not included in the IP estimates ($261 for vendors in States with low VPRs and $235 for vendors in States with medium VPRs). No other significant differences were found.

Table 4. Weighted Mean Monthly Redemption Amounts by Vendor Type and Benefit Type for the CVV Study

	CVV Study			
	Weighted Mean Monthly Redemption Amounts			
Vendor Characteristics	**Included in the IP Estimates ($)**	**Missing from the IP Estimates ($)**	**Difference between the Weighted Means of the Included and those not included in the IP Estimates ($)**	**P-values for the Difference**
Benefit type				
EBT States	1,250	921	329	0.0798
Paper FI States	891	929	-38	0.9369
Vendor to participant ratio				
Low (1: 100 to <150)	694	261	433	<0.0001
Medium (1: 150 to <225)	809	235	574	<0.0001
High (1: 225 to <752)	1,226	1,941	-715	0.1728
Overall	932	926	6	0.9835

Potential Nonresponse Bias in IP Estimates

Ideally, the characteristics of the vendors that were not included in the national IP estimates would mirror those of the vendors that were included in the estimates. If this were true, the assumption could be made that the vendors included in the IP estimates are representative of the vendors that are not included and thus the IP estimates are not biased due to nonresponse.

Our first analysis investigating the nonweighted distributions revealed some potential nonresponse bias due to disproportionate nonresponse, but the weighted distributions clearly indicate that the post-stratified nonresponse adjusted weights compensate for the disproportionality of the nonresponse. The expanded nonresponse analysis comparing the weighted mean monthly vendor redemption amounts did reveal that although the weights compensate for the nonresponse, when comparing the differences in the vendor redemption amounts there are some significant differences between the set of vendors included in the IP estimates and those that are not included.

For the base study, the significantly higher weighted mean monthly redemption amount among vendors in paper FI States and vendors in States with low and medium VPRs included in the IP estimate suggests the IP estimates may be biased

toward reflecting the overcharging and undercharging habits of vendors with these characteristics. Significant differences in the proportion of over or under charges for the base study by benefit type and VPR were not observed, so the potential bias, if any at all, will be minimal.

For the CVV the significantly higher weighted mean monthly redemption amount among vendors in States with low or medium VPRs vendors included in the IP estimate suggests the IP estimates are biased toward reflecting more of the overcharging and undercharging habits of vendors with these characteristics. Furthermore, although the trend suggests that the rate of undercharge is higher among vendors in States with a low or medium VPR than for vendors in States with a high VPR, these finding are based on a small number of vendors undercharging the program in the medium and high VPR categories. Results from a logistic regression model that included the continuous VPR variable were also inconclusive. Because we cannot determine with confidence that VPR is significantly associated with undercharge, we anticipate that any potential bias related to VPR (and the disproportionate number of vendors in States with low and medium VPR being included in the IP estimates) would be minimal.

Appendix D: Comparison of 1998, 2005, and 2013 Study Samples

Comparison of the 1998, 2005, and 2013 Study Samples

	1998	2005	2013
Study Population	Included vendors operating in States with retail food delivery systems plus Washington, DC. Excluded: • Mississippi, Vermont, North Dakota, and parts of Ohio and Illinois because they did not operate a retail food delivery system. • Military commissaries because of issues related to gaining access to these stores without a military ID. • Pharmacies that stock only special order infant formula were excluded for cost reasons (all other pharmacies were included). • Alaska, Hawaii, U.S. Territories, and Indian Tribal Organizations because of the additional costs associated with collecting data in these jurisdictions.	Included vendors operating in States with retail food delivery systems plus Washington, DC. Excluded: • Mississippi, Vermont, North Dakota, and parts of Ohio and Illinois because they did not operate a retail food delivery system. • Military commissaries because of issues related to gaining access to these stores without a military ID. • Pharmacies that stock only special order infant formula were excluded for cost reasons (all other pharmacies were included). • Alaska, Hawaii, U.S. Territories, and Indian Tribal Organizations because of the additional costs associated with collecting data in these jurisdictions.	Included vendors operating in States with retail food delivery systems plus Washington, DC. Excluded: • Mississippi and Vermont because they did not operate a retail food delivery system. Note: Vermont was transitioning to a retail food delivery system during the study. • Military commissaries because of issues related to gaining access to these stores without a military ID. • Pharmacies that stock only special order infant formula were excluded for cost reasons (all other pharmacies were included). • Alaska, Hawaii, U.S. Territories, and Indian Tribal Organizations because of the additional costs associated with collecting data in these jurisdictions.
Sampling Frame	Used a Geographic Information System (GIS) computer program to form 366 PSUs in contiguous counties. Selected 100 PSUs using probability nonreplacement sampling with probabilities proportional to the size of the PSU. Most PSUs had at least 70 vendors. Selected about 18 vendors each from the 100 PSUs. Oversampled PSUs at the rate of 2:1 from vendor-specific FI States versus States that operate an open FI system.	Used a GIS computer program to form 365 PSUs in contiguous counties. Most PSUs had at least 80 vendors. Selected 100 PSUs using probability nonreplacement sampling with probabilities proportional to the size of the PSU. Selected about 16 vendors and 4 reserve vendors from each of the 100 PSUs. Oversampled WIC-only vendors. The oversampling rate varied by strata, but overall WIC-only stores were sampled at a rate that was over eight times larger than the rate in which non-WIC only stores were sampled.	Used a GIS computer program to form 352 PSUs in contiguous counties. Each PSU had at least 80 vendors. Selected 119 PSUs using probability nonreplacement sampling with probabilities proportional to the size of the PSU. Selected about 16 vendors and 9 reserve vendors from each of the 119 PSUs. No oversampling was conducted; however two stratification variables were included in the design: EBT status and small, medium or large participant-to-vendor ratios.
Sample Size	Nationally representative sample. Total 1,600 (unweighted) vendors weighted up to 36,754 vendors. 72% were from a metropolitan area.	Nationally representative sample. Total 1,600 (unweighted) vendors, with at least one completed compliance buy, weighted up to 39,347 vendors.	Nationally representative sample. Total 1,914 (unweighted) vendors, with at least one completed compliance buy, weighted up to 41,615 vendors.
Vendor Size	Small = 2 or fewer cash registers. Medium = 3 to 7 cash registers. Large = 8 or more cash registers.	Small = 2 or fewer cash registers. Medium = 3 to 7 cash registers. Large = 8 or more cash registers. WIC-only was included as separate category.	Small = 2 or fewer cash registers. Medium = 3 to 7 cash registers. Large = 8 or more cash registers.

Compliance Buy Methodology	Three buys were conducted at each vendor. Buy 1: safe buy Buy 2: partial buy Buy 3A: minor substitution Buy 3B: major substitution	Same as 1998.	Three buys were conducted at each vendor. During each buy, a regular WIC purchase and a CVV purchase was made. Buy 1: safe buy (base) / substitution buy (CVB) Buy 2: *(for states using EBT cards)*: safe buy (base) / partial buy (CVB) Buy 2: *(for states using paper checks)*: safe buy (base) / partial buy (CVB) Buy 3: substitution buy (base) / safe buy (CVB)
Hierarchy to Determine Best Price	1. Receipt price (observed or calculated) 2. Register price (observed) 3. Shelf price (calculated) If none of these pieces of information were available, the CB returned to store in order to capture price data by purchasing the same items with cash.	1. Receipt price (observed or calculated) 2. Register price (observed) 3. Shelf prices (calculated) 4. Amount written on the FI	1. Total receipt price (observed) 2. Register price (observed) 3. Shelf prices (calculated) 4. Receipt price (calculated) 5. Amount written on FI (paper FIs only) Best prices were top-coded to the maximum allowable reimbursement amounts established by the State agency, where possible.

Appendices E – H: Results Tables

Appendix E: Study Population

Table E-1. Weighted and Unweighted Vendor Sample Sizes by Buy Type and Study Type

	Base Study		CVV Study	
	n	Weighted N	n	Weighted N
At least one buy completed	**1914**	**41615**	**1258**	**41615**
Vendors with a Safe buy	1905	41615	1229	41615
Vendors with a Partial buy	1242	36146	1236	41615
Vendors with a Minor substitution buy	951	41615	621	41615
Vendors with a Major substitution buy	922	41615	630	41615
All three buys completed	**1860**	**41615**	**1219**	**41615**

Table E-2. Number and Percent of WIC Vendors by Vendor Characteristics by Study Type[1]

VENDOR CHARACTERISTICS	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Total WIC Vendors	**1914**	**41615**	**100.0**	**--**	**1258**	**41615**	**100.0**	**--**
WIC vendor type	1914	41615			1258	41615		
Retail/Grocery	1883	40882	98.2	0.61	1239	40965	98.4	0.57
Above-50-percent	*31*	*733*	*1.76*	*0.61*	*19*	*650*	*1.6*	*0.57*
Vendor size	1906	41448			1252	41421		
Small, 0-2 registers	471	10541	25.4	2.25	314	10671	25.8	2.46
Medium, 3-7 registers	664	14222	34.3	1.86	433	14097	34.0	2.02
Large, 8 or more registers	771	16686	40.3	2.28	505	16653	40.2	2.43
Geographic location[2]	1914	41615			1258	41615		
Urban	1420	31971	76.8	2.97	928	31705	76.2	3.09
Large rural city/town	209	4083	9.8	1.35	126	3808	9.2	1.29
Small rural town	148	2782	6.7	1.09	108	3202	7.7	1.36
Isolated small rural town	137	2778	6.7	1.27	96	2898	7.0	1.38
Has scanning equipment	1914	41615			1258	41615		
Yes	1646	34314	82.5	2.22	1074	33889	81.7	2.42
No	268	7300	17.5	2.22	184	7726	18.6	2.42
Had stand-aside kiosk for scanning WIC items [3]	644	5469			419	5469		
Yes	160	1336	24.4	1.34	111	1430	26.2	4.13
No	484	4124	75.6	1.34	308	4039	73.9	4.13
Volume of WIC sales in FY2011 (monthly average)[4]	1913	41587			1258	41615		
$0–2,774	495	10351	24.9	1.20	333	10499	25.2	1.25
$2,775–7,124	457	10413	25.0	1.16	313	11010	26.5	1.51
$7,125–15,879	458	10395	25.0	1.06	277	9535	22.9	1.31
$15,880 or more	503	10427	25.1	1.17	123	3514	8.4	0.89
Identified as high-risk by State WIC agency	1914	41615			1258	41615		
Yes	292	6845	16.5	1.98	198	7097	17.1	2.15
No	1622	34770	83.6	1.98	1060	34518	83.0	2.15
Number of routine monitoring visits received in FY2011	1914	41615			1258	41615		
None	1378	28519	68.5	3.26	903	28462	68.4	3.46
One	370	8683	20.9	2.13	244	8672	20.8	2.33
Two	125	3301	7.9	1.66	82	3290	7.9	2.00
Three or more	*41*	*1111*	*2.7*	*0.98*	*29*	*1191*	*2.9*	*1.01*
Type of training received in previous year	1914	41615			1258	41615		
Annual	1267	25893	62.2	3.98	822	25768	61.9	4.05
Interactive	644	15637	37.6	3.99	434	15762	37.9	4.07
None	*3*	*85*	*0.2*	*0.12*	*2*	*85*	*0.2*	*0.14*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%). [1] For all vendors having completed at least one buy during the study. [2] Geographic location is based on the rural-urban commuting area (RUCA) approximation. [3] For vendors in EBT states only. A stand-aside kiosk may be used in stores that are not fully integrated into the online or offline EBT system, due to technological limitations. [4] Volume of WIC sales is based on quantiles calculated from 2011 vendor redemptions reported in TIP.

Table E-3. Number and Percent of WIC Vendors by State Agency Vendor Management Practices and Study Type[1]

VENDOR MANAGEMENT PRACTICES	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Total WIC Vendors	**1914**	**41615**	**100.0**	**--**	**419**	**5469**	**100.0**	**--**
Benefit type	1914	41615			419	5469		
Paper FIs	1270	36146	13.1	0.82	308	4039	73.9	0.80
EBT	644	5469	86.9	0.82	111	1430	26.2	0.80
Vendor to participant ratio	1914	41615			1258	41615		
Low (1: 100 to <150)	655	13873	33.3	1.99	425	13780	33.1	1.93
Medium (1: 150 to <225)	477	11746	28.2	2.88	320	11789	28.3	3.00
High (1: 225 to <752)	782	15996	38.4	2.92	513	16046	38.6	3.06
Allows partial buys[2]	1914	41615						
Yes	1678	34965	84.0	4.01		--	--	--
No	236	6650	16.0	4.01		--	--	--
Requires store to provide receipt	1914	41615			1258	41615		
Yes	1213	21625	52.0	5.20	798	21759	52.3	5.28
No	701	19990	48.0	5.20	460	19856	47.7	5.28
Monitoring conducted at least annually	1914	41615			1258	41615		
Yes	950	20960	50.4	5.13	625	21040	50.6	5.22
No	964	20655	49.6	5.13	633	20575	49.4	5.22
Conducts inventory audits	1914	41615			1258	41615		
Yes	1511	31889	76.7	4.26	994	32048	77.0	4.28
No	403	9726	23.4	4.26	264	9567	23.0	4.28
Split-tender policy[3]					1258	41615		
Vendors required to accept split-tender		--	--	--	1028	36951	88.8	2.63
Vendors allowed to accept split-tender		--	--	--	230	4664	11.2	2.63

[1] For all vendors having completed at least one buy during the study.

[2] Three states prohibit partial buys of traditional food items (applicable to the base study, only).

[3] Cash or other means of payment can be used to pay more than the cash value of the fruit and vegetable benefit.

Table E-5. Comparison of State-level Characteristics: 1998, 2005, 2013

State-level characteristics	1998 Study Weighted N=36,908		2005 Study Weighted N=38,995		2013 (Base) Study Weighted N=41,615	
	Weighted %	SE	Weighted %	SE	Weighted %	SE
Vendor-to-participant ratio[1]						
1:<112	24.6	3.1	32.6	1.8	1.1	1.1
1:112-157	27.0	4.2	33.4	2.5	34.4	2.3
1:158-192	24.3	4.1	12.3	2.2	10.9	2.8
1:192+	24.1	2.9	21.7	2.9	53.6	3.2
Allowance of partial buys						
Yes	--	--	79.2	3.7	84.0	4.0
No	--	--	20.8	3.7	16.0	4.0

[1] Vendor-to-participant ratio categories are based on those used in the 1998 study.

Table E-6. Comparison of Vendor Characteristics: 1998, 2005, 2013[1]

Vendor Characteristics	1998 Study Weighted N=36,908		2005 Study Weighted N=38,995		2013 (Base) Study Weighted N=41,615	
	Weighted %	SE	Weighted %	SE	Weighted %	SE
WIC Vendor Type[2]						
Grocery/Retail	97.8	2.2	93.6	1.0	98.2	0.63
Pharmacy	2.2	0.5	4.3	0.9	--	--
Above-50-percent	--	--	--	--	1.8	0.61
WIC-only	--	--	2.2	0.3	--	--
Vendor size[2]						
Small, 0-2 registers	31.2	2.1	28.0	2.0	25.4	2.25
Medium, 3-7 registers	35.3	2.0	32.0	1.9	34.3	1.86
Large, 8 or more registers	33.5	2.4	40.0	2.3	40.3	2.28
Geographic location						
Urban	--	--	73.7	3.1	76.8	2.98
Large rural city/town	--	--	10.5	1.5	9.8	1.36
Small rural town	--	--	8.2	1.2	6.7	1.10
Isolated small rural town	--	--	7.6	1.6	6.7	1.28
Has scanning equipment (YES)	72.6	2.04	73.9	2.2	83.0	2.40
Volume of WIC sales (monthly average)[3]						
$0-1,649	--	--	24.6	1.7	14.9	0.91
$1,650-4,499	--	--	24.6	1.0	21.3	1.10
$4,500-11,199	--	--	25.4	1.3	28.0	1.00
$11,200-24,679	--	--	16.2	1.0	21.5	0.99
$24,680 or more	--	--	9.1	0.8	14.4	1.01

[1] The 1998 data is based on a weighted estimate of vendors that had three completed buys. The 2005 data is based on a weighted estimate of vendors that were each visited for the safe buy. 2013 data is based on a weighted estimate of vendors that were visited for the safe buy for the base study.

[2] WIC-only stores did not exist in 1998 and are included in the A50 category in 2013. No pharmacies were included in the study sample in 2013.

[3] Vendor monthly redemption dollars are based on the categories developed for the 2005 study using quartiles.

Appendix F: Administrative Errors

Table F-1a. Number and Percent of Vendors Committing Administrative Errors, by Study Type, Safe Buys Only[1]

ADMINISTRATIVE ERRORS	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Improper countersignature procedures[2]	1247	35661			807	35706		
Yes	460	13185	37.0	2.71	349	15475	43.3	3.15
No	787	22476	63.0	2.71	458	20231	56.7	3.15
Failed to provide a receipt[3]	1188	21396			733	20840		
Yes	140	3492	16.3	2.92	97	3626	17.4	3.15
No	1048	17904	83.7	2.92	636	17214	82.6	3.15
Insufficient stock	1905	41615			1229	41615		
Yes	201	3999	9.6	1.22	*44*	*1025*	*2.5*	*1.03*
No	1704	37616	90.4	1.22	1185	40591	97.5	1.03
Cashier unfamiliar with conducting WIC transactions[4]	1905	41615						
Yes	168	3667	8.8	0.93	--	--	--	--
No	1737	37948	91.2	0.93	--	--	--	--
Buyer was asked to pay cash in addition to food instrument[2,5]	1264	36146						
Yes	*9*	*259*	*0.7*	*0.25*	--	--	--	--
No	1255	35887	99.3	0.25	--	--	--	--
Cashier would not allow participant to purchase an allowable item[2]	1264	36146			809	35792		
Yes	43	1234	3.4	0.55	*16*	*702*	*2.0*	*0.63*
No	1221	34912	96.6	0.55	793	35090	98.0	0.63

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a safe buy and committed the particular violation.

[2] For vendors transacting paper food instruments only.

[3] Among vendors required by state agency to provide a receipt.

[4] Cashier's familiarity with WIC transactions was collected once for each visit to the vendor. Since the cashier's familiarity applies to both the base and CVV purchases, only one estimate has been created using the buy type for the base study.

[5] Whether a buyer was asked to pay cash in addition to FI was only assessed for traditional foods, since WIC allows participants to pay cash for fruits and vegetables over the amount of the CVV.

Table F-1b. Number and Percent of Vendors Committing Administrative Errors, by Study Type, Partial Buys Only[1]

ADMINISTRATIVE ERRORS	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Improper countersignature procedures[2]	1222	35566			808	35665		
Yes	484	14127	39.7	2.91	369	16337	45.8	3.01
No	738	21440	60.3	2.91	439	19328	54.2	3.01
Failed to provide a receipt[3]	542	15739			736	20622		
Yes	108	3116	19.8	3.72	78	3102	15.0	2.95
No	434	12624	80.2	3.72	658	17520	85.0	2.95
Insufficient stock	1242	36146			1236	41615		
Yes	75	2172	6.0	0.76	35	712	1.7	0.45
No	1167	33974	94.0	0.76	1201	40903	98.3	0.45
Cashier unfamiliar with conducting WIC transactions[4]	1242	36146						
Yes	93	2696	7.5	0.94	--	--	--	--
No	1149	33450	92.5	0.94	--	--	--	--
Cashier would not allow participant to purchase an allowable item[2]	1242	36146			811	35797		
Yes	40	1167	3.2	0.70	*19*	*842*	*2.4*	*0.56*
No	1202	34979	96.8	0.70	792	34956	97.6	0.56
Improper response to partial buy[5]	1230	35796			1186	40557		
Yes	196	5701	15.9	2.30	102	4344	10.7	2.01
No	1034	30095	84.1	2.30	1084	36214	89.3	2.01

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a partial buy and committed the particular violation. Base study estimates do not include vendors in EBT states.

[2] For vendors transacting paper food instruments only.

[3] Among vendors required by state agency to provide a receipt.

[4] Cashier's familiarity with WIC transactions was collected once for each visit to the vendor. Since the cashier's familiarity applies to both the base and CVV purchases, only one estimate has been created using the buy type for the base study.

[5] Partial buy was refused in states allowing partial buy or partial buy was permitted in states that do not allow partial buys.

Table F-1c. Number and Percent of Vendors Committing Administrative Errors, by Study Type, Minor Substitution Buys Only[1]

ADMINISTRATIVE ERRORS	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Improper countersignature procedures[2]	590	34122			409	35449		
Yes	222	12877	37.7	3.34	163	14153	39.9	3.44
No	368	21245	62.3	3.34	246	21296	60.1	3.44
Failed to provide a receipt[3]	518	19654			344	19768		
Yes	64	3015	15.3	3.31	36	2915	14.7	3.72
No	454	16638	84.7	3.31	308	16853	85.3	3.72
Insufficient stock	948	41615			618	41615		
Yes	102	4320	10.4	1.29	34	1629	3.9	1.03
No	846	37295	89.6	1.29	584	39986	96.1	1.03
Cashier unfamiliar with conducting WIC transactions[4]	941	41248						
Yes	72	3475	8.4	1.20	--	--	--	--
No	869	37773	91.6	1.20	--	--	--	--

[1] Results are based on a weighted estimate of vendors that were visited for a minor substitution buy and committed the particular violation.

[2] For vendors transacting paper food instruments only.

[3] Among vendors required by state agency to provide a receipt.

[4] Cashier's familiarity with WIC transactions was collected once for each visit to the vendor. Since the cashier's familiarity applies to both the base and CVV purchases, only one estimate has been created using the buy type for the base study.

Table F-1d. Number and Percent of Vendors Committing Administrative Errors, by Study Type, Major Substitution Buys Only[1]

ADMINISTRATIVE ERRORS	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Improper countersignature procedures[2]	608	35795			406	35189		
Yes	262	15477	43.2	3.38	157	13624	38.7	3.43
No	346	20317	56.8	3.38	249	21565	61.3	3.43
Failed to provide a receipt[3]	576	21201			377	21300		
Yes	65	3202	15.1	3.15	58	4248	19.9	3.42
No	511	17999	84.9	3.15	319	17053	80.1	3.42
Insufficient stock	925	41615			633	41615		
Yes	84	3683	8.8	1.63	*28*	*1427*	*3.4*	*1.12*
No	841	37932	91.2	1.63	605	40188	96.6	1.12
Cashier unfamiliar with conducting WIC transactions[4]	923	41537						
Yes	74	3817	9.2	1.15	--	--	--	--
No	849	37719	90.8	1.15	--	--	--	--

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a major substitution buy and committed the particular violation.

[2] For vendors transacting paper food instruments only.

[3] Among vendors required by state agency to provide a receipt.

[4] Cashier's familiarity with WIC transactions was collected once for each visit to the vendor. Since the cashier's familiarity applies to both the base and CVV purchases, only one estimate has been created using the buy type for the base study.

Table F-2a. Number and Percent of Vendors Employing *Improper Countersignature Procedures*, By Study Type, Across All buys

IMPROPER COUNTERSIGNATURE PROCEDURES	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Number of occurrences of improper countersignature procedures[1]	1226	36028			806	36015		
None	483	14134	39.2	2.93	290	12910	35.8	3.14
One	291	8574	23.8	1.41	184	8234	22.9	1.69
Two	240	7070	19.6	1.53	157	7032	19.5	1.72
Three	212	6250	17.4	2.29	175	7838	21.8	2.51
Employed improper countersignature procedures at least once[2]	743	21894	60.8	2.93	516	23104	64.2	3.14
Type of Food Package[2]	1226	36028			806	36014		
Woman	240	7073	60.2	3.61	251	11237	63.0	3.59
Child	260	7662	64.0	3.55	265	11867	65.3	3.51
Infant	243	7159	58.3	3.45	--	--	--	--

[1] Results are based on a weighted estimate of vendors that had three completed buys, in states with paper food instruments.

[2] Results are based on a weighted estimate of vendors that had three completed buys and committed the violation at least once, in states with paper food instruments.

Table F-2b. Number and Percent of Vendors Employing *Improper Countersignature Procedures*, by Vendor Characteristics and Study Type, Across All Buys[1]

IMPROPER COUNTERSIGNATURE PROCEDURES	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
WIC vendor type	1226	36028			806	36015		
Grocery	727	21417	60.5	2.93	509	22787	64.2	3.18
Above-50-percent	*16*	*477*	*76.4*	*10.11*	*7*	*317*	*63.8*	*13.32*
Vendor size	1226	36028		*p*<0.001	806	36015		*p*<0.05
Small, 0-2 registers	188	5507	61.6	4.06	132	5870	65.1	4.49
Medium, 3-7 registers	222	6548	52.6	3.94	159	7125	57.6	4.76
Large, 8 or more registers	333	9838	67.3	3.15	225	10109	69.1	3.32
Geographic location	1226	36028		*p*<0.05	806	36015		
Urban	612	18040	64.3	2.99	416	18633	67.1	3.17
Large rural city/town	67	1977	58.4	7.12	43	1931	60.7	8.19
Small or isolated rural town	64	1877	40.9	6.09	57	2540	50.1	7.94
Has scanning equipment (Yes)	1226	36028			806	36015		
Yes	591	17447	59.5	3.12	404	18126	62.8	3.33
No	152	4447	66.5	4.09	112	4978	69.7	4.57
Volume of WIC sales in FY2011 (monthly average)	1225	35999		*p*<0.01	806	36015		
$0–2,774	165	4854	56.9	3.80	114	5099	59.0	4.30
$2,775–7,124	189	5564	59.3	3.91	141	6298	63.4	4.07
$7,125–15,879	181	5338	57.1	3.84	122	5471	63.7	4.56
$15,880 or more	207	6108	70.0	3.59	139	6236	70.6	4.12
Identified as high risk by State WIC agency	1226	36028			806	36015		
Yes	120	3523	56.6	4.98	87	3878	59.9	6.44
No	623	18371	61.6	2.90	429	19226	65.1	2.97
Number of routine monitoring visits received in FY2011	1226	36028			806	36015		
None	503	14855	63.0	3.32	342	15349	65.6	3.31
One	145	4249	52.5	5.15	107	4765	58.6	6.28
Two or more	95	2789	64.2	4.55	67	2991	67.0	5.66
Type of training received in previous year	1224	35941			804	35927		
Annual	443	13067	61.3	3.52	304	13628	64.3	3.74
Interactive	298	8769	60.0	4.69	211	9432	64.0	5.15

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once, in states with paper food instruments.

Table F-2c. Number and Percent of Vendors Employing *Improper Countersignature Procedures*, by Transaction Characteristics and Study Type, Safe Buys Only[1]

IMPROPER COUNTERSIGNATURE PROCEDURES	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE	n	Weighted N	Weighted %	Weighted SE
Use of scanning equipment	1247	35661		$p<0.01$	807	35706		$p<0.05$
Used scanning equipment	336	9650	34.6	2.97	260	11552	41.1	3.35
Did not have or did not use scanning equipment	124	3535	45.5	3.60	89	3923	51.9	4.93
Cashier familiarity with WIC	1247	35661			807	35706		
Cashier familiar	416	11931	36.7	2.78	318	14100	44.0	3.31
Cashier unfamiliar[2]	44	1254	40.0	5.58	31	1374	37.4	6.14

[1] Results are based on a weighted estimate of vendors that had a safe buy completed; in states with paper food instruments.
[2] CBs could have recorded multiple reasons for cashier's unfamiliarity with WIC; response items are not mutually exclusive

Table F-2d. Number and Percent of Vendors Employing *Improper Countersignature Procedures*, by Vendor Management Practices and Study Type, Across All Buys[1]

IMPROPER COUNTERSIGNATURE PROCEDURES	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Vendor to participant ratio	1226	36028		p <0.0001	806	36015		p = 0.0014
Low (1: 100 to <150)	184	5315	45.3	4.84	136	5970	51.7	5.63
Medium (1: 150 to <225)	224	6596	59.6	6.06	157	7029	62.5	6.76
High (1: 225 to <752)	335	9984	75.5	3.84	223	10105	76.4	3.65
Requires store to provide receipt	1226	36028		p <0.0001	806	36015		p <0.0001
Yes	239	7033	44.4	4.38	174	7778	49.0	4.64
No	504	14862	73.6	3.23	342	15326	76.1	3.56
Monitoring visits conducted at least annually	1226	36028			806	36015		
Yes	395	11675	64.7	4.02	267	11993	66.3	4.24
No	348	10219	56.8	4.42	249	11111	62.0	4.70
Split-tender policy					806	36015		
Vendors required to accept split-tender	--	--	--	--	479	21435	63.7	3.24
Vendors allowed to accept split-tender	--	--	--	--	37	1669	70.1	15.28

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once, in states with paper food instruments.

Table F-3a. Number and Percent of Vendors *Failing to Provide a Receipt*, By Study Type, Across All Buys

FAILURE TO PROVIDE A RECEIPT	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE	n	Weighted N	Weighted %	Weighted SE %
Number of occurrences of failing to provide a receipt[1]	1167	21278			740	20993		
None	962	16456	77.3	3.27	591	15647	74.5	3.50
One	110	2197	10.3	1.48	87	2696	12.8	2.08
Two	29	728	3.4	0.83	*19*	*813*	*3.9*	*0.93*
Three	66	1896	8.9	2.25	43	1837	8.8	2.79
Failed to Provide Receipt at least once[2]	205	4822	22.7	3.27	149	5346	25.5	3.50
Type of Food Package [2]	1167	21278			740	20993		
Woman	74	1771	25.0	4.38	72	2640	24.9	4.34
Child	70	1555	22.4	3.41	77	2706	26.1	3.52
Infant	61	1495	20.6	3.20	--	--	--	--

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and which are required by the state agency to provide a receipt.

[2] Results are based on a weighted estimate of vendors that had three completed buys and committed the violation at least once, and which are required by the state agency to provide a receipt.

Table F-3b. Number and Percent of Vendors *Failing to Provide a Receipt*, by Vendor Characteristics and Study Type, Across All Buys[1]

FAILURE TO PROVIDE A RECEIPT	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
WIC vendor type	1167	21278			740	20993		
Grocery	202	4795	22.6	3.28	146	5304	25.4	3.51
Above-50-percent	*3*	*27*	*26.5*	*9.43*	*3*	*42*	*50.0*	*12.13*
Vendor size	1167	21278		*p* <0.01	740	20993		*p* <0.01
Small, 0-2 registers	78	2021	49.9	7.63	56	2255	61.7	7.75
Medium, 3-7 registers	66	1387	18.5	3.61	48	1528	20.6	3.79
Large, 8 or more registers	61	1414	14.5	3.68	45	1563	15.8	4.06
Geographic location	1167	21278		*p* <0.05	740	20993		
Urban	133	3071	20.7	3.79	101	3528	24.3	4.08
Large rural city/town	21	507	21.8	5.42	*13*	*513*	*24.6*	*6.72*
Small or isolated rural town	51	1244	30.1	3.99	35	1304	29.9	5.06
Has scanning equipment	1167	21278		*p* <0.01	740	20993		*p* <0.01
Yes	157	3433	17.7	2.87	112	3719	19.6	3.23
No	48	1389	72.7	9.61	37	1627	81.2	7.75
Stand-aside kiosk used to scan WIC items (EBT only)	627	5190			384	5119		
Yes	*8*	*71*	*5.4*	*1.79*	*5*	*65*	*5.6*	*2.44*
No	49	429	10.4	1.50	36	489	12.4	2.11
Volume of WIC sales in FY2011 (monthly average)	1167	21278		*p* <0.05	740	20993		*p* <0.01
$0–2,774	66	1622	30.6	4.12	51	1923	39.0	4.83
$2,775–7,124	57	1393	25.2	5.91	43	1685	28.9	6.70
$7,125–15,879	38	843	16.9	4.12	22	697	14.7	4.14
$15,880 or more	44	963	17.6	2.96	33	1040	19.0	3.80
Identified as high risk	1167	21278			740	20993		
Yes	*26*	*642*	*29.6*	*9.16*	22	826	36.2	7.78
No	179	4180	21.9	3.31	127	4520	24.2	3.70
Received routine monitoring visit in previous year	1167	21278			740	20993		
Yes	44	1138	20.2	3.59	27	1068	20.3	4.06
No	161	3684	23.5	3.86	122	4278	27.2	3.97
Type of training received in previous year	1164	21278			738	20905		
Annual	155	3560	23.8	3.87	113	3932	26.9	3.96
Interactive	49	1233	19.7	5.60	*35*	*1370*	*21.9*	*6.68*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once, and which are required by the state agency to provide a receipt.

Table F-3c. Number and Percent of Vendors *Failing to Provide a Receipt*, by Transaction Characteristics and Study Type, Safe Buys Only[1]

FAILURE TO PROVIDE A RECEIPT	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE	n	Weighted N	Weighted %	Weighted SE
Use of scanning equipment	1188	21396		*p* <0.01	733	20840		*p* <0.01
Used scanning equipment	79	1816	9.6	2.05	58	2017	10.9	2.15
Did not have or did not use scanning equipment	61	1676	65.5	9.36	39	1610	68.6	9.83
Cashier familiarity with WIC	1188	21396			733	20840		
Cashier familiar	129	3239	16.6	3.01	80	2940	15.8	3.14
Cashier unfamiliar	*11*	*253*	*13.7*	*4.59*	*17*	*686*	*NR*	--
Whether buyer saw purchase price entered[2]	563	16062		*p* <0.01	360	15894		
Entered by cashier, register, or buyer	84	2385	16.3	3.25	58	2552	17.8	3.25
Not entered, did not see it entered	32	901	63.5	9.76	*18*	*783*	*49.0*	*13.37*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a safe buy and which are required by the state to provide a receipt.

[2] Not applicable to stores in EBT states.

Table F-3d. Number and Percent of Vendors *Failing to Provide a Receipt*, by Vendor Management Practices and Study Type, Across All Buys[1]

FAILURE TO PROVIDE A RECEIPT	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Benefit type	1167	21278		p <0.001	740	20993		p <0.0001
Paper FIs	148	4322	27.3	4.36	108	4791	30.2	4.57
EBT	57	500	9.2	1.16	41	555	10.8	1.80
Vendor to participant ratio	1167	21278			740	20993		p<0.05
Low (1: 100 to <150)	82	2154	27.7	5.90	62	2498	33.4	6.20
Medium (1: 150 to <225)	*50*	*1334*	*29.6*	*9.16*	37	1532	34.6	8.82
High (1: 225 to <752)	73	1334	14.8	2.52	50	1316	14.5	2.74
Monitoring visits conducted at least annually	1167	21278			740	20993		
Yes	125	2816	25.6	5.18	92	3177	28.5	5.56
No	80	2006	19.5	3.92	57	2168	22.1	4.14
Split-tender policy					740	20993		
Vendors required to accept split-tender	--	--	--	--	117	4785	26.3	4.02
Vendors allowed to accept split-tender	--	--	--	--	32	561	20.0	4.04

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once and which are required by the state to provide a receipt.

Table F-4a. Number and Percent of Vendors with *Insufficient Stock*, By Study Type, Across All Buys

INSUFFICIENT STOCK	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Number of occurrences[1]	1860	41615			1219	41615		
None	1501	34230	82.3	1.68	1143	39494	94.9	1.33
One	252	5104	12.3	1.21	*42*	*1509*	*3.6*	*1.22*
Two	68	1500	3.6	0.59	*9*	*244*	*0.6*	*0.22*
Three	39	781	1.9	0.35	*25*	*368*	*0.9*	*0.30*
Insufficient Stock at least once[2]	359	7385	17.7	1.68	76	2121	5.1	1.33
Type of Food Package[2]	1860	41615			1219	41615		
Woman	140	2717	19.9	2.53	39	1153	5.5	1.60
Child	115	2384	17.4	2.04	37	968	4.6	1.27
Infant	104	2284	16.0	2.11	--	--	--	--

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys.

[2] Results are based on a weighted estimate of vendors that had three completed buys and committed the violation at least once.

Table F-4b. Number and Percent of Vendors with *Insufficient Stock,* by Vendor Characteristics and Study Type, Across All Buys[1]

INSUFFICIENT STOCK	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
WIC vendor type	1860	41615			1219	41615		
Grocery	351	7189	17.6	1.64	74	2030	5.0	1.31
Above-50-percent	*8*	*196*	*28.2*	*9.73*	*2*	*91*	*15.6*	*6.22*
Vendor size	1860	41566		*p* <0.0001	1219	41615		
Small, 0-2 registers	179	3714	35.9	3.22	58	1344	13.0	2.25
Medium, 3-7 registers	104	2069	14.5	1.65	*8*	*329*	*2.3*	*1.17*
Large, 8 or more registers	76	1602	9.5	2.00	*10*	*447*	*2.7*	*1.64*
Geographic location	1860	41615		*p* <0.05	1219	41615		
Urban	278	6087	19.1	1.95	63	1763	5.6	1.53
Large rural city/town	33	575	13.8	3.09	*4*	*148*	*3.8*	*2.58*
Small or isolated rural town	48	723	12.8	1.95	*9*	*210*	*3.4*	*1.21*
Has scanning equipment	1860	41615		*p* <0.0001	1219	41615		
Yes	262	4695	13.5	1.43	58	1315	3.8	1.25
No	97	2691	38.9	4.02	*18*	*805*	*11.0*	*2.75*
Stand-aside kiosk used to scan WIC items (EBT only)	630	5469		*p* <0.01	410	5469		
Yes	59	510	38.8	5.22	27	368	26.6	5.66
No	93	805	19.4	2.59	*14*	*184*	*4.5*	*2.02*
Volume of WIC sales in FY2011 (monthly average)	1859	41586		*p* <0.0001	1219	41615		
$0–2,774	145	2807	27.6	2.83	39	713	6.9	1.59
$2,775–7,124	87	1914	18.2	2.34	*18*	*616*	*5.5*	*1.38*
$7,125–15,879	63	1345	12.9	2.18	*6*	*237*	*2.5*	*1.89*
$15,880 or more	63	1290	12.4	2.68	*13*	*555*	*5.3*	*2.55*
Identified as high risk	1860	41615		*p* <0.05	1219	41615		*p*=0.06
Yes	76	1690	24.7	4.09	21	568	7.9	2.23
No	283	5695	16.4	1.64	55	1553	4.5	1.30
Received routine monitoring visit in previous year	1860	41615			1219	41615		
Yes	95	2254	17.0	2.49	21	688	5.1	1.95
No	264	5132	18.1	1.94	55	1433	5.1	1.42
Type of training received in previous year	1857	41528			1219	41527		
Annual	248	4606	18.0	1.80	45	1042	4.1	1.18
Interactive	110	2750	17.3	2.91	31	1078	6.7	2.64

Italicized text indicates that the estimate does not meet standards of reliability (n< 20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once.

Table F-4c. Number and Percent of Vendors with *Insufficient Stock*, by Vendor Management Practices and Study Type, Across All Buys[1]

INSUFFICIENT STOCK	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Benefit type	1860	41615		$p < 0.05$	1219	41615		
Paper FIs	207	6071	16.8	1.91	*35*	*1568*	*4.3*	*1.50*
EBT	152	1314	24.0	2.53	41	553	10.1	2.31
Vendor to participant ratio	1860	41615			1219	41615		
Low (1: 100 to <150)	158	3174	23.2	2.51	39	767	5.7	1.36
Medium (1: 150 to <225)	74	1787	14.9	3.32	*15*	*518*	*4.3*	*3.33*
High (1: 225 to <752)	127	2424	15.2	2.82	*22*	*835*	*5.2*	*2.07*
Requires store to provide receipt	1860	41615			1219	41615		
Yes	221	3322	15.6	1.83	50	951	4.5	0.93
No	138	4064	20.0	2.67	*26*	*1169*	*5.8*	*2.52*
Monitoring visits conducted at least annually	1860	41615			1219	41615		
Yes	166	3668	17.7	2.51	*23*	*875*	*4.2*	*1.65*
No	193	3718	17.8	2.26	*53*	*1246*	*6.0*	*2.12*
Conducts inventory audits	1860	41615			1219	41615		
Yes	296	5930	18.7	1.98	71	1962	6.2	1.69
No	63	1455	14.6	2.89	*5*	*158*	*1.6*	*0.75*
Split-tender policy					1219	41615		
Vendors required to accept split-tender	--	--	--	--	71	1988	5.4	1.49
Vendors allowed to accept split-tender	--	--	--	--	*5*	*133*	*2.8*	*1.40*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once.

Table F-5a. Number and Percent of Vendors with *Cashiers Unfamiliar with Conducting WIC Transactions*, By Buy Type and Study Type, Across All buys[1]

CASHIER UNFAMILIAR WITH CONDUCTING WIC TRANSACTIONS	Base Study			
	n	Weighted N	Weighted %	Weighted SE %
Number of occurrences[1]	1860	41615		
None	1515	33383	80.2	1.53
One	280	6493	15.6	1.18
Two	55	1446	3.5	0.53
Three	*10*	*293*	*0.7*	*0.21*
Cashier unfamiliar at least once[2]	345	8232	19.8	1.53
Type of Food Package [2]	1860	41615		*p* <0.01
Woman	125	2939	21.6	1.93
Child	136	3187	23.3	2.60
Infant	84	2106	14.8	1.87

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys.

[2] Results are based on a weighted estimate of vendors that had three completed buys and committed the violation at least once.

Table F-5b. Number and Percent of Vendors with *Cashiers Unfamiliar with Conducting WIC Transactions*, by Vendor Characteristics and Study Type, Across All Buys[1]

CASHIER UNFAMILIAR WITH CONDUCTING WIC TRANSACTIONS	Base Study			
	n	Weighted N	Weighted %	Weighted SE
WIC vendor type	1860	41615		
Grocery	344	8202	20.0	1.54
Above-50-percent	*1*	*30*	*4.3*	*4.37*
Vendor size	1860	41566		p<0.05
Small, 0-2 registers	62	1505	14.5	2.37
Medium, 3-7 registers	129	2973	20.8	2.19
Large, 8 or more registers	154	3754	22.2	2.12
Geographic location	1860	41615		
Urban	246	6094	19.2	1.61
Large rural city/town	40	865	20.7	3.36
Small or isolated rural town	59	1273	22.6	4.27
Has scanning equipment	1860	40615		p<0.01
Yes	314	7328	21.1	1.62
No	31	904	13.1	2.53
Stand-aside kiosk used to scan WIC items (EBT only)	630	5469		
Yes	24	205	15.6	2.80
No	67	574	13.8	2.05
Volume of WIC sales in FY2011 (monthly average)	1859	41586		p <0.0001
$0–2,774	135	3231	31.8	2.73
$2,775–7,124	82	1900	18.1	2.19
$7,125–15,879	73	1793	17.1	2.26
$15,880 or more	55	1308	12.6	2.02
Identified as high risk	1860	41615		
Yes	43	1099	16.1	3.06
No	302	7133	20.5	1.56
Received routine monitoring visit in previous year	1860	41615		
Yes	104	2662	20.0	3.01
No	241	5570	19.7	1.58
Type of training received in previous year	1857	41528		
Annual	206	4755	18.5	1.76
Interactive	139	3476	21.9	2.73

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once.

Table F-5d. Number and Percent of Vendors with *Cashier Unfamiliar with Conducting WIC Transactions*, by Vendor Management Practices and Study Type, Across All Buys[1]

CASHIER UNFAMILIAR WITH CONDUCTING WIC TRANSACTIONS	Base Study			
	n	Weighted N	Weighted %	Weighted SE
Benefit type	1860	41615		p<0.05
Paper FIs	254	7452	20.6	1.74
EBT	91	779	14.3	1.76
Vendor to participant ratio	1860	41615		p<0.05
Low (1: 100 to <150)	125	2829	20.7	2.95
Medium (1: 150 to <225)	113	3015	25.2	2.82
High (1: 225 to <752)	107	2387	14.9	2.07
Requires receipt to be provided	1860	41615		
Yes	203	4061	19.1	1.82
No	142	4171	20.5	2.51
Monitoring visits conducted at least annually	1860	41615		
Yes	169	4069	19.7	2.28
No	176	4163	19.9	2.04
Conducts inventory audits	1860	41615		
Yes	251	5766	18.2	1.73
No	94	2466	24.7	2.93
Split-tender policy[2]	1219	41615		
Vendors required to accept split-tender	220	8502	23.1	1.99
Vendors allowed to accept split-tender	41	812	17.1	4.48

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once.

[2] Applies to buys that contained a CVV study buy (i.e., woman and child buys)

Table F-6a. Number and Percent of Vendors where *Cashier Would Not Allow Participant to Purchase an Allowable Item*, By Buy Type and Study Type, Across All Buys

CASHIER WOULD NOT ALLOW PARTICIPANT TO PURCHASE AN ALLOWABLE ITEM	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Number of occurrences[1]	1230	36146			807	36058		
None	1158	34022	94.1	0.89	773	34541	95.8	0.95
One	64	1889	5.2	0.77	33	1473	4.1	0.92
Two	*8*	*235*	*0.7*	*0.25*	*1*	*44*	*0.1*	*0.12*
Cashier did not allow purchase at least once[2]	*72*	2124	5.9	0.89	34	1517	4.2	0.95
Type of Food Package[2]	1230	36146			807	36058		
Woman	29	854	7.2	1.56	*18*	*804*	*4.5*	*1.19*
Child	29	856	7.1	1.51	*16*	*713*	*3.9*	*1.23*
Infant	*14*	*414*	*3.4*	*1.01*	--	--	--	--

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys; includes results for safe and partial buys only in states that use paper food instruments.

[2] Results are based on a weighted estimate of vendors that had three completed buys and committed the violation at least once.

[3] Results are based on a weighted estimate of vendors that had each listed buy type completed.

Table F-6b. Number and Percent of Vendors where *Cashier Would Not Allow Participant to Purchase an Allowable Item*, by Vendor Characteristics, Base Study Only, Across All Buys [1]

CASHIER WOULD NOT ALLOW PARTICIPANT TO PURCHASE AN ALLOWABLE ITEM	Base Study			
	n	Weighted N	Weighted %	Weighted SE %
WIC vendor type	1230	36146		
Grocery	71	2095	5.9	0.90
Above-50-percent	*1*	*29*	*4.7*	*4.94*
Vendor size	1230	36097		
Small, 0-2 registers	*16*	*491*	*5.4*	*1.50*
Medium, 3-7 registers	25	697	5.7	1.26
Large, 8 or more registers	31	926	6.3	1.27
Geographic location	1230	36146		
Urban	61	1798	6.4	1.06
Large rural city/town	*6*	*178*	*5.3*	*2.11*
Small or isolated rural town	*5*	*148*	*3.2*	*1.53*
Has scanning equipment	1230	36146		
Yes	59	1741	5.9	0.95
No	*13*	*383*	*5.6*	*1.88*
Volume of WIC sales in FY2011 (monthly average)	1229	36117		
$0–2,774	22	653	7.6	1.99
$2,775–7,124	*15*	*440*	*4.7*	*1.33*
$7,125–15,879	*18*	*528*	*5.6*	*1.67*
$15,880 or more	*17*	*503*	*5.8*	*1.59*
Identified as high risk	1230	36146		
Yes	*5*	*146*	*2.4*	*0.99*
No	67	1978	6.6	1.02
Received routine monitoring visit in previous year	1230	36146		
Yes	25	734	5.9	1.37
No	47	1390	5.9	1.07
Type of training received in previous year	1227	36059		
Annual	43	1269	5.9	1.10
Interactive	29	855	5.8	1.48

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once in states that use paper food instruments. Findings for the CVV study are not presented, since too few cases were identified to allow for reliable estimates after stratifying by vendor characteristics.

Table F-6c. Number and Percent of Vendors where *Cashier Would Not Allow Participant to Purchase an Allowable Item*, by Transaction Characteristics, Base Study, Safe Buys Only[1]

CASHIER WOULD NOT ALLOW PARTICIPANT TO PURCHASE AN ALLOWABLE ITEM	Base Study			
	n	Weighted N	Weighted %	Weighted SE
Use of scanning equipment	1264	36146		
Used scanning equipment	31	890	3.2	0.62
Did not have or did not use scanning equipment	*12*	*344*	*4.2*	*1.38*
Cashier familiarity with WIC	1264	36146		
Cashier familiar	33	946	2.9	0.51
Cashier unfamiliar	*10*	*287*	*9.0*	*2.73*
Whether buyer saw purchase price entered	1247	35661		
Entered by cashier, register, or buyer	32	916	3.0	0.56
Not entered, did not see it entered	*6*	*173*	*3.7*	*1.54*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a safe buy in states that use paper food instruments. Findings for the CVV study are not presented, since too few cases were identified to allow for reliable estimates after stratifying by transaction characteristics.

Table F-6d. Number and Percent of Vendors where *Cashier Would Not Allow Participant to Purchase an Allowable Item*, by Vendor Management Practices and Study Type, Across All Buys[1]

CASHIER WOULD NOT ALLOW PARTICIPANT TO PURCHASE AN ALLOWABLE ITEM	Base Study			
	n	Weighted N	Weighted %	Weighted SE %
Vendor to participant ratio	1230	36146		
Low (1: 100 to <150)	*17*	*492*	*4.2*	*1.43*
Medium (1: 150 to <225)	20	589	5.3	1.30
High (1: 225 to <752)	35	1043	7.9	1.79
Requires receipt to be provided	1230	36146		
Yes	33	974	6.2	1.46
No	39	1150	5.7	1.11
Monitoring visits conducted at least annually	1230	36146		
Yes	41	1210	6.7	1.25
No	31	914	5.1	1.29
Conducts inventory audits	1230	36146		
Yes	49	1442	5.4	1.03
No	23	682	7.2	1.80
Split-tender policy				
Vendors required to accept split-tender	--	--	--	--
Vendors allowed to accept split-tender	--	--	--	--

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that had three completed buys and committed the particular violation at least once in states that use paper food instruments. Findings for the CVV study are not presented, since too few cases were identified to allow for reliable estimates after stratifying by vendor management practices.

Table F-7a. Number and Percent of Vendors with *Improper Response to a Partial Buy*, By Study Type, Partial Buys Only[1]

IMPROPER RESPONSE TO PARTIAL BUY[2]	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Total WIC Vendors	1230	35796			1186	40557		
Yes, improper response	196	5701	15.9	2.30	102	4344	10.7	2.01
No, correct response	1034	30095	84.1	2.30	1084	36214	89.3	2.01
Type of Food Package[2]	1230	35796		p<0.001	1186	40557		
Woman	43	1245	10.5	2.66	51	2189	10.8	2.19
Child	103	3004	25.0	3.27	51	2155	10.6	2.26
Infant	50	1452	12.2	2.71	--	--	--	--

[1] Results are based on a weighted estimate of vendors that were visited for a partial buy. Not applicable to base study buys in states with EBT.

[2] Allowed a partial buy when state prohibits partial buys; disallowed a partial buy when state allows partial buys.

Table F-7b. Number and Percent of Vendors with *Improper Response to a Partial Buy*, by Vendor Characteristics and Study Type, Partial Buys Only [1]

IMPROPER RESPONSE TO PARTIAL BUY[2]	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
WIC vendor type	1230	35796			1186	40557		
Grocery	186	5405	15.4	2.28	99	4209	10.5	1.96
Above-50-percent	*10*	*295*	*45.6*	*8.67*	*3*	*135*	*22.2*	*11.26*
Vendor size	1227	35708		p<0.01	1183	40490		p<0.01
Small, 0-2 registers	69	1998	22.4	3.36	51	2176	22.1	4.55
Medium, 3-7 registers	70	2038	16.6	2.92	32	1387	9.8	2.61
Large, 8 or more registers	57	1664	11.5	2.20	*19*	*781*	*4.7*	*1.16*
Geographic location	1230	35796			1186	40557		
Urban	178	5179	18.6	2.71	89	3769	12.3	2.44
Large rural city/town	*7*	*204*	*6.2*	*1.97*	*6*	*267*	*6.9*	*2.82*
Small or isolated rural town	*11*	*317*	*6.9*	*2.52*	*7*	*308*	*5.1*	*2.13*
Has scanning equipment	1230	35796		p<0.01	1186	40557		p<0.01
Yes	141	4110	14.1	2.15	64	2679	8.0	1.74
No	55	1591	23.8	3.77	38	1664	23.4	4.94
Volume of WIC sales in FY2011 (monthly average)	1229	35767			1186	40557		
$0–2,774	43	1246	14.7	2.93	21	892	9.0	2.34
$2,775–7,124	51	1481	15.8	2.79	33	1451	13.5	3.08
$7,125–15,879	48	1396	15.2	2.76	24	995	10.6	3.00
$15,880 or more	54	1577	18.1	2.86	24	1005	9.6	2.46
Identified as high risk	1230	35796			1186	40557		p<0.01
Yes	44	1280	20.6	3.68	37	1622	23.3	5.52
No	152	4421	15.0	2.27	65	2721	8.1	1.63
Received routine monitoring visit in previous year	1230	35796			1186	40557		p<0.05
Yes	77	2223	18.1	3.34	51	2229	17.1	3.70
No	119	3478	14.8	2.50	51	2115	7.7	2.13
Type of training received in previous year	1227	35709			1184	40471		p<0.05
Annual	109	3179	15.0	2.33	45	1842	7.4	1.75
Interactive	87	2522	17.3	3.46	57	2502	16.1	3.81

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a partial buy. Not applicable to base study buys in states with EBT.

[2] Allowed a partial buy when state prohibits partial buys; disallowed a partial buy when state allows partial buys.

Table F-7c. Number and Percent of Vendors with *Improper Response to a Partial Buy,* by Transaction Characteristics and Study Type, Partial Buys Only[1]

IMPROPER RESPONSE TO PARTIAL BUY[2]	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE	n	Weighted N	Weighted %	Weighted SE
Use of scanning equipment	1230	35796		*p*<0.01	1186	40557		*p*<0.01
Used scanning equipment	132	3848	13.7	2.14	61	2548	7.9	1.71
Did not have or did not use scanning equipment	64	1853	24.1	3.55	41	1796	22.1	4.59
Cashier familiarity with WIC	1230	35796			1186	40557		
Cashier familiar	183	5327	16.1	2.25	99	4212	11.3	2.13
Cashier unfamiliar	*13*	*374*	*14.0*	*4.54*	*3*	*132*	*4.2*	*2.44*
Whether buyer saw purchase price entered[3]	1222	35566		*p*<0.05	806	35575		
Entered by cashier, register, or buyer	152	4423	14.7	2.21	69	3039	10.3	2.24
Not entered, did not see it entered	42	1220	22.7	3.98	28	1236	20.6	5.26

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a partial buy. Not applicable to base study buys in states with EBT.

[2] Allowed a partial buy when state prohibits partial buys; disallowed a partial buy when state allows partial buys.

[3] Not applicable to stores in EBT states.

Table F-7d. Number and Percent of Vendors with *Improper Response to a Partial Buy*, by Vendor Management Practices and Study Type, Partial Buys Only[1]

IMPROPER RESPONSE TO PARTIAL BUY[2]	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
WIC policy on partial buys	1230	35796			1147	38834		*p*<0.05
Allowed	124	3633	12.5	2.03	66	2779	8.2	1.96
Prohibited for all food packages	62	1776	36.0	7.31	35	1521	30.4	7.75
Prohibited for infant formula	*10*	*291*	*16.1*	*3.33*	--	--	--	--
Vendor to participant ratio	1230	35796			1186	40557		
Low (1: 100 to <150)	79	2256	19.3	4.95	47	1977	15.3	4.08
Medium (1: 150 to <225)	35	1021	9.3	2.32	*9*	*399*	*3.3*	*1.38*
High (1: 225 to <752)	82	2423	18.4	3.90	46	1968	12.5	3.74
Monitoring visits conducted at least annually	1230	35796			1186	40557		
Yes	75	2200	12.2	2.50	35	1464	7.2	2.35
No	121	3501	19.7	3.67	67	2879	14.3	3.13

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a partial buy. Not applicable to base study buys in states with EBT.

[2] Allowed a partial buy when state prohibits partial buys; disallowed a partial buy when state allows partial buys.

Appendix G: Substitutions

Table G-1. Number and Percent of WIC Vendors Accepting Buyer-Initiated Substitutions[1]

Substitutions	Base Study				CVV Study			
	n	N	%	SE %	n	N	%	SE %
Minor	933	40656			578	39129		
Substitution Accepted	146	7500	18.4	1.88	218	16584	42.4	3.00
Substitution Not Accepted	787	33156	81.6	1.88	360	22544	57.6	3.00
Major	917	41363			596	39730		
Substitution Accepted	44	2297	5.6	1.10	93	7223	18.2	2.64
Substitution Not Accepted	873	39067	94.4	1.10	503	32507	81.8	2.64

[1] Results are based on a weighted estimate of vendors that were visited for a substitution buy, and the buyer attempted to substitute a non-WIC item for a WIC benefit.

Table G-2a. Number and Percent of WIC Vendors Allowing a Minor Substitution, by Vendor Characteristics and Study Type[1]

ALLOWED MINOR SUBSTITUTION	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
WIC vendor type	933	40656			578	39129		
Grocery	146	7500	18.8	1.91	214	16346	42.4	3.01
Above-50-percent	0	0	--	--	*4*	*238*	*38.6*	*17.24*
Vendor size	931	40579			578	39122		p<0.001
Small, 0-2 registers	42	2170	21.9	3.76	79	5926	64.1	5.89
Medium, 3-7 registers	52	2602	19.0	2.45	65	4765	33.9	4.35
Large, 8 or more registers	52	2728	16.1	2.74	74	5893	37.3	4.01
Geographic location	933	40656			578	39129		p<0.05
Urban	109	5734	18.5	2.15	174	13782	46.1	3.47
Large rural city/town	*17*	*862*	*18.7*	*4.28*	*15*	*932*	*26.7*	*7.61*
Small or isolated rural town	20	904	17.9	5.13	29	1870	32.5	8.00
Has scanning equipment	933	40656			578	39129		p<0.01
Yes	117	5883	17.1	1.91	164	12015	37.4	2.77
No	29	1617	25.6	5.51	54	4569	65.4	6.57
Stand-aside kiosk used to scan WIC items	324	5435			183	4907		
Yes	*7*	*126*	*9.7*	*4.20*	22	530	41.5	7.81
No	*16*	*270*	*6.5*	*2.40*	*15*	*402*	*11.1*	*3.49*
Volume of WIC sales in FY2011 (monthly average)	932	40598		p<0.001	578	39129		p<0.01
$0–2,774	55	2771	27.8	4.01	81	5762	56.3	4.76
$2,775–7,124	32	1725	18.6	2.97	56	4456	43.5	4.75
$7,125–15,879	36	1918	17.1	2.73	43	3474	39.2	4.98
$15,880 or more	23	1086	10.7	2.31	38	6903	29.5	5.36
Identified as high risk	933	40656			578	39129		
Yes	20	986	16.1	4.30	43	3356	49.7	6.22
No	126	6514	18.9	1.90	175	13228	40.8	3.05
Monitoring visits received in previous year	933	40656			578	39129		p<0.01
Yes	39	2200	16.6	3.18	87	7017	53.7	5.01
No	107	5300	19.4	2.13	131	9568	36.7	3.29
Type of training received in previous year	931	40540			577	39043		
Annual	89	4325	17.4	2.27	125	9438	41.6	3.64
Interactive	57	3175	20.3	2.82	93	7146	43.8	4.27

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a substitution buy

Table G-2b. Number and Percent of WIC Vendors Allowing a Minor Substitution, by Transaction Characteristics and Study Type[1]

ALLOWED MINOR SUBSTITUTION	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Total WIC Vendors								
Use of scanning equipment	931	40581			578	39129		p<0.01
Used scanning equipment	108	5483	17.1	1.99	163	11927	37.7	2.76
Did not have or did not use scanning equipment	37	2000	23.5	4.25	55	4657	61.9	6.54
Cashier familiarity with WIC	930	40522			578	39129		
Cashier familiar	*8*	*464*	*13.4*	*4.27*	25	1791	44.8	7.10
Cashier unfamiliar	137	7019	18.9	2.02	193	14794	42.1	3.29
Purchase price entered on check[2]	588	34007			394	34135		
Yes	102	5891	20.3	2.31	146	12623	44.5	3.50
No	21	1213	24.4	4.63	34	2941	50.7	6.39

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a substitution buy.

[2] Not applicable to stores in EBT states.

Table G-2c. Number and Percent of WIC Vendors Allowing a Minor Substitution, by Vendor Management Practices and Study Type[1]

ALLOWED MINOR SUBSTITUTION	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Total WIC Vendors								
Benefit type	933	40656		p<0.001	578	39129		p<0.0001
Paper FIs	123	7104	20.2	2.13	181	15652	45.7	3.35
EBT	23	396	7.3	2.20	37	933	19.0	3.47
Vendor to participant ratio	933	40656			578	39129		p<0.01
Low (1: 100 to <150)	67	3172	22.5	3.83	95	7262	54.3	5.64
Medium (1: 150 to <225)	30	1661	14.6	3.53	50	3511	30.2	4.62
High (1: 225 to <752)	49	2667	17.6	2.21	73	5812	41.2	4.72
Monitoring visits conducted annually	933	40656			578	39129		
Yes	64	3458	17.7	2.46	94	7706	42.0	4.28
No	82	4042	19.2	2.83	124	8878	42.7	4.45
Split-tender policy					578	39129		
Vendors required to accept split-tender	--	--	--	--	201	15557	45.2	3.27
Vendors allowed to accept split-tender	--	--	--	--	*17*	*1027*	*21.7*	*5.40*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a substitution buy and committed the violation.

Table G-3a. Number and Percent of WIC Vendors Allowing a Major Substitution, by Vendor Characteristics and Study Type[1]

ALLOWED MAJOR SUBSTITUTION	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
WIC vendor type	917	41363			596	39730		
Grocery	44	2297	5.6	1.11	91	7047	18.0	2.46
Above-50-percent	0	0	--	--	*2*	*176*	*37.8*	*29.10*
Vendor size	912	41155			596	39730		
Small, 0-2 registers	*17*	*912*	*9.3*	*2.36*	31	2315	23.8	4.43
Medium, 3-7 registers	*10*	*462*	*3.1*	*1.03*	*18*	*1506*	*11.5*	*3.11*
Large, 8 or more registers	*15*	*845*	*5.1*	*1.65*	44	3403	20.2	3.42
Geographic location	917	41363			596	39730		
Urban	35	1852	5.8	1.28	78	6046	20.5	3.22
Large rural city/town	*3*	*177*	*5.0*	*2.69*	*6*	*463*	*11.3*	*4.23*
Small or isolated rural town	*6*	*268*	*4.4*	*2.29*	*9*	*714*	*11.8*	*3.86*
Has scanning equipment	917	41363			596	39730		
Yes	33	1656	4.8	1.16	72	5471	16.7	2.57
No	*11*	*640*	*9.1*	*2.79*	21	1753	25.4	5.59
Volume of WIC sales in FY2011 (monthly average)	917	41363			596	39730		
$0–2,774	*17*	*876*	*8.8*	*2.30*	23	1811	19.2	4.21
$2,775–7,124	*10*	*547*	*4.8*	*1.49*	27	2151	20.4	4.00
$7,125–15,879	*10*	*466*	*4.9*	*1.88*	*18*	*1442*	*15.3*	*3.72*
$15,880 or more	*7*	*408*	*3.9*	*1.62*	25	1819	17.5	4.75
Identified as high risk	917	41363			596	39730		
Yes	*7*	*409*	*5.6*	*2.50*	*17*	*1298*	*19.3*	*5.66*
No	37	1888	5.5	1.16	76	5925	18.0	2.52
Monitoring visits received in previous year	917	41363			596	39730		
Yes	*12*	*663*	*5.2*	*1.75*	25	2037	16.2	3.31
No	32	1634	5.7	1.34	68	5187	19.1	3.02
Type of training received in previous year	916	41306			595	39645		
Annual	34	1711	6.6	1.55	62	4596	18.2	3.07
Interactive	*10*	*586*	*3.8*	*1.25*	30	2543	17.7	3.50

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a substitution buy and committed the violation.

Table G-3b. Number and Percent of WIC Vendors Allowing a Major Substitution, by Transaction Characteristics and Study Type[1]

ALLOWED MAJOR SUBSTITUTION	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Use of scanning equipment	916	41344			596	39730		
Used scanning equipment	31	1538	4.6	1.15	69	5209	16.4	2.51
Did not have or did not use scanning equipment	*13*	*759*	*9.8*	*2.79*	24	2014	25.5	5.93
Cashier familiarity with WIC	916	41344			596	39730		
Cashier familiar	37	1927	5.1	1.15	81	6362	18.0	2.82
Cashier unfamiliar	*7*	*370*	*9.8*	*4.15*	*12*	*861*	*19.9*	*5.90*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a substitution buy.

Table G-3c. Number and Percent of WIC Vendors Allowing a Major Substitution, by Vendor Management Practices and Study Type[1]

ALLOWED MAJOR SUBSTITUTION	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Benefit type	917	41363			596	39730		
Paper FIs	37	2170	6.0	1.26	79	6859	19.7	3.00
EBT	*7*	*127*	*2.3*	*1.06*	*14*	*364*	*7.3*	*2.53*
Vendor to participant ratio	917	41363			596	39730		p<0.01
Low (1: 100 to <150)	*18*	*916*	*7.2*	*1.98*	29	2238	17.8	3.60
Medium (1: 150 to <225)	*12*	*707*	*5.8*	*1.94*	*9*	*781*	*6.6*	*2.38*
High (1: 225 to <752)	*14*	*674*	*4.1*	*1.74*	55	4204	27.3	5.34
Monitoring visits conducted annually	917	41363			596	39730		
Yes	24	1249	5.9	1.67	51	3880	18.5	4.22
No	20	1048	5.2	1.43	42	3343	17.8	3.13
Split-tender policy					596	39730		
Vendors required to accept split-tender	--	--	--	--	82	6819	19.2	2.91
Vendors allowed to accept split-tender	--	--	--	--	*11*	*404*	*9.8*	*3.74*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a substitution buy.

Appendix H: Overcharge and Undercharge

Table H-1a. National Estimate of Undercharge and Overcharge Rates for Safe Buys by Study Type[1]

Type of Purchase Price Deviation	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Total WIC Vendors								
Undercharge	1697	36986			1117	39019		
Yes	78	1685	4.6	0.80	57	1957	5.0	0.80
No	1619	35301	95.4	0.80	1060	37062	95.0	0.80
Overcharge	1697	36986			1117	39019		
Yes	91	2060	5.6	0.75	52	2020	5.2	0.91
No	1606	34926	94.4	0.75	1065	36999	94.8	0.91

[1] Results are based on a weighted estimate of vendors that were visited for a safe buy and committed the particular violation.

Table H-1b. National Estimate of Undercharge and Overcharge Rates for Partial Buys by Study Type[1]

Type of Purchase Price Deviation	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Total WIC Vendors								
Undercharge	1108	32266			1128	38922		
Yes	34	994	3.0	0.60	28	946	2.4	0.62
No	1074	31271	97.0	0.60	1100	37976	97.6	0.62
Overcharge	1108	32266			1128	38922		
Yes	48	1401	4.3	0.82	70	2864	7.4	1.15
No	1060	30865	96.0	0.82	1058	36058	92.6	1.15

[1] Results are based on a weighted estimate of vendors that were visited for a partial buy and committed the particular violation.

Table H-2a. Number and Percent of WIC Vendors Undercharging, by Vendor Characteristics and Study Type, Safe Buys Only[1]

UNDERCHARGED	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Vendor type	1697	36986			1117	39020		
Grocery	70	1454	4.0	0.68	57	1957	5.0	0.80
Above-50-percent	*8*	*232*	*43.1*	*12.9*	0	0	--	--
Geographic location	1697	36986			1117	39020		
Urban	62	1354	4.8	0.99	38	1369	4.6	0.93
Large rural city/town	*3*	*66*	*1.8*	*1.14*	*10*	*292*	*7.8*	*2.83*
Small/Isolated small rural town rural town	*13*	*265*	*5.0*	*1.81*	*9*	*296*	*5.1*	*1.87*
Vendor size	1697	36986		*p*<0.01	1111	38820		*p*<0.05
Small, 0-2 registers	33	885	12.3	2.85	23	886	10.4	2.37
Medium, 3-7 registers	25	470	3.4	0.76	*19*	*625*	*4.5*	*1.14*
Large, 8 or more registers	20	330	2.0	0.53	*14*	*403*	*2.4*	*0.88*
Volume of WIC sales in 2011 (monthly average)	1696	36957			1117	39020		
$0–2,774	21	461	5.3	1.36	*17*	*561*	*5.9*	*1.46*
$2,775–7,124	24	477	5.3	1.26	*16*	*614*	*6.0*	*1.49*
$7,125–15,879	*15*	*329*	*3.5*	*1.08*	*12*	*375*	*4.0*	*1.21*
$15,880 or more	*18*	*418*	*4.3*	*1.26*	*12*	*407*	*4.1*	*1.36*
Identified as high risk	1697	36986		*p*=0.07	1117	39020		
Yes	*25*	*575*	*10.5*	*3.38*	*14*	*555*	*5.0*	*0.80*
No	53	1110	3.5	0.68	43	1402	4.3	0.72
Received routine monitoring visit in previous year	1697	36986			1117	39020		
Yes	26	613	5.3	1.5	20	850	6.9	1.85
No	52	1073	4.2	0.89	37	1108	4.2	0.73

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a safe buy and committed the particular violation.

Table H-2b. Number and Percent of WIC Vendors Undercharging, by Transaction Characteristics and Study Type, Safe Buys Only[1]

UNDERCHARGED	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Use of scanning equipment	1697	36986		*p*<0.01	1117	39019		
Used scanning equipment	50	882	2.7	0.44	43	1341	4.1	0.71
Did not have or did not use scanning equipment	28	803	18.3	4.09	*14*	*616*	*9.9*	*3.12*
Cashier familiarity with WIC	1697	36986			1116	38975		
Cashier familiar	*7*	*162*	*4.8*	*1.95*	*4*	*146*	*3.8*	*1.93*
Cashier unfamiliar	71	1523	4.5	0.82	53	1811	5.1	0.86
Whether buyer saw purchase price entered[2]	1121	32076			781	34558		*p*<0.05
Entered by cashier, register, or buyer	44	1262	4.2	0.95	26	1145	3.9	0.83
Not entered, did not see it entered	*7*	*201*	*10.6*	*3.88*	*13*	*573*	*11.0*	*3.08*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a safe buy and committed the particular violation.

[2] not applicable to stores in paper-based states

Table H-2c. Number and Percent of WIC Vendors Undercharging, by Vendor Management Practices and Study Type, Safe Buys Only[1]

UNDERCHARGED	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Benefit type	1697	36986			1117	39020		
Paper FIs	51	1464	4.6	0.90	39	1718	5.0	0.89
EBT	27	222	4.5	1.10	*18*	*239*	*5.4*	*1.26*
Vendor to participant ratio	1697	36986			1117	39020		*p*<0.05
Low (1: 100 to <150)	39	676	5.9	1.67	32	1057	8.5	1.88
Medium (1: 150 to <225)	*12*	*326*	*2.9*	*0.92*	*12*	*472*	*4.0*	*1.20*
High (1: 225 to <752)	27	684	4.7	1.35	*13*	*429*	*2.9*	*0.77*
Requires store to provide receipt	1697	36986		*p*<0.05	1117	39020		
Yes	40	592	3.0	0.62	31	811	4.0	0.79
No	38	1093	6.4	1.48	26	1147	6.0	1.38
Monitoring visits conducted at least annually	1697	36986			1117	39020		
Yes	41	1011	5.4	1.32	23	824	4.2	1.21
No	37	674	3.7	0.83	34	1133	5.8	0.99
Split-tender policy					1117	39020		
Vendors required to accept split-tender	--	--	--	--	48	1749	5.0	0.87
Vendors allowed to accept split-tender	--	--	--	--	*9*	*208*	*5.0*	*2.00*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

[1] Results are based on a weighted estimate of vendors that were visited for a safe buy and committed the particular violation.

Table H-2e1. Average Dollar Value of Undercharge By Study Type

UNDERCHARGED	Base Study				CVV Study			
	n	Weighted N	Mean ($)	SE of Mean ($)	n	Weighted N	Mean ($)	SE of Mean ($)
Total WIC Vendors for Safe Buy	**1697**	**36986**	**-0.07**	**0.01**	**1065**	**36999**	**-0.04**	**0.01**
Type of Food Package†				*p*<0.05†				
Woman	554	12023	-0.07	0.02	533	18285	-0.04	0.01
Child	*552*	*12189*	*-0.03*	*0.01*	*532*	*18714*	*-0.03*	*0.01*
Infant	591	12773	-0.11	0.03	0	0.00	--	--
Benefit Type				*p*<0.05			*p*=0.0045	*p*<0.01
EBT	576	4910	-0.16	0.05	326	4296	-0.13	0.03
Paper FIs	1121	32076	-0.06	0.02	739	32704	-0.02	0.01
Total WIC Vendors for Partial Buy	**1107**	**32237**	**-0.03**	**0.01**	**1058**	**36058**	**-0.02**	**0.01**

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

†Difference between infant and child

Table H-2e1. Average Dollar Value of Undercharge Among Vendors That Undercharged By Study Type

UNDERCHARGED	Base Study				CVV Study			
	n	Weighted N	Mean ($)	SE of Mean ($)	n	Weighted N	Mean ($)	SE of Mean ($)
Undercharged for Safe Buy	**78**	**1685**	**-1.53**	**0.25**	**57**	**1957**	**-0.69**	**0.13**
Type of Food Package	p=0.0069†	p=0.0485‡		p<0.0001*				
Woman	24	609	-1.35	0.35	29	935	-0.86	0.22
Child	26	667	-0.60	0.17	28	1023	-0.54	0.16
Infant	28	409	-3.32	0.60	0	0	--	--
Benefit Type				p<0.0001				p<0.0001
EBT	27	222	-3.50	0.28	18	239	-2.28	0.33
Paper FIs	51	1464	-1.23	0.26	39	1718	-0.47	0.13
Undercharged for Partial Buy	**33**	**966**	**-0.85**	**0.20**	**28**	**946**	**-0.90**	**0.25**

†Difference between woman and infant ‡Difference between woman and child *Difference between woman and child

Table H-2f. Odds of Vendors Undercharging When Also Committing an Administrative Violation, Safe Buy Only

UNDERCHARGED	Base Study		CVV Study	
	Weighted OR	Weighted 95% CI	Weighted OR	Weighted 95% CI
Total WIC Vendors				
Failed to provide receipt (compared to provided a receipt)	**5.66**	**3.31, 9.66**	**6.08**	**3.13, 11.78**
Cashier unfamiliar with conducting WIC transactions (compared to cashier familiar)	1.08	0.47, 2.50	0.73	0.24, 2.19
Improper countersignature procedures (compared to proper countersignature) [1]	0.97	0.47, 1.98	1.30	0.63, 2.70

[1] Not applicable to stores in EBT states.

Table H-3b. Number and Percent of WIC Vendors Overcharging, by Vendor Characteristics and Study Type, Safe Buys Only

OVERCHARGED	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Total WIC Vendors								
Vendor type	1697	36986		$p<0.05$	1117	39019		
Grocery	91	2060	5.6	0.77	51	1975	5.1	0.93
Above-50-percent	0	0	0	0	*1*	*45*	*16.8*	*9.72*
Geographic location	1697	36986			1117	39019		
Urban	68	1584	5.7	0.85	44	1731	5.9	1.14
Large rural city/town	*9*	*137*	*3.7*	*1.41*	*2*	*89*	*2.4*	*1.62*
Small/Isolated small rural town rural town	*14*	*339*	*6.4*	*1.96*	*6*	*200*	*3.5*	*1.64*
Vendor size	1697	36986		$p<0.001$	1111	38821		$p<0.001$
Small, 0-2 registers	38	1040	14.4	2.49	28	1235	14.5	2.65
Medium, 3-7 registers	27	574	4.2	0.98	*15*	*509*	*3.7*	*1.08*
Large, 8 or more registers	26	446	2.8	0.69	*9*	*277*	*1.7*	*0.62*
Volume of WIC sales in 2011 (monthly average)	1696	36957		$p<0.01$	1117	39019		
$0–2,774	33	857	9.9	1.69	*18*	*734*	*7.8*	*2.05*
$2,775–7,124	20	472	5.2	1.55	*17*	*660*	*6.4*	*1.91*
$7,125–15,879	*16*	*376*	*4.0*	*1.05*	*8*	*290*	*3.1*	*1.17*
$15,880 or more	22	355	3.6	1.01	*9*	*336*	*3.4*	*1.33*
Identified as high risk	1697	36986			1117	39019		
Yes	*19*	*522*	*9.6*	*2.79*	*12*	*498*	*7.9*	*2.18*
No	72	1538	4.9	0.71	40	1522	4.7	0.97
Received routine monitoring visit in previous year	1697	36986			1117	39019		
Yes	26	640	5.6	1.42	*16*	*672*	*5.4*	*1.39*
No	65	1420	5.6	0.85	36	1349	5.1	1.09

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

Table H-3c. Number and Percent of WIC Vendors Overcharging, by Transaction Characteristics and Study Type, Safe Buys Only

OVERCHARGED	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Use of scanning equipment	1697	36986		*p*<0.001	1116	38975		*p*<0.001
Used scanning equipment	59	1172	3.7	0.60	28	963	3.0	0.66
Did not have or did not use scanning equipment	32	888	16.9	3.00	24	1058	15.4	3.00
Cashier familiarity with WIC	1697	36986			1116	38975		
Cashier familiar	*6*	*152*	*4.6*	*1.94*	*6*	*234*	*6.1*	*2.35*
Cashier unfamiliar	85	3172	5.7	0.77	46	1786	5.1	0.97
Whether buyer saw purchase price entered[1]	1121	32076			781	34558		*p*<0.001
Entered by cashier, register, or buyer	54	1542	5.1	0.84	*19*	*840*	*2.9*	*0.75*
Not entered, did not see it entered	*10*	*288*	*15.3*	*5.58*	24	1059	20.3	3.75

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error > 30%).

[1] not applicable to stores in paper-based states

Table H-3d. Number and Percent of WIC Vendors Overcharging, by Vendor Management Practices and Study Type, Safe Buys Only

OVERCHARGED	Base Study				CVV Study			
	n	Weighted N	Weighted %	Weighted SE %	n	Weighted N	Weighted %	Weighted SE %
Benefit type	1697	36986			1117	39019		*p*<0.05
Paper FIs	64	1830	5.7	0.85	43	1899	5.5	1.02
EBT	27	230	4.7	0.98	*9*	*121*	*2.74*	*0.91*
Vendor to participant ratio	1697	36986			1117	39019		
Low (1: 100 to <150)	28	705	6.2	1.47	23	882	7.1	1.87
Medium (1: 150 to <225)	25	622	5.6	1.32	*10*	*443*	*3.8*	*1.10*
High (1: 225 to <752)	38	733	5.1	1.15	*19*	*696*	*4.7*	*1.53*
Requires store to provide receipt	1697	36986		*p*<0.05	1117	39019		*p*=0.05
Yes	46	767	3.8	0.78	22	690	3.5	1.04
No	45	1293	7.6	1.22	30	1330	7.0	1.49
Split-tender policy					1117	39019		
Vendors required to accept split-tender	--	--	--	--	39	1563	4.5	0.80
Vendors allowed to accept split-tender	--	--	--	--	*13*	*457*	*10.9*	*4.42*

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

Table H-3e1. Average Dollar Value of Overcharge Overall By Buy Type and Study Type

OVERCHARGED	Base Study				CVV Study			
	n	Weighted N	Mean ($)	SE of Mean ($)	n	Weighted N	Mean ($)	SE of Mean ($)
Total WIC Vendors for Safe Buy	1697	36986	0.06	0.01	1059	37018	0.03	0.01
Type of Food Package								*p*<0.01†
Woman	554	12024	0.05	0.01	532	18399	0.05	0.01
Infant	591	12773	0.04	0.01	--	--	--	--
Child	552	12189	0.08	0.03	527	18619	0.01	0.01
Benefit Type								
EBT	576	4910	0.08	0.03	317	4178	0.04	0.02
Paper FIs	1121	32076	0.06	0.01	742	32480	0.03	0.01
Total WIC Vendors for Partial Buy	1108	32266	0.21	0.08	1100	37976	0.11	0.03
Type of Food Package				*p*<0.05†				*p*<0.05†
Woman	368	10720	0.16	0.06	560	19183	0.16	0.04
Infant	382	11119	0.43	0.24	--	--	--	--
Child	358	10427	0.04	0.02	540	18793	0.06	0.02

† Difference between woman and child food package

Table H-3e2. Average Dollar Value of Overcharge Among Vendors That Overcharged By Buy Type and Study Type

OVERCHARGED	Base Study				CVV Study			
	n	Weighted N	Mean ($)	SE of Mean ($)	n	Weighted N	Mean ($)	SE of Mean ($)
Overcharged for Safe Buy	91	2060	1.08	0.14	51	1976	0.61	0.12
Type of Food Package								*p*<0.01†
Woman	33	719	0.89	0.15	28	1049	0.93	0.19
Infant	17	451	1.24	0.31	--	--	--	--
Child	41	890	1.16	0.28	23	927	0.25	0.09
Benefit Type								
EBT	*27*	*230*	*1.71*	*0.53*	*9*	*121*	*1.44*	*0.62*
Paper FIs	64	1830	1.00	0.14	42	1855	0.56	0.12
Overcharged for Partial Buy	48	1401	4.88	1.84	70	2864	1.46	0.21
Type of Food Package				*p*<0.01†				*p*=0.06†
Woman	21	612	2.78	0.53	44	1779	1.72	0.27
Infant	*16*	*467*	*10.21*	*5.18*	--	--	--	--
Child	*11*	*322*	*1.15*	*0.41*	26	1085	1.04	0.24

Italicized text indicates that the estimate does not meet standards of reliability (n<20 or relative standard error >30%).

† Difference between woman and child food package

Table H-3f. Odds of Vendors Overcharging When Also Committing an Administrative Violation

OVERCHARGED	Base Study		CVV Study	
	Weighted OR	Weighted 95% CI	Weighted OR	Weighted 95% CI
Total WIC Vendors				
Failed to provide receipt (compared to provided a receipt)	**13.88**	**8.44, 22.85**	**8.16**	**3.93, 16.93**
Cashier unfamiliar with conducting WIC transactions (compared to cashier familiar)	0.80	0.33, 1.92	1.21	0.49, 2.97
Improper countersignature procedures (compared to proper countersignature) [1]	1.29	0.64, 2.60	**3.77**	**1.72, 8.23**

[1] Not applicable to stores in EBT states.

Table H-4. National estimate of overcharge, undercharge, and improper payments overall and by study type

OVERALL	TOTAL IP Estimates (in millions)		Base Study IP Estimates (in millions)		CVV Study IP Estimates (in millions)	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
National estimate of overcharges	$13.79	($7.01, $20.58)	$12.63	($5.96, $19.31)	$1.16	($50.423, $2.27)
National estimate of undercharges	-$54.36	(-$81.59, -$27.14)	-$51.55	(-$79.07, -$24.03)	-$2.82	($-4.43, -$1.20)
National estimate of net value of overcharges and Undercharges (sum of overcharges and undercharges)	-$40.57	($-68.35, -$12.79)	-$38.92	(-$66.96, -$10.87)	-$1.65	($-3.61, $0.30)
National estimate of improper payments (sum of the absolute value of overcharges and undercharges)	$68.16	($39.84, 96.48)	$64.18	($35.60, $92.77)	$3.98	($2.01, $5.94)

Table H-4a. National estimate of overcharge, undercharge, and improper payments overall and by study type among vendors in paper-based states only

AMONG VENDORS IN PAPER-BASED STATES ONLY	TOTAL IP Estimates (in millions)		Base Study IP Estimates (in millions)		CVV Study IP Estimates (in millions)	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
National estimate of overcharges	$9.20	($2.97, $15.42)	$8.26	($0.12, $14.40)	$0.94	($-0.14, $2.01)
National estimate of undercharges	-$15.80	(-$26.41, -$5.18)	-$14.63	($-25.34, -$3.93)	-$1.16	($-2.10, -$0.23)
National estimate of net value of overcharges and Undercharges (sum of overcharges and undercharges)	-$6.60	(-$17.81,$ 4.61)	-$6.37	($-17.55,$ 4.81)	-$0.23	($-1.63,$1.18)
National estimate of improper payments (sum of the absolute value of overcharges and undercharges)	$24.99	($11.67, $38.31)	$22.89	($9.49, $36.29)	$2.10	($0.65, $3.54)

Table H-4b. National estimate of overcharge, undercharge, and improper payments overall and by study type among vendors in EBT states only

AMONG VENDORS IN EBT STATES ONLY	TOTAL IP Estimates (in millions)		Base Study IP Estimates (in millions)		CVV Study IP Estimates (in millions)	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
National estimate of overcharges	$4.60	($1.99, $7.21)	$4.37	($1.83, $6.92)	$0.23	($-0.05, $0.50)
National estimate of undercharges	-$38.57	($-64.53, -$12.61)	-$36.92	(-$63.04, -$10.79)	-$1.65	($-2.94, -$0.37)
National estimate of net value of overcharges and Undercharges (sum of overcharges and undercharges)	-$33.97	($-60.29, -$7.65)	-$32.54	(-$59.02, -$6.06)	-$1.43	($-2.77, -$0.09)
National estimate of improper payments (sum of the absolute value of overcharges and undercharges)	$43.17	($17.31, $69.03)	$41.29	($15.27, $67.31)	$1.88	($0.60, $3.16)